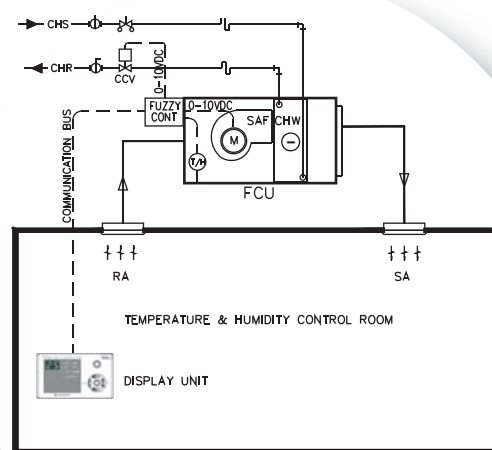


*Intelligent Temperature & Humidity Controller
For Small Chilled Water Fan Coil Unit
No need electric heater
by ENERCOV method.*



With FUZZY adaptive algorithm
adjustable temperature control range 15 - 30°C
humidity 30 - 70%RH

°C +
%RH



IFH Series

Complete with single phase fan speed control board
or fan speed control & CHW control valve signal 0-10VDC

New innnovation of HVAC controls system, cost effective and accuracy.

IFH Series

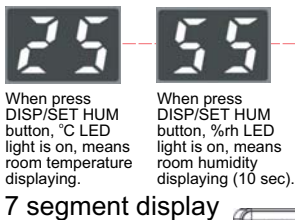
ENERCOV intelligent temp. & humidity controller

ENERCOV's IFH series, new innovation of humidity controls system. It is applied to conventional chilled water fan coil unit to control room temperature and humidity at desirably range without electric heater elements. IFH series provide fully equipments for small FCU system such as micro-processor controller (p/n : ITH-01-CW), display unit (p/n : DT-05HE), room temperature & humidity sensor (p/n : THS-01), fan speed control board (p/n : FCS-01-4A), control signal 0-10VDC for proportional controls valve. IFH-01-CW is suitable for small conventional chilled water fan coil unit from 1.0 to 3.0 tons. IFH-02-CW is suitable for three phase fan motor air handling unit which must supply VSD by other.

FUZZY algorithm

Intelligent temperature & humidity controller with completed FUZZY algorithm provides very precise of room temperature & humidity. FUZZY algorithm adjusts FCU fan speed and regulates chilled water control valve to maintain sensible & latent capacity follows cooling coil characteristic (coil curve) by automatically. That mean we can control room temperature & humidity without additional high power consumption device such as electric heater. Display unit can display room temperature & relative humidity as per configure by user. The user also can adjust room condition very easily.

Display unit functions

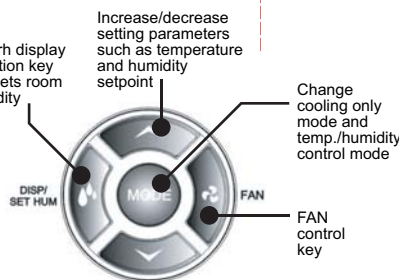
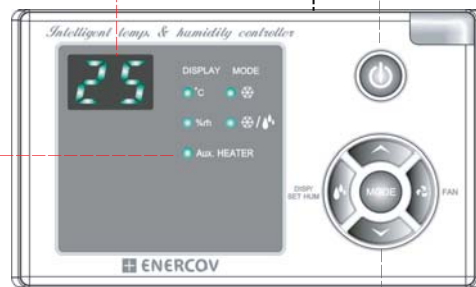


DISPLAY

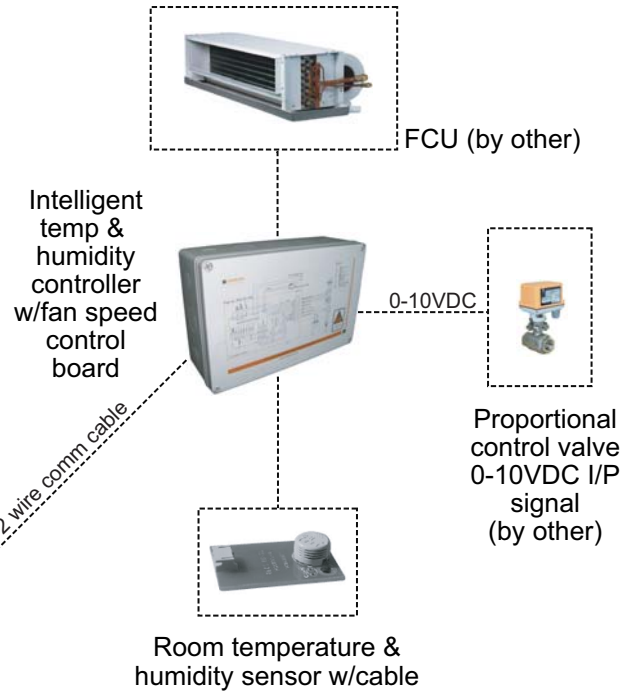
- °C
Room temperature displaying lamp
- %rh
Room humidity displaying lamp
- Aux HEATER
Auxilliary heater operating lamp

MODE

- Mode cooling only
- Mode temperature & humidity control



Function keys



Configuration & Functions

1. Room temp. & humidity are controlled by FUZZY adaptive algorithm.
2. Cooling mode and temperature/humidity control mode selectable
3. Aux HEATER LED lights up when aux heater is enabled. This function is applied at higher accuracy of room condition by aux heater option.
4. Room temperature and humidity display selectable. These 2 parameters can configurable to swap display by automatically.
5. Supply air fan can config to minimum 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. Remote contact On/Off configurable.
10. Un-occupied T&H setpoint configurable from free contact input.

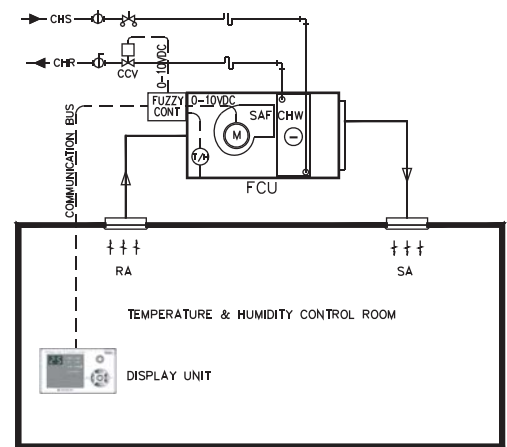
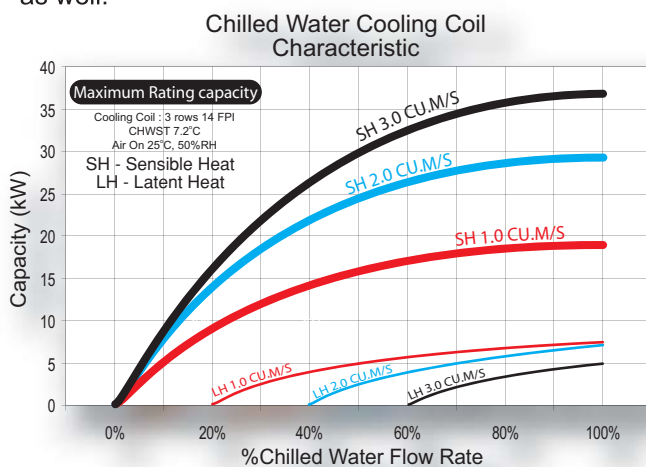
Intelligent Temp. & Humidity Controller

ENERCOV Method (cooling coil characteristic control.)

According to relationship between sensible capacity, latent capacity versus water flow rate and air volume of chilled water cooling coil. Cooling coil capacity varies upon chilled water flow through the coil, both sensible and latent capacity vary in term of natural logarithm related with percentage of water flow rate. Sensible capacity starts from 0%, latent capacity starts from somewhere between 0-100% of chilled water flow. The starting point of latent capacity depends on air flow rate and chilled water supply temperature. Lower chilled water supply temperature means lower latent capacity starting point. This relationship can be applied to lower range of absolute humidity of control room by reducing chilled water supply temperature low as low possible.

The relationship between cooling capacity versus air volume, when decreasing air volume, sensible capacity also reduces but latent capacity is increased which is different from adjusting water flow rate. See graph below.

Thus, we can adjust the amount of chilled water flow rate by regulating chilled water control valve incorporated with varying amount of air flow rate by VSD, or by bypassing damper that is automatically adjusted depends on room sensible and latent heat. FUZZY algorithm within Enercov's IFH series product will pick up room temperature and humidity sensors, then regulate proper amount of chilled water and air flow by automatically as per cooling coil characteristic to maintain both of important parameters, room temperature and relative humidity as well.



CHW & air flow diagram

IFH series specification (For FCU 1-3 tons)

BASE UNIT (part no. IFH-01-CW)

Processor unit	part no. ITH-01-CW
Type	Micro processor W/FUZZY algorithm
Power supply	220-240VAC 1PH 50Hz
Power consumption	Max. 800W (include FCU fan)
Dimension	300W x 200H x 100D mm.
Harmonic generation	Current <2.0% (at 2.0 Amp)

INPUT ;

Temp & humidity sensor	part no. THS-01
Temp sensor element	Semi conductor
Temp sensor accuracy	+/-0.50 deg C
Hum sensor element	Capacitive type
Hum sensor accuracy	+/-3.0%RH
Cable lenght	1 m.

DISPLAY UNIT ;

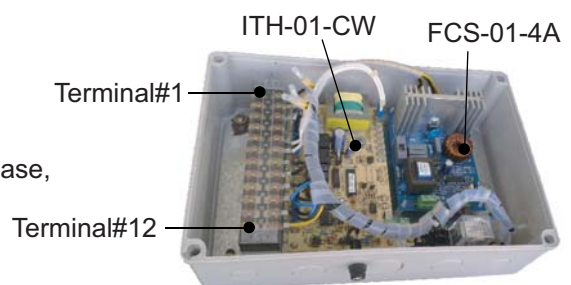
Display unit	part no. DT-05HE
Dimension	65W x 110L x 21D mm.
Cable lenght	6 m. (15 m. option)
Cable type	2 cores telephone cable
Display	2 digits LED height 9.5 mm.
Keypads	On/Off, MODE, increase, decrease, fan, DISP/SET HUM

OUTPUT ;

Control valve signal	0-10VDC
Fan control speed	part no. FCS-01-4A
Fan control output	220VAC 1PH, Phase cut
Fan current	4Amp max.



Intelligent temp.&humidity controller p/n IFH-01-CW



Inside Equipments

IFH Series

IFH series specification (For FCU/AHU > 3 refrigerant tons)

BASE UNIT (part no. IFH-02-CW)

Processor unit	part no. ITH-02-CW
Type	Micro processor W/FUZZY algorithm
Power supply	220-240VAC 1PH 50Hz
Power consumption	< 2 Watts
Dimension	300W x 200H x 100D mm.
Harmonic generation	Current <0.1%

INPUT ;

Temp & humidity sensor	part no. THS-01
Temp sensor element	Semi conductor
Temp sensor accuracy	+/-0.50 deg C
Hum sensor element	Capacitive type
Hum sensor accuracy	+/-3.0%RH
Cable lenght	1 m.

DISPLAY UNIT ;

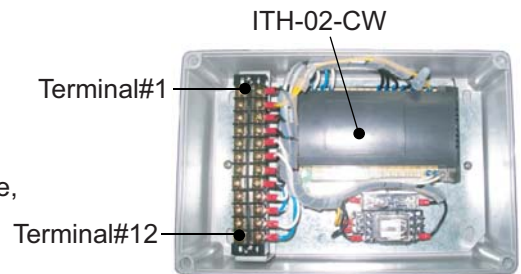
Display unit	part no. DT-05HE
Dimension	65W x 110L x 21D mm.
Cable lenght	6 m. (15 m. option)
Cable type	2 cores telephone cable
Display	2 digits LED height 9.5 mm.
Keypads	On/Off, MODE, increase, decrease, fan, DISP/SET HUM

OUTPUT ;

Control valve signal	0-10VDC
Fan control speed signal	0-10VDC



Intelligent temp.&humidity controller p/n IFH-02-CW



Inside Equipments

IFH-01-CW and IFH-02-CW will be supplied with associated parts below.

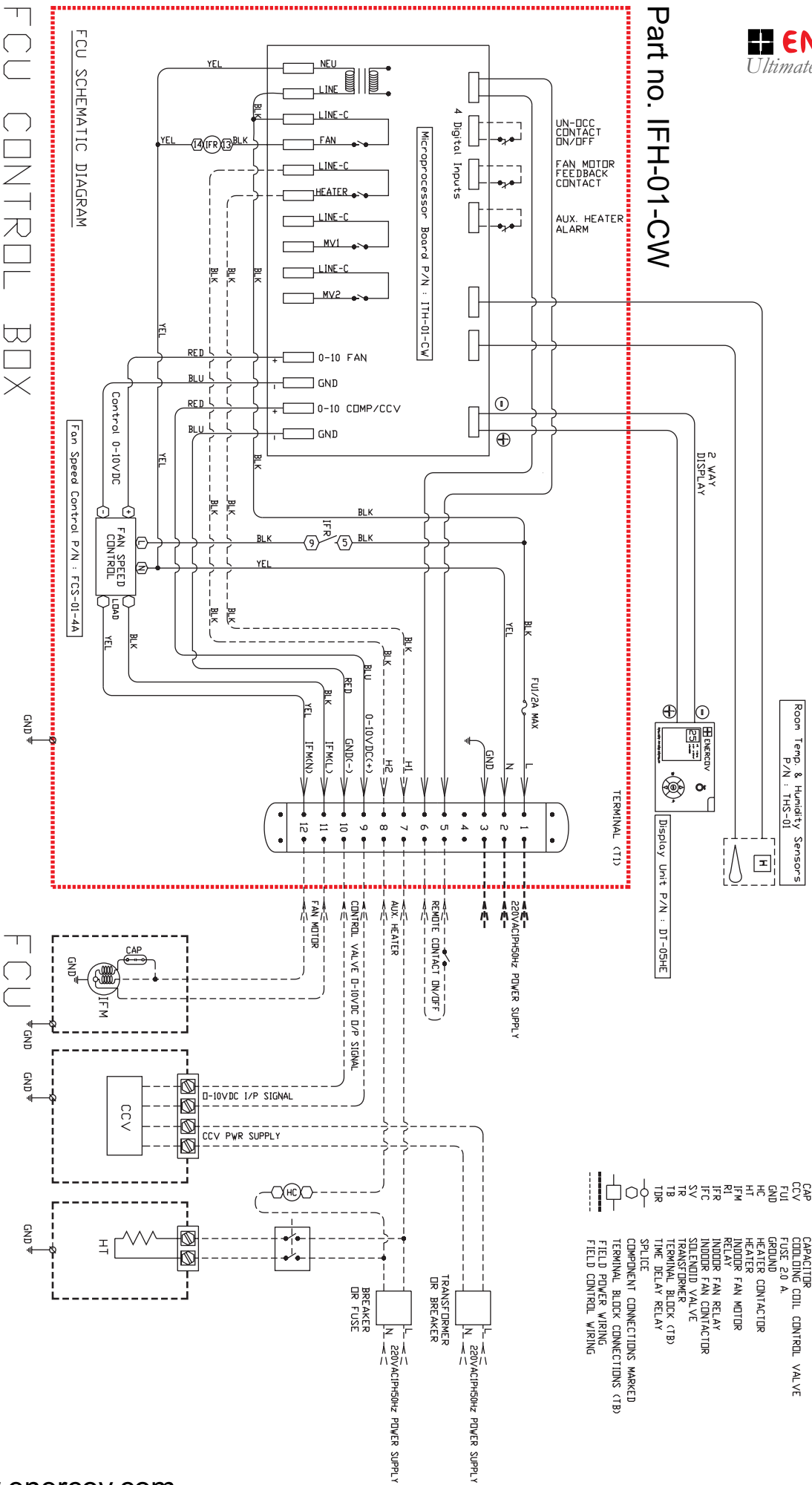


Display unit part no. DT-05HE

Temperature & humidity sensor with cable lenght 1 m.
part no. THS-01
(please call us to extend sensor cable length.)

Controller to display unit cable lenght 6 m.
(please call us to extend cable length.)

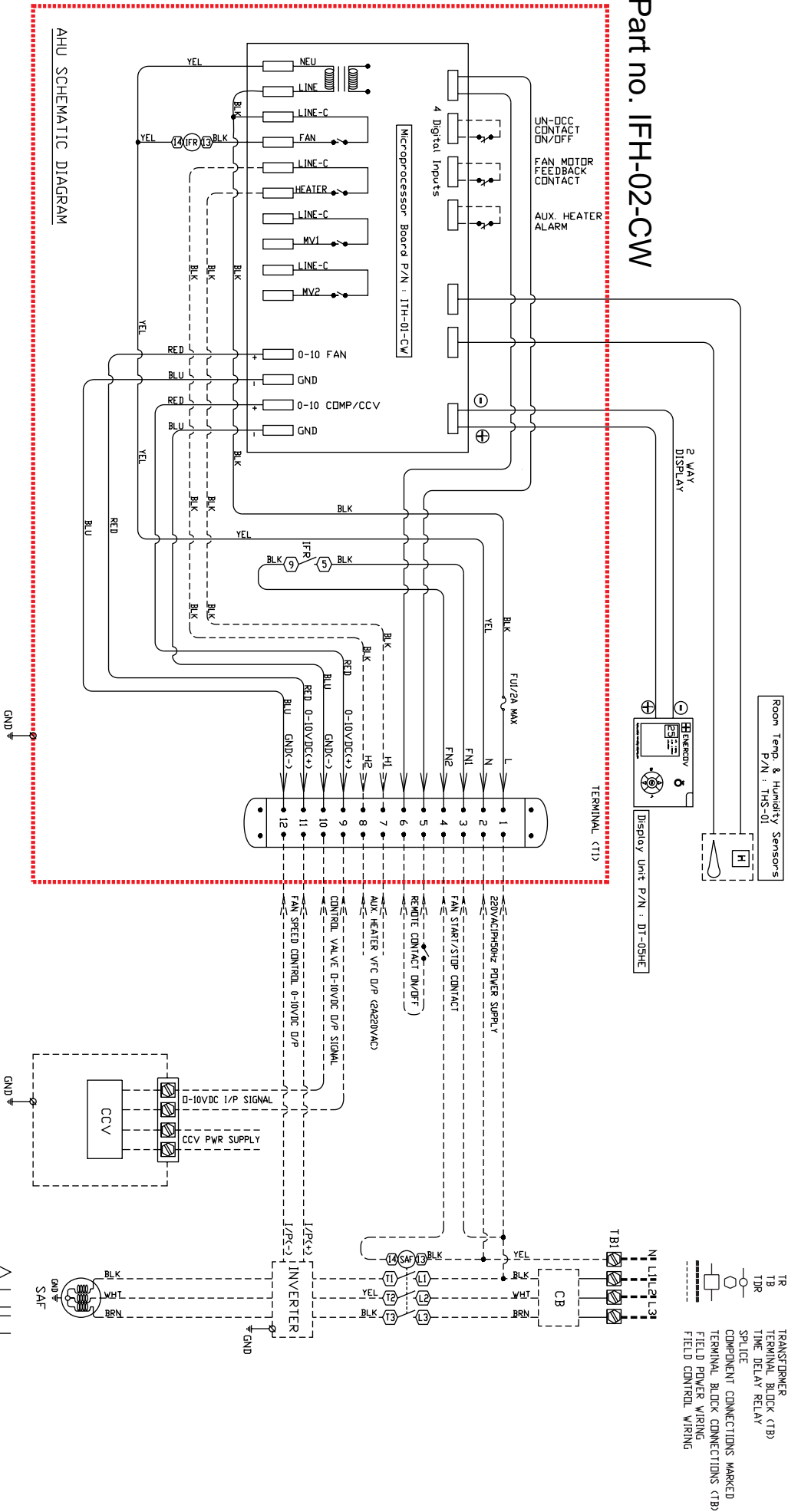
Part no. IFH-01-CW



Symbols

IFH series schematic wiring diagram (1 Phase)

Part no. IFH-02-CW



IFH series schematic wiring diagram (3 Phase)