FPG

PRODUCT MANUAL

visair
REFRIGERATED
FOOD AND DRINK CABINETS

R290

Open Front
Food & Drinks Cabinet
Refrigerant R-290

INSTALLATION - OPERATION - MAINTENANCE

Warnings

Operational Safety	This appliance is not intended for use by young children or infirm persons, unless they have been adequately supervised by a responsible person, to ensure that they can use the appliance safely. Young children should be supervised, to ensure that they do not play with the appliance.
Water	THIS UNIT IS NOT WATERPROOF. DO NOT USE A WATER JET SPRAY TO CLEAN THE INTERIOR OR EXTERIOR OF THIS CABINET.
Caution	Do not store explosive substances, such as aerosol cans with flammable propellant, in this appliance.
Mains Supply Cord	If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons, in order to avoid a hazard.
Specialist Disposal	Specialist disposal procedures are required for the safe removal of refrigerant gasses and potentially flammable foam materials. Pentane, Dimethyl Ether, Isobutene, Butane and Propane may be present.
Hazardous Substances	The cabinet does not contain any of the following, in its construction: Asbestos PCBs (Oils containing polychlorinated biphenyl) Mercury

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INTRODUCTION

Welcome

VISAIR CABINETS - INTRODUCTION

Future Products Group (FPG)

Welcome to the world of FPG! Our products are designed and engineered to give you the optimal performance that you deserve with innovative visual merchandising appeal.

We are confident that you will be delighted with your state of the art Inline Visair food service cabinet, and that it will become a valued appliance in your store.

Guidance and Help

Any new appliance can seem very complex and confusing at first glance. To ensure you receive the utmost benefit from your new Inline Visair cabinet, there are two things you can do.

- Before operating the cabinet, please read the instruction book carefully and follow its recommendations. The time taken will be well spent. These instructions both general and technical tell you how to operate and look after your Inline Visair food service cabinet so that you can receive the full benefits that this cabinet has to offer.
- These instructions cannot, however, cover all eventualities. If you are unsure of any aspect of the installation, instructions or performance of your cabinet, contact your dealer promptly or contact us via email to support@fpgworld.com.

Warranty

VISAIR CABINETS - INTRODUCTION

Warranty Period

Future Products Group Limited warrants, to the original purchaser of an FPG manufactured food service cabinet, that for ONE YEAR (12 months) from the date of purchase, any defect in workmanship or material resulting in the product malfunctioning while under correct use will be rectified.

For refrigerated cabinets with integral or near-remote refrigeration the warranty is extended to THREE YEARS (36 months), for refrigeration condenser units. Conditions apply, see Liability Exceptions.

Liability under this warranty is limited to replacing or repairing a part, without charge.

Continued on next page

Warranty cont.

VISAIR CABINETS - INTRODUCTION

Liability Exceptions

Liability under this warranty does not include:

- Any loss, damage, or expenses directly or indirectly arising from the use of, or inability to use, the product or from any other cause.
- Any part of the cabinet which has been subject to misuse, neglect, alteration, incorrect installation, accident, or damage caused by transportation, use of abrasive or caustic chemicals, flood, fire or acts of God.
- Damage, resulting from failure to have the cabinet regularly serviced by a refrigeration engineer:
    - For cabinets with integral or near-remote refrigeration, every three months. NB: You will be required to provide copies of service records in the event of condenser failure.
    - For cabinets with remote refrigeration, annually.
- Any damage or malfunction, resulting from the use of non-FPG supplied spare parts.

Specific Exclusions

The following are specifically excluded from warranty:

- Breakage of glass or plastic components, or the replacement of LED lighting assemblies or gaskets.
- Maladjustment of the electronic refrigeration controller, by an unqualified person.
- For cabinets with integral or near-remote refrigeration, failure resulting from a lack of routine condenser / radiator cleaning.
- Failure to re-assemble the cabinet correctly after cleaning.
- Fair wear and tear.

Assessment

The liability under this warranty is dependent on an assessment by FPG, to determine the defect in workmanship or materials.

Time Limit

FPG does not guarantee that any service to be performed under this warranty will be carried out within any particular time limit.

Caution

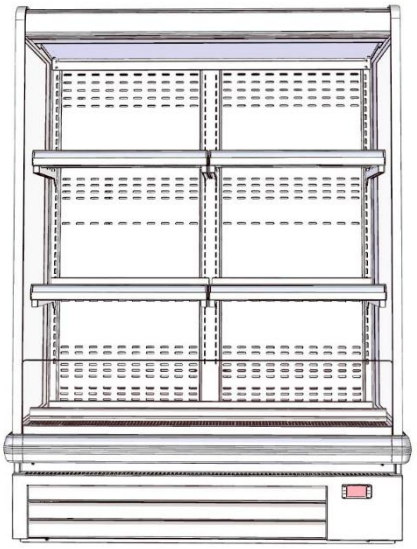
FPG will not be held responsible for any servicing costs incurred prior to FPG's acceptance of a warranty claim.

OPERATION

Cabinet Layout

VISAIR CABINETS - OPERATION

Visair Cabinet Configuration



These are fully self-contained, stand-alone, open front cabinets, with glass side panels and LED lighting.

The two metre wide cabinet has an acrylic centre divider, and each half is individually controllable.

Cabinets are available with two shelf configurations. See Mechanical Drawings.

They are fitted with automatic condensate removal units, ACRs, in the base of the cabinet.

The controls and refrigeration equipment are mounted in the base of the cabinet.

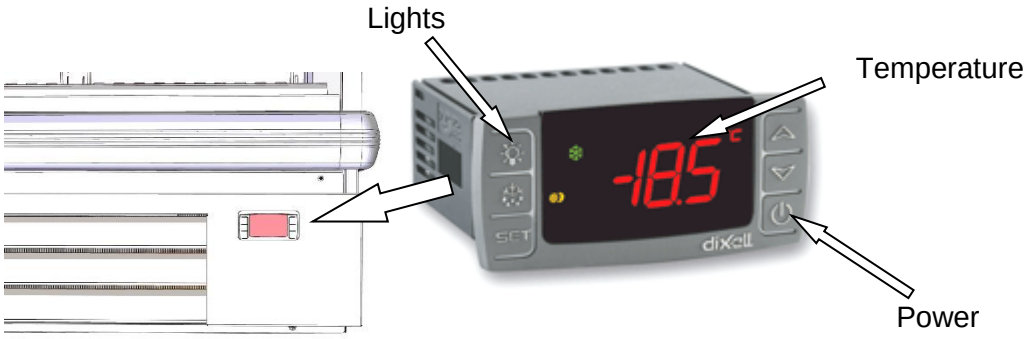
Cooling air for the refrigeration system is drawn in from the front of the cabinet, and exhausts from slots on the cabinet top.

Vaporised condensate mixes with this air flow and also exhausts from the top of the cabinet.

Controls

VISAIR CABINETS - OPERATION

Power, Lights and Refrigeration Controller



Preparation

VISAIR CABINETS - OPERATION

Shelf Location and Ticketing

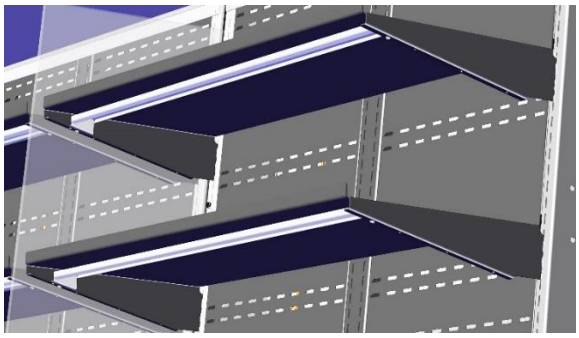
All shelves are adjustable in height and can easily be moved up or down, to match product size. The front edges of the shelves are profiled to carry ticketing/labels.

Shelf Adjustment

To alter the shelf position, slide it upwards to disengage it from the support pillars.

Insert it in the new position and push it down firmly.

Make sure it is pushed down as far as it can go. Failure to do this may result in shelf collapse, when loaded with product.



Switch Power On

Press the power button.

The temperature controller is pre-set to maintain the cabinet temperature between 2°C and 4°C. It should not need adjustment.

Load Cabinet

After the cabinet has run for a 30 minute initial cool-down period, load it with pre-chilled products.

The cabinet is designed to maintain the temperature of pre-chilled products.

If warm product is introduced, there could be a delay before the temperature falls to the normal operating level.

Loading Restrictions

It is important to leave adequate free space for the refrigerated air to circulate within the cabinet.

Allow at least 40mm above canned drinks, or other cylindrical containers.

The air grills at the front of the cabinet must not be covered or restricted.

Defrost Cycle

Defrosting of the evaporator coil is fully automatic.

Defrosting stops automatically when all the ice has melted.

Shelf Load Restrictions

- Two-piece pull out shelves must not be loaded with more than 15kg of evenly distributed products per shelf.
- Full width fixed shelves must not be loaded with more than 35kg of evenly distributed products per shelf.

Routines

VISAIR CABINETS - OPERATION

After Hours

Ideally, cabinets should not be turned off after hours or at night.

If a night blind is fitted, this should be lowered to reduce power consumption.

If the cabinet is turned off, transfer the products to a cool store. When the cabinet is turned on again, allow it to run for 30 minutes before returning the chilled products.

Cleaning

It is recommended to clean cabinets at the end of the working day, since they need to be shut down for this. See Cleaning section.

De-frost Cycle

Defrosting of the evaporator coil is fully automatic, taking place every two hours.

If you suspect that the defrost system is not working properly, have it checked by a qualified service person.

Operators must not attempt to adjust the refrigeration controller.

Temperature Checks

Cabinet temperatures should be routinely checked, to confirm satisfactory operation.

The refrigeration controller shows the temperature of the circulating air, as it enters the cooling coil. This will be slightly higher than the air temperature in the display area, so a temperature probe should be used to check product temperatures.

To avoid misleading temperature measurements, do not take a reading within 20 minutes of a defrost cycle.

TROUBLE SHOOTING

FAULT	POSSIBLE CAUSE	REMEDY
Cabinet does not operate/start	The mains isolating switch on the wall, circuit breaker or fuses are off at the power board	Turn isolating switch circuit breaker or fuses on
	The power switch on the controller is OFF	Press the power button
	The internal fuse has blown	***Have circuit checked and replace fuse***
	The controller is faulty	***Have the controller replaced***
HA2 Alarm Display on Controller	Compressor discharge pipe high temperature	Turn power off, clean condenser radiator & pre-filter. Turn power on. If no cooling, or alarm returns within 24 h, call for service.
Refrigerated Cabinet does not reach temperature	Ventilation grills are blocked	Vacuum or remove blockage
	Product blocking air grill	Place product on shelves
	Thermostat needs adjustment	***Adjust refrigeration controller***
	Ambient > 25°C & 60%RH	Adjust store air conditioning
	Evaporator coil iced up	***De-ice coil, check defrost parameters, replace controller if found faulty***
	Condenser radiator blocked	***Remove dust and debris***
	Refrigeration controller faulty	***Replace controller***
	Temperature probe damaged	***Replace temperature probe***
	Fans not operating	***Have fans checked/replaced***
Condensate Overflows	Defrost cycle unsuitable	***Have defrost cycle adjusted***
	Boil off element failed	***Replace element***
Cabinet lights not working	LED strip has failed	***Replace LED strip***
	LED power supply has failed	***Replace LED power supply***
	Internal fuse has blown	***Have circuit checked and replace fuse***
Aluminium parts corroded	Caustic detergent damage	Order replacement parts

Service Personnel Only

The table entries in ***italics*** indicate actions to be taken only by qualified Service Personnel.

CLEANING

Cautions

VISAIR CABINETS - CLEANING

Power

ALWAYS TURN THE POWER SUPPLY OFF BEFORE CLEANING.

Water

THIS UNIT IS NOT WATERPROOF. DO NOT USE A WATER JET SPRAY TO CLEAN THE INTERIOR OR EXTERIOR OF THIS CABINET.

Exterior

VISAIR CABINETS - CLEANING

Louvers

Use a vacuum cleaner to remove dust and fluff from the ventilation louvers on the front and top of the cabinet.

This will maintain the refrigeration efficiency, and prevent overheating.

Painted and Metal Surfaces

Painted, galvanised steel or aluminium surfaces should be cleaned with hot soapy water then dried off with paper towel or dry cloth. DO NOT clean surfaces with abrasive pads or cleaners as paint, galvanised steel and aluminium surfaces will be damaged.

Glass

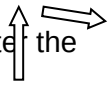
All glass should be cleaned using a good quality glass cleaner and a clean cloth.
DO NOT clean glass with abrasive pads or cleaners as the glass will be damaged.

Interior

VISAIR CABINETS - CLEANING

Side Glass

The inside surfaces of the side panels are most easily cleaned after the products and shelves have been removed.



Shelves

The shelves can be cleaned in place, or lifted off.

The complete shelf module can be removed by lifting it vertically, to disengage the support brackets from the back panel.

Base Tray

The base tray is mounted on runners, and can be pulled forward for cleaning.

Back Plates

Once the shelves have been removed, and the base drawer slightly opened, the back plates can be removed.

Lift the plate vertically, to disengage it from the bottom location slot, pull it forward, then lower it to disengage it from the top location slot. It can now be removed for cleaning.

Continued on next page

Interior cont.

VISAIR CABINETS - CLEANING

Cleaning the Base Cavity

With the base tray pulled out, sweep out, or use a vacuum cleaner, to remove any debris from the base cavity.

A Wet-and-Dry vacuum cleaner should be used, since there is likely to be some water in the bottom.

Fan Deck and Drain Hole

After removing the fixing screws, the fan deck can be lifted and unplugged from the cabinet for thorough cleaning.

Be careful not to trap the cables when it is replaced.

Check the drain hole is clear of debris.

Condensate Capacity Warning

The condensate tray and boil off heater is only designed to handle cooling-coil defrosting water that drains from the well during normal operation. The boil off container has a capacity of five litres.

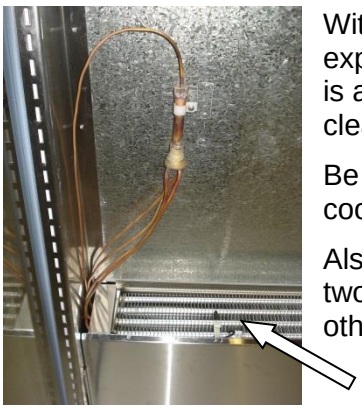
When cleaning, DO NOT fill the well with liquid or attempt to hose it out, as the condensate tray will overflow and leak onto the floor.

Cleaning Materials

Steel trays, shelves, grills etc. should be cleaned with hot soapy water then dried off with paper towel or dry cloth.

DO NOT use abrasive pads or cleaners as these may damage surfaces.
Warning: Dishwasher detergent may damage anodised aluminium parts.

Cooling Coil and Probes



With the back plates removed, the cooling coil is exposed. No cleaning is normally required, but if there is any debris visible, carefully remove it with a vacuum cleaner.

Be very careful not to bend or distort the fins of the cooling coil, as this would reduce the airflow.

Also be careful not to move or disturb the location of the two temperature probes. One is in free air, and the other is inserted between the fins of the coil.

Continued on next page

Mandatory Cleaning Routines

VISAIR CABINETS - CLEANING

Warning

It is mandatory to have the radiator fins cleaned periodically, by a refrigeration engineer. (see Servicing section).

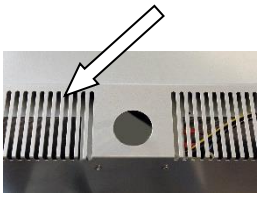
Failure to carry out routine cleaning/servicing schedules will void the warranty on the refrigeration equipment.

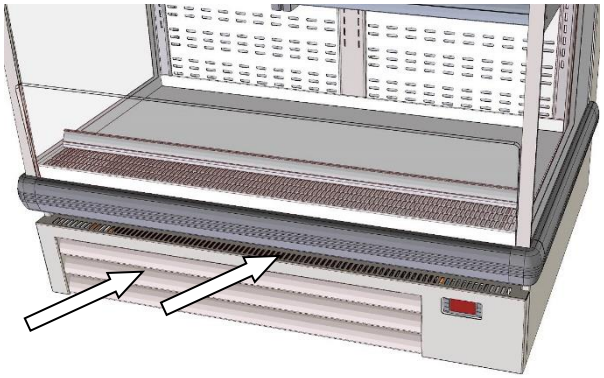
To maintain optimum performance, cleaning must be regular and thorough.
It is recommended that a schedule of cleaning operations should be drawn up.

Air Vents

Vacuum away any dust and fluff from all air vents.

The top air vents must be kept free of blockages at all times.





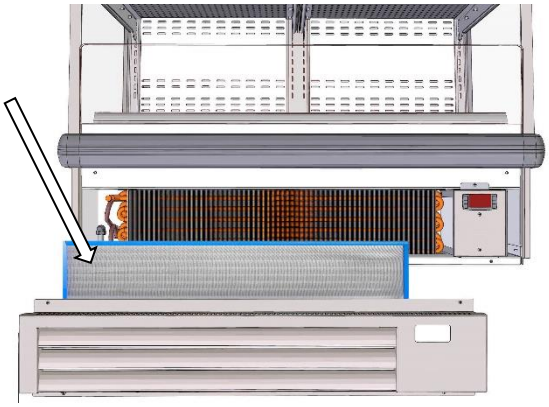
Condenser Radiator

Pull off the louver panel and pre-filter, shake dust from pre-filter and wash if needed.

Vacuum away any dust and fluff from the condenser radiator, to maintain good refrigeration efficiency.

Be careful not to bend or distort the radiator fins.

In locations with elevated levels of air born dust or fluff, the radiator should be checked frequently and an appropriate cleaning schedule established.



Inspection and Rectification

As part of the cleaning routine, the controls, mechanical parts and electrical wiring should be inspected for damage, deterioration or need of adjustment.

If any small faults are found, have them attended to promptly by a competent serviceman. Don't wait until they cause a complete breakdown.

INSTALLATION

Regulations

VISAIR CABINETS - INSTALLATION

Compliance with Local Requirements

It is very important that your food cabinet is installed correctly and is operating properly before use. Installation must comply with local electrical, health & safety and hygiene requirements.

Setting Up

VISAIR CABINETS - INSTALLATION

Unpacking

Unpack and check unit for damage and report any damage to the carrier and supplier. Report any deficiencies to your supplier.

Cabinet Preparation

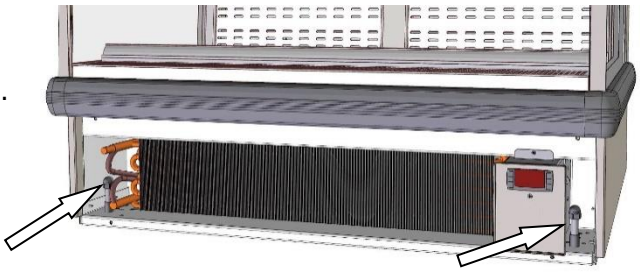
Remove all tapes, ties and packers, used to prevent movement during transit.

Pull the base drawer open to check for packing materials in the well.

Positioning the Cabinet

Position the cabinet in its allocated working position, and remove the front louvered panel.

With the feet raised, rollers at front and rear enable easy manoeuvrability.



Using a spirit level, adjust each front foot to ensure the cabinet is level from front to back and side to side. If the floor is not level, place packing under one of the castors.

Power Supply and Earthing

The cabinet is fitted with a four metre mains lead and connection block, located at the bottom rear of the cabinet.

An EMI line filter is mounted adjacent to the mains inlet. If the cabinet is to be hard wired, this must only be done by a suitably qualified person.

Before connecting to the power supply, check that the local supply is correct to that shown on the cabinet label.

WARNING - THE CABINET MUST BE EARTHED/GROUNDED

Isolation

If the cabinet is not connected to an outlet socket, but is hard wired to the mains supply, a means of isolation must be provided.

If a plug and socket are used, they should still be accessible after the cabinet is installed.

Location

VISAIR CABINETS - INSTALLATION

Ventilation

The front louvers and vents located on the top of the cabinet must never be obstructed. If obstructed the cabinet may overheat and cause an electrical malfunction.

If the cabinet is installed in an alcove, or under any structure, a minimum clearance space of 200mm must exist above the cabinet top.

Before use, operate the cabinet for 1-2 hours to remove any fumes or odours, which may be present.

Draughts

The door-less cabinet features an “air curtain” to retain the cold air within the cabinet. A “curtain” of cold air falls from a linear vent, across the top of the open cabinet front, to be re-circulated through the evaporator cooling coils.

The cabinet should not be sited where strong draughts will deflect the “air curtain”. If this happens, excess condensation will form on the products, and cooling will be less effective.

SERVICING

Electrical Protection

VISAIR CABINETS - SERVICING

Fuse Link

The lighting and control circuits are protected by a fuse, located in the control gear chassis.

Lighting

VISAIR CABINETS - SERVICING

Caution

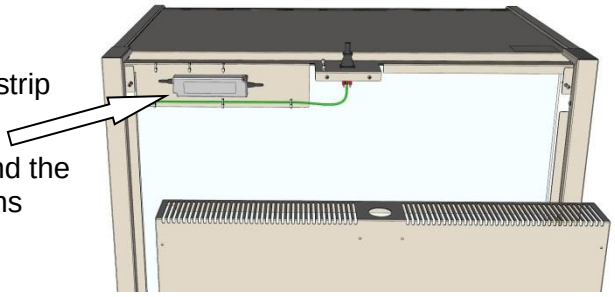
DO NOT service the lights, without isolating the cabinet at the main switch or unplugging it from the electricity supply.

LED Power Supplies

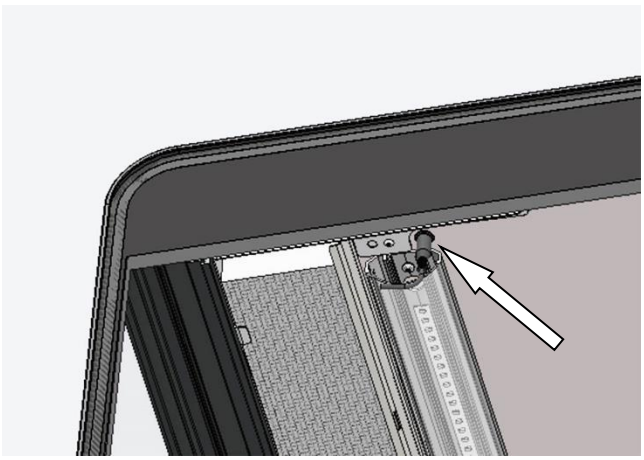
The LEDs are fed with a 24Vdc constant voltage. They consume approximately 17 W per metre of strip length.

The power supply is located behind the back panel, to the side of the mains connector.

Check the power supply before replacing any LED assemblies.



LED Lighting Strips



Light is provided by LED strips, under the top of the cabinet and under each shelf.

The LED modules have a very long life, but if they fail, the complete LED assembly should be replaced.

Each light strip is connected with a plug and socket, enabling easy replacement.

Remove the mounting screws to release the assembly from the cabinet/shelf.

Note that the top light assembly is different from the shelf lights. See Spares list.

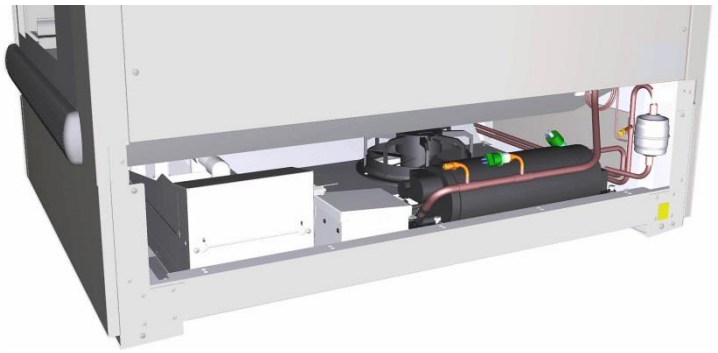
Refrigeration Equipment

VISAIR CABINETS - SERVICING

Caution

DO NOT attempt to service the refrigeration equipment without isolating the cabinet from the mains supply.

Refrigeration Equipment



The compressor, condenser fan and condensate disposal system are mounted in the base of the cabinet, behind the condenser radiator.

Unscrew the lower back panel to gain access.

Compressor

The scroll type compressor is hermetically sealed.

It is fitted with a dryer, an overtemperature switch.

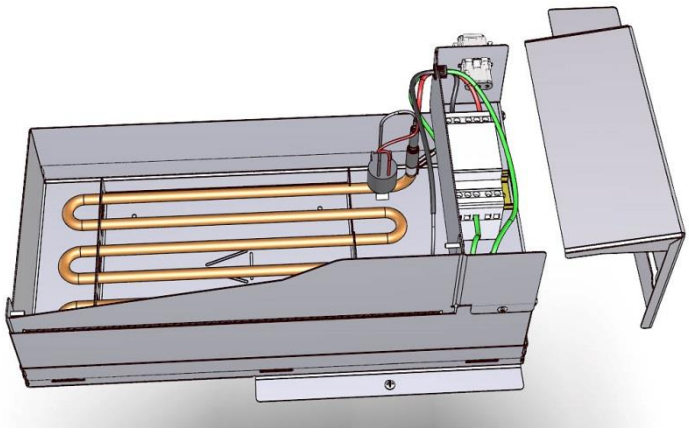
Two tails are provided for charging with refrigerant. See Appendix A.

A temperature sensor is located on the discharge pipe.

Condensate Disposal

The condensate disposal system consists of a water tray, a water level detector and a boil-off element with an over temperature cut-out.

If the element fails, it may be replaced by springing it from the mounting bracket. Cut and splice the leads and protect with heat-shrink sleeves.



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Refrigeration Equipment cont.

VISAIR CABINETS - SERVICING

ACR Fault Finding Guide

First check if the condensate water level probe in the ACR tank is dirty and needs cleaning (a dirty probe may either fail to detect water, or give a false indication of water) clean if required.

Check the Finder Level Control unit sensitivity range adjustment is set to 75kΩ. If the sensitivity is set too low, the Finder Level Control unit may not detect the condensate water and won't switch on the ACR element. If the sensitivity is set too high, the Finder Level Control unit may get a false indication of the condensate water and switch on the ACR element without water present.

Fault: ACR element is on continuously when no condensate water is present.

Test: Check if the Finder Level Control unit is faulty by disconnecting the probe wire from terminal B1 on the Finder Level Control unit. With the cabinet power turned on and after waiting 10 seconds, check for 230V across terminals 11 and 14. If 230v is not present across terminals 11 & 14, replace the Finder Level Control unit.

Fault: ACR element does not heat even though condensate water is present and touching the water level probe.

Test: First check the ACR unit has a 230V power supply.

Next, check the Finder Level Control unit water sensing circuit by short-circuiting the level sensor terminals B1 & B3. Turn the cabinet power on and wait 10 seconds and then check if the ACR element heats. If the element heats, check for an open circuit in the water sensing probe circuit and clean the probe.

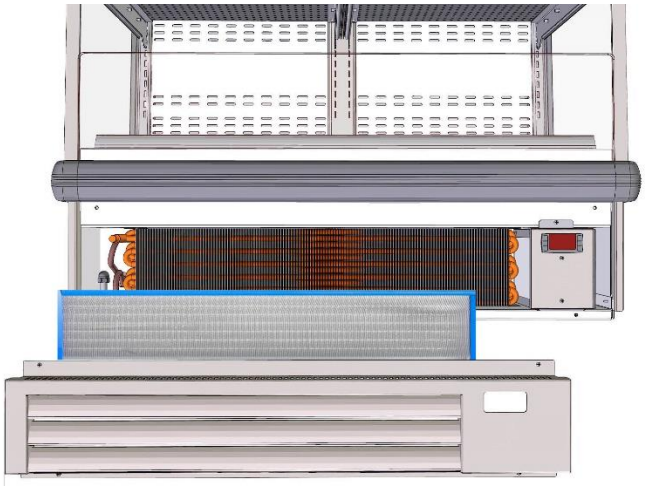
If the element does not heat, turn the cabinet power off and take the element wire out of terminal 11 and wire into terminal 14 on the Finder Level Control unit. Turn the cabinet power on and wait 10 seconds and then check if the ACR element heats. If the element heats, replace the Finder Level Control Unit. If the element does not heat replace the element and Therm-O-Disc assembly.

Note: The element and Therm-O-Disc are supplied as a complete assembly.

Access to Condenser Radiator and Control Gear

To access the condenser radiator and control gear, simply pull the louver panel forward, to disengage the magnetic catches.

It is vital that the pre-filter and radiator are kept clean. If air flow is restricted, refrigeration efficiency will be poor.



The radiator fins must be regularly cleaned, using compressed air. Do this at least every six months, or more often if needed.

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Refrigeration Equipment cont.

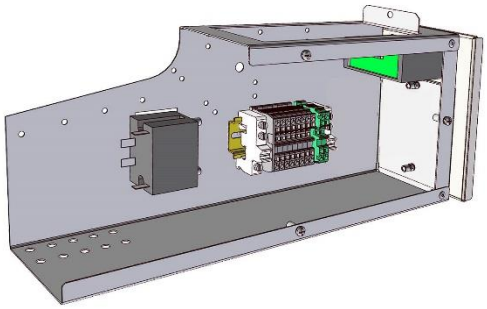
VISAIR CABINETS - SERVICING

Control Gear

The refrigeration controller and associated compressor relay etc. are all mounted on this chassis.

Other control components are included in the compressor assembly.

A High Temperature sensor is mounted on the compressor assembly.

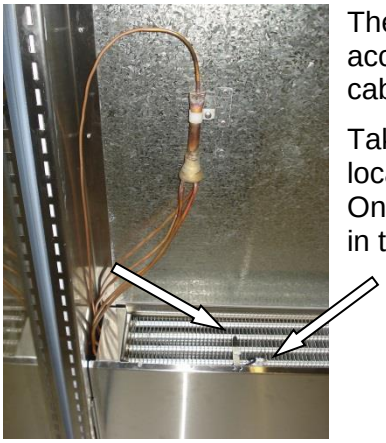


Evaporator Fan Replacement

The fan deck is connected to the cabinet with a plug and socket, and can be withdrawn to replace a faulty fan, after removing the fixing screws.

The fan speeds are electronically programmed, so the correct spare must be used.

Evaporator Coil



The evaporator coil and temperature probes are accessed by removing the inside back panels of the cabinet.

Take care not to disturb the location of the two probes. One is in the air flow, the other in the coil fins.

Air Ducts and Grills

All air ducts, grills and louvers must be regularly vacuumed, to keep them free of dust and fluff.

This is best done after cleaning the condenser radiator with compressed air.

Grills are located on the top of the cabinet and louvers on the front bottom panel.

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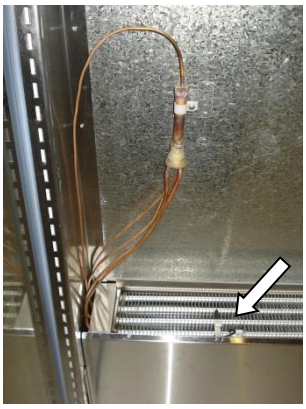
Temperature Regulator XR70CX



Model XR70CX is a microprocessor-based controller. It is provided with four NTC probes. The first one for temperature control (air off), the second one, located on the evaporator coil, to control the defrost termination, the third one senses the temperature of the compressor discharge pipe.

Another probe is connected to the Pb4 input. It is located at the input side of the evaporator coil, and is used to display the temperature of air returning from the cabinet interior.

The indicated set-point temperature will be lower than the air temperature inside the cabinet, because the refrigeration compressor is controlled in response to the exit air (air off) temperature from the evaporator cooling coils.

The instrument is fully configurable through special parameters that can be easily programmed through the keyboard.

Dixell Information

Additional information about the Dixell XR70 can be found at:

http://www.dixell.de/en/Dixell/artikel/11178

webapps.emerson.com › Manuals › PRIME › XR70CX › XR70CX-GB

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Refrigeration cont.

VISAIR CABINETS - SERVICING

XR70CX Key Functions

KEY	FUNCTION
SET	To display target set point; in programming mode it selects a parameter or confirm an operation
❄	(DEF) To start a manual defrost
∧	(UP): To see the max. stored temperature; in programming mode it browses the parameter codes or increases the displayed value
∨	(DOWN): To see the min stored temperature; in programming mode it browses the parameter codes or decreases the displayed value
⏻	To switch the instrument off, if onF = oFF. Not enabled
∧ + ∨	To lock & unlock the keyboard
SET + ∨	To enter into programming mode
SET + ∧	To return to the temperature display mode

XR70CX LED Functions

LED	MODE	FUNCTION
❄	ON	Compressor enabled
❄	Flashing	Anti-short cycle delay enabled
❄	ON	Defrost enabled
❄	Flashing	Drip time in progress
(!)	ON	An alarm is occurring
❄	ON	Continuous cycle is running
☀	ON	Energy saving enabled
°C/°F	ON	Measurement unit
°C/°F	Flashing	Programming phase

Continued on next page

Refrigeration cont.

VISAIR CABINETS - SERVICING

XR70CX Alarm Signals

Message	Cause	Outputs
P1	Room probe failure	Compressor output acc. to par. **Con** and **COF**
P2	Evaporator probe failure	Defrost end is timed
P3	Third probe failure	Outputs unchanged
P4	Fourth probe failure	Outputs unchanged
HA	Maximum temperature alarm	Outputs unchanged.
LA	Minimum temperature alarm	Outputs unchanged.
HA2	Condenser high temperature	It depends on the **Ac2** parameter
LA2	Condenser low temperature	It depends on the **bLL** parameter
dA	Door open	Compressor according to rrd
EA	External alarm	Output unchanged.
CA	Serious external alarm (i1 F=bAL)	All outputs OFF.
CA	Pressure switch alarm (i1 F=PAL)	All outputs OFF

XR70CX Alarm Recovery

Probe alarms P1, P2, P3 and P4 start some seconds after the fault in the related probe; they automatically stop some seconds after the probe restarts normal operation. Check connections before replacing the probe.

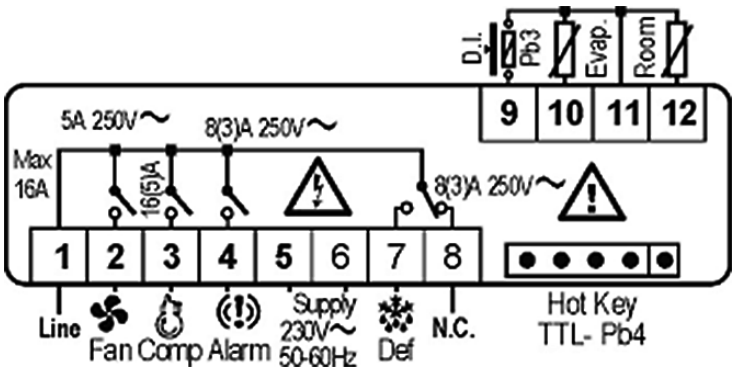
Temperature alarms HA, LA, HA2 and LA2 automatically stop as soon as the temperature returns to normal values.

Alarms EA and CA (with i1 F=bAL) recover as soon as the digital input is disabled. Alarm CA (with i1 F=PAL) recovers only by switching off and on the instrument.

XR70CX Other Messages

Message	Cause
Pon	Keyboard unlocked.
PoF	Keyboard locked
noP	**In programming mode**: none parameter is present in Pr1 **On the display** or in dP2, dP3, dP4: the selected probe is not enabled
noA	No alarm is recorded.

XR70CX Connections



SPECIFICATIONS

Mechanical

VISAIR CABINETS - SPECIFICATIONS

	CABINET MODEL				
	IN–VA10-B002	**IN–VA10-B001**	**IN–VA20-B002**	**IN–VA20-B001**	
Height mm	1480	1480	1480	1480	
Width mm	1096	1096	2112	2112	
Depth mm	830	830	830	830	
Dry Weight kg (Integral)	231	236	470	477	
Cabinet Well Material	Stainless steel	Stainless steel	Stainless steel	Stainless steel	
Number of Shelf Modules	2	3	4	6	
Display Area m²	0.73 (shelves) + 0.36 (base)	0.99 (shelves) + 0.35 (base)	1.46 (shelves) + 0.72 (base)	2.0(shelves) + 0.72 (base)	
Refrigerant	R-290	R-290	R-290	R-290	
Refrigerant Charge	Refer to cabinet Serial No./Rating label				
Condensate capacity	5 litres	5 litres	2 x 5 litres	2 x 5 litres	
Climatic Class & IP Rating	All cabinets are suitable for class N climates and have an IP X0 rating				

Electrical

VISAIR CABINETS - SPECIFICATIONS

	CABINET MODEL				
	IN–VA10-B002	**IN–VA10-B001**	**IN–VA20-B002**	**IN–VA20-B001**	
Voltage	220-240 V 50 Hz 1ϕ				
Power	1.9 kW	1.9 kW	2 x 1.9 kW	2 x 1.9 kW	
Energy Consumption	1.07 kWh/h	1.07 kWh/h	2 x 1.07 kWh/h	2 x 1.07 kWh/h	
Current	8.4A	8.4A	2 x 8.4A	2 x 8.4A	
Connection	3 core cable with 10A plug	3 core cable with 10A plug	2 x 3 core cable with 10A plug	2 x 3 core cable with 10A plug	
Temperature Range, °C	2 - 4°	2 - 4°	2 - 4°	2 - 4°	
Lights	3 x LED strip	4 x LED strip	6 x LED strip	8 x LED strip	

Cabinet Performance

VISAIR CABINETS - SPECIFICATIONS

Refrigerated Section Performance

Operating Temperature	Average Internal Humidity	Climatic Class 3 Test Conditions
+2° to +4°C	N/A	25°C Ambient with 60% RH

Controller Settings

VISAIR CABINETS - SPECIFICATIONS

Dixell XR70CX Settings	Parameter	Integral		Units / Range
Set Point	Set	-3		degC
Differential	Hy	3		degC
Third Probe Presence	P3P	Y		N,Y
Fourth Probe Presence	P4P	Y		N,Y
Fourth Probe Calibration	O4	-2		degC
Anti Short Cycle Delay	AC	0		Min
Comp On Time - Faulty Probe	Con	4		Min
Comp Off Time - Faulty Probe	CoF	6		Min
Probe Displayed	Lod	P4		P1, P2, P3, P4
Defrost Terminate Temp	dtE	6		degC
Interval Between Defrosts	IdF	2		Hrs
Display During Defrost	dFd	DEF		rt, it, Set, DEF
Fan Operating Mode	Fnc	o-Y		C-n, o-n, C-Y, o-Y
Fan Delay After Defrost	Fnd	0		Min
Probe For Fan Management	FAP	nP		nP, P1, P2, P3, P4
Probe For High Discharge Temp Alarm	AP2	P3		nP, P1, P2, P3, P4
High Discharge Temp Alarm Set Point	AU2	90		degC
High Discharge Temp Alarm Diff	AH2	25		degC
High Discharge Temp Alarm Delay	Ad2	0		Min
High Discharge Temp Alarm Delay At Start	dA2	0		Min
Comp Off For High Discharge Temp Alarm	AC2	Y		n, Y
Fourth Relay Configuration	oA3	LiG		Alr, dEF, LiG, AUS, AUX, onF, Fan, db, CP2, dF2.
On/Off Key Enabling	onF	oFF		nu, oFF, ES

Compliance

VISAIR CABINETS - SPECIFICATIONS

Standards

FPG refrigerated, controlled ambient and ambient food display cabinets are designed to meet and exceed:

- International safety standards for electrical appliances: IEC 60335-1, IEC 60335-2-89, and the equivalent country-specific standards including AS/NZS, BS EN and UL 471.
- International standards for electromagnetic compatibility/emissions: CISPR 14-1, and the equivalent county-specific standards including AS/NZS CISPR and BS EN 55014-1.
- Essential safety requirements: AS/NZS 3820 and AS/NZS 4417
- Energy efficiency for refrigerated appliances: MEPS (Australia/New Zealand)

Please contact FPG to discuss your requirements for meeting country-specific standards.

Improvements

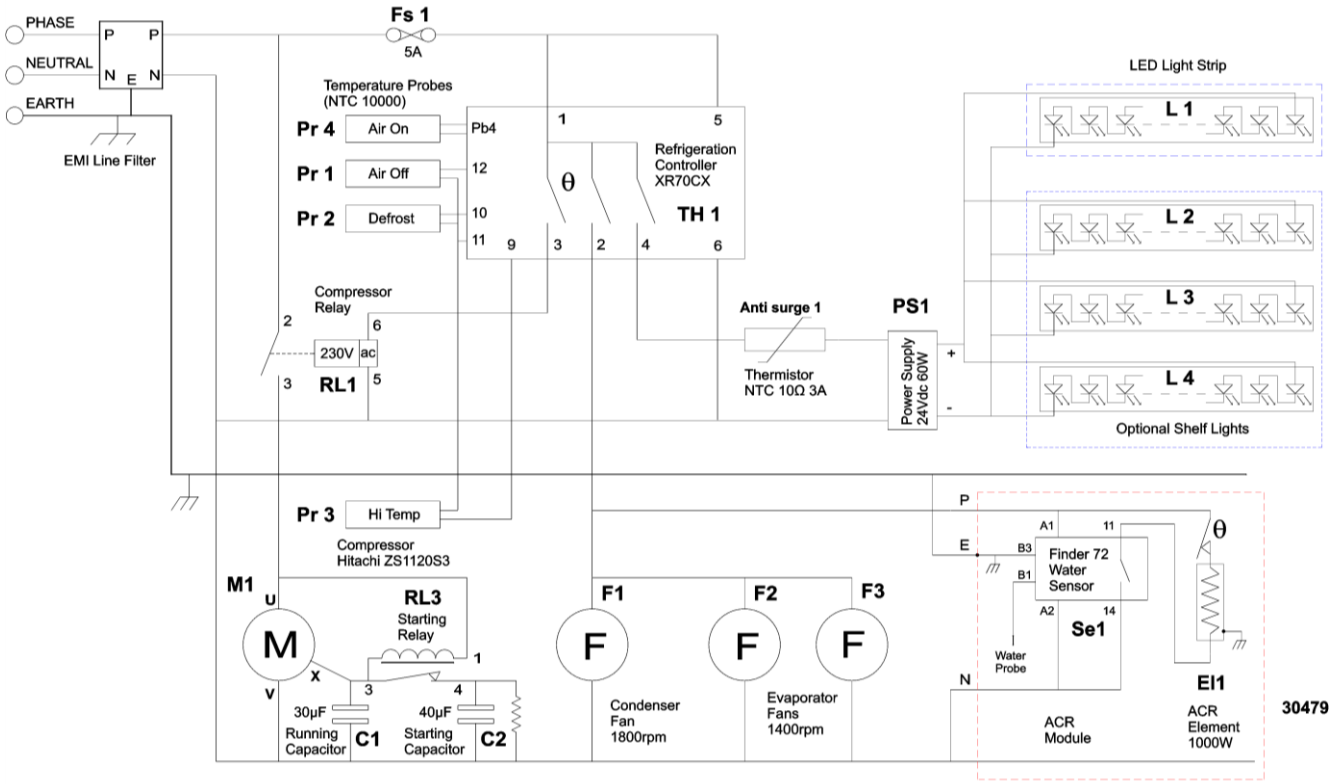
VISAIR CABINETS - SPECIFICATIONS

Ongoing Development

FPG reserves the right to change specifications and construction, as part of ongoing product improvement.

ELECTRICAL CIRCUIT DIAGRAMS

Model: IN–VA10-B001/B002 **Visair Refrigerated Cabinets**



Model: IN–VA20-B001/B002 **Visair Refrigerated Cabinets**

Each half of the VA20 cabinet is functionally identical, and has the same circuit diagram as the VA10, #30479.

SPARE PARTS

Cabinet Serial Number

When ordering spare parts, it is important to quote the Serial Number printed on the label fixed to the control panel.

This serial number will enable FPG to trace details of the build specification of your particular cabinet, and hence ensure that spare parts are fully compatible.

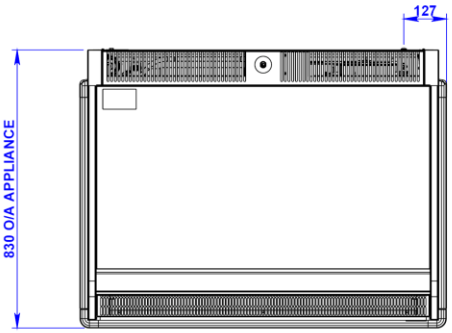
To satisfy warranty conditions, and ensure optimum performance, use only FPG supplied spare parts.

Part Description	FPG Part No.
Adjustable feet	16773
LED power supply 24V 60W	25473
Mains lead, cord-set 1.0mm^2 - 4m - 3 core black - moulded plug	13237
Mains EMI Line Filter	21370
Anti-surge thermistor 10 Ohm 3A	22354
Replacement Top Light LED Assembly	74196
Replacement Shelf Light LED Assembly	76096
Dixell XR70cx Refrigeration Controller	30647
NTC temperature probe (3 metre)	15870
Evaporator Fans EBM K1G200 1400rpm	30714
Condenser Fan EBM K1G250 1800rpm	30715
Permalon pre-filter element	26313
Fuse 5A	13330
1000 watt 230V condensate element	18051
Condensate Water Sensor, Finder 72.01.8.240.0000	25309
Compressor control relay	16824
Compressor starting relay	18956
30µF 400V motor run capacitor	18380
40µF 400V motor start capacitor	18957
Deck tray runner	16717
Shelf runner	16718
Curved Louver 800mm long	25558
Acrylic Centre Divider (VA20)	28613
Visair cabinet toughened side glass	29611
ZS1120S3 Horizontal scroll compressor	30481
Product Manual for Inline Visair VA10 Cabinet R290	31004

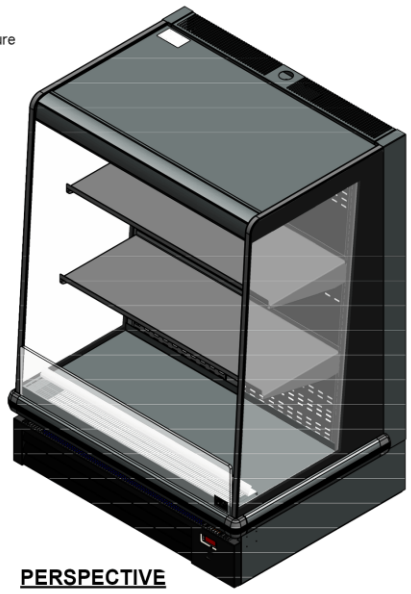
MECHANICAL DRAWINGS

Inline Visair IN–VA10-B002-00

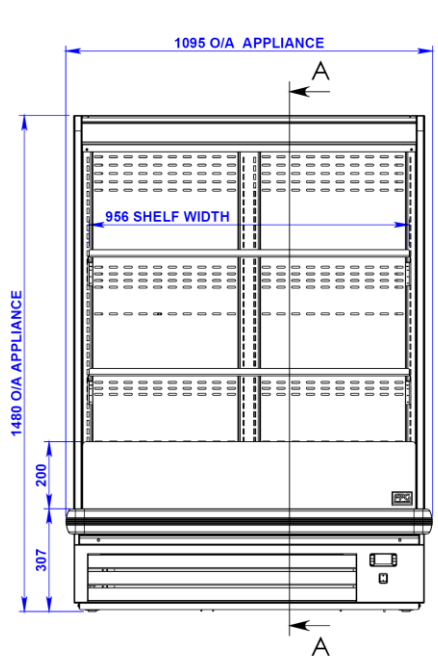
For adequate ventilation,
a minimum clearance of 200mm is required
between the top of the cabinet and any overhead structure



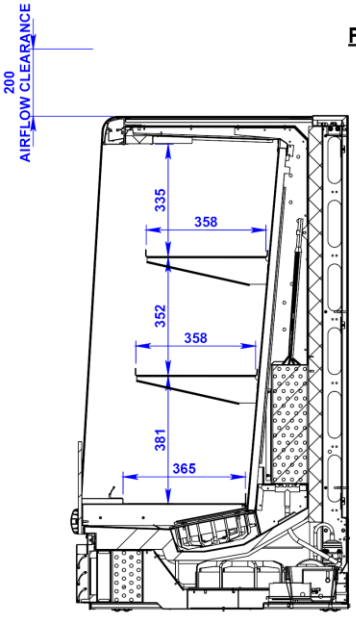
PLAN



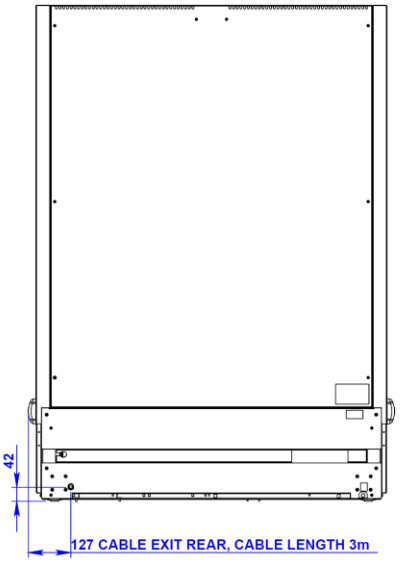
PERSPECTIVE



FRONT ELEVATION

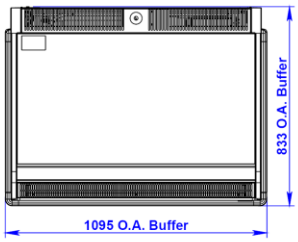


SECTION A-A



REAR ELEVATION

Inline Visair IN–VA10-B001-00



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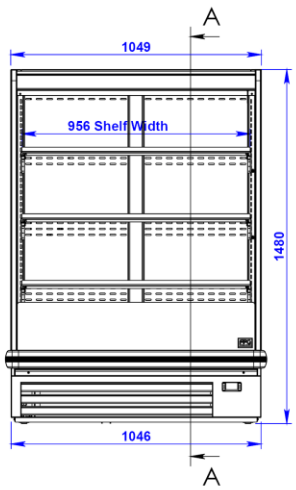
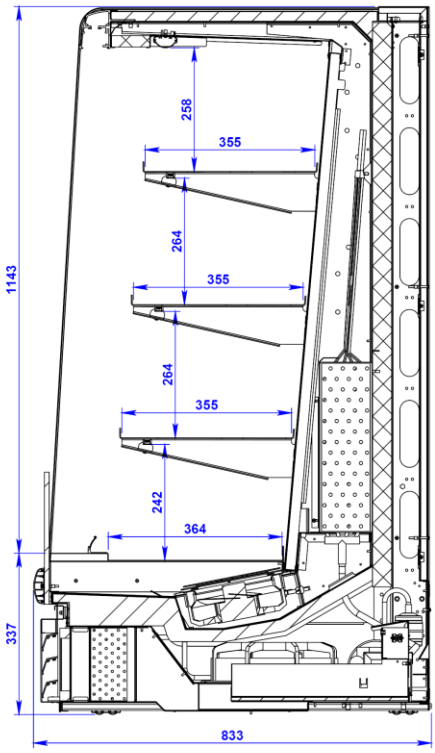


FRONT ELEVATION

For adequate ventilation,
a minimum clearance of 200mm is required
between the top of the cabinet and any overhead structure



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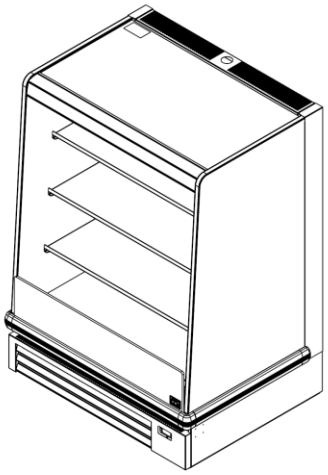

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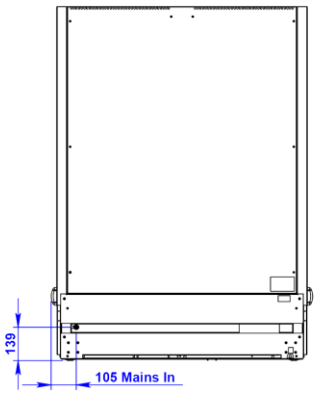
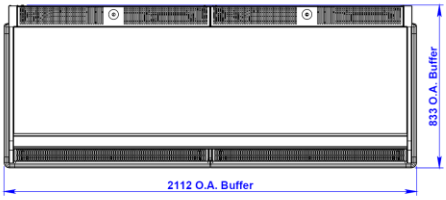
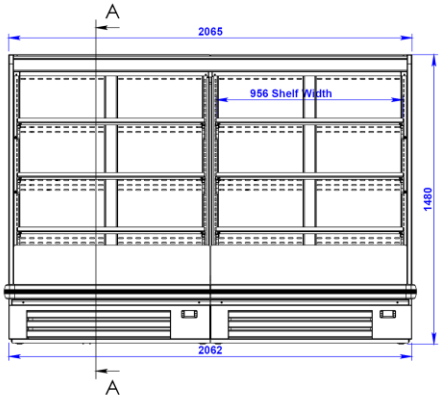


REAR ELEVATION

Inline Visair IN–VA20-B001-00



PLAN



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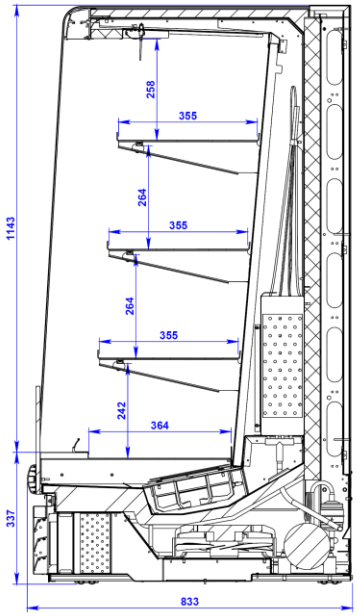
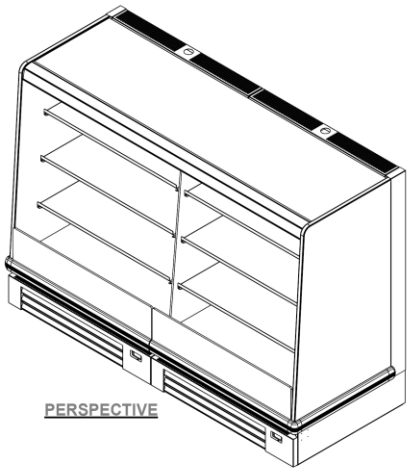
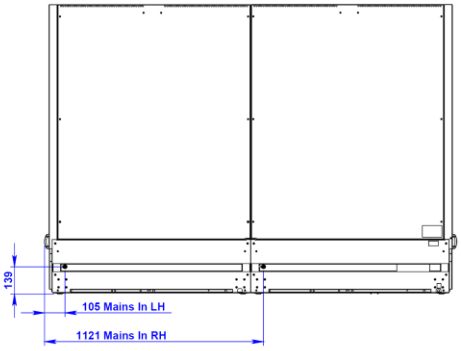


SECTION A-A



PERSPECTIVE



REAR ELEVATION

APPENDIX A
R-290 Refrigerant

General Guidance

VISAIR CABINETS - APPENDIX A
R-290 Refrigerant

R-290	R-290 is the name for refrigerant grade high purity odorless propane. **It is NOT barbeque grill propane.** PROPANE IS HIGHLY FLAMMABLE. You MUST observe caution and proper safety practices when servicing equipment with R-290.
Servicing	Servicing refers to making repairs to the hermetically-sealed system and any parts of the electrical system.
Specialized Training	Although not mandatory, specialized training of service personnel is desirable.
Environment	Repair on R-290 equipment should always be done in a well ventilated area.
Gas Detector	Because R-290 is highly flammable, an electronic combustible gas leak detector is required when servicing R-290 systems.
Replacement Parts	When opening any refrigeration system, the filter/dryer must be replaced with the manufacturers specified spare part.
Fault Diagnosis	Since there are no access fittings on R-290 systems, temperatures and current draw must be used to evaluate system performance.
Check List	Before proceeding with servicing, check the following: **MONITOR**: make sure the combustible-gas meter is on and in proper position. **VENTILATE**: make sure there is adequate ventilation in the work area. **ELIMINATE**: make sure to eliminate any potential ignition sources.

Servicing

VISAIR CABINETS - APPENDIX A
R-290 Refrigerant

Gas Monitor

Before entering any service area that may have hydrocarbons, always turn on a combustible gas monitor to alert you to the presence of flammable refrigerants while you are working.

Do not turn the combustible gas monitor off until you leave the service area.

Ignition

Do not unplug, disconnect power to, or begin servicing a system before checking for flammable refrigerants with the combustible gas monitor.

Sparks from unplugging or power disconnects could ignite flammable refrigerants.

Danger Sign

Display a Danger Propane placard to alert all that you are working on a R-290 system.

No open flames or smoking is allowed.

Instruct anyone in the immediate area the nature of the work taking place.

Be aware that E-cigarettes or similar electronic devices could be a source of ignition.

Fire Extinguisher

An approved fire extinguisher is required when servicing a system that contains a flammable refrigerant.

Access Fittings

Since access fittings are not supplied on any R-290 systems. Before adding access-fittings you should check temperatures and amps and contact FPG for guidance on fault finding.

Electrical Connectors

Wire nuts are not approved for R-290. All connectors must be UL approved for use with Hydrocarbons.

Wire connectors must have sufficient strength to hold the conductor/wire in place.

Replacement Components

When replacing components, ignition-proof sealed electrical components are required.

To avoid using unapproved parts, only FPG replacement parts are to be used on a R-290 system.

Continued on next page

Tools

VISAIR CABINETS - APPENDIX A
R-290 Refrigerant

Basic Tools

Use the same basic refrigeration tools as for R404-A & R-134a refrigerant.

Required Tools

	Combustible gas leak detector (Inficon Gas Mate) or equal		Propane warning notice
	Tubing cutter		Approved fire extinguisher (Class B dry powder type)
	Vacuum gauge		30cm charging hose (low Loss design)
	Ball charging valves (3)		Gram scale
	Tap valves 1/4” (2)		Digital thermometer
	Pinch off tool (2		Venting hose

Leak Checking

VISAIR CABINETS - APPENDIX A
R-290 Refrigerant

Warning

Do NOT use any leak test dyes when working on an R-290 refrigeration system.

Detection Methods

- Bubble test.
- Electronic combustible gas detection.
- Nitrogen holding pressure test (only possible on accessed systems).

For the most part, you would leak check a R-290 system the same way you would a R-134a or R-404A system with a couple of exceptions.

You cannot use a halide leak detector on an R-290 system, the electronic leak detector must be designed specifically for combustible gas.

Using oxygen-free dry nitrogen with a trace gas not exceeding 150PSIG is also recommended.

Accessing the Refrigeration System

VISAIR CABINETS - APPENDIX A
R-290 Refrigerant

Installing Piercing Valves

Line tap valves can be used to access the refrigeration system. Line tap valves should be temporarily placed on the suction and liquid process tubes.

IMPORTANT: Never leave piercing valves of any type on the R-290 refrigeration system. This would void the warranty.

Procedure

Make sure the cabinet is disconnected from the power source. Wear safety glasses and gloves (rubber coated are best).	
Turn the combustible-gas leak detector “ON”. Refer to the manufacturer’s instructions for the detector you are using.	
Post the warning notice in plain view for all to see on the front and rear of the refrigeration appliance.	
Remove the red sleeves on the suction and liquid line process tubes. Install the piercing valves following manufacturer’s instructions. Red sleeves must be replaced when done servicing.	

Recovering Refrigerant

VISAIR CABINETS - APPENDIX A
R-290 Refrigerant

Recovery Machines

Recovery machines for use with hydrocarbon refrigerants are in limited production.

Only an explosion proof recovery machine can be used to recover.

Procedure Without Machine

1. Evacuate an empty recovery cylinder into a vacuum.
2. Using an accurate refrigerant scale, zero out the refrigerant scale and weigh the empty recovery cylinder prior to adding refrigerant gauges or hoses. Note this weight.
3. Securely connect the evacuated cylinder to the refrigeration system using refrigerant gauges and hoses.
4. Open both refrigerant gauges to allow refrigerant to flow through the gauges to the recovery cylinder. You must evacuate from both sides.
5. Once the pressures have equalized, valve off the refrigerant gauges and the recovery cylinder securely.
6. Carefully remove the refrigerant hose from the recovery cylinder.
7. Zero out the refrigerant scale and weigh the recovery cylinder. Note this weight.
8. Subtract the empty tank weight recorded from the cylinder now containing the refrigerant. This will be the amount recovered.
   NOTE: You can check Serial Label to verify any leak.
9. A recovery cylinder containing R-290 can be vented outdoors.
   See “Venting R-290” for instructions on venting R-290.
10. After venting the refrigerant, purge the recovery cylinder with nitrogen at a flow rate of 5PSIG through the liquid port of the recovery cylinder for 2 minutes outdoors, 3 metres away perimeter from any structures or ignition sources.
11. Repeat steps 1-9 until the recovery cylinder and the system equalize into a vacuum.

NOTE: Trace amounts of R-290 will remain trapped in the POE oil of the compressor.

Venting R-290

VISAIR CABINETS - APPENDIX A
R-290 Refrigerant

Venting Procedures

1. Do NOT vent hydrocarbon refrigerants inside a building under any circumstance (SAFETY RISK).
2. Venting hydrocarbon refrigerants to a public area or where people are unaware of the procedure is not permitted.
3. When venting R-290 YOU MUST make everyone in the immediate area aware that you are venting a flammable gas to the atmosphere.
4. Ensure there are no ignition sources within a 10 ft. perimeter of the area you are venting R-290. Be aware that E-cigarettes or similar electronic devices could be a source an ignition.
5. Ensure that all local legislation/regulations addressing safety of hazardous or flammable substances are satisfied.
6. Ensure you are not venting R-290 into a low-lying area. R-290 is heavier than air and can accumulate in floor drains, grease traps, piping troughs, etc.
7. After venting, purge with Nitrogen through the system for a minimum of 10 seconds.

System Evacuation

VISAIR CABINETS - APPENDIX A
R-290 Refrigerant

Preliminary Tasks

Prior to sealing up the system make sure you have a sufficient amount of service access tubing remaining for service in the future.

1. Remove the crimped tubing and piercing/saddle valve from the process tube.
2. Extend the process tube a minimum of 30cm.
3. Crimp and braze the process tube extension.
4. Install piercing/saddle valve just before last crimp.

After the system has been sealed and leak checked, it is necessary to evacuate it in order to remove air, moisture, and unwanted residual refrigerant.

NOTE

Technician must use tube cutter instead of torch when removing refrigeration system components.

System Evacuation cont.

VISAIR CABINETS - APPENDIX A
R-290 Refrigerant

Evacuation Procedure

1. It is necessary to purge the system with nitrogen. This is necessary to prevent flammable mixtures from occurring.
2. When connecting the hoses between the system, gauge manifolds, and vacuum pump, ensure that the connections are secure and there are no potential ignition sources nearby.
3. Ensure that the pump discharge is in an area free of potential ignition sources.
4. Ensure that a micron gauge is used since conventional manifold gauges may not provide a proper reading.
5. The system should be evacuated to the desired pressure (typically 250 microns or less) and then left to stand for 15 minutes to ensure that the entire refrigerant charge has been removed from the oil and any residual moisture has been evaporated from the system.
6. Ensure that the vacuum pump is of good quality and of appropriate capacity for the system, and the oil level is correct.

Charging the System

VISAIR CABINETS - APPENDIX A
R-290 Refrigerant

WARNING **Dial-a-charge cylinders, with a sight glass, should not be used to charge systems with flammable refrigerant.**

Precautions

Although charging procedures are similar to those used with any other type of refrigerant, the following considerations are important for R-290:

- Prior to charging, ensure the system has been leak checked.
- Hoses or lines must be as short as possible to minimize the amount of refrigerant contained in them.
- Evacuate the hoses and manifold prior to charging to avoid contamination of the refrigerant.
- Upon completion of charging, a further leak check must be carried out prior to leaving the site.
- After charging, carefully disconnect the hoses, attempting to minimize the release of refrigerant.
- After charging, all access ports/points must be removed following the correct procedures.

DO NOT OVERCHARGE A SYSTEM USING R-290.
Weigh in the exact charge.

Removal and Sealing of Access Ports

VISAIR CABINETS - APPENDIX A
R-290 Refrigerant

CAUTION **Do not leave piercing valves on the system.**

Procedure

1. Pinch line off just before the temporary access port two times using a crimping tool. Keep crimping tool in place as shown in photo.
2. Verify that there are no leaks.
3. Remove the piercing valve/temporary access port.
4. Snap off at “crimp 1” and check for leaks.
5. Braze open end shut while crimping tool is in place.
6. Leak check the system, with crimping tool removed.

Electrical Repairs

VISAIR CABINETS - APPENDIX A
R-290 Refrigerant

CAUTION The electrical power to the equipment must be disconnected. A combustible-gas leak detector must be on at all times.

Protect yourself from hazards of working on the electrical components by following some basic guidelines before you begin the repair. Prior to starting your repair work on an electrical component, use your combustible gas detector to see if flammable gas is present.

Only when the area is clear of any flammable gas should you start the repair.

Guidlines

- Do not use components that produce sparks, discharge, etc.
- Components that could produce a potential ignition source need to be positioned in an area, distant and unreachable, from any potential refrigerant leak.
- FPG components are designed for use with flammable refrigerants.
- Do not replace faulty components that are intended not to spark with components that do. ONLY use FPG recommended spares.
- • Do not modify components that are intended not to spark in such a way that they will spark.

Electrical Repairs cont.

VISAIR CABINETS - APPENDIX A
R-290 Refrigerant

Check General Condition

You may not be the first person that has worked on this system.

- Check all components for unauthorized/non-OEM replacement parts.
- Look beyond your repair for any wear, stresses, that could become an ignition source. Are terminal connections tight and in a UL approved connectors?
- Check all protective conductors' connections each time you access a system or repair is made.
- Finally, check the plug, cabling and wiring for any damage.

R-290 SERVICING FLOW CHART

Before starting work on the R-290 system, turn on the gas-leak detector and place it on the floor, next to the cabinet.

	Refrigeration Circuit Access	Comments
1	Disconnect electrical supply to appliance.	If possible, ground the appliance to avoid static electric sparks.
2	Access condenser/compressor and install two piercing valves.	Vent both the high and low side of the system in case there is a blocked cap tube and/or drier.
3	Connect your refrigeration gauge equipped with 30cm hoses to the two piercing valves.	
4	Connect the yellow hose of your gauge set to a recovery bag or a venting tube, if a safe venting location is available.	
5	Once the charge is removed, connect the Nitrogen tank.	
6	Purge Nitrogen through the system for a min. of 10 seconds.	If using a recovery bag, be sure to take it to a safe location and vent.
7	Always cut the compressor or other components out with a tubing cutter.	
8	Purge Nitrogen through the system at 70 to 140 hPa, before any parts must are un-brazed.	
9	Purge Nitrogen through system at 70 to 140 hPa, while brazing in new components.	

	Installing New Components	Comments
1	Remove old compressor, drier and any other defective component.	If the compressor is removed, seal the suction and discharged tubes to prevent a spill.
2	Install new FPG approved spare parts.	A new dryer must be fitted if the compressor is replaced.
3	If the two access line tubes are not at least 30cm long, add more tube with brazed pinched-off ends. Reinstall tap valves.	Access tubing lines may need to be braced to prevent bending over.
4	Purge with Nitrogen again at 70 to 140 hPa while brazing. Wrap drier with wet rag when brazing.	
5	Fill the system with Nitrogen to 1000 kPa and check for leaks.	
6	Release Nitrogen and pull a vacuum on the system to 250 microns or less. Turn off the vacuum and confirm that it holds the vacuum.	
7	If vacuum holds, the system can now be charged.	Propane labelled ‘R-290 Refrigerant’ must be used. **DO NOT USE BBQ PROPANE**.
8	Purge the charging hoses and ready your gauge set and hoses so they will not move during the charging process.	
9	Check the cabinet Serial Number label for the required charge.	
10	Use the ball valves installed on your hose to meter in the charge.	Because the charge is small, take care and be precise.
11	Charge the circuit. (preferred method of charging is to charge liquid into liquid line).	
12	If new starting components have been fitted, check electrical connections and install all terminal covers.	FPG compressor start components are designed for use with HC refrigerants. Do not use non-FPG approved spare parts.
13	Start the system and check operation. Do a final check for leaks	

VISAIR CABINETS

