Pioneer

Technical Manual

Split System , Cooling Only 075-200

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Features

- General
  - –Fabricated with a rigid galvanized steel casing.
  - –Single skin galvanized steel casing with 10mm thickness, 25 kg/m3 high-density non-flammable PE insulation for the indoor unit.
- Motor
  - –The single phase motor is consisted with hermetic aluminum alloy casing and permanently lubricated ball bearing.
  - - The motor has class B insulation ; with internal thermal protection.
  - – Motor lead-out wires are with sleeve, providing protection against damage
  - – The 3 phase motor has Class F insulation, with IP55 protection index
- Drain Pan
  - –The drain pan is 45~50mm depth with 1.0mm thickness galvanized steel c/w internal epoxy polyester resin coating.
  - –The drain pan is sloped towards the drain pipe with a 2 deg. gradient.
  - –The drain pan has one 3/4-inch to 1-1/4-inch male pipe thread (BT) connection.
  - – The standard insulation material is 10mm thickness, 25kg^3/m density PE foam.
- Flat type design which allows maximum utilization of storage and container loading. Modular design allows minimum space for site installation.
- All condensing units are supplied with scroll compressor, which is high in energy efficiency and quiet in operation.

Product Nomenclature

Outdoor

1	2	3	4	5	6	7	8	9
K	F	D	H	1	2	5	U	W

1- 4 KFDH - Ducted Fan Coil Unit
KODH - Outdoor Unit

5-7 Nominal Capacity - MBH

075 - 75,000 Btu/hr
100 - 100,000 Btu/hr
125 - 125,000 Btu/hr
150 - 150,000 Btu/hr
200 - 200,000 Btu/hr

8-9 Generation

Refrigeration Schematic Diagram

Operation Limit

⚠ **Caution:**

Ambient temperature deg C

	Dry bulb	Wet bulb
Indoor		
Maximum	35	21
Minimum	19	14
Outdoor		
Maximum	43	-
Minimum	20**	

** For working conditions below 20 deg C head pressure control shall be installed (Eg , Fan speed Controller , Field installed)

Specification

General Data

MODEL		Indoor Unit		KFDH075UW	KFDH100UW	KFDH125UW	KFDH150UW	KFDH200UW
		Outdoor Unit		KODH075UW	KODH100UW	KODH125UW	KODH150UW	KODH200UW
NOMINAL COOLING CAPACITY			Btu/h	75,000	98,000	120,000	150,000	200,000
			W	22,000	29,000	36,000	44,000	59,000
			kcal/h	19,000	25,000	31,000	38,000	51,000
NOMINAL INPUT POWER			W	7,760	9,900	11,790	17,020	21,660
NOMINAL RUNNING CURRENT			A	15.6	19.1	21.9	33.8	41.0
POWER SUPPLY			V/Ph/Hz	380~415V/3Ph/50Hz		380~415V/3Ph/50Hz		
INDOOR UNIT	Control			1 stage		1 stage		2 stage
	Air Flow		L/s (cfm)	1140 (2400)	1511 (3200)	1889 (4000)	2266 (4800)	3022 (6400)
	External Static Pressure		Pa	100	100	150	150	150
	Sound Pressure Level		dB-A	56	57	58	61	62
	Unit Dimension	Height	mm	549	549	885	885	885
		Length	mm	1502	1502	1640	1640	1894
		Depth	mm	761	761	1040	1040	1040
	Unit Dimension, Double Skin	Height	mm	559	559	881	881	881
		Length	mm	1399	1399	1546	1546	1799
		Depth	mm	756	756	1057	1057	1057
	Unit Weight		kg	91	100	179	187	212
	Condensate Drain Pipe		mm (in)	25 (1")	25 (1")	25 (1")	25 (1")	32 (1-1/4")
OUTDOOR UNIT	Air Flow		cfm	5500	5500	5500	8000	11000
	Sound Pressure Level		dB-A	66	67	67	70	70
	Unit Dimension	Height	mm	1085	1085	1085	1372	1085
		Width	mm	985	985	985	985	985
		Depth	mm	1220	1220	1220	1220	2250
	Weight		kg	165	170	200	310	340
	Connection (Braze Type)	Liquid	mm (in)	12.7 / 1/2	15.88 / 5/8	15.88 / 5/8	15.88 / 5/8	15.88 / 5/8
		Suction	mm (in)	28.6 / 1 1/8	28.6 / 1 1/8	34.9 / 1 3/8	34.9 / 1 3/8	28.6 / 1 1/8
	Refrigerant Charge **		kg	5.6	6.5	9.4	12	6.5 x 2

Component Data

INDOOR UNIT	Casing	Material		GI				
		Coating/ Colour		Polyester , Saiver Blue (Ext)/ Bare GI (Int)				
		Insulation /		PE / 10mm				
	Fan	Type / Drive / Material		DIDW Centrifugal Fwd Curve ;		DIDW Fwd Curve ; Belt ; Galvabond Steel		
		Qty		2		1		
		Diameter X Length	mm	241 X 241		381 X 474		
	Fan Motor	Type, Qty, Poles		Capacitor Run Motor, 2, 4P		Induction Motor; 1 ; 4P		
		Index of Protection; Insulation		IP20; F		IP54; F		
		Power Source (V/Ph//Hz)		220~240V/1Ph/50Hz		380~415V/3Ph/50Hz		
		Capacitor	µF	10 + 10	12 + 12	-	-	-
		Rated Running Curre	A	2.0 + 2.0	2.0 + 2.0	3.4	4.7	6.2
		Rated Output Power	W	250 + 250	315 + 315	1500	2200	3000
	Coil	Tube Material, Size	mm (in)	Cu 9.52 (3/8")				
		Fin Material, Thickness	mm	Aluminum , 0.11				
		Face Area	m^2 (ft^2)	0.54 (5.8)		1.01 (10.9)		
		Row, FPI		3 X 14	4 X 14	3 X 14	4 X 14	4 X 14
	Filtration	Type		Washable Alu Frame Filter / G3		Washable Alu Frame Filter / G3		
		Dimension (LxWxt): Qty	mm	420 x 420 x 21 x 3		738 x 456 x 46 x 3, 738 x 264 x 46 x 1 (200 only)		
OUTDOOR UNIT	Casing	Material/Coating/ Colour		GI ; Polyester ; Saiver Blue & Silk Grey				
		Type of Discharge	Throw	Vertical	Vertical	Vertical	Vertical	Vertical
	Compressor	Compressor Type		Scroll	Scroll	Scroll	Scroll	Scroll
		Lock Rotor Amp	A	95	125	128	198	2 x 125
		Rated Running Current	A	11.7	16.2	16.9	25	2 x 16.2
		Input Power	W	6500	8520	9550	12600	2 x 8520
	Fan	Type/ Drive/ Material		Propellar/ Direct / Metal				
		Qty		1	1	1	1	2
		Diameter	mm (in)	660 (26)	660 (26)	660 (26)	760 (30)	660 (26)
	Fan Motor	Index of Protection; Insulation		IP55; F	IP55; F	IP55; F	IP55; F	IP55; F
		Rated Running Current	A	1.4	1.4	1.4	4	2X1.4
		Rated Output Power	W	550	550	550	1500	2x550
		Rated Input Power	W	670	670	670	2000	2x670
	Coil	Tube Material, Size	mm (in)	Cu, S.I.G.C. ,9.52 (3/8")				
		Fin Material, Thickness	mm	Aluminum , 0,11				
		Face Area	m2	1.67	1.67	1.67	2.16	3.37
		Row , FPI		1 X 18	2 x12	2 x 18	2 x 18	2 x 12

Note:-

1. All specifications are subjected to change by the manufacturer without prior notice
2. Nominal cooling capacity are based on the below conditions:-
   a) Entering air temp 27 deg C DB and 19 deg C WB.
   b) Entering outdoor temperature 35deg C
3. **. Charging level based on 7m copper tube connection, actual charge level shall be based on site installation.

Performance Table

MODEL : 075

ID DB'C	ID WB'C	Outdoor DB C											
		20		25		30		35		40		43	
		TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)
20	15	24.4	15.1	22.9	13.7	21.4	12.4	19.7	10.8	18.4	9.7	16.6	8.0
	16	24.7	13.8	23.3	12.7	21.8	11.5	20.2	10.2	19.0	9.3	17.2	7.9
24	16	24.7	18.4	23.3	17.2	21.8	16.1	20.2	14.8	19.0	13.8	17.2	12.4
	17	25.0	17.1	23.6	16.2	22.3	15.3	20.7	14.2	19.6	13.3	17.9	12.3
	18	25.3	15.9	24.0	15.2	22.7	14.5	21.2	13.6	20.2	13.1	18.6	12.2
	19	25.6	14.6	24.4	14.1	23.2	13.6	21.8	13.0	20.8	12.7	19.3	12.1
	20	25.9	13.3	24.7	13.0	23.6	12.6	22.2	12.1	21.2	11.9	19.8	11.5
27	18	25.3	20.3	24.0	19.7	22.7	19.0	21.1	18.1	20.2	17.6	18.6	16.8
	19	25.6	19.2	24.4	18.7	23.2	18.2	22.0	17.5	20.8	17.2	19.3	16.7
	20	25.9	17.9	24.7	17.5	23.6	17.2	22.2	16.6	21.2	16.5	19.8	16.0
	21	26.2	16.6	25.1	16.3	23.9	16.1	22.6	15.6	21.7	15.5	20.3	15.1
	22	26.5	15.4	25.4	15.1	24.3	14.9	23.0	14.5	22.1	14.5	20.8	14.2
	23	26.8	14.1	25.7	13.9	24.7	13.8	23.4	13.4	22.5	13.5	21.2	13.3
	24	27.1	12.8	26.1	12.7	25.0	12.6	23.8	12.4	22.9	12.5	21.7	12.4
30	20	25.9	20.2	24.7	19.8	23.6	19.5	22.2	18.9	21.2	18.8	19.8	18.3
	21	26.2	18.9	25.1	18.6	23.9	18.3	21.6	17.8	21.7	17.8	20.3	17.4
	22	26.5	17.6	25.4	17.4	24.3	17.2	23.0	16.8	22.1	16.7	20.8	16.5
	23	26.8	16.4	25.7	16.2	24.7	16.1	23.4	15.7	22.5	15.7	21.2	15.6
	24	27.1	15.1	26.1	15.0	25.0	14.9	23.8	14.6	22.9	14.7	21.7	14.6

MODEL : 100

ID DB'C	ID WB'C	Outdoor DB C											
		20		25		30		35		40		43	
		TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)
20	15	29.7	17.5	28.0	16.1	26.3	14.7	24.3	13.1	22.8	11.9	20.6	10.1
	16	31.3	16.9	29.4	15.5	27.4	14.1	25.3	12.6	23.5	11.4	21.1	9.7
24	16	31.3	22.5	29.4	21.3	27.4	19.9	25.3	18.3	23.5	17.1	21.1	15.5
	17	33.0	22.0	30.8	20.6	28.6	19.3	26.2	17.8	24.1	16.7	21.5	15.1
	18	34.6	21.3	32.1	20.0	29.7	18.7	27.1	17.3	24.8	16.2	21.9	14.7
	19	36.2	20.6	33.5	19.4	30.8	18.2	28.7	16.7	25.5	15.7	22.3	14.2
	20	37.8	19.9	35.0	18.7	32.2	17.5	29.1	16.1	26.5	15.0	23.1	13.5
27	18	34.6	27.1	32.1	25.8	29.7	24.5	27.1	23.0	24.8	22.0	21.9	20.4
	19	36.2	26.4	33.5	25.2	30.8	23.9	29.0	23.2	25.5	21.5	22.3	20.0
	20	37.8	25.7	35.0	24.5	32.2	23.2	29.1	21.8	2.8	20.8	23.1	19.3
	21	39.4	25.0	36.5	23.8	33.6	22.5	30.5	21.0	27.8	20.0	24.3	18.5
	22	40.9	24.3	38.1	23.0	35.1	21.7	31.9	20.3	29.1	19.1	25.5	17.6
	23	42.7	23.7	39.6	22.3	36.5	21.0	33.3	19.5	30.4	18.3	26.7	16.7
	24	44.3	23.0	41.1	21.6	38.0	20.2	34.6	18.7	31.7	17.5	27.9	15.9
30	20	37.8	28.6	35.0	27.4	32.2	26.1	29.1	24.7	26.5	23.7	23.1	22.2
	21	39.4	27.9	36.5	26.6	33.6	25.4	30.5	23.9	27.8	22.9	24.3	21.3
	22	41.0	27.2	38.1	25.9	35.1	24.6	31.9	23.1	29.1	22.0	25.5	20.5
	23	42.7	26.5	39.6	25.2	36.5	23.9	33.3	22.4	30.4	21.2	26.7	19.6
	24	44.3	25.9	41.1	24.5	38.0	23.1	34.6	21.6	31.7	20.4	27.9	18.8

MODEL : 125

ID DB'C	ID WB'C	Outdoor DB C											
		20		25		30		35		40		43	
		TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)
20	15	39.3	22.8	36.7	20.9	34.1	19.0	31.4	16.9	29.0	15.2	26.0	12.9
	16	41.0	20.6	38.2	19.0	35.4	17.4	32.4	15.7	29.7	14.3	26.4	12.4
24	16	41.0	27.8	38.2	26.3	35.4	24.7	32.4	22.9	29.7	21.6	26.4	19.7
	17	42.7	25.6	39.6	24.4	36.6	23.2	33.3	21.7	30.5	20.7	26.8	19.2
	18	44.4	23.4	41.1	22.5	37.8	21.6	34.3	20.5	31.2	19.9	27.2	18.8
	19	46.1	21.2	42.6	20.6	39.0	20.1	35.7	19.4	31.9	19.0	27.6	18.4
	20	47.9	18.9	44.2	18.6	40.5	18.3	36.6	17.8	33.1	17.7	28.7	17.3
27	18	44.4	30.6	41.1	29.8	37.8	28.9	34.3	27.8	31.2	27.1	27.2	26.1
	19	46.1	28.4	42.6	27.9	39.0	27.3	36.0	26.9	31.9	26.3	27.6	25.6
	20	47.9	26.2	44.2	25.9	40.5	25.5	36.6	25.0	33.1	24.9	28.7	24.5
	21	49.6	23.9	45.9	23.8	42.2	23.6	38.3	23.2	34.7	23.3	30.3	23.1
	22	51.4	21.7	47.6	21.7	43.9	21.6	39.9	21.4	36.4	21.6	31.9	21.6
	23	53.1	19.4	49.3	19.6	45.5	19.7	41.6	19.6	38.0	19.9	33.4	20.1
	24	54.9	17.2	51.0	17.5	47.2	17.7	43.2	17.8	39.6	18.3	35.0	18.6
30	20	47.9	29.8	44.2	29.5	40.5	29.2	36.6	28.7	33.1	28.5	28.7	28.2
	21	49.6	27.6	45.9	27.4	42.2	27.2	38.3	26.9	34.7	26.9	30.3	26.7
	22	51.4	25.3	47.6	25.3	43.9	25.3	39.9	25.1	36.4	25.2	31.9	25.0
	23	53.1	23.1	49.3	23.2	45.5	23.3	41.6	23.2	38.0	23.6	33.4	23.7
	24	54.9	20.8	51.0	21.1	47.2	21.4	43.2	21.4	39.6	21.9	35.0	22.2

Performance Table

MODEL : 150

ID DB'C	ID WB'C	Outdoor DB C											
		20		25		30		35		40		43	
		TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)
20	15	49.0	28.7	45.7	26.3	42.4	23.9	38.9	21.3	35.9	19.1	31.9	16.3
	16	51.0	25.9	47.4	24.0	43.9	22.1	40.1	20.0	36.7	18.3	32.4	16.1
24	16	51.0	34.8	47.4	32.9	43.9	31.0	40.1	28.9	36.7	27.2	32.4	25.0
	17	53.1	32.0	49.2	30.6	45.3	29.2	41.2	27.6	37.5	26.4	32.9	24.8
	18	55.1	29.1	50.9	28.3	46.7	27.4	42.4	26.3	38.4	25.6	33.4	24.6
	19	57.2	26.3	52.7	25.9	48.1	25.6	43.8	25.0	39.2	24.8	33.8	24.4
	20	59.2	23.5	54.6	23.4	50.0	23.3	45.2	23.0	40.8	23.1	35.2	23.0
27	18	55.1	38.1	50.9	37.2	46.7	36.3	42.4	35.2	38.4	34.5	33.5	33.5
	19	57.2	35.2	52.7	34.9	48.1	34.5	44.0	34.2	39.2	33.7	33.8	33.3
	20	59.2	32.4	54.6	32.3	50.0	32.2	45.2	31.9	40.8	32.1	35.2	32.0
	21	61.3	29.5	56.7	29.6	52.0	29.7	47.2	29.5	42.8	29.8	37.2	29.9
	22	63.4	26.7	58.7	26.9	54.1	27.1	49.2	27.1	44.8	27.6	39.2	27.8
	23	65.5	23.8	60.8	24.2	56.1	24.6	51.3	24.7	46.8	25.3	41.2	25.8
	24	67.6	21.0	62.9	21.5	58.2	22.0	53.3	22.3	48.8	23.1	43.1	23.7
30	20	59.2	36.8	54.6	36.8	50.0	36.7	45.2	36.4	40.8	36.5	36.4	36.4
	21	61.3	34.0	56.7	34.1	52.0	33.4	47.2	34.0	42.8	34.3	37.2	34.4
	22	63.4	31.1	58.7	31.4	54.1	31.6	49.2	31.6	44.8	32.0	39.2	32.3
	23	65.5	28.3	60.8	28.6	56.1	29.0	51.3	29.2	46.8	29.8	41.2	30.2
	24	67.6	25.4	62.9	25.9	58.2	26.5	53.3	26.8	48.8	27.5	43.1	28.2

MODEL : 200

ID DB'C	ID WB'C	Outdoor DB C											
		20		25		30		35		40		43	
		TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)	TC(kW)	SC(kW)
20	15	56.4	31.9	53.7	30.0	51.0	28.2	48.0	26.1	45.5	24.5	42.2	22.3
	16	61.6	31.0	57.9	29.0	54.3	27.1	50.4	24.9	47.0	23.2	42.6	20.8
24	16	61.6	41.7	57.9	39.8	54.3	37.8	50.4	35.6	47.0	33.9	42.6	31.5
	17	66.7	40.9	62.2	38.8	57.6	36.7	52.8	34.4	48.5	32.6	43.0	30.1
	18	71.9	40.0	66.4	37.8	60.9	35.6	55.2	33.2	50.0	31.3	43.4	28.7
	19	76.3	39.1	70.6	36.8	64.2	34.5	58.8	32.0	51.4	30.0	43.8	27.2
	20	82.2	38.3	75.2	35.8	68.2	33.4	60.9	30.8	54.1	28.6	45.7	25.7
27	18	71.9	50.7	66.4	48.5	60.9	46.4	55.2	44.0	50.0	42.0	43.4	39.4
	19	77.0	49.9	70.6	47.6	64.2	45.3	59.0	44.2	51.4	40.7	43.8	37.9
	20	82.2	49.0	75.2	46.6	68.2	44.1	60.9	41.5	54.1	39.3	45.7	36.4
	21	87.4	48.1	80.0	45.5	72.5	43.0	64.8	40.2	57.6	37.9	48.6	34.8
	22	92.6	47.2	84.7	44.5	76.8	41.8	68.7	38.9	61.1	36.4	51.6	33.2
	23	97.9	46.4	89.5	43.5	81.2	40.7	72.7	37.6	64.5	35.0	54.5	31.5
	24	103.1	45.5	94.3	42.5	85.5	39.5	76.6	36.3	68.0	33.5	57.5	29.9
30	20	82.2	54.3	75.2	51.9	68.2	49.5	60.9	46.9	54.1	44.7	45.7	41.8
	21	87.4	53.5	80.0	50.9	72.5	48.3	64.8	45.6	57.6	43.2	48.6	40.1
	22	92.6	52.6	84.7	49.9	76.8	47.2	68.7	44.3	61.1	41.8	51.6	38.5
	23	97.9	51.7	89.5	48.9	81.2	46.0	72.7	43.0	64.5	40.3	54.5	36.9
	24	103.1	50.9	94.3	47.9	85.5	44.9	76.6	41.7	68.0	38.9	57.5	35.3

Fan Performance Curve

Fan Performance Table

Model	Air Flow CMH (CFM)	ESP Pa	Blower rpm	Motor Power	Pulley Size (Motor)	Pulley Size (Blower)	Type /Qty
KFDH125UW	5800 (3400)	100	712	1.5	80	160	SPZ/ 1
		200	841	1.5	90	150	SPZ/ 1
		300	958	1.5	90	140	SPZ/ 1
		400	1064	2.2	100	140	SPZ/ 1
		500	1161	2.2	112	140	SPZ/ 1
	6800 (4000)	100	751	1.5	80	150	SPZ/ 1
		150	802	1.5	80	140	SPZ/ 1
		200	867	1.5	90	150	SPZ/ 1
		300	976	2.2	100	150	SPZ/ 1
		400	1078	2.2	112	150	SPZ/ 1
		450	1126	3	125	160	SPZ/ 1
	7500 (4400)	100	756	1.5	80	150	SPZ/ 1
		200	800	1.5	90	150	SPZ/ 1
		300	890	2.2	95	150	SPZ/ 1
		400	992	2.2	100	150	SPZ/ 1
KFDH150UW	6800 (4000)	100	751	1.5	85	160	SPZ/ 1
		200	867	1.5	100	160	SPZ/ 1
		300	976	2.2	118	180	SPZ/ 1
		400	1078	2.2	118	160	SPZ/ 1
		450	1170	3	125	160	SPZ/ 1
	8200 (4800)	100	810	2.2	90	160	SPZ/ 1
		150	859	2.2	100	160	SPZ/ 1
		200	911	2.2	118	180	SPZ/ 1
		300	1010	3	125	180	SPZ/ 1
		400	1103	4	140	180	SPZ/ 1
	9200 (5400)	100	826	3	95	160	SPZ/ 1
		200	920	3	118	180	SPZ/ 1
		300	1010	3	125	180	SPZ/ 1
		400	1098	4	140	180	SPZ/ 1
KFDH200UW	9200 (5400)	100	826	3	140	224	SPZ/ 1
		200	920	3	150	224	SPZ/ 1
		300	1010	3	160	224	SPZ/ 1
		400	1098	4	170	224	SPZ/ 1
	10900 (6400)	100	903	3	140	224	SPZ/ 1
		150	944	4	140	224	SPZ/1
		200	984	4	150	224	SPZ/1
		300	1063	4	160	224	SPZ/1
		400	1140	5.5	170	224	SPZ/ 2
	11900 (7000)	100	953	4	150	224	SPZ/ 1
		200	1027	4	160	224	SPZ/ 1
		300	1100	5.5	170	224	SPZ/ 2

Standard Point , ESP

Sound Data

Sound Pressure Level

Model	Connection	1/1 Octave Sound Pressure Level (dB, ref 20uPa)							Overall (dBA)	NC
		125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz		
KFDH 075UW	High	51	50	48	48	43	38	31	51	47
	Medium	48	46	45	45	39	33	26	48	44
	Low	45	43	42	39	35	29	23	44	38
KFDH 100UW	High	53	51	50	49	44	41	34	53	48
	Medium	49	46	48	46	40	35	27	50	45
	Low	46	43	43	41	35	30	24	45	40
KFDH125UW		57	52	54	52	48	48	45	56	51
KFDH150UW		56	53	59	48	45	46	38	57	57
KFDH200UW		56	52	61	51	45	43	39	60	58

Sound pressure measuring point is 1.4m below the unit surface.
(unit is ducted with 3m discharge air duct)

Sound Pressure Level

Model	1/1 Octave Sound Pressure Level (dB, ref 20uPa)							Overall (dBA)	NC
	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz		
KODH075UW	67.5	64	64	62	54	48.5	39	66	61
KODH100UW	68	65	66	63	55.5	49	41	67	63
KODH125UW	70	66	66	63	56	50	41	67	63
KODH150UW	72	68	66.5	66	60	53.5	44	70	65
KODH200UW	74	68	68	66.5	60	52.5	43.5	70	66

Sound pressure measuring point is 1.4m from corner of the unit.

Unit Dimension

Model :

KFDH075/100UW

Model :

KFDH125,150,200UW

Model	125,150	200
A	1600	2854
B	1541	1975
C	1376	1630

Unit Dimension

Model :

KODH075/100/125/150UW

Liquid line (75: 1/2 ", 100/125/150 : 5/8")

Gas line (75/100 : 1 1/8" ; 125/150 : 1 3/8")

Model	A	B
75/100/125	1000	1085
150	1287	1372

Model :

KODH200UW

Liquid line (5/8")

Gas line (1 1/8")

Indoor unit Installation

- Select a location where air can be distributed to all corners of the room.
- Make sure no obstruction to return and dischage air.
- Avoid installation at the following location:
  - area where flamable gas may leak or generated.
  - places where unit is frequently exposed to corrosive gas, or acidic solutions.

⚠Warning:

•The unit must be securely installed on structure that can sustain its weight.

Service space

- Make sure sufficient space for service and maintenance (see figure).

Installing indoor unit

Unit suspension

- Use the hanging rods to hang the unit through the holes provided. Strength of hanging rods must be ble to support the total weight of the unit.
- Add isolator, absorber , if necessary , to minimize the vibration transmission to the ceiling.

Drain pipe

- Drain pipe shall be properly installed for the drainage for the drainge of condensate water.
- Trap shall be installed (See figure)
- Make sure no leak at the connecting joint.
- Insulate the drain pipe to avoid water condensation.

Condensing unit Installation

- In order to optimize capacity, unit shall be installed as recommended requirements :-

a) Allow sufficient space around the unit, to avoid the recirculation of the hot discharge air.
b) Ensure no obstruction air flow into or out of the unit.
c) The location which is well ventilated
d) A place which protected from direct sunlighght, use an awning for protection , if necessary.
e) A place where the hot air discharge and operating sound level will not annoy the neighbours.
f) A place must not be susceptible to dust or oil mist, or other corrosive chemicals

⚠ Caution: If the condensing unit is operated in an atmosphere containing oils (including machine oils), salt (coastal area), sulphide gas (near hot spring, oil refinery plant), corrosive chemicals etc may lead to failure of the unit.

Installation Space and Clearance

Orientation 1 2 X KODH075 to 150
Orientation 2 2 X KODH075 to 150, 1 X KODH 200
Orientation 3 4X KODH075 to 150, 2 X KODH 200

ORIENTATION 1

ORIENTATION 2

ORIENTATION 3

Unit in mm

Condensing unit Installation

Unit Lifting

Holes at the unit base are for the lifting purpose.
Belt shall be used for lifting the unit, properly tied the belt to the holes , use shackles to tighten the belt.
Make sure the belt strenght is able to withstand the unit weight.
The length of the belt shall be adjust properly,
in order to prevent the imbalance of the unit when lifting

Unit Support

Unit shall be placed on a secured base, on slab , curb or steel frame

Absorber should be installed to absorb the unit vibration during operation.

Unit Installation

Field Copper Tubing Connection

To ensure satisfactory operation and performance, the following points should be noted for the field tubing arrangements of the complete refrigerant cycle.

a) Liquid loops or oil traps must be provided according to the position of the outdoor and the indoor units (depending on whether the indoor unit is above or below the outdoor unit).

b) **Field supplied filter drier must be installed** as close to the expansion valve(s) of the indoor unit (evaporator) as possible.

c) Field supplied sight glass must be assembled and mounted next to filter dryer.

d) Pipe size shall be followed as listed in page 8.

⚠ **Caution:**

- During the preparation, piping shall be properly covered to avoid the containmination of the system.
- Both indoor and outdoor are brazed connection.

⚠ **Warning:**

- Make sure there is no flammable gas at the surrounding before the brazing work started.
- DO NOT charge in flammable gas.

Maximum tube length and Maximum number of Bends

When the pipe is too long, the required refrigerant quantity increases, both the capacity and reliability of compressor will drop.

When the number of bends increases, refrigerant flow resistance increases, thus lowering the cooling capacity; the excessive pressure drop might eventually cause the failure of compressor.

If height difference of evaporator and condenser is excessive, this will retard the compressor oil return and affecting the compressor efficiency

Always choose the shortest piping path with minimum bends.

Cautions: All units installation length

Max elevation	20M
Max total equivalent length	35M
Max bends	8

For operation safety, accumulator is recommended to be added for any installation more than 30m in length

Field Charging & Refrigerant Handling

Scroll compressors have a very high volumetric efficiency and quickly pump a deep vacuum if there is insufficient refrigerant in the system or if refrigerant is added too slowly. Low suction pressure will lead to high discharge temperatures.

This process will casue the scrolls are not being well-lubricated eventually leads to high friction between the scroll flanks and tips and generates additional heat.

This will cause damage to scroll bearing which can occur in less than one minute. But the failure might occur only in later of time after charging.

Other typical field charging problems include undercharging, overcharging, moisture or air in the system etc. In time each one of these problems can cause compressor failure.

Equipment

Minimal equipments are required for field charging. to do a satisfactory job is :

Set of service gauges	Hoses ,	Vacuum pump,	Charging Cylinder
	Scales	Thermometer	Vacuum gauge

Unit Installation

Charging Hose

Most field-charging is done using standard service hoses. Hoses are made in different colors with different working pressures and with different leak rates but the most important point is the presence or absence of hoses

This slows evacuation and vapor charging dramatically. In most cases the Shredder depressor can be removed but it is simpler to have one set of hoses with and one set without Shredder depressors

Hose selection is important depending whether the system is being evacuated or charged. Charging liquid from the cylinder into the liquid line should be carried out using an open hose connected to an unrestricted fitting. This will reduce charging time.

How much refrigerant?

The proper refrigerant charge should follow the volume as recommended by manufacturer , addtional charge for extended length installation can follow general guideline below.

If the installer cannot find the correct charge but the system must be started, refrigerant should be carefully added to the system until reasonable sub-cooling is measured in the liquid line and reasonable suction superheat is measured at the compressor suction. Suction and discharge pressures must be monitored carefully during the charging process.

Additional Chage

Based on liquid pipe size per meter length:

Liquid line size	kg
1/2”	0.10
5/8”	0.17
3/4”	0.26
7/8”	0.37

Above is the recommendation, actual charge level may be different due to the different application and ambient condition.

Refrigerant R410A : special precaution

R410A is HFC refrigerant which has Zero Ozone Depletion Potential (ODP = 0). The working pressure of this refrigerant is 1.6 times higher than refrigerant (R22), thus proper installation / servicing is essential

i) Characteristic

Mixture of composition by weight : R32(50%) and R125(50%)

R410A liquid and vapor components have different compositions when the fluid evaporates or condenses. Hence, when leak occurs and only vapor leaks out, the composition of the refrigerant mixture left in the system will change and subsequently affect the system performance.
It is NOT recommended to add new refrigerant to leaked system.
System shall be evacuated thoroughly and recharging with liquid refrigerant (original mixture composition of R410A).

Polyol-ester (POE) oil is used as lubricant for R410A compressor. As the water will react with POE oil and become acid.**Extra precaution** must be taken to avoid exposing the R410A system to moist air.

Unit Installation

Charging Hose

Refrigerant R410A : special precaution

ii) Check List Before Installation / Servicing

• Tubing -Refrigerant R410A is more easily affected by dust or moisture compared with R22, make sure to temporarily cover the ends of the tubing prior to installation

• Compressor oil - No additional charge of compressor oil is permitted.

• Tools - Tools used for R410A only (must not be share with other refrigerant)

Gauge manifold and charging hose ,Refrigerant cylinder/charging cylinder

Vacuum pump c/w adapter, Refrigerant recovery machine etc

iii) Handling and Installation Guidelines

Like R22 systems, the handling and installation of R410A system are closely similar. All precautionary measures; such as ensuring no moisture, no dirt or chips in the system, clean brazing using nitrogen, and thorough leak check and vacuuming are equally important requirements. However, due to its hydroscopic POE oil, additional precautions must be taken to ensure optimum and trouble-free system operation.

a) During installation or servicing, avoid prolong exposure of the internal part of the refrigerant system to moist air. Residual POE oil in the piping and components can absorb moisture from the air.

b) Ensure that the compressor is not expose to open air for more than the recommended time specified by its manufacturer (typically less than 10 minutes). Removed the seal-plugs only when the compressor is about to be brazed.

c) The system should be thoroughly vacuumed to 1.0 Pa (700mmHg) or lower. This vacuuming level is more stringent than R22 system so as to ensure no incompressible gas and moisture in the system.

d) When charging R410A, ensure that only liquid is being withdrawn from the cylinder or can. This is to ensure that only the original composition of R410A is being delivered into the system. The liquid composition can be different from the vapor composition.

e) Normally, the R410A cylinder or can is being equipped with a dip-pipe for liquid withdrawal. However, if the dip-pipe is not available, invert the cylinder or can so as to withdraw liquid from the valve at the bottom.

Electrical Wiring

⚠ Caution:

- Field-installed wirings must comply with local codes and regulations. Voltage tolerance should be kept at rated voltage ±10%.
- Check if the main power supply matches the nameplate rating before installation takes place.
- Each air-conditioning unit should be installed with independent circuit breaker (Field installed)
- Unit must be properly GROUNDED.
- Entire unit wiring diagram.

a.	Power supply
b.	Circuit Breaker (field supply)
c.	Power supply wiring for unit
d.	indoor unit
e.	outdoor unit
f.	Wired remote controller
g.	Unit interconnecting wire
h.	Earth

Note:
75/100 ⓒ 200 ⓖ

Wiring Diagram : KFDH/KODH 75,100

Electrical Wiring

Wiring Diagram : KFDH/KODH125/150

Wiring Diagram : KFDH/KODH200 (2 stage)

- Recommended field installed minimum wire size (90deg C insulation).

	Model	75	100	125	150	200
Power Suppy	Indoor	220V/1ph/50Hz ~N		380V/3ph/50Hz ~N		
	Outdoor	380V/3ph/50Hz ~N				
Supply No. × size (mm2)	Indoor	5× 1.5		5× 1.5		
	Outdoor	5 × 4	5× 6		5× 8	
Interconnecting, No x 0.75mm2		1 x				5 x

Controller Operation

1 stage

The controller supports the following functions:

a) Mode：Cool, Dry, Fan
b) Indoor fan speed：Auto, High, Medium, Low (* For 75/100 model only)
c) Sleep mode
d) Compressor protections:-
    1. Comp 3 minutes restart protection
    2. Indoor coil anti freeze

e) Room sensor and indoor coil sensor failure monitoring.
f) Non volatile memory – keep system settings
g) Programmable On/Off timer
h) Random restart to minimize voltage dip during compressor first cut in cycle upon power up.

2） Hardware setting

A 2 way DIP switch, default setting as SW1 on, SW2 off.
CAUTION: DON'T CHANGE THE SETTING.

3) Power Up

Upon power up, system will retrieve the most recent settings and system status from the non volatile memory as below:-

a) Mode
b) Set temperature（F or C）
c) Fan speed
d) Sleep
e) Key lock status
f) System status（On/Off）
g) Temperature display option

The above setting can be changed via wired control panel or remote handset. The latest settings will be recorded into the memory.
Should the data in the non-volatile memory were invalid, system will start with the default settings as follow:-

a) System status - Off
b) Fan speed - High
c) Set temperature - 24
d) Mode-Cool
e) Key lock – off
f) Temperature display- set temperature

4） Programmable Timer

Upon count down of the number of set hours, the system will switch from Off to On or On to Off depending on its current status.

5） Sleep mode (Set temperature will be increased)

Controller Operation

6）Compressor protection

a) Comp restart protection

1. 3 minutes protection
2. Hardware Anti short cycle timer

Should the power supply is cut off and resume, compressor 3 minutes protection control logic is as below:-

Power outage duration	Restart protection timer
<180S	180S— 243S
>180S	< 63S

b) 90S minimum run time (compressor)

c) Indoor coil anti freeze

7）Temperature sensor fault

a) Return air sensor

Monitor continuously

b) Indoor coil sensor

- If comp is turned on, monitoring is done 5 minutes after comp running.
- If comp is stop, monitor continuously

Upon happening of any sensor fault, system is forced to Fan mode. It will then resume to normal mode upon clearance of fault.

8） IR reception

System receives commands from handset.

9） Cool mode

In Cool mode, compressor will cut in if Tr - Ts >= 0.5°C and cut out if Tr - Ts =< (-1.0)°C, subject to 3 minutes protections and minimum run time. Indoor fan speed can be manually selected or determine by the system in Auto Fan speed according to the return air temp.

10） Dry mode

Indoor fan runs at low speed.

Compressor will cut out if:-

a) It has run for 10 minutes continuously or

b) Tr - Ts =< (-1.0)°C

It is then allow to cut in if:-

a) It has stop for 5 minutes and

b) Tr - Ts >= 0.5°C

11） Fan mode

Only High, Medium and Low speed selection is allowed (KFDH075,100 only) .

12） Error code

Fault	Error code
Room sensor fault	E1
Indoor coil sensor fault	E2
Comp fault	E4

If multiple faults happen at the same time, the corresponding error code will be shown one after another.

13） Off mode

All output are off during system off state except indoor fan which are subject to the minimum operating time guard where applicable.

Controller Operation

14 Control Panel

a) On/Off
To turn on/off the unit. .

b) Mode
Press mode key to change operating mode as follow:

- Cool only mode Cool -Dry-Fan

c) Fan speed
Press Fan key to select: Auto-High-Medium-Low.
Fan key is invalid in Dry mode.

d) Sleep
Press Sleep key to toggle sleep mode. Sleep key is invalid in Fan Mode

e) Temperature
Temperature setting is 16C to 30C or 60F to 85F. Hold down Temp Down and Fan keys at the same time for about 5S will toggle the setting from degree C to degree F and vice versa. Temp keys are invalid in Fan mode.

f) Timer
Timer setting is 1HR—24HR. First key press will flash the digital display and timer LED for 3S. The display shows the number of count down hours left. Subsequent 3S will show the number of hours previously set, only the timer LED flashes. Should there be no further key press, it will revert to normal mode. Should Timer key is not released, timer setting will incremented automatically every 0.5S.

g) Key lock
Hold down Temp Down and Mode keys for 3S to activate key lock mode, similarly to unlock.
In key lock mode, the following keys are valid：
1. On/Off- to turn on/off the unit
2. Hold down Temp Down and Sleep button for 1S to enter into coil temp display mode. Press Temp Up key to display indoor coil temp, High Fan LED flashes. Press Temp Down key to display outdoor coil temp, Medium Fan LED flashes. With the same sequence to exit coil temp display mode. Temperature display range is –9C to 78C.
3 .Hold down ▽ and FAN buttons for 1 second to activate temperature display setting and auto fan LED flashes. Repeat the same sequence to cancel this function. Press ▽ or △ button to change the setting from 1～2. “1” means disable room temperature display and “2” means enable room temperature display.

Controller Operation

2 stage controller (KFDH200UW)

System Operation & Functions

Upon the power on, the unit is at the standby mode.

The unit able operates at Cool or Fan mode , the operation mode can be changed via Mode button.

Default setting of the controller : Cool mode, high fan, 24℃

NO	**Fan mode on** sequence	Remarks
1	Wall pad on	
2	External interlock (remote on/off) contact close	Should the contact is opened, system enter into standby mode.
3	Turn on indoor fan,	If there be indoor fan failure (OLP fan motor open), indoor fan can not be turned on and system enters standby mode.
4	On cycle completed	

NO	**Cool mode on** sequence	Remarks
1	Wall pad on	
2	External interlock (remote on/off) contact close	Should the contact is opened, system enter into standby mode.
3	Turn on indoor fan, delay 15 sec	If there be indoor fan failure (OLP fan motor open) , indoor fan can not be turned on and system enters standby mode.
4	Check return air temperature, delay 15sec.	If setting temp not met, continue checking.
5	Turn on compressor	Use equal loading logic to turn on the compressor with the shortest cumulative run time. (lead-lag function)
6	Check for loading equirement.	If further loading is required, proceed with loading control.
7	On cycle completed	

Controller Operation

NO	**Cool mode off** sequence	Remarks
1	Wallpad off or remote on/off contact open	
2	Off compressor 1	If compressor 1 is not running, jump to step 4
3	Delay 3 sec	
4	Off compressor 2	
5	Delay 30 sec	
6	Off indoor fan	
7	Off cycle complete	

2 Wallpad

2.1 Wallpad Dimension, Figure 1

Figure 1

22 Button/key Description (Details refer to operation guide) Figure 2

Figure 2

DAY：Set day of week
TIME+/-：Adjust clock
CLOCK：Set clock
CANCEL: Cancel timer
TIMER：Set on/off timer
MODE: Set operation mode
SET：Set parameter
DISPLAY: Browse temperature
SELECT+/-：Menu selection
RESET：Reset fault
TiO2:TiO2on/off

Controller Operation

2.3 LCD Display Description Figure 3

Figure 3

A: Return air or set temperature display section. This section has no indication if system in standby mode and backlight is off.

B: Wallpad key lock symbol. Symbol appears if wallpad keypad is locked and vice versa.

C: Compressor status indication. Symbol will lights up if its corresponding compressor is running.

D: Day display from Monday to Sunday

E: On/Off timer setting symbol. During on/off timer setting mode, this symbol and F or G symbol flashing. In none timer setting mode, this symbol will light up should there be any on/off timer being set.

F: Off symbol. During off timer setting mode, this symbol and D symbol flashing. In none off timer setting mode, this symbol will light up should be unexecuted off timer for the current day.

G: On symbol. During on timer setting mode, this symbol and D symbol flashing. In none on timer setting mode, this symbol will light up should be unexecuted on timer for the current day.

H: Clock display. In temperature browsing mode, it shows the temperature being searched. In parameter setting mode, it shows the set parameter.

I: It shows the error code if there is system failure. It shows the menu number in temperature browsing or parameter setting mode.

J: Error symbol flashes if there is system failure and vice versa.

K: Indoor fan status indication. This symbol lights up if indoor fan is running and vice versa.

L: TiO2 status indication. This symbol lights up if TiO2 is on and vice versa.

M: Symbol lights up in Fan mode and vice versa.

N: Symbol lights up in Cool mode and vice versa.

O: Symbol flashes in temperature setting mode.

2.4 Wallpad Operation Guide

2.4.1 On/Off Control

Press ⏻ button to control the system on/off. If the unit is off, press ⏻ will turn on the system with two beeping sounds. If the unit is on, press ⏻ to turn off the unit with one beeping sound.

Controller Operation

2.4.2Temperature Setting

Press - or + button to adjust the temperature setting from 16 oC to 30 oC.

2.4.3 Mode Setting

Press <MODE> button to select Cool or Fan mode.

2.4.4 Clock Setting

System has an inbuilt real time clock for time indication and on/off timer control. Press <CLOCK> button to enter into clock setting mode and second indication stop flashing. Press <TIME+/-> button to adjust the system clock. Press <CLOCK> button once more to exit the clock setting mode. Second indication resume flashing.

2.4.5 Day Setting

This wallpad supports the day indication. Day indication can be used for normal day display and on/off timer setting. Day display section shows the current day. Use the <DAY> button to adjust the day setting accordingly.

2.4.6 On/Off Timer Setting

The system supports 7 groups of on/off timer setting, ie 7 days weekly timer.

a) Press <TIMER> button once, timer symbol flashes. Press <TIMER> button again, timer and On symbols flashing, system is now in on timer setting mode. The day display section shows the day of the corresponding on timer setting. If clock display section shows --:--, it means the current timer is null. Pressing <TIMER+/-> button will activate this timer. If there is time being displayed, it means the current timer is already activated. Press <TIME+/-> button to adjust the timer setting. Press <CANCEL> button will cancel this setting and the display will be shown as --: --.

b) Press <TIMER> button again, On symbol is off while timer and Off symbols flashing, system is now in on timer setting mode. The day display section shows the day of the corresponding off timer setting. If clock display section shows --: --, it means the current timer is null. Pressing <TIME+/-> button will activate this timer. If there is time being displayed, it means the current timer is already activated. Press <TIME+/-> button to adjust the timer setting. Press <CANCEL> button will cancel this setting and the display will be shown as --: --.

c) Press <TIMER> button again, Off symbol off and timer symbol flashing. Pressing button will exit on/off timer setting.

d) Press <TIMER> button again to repeat steps a) and b).

e) Press <DAY> button to adjust different day of on/off timer setting.

f) In normal operation, timer symbol will light up should there be any on/off timer being set. Should there be unexecuted on or off timer for the current day, its corresponding On or Off symbol will light up.

g) In on/off timer setting mode, pressing <CANCEL> button for 5 sec will cancel all on/off timer settings.

2.4.7 TiO2 Control

Press <TiO2> button to start or stop TiO2 control.

Controller Operation

2.4.8 Temperature Browsing

In normal operation, press <DISPLAY> button to enter into temperature browsing menu. Press <SELECT▲/▼> button to select the menu as follow:

Menu Shown in error code display section	Value Shown clock display section	Unit	Remarks
C0	Main board DIP switch setting	unit	Shows number of outdoor unit connected
C1	Indoor coil 1 temperature	C	
C2	Indoor coil 2 temperature	C	
C3	Indoor coil 3 temperature	C	If main board is configured as dual circuits, C3 and C4 can not be selected.
C4	Indoor coil 4 temperature	C	If main board is configured as three circuits, C4 can not be selected.

Press < DISPLAY> button again to exit.

2.4.9 Keylock

System is equipped with keylock function to prevent mischief. Press and buttons for 5 sec to activate keylock mode. Keylock symbol will light up, likewise to exit keylock mode.

Only button will be responded in keylock mode.

2.4.10 Key Validity

There are some buttons that will be acknowledged in certain function only. The valid key press will be responded with the beeping sound.

2.4.11 Parameter Setting

In normal mode, press < SET> button for 5 sec to enter into parameter setting menu. Press <SELECT▲/▼> button the select the menu. Press or button to edit the parameter as follow:

Menu Shown in error code display section	Parameter Shown clock display section	Characteristic	Remarks
d0	Recover to the state before power failure.	Display as En: Recover Display as Dn: Not recover	
d1	Service password 1	0~99, default 0	
d2	Service password 2	0~99, default 0	
d3	Indoor coil anti freeze	-10~2degC, default 0degC	
d4	Compressor consecutive cut in interval	3~8 min, default 5min	
d5	Thermostatic control cycle	30~240 sec, default 90 sec	
d6	Recover to default setting	Display as En: Recover Display as Dn: Not recover	

Controller Operation

Note:

1 Upon enter to parameter setting menu, “READ” wording will be shown, indicates retrieving the data from the main board.

2 At menu d1, a password of “16” is required to proceed to menu d2. If the password is incorrect, system will exit prameter edit mode.

3 At menu d2, a password of “32” is required to proceed to menu d3. If the password is incorrect, system will exit prameter edit mode.

4 Upon completion of parameter editing, press <SET> button to exit in order for the new settings to take effect.

2.4.12 Error Display

Should there be error occurred, backlight will turn to red colour. Error display section shows the conrresponding error code as follow:

Error Code	Description	Remarks
1	Indoor fan failure (power off to reset)	Display error, stop the system for protection Power off and on to restart. [check motor overload]
2	Indoor return air sensor failure (auto reset)	Display error, resume upon recovered, default at 26degC [check sensor connection]
3	Indoor coil 1 sensor failure (auto reset)	Display error, system continue to operate, bypassed anti freeze. [check sensor connection]
4	Indoor coil 2 sensor failure (auto reset)	Display error, system continue to operate, bypassed anti freeze.[check sensor connection]
5	Indoor coil 3 sensor failure (auto reset)	Display error, system continue to operate, bypassed anti freeze.[check sensor connection]
6	Indoor coil 4 sensor failure (auto reset)	Display error, system continue to operate, bypassed anti freeze.[check sensor connection]
7	Outdoor unit 1 power protection, comp overload trip, compressor 1 high/low pressure trip (manual reset)	Display error, stop the outdoor unit, manual reset required, should the failure be occurred 5 times consecutively, pressing of “RESET” will not be able to reset the unit. Needs power off and on to restart the unit.
8	Indoor coil 1 anti freeze (auto reset)	Display error, Resume upon recovered . [check coil]
9	Circuit 1 no cooling (power off to reset)	Display error. [check outdoor unit 1]

Controller Operation

Error Code	Description	Remarks
10	Outdoor unit 2 power protection, comp overload trip, compressor 2 high/low pressure trip (manual reset)	same as 7
11	Indoor coil 2 anti freeze (auto reset)	same as 8
12	Circuit 2 no cooling (power off to reset)	same as 9
13	Outdoor unit 3 power protection, comp overload trip, compressor 3 high/low pressure trip (manual reset)	same as 7
14	Indoor coil 3 anti freeze (auto reset)	same as 8
15	Circuit 3 no cooling (power off to reset)	same as 9
16	Outdoor unit 4 power protection, comp overload trip, compressor 4 high/low pressure trip (manual reset)	same as 7
17	Indoor coil 4 anti freeze (auto reset)	same as 8
18	Circuit 4 no cooling (power off to reset)	same as 9

Note:

1 Failure of any circuit will not affect the operation of other circuits.

2 During system failure, press <RESET> button for 3 sec to reset the fault.

Controller Operation

Phase Protector /Phase Failure Relay

Phase protector is installed on each condensing unit.

Function of phase protector

1. Phase reversal
2. Over or under voltage
3. Multiple type of fault auto recovery and lock function

Hardware Configuration

There is a 8 way DIP switch to program the 3 phase monitor according to the table below:

SW1 SW2	SW3 SW4	SW5	SW6	SW7 SW8
Fault time delay	Voltage tolerance	Reserved	Voltage measuring	3 phase input
00 - 5sec 01 - 10sec 10 - 15sec 11 - 20sec	00 - 5% 01 - 10% 10 - 15% 11 - 20%		0 - Monitor 1 - Bypassed	00 - 380V 01 - 400V 10 - 415V 11 - 440V
To select time delay to confirm fault	Check according to SW7 SW8 settings		When set to ‘ 1’ , no under / over voltage checking will be done.	When set to ‘ 1’ , no under / over voltage checking will be done.

DIP setting has been default set. User only recommended to set SW7 SW8 to local voltage supply. (Default setting 00 – 380V)

“ 0” – off “ 1” - on

Upon power up, the controller will blink the red LED quickly indicating at warm up stage. This process may take a few seconds [0~20 sec depends on the voltage supply and monitor settings]. Red LED will be off once the power supply is stable. Green LED and relay will turn on 5 sec later.

Should the controller is unable to read the healthy 3 phase supply after 20 seconds, it will lock the error and flash the red LED according to the alarm code.

It will check the power supply again 280 sec later. Upon confirmation of healthy 3 phase supply, system will monitor the power supply constantly according to the DIP switch settings. Should there be failure occurred, system will flash the red LED slowly until the error delay time out and relay will be turn off. If the power supply is recovered before the error delay time out, red LED will be off and system operate as normal.

System will lock the error if this failure happens ≧ 5 times within 2 hours. This fault can be reset by manually turn off the power supply only.

Controller Operation

When there is fault occurred, red LED will blink according to the following error code:
Fault Error code

Over voltage	Blink 8 times, off 3 sec
Under voltage	Blink 7 times, off 3 sec
R phase failure	Blink 6 times, off 3 sec
S phase failure	Blink 5 times, off 3 sec
T phase failure	Blink 4 times, off 3 sec
Phase reversal	Blink 3 times, off 3 sec

When one of the error occur, check the power supply and supply wire connection to the unit.
CAUTION: DO NOT CHANGE THE WIRE POSITION WHICH IS ORIGINALLY CONNECTED IN THE CONTROLLER ITSELF. For eg. wire from TB1 to PP.

Display error code on the wall pad (refer 3.4.12: 9, 12, 15 0r 18).

Other Protection Device

Over current protector (OLP), High pressure switch and low pressure switch are installed for compressor protection. When activated, compressor will be cut off, error will be displayed on the wall pad. Check the system accordingly.

Service and Maintenance

Item	Maintenance Procedure	Frequency
Air Filter	Remove any dust adhered on the filter by using a vacuum cleaner or wash in lukewarm water (below 40°C) with neutral cleaning detergent Rinse well and dry the filter before placing it back onto the unit. Do not use gasoline, volatile substances or chemical to clean the filter.	Once every 2 weeks. More frequently if necessary
External panel surface	Clean any dust or dust on the grille or panel by wiping it using soft cloth soaked in lukewarm water (below 40°C) with neutral cleaning detergent Do not use gasoline, volatile substances or chemical to clean the unit	Once every 2 weeks. More frequently if necessary
Coil	Check and remove any dirt clogged between fins. Check and remove any obstacles that hinder air flowing into and out of the unit.	Monthly
Power supply	Check the voltage and current of the indoor unit. Check the electrical wiring for any faulty contacts caused by loose connections, foreign matters, etc. Tighten the wires onto the terminal block if necessary	Every 2 months
Drain pan & pipe	Check its cleanliness and clean it if necessary.	Once every 3 months
Fan &Motor	Check for any abnormal noise.	Only when necessary.

⚠ **Warning:**

- Disconnect power supply before servicing
- Do not place flammable objects close to unit, when the unit is operating.
- Do not attempt to disassemble or repair the unit upon unit operation failure. Contact your nearest dealer immediately.

⚠ **Caution:**

- Disconnect main power supply when the unit is not operating for long period of time Unit should be heated up for 24 hours before operating if it has not been operating for long period of time.
- Do not switch On/Off of the controller too frequent or in short interval time.
- Do not damage coil fins.
- Do not operate the unit at cooling mode when outdoor ambient below 20°C, this might causes failure to compressor.

Trouble Shooting

In case of malfunction, perform the following preliminary check , before asking for repair service.

Problem	Cause	Trouble Shooting/ Remedy
Unit cannot operate	The power supply is turned OFF.	Turn the power supply ON.
	The fuse in the PCB is gone or blown.	Replace fuse.
Air flow too small	Running at low (model 75/100)	Switch to high mode
	Reverse rotation (model 125/150)	Swtich the phase for power line
At Cooling Mode, no cold air is delivered	The set temperature is higher than room temperature	Lower the set temperature.
	The room temperature is excessively low for cooling	Can not operate as it is out of temperature control range.
	a Phase protector open (condensing unit)	refer to page 28
	b High pressure switch open	Check if any i. air blockage on outdoor unit. ii outdoor fan motor malfunction iii. refrigernat overcharge. iv. outdoor ambient above operating limit.
	c Low pressure switch open	Check if any i. refrigerant gas leakage
	d comp overload protector open	Check if any i. refrigernat overcharge.
Cooling , but not cold enough	The unit is just started the cooling mode	Wait for a while
	High infiltration through door, windows	Close the door ,windows
	Low refrigerant level	check suction, discharge pressure and temperature
Water discharge from the unit	Air flow too high	Change fan speed
	Drain pipe is cloagged, water overflow	Clear the drain pipe