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※ Manufacture reserves the right to discontinue, or change at any time, specifications or designs without notices and without incurring obligations.

### 1. Product Lineup

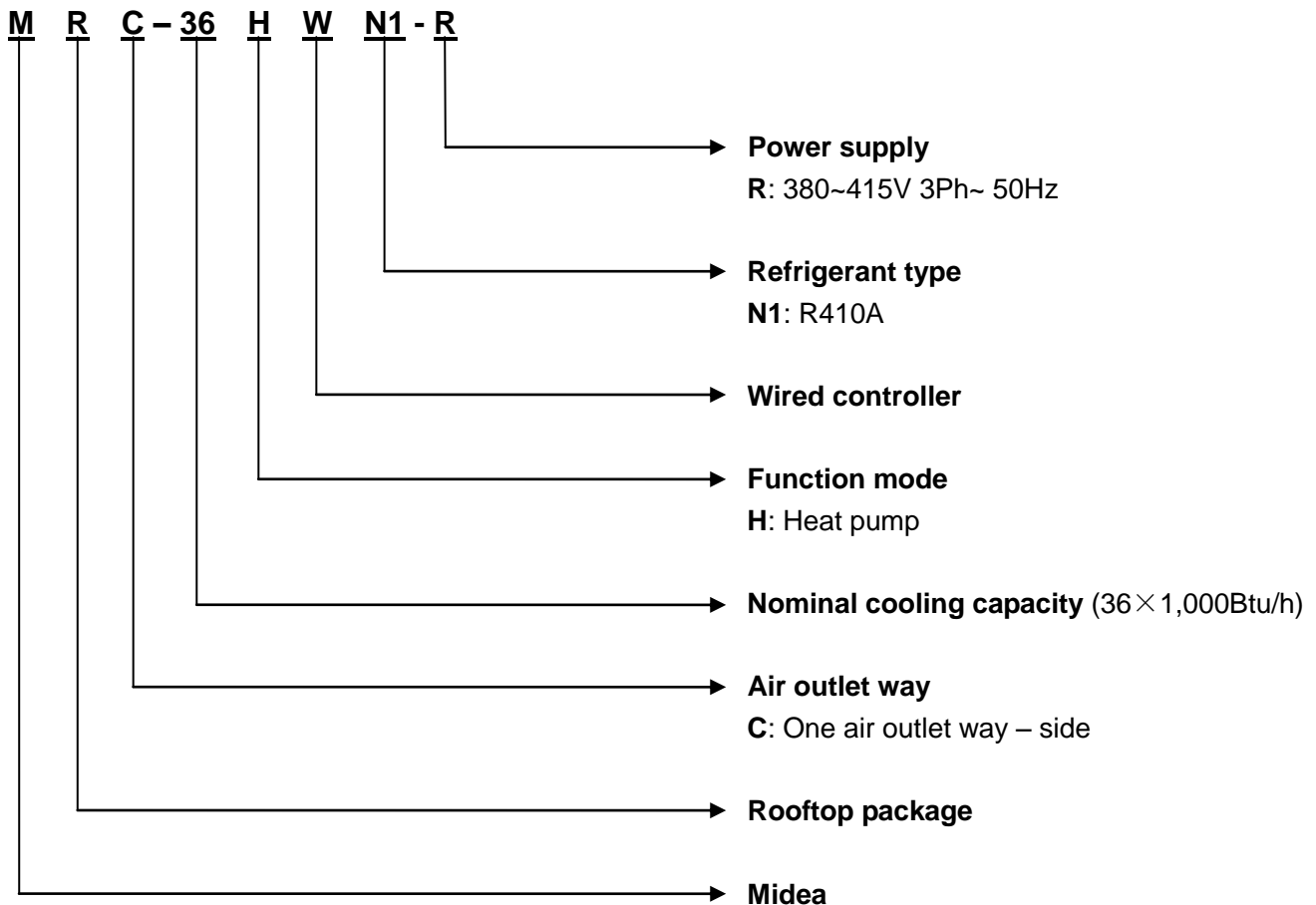
Nominal Cooling Capacity	Model		Refrigerant	Power Supply
	Model Name	Function		
3ton	MRC-36HWN1-R	Heat pump	R410A	380-415V, 3Ph,50Hz
4ton	MRC-48HWN1-R	Heat pump		
5ton	MRC-60HWN1-R	Heat pump		

Notes: Please refer to specification tables for accurate cooling or heating capacity with Kw or Btu/h unit.

### 2. External Appearance



### 3. Nomenclature



## 4. Features

### 4.1 The adoption of anticorrosive-box

The reinforced anticorrosion by using galvanization armor plate and coated with man-composed paint. The appearance is stylish and easy for maintenance.

(Has been passed 1000 hours salt spray test)

### 4.2 The adoption of credible protection system

#### ➤ **The protections of compressor**

Multi-protections include hi-pressure protection, low-pressure protection, current protection of compressor, etc. The series' protectors can ensure compressor operating normally.

It adopts independent system, except for protection of sequence and wired controller output, any related protection to its corresponding compressor. Once a compressor protection energized, the corresponding compressor will stop, the others working still.

#### ➤ **The protections of fan motor**

The fan motors for evaporator have over-heat protection and over-current protection function. The fan motors for condenser have the temperature controller protection function.

### 4.3 Energy saving design

#### ➤ **High efficiency compressor**

Using professional compressor, heat exchanger and optimum connection pipe, the compressor can startup under low power input. Provide maximum reliability, efficiency and quiet operation.

#### ➤ **Standard low and high pressure safety switches**

#### ➤ **Well compressor control**

Compressor staging is controlled directly by the control temperature. When the control temperature is warmer than the cooling set point, cooling is staged up; when the control temperature is cooler than the cooling set point, cooling is staged down. However, a stage change can only occur when the control temperature is outside the dead band. Staging is constrained by an inter-stage delay timer. These constraints protect the compressors from short cycling while eliminating temperature variations near the diffusers.

#### ➤ **Condenser**

By using high-efficient thin wing, the condenser has high-efficient heat exchanger, the energy waste decreases greatly.

#### ➤ **Evaporator**

By using the high-efficient, super thin wing and inner grooved copper pipe, the evaporators get the higher capacity and the lower noise level.

#### ➤ **The heat insulation of indoor unit**

The heat insulation of indoor unit can availably decrease heat loss.

### 4.4 Optional collocation

#### ➤ **Operation in high temperature**

The air-conditioner designed for high temperature operating, even when the ambient temperature reaches up to 43°C (109.4°F).

#### ➤ **Strong air flow**

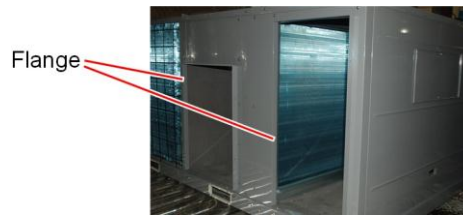
Large air volume from the air inlet is forced ventilating by the condenser fan.

#### ➤ **Minimum installation arrangement**

The installation is fast and low cost with the easy installation and ready operation.

➤ **Pre-drilled duct flange**

Flanges are prepared at the supply and return duct connections so that they can reduce duct connection work at site.



➤ **Quiet operation**

Noise and vibration have been effectively reduced by adopting new style hermetic compressor. The centrifugal fan and fan casing are optimum shaped for efficient and low noise operation.

#### 4.5 Cabinet

➤ **Sloped drain pan and drain pipe.**

➤ **Cabinet have forklift and lifting holes for easy transportation.**

➤ **Filter can be washable.**

➤ **External pressure gauge ports.**

With the gauge ports mounted externally, an accurate diagnostic of system operation can be performed quickly and easily without disrupting airflow.



➤ **Durable construction.**

G90 galvanized heavy gauge plate conforming to ASTM-A-653, zinc content of galvanized plate is 275g/m<sup>2</sup>.

## 5. List of Functions

### 5.1 Standard specifications

#### A. General

The units are convertible airflow. All units shall be factory assembled, internally wired, fully charged refrigerant and 100% run tested to check cooling and heating operation, fan and blower rotation, and control sequence before leaving the factory. Wiring internal to the unit shall be colored and numbered for simplified identification. The unit is provided with an integral weather resistant control panel.

#### B. Unit enclosure

Panels are of heavy gauge, G-90 galvanized steel sheet with removable access panels, completely weatherized for outdoor installation and properly reinforced and brazed. Panels and access door are provided for inspection and access for all internal parts. Enclosures are provided with adequately reinforced points of support for setting in the unit. Steel sheet panels are zinc-coated and galvanized by the hot dip process of lock forming quality conforming to ASTM A 653 commercial weight G-90, followed by baked on electrostatic polyester dry powder coat paint,

on all external panel.

### **C. Compressor**

Compressors are scroll for all the models. They are provided with all the standard controls and accessories necessary for safe operation. These are equipped with internal motor protector; factory installed crank case heater and rubber vibration isolator for quiet and efficient operation.

### **D. Air-cooled condensing section**

- The air-cooled condensing section is enclosed within the unit housing and consists of condenser coil, fan(s) electric motor(s) and inherently protected compressor(s). Inner grooved copper tubes with wall thickness of 0.3mm, mechanically bonded to enhanced louvered aluminum fins are standard for all condenser coils. As an option, enhanced coated aluminum fins may be provided. Tube support sheets are galvanized steel, formed to provide structural strength.
- Fans are propeller type, direct driven, upward discharge and provided with fan grille mounted on the casing.
- Motors are totally enclosed air-over type with class F insulation. Inherent thermal protection is automatic reset type.

### **E. Evaporator coil section**

- All cooling coils are of enhanced louvered fins and inner grooved copper tubes with wall thickness of 0.3mm, mechanically bonded to aluminum fins. As option, enhanced coated aluminum fins may be provided. Tube support sheets are galvanized steel, formed to provide structural strength.
- Drainage pan: An insulated drainage pan made of G-90 galvanized steel is provided, for additional corrosion protection.
- Insulation: Insulation is supplied in adequate density and thickness for all units to prevent condensation from forming on the unit casing. Insulation meets the requirements of NFPA 90A and is protected against deterioration and erosion from air currents.

### **F. Evaporator fan**

Evaporator fan is of centrifugal forward-curved blade design capable of handling total required CFM and static pressure in the low and the medium ranges. Casings are made of galvanized steel. Blower motors are of open drip proof type (totally enclosed types are optional) and conform to NEMA MG-1 and MG-2. Pillow block bearing are selected for at 200,000 hours average life at design operating conditions. Shaft is turned, ground and polished from solid steel. Fans and pulleys are keyed to shaft and designed for continuous operation at maximum motor horse power and fan speed. All rotating components and assemblies are statically and dynamically balanced and every unit is vibration tested before shipment from the factory.

### **G. Electronic thermostats**

General information: A dedicated electronic thermostat is supplied with unit controls as standard. The thermostat normally displays room temperature and mode of operation.

The temperature can be set by up/down buttons for both cooling and heating cycles. The thermostat also allows you to select continuous fan operation, or have the fan on intermittent operation with the equipment. It also displays the status of unit, thus providing maximum information for the end user.

**5.2 Standard features/options/accessories**

Description	Standard features	Options (factory installed)	Accessories (field installed)
Compressor crankcase heaters	◆		
Condenser fan-direct drive, axial type	◆		
Filter, Nylon (Thickness 10mm)	◆		
Compressor overload protection	◆		
Low &high pressure switch	◆		
Cooling & heating thermostat		◆	
Condenser fan guard	◆		
Condenser coil guard	◆		
Wired controller KJR-25B		◆	
Drainage pipe			◆
Drainage outlet			◆
Snap ring			◆

## 6. Specifications

Nominal ton			3	4	5
Model			MRC-36HWN1-R	MRC-48HWN1-R	MRC-60HWN1-R
Cooling	Capacity	Btu/h	36,000	48,000	58,000
		kW	10.55	14.07	17.29
	Power Input	kW	3.05	4.79	5.64
Heating	Capacity	Btu/h	37,500	51,500	62,500
		kW	10.99	15.09	18.32
	Power Input	kW	3.00	4.56	5.21
Electrical data	Power supply	\	380-415V 3Ph~ 50Hz		
	Max. input consumption	kW	4.25	6.05	7.05
	Max. current	A	6.4	8.8	10.9
Performance	Indoor fan air flow	CFM	1,500	1,858	2,045
	ESP	Pa	50	50	50
	EER	Btu/h.W	11.8	10.0	10.3
	COP	Btu/h.W	12.5	11.3	12.0
Indoor coil	Number of rows	\	3	4	4
	Fin spacing	mm	1.5	1.5	1.5
		inch	1/16"	1/16"	1/16"
	Tube diameter	mm	Φ7	Φ7	Φ7
		inch	1/4"	1/4"	1/4"
	Coil length x height	mm	421x714	421x714	421x714
inch		16.6x28.1	16.6x28.1	16.6x28.1	
Number of circuits	\	8	8	8	
Indoor fan	Type	\	Centrifugal	Centrifugal	Centrifugal
	Quantity	\	1	1	1
	Diameter	mm	Φ282	Φ282	Φ282
		inch	11.1"	11.1"	11.1"
	Drive type	\	Direct	Direct	Direct
	Motors quantity	\	1	1	1
	Motor model	\	YDK250-6X	YDK550-4E	YDK550-4E
	Motor output	kW	0.25	0.55	0.55
Motor rpm	r/min	770/720	960/902/845	960/902/845	
Compressor	Type	\	Scroll	Scroll	Scroll
	Quantity	\	1	1	1
	Model	\	ZP36KSE-TFM-522	ZP51KSE-TFM-522	ZP61KCE-TFD-522
	Brand	\	Copeland	Copeland	Copeland
	Capacity	Btu/h	29,343	41,456	50,000
	Input	kW	2.94	4.04	4.75
	Rated load Amps (RLA)	A	6	7.8	10.9
	Locked rotor Amps (LRA)	A	46.0	51.5	64.0
	Refrigerant oil charge	ml	1,242	1,240	1,685

Nominal ton			3	4	5
Model			MRC-36HWN1-R	MRC-48HWN1-R	MRC-60HWN1-R
Outdoor coil	Number of rows	\	2	2	3
	Fin spacing	mm	1.5	1.5	1.5
		inch	1/16"	1/16"	1/16"
	Tube diameter	mm	Φ7	Φ7	Φ7
		inch	1/4"	1/4"	1/4"
	Coil length × height	mm	1,495×756	1,495×756	1,482×756
inch		58.9×29.8	58.9×29.8	58.3×29.8	
Number of circuits		\	10	8	8
Outdoor fan	Type	\	Axial	Axial	Axial
	Quantity	\	1	1	1
	Diameter	mm	Φ550	Φ550	Φ550
		inch	21.7"	21.7"	21.7"
	Drive type	\	Direct	Direct	Direct
	Motors quantity	\	1	1	1
	Motor model	\	YDK180-6A	YDK240-4A	YDK240-4A
	Motor output	kW	0.18	0.24	0.24
Motor rpm	r/min	930	1,050	1,050	
Outdoor sound pressure level		dB(A)	63	66	67
Refrigerant	Type	\	R410A	R410A	R410A
	Refrigerant volume	Kg	2.9	2.9	4.0
	Refrigerant Control	\	Throttle valve	Throttle valve	Throttle valve
Wired controller		\	KJR-25B (Optional)		
Operation temp		°C	17~30	17~30	17~30
Outdoor ambient Temp.	Cooling	°C	21~43	21~43	21~43
	Heating	°C	-5~24	-5~24	-5~24
Dimensions	Net(W×H×D)	mm	744×830×1,116	744×830×1,116	744×830×1,116
	Packing(W×H×D)	mm	765×855×1,152	765×855×1,152	765×855×1,152
Weight	Net weight	Kg(lbs)	139 (306.5)	146 (322)	159 (351)
	Gross weight	Kg(lbs)	142 (313)	149 (329)	162 (357)
Filter	Type	\	Nylon	Nylon	Nylon
	Quantity	Pieces	1	1	1
	Size (W×H×D)	mm	197×670×10	197×670×10	197×670×10
Shipping	Qty. (20'/40'/40'HQ)	Pieces	30/62/90	30/62/90	30/62/90

**Notes:**

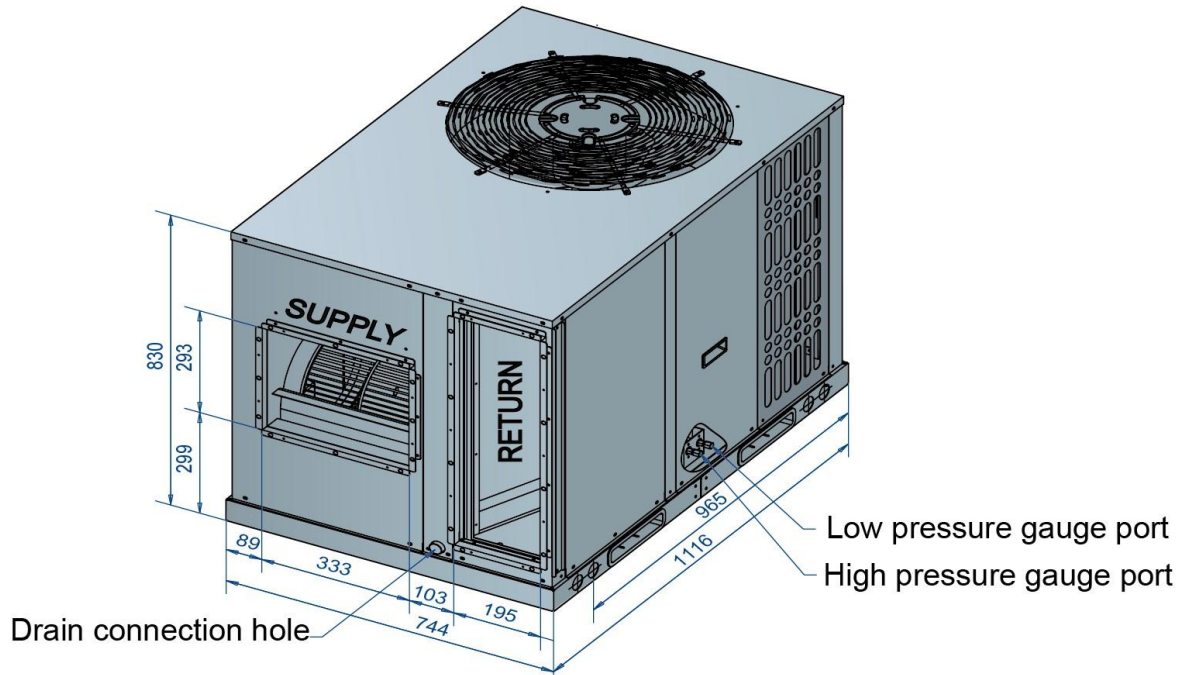
The data are based on the following conditions:

Cooling: Indoor Temperature: 27°C (80.6°F) DB / 19°C (66.2°F) WB; - Outdoor Temperature: 35°C (95°F) DB.

Heating: Indoor Temperature: 20°C (68°F) DB; - Outdoor Temperature: 7°C (44.6°F) DB/6°C (42.8°F) DB

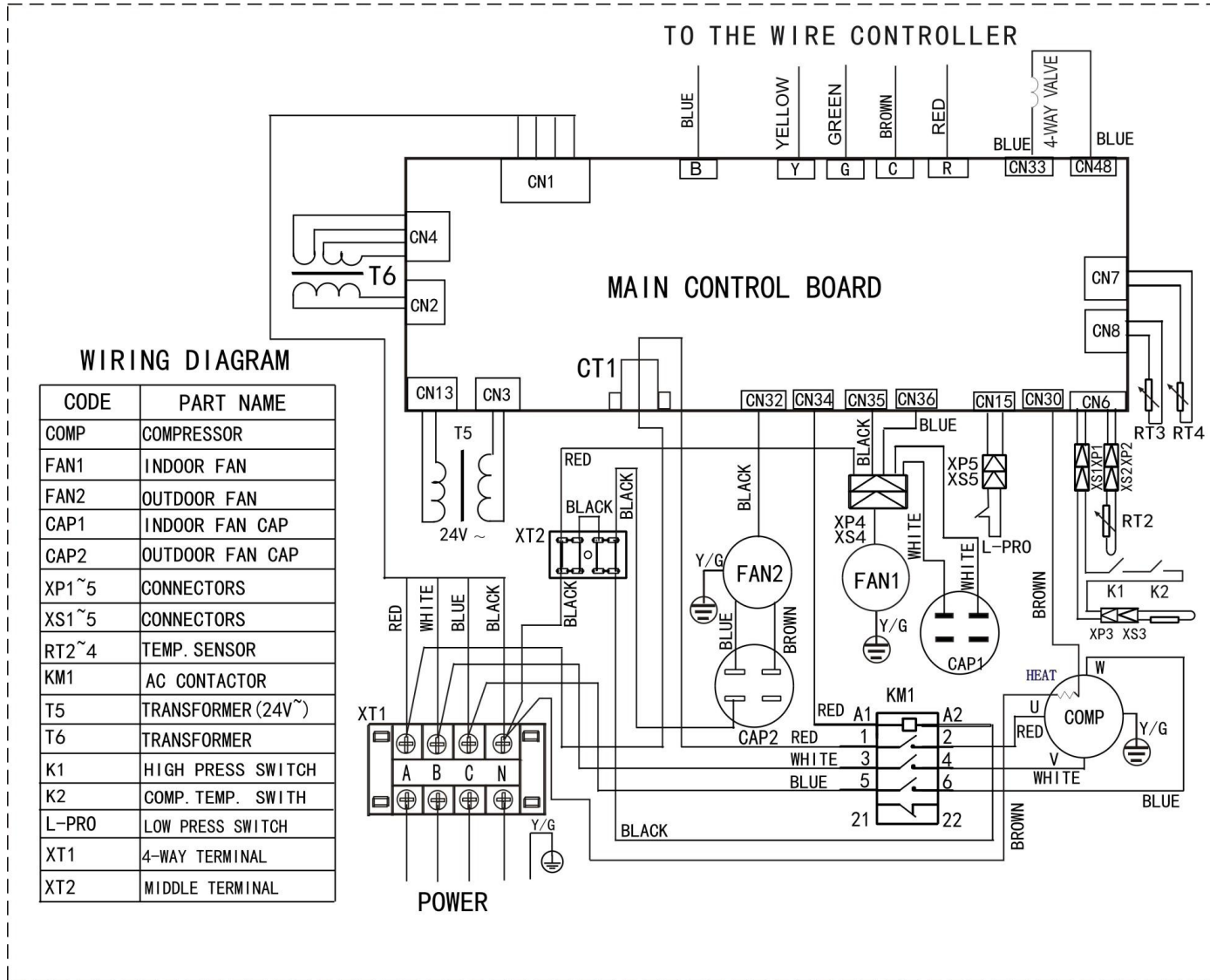


## 7. Dimensional Drawings

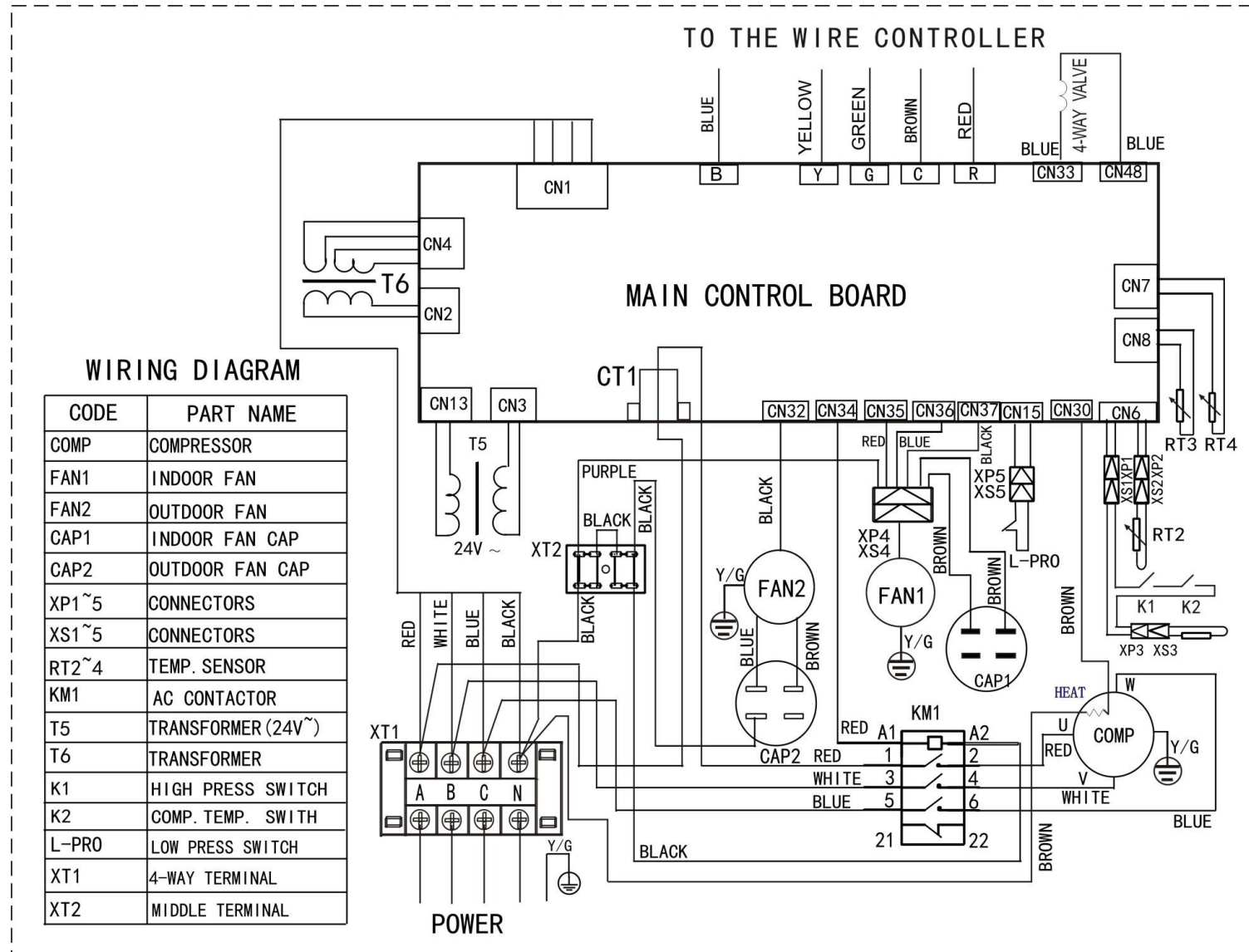


## 8. Wiring Diagrams

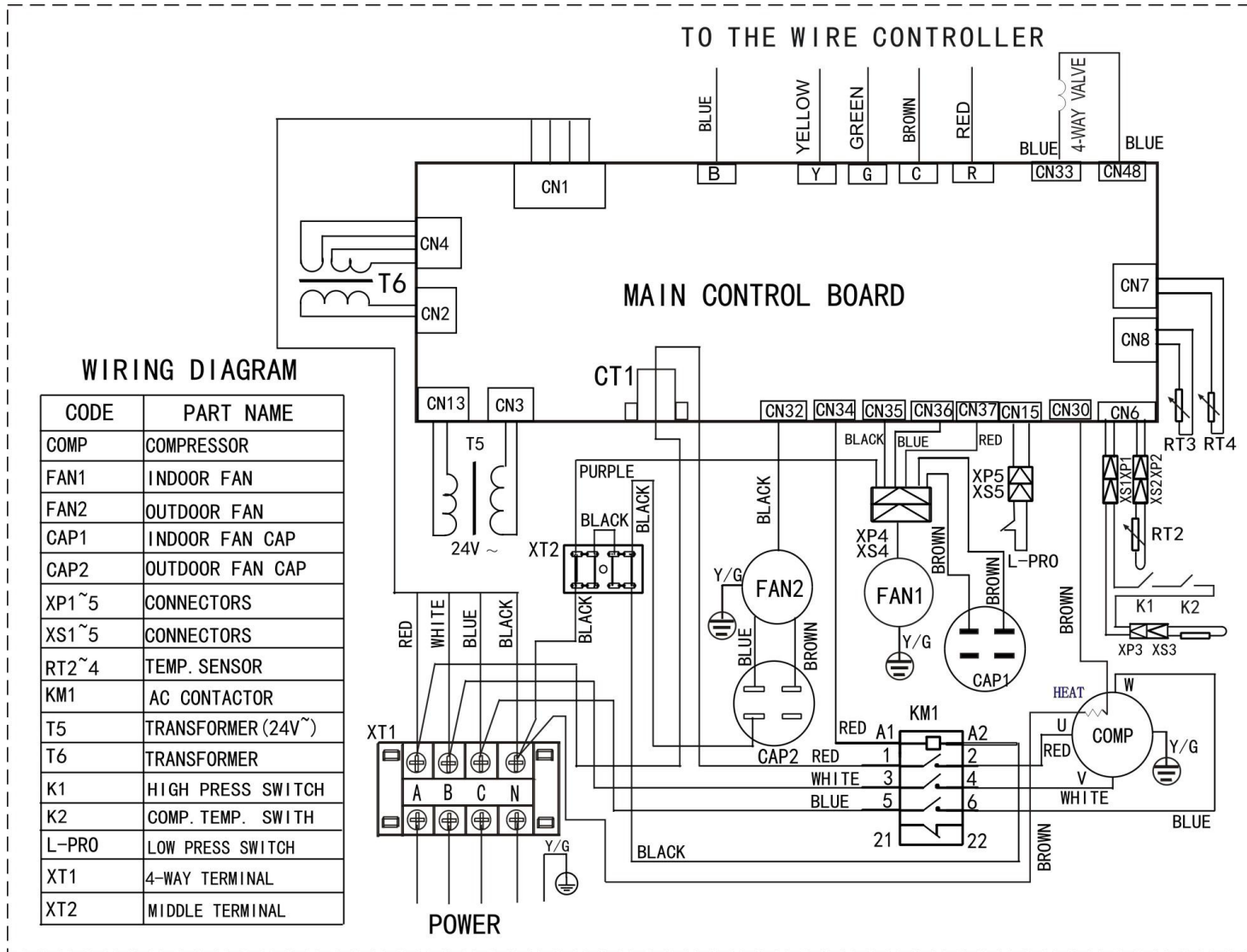
### MRC-36HWN1-R



**MRC-48HWN1-R**



**MRC-60HWN1-R**



## 9. Performance Data

### MRC-36HWN1-R – Cooling:

Air Flow (CFM)			1,370				1,500				
		Ent. (DB)	(°F)	72	75	78	80	72	75	78	80
Ambient Temperature	85	63	TC	27.5	30.9	33.9	35.7	28.1	31.5	34.6	36.4
			SC	20.8	24.1	27.1	28.9	21.2	24.6	27.7	29.5
			PI	2.69	2.71	2.72	2.73	2.72	2.73	2.75	2.76
		67	TC	28.6	32.3	35.9	38.0	29.2	33.0	36.6	38.8
			SC	16.5	20.2	23.7	25.9	16.8	20.6	24.2	26.4
			PI	2.71	2.72	2.74	2.75	2.74	2.75	2.77	2.78
		71	TC	29.7	33.7	37.5	39.9	30.3	34.4	38.3	40.7
			SC	11.6	15.6	19.4	21.8	11.8	15.9	19.8	22.2
			PI	2.72	2.73	2.75	2.76	2.75	2.76	2.78	2.79
	95	63	TC	24.2	27.7	31.0	32.9	24.7	28.3	31.6	33.6
			SC	20.0	23.5	26.8	28.7	20.4	24.0	27.3	29.3
			PI	2.96	2.98	2.99	3.01	2.99	3.01	3.02	3.04
		67	TC	26.3	30.1	33.7	35.3	26.8	30.7	34.4	36.0
			SC	15.7	19.5	23.1	24.7	16.0	19.9	23.6	25.2
			PI	2.98	3.00	3.01	3.03	3.01	3.03	3.04	3.06
		71	TC	27.0	30.9	34.7	37.1	27.5	31.5	35.4	37.9
			SC	10.9	14.8	18.6	21.1	11.1	15.1	19.0	21.5
			PI	2.99	3.01	3.02	3.04	3.02	3.04	3.05	3.07
	105	63	TC	21.1	24.7	28.0	30.2	21.5	25.2	28.6	30.8
			SC	19.1	22.7	26.1	28.2	19.5	23.2	26.6	28.8
			PI	3.24	3.25	3.27	3.29	3.27	3.29	3.30	3.32
		67	TC	22.6	26.5	30.2	32.5	23.1	27.0	30.8	33.2
			SC	14.8	18.6	22.3	24.7	15.1	19.0	22.8	25.2
			PI	3.26	3.27	3.29	3.31	3.29	3.31	3.32	3.34
71		TC	24.3	28.0	31.9	34.4	24.8	28.6	32.5	35.1	
		SC	10.2	13.9	17.7	20.3	10.4	14.2	18.1	20.7	
		PI	3.27	3.28	3.30	3.32	3.30	3.32	3.33	3.35	
115	63	TC	18.2	21.9	25.3	27.4	18.6	22.3	25.8	28.0	
		SC	18.1	21.8	25.2	27.3	18.5	22.2	25.7	27.9	
		PI	3.51	3.53	3.55	3.56	3.55	3.56	3.58	3.60	
	67	TC	19.8	23.6	27.3	29.8	20.2	24.1	27.9	30.4	
		SC	13.8	17.6	21.4	23.8	14.1	18.0	21.8	24.3	
		PI	3.53	3.55	3.57	3.58	3.57	3.58	3.60	3.62	
	71	TC	21.8	25.3	29.1	31.7	22.2	25.8	29.7	32.3	
		SC	9.5	13.0	16.9	19.4	9.7	13.3	17.2	19.8	
		PI	3.54	3.56	3.58	3.59	3.58	3.59	3.61	3.63	

#### Notes:

1. All capacities are gross and have not considered indoor fan heat. To obtain NET cooling capacity subtract indoor fan heat.
2. TC=Total Capacity. (Unit: 1000Btu/h).
3. SC=Sensible Capacity. (Unit: 1000Btu/h).
4. PI=Power Input. (Unit: kW)

**MRC-48HWN1-R – Cooling:**

Air Flow (CFM)			1,650				1,750				1,950				
	Ent. (DB)	(°F)	72	75	78	80	72	75	78	80	72	75	78	80	
Ambient Temperature	85	63	TC	36.7	41.1	45.1	47.5	37.4	41.9	46.0	48.5	38.1	42.7	46.9	49.5
			SC	27.6	32.0	36.1	38.5	28.2	32.7	36.8	39.3	28.8	33.4	37.5	40.1
			PI	4.16	4.19	4.21	4.23	4.21	4.23	4.25	4.27	4.25	4.27	4.29	4.31
		67	TC	38.2	43.2	47.8	50.7	39.0	44.1	48.8	51.7	39.8	45.0	49.8	52.7
			SC	22.0	27.0	31.6	34.4	22.4	27.5	32.2	35.1	22.8	28.1	32.8	35.8
			PI	4.19	4.21	4.24	4.26	4.24	4.26	4.28	4.30	4.28	4.30	4.32	4.34
		71	TC	39.6	44.9	50.0	53.2	40.4	45.8	51.0	54.3	41.2	46.7	52.0	55.4
			SC	15.5	20.8	25.9	29.1	15.8	21.2	26.4	29.7	16.1	21.6	26.9	30.3
			PI	4.22	4.24	4.27	4.29	4.27	4.29	4.31	4.33	4.31	4.33	4.35	4.37
	95	63	TC	32.2	36.9	41.3	43.9	32.9	37.7	42.1	44.8	33.6	38.5	42.9	45.7
			SC	26.7	31.4	35.7	38.3	27.2	32.0	36.4	39.1	27.7	32.6	37.1	39.9
			PI	4.60	4.63	4.65	4.67	4.65	4.67	4.70	4.72	4.70	4.72	4.74	4.77
		67	TC	35.0	40.1	44.9	47.0	35.7	40.9	45.8	48.0	36.4	41.7	46.7	49.0
			SC	20.9	26.0	30.8	32.9	21.3	26.5	31.4	33.6	21.7	27.0	32.0	34.3
			PI	4.63	4.66	4.68	4.70	4.68	4.70	4.73	4.75	4.73	4.75	4.77	4.80
		71	TC	35.9	41.1	46.2	49.5	36.6	41.9	47.1	50.5	37.3	42.7	48.0	51.5
			SC	14.5	19.7	24.8	28.1	14.8	20.1	25.3	28.7	15.1	20.5	25.8	29.3
			PI	4.65	4.68	4.70	4.72	4.70	4.72	4.75	4.77	4.75	4.77	4.79	4.82
	105	63	TC	28.1	32.9	37.4	40.3	28.7	33.6	38.2	41.1	29.3	34.3	39.0	41.9
			SC	25.5	30.3	34.8	37.6	26.0	30.9	35.5	38.4	26.5	31.5	36.2	39.2
			PI	5.03	5.06	5.08	5.11	5.08	5.11	5.13	5.16	5.13	5.16	5.19	5.21
		67	TC	30.2	35.3	40.3	43.4	30.8	36.0	41.1	44.3	31.4	36.7	41.9	45.2
			SC	19.7	24.8	29.8	32.9	20.1	25.3	30.4	33.6	20.5	25.8	31.0	34.3
			PI	5.06	5.09	5.11	5.14	5.11	5.14	5.16	5.19	5.16	5.19	5.22	5.24
71		TC	32.4	37.4	42.5	45.9	33.1	38.2	43.4	46.8	33.8	39.0	44.3	47.7	
		SC	13.6	18.6	23.7	27.0	13.9	19.0	24.2	27.6	14.2	19.4	24.7	28.2	
		PI	5.09	5.12	5.14	5.17	5.14	5.17	5.19	5.22	5.19	5.22	5.25	5.27	
115	63	TC	24.4	29.2	33.8	36.7	24.9	29.8	34.5	37.4	25.4	30.4	35.2	38.1	
		SC	24.2	29.0	33.6	36.5	24.7	29.6	34.3	37.2	25.2	30.2	35.0	37.9	
		PI	5.47	5.50	5.53	5.55	5.53	5.55	5.58	5.61	5.58	5.61	5.64	5.67	
	67	TC	26.6	31.6	36.6	39.8	27.1	32.2	37.3	40.6	27.6	32.8	38.0	41.4	
		SC	18.5	23.5	28.5	31.8	18.9	24.0	29.1	32.4	19.3	24.5	29.7	33.0	
		PI	5.49	5.52	5.55	5.57	5.55	5.57	5.60	5.63	5.60	5.63	5.66	5.69	
	71	TC	29.0	33.8	38.8	42.2	29.6	34.5	39.6	43.1	30.2	35.2	40.4	44.0	
		SC	12.6	17.4	22.4	25.9	12.9	17.8	22.9	26.4	13.2	18.2	23.4	26.9	
		PI	5.52	5.55	5.58	5.60	5.58	5.60	5.63	5.66	5.63	5.66	5.69	5.72	

**Notes:**

1. All capacities are gross and have not considered indoor fan heat. To obtain NET cooling capacity subtract indoor fan heat.
2. TC=Total Capacity. (Unit: 1000Btu/h).
3. SC=Sensible Capacity. (Unit: 1000Btu/h).
4. PI=Power Input. (Unit: kW)

**MRC-60HWN1-R – Cooling:**

Air Flow (CFM)			1,650				1,750				1,950				
	Ent. (DB)	(°F)	72	75	78	80	72	75	78	80	72	75	78	80	
Ambient Temperature	85	63	TC	43.4	48.6	53.4	56.3	44.3	49.6	54.5	57.4	45.2	50.6	55.6	58.6
			SC	32.7	37.9	42.7	45.6	33.4	38.7	43.6	46.6	34.1	39.5	44.5	47.5
			PI	4.92	4.95	4.97	5.00	4.97	5.00	5.02	5.05	5.02	5.05	5.07	5.10
		67	TC	45.2	51.1	56.5	60.0	46.2	52.1	57.7	61.3	47.1	53.2	58.9	62.5
			SC	26.0	31.9	37.3	40.8	26.6	32.5	38.1	41.7	27.1	33.2	38.9	42.5
			PI	4.96	4.99	5.01	5.04	5.01	5.04	5.06	5.09	5.06	5.09	5.11	5.14
		71	TC	46.8	53.2	59.1	63.0	47.8	54.3	60.4	64.3	48.8	55.4	61.6	65.6
			SC	18.3	24.7	30.6	34.5	18.7	25.2	31.3	35.2	19.1	25.7	31.9	35.9
			PI	4.99	5.02	5.04	5.07	5.04	5.07	5.09	5.12	5.09	5.12	5.14	5.17
	95	63	TC	38.2	43.7	48.8	51.9	39.0	44.6	49.8	53.0	39.8	45.5	50.8	54.1
			SC	31.6	37.1	42.1	45.3	32.2	37.8	43.0	46.3	32.9	38.6	43.9	47.2
			PI	5.44	5.46	5.49	5.52	5.49	5.52	5.55	5.57	5.55	5.57	5.60	5.63
		67	TC	41.4	47.4	53.2	55.7	42.2	48.4	54.3	56.8	43.1	49.4	55.4	58.0
			SC	24.7	30.7	36.5	39.0	25.2	31.4	37.2	39.8	25.7	32.0	38.0	40.6
			PI	5.46	5.49	5.52	5.55	5.52	5.55	5.58	5.60	5.58	5.60	5.63	5.66
		71	TC	42.6	48.8	54.8	58.7	43.5	49.8	56.0	59.9	44.4	50.8	57.1	61.1
			SC	17.3	23.4	29.5	33.3	17.6	23.9	30.1	34.0	18.0	24.4	30.7	34.7
			PI	5.50	5.53	5.56	5.59	5.56	5.59	5.61	5.64	5.61	5.64	5.67	5.70
	105	63	TC	33.3	39.0	44.4	47.6	34.0	39.8	45.3	48.6	34.7	40.6	46.2	49.6
			SC	30.1	35.8	41.2	44.4	30.8	36.6	42.0	45.4	31.4	37.3	42.9	46.3
			PI	5.95	5.98	6.01	6.04	6.01	6.04	6.07	6.10	6.07	6.10	6.13	6.16
		67	TC	35.7	41.8	47.6	51.4	36.5	42.6	48.6	52.4	37.2	43.5	49.6	53.5
			SC	23.3	29.4	35.2	39.0	23.8	30.0	36.0	39.8	24.3	30.6	36.7	40.6
			PI	5.98	6.01	6.04	6.07	6.04	6.07	6.10	6.13	6.10	6.13	6.16	6.19
71		TC	38.4	44.4	50.4	54.3	39.2	45.3	51.5	55.5	40.0	46.2	52.5	56.6	
		SC	16.1	22.1	28.1	32.1	16.5	22.5	28.7	32.7	16.8	23.0	29.3	33.4	
		PI	6.00	6.03	6.07	6.10	6.07	6.10	6.13	6.16	6.13	6.16	6.19	6.22	
115	63	TC	28.7	34.5	39.9	43.3	29.3	35.2	40.8	44.2	29.9	35.9	41.6	45.1	
		SC	28.5	34.3	39.7	43.1	29.1	35.0	40.6	44.0	29.7	35.7	41.4	44.9	
		PI	6.46	6.49	6.52	6.56	6.52	6.56	6.59	6.62	6.59	6.62	6.66	6.69	
	67	TC	31.4	37.3	43.3	47.0	32.0	38.1	44.2	48.0	32.7	38.9	45.1	49.0	
		SC	21.9	27.8	33.8	37.5	22.3	28.4	34.5	38.3	22.8	29.0	35.2	39.1	
		PI	6.49	6.52	6.55	6.59	6.55	6.59	6.62	6.65	6.62	6.65	6.69	6.72	
	71	TC	34.5	40.0	46.0	50.0	35.2	40.9	46.9	51.1	35.9	41.7	47.9	52.1	
		SC	15.1	20.6	26.6	30.6	15.4	21.1	27.1	31.3	15.7	21.5	27.7	31.9	
		PI	6.52	6.55	6.58	6.62	6.58	6.62	6.65	6.68	6.65	6.68	6.72	6.75	

**Notes:**

1. All capacities are gross and have not considered indoor fan heat. To obtain NET cooling capacity subtract indoor fan heat.
2. TC=Total Capacity. (Unit: 1000Btu/h).
3. SC=Sensible Capacity. (Unit: 1000Btu/h).
4. PI=Power Input. (Unit: kW)

**MRC-36HWN1-R – Heating:**

Outdoor Temp. (°F) 70% RH	Net Capacities(kW)-1,500 CFM							
	Peak Net Heating(kW) at Indicated Dry Bulb (°F)				Peak Total Power(KW) at Indicated Dry Bulb (°F)			
	60	70	75	80	60	70	75	80
17	20.6	20.2	20.0	19.8	2.41	2.55	2.62	2.69
22	22.8	22.3	22.1	21.9	2.53	2.68	2.75	2.83
27	25.0	24.5	24.2	24.0	2.64	2.80	2.88	2.96
32	26.8	26.2	26.0	25.7	2.76	2.93	3.01	3.09
37	29.7	29.1	28.8	28.5	2.91	3.08	3.17	3.26
42	33.8	33.1	32.8	32.5	3.06	3.24	3.34	3.43
47	38.2	37.5	37.2	36.8	3.21	3.40	3.50	3.60
52	41.1	40.4	40.0	39.6	3.34	3.54	3.64	3.75
57	44.1	43.3	42.9	42.5	3.47	3.69	3.79	3.90
62	47.0	46.2	45.7	45.3	3.61	3.83	3.94	4.05
67	49.9	49.0	48.6	48.2	3.74	3.97	4.08	4.20
72	52.8	51.9	51.5	51.0	3.87	4.11	4.23	4.35

**Notes:**

Heating capacities and power are integrated to include the effects of defrost in the frost region.

**MRC-48HWN1-R – Heating:**

Outdoor Temp. (°F) 70% RH	Net Capacities(kW)-1,750 CFM							
	Peak Net Heating(kW) at Indicated Dry Bulb (°F)				Peak Total Power(KW) at Indicated Dry Bulb (°F)			
	60	70	75	80	60	70	75	80
17	27.8	27.2	26.9	26.6	3.62	3.83	3.94	4.04
22	30.8	30.2	29.9	29.6	3.79	4.01	4.12	4.23
27	33.9	33.2	32.9	32.6	3.95	4.18	4.30	4.41
32	36.5	35.7	35.4	35.0	4.11	4.36	4.48	4.60
37	40.6	39.8	39.4	39.0	4.32	4.58	4.71	4.84
42	46.3	45.4	44.9	44.5	4.54	4.80	4.94	5.07
47	52.4	51.5	51.0	50.6	4.75	5.03	5.17	5.31
52	56.6	55.6	55.0	54.5	4.94	5.23	5.38	5.52
57	60.7	59.6	59.1	58.5	5.12	5.43	5.58	5.73
62	64.8	63.7	63.1	62.5	5.31	5.63	5.79	5.95
67	68.9	67.7	67.1	66.5	5.50	5.83	5.99	6.16
72	73.0	71.8	71.1	70.5	5.69	6.03	6.20	6.37

**Notes:**

Heating capacities and power are integrated to include the effects of defrost in the frost region.



**MRC-60HWN1-R – Heating:**

Outdoor Temp (°F) 70% RH	Net Capacities(kW)-1950 CFM							
	Peak Net Heating(kW) at Indicated Dry Bulb(°F)				Peak Total Power(KW) at Indicated Dry Bulb(°F)			
	60	70	75	80	60	70	75	80
17	34.5	33.8	33.5	33.2	4.19	4.45	4.58	4.71
22	38.1	37.4	37.0	36.6	4.42	4.70	4.84	4.98
27	41.7	40.9	40.5	40.1	4.66	4.95	5.10	5.25
32	44.7	43.8	43.3	42.9	4.89	5.20	5.36	5.52
37	49.6	48.6	48.1	47.6	5.19	5.52	5.68	5.85
42	56.3	55.2	54.7	54.2	5.48	5.83	6.01	6.18
47	63.6	62.5	61.9	61.4	5.78	6.15	6.33	6.51
52	68.5	67.3	66.7	66.0	6.05	6.43	6.62	6.81
57	73.4	72.1	71.4	70.7	6.31	6.71	6.91	7.11
62	78.2	76.8	76.1	75.4	6.58	6.99	7.20	7.41
67	83.1	81.6	80.9	80.1	6.84	7.28	7.49	7.71
72	87.9	86.4	85.6	84.8	7.11	7.56	7.79	8.01

**10. Electrical Data****10.1 Electrical Data**

Model	Power supply			Compressor		Indoor fan motor		Outdoor fan motor	
	MCA	TOCA	MFA	MSC	LRA	FLA	IP	FLA	IP
MRC-36HWN1-R	8.65	14.65	10	46	6	1.9	0.25	1.15	0.18
MRC-48HWN1-R	11.87	19.67	15	51.5	7.8	4.5	0.55	2.12	0.24
MRC-60HWN1-R	15.745	26.645	25	64	10.9	4.5	0.55	2.12	0.24

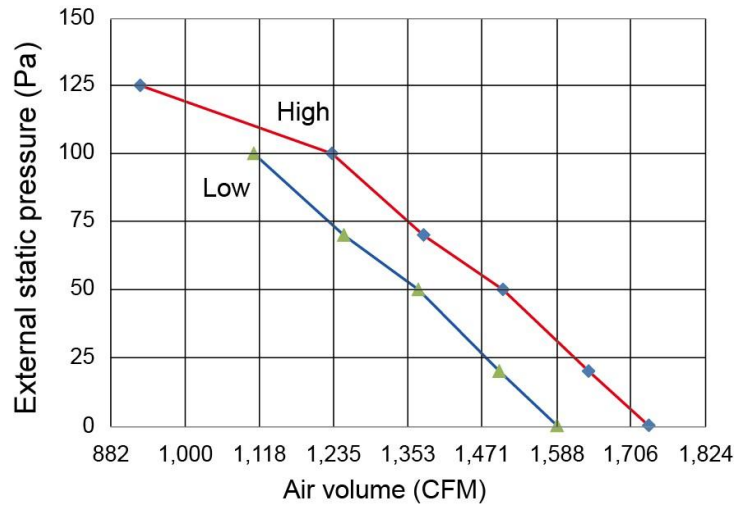
**MCA:** Min. Current Amps. (A)**TOCA:** Total Over-current Amps. (A)**MFA:** Max. Fuse Amps. (A)**RLA:** Rated Current (A)**MSC:** Max. Starting Amps. (A)**IP:** Input (kW)**FLA:** Full Load Amps. (A)**10.2 Motor protection class**

Model	Compressor	Indoor fan motor		Outdoor fan motor	
	Motor protection	Insulation class	Safe class	Insulation class	Safe class
MRC-36HWN1-R	IOP	B	IPX0	F	IPX4
MRC-48HWN1-R	IOP	F	IPX0	F	IP44
MRC-60HWN1-R	IOP	F	IPX0	F	IP44

**IOP:** Internal overload protector

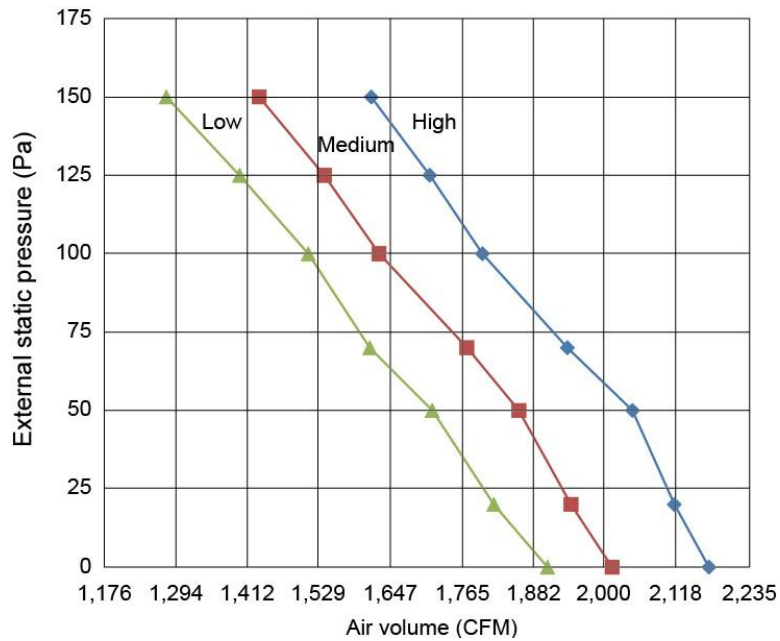
### 11. Parameter and Pressure Chart for Air Volume

#### MRC-36HWN1-R (Indoor side)



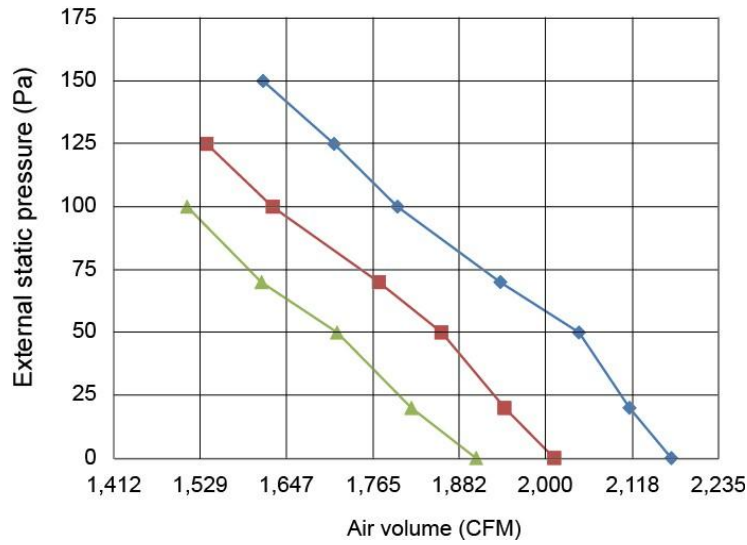
#### Parameter table for indoor side air volume:

Fan speed	Static pressure	Air flow	
		m <sup>3</sup> /h	CFM
Low	0Pa	2,703	1,590
Low	20Pa	2,547	1,498
Low	50Pa	2,329	1,370
Low	70Pa	2,128	1,252
Low	100Pa	1,885	1,109
High	0Pa	2,950	1,735
High	20Pa	2,788	1,640
High	50Pa	2,557	1,500
High	70Pa	2,343	1,378
High	100Pa	2,096	1,233
High	125 Pa	1,579	929

**MRC-48HWN1-R****Parameter table for indoor side air volume:**

Fan speed	Static pressure	Air flow	
		m <sup>3</sup> /h	CFM
Low	0Pa	3,239	1,905
Low	20Pa	3,089	1,817
Low	50Pa	2,917	1,716
Low	70Pa	2,742	1,613
Low	100Pa	2,570	1,512
Low	125Pa	2,378	1,399
Low	150Pa	2,173	1,278
Medium	0Pa	3,420	2,012
Medium	20Pa	3,305	1,944
Medium	50Pa	3,159	1,858
Medium	70Pa	3,014	1,773
Medium	100Pa	2,768	1,628
Medium	125 Pa	2,615	1,538
Medium	150 Pa	2,433	1,431
High	0Pa	3,691	2,171
High	20Pa	3,594	2,114
High	50Pa	3,477	2,045
High	70Pa	3,295	1,938
High	100Pa	3,057	1,798
High	125 Pa	2,910	1,712
High	150 Pa	2,746	1,615

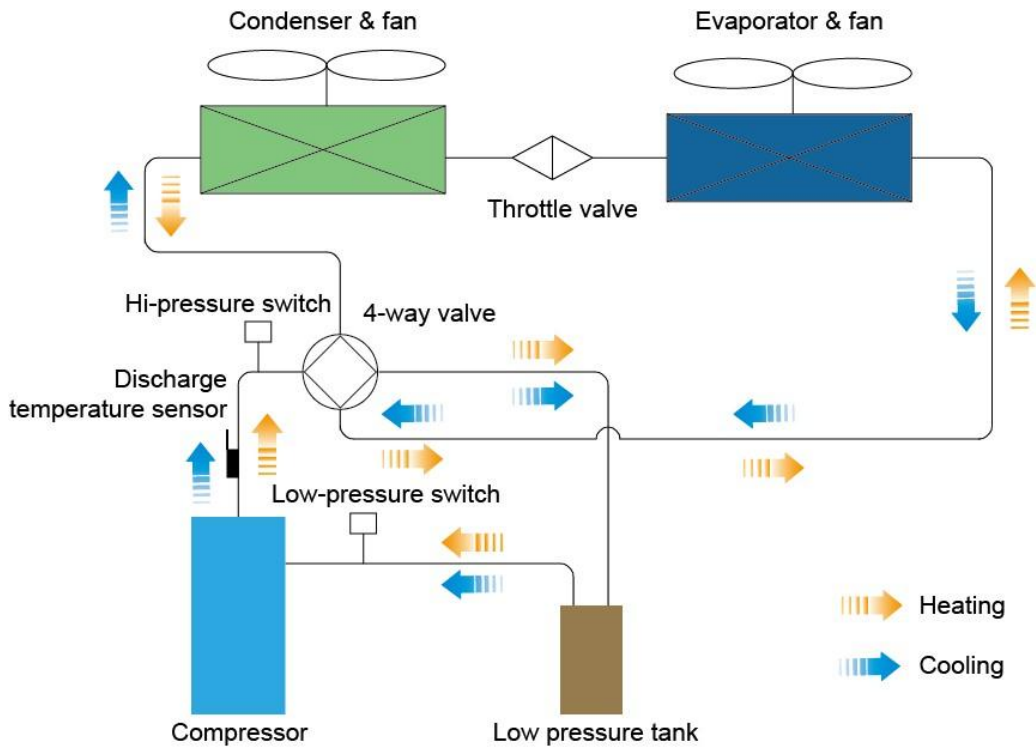
**MRC-60HWN1-R**



**Parameter table for indoor side air volume:**

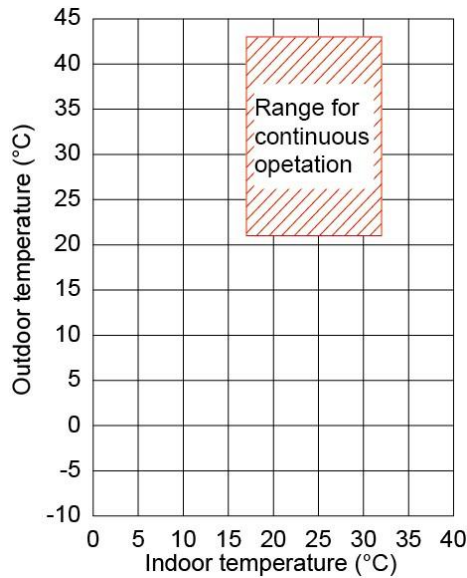
Fan speed	Static pressure	Air flow	
		m <sup>3</sup> /h	CFM
Low	0Pa	3,239	1,905
Low	20Pa	3,089	1,817
Low	50Pa	2,917	1,716
Low	70Pa	2,742	1,613
Low	100Pa	2,570	1,512
Medium	0Pa	3,420	2,012
Medium	20Pa	3,305	1,944
Medium	50Pa	3,159	1,858
Medium	70Pa	3,014	1,773
Medium	100Pa	2,768	1,628
Medium	125 Pa	2,615	1,538
High	0Pa	3,691	2,171
High	20Pa	3,594	2,114
High	50Pa	3,477	2,045
High	70Pa	3,295	1,938
High	100Pa	3,057	1,798
High	125 Pa	2,910	1,712
High	150 Pa	2,746	1,615

## 12. Refrigerant Cycle Diagram



## 13. Operation Limit

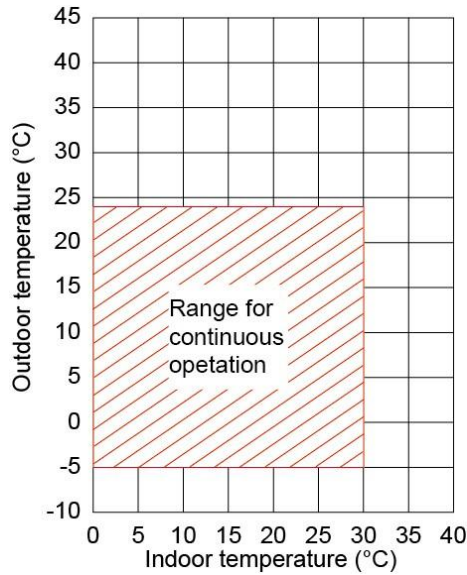
### Cooling mode



Outdoor temperature	Indoor temperature
21°C~43°C	17°C~32°C

Notes: Room relative humidity less than 80%. If the unit operates in excess of this figure, the surface of the unit may attract condensation.

**Heating mode**



Outdoor temperature	Indoor temperature
-5°C~24°C	0°C~30°C

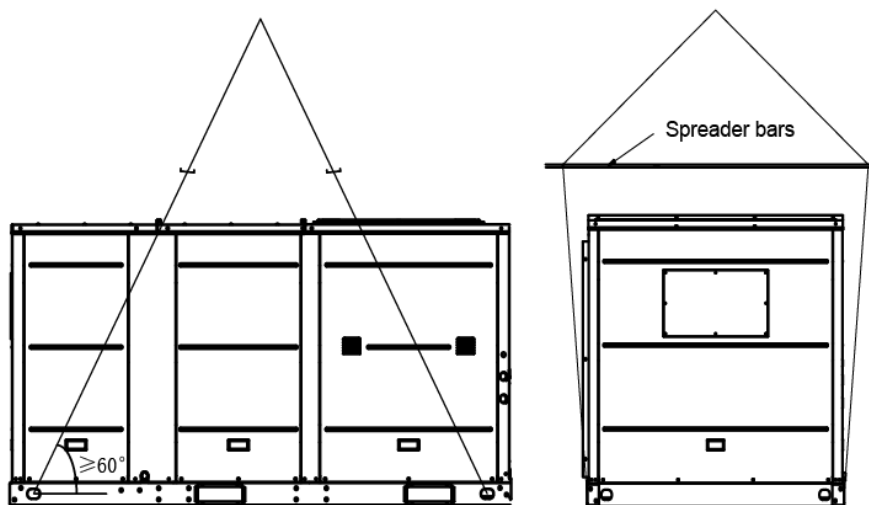
**14. Installation**

**14.1 Lifting**

Rigging cables should have adequate capability to resist 3 times weight of unit. Before lift, please check and ensure that hooks are holding tightly to unit and lifting angles are no less than 60°.

Cloth material or hard-paper should be padded in the contact place between unit and rigging cable. Rigging cable should be entwined a round at the hook to avoid danger by cable slip because of weight unbalance.

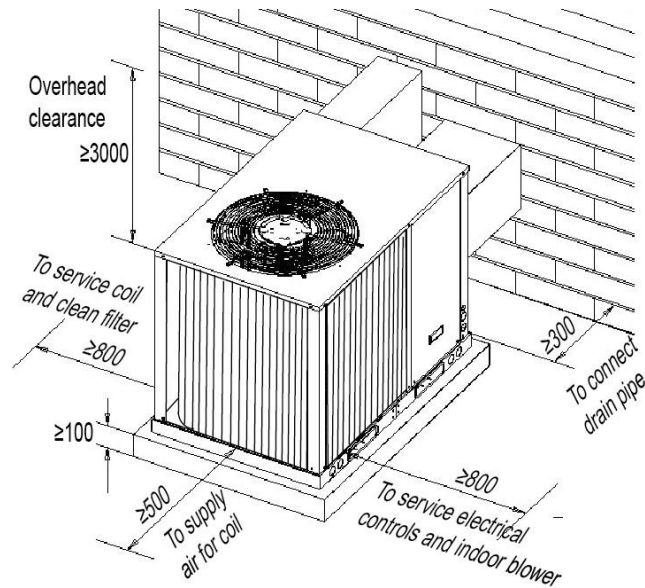
During lifting, anyone forbidden lingering under the lifting unit.



**14.2 Service Space**

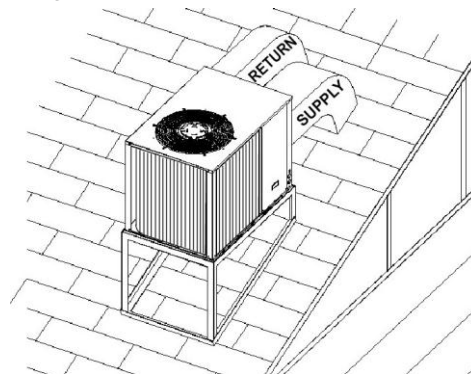
- The recommended clearances for single-unit installations are illustrated in following picture. These minimum requirements are not only an important consideration when determining unit placement, but they are also essential to ensure adequate serviceability, maximum capacity, and peak operating efficiency.

- Any reduction of the unit clearances indicated in these illustrations may result in condenser coil starvation or the recirculation of warm condenser air. Actual clearances which appear to be inadequate should be reviewed with a local engineer.



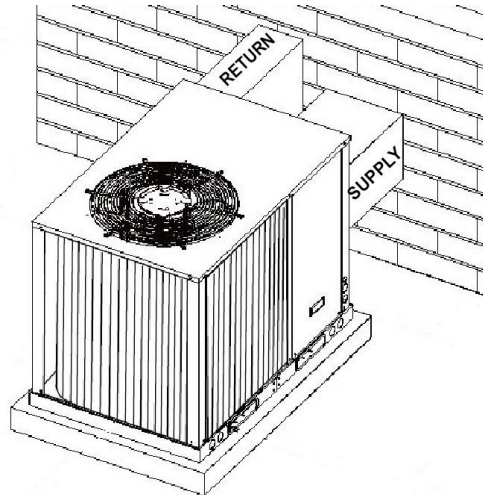
### 14.3 Fixing of the rooftop package

- Locations and recommendations:
  - ✓ The unit is designed for outdoor installations only. The unit may be installed directly on wood flooring or on class A, class B, or class C roof covering material.
  - ✓ Location of the unit must allow service clearance around it. Clearance of the unit must be given careful consideration.
  - ✓ Outdoor coils must have an unlimited supply of air.
  - ✓ Check the handling facilities to ensure the safety of personnel and the unit.
  - ✓ Caution must be taken at all times to avoid personal injuries or damage to equipment.
  - ✓ The unit must be mounted level for proper drainage of water through the holes in the base pan.
  - ✓ The unit must not be exposed to direct roof water runoff.
  - ✓ Flexible duct connectors must be of a flame retardant material. All duct work outside of the structure must be insulated and weatherproofed in accordance with local codes.
  - ✓ Holes through exterior walls must be sealed in accordance with local codes.
  - ✓ All fabricated outdoor ducts should be as short as possible.
- Rooftop installation  
For rooftop application using a field fabricated frame and the ducts:



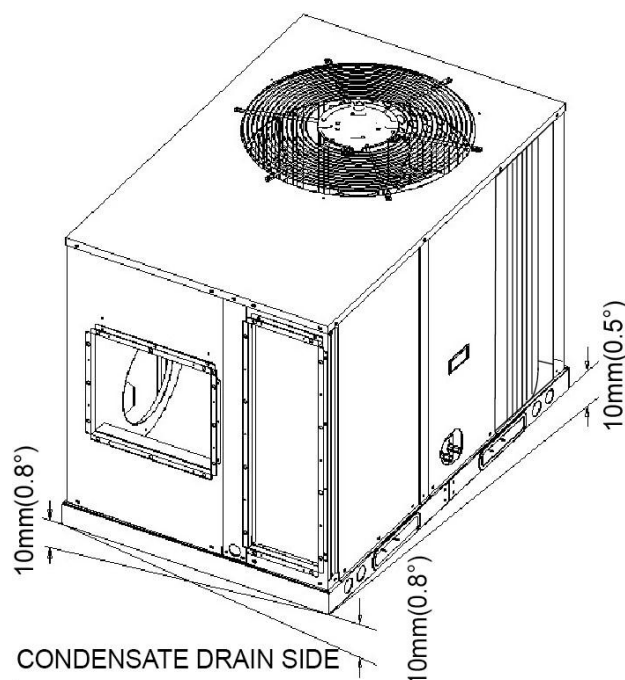
- ✓ Roof structure must be able to support the weight of the unit and its options and/or accessories. Unit must be installed on a solid level roof curb or appropriate angle iron frame.

- ✓ The frame must be located and secured by bolting or welding to the roof. Flashing is required.
  - ✓ The hole in the roof must be prepared in advance of installing the unit.
  - ✓ Secure the ducts to the roof.
  - ✓ Place the unit on the frame or roof curb.
  - ✓ Insulate any duct work outside of the structure with at least two inches of insulation and then weatherproof. There must be a weatherproof seal where the duct enters the structure.
  - ✓ Secure the unit to the frame or roof curb.
- On-the-ground installation



For ground level installations, the unit should be positioned on a pad with a minimum thickness of 100mm. The length and width of the pad should be at least 150mm greater than the unit base rails. The unit must be level on the pad. The pad must not come in contact with the structure. Be sure the outdoor portion of the supply and return air ducts are as short as possible.

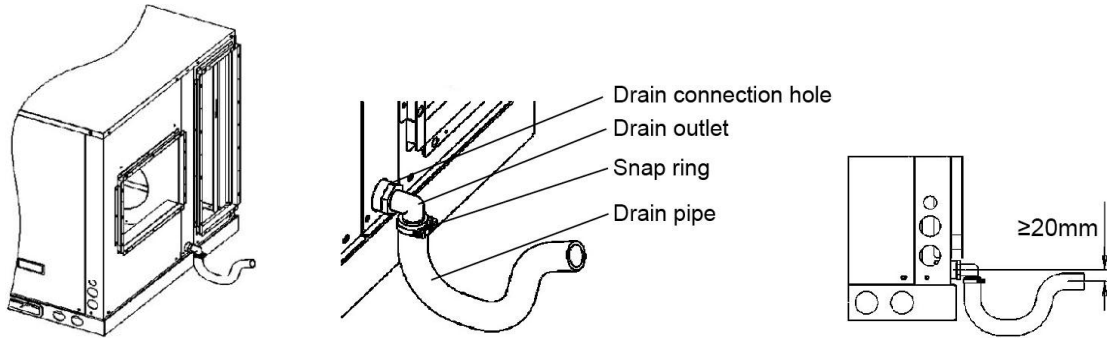
- ✓ Place the unit on the pad.
  - ✓ Attach the supply and return air ducts to the unit.
  - ✓ Insulate any duct work outside of the structure with at least 2 inches of insulation and weatherproof. There must be a weatherproof seal where the duct enters the structure.
- Maximum foundation gradient
- Make sure the condensate drain side is lower than the other side.





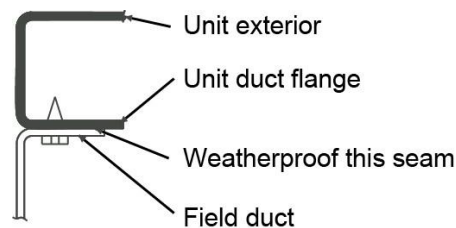
➤ Condensate drain piping

Twist drain outlet into drain connection hole, sheathe drain pipe, and lock in the snap ring.



➤ Duct work

- ✓ All conditioned air duct work should be insulated to minimize heating and cooling duct losses. Use a minimum of two inches of insulation with a vapor barrier. The outside duct work must be weatherproofed between the unit and the building.
- ✓ When attaching duct work to a horizontal unit, provide a flexible watertight connection to prevent noise transmission from the unit to the ducts. The flexible connection must be indoors and made out of heavy canvas.
- ✓ Do not draw the canvas taut between the solid ducts.



#### 14.4 Wiring connection

➤ Electrical power

It is important that proper electrical power be available for the unit. Voltage variation should remain within the limits stamped on the unit nameplate.

➤ Disconnect switch

Provide an approved weatherproof disconnect either on the side of the unit or within close proximity and within sight of the unit.

➤ Over current protection

The branch circuit feeding the unit must be protected as shown on the unit rating plate.

➤ Power wiring

The power supply lines must be run in weather tight conduit to the disconnection and into the bottom of the unit control box. Provide strain relief for all conduits with suitable connectors. Provide flexible conduit supports whenever vibration transmission may cause a noise problem within the building structure. Be sure all connections are made tight.

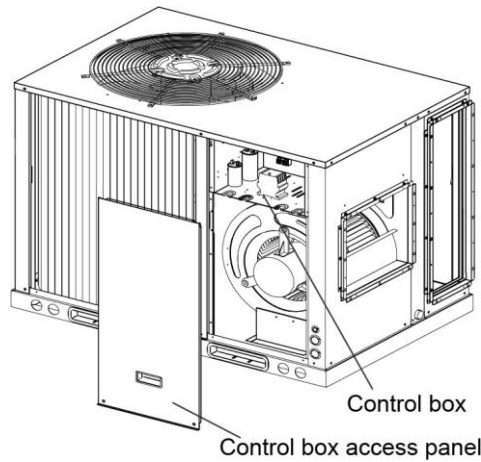
➤ Control wiring (class II)

Low voltage control wiring should not be run in conduit with power wiring unless Class 1 wire of proper voltage rating is used. Make connections as shown on the unit wiring diagram. Do not short thermostat wires since this will damage the control transformer.

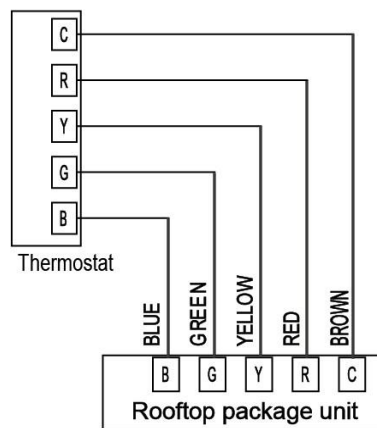
Suggestion: thermostat choose non-programmed electrical thermostat series such as KJR-25B (Midea), TH5220D (Honeywell) or A3211 (Hailin).

- Upon completion of wiring check all electrical connections, including factory wiring within the unit; make sure all connections are tight. Replace and secure all electrical box covers and access doors before leaving the unit or turning on the power to the unit.

- Knock down the control box access panel, first twist off screws and then up it, the control box access panel is getting out.



- If the supply cord is damaged, it must be replaced by the manufacture or its service agent or a similarly qualified person in order to avoid a hazard.
- An all-pole disconnection device with has at least 3mm separation distance in all pole and residual current device (RCD) with the rating of above 10mA shall be incorporated in the fixed wiring according to the national rule.
- Wiring diagram of wired controller and unit



- Specifications of power supply

	MRC-36HWN1-R	MRC-48HWN1-R	MRC-60HWN1-R
Power supply	380~415V 3Ph~ 50Hz		
Circuit breaker/fuse	20A/16A	20A/16A	20A/16A
Power wire	5×2.0mm <sup>2</sup>	5×2.0mm <sup>2</sup>	5×2.0mm <sup>2</sup>
Signal wire	5×1.0mm <sup>2</sup>	5×1.0mm <sup>2</sup>	5×1.0mm <sup>2</sup>

The power cord type designation is H07RN-F.

## 15. Start-up

- Please check following item before start-up
  - ✓ Is the unit properly located and level with the proper clearance?
  - ✓ Is the duct work correctly sized, run, taped, insulated, and weatherproofed with proper unit arrangement?
  - ✓ Is the wiring properly sized and run?
  - ✓ Are all the wiring connections, including those in the unit, tight?
  - ✓ Has the unit been properly grounded and fused with the recommended fuse size?
  - ✓ Have the air conditioning systems been checked at the service ports for charge and leak tested if necessary?
  - ✓ Dose the condenser fan and indoor blower turn free without rubbing, and are they tight on the shafts?
  - ✓ Has the indoor blower speed been determined and the proper speed been set?
  - ✓ Are all covers and access panels in place to prevent air loss and safety hazards?
- Allow the heater to operate a minimum of 8 hours.

Before starting the system on the cooling cycle, turn the thermostat switch to OFF and close the unit disconnect switch. This procedure energizes the compressor crankcase heater, vaporizing any liquid refrigerant in the crankcase. This is a precaution against foaming at startup which could damage the compressor bearings.
- Starting the unit in cooling mode

To start the unit in cool mode, set the thermostat system switch to COOL and move the thermostat COOL indicator to a setting below room temperature. The condenser (outdoor) fan motor, compressor and evaporator (indoor) fan motor will operate automatically.
- Voltage

With the compressor operating, check the line voltage at the unit. The voltage should be within the range shown on the nameplate.

If low voltage is encountered, check the size and length of the supply line from the main disconnect to the unit. The line may be undersized for the length of run.
- Cooling shut-down

Place the system selector in the OFF position or reset thermostat at a setting above room temperature.

Do not de-energize the main power disconnect except when unit is to be serviced. Power is required to keep the heat pump compressor warm and boil off refrigerant in the compressor.
- LED display

The control would display any fault code that is currently active using the LED. The control will display the fault code, when the LEDs are flashing quickly; there is something wrong with the system.
- Low pressure switch

The control will detect the status of low pressure switch, which is normally close. If the low pressure switch is open during the first time of power supply, the control will de-energized the compressor. If low pressure switch protection appears 3 times in 20 minutes, the control should be restored by switch off the power supply. The control will ignore the low pressure switch input during the following conditions: defrost operation, 4 minutes following the completion of a defrost cycle, first 5 minutes of compressor operation during the heat mode.
- High pressure switch

The unit is equipped with a high pressure switch that is connected to the main board, if the high pressure switch opens for more than 40 milliseconds, the control will de-energized the compressor

and store and display the appropriate fault code. If the pressure switch closes and a thermostat call for compressor operation is present, the control will apply the three-minute anti-short cycle delay timer and start the compressor when the timer expires.

➤ Temperature sensor

The unit has T3 and T4 two temperature sensors. T3 means pipe temperature sensor, and T4 means outdoor unit circumstance temperature sensor. When the sensor was damaged, the system would be closed and the LED would flash.

### 16. Error Code

Code	LED1 (Red)	LED2 (Yellow)	LED3 (Green)
Standby	Off	Off	On
Running	On	On	On
Phase-missing	Flash	Flash	Flash
Phase-error			
High pressure protection	Flash	Flash	Off
Discharge temperature protection			
T2 sensor failure	Flash	Off	Flash
T3 sensor failure	Off	Flash	Flash
T4 sensor failure	On	Flash	Flash
T2 evaporator low temperature protection	Off	Flash	Off
T2 evaporator high temperature protection	Flash	On	On
T3 condenser high temperature protection	Flash	Off	Off
Wired controller input failure	Flash	Flash	On
Compressor over-current protection	Off	Off	Flash
Low pressure protection	Flash	On	Flash
Defrost	On	Flash	Flash




Notes:

T2 means the pipe temperature sensor of evaporator.

T3 means the pipe temperature sensor of condenser.

T4 means the ambient temperature sensor of outdoor side.

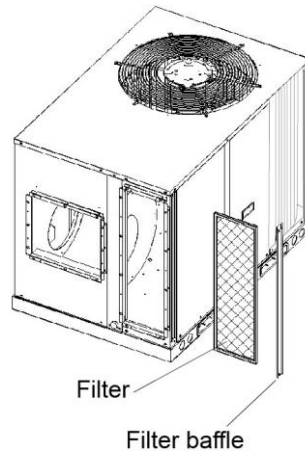
### 17. Accessories

Name	Quantity	Shape
Manual	1	-----
Drain outlet	1	
Snap ring	1	
Drain pipe	1	

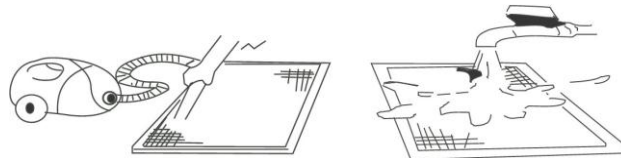
## 18. Maintenance and Upkeep

### 18.1 Clean the air filter

- Dismantle the air filter.
  - ✓ Twist of screws, then the filter baffle gets out.
  - ✓ Drag out filter.



- Clean the air filter.  
Vacuum cleaner or pure water may be used to clean the air filter. If the dust accumulation is too heavy, please use soft brush and mild detergent to clean it and dry out.



The air-in side should face up when using vacuum cleaner.

The air-in side should face down when using water.

Do not dry out the air filter under direct sunshine or with fire.

- Re-install the air filter.

### 18.2 Condenser coil

Unfiltered air circulates through the unit's condenser coil and can cause the coil's surface to become clogged with dust, dirt, etc. To clean the coil, vertically stroke the coil surface with a soft-bristled brush. Be sure to keep all vegetation away from the condenser coil area.

### 18.3 Maintenance performed by serviceman-cooling season

To keep unit operating safely and efficiently, the manufacturer recommends that a qualified serviceman check the entire system at least once year and any other time that you feel one is needed:

- ✓ Filters
- ✓ Motors and drive system components
- ✓ Economizer gaskets (for possible replacement)
- ✓ Safety controls (for mechanical cleaning)
- ✓ Electrical components and wiring (for possible replacement and connection tightness)
- ✓ Condensate drain (for cleaning)
- ✓ Unit duct connections (to check that they are physically sound and sealed to the unit casing)
- ✓ Unit mounting support (for structural integrity)
- ✓ The unit (for obvious unit deterioration)

18.4 Do not operate the unit without the evaporator fan access panel in place. Reinstall the access panel after performing any maintenance procedures on the fan. Operating the unit without the access panel properly installed may result in severe personal injury or death.