



LINEAGE POWER®

Free Cooling Unit (FCU)

-48V Operated DC Fan Solution

- Microprocessor based
- Supports up to 3 Aircons
- Temperature & Humidity control
- standard Gravity based dampeners
- Motorized Dampener[^]
- Variable fan speed control
- Low fan noise

Overview

Free Cooling Units are to provide cost effective and reliable cooling solution for telecom sites i.e. indoor shelters, Indoor cabinets, Indoor room having GSM, CDMA etc. networks. FCU is very economical in terms of its operation where it reduces the air-conditioner usage significantly. It consumes low power when compared to aircons there by reducing the OPEX. It runs on -48V and hence reliability of the solution is greater as there is no ac line disturbances which can affect this equipment. The Inlet is wall mountable type having fan & washable filter in single cabinet. Outlet will be Gravity based auto damper which operates only when positive pressure is built in the shelter. Controller box can be mounted on wall with LCD display & indication LEDs and termination points for various input /outputs.

Operations

FCU from Lineage is an unmatched solution for Telecom Tower Companies or Operators which provides higher energy savings with high reliability. Equipment inside the Telecom Shelter can be cooled very economically by FCU which will operate for much longer durations thereby reducing the run time of Air Conditioners. FCU in the shelter allows cooler air from outside ambient and air re-circulates within the shelter instead of running compressor based air conditioners which operates at higher energy cost.



The controller continuously monitors the inside & outside temperatures and inside humidity which will effectively maintain room temperature at desired limits. In case outside ambient air can't cool the shelter the controller will power the air conditioner till the logic conditions are met to operate FCU again. The FCU has ability to operate in variable speed which maximizes the efficiency and allows small to large volume of air to cool the shelter. The fan is with speed control and can be programmed to switch OFF the FCU during night time. The DC FCU can be deployed with various cooling capacity of up to 2000 CFM in a single cabinet or expanded over multiple cabinets to 4000 CFM. It's designed for terminating up to three air conditioner power control. The inlet has got washable filter which is combined with fan assembly in a single cabinet. It's easy install on the shelter wall.

Pluto Cool Controllers

The Pluto Cool controller combines sophisticated control and monitoring with and remote management. This flagship controller simplifies operations and maintenance while lowering administrative costs. It has option to control 4 FCU fans and power control up to 3 air conditioners. It measures individual air conditioner energy consumption, Total DC fan energy consumption. It also captures the run hours for both air conditioner as well as DC FCU. It has got RS 232 port in the front panel for local configuration.

Benefits

Reliability

- Distributed fault tolerance
- Quality Components
- Controller continuity

Intelligence

- Energy Management
- Industry leading controller features
- RS485 interface for remote access

Investment Protection

- Low energy consumption,
- high ROI
- Carbon Credit
- Flexible installation for legacy sites and new sites

On Time Delivery

- 4 - 6 week availability
- Technical support
- Standard building blocks

[^]Optional

Pluto Cool Controller



Pluto Cool Controller is designed to meet the needs of the Free Cooling Unit. Building on the Pluto platform, the FCU delivers state-of-the-art performance by combining sophisticated control, monitoring, and remote access in a single integrated unit. The controller has been designed to simplify system administrative and surveillance routines as well as reduce operating, provisioning, and personnel expenses.

Configuration of the **Pluto Cool Controller** can be performed via menu based front panel display, a local terminal or through a remote Via RS 485 connection utilizing

standard MODBUS protocols.

Applications

- Indoor Telecom Shelter
- Indoor Cooling application
- Outdoor cabinet

Key Features

Controller Feature

- Up to 4 independent DC fan control
- Up to 3 independent Aircon power control
- 2 Temperature Measurement
- Humidity measurement
- Various mode of FCU operation – Energy Savings, Emergency and Manual
- Up to 3 Digital output (Alarm relays)
- Up to 3 Digital input (Auxiliary Input)
- LCD Display with Key pad
- 5 Alarm and 3 Status LED

Energy Management

- FCU run hours –EB, DG & Battery
- Individual Aircon run hours
- FCU Energy Measurement
- Individual Aircon Energy measurement

Local & Remote Access

- RS 232 Port (DB9)-local configuration
- RS 485 port (RJ 11) – future use
- Remote communication through GPRS Modem*
- Multi level password protection

Fail safe Controller

- Switch to Aircon mode in case of controller failure

Alarm & Statistics

- System alarms
- Audio Alarm with cut-off
- Alarm test
- Multi-level alarm severity:
 - Various levels of configuration, statistics, and history
 - Software upgrade through Craft port

Specifications

General	
Operating Voltage	48Vdc (Range: 40 to 60Vdc)
Controller Input Power	10W (depending on options)
Operating Temperature Range	-10°C to +55°C (14 to 131°F)
Storage Temperature Range	-20°C to +85°C (-4 to 185°F)
Operating Relative Humidity	0 - 95% (non-condensing)
Physical Specifications (Controller Box)	355 x330 x 130 mm (W x D x H)
Display	8-line by 40-character backlit LCD

*Optional

Agency Certifications (Certification on Request)	
EMC (Emissions)	EN 55022, Class A;

Cabinet Specifications

Mechanical (Inlet)	
Height	650mm
Width	690mm
Depth	620mm
Weight	35kg

Mechanical (Outlet)	
Height	440mm
Width	320mm
Depth	275mm
Weight	5.5kg

Mechanical (Controller Box)	
Height	330mm
Width	355mm
Depth	130mm
Weight	6.5kg

Environmental	
Operating Temperature Range	0°C to +55°C
Operating Relative Humidity	< 95% non-condensing
Storage Temperature Range	-20°C to +85°C (-4°F to 185°F)
EMC	EN55022 Class A (Certification on Request)
Ingress Protection	Inlet IP54 as per IEC 60529 (Certification on Request)

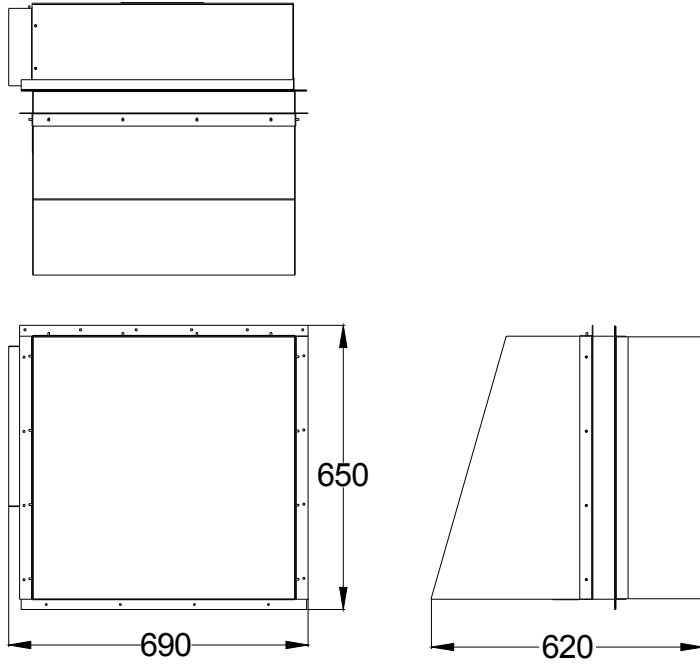
Fan Options	
1200CFM	2.4 kW @ $\Delta T < 5^{\circ}\text{C}$ **
2000CFM (Standard)	4 kW @ $\Delta T < 5^{\circ}\text{C}$ **

**standard Shelter dimension 3.6m x 2.4m x 3m (W x D x H) , $T_{\text{amb}} - T_{\text{sh}} < 5^{\circ}\text{C}$

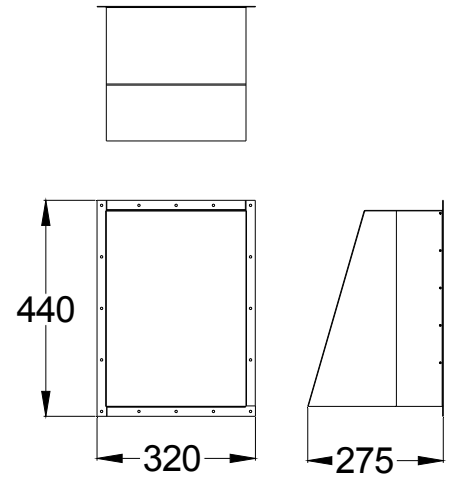
T_{amb} : Ambient Temperature T_{sh} : Shelter Temperature

Outline Drawing

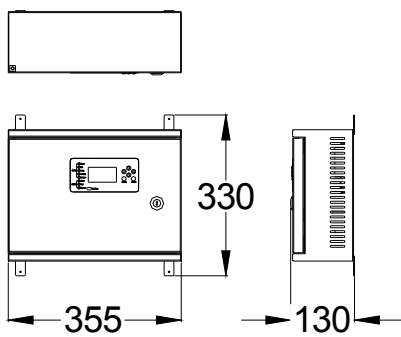
Inlet



Outlet



Controller Box



Note: All Dimensions are in mm

FCU Technical Specifications Over View	
Operating Voltage	48Vdc (38Vdc -57Vdc)
Power Consumption	380W for Single Fan
No. of Fans	1
Airflow	3440m ³ /h Typical
Aircon Power Control	1 (extendable to 3)
Aircon Power Relay rating	25A Suitable up to 1.5TR Airconditioners
Dimensions (W x D x H)	
	Inlet 690 x 650 x 620
	Outlet 320 x 275 x 440
	Controller Box 350 x 130 x 330
Weight	
	Inlet 35kg
	Outlet 5.5kg
	Controller Box 6.5kg
Mounting	Wall mounting
Temperature Probe for Ambient measurement	1Nos.
Temperature with Humidity Sensor	1 No.
Dampener	Standard Gravity based Dampeners to arrest reverse flow of air Motorized -Optional
Inlet Filters	Standard Washable P.U. Foam on Polyester base, G4 Class Heavy duty Filter FC3 class -Optional
Operating Temperature	-10°C to +55°C
Operating Humidity	0 to 95% RH non condensing
PFC Output	3 Nos. Programmable through Craft Port
RS 485 Port	1No. (Future Use- MODBUS Protocol)
RS 232 port (DB9)	1No.
IP Category	
	Inlet IP54
	Outlet IPX4 (Rain protection)
	Controller Box IP20

Country of Sale

Country of Sale	
South Asia	India, Sri Lanka
SE Asia	-
NA	-
CALA	-
European	-
Africa	-



Contact Us

For more information, call us at **+91 8028411633-40** or Email us at Sales@lineagepowersystems.com and visit us on the web at

www.lineagepowersystems.com