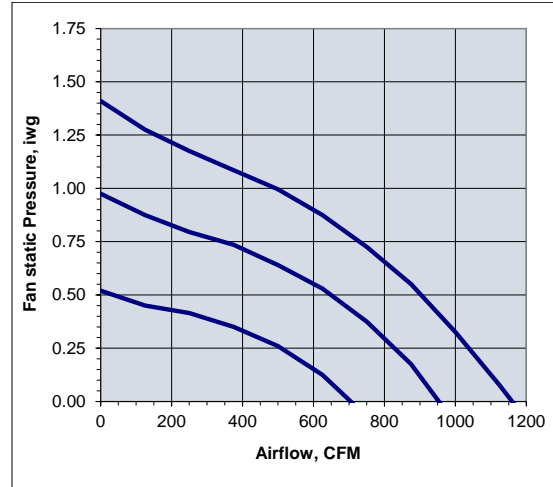
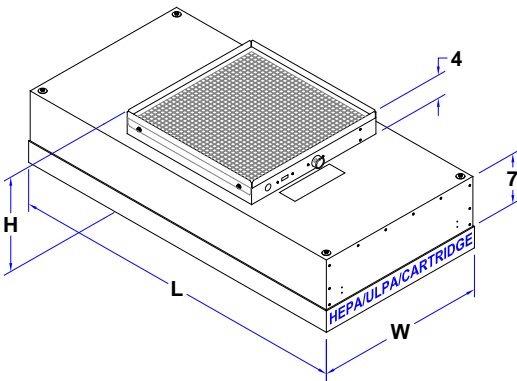


CPFFU-DC-EB-2X4



Voltage	Max W	Unit Label FLA
200-277VAC	170	2.0-1.0

Can be custom rated at lower FLA

24"x48" grid centerlines		Part that mates to grid			Filter		Fan housing		Overall
Loading and grid style		Grid surface	W	L	Width	Length	Width	Length	H
<input type="checkbox"/>	Top load light weight T grid	Gasket			23.63	47.63	23.38	47.38	14
<input type="checkbox"/>	Top load heavy duty 2" T grid	Gasket			22.75	46.75	22.5	46.5	14
<input type="checkbox"/>	Top load flush 2.6 grid	<input type="checkbox"/> Gasket <input type="checkbox"/> Gel			22.6	46.6	22.5	46.5	14
<input type="checkbox"/>	Room side replaceable cartridge on flush 2.6 grid	<input type="checkbox"/> Gasket <input type="checkbox"/> Gel	22.6	46.6	21.0	45.0	21.0	45.0	18
<input type="checkbox"/>	Bottom load flush 2.6 grid	Downward facing knife-edge			20.13	44.13	18.3	42.3	14.75
<input type="checkbox"/>	Other								

Filter efficiency	<input type="checkbox"/> HEPA 99.99% 0.3 microns	<input type="checkbox"/> ULPA 99.9995% 0.12 microns
Filter pack depth	<input type="checkbox"/> 53 mm (2") Standard	<input type="checkbox"/> 70 mm (3")
Input power	<input type="checkbox"/> 200-277VAC single phase 50/60 Hz	

Sound at Varying Static Pressures

Point	Velocity, FPM (m/s)	SP, iwg (Pa)	Speed, RPM	Lw / Lp	Octave Band Center Frequencies, Hz						A-weighted	
					63	125	250	500	1K	2K		4K
A	90 (0.45)	0.39 (97)	1086	Lw	53	63	57	52	50	46	36	56
				Lp	52	57	51	46	47	42	34	51
B	90 (0.45)	0.50 (124)	1157	Lw	54	69	60	56	52	48	38	59
				Lp	54	65	55	51	50	46	37	55
C	90 (0.45)	0.63 (156)	1353	Lw	60	71	65	60	57	53	44	63
				Lp	60	66	62	57	54	51	42	60
D	90 (0.45)	0.75 (187)	1426	Lw	61	72	67	62	58	54	45	65
				Lp	61	66	62	58	55	51	43	61

Lw is Sound Power Level, dB re 1 pico Watt.

Lp is single unit Sound Pressure Level, db re 20 micro Pa, at a distance of 1 m from filter face

Power Consumption, Power Factor and Harmonics (data taken at 120VAC)

Point	Irms	P (W)	S (VA)	Q (VAR)	PF	Φ (deg)	Vthd, %	Ithd, %	Ifund, A	I 3 rd har, A	I 5 th har, A	I 3 rd har, %	I 5 th har, %
A	0.62	62	73	39	0.84	32	2.1%	28%	0.59	0.14	0.06	25%	10%
B	0.79	84	93	42	0.90	26	2.1%	21%	0.77	0.14	0.06	18%	7%
C	1.14	127	134	44	0.94	19	2.0%	15%	1.12	0.14	0.05	13%	5%
D	1.23	144	151	46	0.95	18	2.2%	14%	1.28	0.15	0.06	12%	4%

Harmonics are as percentage of fundamental.

Control and Monitoring Options

- Local manual speed control
- ModBus RTU with small control console
- ModBus RTU for direct control from building management system

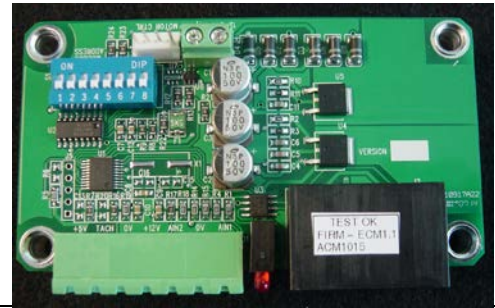
CPFFU-DC-EB-2X4 SPECIFICATION

FFU Specification [Optional items]

Fan housing shall be powder-coated steel [aluminum] [galvalume]. Unit shall incorporate a sound baffle with sound absorbent insulation. Unit shall carry an ETL listing per UL 1995.

The nominal 2x4 foot FFU shall be capable of producing 720 CFM (1223 CMH) of airflow at 0.75 iwg (187 Pa) of fan static pressure. The fan shall consist of an integrated motor and centrifugal plug fan. The impeller shall backward-curved blades made of aluminum and be mounted directly to the rotor of the motor. Motor shall be an electronically commutated brushless DC external rotor motor with permanently lubricated ball bearings. The controller shall have active power factor correction. The total current harmonic distortion (I_{thd}) as a percentage of fundamental shall be no higher than 15% at full speed and no higher than 30% at any speed. The power factor shall be no lower than 95% at full speed and no lower than 84% at any speed. The fan assembly shall be statically and dynamically balanced as per ISO 1940, class G 6.3. Housing shall incorporate a finger guard on the inlet side of the fan that requires tool removal. Power input to the unit shall be 200-277VAC 50/60 Hz.

[Provide a 1" (25 mm) thick 20"x20" (500x500 mm) 30% pre-filter mounted on top of the unit.] Provide a plenum style final filter with a 50 [70] [100] mm pack depth with an anodized extruded aluminum frame. HEPA filter shall have a minimum DOP efficiency of 99.99% @ 0.3 microns. [ULPA filter shall have a minimum DOP efficiency of 99.9995% @ 0.12 microns.] The filter shall have a flat bottom face for seating onto gasketed grid. The final filter shall have a coated metal screen on the downstream face to protect the filter. The fan housing shall sit directly on the final filter with a gasket seal between. [Provide an intermediate cartridge with gel seal final filter to enable removal of filter without removing fan housing.]



BUILT-IN MODBUS COMMUNICATION ACM1015

<p>Overview</p> <p>The ACM1015 provides Modbus network and analog control capabilities to a BLDC motor. ACM1015 is fully compatible with the plug and go Modbus system. Simply add a Control Console for a complete control and monitoring solution.</p>																					
<p>Specifications</p> <ul style="list-style-type: none"> Control Interface for BLDC motor Network or Analog Control Simple connections 4 pin MTA for motor control signals RJ45 for networking 7 pin terminal for analog inputs LED diagnostics Board Status Network Traffic Industry standard Modbus Networking RTU protocol RS485 9600,8,n,1 Flexible analog control options 0-5V source potentiometer Sensor with 0-5V output Internal closed loop control Open frame PCB with standoffs 0-50° C operating temperature 3.9" x 2.16" x 0.95" 	<p>Installation</p> <p>ACM1015 gets its low voltage power from the Modbus network (using the network power supply ACM1005, ACM1008 or similar) or from a local 12-24V DC supply or AC transformer.</p> <p>Two RJ45 jacks provide the In/Out connections for the network cables. The ACM1015 is daisy chained using CAT5 patch cables.</p> <table border="1" data-bbox="764 667 1432 894"> <thead> <tr> <th>Pin Number</th> <th>Signal Name</th> <th>Function</th> <th>Motor Wire Color</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>+10V</td> <td>+10V output from motor</td> <td>Red</td> </tr> <tr> <td>2</td> <td>Tach</td> <td>Feedback signal from Motor</td> <td>White</td> </tr> <tr> <td>3</td> <td>0V/Gnd</td> <td>Common Ground</td> <td>Blue</td> </tr> <tr> <td>4</td> <td>SPD</td> <td>PWM speed signal to motor</td> <td>Yellow</td> </tr> </tbody> </table>	Pin Number	Signal Name	Function	Motor Wire Color	1	+10V	+10V output from motor	Red	2	Tach	Feedback signal from Motor	White	3	0V/Gnd	Common Ground	Blue	4	SPD	PWM speed signal to motor	Yellow
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BUILT-IN MODBUS COMMUNICATION ACM1015 REGISTERS

<ul style="list-style-type: none"> MODBUS RTU protocol Selectable Physical medium: RS485 (2-wire) Selectable baud rate 9600, 8, n, 1 	<ul style="list-style-type: none"> Network wiring method: Dual RJ-45 sockets (2 wire) Up to 127 unique addresses selectable by DIP switch settings Slew rate limited for improved performance
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Table 1 Register Descriptions

Register	Upper Byte	Lower Byte	Type	Description
1		Bit 0: Start/Stop	R/W	Enter Decimal 0-stop 1-start
2		Motor Speed (0-100%)	R/W	Enter 0-100% motor speed
3	P Value		R/W	PID – Proportional Variable
4	1 Value		R/W	PID- Integral Variable
5	D Value		R/W	PID- Derivative Variable
6	Motor Speed (RPM)		R	RPM Feedback-Fans with Tach Input
7	Analog Input (0-1023)		R	
8	Minimum Speed Pot (0-1023)		R	
9	Status Flags		R	
10		Default Speed (0-100%)	R/W	Default Power up Speed
11	Version Major	Version Minor	R	
12		Triac Phase Angle (0-100)	R	
13	Max Speed (750-3600rpm)		R/W	Max Speed for Motor
14		Bit 0: Default Start/Stop	R/W	Set 0-stop 1-start for Power Up
15				
16				
17		Number of Good Packets	R/W	
18		Number of Bad Packets	R/W	
19	Reset Counter		R/W	
20	Speed	Update Time	R/W	
21				
22				
23		Configuration Control	R/W	0-Mode0, 1-Mode1, 2-Mode2, 3-Mode3, 4-Mode4, 5-Mode5

Table 4 RJ45 Network Cable Connections

1	2	3	4	5	6	7	8
Bus Power Pass Through	0V(GND)	RS485				0V(GND)	Bus Power Pass Through
		+			-		

OPTIONAL SMALL SYSTEM CONSOLE ACC 1 TO 125 UNITS

Overview

The Small System Console is a simple and economical controller box for controlling and monitoring a network of ACM1015 speed controls up to 125 units.

The Console will have two modes of operation. In general the unit will be scanning the attached units and monitoring their unit function. Upon entering a special code into the unit the supervisor (or installer) can enter the selection mode and change speeds, turn-on feedback function and initiate and set the speed set-back function. The performance of the units, therefore, can only be adjusted by someone authorized to enter the ADJUST Mode.

The user will be able to choose the desired unit and then the particular operation desired (increase speed, decrease speed etc.). The system also provides key features including a global setting for all units (for set-up), manual speed set-back mode and pressure switch status feedback (for differential pressure switch connected to each unit).



Monitor and ADJUST Mode (Access Level A4)

- Setback setting to hi-low(Access Level A3)
- Set speed of each unit (Access Level A2)
- Setback speed (global) setting (Access Level A2)
- Differential pressure switch monitoring (Access Level A1)
- Global command for entire zone(Access Level A1)

Up to 125 Units / control

- Easy to Read Display
- Simple Knob Control
- Individual Control/Adjust
- Global command Controls
- Manual Set-back capability
- Differential Pressure switch alarm optional
- 4:1 Speed Range
- Speed Resolution 1%
- Each Unit Addressed
- Differential Pressure switch feedback
- Analog feedback to Console
- Inherent Hi-Reliability
- MODBUS Communication Protocol

Easy to set-up. Easy to use.

The Console communicates through Standard RJ45 connector to the units. The Console connects to the first unit which is then daisy-chain connected to the other units. Upon start-up the Console scans the units on the network and then monitors the units on the line. By watching the Console scroll through the units on-line it is easy to identify if a unit is not connected properly.