

Floor Standing Air Conditioner For Precision Temperature & Humidity Controls



With intelligent temp. & humidity controller
adjustable temperature control range 20 - 26°C
humidity 40 - 65%RH

R22

°C +
%RH



FUH Series

Cooling capacity range 10 - 44 kW

New innnovation of humidity controls product.

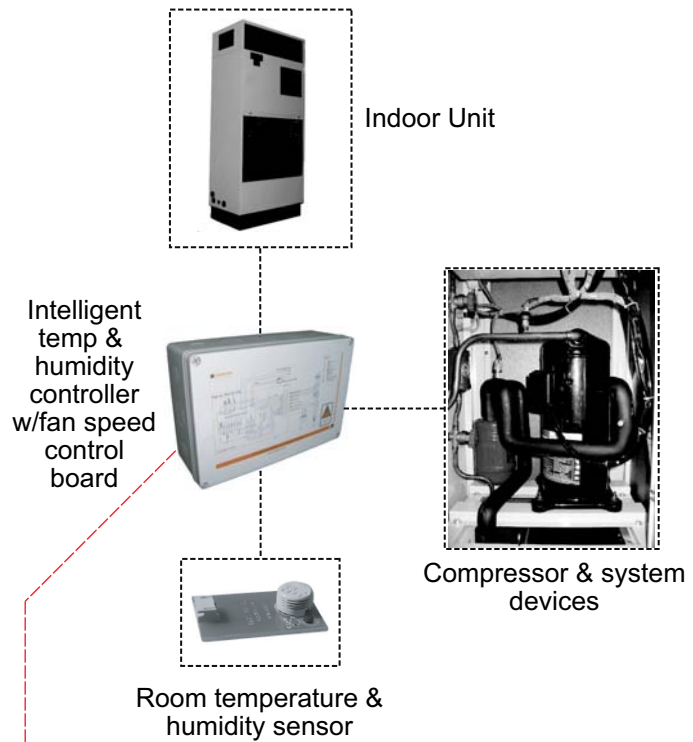
FUH Series

ENERCOV air conditioner for humidity control

FUH series, Air conditioner system for special function room application to maintain environment such as temperature and humidity at desirably range. The indoor unit is floor standing installation type. Matching to high performance and heavy duty condensing unit SPA, PV and PC series for widely applications.

Micro-processor controls

Intelligent temperature & humidity controller with completed FUZZY algorithm provides very precise of room parameters. It consist of display unit, temperature & relative humidity sensors, controller and fan motor speed control. LED display on the display unit shows actual temperature. It also can switch displaying to room humidity by pressing DISP/SET HUM button.



Display unit functions

7 segment display



When press DISP/SET HUM button, °C LED light is on, means room temperature displaying.



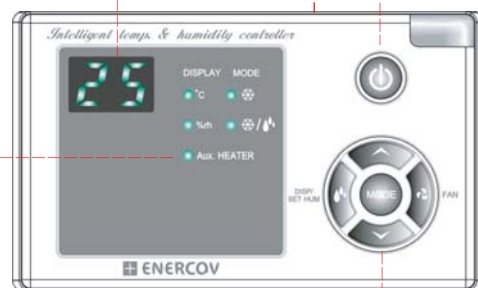
When press DISP/SET HUM button, %rh LED light is on, means room humidity displaying (10 sec).

DISPLAY

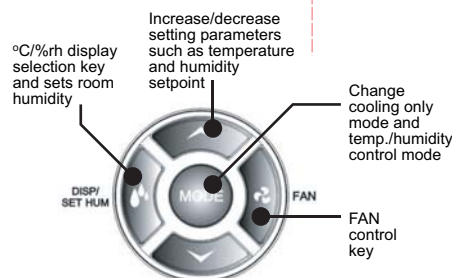
- °C
Room temperature displaying lamp
- %rh
Room humidity displaying lamp
- Aux HEATER
Auxillary heater operating lamp

MODE

- Mode cooling only
- Mode temperature & humidity control



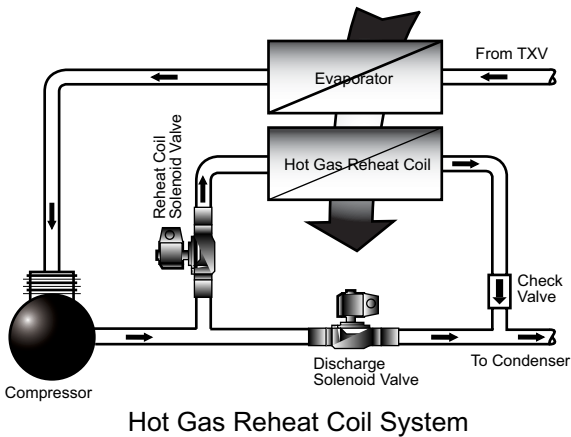
On/Off button



Function keys

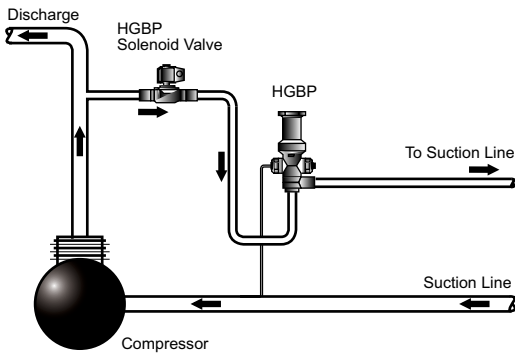
Control Functions

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 means hot gas reheat coil energized.
4. Room temperature and humidity display selectable. These 2 parameters can swap display by automatically.
5. Supply air fan can config to vary speed to maintain room condition by automatically.
6. HGPB solenoid valve is operated in term of PWM (pulse width modulating) function.
7. Room sensors faulty alarm codes.
8. Condensing fan is adjust speed to control refrigerant discharge pressure.
9. Room temperature & humidity sensors calibration is also available.
10. Proportional, integral gain and calculation time are configurable.



Hot gas reheat coil

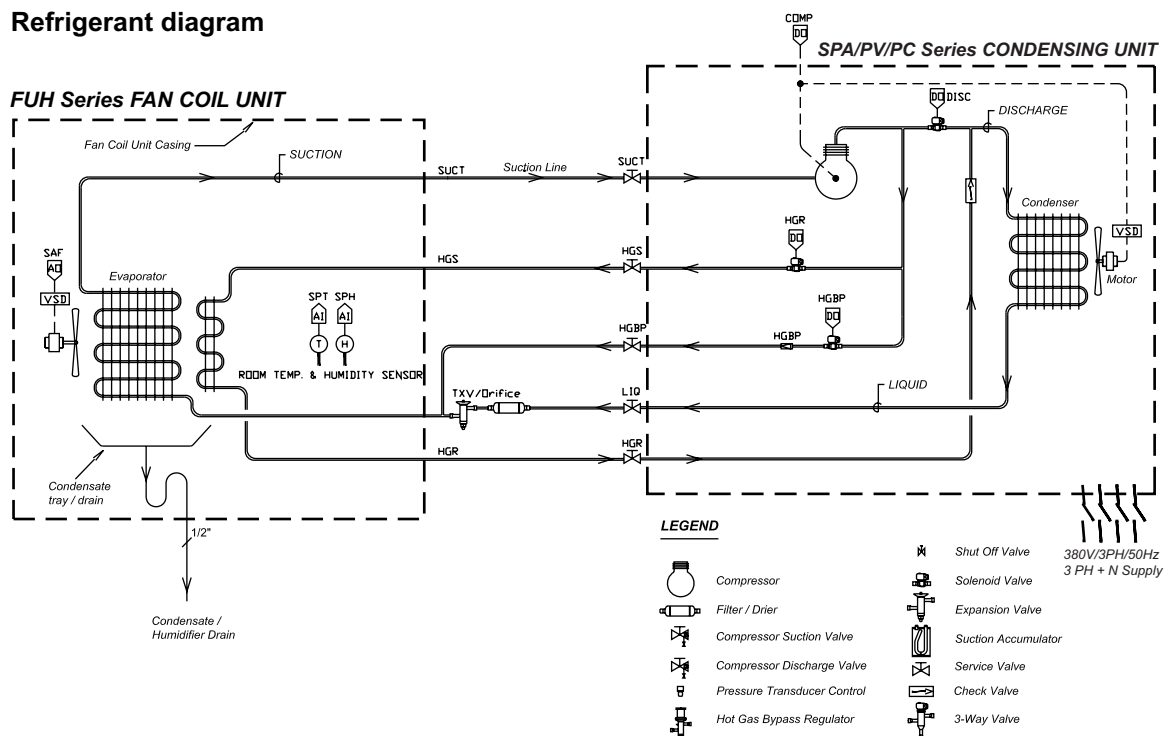
When compressor is running to reduce room sensible and latent heat in term of temperature and humidity respectively. In case of high latent heat and low sensible heat, the compressor still run although room temperature is reduced below setpoint to keep dehumidifying process. The system requires reheat function to compensate too high cooling supplied. Generally, electric heaters are applied to this function which is very high power consumption for re-heating. ENERCOV provides hot gas reheat coil instead of electric heater position. By using the waste heat energy from discharge superheat gas approximately 80-90°C and controls hot gas flows through reheat coil by solenoid valve. The refrigerant sub-cool also increases whilst hot gas reheat is operated. Energy saving over 40% is guaranteed.



Compressor capacity control system

Generally, the compressor will be controlled to start and stop to maintain room temperature and humidity. During stopping, room humidity fluctuates due to the latent heat of room condition. Compressor can be re-started after 1-3 minutes to prevent short cycling. ENERCOV develops a new improved technology to unload compressor during low load condition down to 40% of compressor capacity by Hot Gas Bypass (HGBP) system. The HGBP system bypasses discharge gas of refrigerant back to suction line at appropriated amount and related to actual room heat load. So, the system is regulated refrigerant quantity flows to evaporator based on room heat load requirement. We can maintain room temperature error within +/-1.0°C and humidity +/-10%RH controlled range possibility.

Refrigerant diagram



FUH Series



Outdoor Unit
SPA Series



Outdoor Unit
PV Series



Outdoor Unit
PC Series

Specification, Free blow floor standing

Indoor Unit Model	Unit	FUH032	FUH040	FUH048	FUH060	FUH080	FUH100	FUH140	FUH150	
Outdoor Unit Model		SPA032	SPA040	PV048	PV060	PV080	PV100	PC140	PC150	
Total cooling capacity	kW	9.53	12.35	15.50	16.62	22.88	26.90	35.33	42.50	
	Btu/hr	32,526	42,150	52,901	56,724	78,089	91,809	120,580	145,051	
Sensible heat factor	-	0.79	0.77	0.76	0.78	0.80	0.71	0.77	0.75	
Outdoor Unit (SPA, PV & PC-Series)										
Power source	V/Ph/Hz	220/1/50		380V/3PH/50Hz						
Compressor Rated Load Amps	RLA	23.1	7.5	8.2	10.0	16.4	19.2	22.2	29.8	
Refrigerant	-	R-22								
Compressor type	-	Hermetic Scroll/Reciprocating								
Capacity control device	-	Hot gas bypass valve (HGBP)								
Capacity control range	-	50% - 100% Proportional								
Suction accumulator	-	Yes								
Hot gas reheat solenoid valve	-	Yes								
Air flow direction	-	Horizontal				Vertical				
CDU Fan Type	-	Propeller Fan				Direct Drive				
Motor	RLA	0.95		1.97			3.20		3.20	
Volt/Ph/Hz	-	220V/1PH/50Hz								
No. of fan	-	1	2		1			2		
Air Flow	CMH	5,000	5,000	6,000	6,000	8,500	8,500	12,000	16,500	
Condenser Coil	-	Aluminium fins/Copper tube								
Dimension in mm.	Height	762		660		830		985	885	
	Width	955		660		830		1,300	2,440	
	Dept	395		730		846		950	1,130	
Approx. net weight	kg	67	84	110	123	155	172	244	253	
Pipe conn. Liquid,Suction	inch	3/8,3/4		3/8,7/8		1/2,1-1/8	5/8,1-1/8	5/8,1-3/8	7/8,1-5/8	
Pipe conn. Reheat Coil (in & out)	inch	1/2		5/8			7/8		1-1/8	
Indoor Unit (FUH-Series)										
Nominal air flow quantities	CMH	2,000	2,400	2,700	3,400	4,000	4,750	6,000	7,500	
Power source	V/Ph/Hz	220/1/50								
Motor Full Load Amps	FLA	1.30	1.70	1.76	2.80	2.80	2x1.73	2x1.76	2x2.87	
Supply air fan type	-	Direct drive centrifugal fan								
Cooling coil No. of row(s)	-	3		4	3			4		
Fin/inch	-	14		12	14			12	14	
Face area	sq.m.	0.365	0.454	0.336	0.413	0.491	0.491	0.710	0.880	
Reheat coil capacity	kW	7.5	9.8	12.4	13.0	18.0	21.0	28.0	34.0	
Dimension in mm.	Width	600	600	794	944	1,094		1394	1694	
	Dept	270	300	450	450	450		500	500	
	Height	1,895	1,895	1,750	1,750	1,750		1,750	1,750	
Approx. net weight	kg	48	59	135	144	155	160	175	208	
Pipe conn. Liquid,Suction	inch	3/8,3/4		1/2,7/8			5/8,1-1/8	5/8,1-3/8		
Drain	inch	7/8		1						
Pipe conn. Reheat Coil (in & out)	inch	1/2		5/8			7/8			

Note : Total heat removal based on 24.0°C, 50%RH air on cooling coil and 35.0°C outdoor temperature.

All specifications are subject to change without prior notice.

Cooling capacity @room air humidity (FUH + SPA, PV, PC series)

45%RH

Cooling capacity @entering room air humidity 45%RH										
Model/Desc./Unit		Entering air temperature (°C DB)								
		20	21	22	23	24	25	26	27	
FUH032	Total cap.	kW	8.41	8.61	8.83	9.05	9.33	9.59	9.88	10.21
	Sensible cap.	kW	7.49	7.58	7.68	7.78	7.93	8.06	8.20	8.27
	SHF	%	89	88	87	86	85	84	83	81
FUH040	Total cap.	kW	10.79	11.03	11.34	11.65	12.05	12.37	12.76	13.21
	Sensible cap.	kW	9.50	9.60	9.75	9.90	10.00	10.14	10.34	10.57
	SHF	%	88	87	86	85	83	82	81	80
FUH048	Total cap.	kW	13.72	13.94	14.36	14.71	15.14	15.52	15.96	16.47
	Sensible cap.	kW	11.80	11.85	12.06	12.21	12.41	12.57	12.77	13.01
	SHF	%	86	85	84	83	82	81	80	79
FUH060	Total cap.	kW	14.86	15.21	15.57	15.92	16.32	16.62	17.19	17.68
	Sensible cap.	kW	13.08	13.24	13.39	13.53	13.71	13.63	13.93	14.15
	SHF	%	88	87	86	85	84	82	81	80
FUH080	Total cap.	kW	20.33	20.78	21.27	21.80	22.35	22.93	23.56	24.30
	Sensible cap.	kW	18.09	18.29	18.72	18.97	19.22	19.49	19.79	20.17
	SHF	%	89	88	88	87	86	85	84	83
FUH100	Total cap.	kW	23.79	24.38	24.96	25.60	26.30	27.00	27.72	28.71
	Sensible cap.	kW	19.27	19.51	19.72	19.97	20.25	20.52	20.79	21.25
	SHF	%	81	80	79	78	77	76	75	74
FUH140	Total cap.	kW	31.69	32.39	33.02	33.70	34.60	35.40	36.39	37.48
	Sensible cap.	kW	27.57	27.86	28.07	28.31	28.72	29.03	29.48	29.98
	SHF	%	87	86	85	84	83	82	81	80
FUH150	Total cap.	kW	37.77	38.49	39.40	40.40	41.60	42.60	43.81	45.19
	Sensible cap.	kW	32.10	32.33	32.70	33.13	33.70	34.08	34.61	35.25
	SHF	%	85	84	83	82	81	80	79	78

Note : 1 kW = 3413 Btu/h

50%RH

Cooling capacity @entering room air humidity 50%RH										
Model/Desc./Unit		Entering air temperature (°C DB)								
		20	21	22	23	24	25	26	27	
FUH032	Total cap.	kW	8.54	8.77	8.98	9.23	9.53	9.82	10.13	10.46
	Sensible cap.	kW	7.08	7.19	7.28	7.38	7.53	7.66	7.80	7.84
	SHF	%	83	82	81	80	79	78	77	75
FUH040	Total cap.	kW	11.05	11.35	11.44	12.00	12.35	12.70	13.12	13.55
	Sensible cap.	kW	9.06	9.20	9.15	9.48	9.51	9.65	9.84	10.03
	SHF	%	82	81	80	79	77	76	75	74
FUH048	Total cap.	kW	14.06	14.39	14.74	15.09	15.50	15.90	16.34	16.86
	Sensible cap.	kW	11.25	11.37	11.49	11.62	11.78	11.93	12.09	12.30
	SHF	%	80	79	78	77	76	75	74	73
FUH060	Total cap.	kW	15.10	15.47	15.83	16.21	16.62	17.04	17.56	18.14
	Sensible cap.	kW	12.38	12.53	12.66	12.81	12.96	13.12	13.35	13.60
	SHF	%	82	81	80	79	78	77	76	75
FUH080	Total cap.	kW	20.76	21.24	21.75	22.28	22.88	23.45	24.15	24.91
	Sensible cap.	kW	17.44	17.63	17.84	18.05	18.30	18.53	18.84	19.18
	SHF	%	84	83	82	81	80	79	78	77
FUH100	Total cap.	kW	24.40	24.99	25.61	26.28	26.90	27.70	28.57	29.42
	Sensible cap.	kW	18.79	18.74	18.95	19.18	19.10	19.39	19.71	20.00
	SHF	%	77	75	74	73	71	70	69	68
FUH140	Total cap.	kW	32.25	33.00	33.68	34.40	35.33	36.20	37.19	38.23
	Sensible cap.	kW	26.12	26.40	26.61	26.83	27.20	27.51	27.89	27.91
	SHF	%	81	80	79	78	77	76	75	73
FUH150	Total cap.	kW	38.48	39.39	40.30	41.40	42.50	43.70	44.86	46.35
	Sensible cap.	kW	30.78	30.73	31.03	31.46	31.88	32.34	32.30	32.90
	SHF	%	80	78	77	76	75	74	72	71

Note : 1 kW = 3413 Btu/h

55%RH

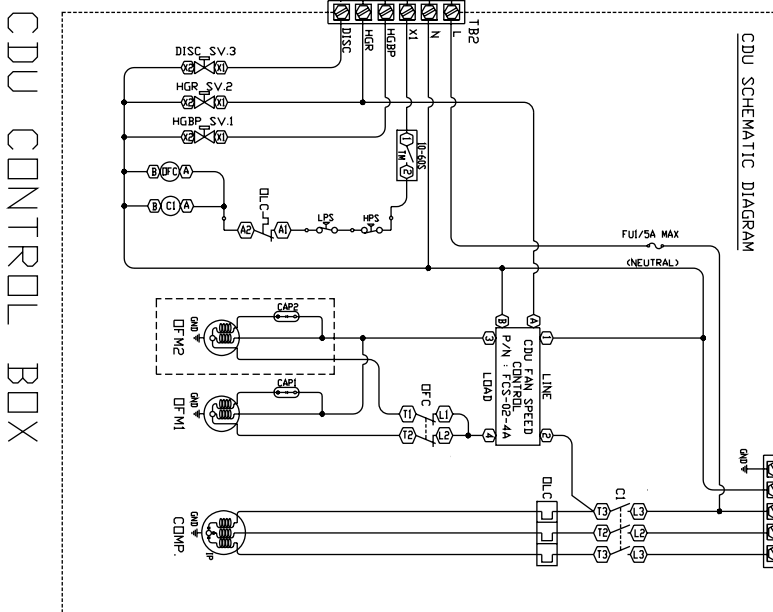
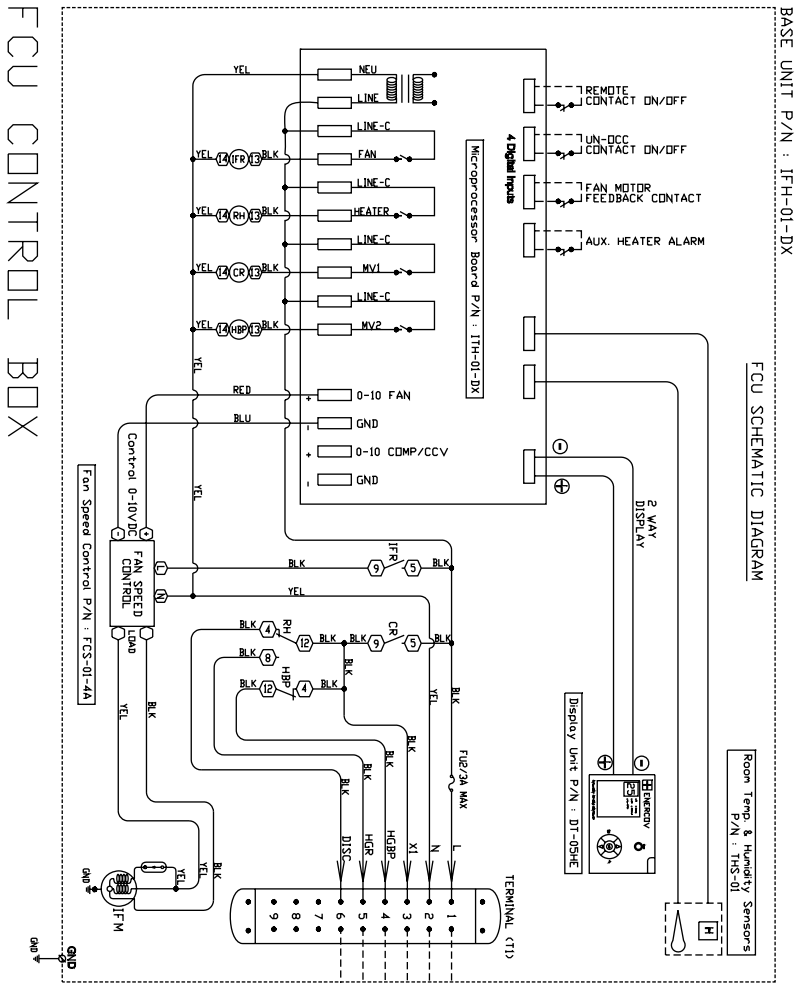
Cooling capacity @entering room air humidity 55%RH										
Model/Desc./Unit		Entering air temperature (°C DB)								
		20	21	22	23	24	25	26	27	
FUH032	Total cap.	kW	8.74	8.94	9.17	9.46	9.77	10.04	10.37	10.71
	Sensible cap.	kW	6.82	6.79	6.88	7.00	7.13	7.23	7.26	7.39
	SHF	%	78	76	75	74	73	72	70	69
FUH040	Total cap.	kW	11.32	11.57	11.91	12.29	12.70	13.08	13.49	14.00
	Sensible cap.	kW	8.72	8.79	8.81	8.97	9.02	9.16	9.18	9.38
	SHF	%	77	76	74	73	71	70	68	67
FUH048	Total cap.	kW	14.31	14.66	15.01	15.38	15.85	16.28	16.73	17.25
	Sensible cap.	kW	10.73	10.85	10.81	10.92	11.10	11.23	11.21	11.38
	SHF	%	75	74	72	71	70	69	67	66
FUH060	Total cap.	kW	15.41	15.54	16.09	16.55	17.03	17.44	17.95	18.57
	Sensible cap.	kW	11.87	11.65	11.91	12.08	12.26	12.21	12.39	12.63
	SHF	%	77	75	74	73	72	70	69	68
FUH080	Total cap.	kW	21.17	21.68	22.24	22.80	23.41	24.00	24.67	25.57
	Sensible cap.	kW	16.51	16.69	16.90	17.10	17.32	17.52	17.76	18.15
	SHF	%	78	77	76	75	74	73	72	71
FUH100	Total cap.	kW	24.91	25.59	26.27	26.90	27.65	28.40	29.27	30.23
	Sensible cap.	kW	17.68	17.91	18.12	18.29	18.53	18.46	18.73	19.04
	SHF	%	71	70	69	68	67	65	64	63
FUH140	Total cap.	kW	32.81	33.60	34.34	35.16	36.18	37.00	38.10	39.29
	Sensible cap.	kW	24.93	25.20	25.41	25.67	25.69	25.90	26.29	26.72
	SHF	%	76	75	74	73	71	70	69	68
FUH150	Total cap.	kW	39.34	40.23	41.20	42.25	43.60	44.70	46.12	47.55
	Sensible cap.	kW	29.11	29.37	29.67	30.00	30.08	30.40	30.44	30.91
	SHF	%	74	73	72	71	69	68	66	65

Note : 1 kW = 3413 Btu/h

Note : SHF = Sensible Heat Factor

FUH Series

Electrical schematic wiring diagram

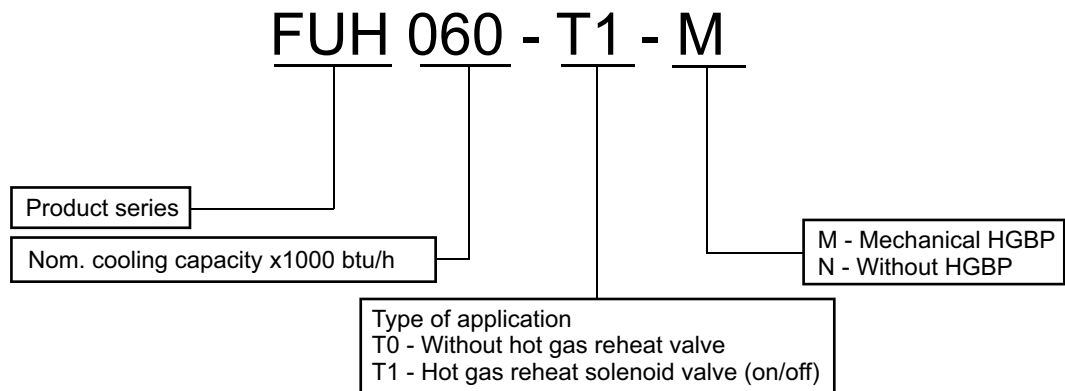


LEGEND

- COMP. COMPRESSOR MOTOR
- CI COMPRESSOR CONTACT
- CR COMPRESSOR RELAY
- CAP CAPACITOR
- DGT DISCHARGE GAS THERMOSTAT
- FCB FAN CIRCUIT BREAKER
- MOD MODULATING VALVE
- FU CONTROL FUSE
- GRD GROUND
- HPS HIGH PRESSURE SWITCH
- HBP HOT GAS BYPASS RELAY
- HGBP HOT GAS BYPASS
- HGR HOT GAS REHEAT
- IFM INDOOR FAN MOTOR
- IFR INDOOR FAN RELAY
- IFC INDOOR FAN CONTACTOR
- IP INTERNAL PROTECTOR
- IP(DFM1,2) INT. PROTECTOR OUT DOOR FAN MOTOR
- LLS 1 LIQUIT LINE SOLENOID
- LPS LOW PRESSURE SWITCH
- OFC OUTDOOR FAN CONTACTOR
- OFM OUTDOOR FAN MOTOR
- OLC COMPRESSOR OVERLOAD
- OPS OIL PRESSURE SWITCH
- R1 RELAY
- RH REHEAT COIL RELAY
- SV SOLENOID VALVE
- TRAN TRANSFORMER
- TB TERMINAL BLOCK (TB)
- TC 1,2 THERMOSTAT COOLING
- TM TIMER
- SPLICE
- COMPONENT CONNECTIONS MARKED
- TERMINAL BLOCK CONNECTIONS (TB)
- FIELD POWER WIRING
- FIELD CONTROL WIRING



Product Nomenclature



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Psychrometric Chart

Barometer 101.325 kPa

