ENERCOV™
## AHDF Series
Duct Type

# Humidity controls fan coil unit, hydronic duct connect FCU without electric heaters.

Humidity
is a nature treatment.

Temperature & Humidity
Controls Air Conditioner

Chilled water
duct connect fan coil unit

Patent
Pending

●●●
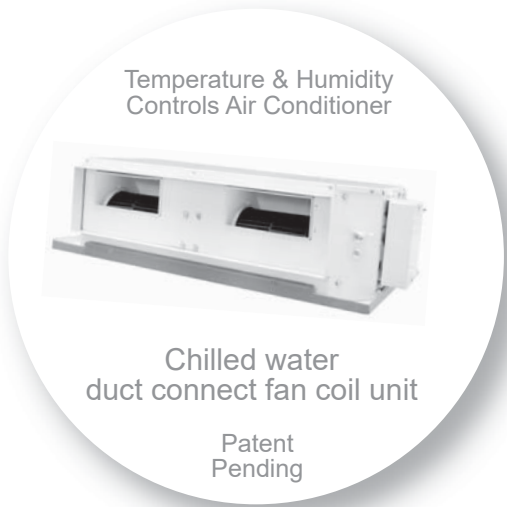
New generation of FCU with ENERCOV's process algorithm controls. Design for special conditioned space that requires very precise of temperature and humidity to maintain very comfortably, moreover air fresher and healthy breathing.

**Wall mount
intelligent temp & humidity controller
with °C & %rh display.**

# AHDF Series

## ▪▪ ENERCOV air conditioner for humidity control

AHDC series, Air conditioner system for special function room application to maintain environment such as temperature and humidity at desirable range. Chilled water fan coil unit (FCU) is ceiling concealed with ducting installation and connected with proportional type control valve (0-10Vdc). Chilled water supply temperature shall be provided 7.2 deg C or below which is suitable within comfortable range of human being.

## ▪▪ Micro-processor controls

Intelligent temperture & humidity controller with ENERCOV's process FUZZY algorithm provides very precise of room parameters. It consists of display unit, temperature & relative humidity sensors, controller and fan motor speed control. LCD display on the display unit shows real time actual temperature and relative humidity.
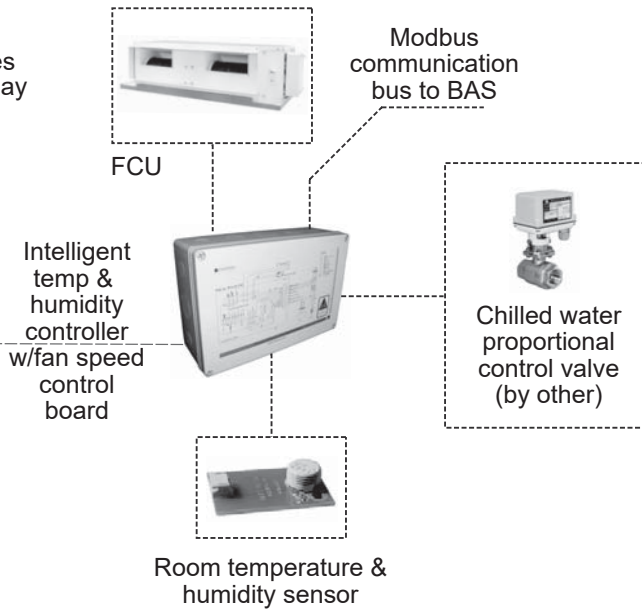
## ▪▪ Display unit functions



Dim : 87Wx87Hx20D mm.
Wall mount

| | |
|---|---|
| ⌇⌇⌇ | Heating Element On/Off |
| ✳/◌ | Temperature and Humidity Control Mode |
| ❄ | Cooling Control Mode |
| FILTER | Filter Clog Indicator (if applied) |
| ALARM | Unit Alarm Indicator |
| FAN AUTO | Fan Automatic Control Status Indicator |
| PROGM | Programmable Mode |
| 25.℃ | Actual Room Temperature or Setpoint Indicator |
| 50 %RH | Actual Room Humidity or Setpoint Indicator |
| ☰ | Fan Speed Running Indicator |

Function Keypads



Wireless Remote Control

Modbus communication bus to BAS

FCU

Intelligent temp & humidity controller w/fan speed control board

Chilled water proportional control valve (by other)
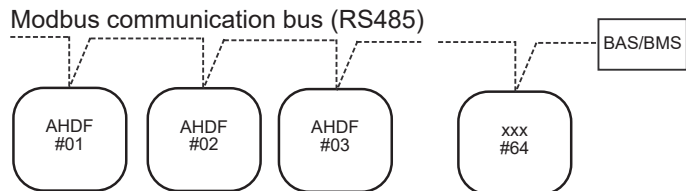
Room temperature & humidity sensor

## ▪▪ Control Functions

1. Room temp. & humidity are controlled by ENERCOV's process FUZZY/PID adaptive algorithm.
2. Cooling mode and temperature/humidity control mode selectable.
3. Aux HEATER lights up means heater energized.
4. Room temperature and relative humidity real time display
5. Supply air fan can config to vary speed to maintain room condition by automatically.
6. Room sensors faulty alarm codes.
7. Room temperature & humidity sensors calibration is also available.
8. Proportional, integral gain and calculation time are configurable.
9. FCU fan minimum speed is configurable.
10. Alarm display codes.
11. Provide with infrared wireless remote control.
12. Pre-configuration programmable software.
13. Modbus interface port for BAS communication (option).

## ▪▪ Network Management by BAS (max 64 IFCs/loop)

AHDF's controller can communicate with BAS or BMS by modbus protocal, max 64 nodes per loop and 300 meters length.

Modbus communication bus (RS485)

| AHDF #01 | AHDF #02 | AHDF #03 | xxx #64 |

BAS/BMS

*Operating Mode*
> Cooling Only is a normal room thermostat function. This mode will control room temperature only.
> Temp & humidty control mode is an ENERCOV's process algorithm to maintain room temperature and humidity automatically.

*Temperature and humidity setting*
> Temperature setting
   By pressing UP or DOWN key to decrease or increase temperature setpoint by 1.0°C
> Humidity setting
   By pressing 2 configured keypads for 7 seconds and press UP or DOWN key to decrease or increase humidity setpoint by 5%RH (30 - 80%RH adjustable).

*Temperature & Humidity displaying*
> Bigger 7 segments LCD will display real time space temperature (deg C)
> Lower 7 segments LCD will display real time space relative humidity (%rh)

*Configuration Mode*
Intelligent controller can apply to various application. Each application can acces to set up internal programme to config each decision by pressing configuration access keys. This configuration mode includes temperature /humidity sensor calibration, response time setting, minimun/maximum fan speed set up, remote on/off setting, aux. heater setting, etc.

*Other Functions*
> Self Diagnostic
> Watchdog
> Humidity sensor ERROR code
> Temperature sensor ERROR code
> Non-volatile memory
> Modbus communication to link to other network such as BAS/BMS.

## Technical Product Data (DC Motor)

| Fan Coil Model | | Unit | AHDF080 | AHDF100 | AHDF120 |
|---|---|---|---|---|---|
| Air Flow Rate | Max Speed | CMH | 3738 | 5097 | 6388 |
| | | CFM | 2200 | 3000 | 3760 |
| Cooling Max Speed | Nominal Cooling Capacity | BTU/H | 87300 | 115100 | 149500 |
| | | kW | 25.58 | 33.72 | 43.80 |
| | Water Flow Rate | l/s | 1.10 | 1.45 | 1.89 |
| | | GPM | 17.5 | 23.0 | 29.9 |
| | Pressure Drop | kPa | 33.00 | 35.00 | 38.00 |
| Fan Motor Power Input | Total Rated Power | W | 400 | 550 | 550 |
| | Qty | - | 1 | 1 | 1 |
| Motor | Type | - | BLDC Motor | | |
| Power | Rated | kW | 0.75 | 1.1 | 1.1 |
| | Source | - | 220-240V/1Ph/50Hz | | |
| Aux. Electric Heater (Option) | Total Heating Capacity | W | 3000 | 3000 | 4500 |
| | Power Supply | - | 220-240V/1Ph/50Hz | | |
| | Current | A | 13.64 | 13.64 | 20.45 |
| Water Pipe Connection | Diameter | In. | Threaded 1-1/4" | | |
| Drain Pipe | Diameter (OD) | In. | 7/8" | | |
| Dimension | Width | mm. | 1560 | 1560 | 1892 |
| | Height | mm. | 400 | 452 | 452 |
| | Depth | mm. | 592 | 614 | 714 |
| Weight | Approx. | Kg. | 65 | 99 | 104 |
| Controller | Main | - | Micro Processor W/Modbus Communication to BAS/BMS | | |
| | Display | - | LCD W/Temperature & Relative Humidity Display | | |
| | Wireless Remote Control | - | Yes, Infrared | | |

Note : Cooling cap. based on 27°CDB, 19°CWB of room condition and CHW supply temperature 7.0°C, temperature rising 5.0°C.



AHDF080 to 125
Duct connect, high pressure

# Applications

## Application T1 : Proportional control valves (0-10Vdc)
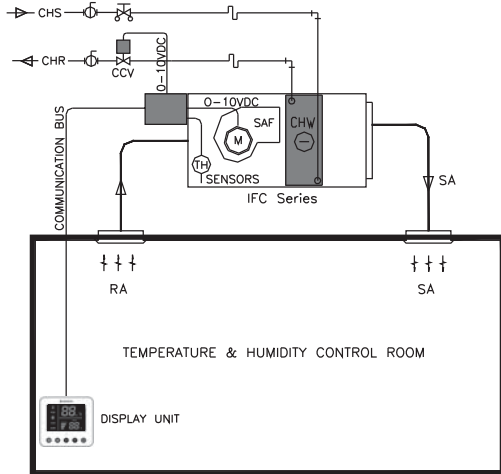


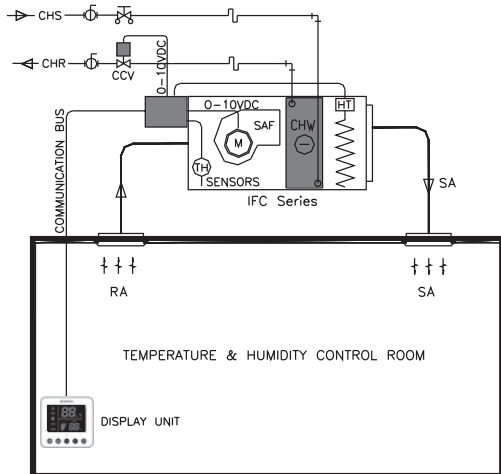| Operating Features & Functions |
| --- |
| FUZZY controller adjusts SAF speed automatically |
| FUZZY controller adjusts CCV opening automatically |
| CCV operation only can get cooling capacity 0-100% |
| SAF & CCV operation together to maintain temp. & humidity |
| SAF minimum speed 10% (configurable) |
| SAF & CCV are operated on temp. & humidity sensors and setpoint |
| Temperautre control deviation +1.0/-1.0 deg C |
| Humidity control deviation +10/-10%rh |

## Application T2 : Proportional control valves (0-10Vdc) W/aux heater



| Operating Features & Functions |
| --- |
| FUZZY controller adjusts SAF speed automatically |
| FUZZY controller adjusts CCV opening automatically |
| CCV operation only can get cooling capacity 0-100% |
| SAF & CCV operation together to maintain temp. & humidity |
| SAF minimum speed 10% (configurable) |
| SAF & CCV are operated on temp. & humidity sensors and setpoint |
| Temperautre control deviation +1.0/-1.0 deg C |
| Humidity control deviation +/-5%rh |
| HT activates during too low temperature at minimum fan speed |

### Abbreviation

| | |
| --- | --- |
| MV | Motorized Valve |
| SAF | Supply Air Fan |
| CHS | Chilled Water Supply |
| CHR | Chilled Water Return |
| RA | Return Air |
| SA | Supply Air |
| PWM | Pulse Width Modulation |
| HT | Heater |
| VFC | Voltage Free Contact |
| CCV | Cooling Coil Control Valve |

ENERCOV™

## Scope of supply table

| Item | Enercov | Contractor |
|---|---|---|
| Fan coil unit | Standard | |
| Enercov's process controller & display unit | Standard | |
| Room temp. & humidity sensors W/cable 6 m. | Standard | |
| Room temp. & humidity sensors W/cable 15 m. | Option | |
| Aux. electric heater | Option | |
| Chilled water control valve (Prop. 0-10Vdc) | | Standard |
| Chilled water motorized valve (On/Off) 2 sets | | n/a |
| Transformer 220/24 Vac for control valve | | Standard |

## FCU Specification

| Description | Specification |
|---|---|
| FCU Housing material | Galvanized steel |
| Cooling coil tube diameter | 3/8" |
| Cooling coil material | Aluminium fin copper tube |
| Reference standard | ARI 441 |
| Face velocity | <2.50 m/s |
| Coil operating pressure/Test pressure | 250 PSIG/350 PSIG |
| Drain pan | Galvanized steel w/closecell self-distinguishing insulation |
| Fan | centrifugal forward curved blade |
| Motor type | DC motor |
| Motor speed adjustable (linearity) | 0-10Vdc by controller |
| Drain pan | Galvanized steel w/closecell insulation |

ENERCOV™
*Expert in humidity*

www.enercov.com