MODELS
IL-7EL-VI09-R-13-05-B100

PRODUCT MANUAL 33872 Dixell

REV B NOV 2024

FPGWORLD.COM

CUSTOM

7-ELEVEN IMPULSE

FREESTANDING/OPEN FRONT
REFRIGERATED: R-290 **VSD**

WIDTH: 900mm
HEIGHT: 1350mm
DEPTH: 466mm

NOTE: IMPULSE cabinets may be fitted with either Dixell or Embraco refrigeration controllers.

This manual is for **Dixell** controllers.

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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
≥ 9.1 m^2 Floor Area	The 1350mm high cabinet must only be installed, operated, and stored in a room with a floor area greater than the stated area.

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INTRODUCTION

Welcome

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 IMPULSE 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 IMPULSE 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 IMPULSE 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

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.

IMPULSE 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

Impulse Cabinet Configuration

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

Cabinets are available with up to four shelves.

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 the rear.

Vaporised condensate mixes with this air flow and exhausts behind the cabinet.

Controls

Touch-Screen Controller

The Dixel XRi31T controller is operated by a touch screen, using the following gestures.

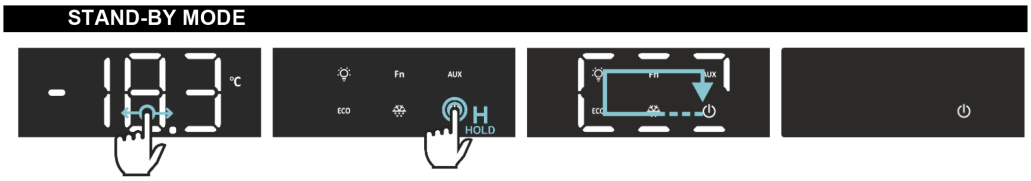
GESTURE	NAME	HOW-TO	DESCRIPTION
	**ONE TAP**	Press a specific area of the screen with a finger for 1 sec	**Switch ON / Switch OFF:** when in Virtual Keyboard, use this to turn on/off a specific function. When in Programming mode, use this to select a parameter or a parameter value.
	**TAP and HOLD**	Press any place of the screen with a finger for 1 or 3 sec (depending on par. **bPt**)	**Enter / Save:** use this to enter Programming mode or Parameter menu and to save modifications. When in Virtual Keyboard, use this on the “ONOFF” to switch OFF and ON the device.
	**H-SWIPE**	Drag a finger across the screen, from left to right or from right to left	**Browse:** use horizontal swipe (right to left or left to right) to browse through HOME, Virtual Keyboard and Info View. When in programming mode: use horizontal swipe to browse through parameter menu.
	**V-SWIPE**	Drag a finger across the screen, from top to bottom or from bottom to top (overlapping only one of the digits)	**Modify:** use vertical swipe (from top to bottom or bottom to top) to change a parameter value.

Controls cont.

IMPULSE CABINETS - OPERATION

Browsing Screens

Use H-SWIPE to move through the screens. The logic implements a circular browsing: H-SWIPE to left or to right is possible. A programmable timeout is implemented to return **HOME** from any lateral screen.



When in **HOME** screen, H-swipe to go to the Virtual Keyboard screen and then touch the **OFF** icon for 3 sec. The beginning of this action will trigger an animation effect (a “snake” moving effect of the frame around the icons). to All outputs and alarms are deactivated in Stand-by mode.

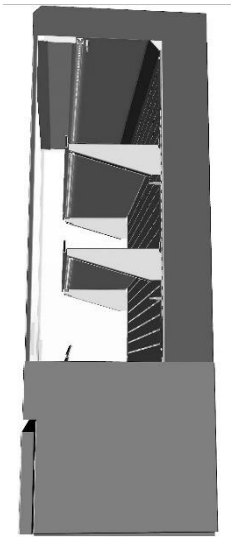
Preparation

IMPULSE CABINETS - OPERATION

Shelf Location and Ticketing

Cabinets can be fitted with up to four shelves, (three for 1200 cabinet), and all lighting power sockets are provided on cabinets.

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.

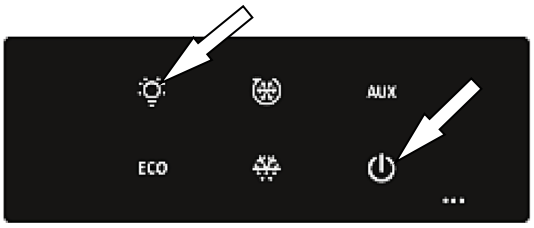
Insert it in the new position and push it down firmly.

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.

Preparation cont.

IMPULSE CABINETS - OPERATION

Switch On Power and Lights



H-Swipe to the virtual keyboard to control power and lights.
The temperature controller is pre-set to maintain the cabinet temperature between 2°C and 4°C. It should not need adjustment.
Refer to FPG if further information is wanted.

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

IMPULSE CABINETS - OPERATION

After Hours	Ideally, cabinets should not be turned off after hours or at night. 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.
Night Blind	If an optional night blind has been fitted to the top of the cabinet, this should be lowered to further reduce power consumption at night.
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***
HA Alarm Display on Controller	Compressor discharge pipe high temperature	Clean condenser radiator & pre-filter. The alarm will reset when the temperature returns to normal. If there is no cooling, or alarm returns within 24h, 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***
	ACR 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

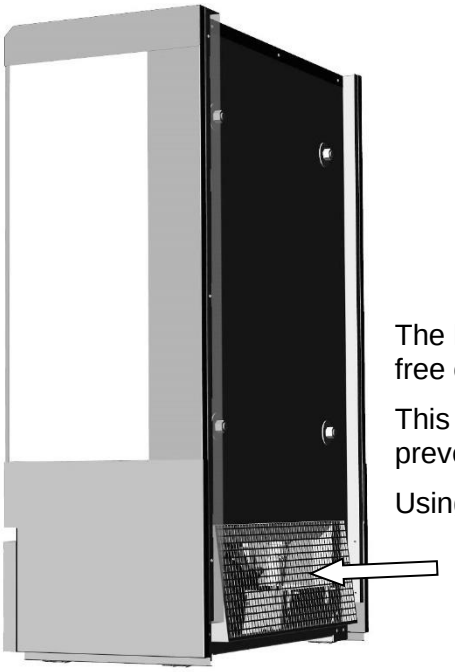
IMPULSE CABINETS - CLEANING

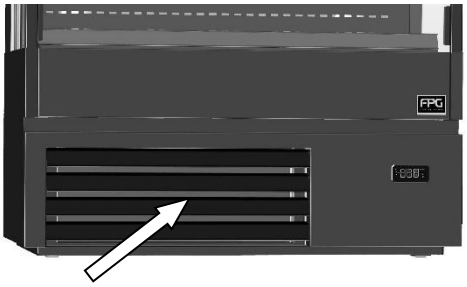
Power	**ALWAYS TURN THE POWER SUPPLY OFF BEFORE CLEANING.**
Water	THIS UNIT IS NOT WATERPROOF. DO NOT USE A WATER JET SPRAY TO CLEAN THE INTERIOR OR EXTERIOR OF THIS CABINET.

Exterior

IMPULSE CABINETS - CLEANING

Louvers





The louvers on the front and back must be kept free of dust and fluff.

This will maintain the refrigeration efficiency, and prevent overheating of the condenser.

Using a vacuum cleaner is the best method.

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

IMPULSE CABINETS - CLEANING

Side Glass

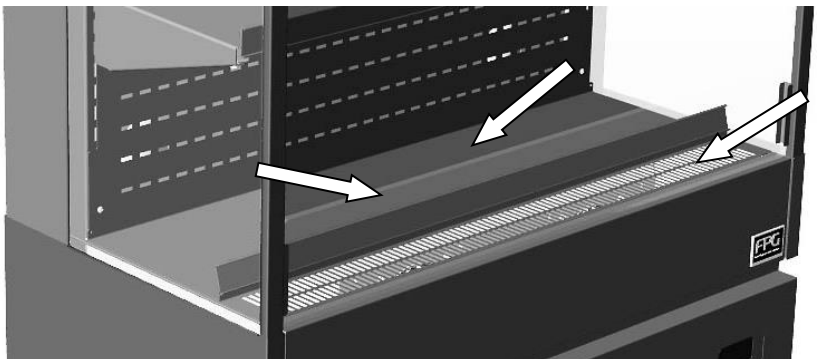
The inside surfaces of the side panels are most easily cleaned after the products and shelves have been removed.

Shelves

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

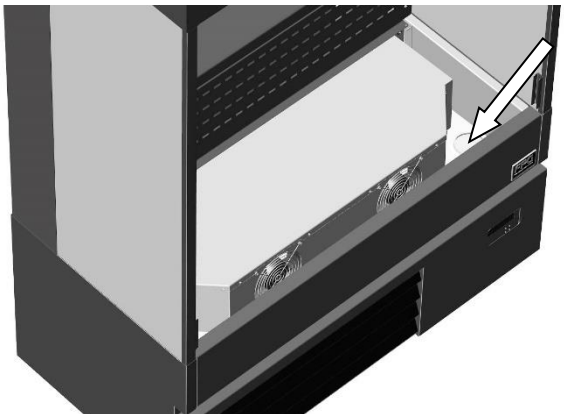
The complete shelf module can be removed by lifting it vertically, to disengage the support brackets from the back panel.

Base Area



The acrylic air deflector, base plate and air grille can all be lifted out to clean the base area.

Fan Deck



With the above-mentioned parts removed, the fan deck will be seen.

Remove any debris that may have accumulated, making sure that the drain hole is clear.

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

Condensate Capacity Warning

The condensate tray and ACR is only designed to handle cooling-coil defrosting water that drains from the well during normal operation. The 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.

Continued on next page

Mandatory Cleaning Routines

IMPULSE CABINETS - CLEANING

Warning

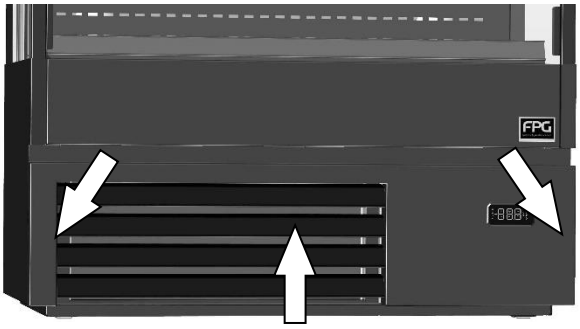
It is mandatory to have the radiator fins cleaned periodically, by a refrigeration engineer.

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.

Condenser Radiator

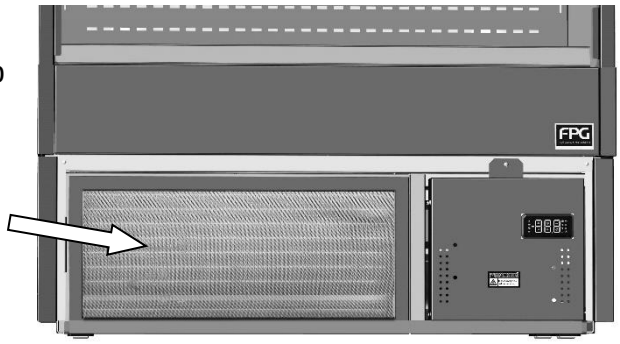
To remove the louver panel, pull the top to free it from the magnetic catches, and then disengage the bottom from the chassis



The pre-filter is attached by magnetic strips along the top and sides.

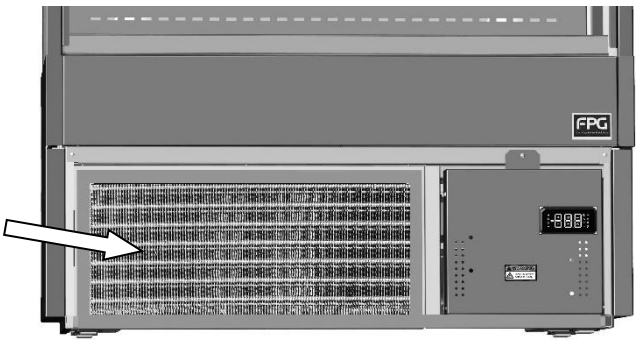
Pull it forward and lift it from the bottom channel.

Shake off dust 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.



Inspection and Rectification

As part of the cleaning routine, 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

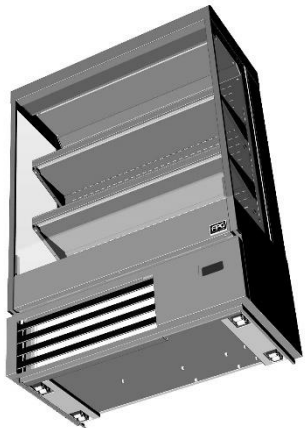
IMPULSE CABINETS - INSTALLATION

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

IMPULSE 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. Lift the base tray to check for packing materials in the well.
Positioning the Cabinet	Position the cabinet in its allocated working position. The cabinet has four casters underneath, to make moving easier. Using a spirit level, ensure the cabinet is level from front to back and side to side. If the floor is not level, place packing under the castors, as required.
Power Supply and Earthing	The cabinet is fitted with a four metre mains lead, 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

IMPULSE CABINETS - INSTALLATION

Ventilation

The front louvers and rear vent 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

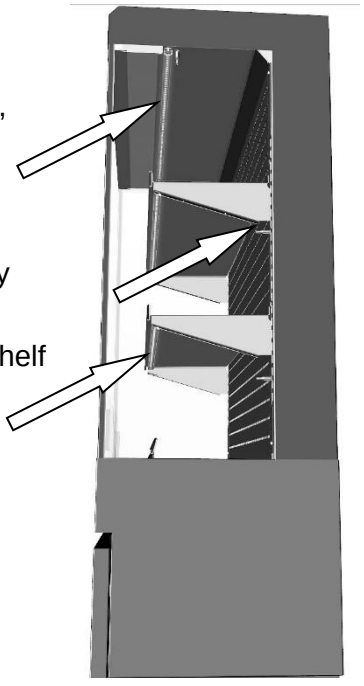
IMPULSE CABINETS - SERVICING

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

Lighting

IMPULSE 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 7 W per metre of strip length. The power supply is located on the control gear chassis. 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.



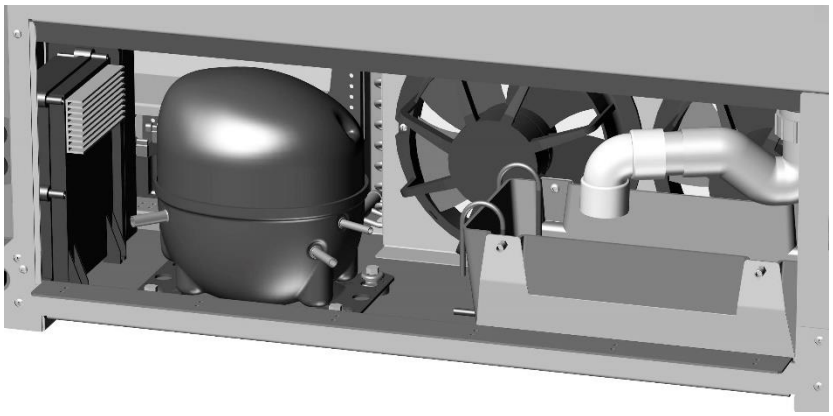
Refrigeration Equipment

IMPULSE CABINETS - SERVICING

Caution

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

Refrigeration Equipment



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

The perforated panel is secured with screws.

The condensate drain pipe coupling can be unscrewed for better access to the fans

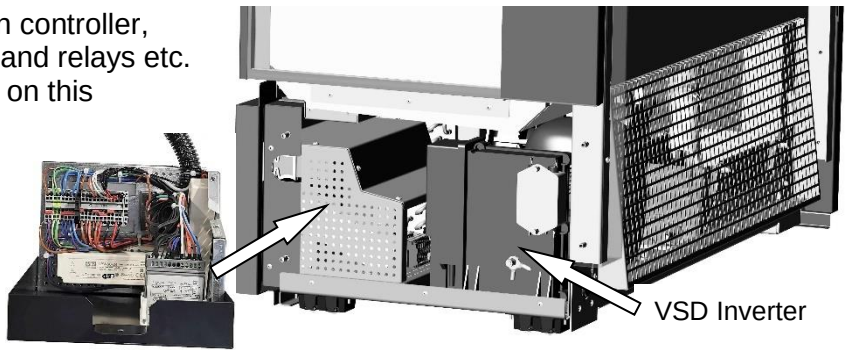
Condensate Disposal

The automatic condensate removal, ACR system consists of a water tray and evaporation elements, supplemented with hot-gas heating from the compressor output.

Each element's resistance has a positive temperature coefficient, so that the element power is reduced when it is not cooled by condensate water.

Elements are replaceable, should they fail.

Control Gear



The refrigeration controller, power supplies and relays etc. are all mounted on this chassis.

The chassis is connected by an umbilical cord, and can be withdrawn from the front of the cabinet, after removing the securing screw.

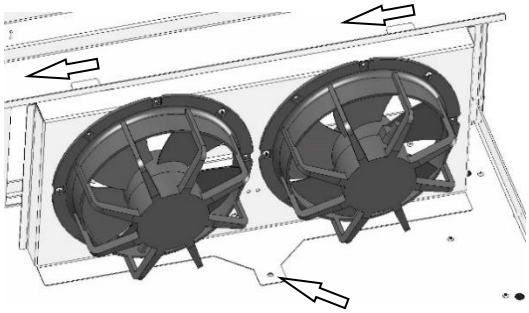
A High Temperature sensor is mounted on the compressor assembly.

Refrigeration Equipment cont.

IMPULSE CABINETS - SERVICING

Condenser Fan Replacemnt

The condenser fan shroud can be removed. Remove the screw on the bottom tag fixing it to the chassis. The Whole condenser fan shroud can then be shifted to the left then pulled out. It may be necessary to remove the ACR tray for easier access.



Each fan is secured with three screws and captive nut inserts.

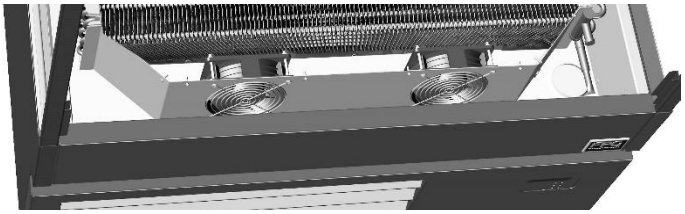
Remove the screws to replace the faulty fan.

Disconnect the faulty fan, connect the replacement and secure it with the three screws.

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

Evaporator Fan Replacement

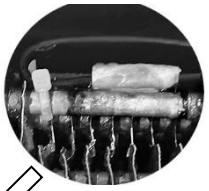
After removing the base tray, air deflector, and grille, remove the coil cover to access the fans.



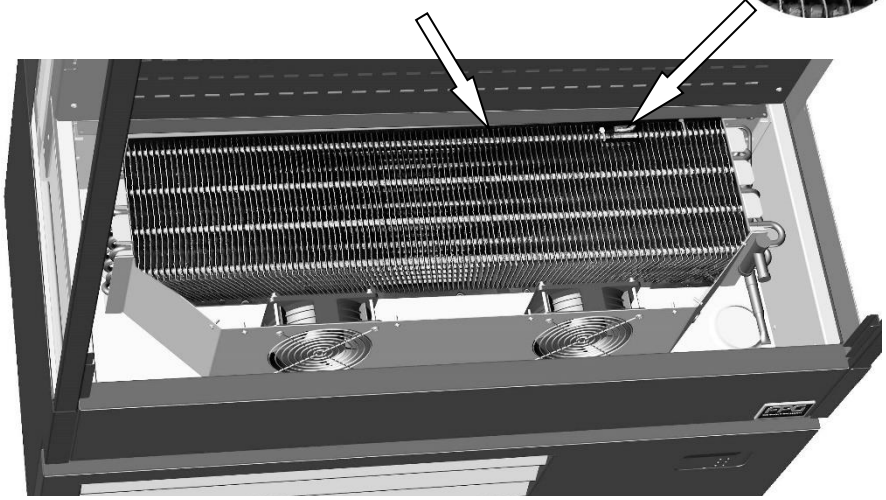
Evaporator Coil

The evaporator coil and temperature probes for temperature and defrost control are accessed by removing the coil cover, from the fan deck.

Note that a silicone encased probe is used for indicating the product temperatures. This is mounted above the top shelf, on the left of the cabinet.



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



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Refrigeration Equipment cont.

IMPULSE CABINETS - SERVICING

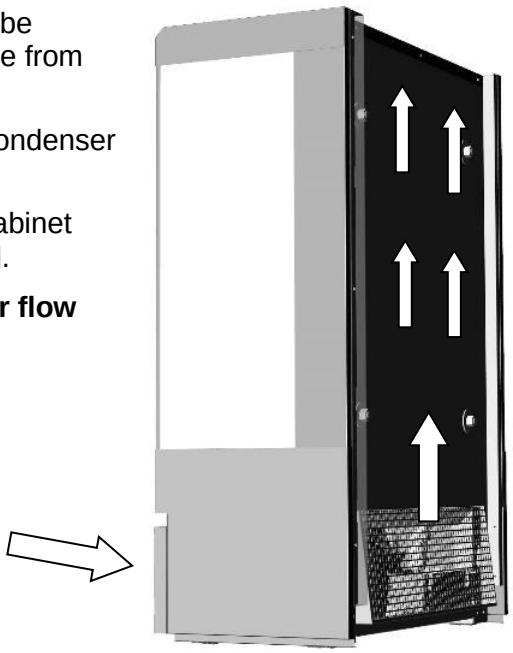
Air Ducts and Grilles

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

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

A grille is located on the rear of the cabinet and louvers on the front bottom panel.

There must be no obstruction to air flow from the top of the cabinet.



Temperature Regulator XRi31T

Model XRi31T is a microprocessor-based controller, featuring a touch-screen.
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. This PSP probe is encapsulated in a silicone block, and mimics the temperature characteristics of the displayed products. It is located above the top shelf, and is used to display the temperature of the cabinet interior.

The 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 controls the speed of the VSD inverter/compressor to maintain the set cabinet temperature.

The instrument features a touch-screen display, and is fully configurable through special parameters that can be easily programmed through the keyboard.

A special cable is used to connect the controller to the variable frequency inverter, which drives the variable speed compressor.

Continued on next page

Refrigeration cont.

IMPULSE CABINETS - SERVICING

Touch Screen

The XRi31T has a capacitive user interface with Full Touch technology. The whole display area is used to interact with the device. Specific gestures are used to enable or disable functions, browse through screens and operational modes and modify the configuration of the device.

Screen Descriptions

	**Home:** This screen shows temperature value measurement unit and active alarms only. This is the first screen after power on or after exit from other status.
	**Virtual Keyboard:** This screen shows available function. Activated function will blink when this screen is visualized.
	**Status:** This screen shows activated functions and regulation outputs (compressor, fans).
	**Programming Mode:** This screen enables the modification of all parameters.
	**Setpoint Menu:** this screen enables the modification of the Set Point values.
	**TemperatureSetpoint:** this screen enables the modification of the Temperature Set Point value.
	**Parameter Menu:** These screens enable the modification of all parameter values.
	**Stand-By:** In this condition, all outputs are deactivated.
	**HotKey Download:** “PRG” blinks during download operations (copy from HotKey to internal memory).

Continued on next page

Refrigeration cont.

IMPULSE CABINETS - SERVICING

Display Icons

	ONOFF
	LIGHT
	COMPRESSOR
	DEFROST

These are the main display icons used in normal operation.

Inverter Diagnostics

The CF10B inverter has two diagnostic methods. By LED signals or by serial communication protocol.

The LED diagnostics function helps to diagnose possible fault components by blinking a LED inside the box in different patterns. Basically, it indicates if the problem is with the Compressor, CF10B Inverter or XRi31T Thermostat.

The table below describes the failure modes.

LED Status	Period	Color	Description
1 Flash	30 seconds	Green	Normal operation
2 Flashes	5 seconds	Green	Communication problem
3 Flashes	5 seconds	Red	Inverter problem
4 Flashes	5 seconds	Orange	Compressor problem
No Flash	–	–	No input power / Damaged inverter

Compressor Problems

Compressor does not run at the selected speed	
Problem	Action
High compression load, with compressor being subjected to a stall condition.	·Review system design,refrigerant gas load or compressor capacity is not suitable for the application. If system is apropriated designed, speed will reach set value when load condition is stabilized.
Compressor always on pulldown cycle for Drop-In Mode.	·In Drop-In mode, check if the inverter AC input is connected to thermostat output. Inverter AC input should be directly connected to AC power supply (see Drop-In mode schematic).
No or incorrect control signal.	·Check if the appropriate control signal is being correctly applied to the Control Input Connection.

Refrigeration cont.

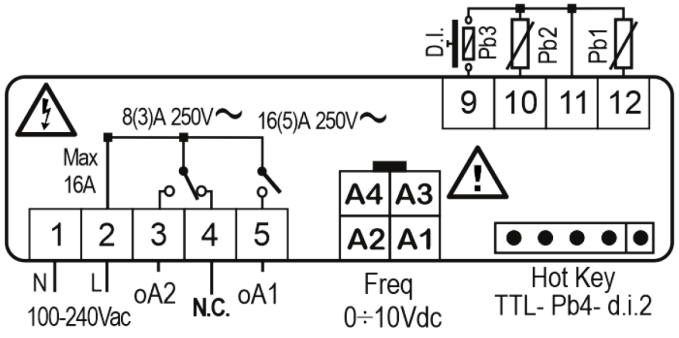
IMPULSE CABINETS - SERVICING

Compressor Trouble Shooting

The following table shows some possible problems, and the best action to deal with them.

Compressor does not start	
Problem	Action
Compressor disconnected from the inverter.	·Verify compressor cable connection.
No AC power supply; or wrong voltage/terminals connected.	·Verify AC input cable connection and measure AC input voltage.
No control signal input or bad connection.	·Verify control input cable connection and measure the signal from the thermostat.
Blown fuse (due to previous major failure).	·Return the unit to manufacturer, replacing it by new one.
Open compressor motor winding.	·Measure winding for open circuit between all pair of pins on the hermetic terminal. If any winding is open, return compressor to manufacturer.
Compressor with locked rotor (due to mechanical damage).	·Replace compressor by new one and test for confirmation. Return damaged unit to manufacturer.
Dropped, damaged, burnt inverter.	·Replace by new one and test for confirmation. Return damaged unit to manufacturer.
Inverter on waiting time after failed start.	·Wait the necessary time or reset the inverter disconnecting it from the AC power supply. The reset time is about 50s.
Demagnetized rotor (only if compressor was previously connected directly to the AC power supply).	·Replace compressor by a new one and test for confirmation. Return damaged unit to manufacturer.
Unequaled pressures between discharge and suction pressures in the refrigerating system.	·Allow the Inverter to equalize pressure between suction and discharge sides.
Low input voltage supplied to the inverter.	·Measure AC voltage to confirm.

XRi31T Connections



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SPECIFICATIONS

Mechanical

IMPULSE CABINETS - SPECIFICATIONS

	CABINET MODEL
	IL-7EL–VI09-13-05-B100
Height mm	1350
Width mm	900
Depth mm	466
Dry Weight kg (Integral)	
Cabinet Well Material	Stainless steel
Number of Shelves	One to four shelves
Display Area m^2	0.2 (per shelf) + 0.19 (base)
Refrigerant	R-290
Refrigerant Charge	Refer to cabinet Serial No./Rating label
Condensate capacity	5 litres
Climatic Class & IP Rating	All cabinets are suitable for class N climates and have an IP X0 rating

Electrical

IMPULSE CABINETS - SPECIFICATIONS

	CABINET MODEL
	IL-7EL–VI09-13-05-B100
Voltage	220-240 V 50/60 Hz 1ϕ
Max Power	1.2kW
Energy Consumption	0.57kWh/h
Max Current	5.3A
Connection	3 core cable with 10A plug
Temperature Range, °C	2 - 4°
Lights	Top light plus one per shelf

Cabinet Performance

IMPULSE CABINETS - SPECIFICATIONS

Refrigeration 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

IMPULSE CABINETS - SPECIFICATIONS

Dixell XRi31T Settings	Protected	Parameter	Value	Units / Range
Set point	Pr1	SEt	-3	deg C
Differential		HY	2	deg C
Second probe present		P2P	Y	n, Y
Third probe present		P3P	Y	n, Y
Fourth probe present		P4P	Y	n, Y
Probe p4 calibration		o4	-2	deg C
Probe displayed		Lod	P4	P1, P2, P3, P4, SEt, dtr

Program Data

All other parameter settings are password protected, and can only be altered in consultation with FPG.

A full factory restore can be made by requesting a soft-key programing device.

Compliance

IMPULSE 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

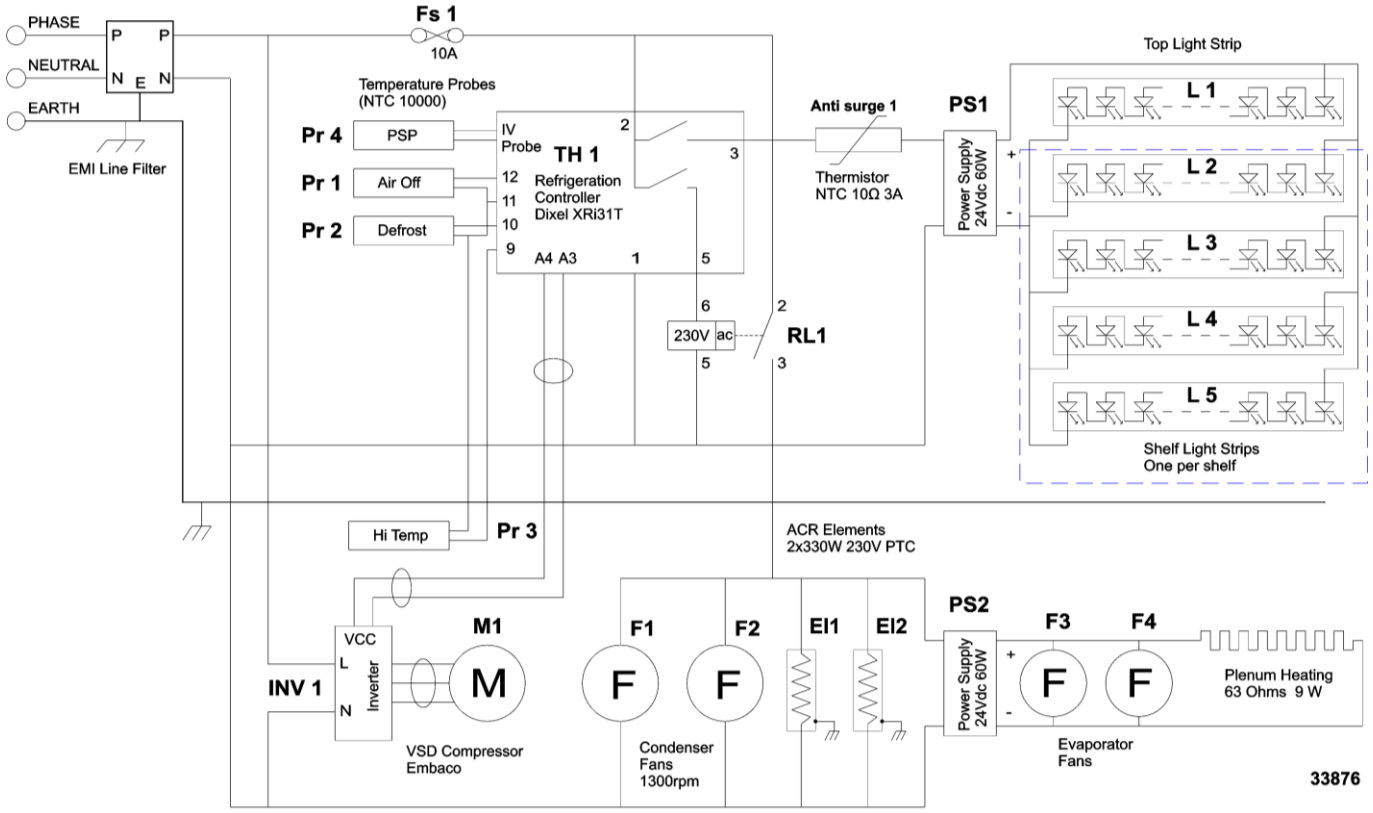
IMPULSE CABINETS - SPECIFICATIONS

Ongoing Development

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

ELECTRICAL CIRCUIT DIAGRAMS

Model: IL-7EL-VI09-13-05-B100 **Impulse Refrigerated Cabinets**



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.

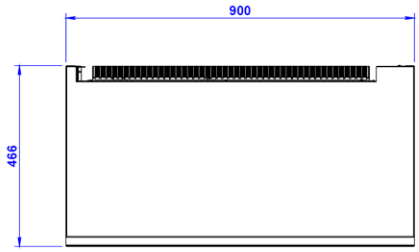
This serial number will enable FPG to trace details of the build specification of your particular cabinet, and hence ensure that spare parts are fully compatible.

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

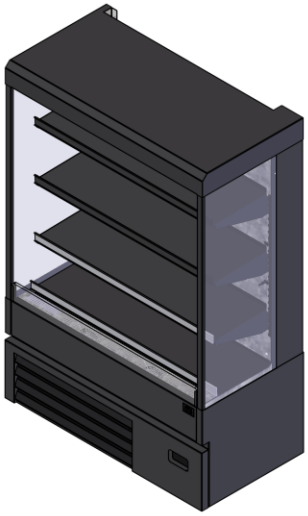
Part Description	FPG Part No.
LED power supply 24V 60W	25473
Mains lead, cord-set 1.0mm^2 - 4m - 3 core black - moulded plug	13237
Anti-surge thermistor 10 Ohm 3A	22354
Replacement Top Light LED Assembly	78700
Replacement Shelf Light LED Assembly	78683
Dixell XRi31T Refrigeration Controller ***pre-programmed***	78784
NTC temperature probe (Black, Defrost)	31217
NTC temperature probe (Red, Hi Temp)	31219
PSP NTC temperature probe (Silicone encased probe)	33845
NTC temperature probe (Blue, Air Off)	31218
Evaporator Fans 24V	31383
Condenser Fans 1300rpm	78666
Permalon pre-filter	33602
Fuse 10A	24018
Relay 30A 230V	16824
330W 230V PTC ACR element	27751
1350 Cabinet replacement glass kit RHS (viewed from front)	79045
1350 Cabinet replacement glass kit LHS (viewed from front)	79046
Embraco VEHT409U VSD compressor and inverter	33450
Product Manual for IL-7EL-V109-13-05-B100 cabinets	33872

MECHANICAL DRAWINGS

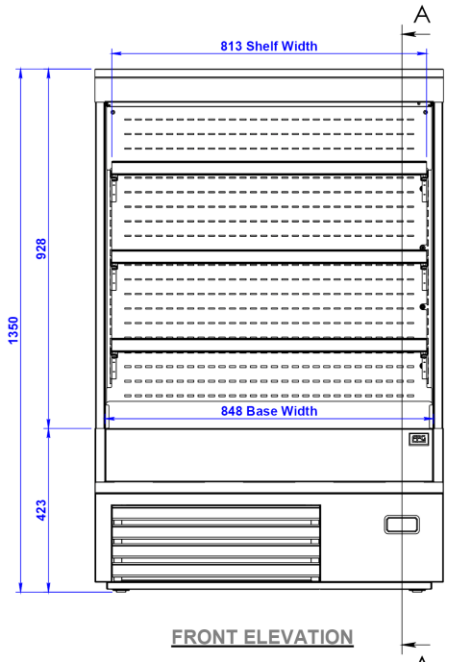
Impulse IL-7EL-VI09-13-05-B100



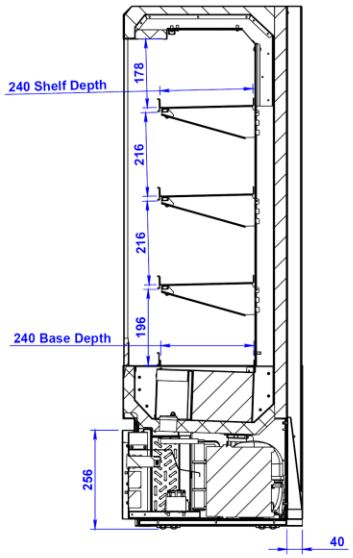
PLAN



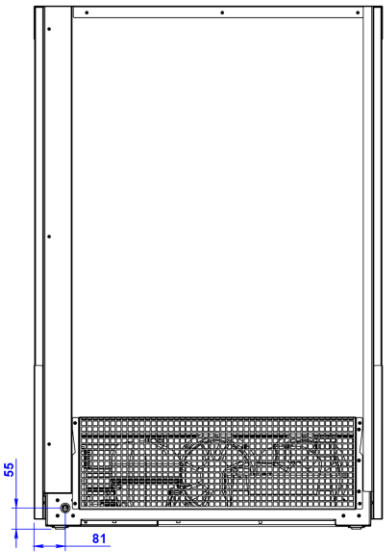
PERSPECTIVE



FRONT ELEVATION



SECTION A-A CABLE EXIT



CABLE EXIT REAR ELEVATION

SHELVES

Up to three shelves can be fitted in the 1200 cabinet, and four in the 1350 cabinet.

All sockets for shelf lighting power are provided, and shelves can be fitted in any desired location.

Allow for cold air circulation around the displayed products.

APPENDIX A
R-290 Refrigerant

General Guidance

IMPULSE 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

IMPULSE 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.

Tools

IMPULSE 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

IMPULSE 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

IMPULSE 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

IMPULSE 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

IMPULSE 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

IMPULSE 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.

IMPULSE 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

IMPULSE 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

IMPULSE 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

IMPULSE 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.

IMPULSE 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	

Revision History

Revision Level	Date of Change	Change Details
A	26/09/24	First released 7-Eleven version of the manual, using Dixell controller.
	10/10/24	Glass spares P/Ns updated. Plenum heating reduced to 9W.
	07/11/24	Electrical specifications updated, spare fuse changed to 10A
B	08/11/24	Manual identified as using Dixell controller. !200 cabinet details removed.

PRODUCT MANUAL 33872 Dixell

REV B NOV 2024

In line with our policy to continually develop, improve and support our products,
Future Products Group Ltd reserves the right to change specifications and design without notice.

Have a question? Please email us at:
sales@fpgworld.com or visit www.fpgworld.com for full contact details for your region.

Worldwide contact details: