

Ducted  
Split Unit

R22

## DSP CATALOG



Ducted Split Condensing Units  
with Hermetic Compressor  
**Low Capacity**

15 - 60 MBH @ 50 Hz

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# INTRODUCTION

PETRA's Ducted Split Units (DSP Low Capacity) are designed specifically for easy maintenance and installation in small and medium sized air conditioning systems. These air-cooled condensing units may be connected to a wide range of PETRA's indoor units, making them ideal for use in residential and commercial applications such as homes, stores, shops, villas, restaurants, commercial complexes, offices, laboratories, etc. DSP Low Capacity units can be used for cooling or heating with the optional heat pump. Additional

optional controls and accessories are available to meet different design requirements.

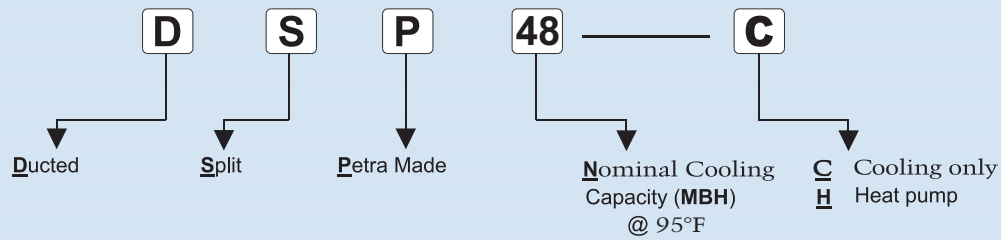
DSP Low Capacity units consist of two sections: the evaporator section (RAC unit, CMD unit or CM unit) and the condenser section (DSP unit) of matching size. This series is available in a capacity range of 15 to 60 @ 50 Hz nominal MBH.



For more technical details, please refer to the nearest PETRA sales office or to the PETRA factory .

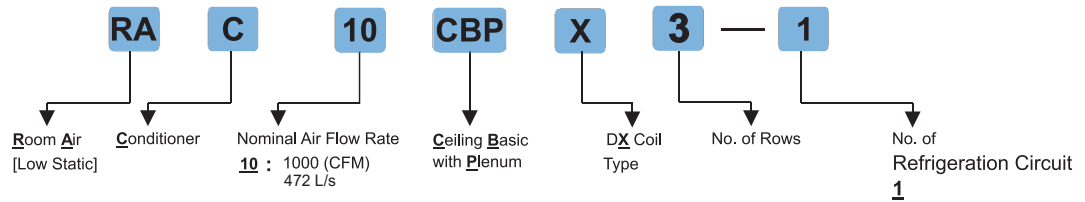
# NOMENCLATURE

## A. Outdoor Unit

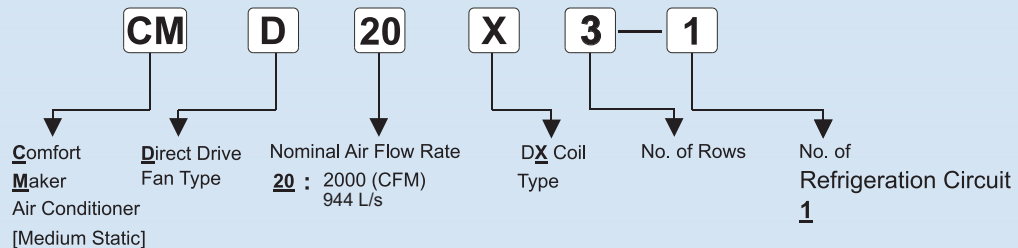


## B. Indoor Unit

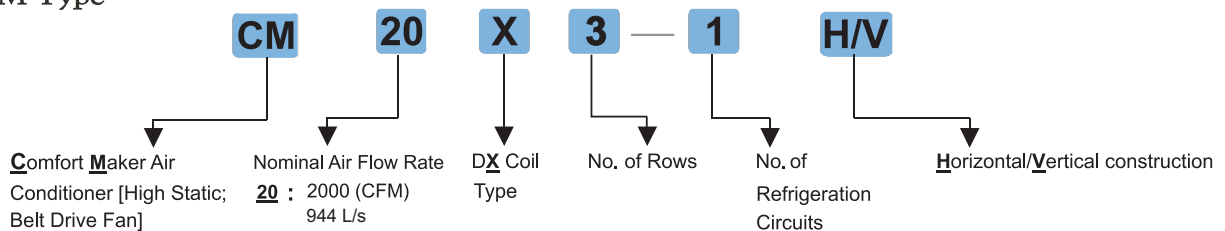
### 1-RAC Type



### 2-CMD Type



### 3- CM Type



## FEATURES AND BENEFITS

### Outdoor Unit (DSP Type)

#### Casing

It is a heavy gauge galvanized steel casing with weatherproof, polyester powder electrostatic paint, oven-baked to ensure maximum gloss and hardness.

#### Compressor

It is a low noise, hermetically sealed, high efficiency with internal thermal motor protection. (Suitable for cooling and heat pump application)

#### Coils

Coils are designed to function with optimum performance in all design conditions. Coils are manufactured from seamless copper tubes mechanically expanded into aluminum fins. All coils are air pressure tested at 450 Psi, under water to avoid leakage.

They also undergo dry chemical cleaning after manufacturing for optimum system cleanness. All condenser coils have type-L design.

#### Direct-drive fans

All condenser fans are of the propeller (axial) type, which are directly mounted on the motor's shaft. All fans are selected for optimum efficiency and for maximum sound power reduction. Fan blades are corrosion resistant and are statically and dynamically balanced before installation. PETRA also provides its "Patented Design" for the mounting of the condenser fans. This new design offers low noise operation with high efficiency performance. All condenser fans are equipped with protecting guards.

### Indoor Unit

#### A.(RAC & CMD – Type)

##### Unit Description

Units are considered to be of the "Ceiling Basic with Plenum Model" type. They are designed for concealed ceiling installation above the false ceiling with ducted supply and free return air distribution system. Units of this type consist of a coil, fan and filter.

#### Coils

All coils are constructed of 3/8 inch diameter copper tubes mechanically expanded into aluminum fins. Coil fins are spaced at 12 FPI as standard. All coils are air pressure tested at 450 Psi to avoid leakage.

#### Fans

All units are provided with direct driven forward curved centrifugal fans of the double inlet type that are designed for maximum efficiency and uniform air distribution. The fans are statically and dynamically balanced to ensure quiet operation and optimal performance.

#### Motors

Permanent split capacitor three-speed electrical motors, with internal thermal protection.

#### Filters

All models are provided with a nominal 0.5 inch thick aluminum mesh media flat filter.

#### Drain Pan

All units are provided with a drain pan. The drain pan is insulated on the underside and sides to prevent condensation and is coated with weatherproof, polyester powder electrostatic paint, oven-baked to ensure maximum gloss, hardness and rust prevention.

#### Casing

All units are constructed of heavy gauge galvanized steel casing without paint.

#### Insulation

All units are internally lined with 0.5 inch thick fiberglass or equivalent insulation for the coil and fan sections. Fiber glass is covered with corrugated rubber lining for low sound and protect the fiber against scattered.

#### B.(CM – Type)

##### Unit Description

Units are considered to be of the "Ceiling Model" type. They are designed for concealed ceiling installation above the false ceiling with ducted supply and free return air distribution system. Units of this type consist of a coil, a fan and a filter.

#### Coils

Coils are designed to function with optimum performance in all design conditions. Coils are manufactured from seamless copper tubes mechanically expanded into aluminum fins. All coils are air pressure tested at 450 Psi, under water to avoid leakage. They also undergo dry chemical cleaning after manufacturing for optimum system cleanness.

#### Fans

Double Width, Double Inlet (DWDI) centrifugal forward curved fans are used, with a V-belt drive and a variable pitch pulley. The fans are statically and dynamically balanced to ensure quiet operation and optimal performance.

#### Motors

All motors are of the totally enclosed fan-cooled induction type. All units have their fan/motor assembly placed on a floating base with rubber pad vibration isolators and a flexible connection at the fan/casing interface. All motors are of the single speed type.

#### Filters

All models are provided with a nominal 1.0 inch thick aluminum flat filter.

#### Drain Pan

All units are provided with a drain pan. The drain pan is insulated to prevent condensation and is coated with weatherproof, polyester powder electrostatic paint, oven-baked to ensure maximum gloss, hardness and rust prevention.

#### Insulation

All units are internally lined with 1 inch thick fiber glass or equivalent insulation for the coil and fan sections. Fiber glass is covered with corrugated rubber lining for low sound and protect the fiber against scattered.

## STANDARD FEATURES

### Outdoor Unit (DSP Type)

- Control and power panels include the direct-online starting for the compressor and fan motor condenser
- 220-240 volts as the standard control voltage (for control circuits)
- Compressor time delay relay (anti re-cycling protection through controller)
- One power supply in the outdoor unit
- Internal thermal protection for all motors (compressor and condenser fan)
- Service charging nipples at the valves
- High and low pressure protection using controller
- Expansion device (Except when installed with CM units).
- Pre-charged outdoor unit with shut off valves (enough charge for indoor+outdoor+5 meter pipe kit)
- Room temperature controller (hung-down microprocessor controller)

### Indoor Unit

#### RAC & CMD Type

- Direct-driven fans
- Single phase power supply
- Three-speed fan motor
- 0.5" nominal thick aluminum flat filter
- Nitrogen charge
- Internal thermal protection for all motors
- Internal fiberglass insulation for the coil and fan sections
- Digital hung-down microprocessor controller
- Infrared remote handset keypad

### CM Type

- Three-phase power supply
- Belt driven fans
- Single-speed fan motor
- 1" nominal thick aluminum flat filter
- Expansion device
- Internal thermal protection for all motors
- Contactor (built-in, matching the outdoor electrical panel in case unit is a complete Package with indoor & outdoor units)
- Digital hang-down microprocessor controller
- Infrared remote handset keypad
- Expansion device

## OPTIONS

### Outdoor Unit (DSP Type)

- Heat pump application with a suction accumulator and 4-way reversing valve as standard features in the heat pump option
- Suction accumulator for the cooling only unit (for low suction applications)
- Low ambient operation control using the fan speed controller (modulating type)
- Phase failure relay (only for units with three-phase power supply)
- External over-load for motors (compressor, condenser fan motor and evaporator fan motor only for units with three-phase power supply)
- Compressor sound jacket
- Ozone friendly refrigerants (R407c, R134a)
- Plastic mesh protection on condenser coil
- Power circuit breaker for the whole unit built inside the electrical panel
- Control circuit breaker

- Power circuit breaker for motors (compressor, condenser fan motor and evaporator fan motor).

### Indoor Unit

- Ducted return air unit with side or bottom withdrawal type filter
- Built-in electric heater for heating purposes (with cooling only units) or to supplement heat pump
- Electric heaters are provided with the following features:

#### Standard:

- Finned tube and electric heating elements
- Automatic thermal safety cutout

#### Options:

- Manual thermal safety cutout
- Contactor

If any additional options are required, please consult the PETRA factory or the nearest PETRA sales office

## ACCESSORIES

- Sight glass (loose item)
- Filter drier (disposable type, loose item)
- Solenoid valve (for cooling only units, loose item)

## INDOOR/OUTDOOR AVAILABLE COMBINATIONS

DSP Model	Applicable Indoor Unit Model
DSP 15	RAC 5 CMD 6
DSP 18	RAC 6 CMD 8
DSP 24	RAC 8 CMD 10
DSP 30	RAC 8 RAC 10 CMD 10
DSP 36	RAC 12 CMD 16
DSP 48	CMD 16 CM 15
DSP 60	CMD 20 CM 20

## CONTROLLER

Hung-Down Microprocessor Controller (Standard)



Infrared Remote Keypad



## SELECTION PROCEDURE

The example below illustrates the step-by-step selection procedure to assist any user of this catalog to select the appropriate unit to meet specific requirements.

### Design Conditions Requirements

Total cooling loads	33 MBH
Sensible cooling loads	22 MBH
Ambient temperature	95 °F
Indoor unit type	Three-speed fan with single-phase power supply
Evaporator entering air temperature DB/WB	80/67 °F/°F
Evaporator air flow	850 CFM@ high fan speed
External static pressure	0.15 inch of water (low static pressure indoor unit)
Altitude	3000 ft
Power Supply	220V/1Ph/50Hz

The example below illustrates the step-by-step selection procedure to assist any user of this catalog to select the appropriate unit to meet specific requirements.

### Unit Size Selection

Using the correction multiplier to correct for altitude, the required capacities

will be :

Corrected Capacity	= Required Capacity /
Correction Multiplier	
a. Cooling Capacity	= 33/0.985
	= 33.5 MBH
b. Sensible Capacity	= 22/0.985
	= 22.3 MBH

From the performance tables for cooling data on page 17, model DSP 30 + RAC 10x3 is the closest selection to the required data.

### a. Indoor unit actual air flow rate:

From the indoor unit's fan performance tables on page 19 and based on external static pressure of 0.15 inch of water and high fan speed, the unit's actual air flow rate will be 916 CFM.

### b. Indoor unit actual capacities:

(By interpolation from the performance Cooling Tables @916 CFM):  
 Total capacity = 33.7 MBH  
 Sensible capacity = 22.5 MBH

Altitude [Ft]	Correction factor
Sea level	1
1000	0.995
2000	0.990
3000	0.985
4000	0.980
5000	0.973
6000	0.967
7000	0.960
8000	0.950

## GENERAL DATA TABLES

### Outdoor Unit

MODEL	[DSP]	15	18	24	30	36	48	60
Power supply	Phase/Hz	1/50 (see electric data tables)				3/50 (see electric data tables)		
Control voltage	Volt	220-240						
Unit casing		Heavy gauge, galvanized steel, with oven- backed weatherproof, polyester powder electrostatic paint						
Compressor		Hermetically sealed						
No.		1						
Condenser coil		Copper tube- Aluminum fins						
Fins per inch		18	18	17	17	12	17	17
No.of rows		2						
Face area (Total)	Ft <sup>2</sup>	4.4	4.4	6.1	6.1	7.3	12.0	12.0
Tube diameter	Inch	3/8						
Condenser fan		Propeller [Axial]						
No.		1	1	1	1	1	2	2
Drive type		Direct driven						
Nominal air flow (50 Hz)	CFM	1420	1420	2200	2200	3300	3840	3840
Refrigerant circuit		1						
Refrigerant type		R-22						
Control		Expansion device						
No.of refrigerant circuits		1						
Refrigerant lines sizes								
	Suction line diam. (Inch)	1/2	1/2	5/8	5/8	3/4	3/4	3/4
	Liquid line diam. (Inch)	1/4	1/4	3/8	3/8	1/2	1/2	1/2
Operating weight	Ib	97.0	97.0	132.0	152.0	165.0	260.0	260.0
Sound pressure level	dB(A)							
	3 ft	52	53	54	57	57	55	61
	10 ft	46	47	48	51	51	49	55



NOTA

- Sound data is  $\pm 2$  dB(A)



## GENERAL DATA TABLES

### Indoor Unit

MODEL	[RAC-CBP]	5	6	8	10	12
Power supply	Phase/Hz	1/50 (see electric data tables)				
Control voltage	Volt	220-240				
Unit casing		Heavy gauge, galvanized steel, with paint				
Insulation		1/2" Thick fiber-glass or equivalent				
Coil		Copper tube-Aluminum fins				
Fins per inch		12				
No.of rows		3				
Face area (Total)	Ft <sup>2</sup>	1.93	1.93	2.26	3.43	3.43
Tube diameter	Inch	3/8				
Fan		Double inlet forward curved centrifugal				
No.		2	2	2	4	4
Drive type		Direct driven				
Nominal air flow	CFM	500	600	800	1000	1200
Fan motor		Split capacitor				
Type		Split capacitor				
No.		1	1	1	2	2
Nominal motor rating (Each)	HP	1/15				
Refrigerant circuit		As per the matching outdoor unit				
Refrigerant lines sizes		As per the matching outdoor unit				
Drain connection size (Sweet)	Inch	7/8				
Air filter		Aluminum mesh type				
Type		Aluminum mesh type				
Thickness (Nominal)	Inch	1/2				
Operating weight	Ib	68.3	68.3	81.6	121.3	121.3

## GENERAL DATA TABLES

### Indoor Unit Sound Power Level dB

Fan Speed	Frequency Hz	Discharge sound power level (Reference to SWL 1 pico watt)				
		MODEL				
		RAC 5	RAC 6	RAC 8	RAC 10	RAC 12
Low Speed	63	45	47	48	51	51
	125	45	47	49	51	52
	250	46	48	51	54	55
	500	39	41	43	46	46
	1k	39	40	42	45	47
	2k	32	34	35	37	37
	4k	30	33	33	36	35
	8k	22	23	24	25	26
Medium Speed	63	47	49	50	53	53
	125	47	49	51	53	54
	250	48	50	53	56	57
	500	43	45	47	50	50
	1k	43	44	46	49	51
	2k	36	38	39	41	41
	4k	34	37	37	40	39
	8k	26	27	28	29	30
High Speed	63	49	51	52	55	55
	125	49	51	53	55	56
	250	50	52	55	58	59
	500	47	49	51	54	54
	1k	47	48	50	53	55
	2k	40	42	43	45	45
	4k	38	41	41	44	43
	8k	30	31	32	33	34



NOTA  
Noise data  $\pm$  dB  
Data are measured outside the termination of the duct

## GENERAL DATA TABLES

### Indoor Unit

MODEL	CMD	6	8	10	12	14	16	18	20
<b>Power supply</b>	<b>Volt/Phas/Hz</b>	See electrical data tables							
<b>Unit casing</b>		Heavy gauge galvanized steel without paint							
Insulation		1" Thick fiber-glass or equivalent							
<b>Coil</b>		Copper tubes, Aluminum fins							
Fins per inch		12							
No. of rows		3							
Total face area	Ft <sup>2</sup>	2.19	2.19	2.19	3.65	3.65	3.65	4.96	4.96
Tube Diameter	inch	3/8							
<b>Fan</b>		Double inlet forward curved centrifugal							
No.		1	1	1	2	2	2	2	2
Drive type		Direct driven							
Total air flow (Nominal)	CFM	600	800	1000	1200	1400	1600	1800	2000
<b>Fan motor</b>		Induction - TEFC - IP 55 protection - Class F insulation thermal overload protection							
Type		Split capacitor							
No.		1	1	1	2	2	2	2	2
Nominal motor rating (Each)	Kw	0.19							
<b>Refrigerant circuit</b>									
Refrigerant line sizes		As per the matching outdoor unit							
<b>Drain connection size(Sweet)</b>	<b>Inch</b>	7/8							
<b>Air filter</b>									
Type		Aluminum mesh media (Washable)							
Thickness (Nominal)	Inch	1/2							
<b>Operating weight</b>	<b>Ib</b>	66.1	66.1	66.1	119.0	119.0	119.0	149.9	149.9

## GENERAL DATA TABLES

### Indoor Unit Sound Power Level dB

Fan Speed	Frequency [Hz]	Discharge sound power level (Reference to SWL1 pico watt)							
		MODEL							
		CMD 6	CMD 8	CMD 10	CMD 12	CMD 14	CMD 16	CMD 18	CMD 20
Low Speed	63	51	55	58	55	60	61	63	63
	125	49	52	55	53	58	59	61	62
	250	47	50	52	51	55	57	58	60
	500	40	42	45	43	48	48	51	52
	1k	38	41	44	42	47	48	49	50
	2k	34	36	41	38	44	43	47	47
	4k	33	35	41	38	44	45	47	48
	8k	28	31	33	32	37	37	39	40
Medium Speed	63	54	57	60	57	62	63	65	65
	125	51	54	57	55	60	61	63	64
	250	49	52	54	53	57	59	60	62
	500	44	46	49	47	52	52	55	56
	1k	42	45	48	46	51	52	53	54
	2k	38	40	45	42	48	47	51	51
	4k	37	39	45	42	48	49	51	52
	8k	32	35	37	36	41	41	43	44
High Speed	63	56	59	62	59	64	65	67	67
	125	53	56	59	57	62	63	65	66
	250	51	54	56	55	59	61	62	64
	500	48	50	53	51	56	56	59	60
	1k	46	49	52	50	55	56	57	58
	2k	42	44	49	46	52	51	55	55
	4k	41	43	49	46	52	53	55	56
	8k	36	39	41	40	45	45	47	48



NOTA

- Sound data  $\pm 2$  dB
- Data are taken outside the termination of the duct

## GENERAL DATA TABLES

### Indoor Unit

<b>MODEL</b>	<b>CM</b>	<b>15</b>	<b>20</b>
<b>Power supply</b>	<b>Volt/Phas/Hz</b>	See electrical data tables	
<b>Unit casing</b>		Heavy gauge galvanised steel without paint	
Insulation		1.0" Thick fiber-glass or equivalent	
<b>Coil</b>		Copper tubes, Aluminum fins	
Total face area	Ft <sup>2</sup>	3.12	4.00
Tube Diameter	Inch	3/8	
<b>Fan</b>		DWDI Forward curved centrifugal	
No.		1	
Type of drive		Belt driven	
Fan model		PETRA 6	
Total air flow (Nominal)	CFM	1500	2000
<b>Fan motor</b>		Induction - TEFC - IP 55 protection - Class F insulation thermal overload protection	
No.		1	
<b>Drain connection size(NPT)</b>	<b>Inch</b>	1	
<b>Air filter</b>		Aluminum mesh type	
Nominal (thickness)	Inch	1	
<b>Operating weight</b>	<b>Ib</b>	220.5	242.5

MODEL	Sound power [dBA]															
	63 Hz		125 Hz		250 Hz		500 Hz		1 KHz		2 KHz		4 KHz		8 KHz	
	Outlet	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet	Inlet
CM 15	67	68	68	72	70	71	69	70	66	70	63	69	59	62	54	57
CM 20	71	72	62	76	73	74	72	73	70	74	66	72	62	65	57	60



NOTA

-Sound data is  $\pm 2$  dB(A)

-Sound power data for the units are calculated based on an external static pressure of 1" of water

# MODELS LAYOUT - DSP

## Outdoor Unit



MODEL	X	Y	Z
DSP 15, 18	30.7	9.4	20.9



All dimensions are in inch



MODEL	X	Y	Z
DSP 24, 30	33.3	12.2	26.8



All dimensions are in inch

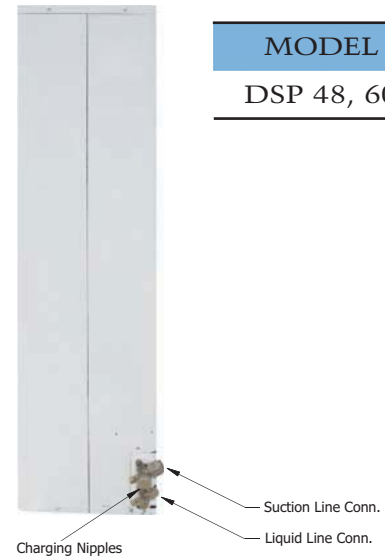
# MODELS LAYOUT - DSP

## Outdoor Unit

MODEL	X	Y	Z
<b>DSP 36</b>	34.5	14.4	30.0



All dimensions are in inch



MODEL
<b>DSP 48, 60</b>

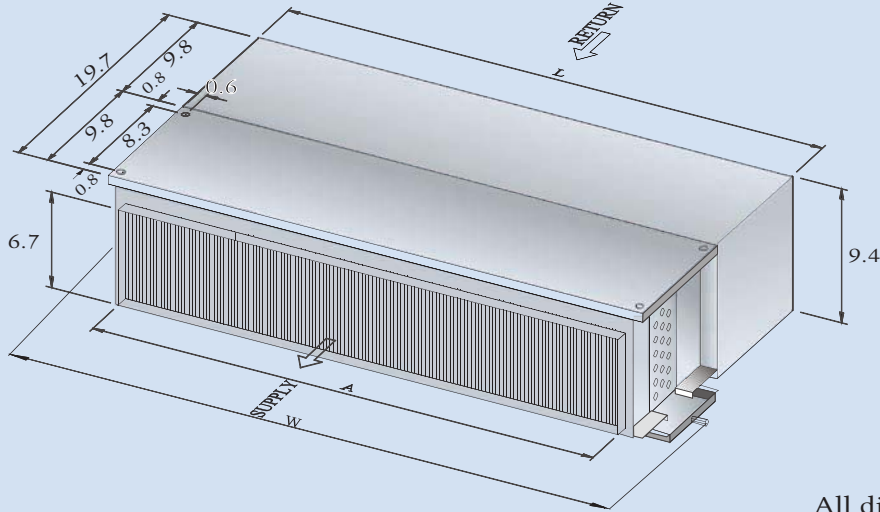
All dimensions are in inch

# MODELS LAYOUT – RAC & CMD

## Indoor Units

RAC Type

MODEL	L	A	W
<b>5,6CBP</b>	37.2	33.7	49.0
<b>8CBP</b>	42.7	39.4	54.6
<b>10 CBP</b>	64.1	60.6	75.9
<b>12CBP</b>	64.1	60.6	75.9

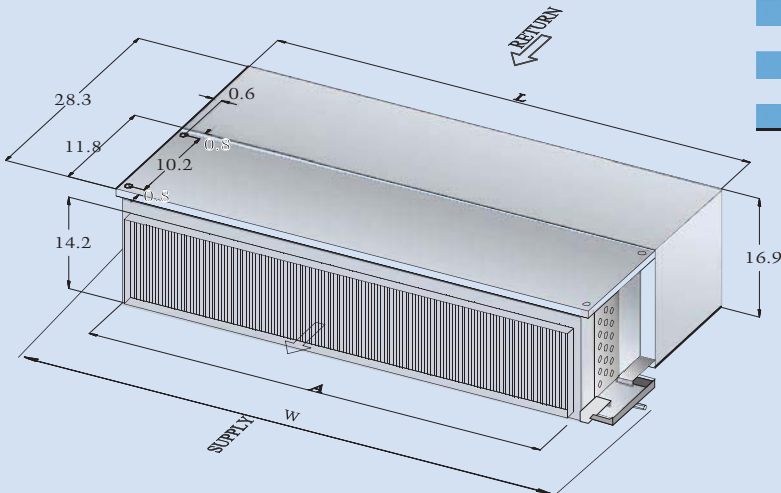


All dimensions are in inch

## Outdoor Unit

CMD Type

MODEL	L	A	W
<b>6 CMD</b>	22.8	19.8	30.8
<b>8 CMD</b>	22.8	19.8	30.8
<b>10 CMD</b>	22.8	19.8	30.8
<b>12CMD</b>	37.1	33.6	44.8
<b>14CMD</b>	37.1	33.6	44.8
<b>16CMD</b>	37.1	33.6	44.8
<b>18 CMD</b>	47.1	43.6	54.9
<b>20 CMD</b>	47.1	43.6	54.9



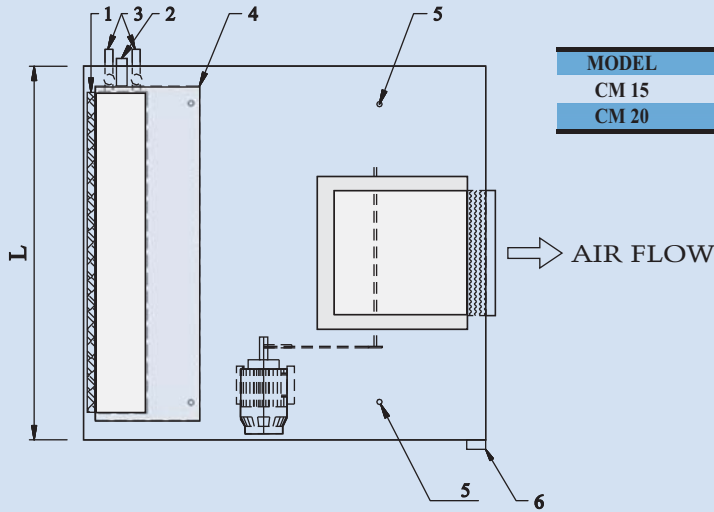
All dimensions are in inch



# MODELS LAYOUT – CM

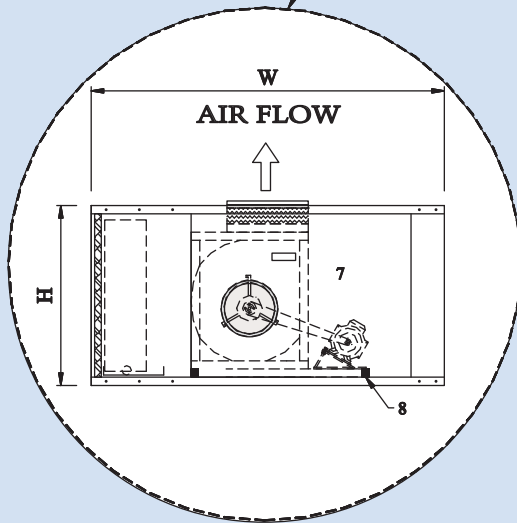
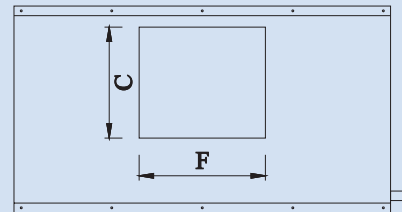
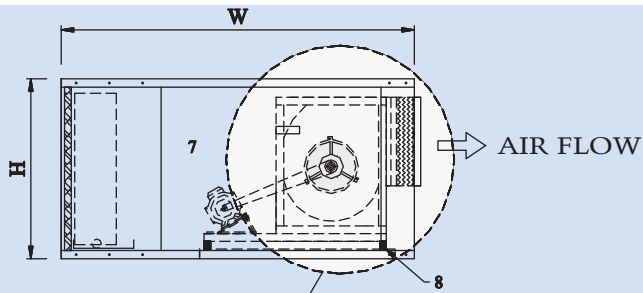
## Indoor Units

(H) Horizontal construction with horizontal discharge



MODEL	L	W	H	F	C
CM 15	38.8	41.7	21.3	13.0	11.4
CM 20	45.9	41.7	21.4	13.0	11.4

All dimensions are in inch



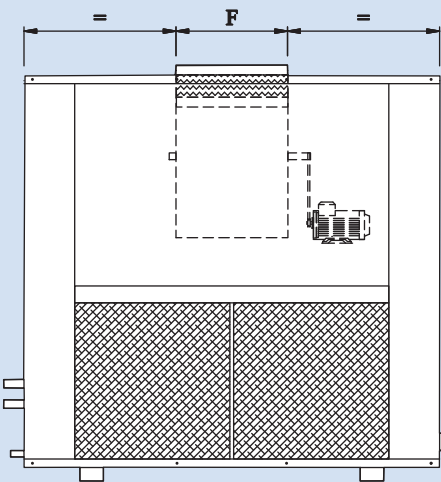
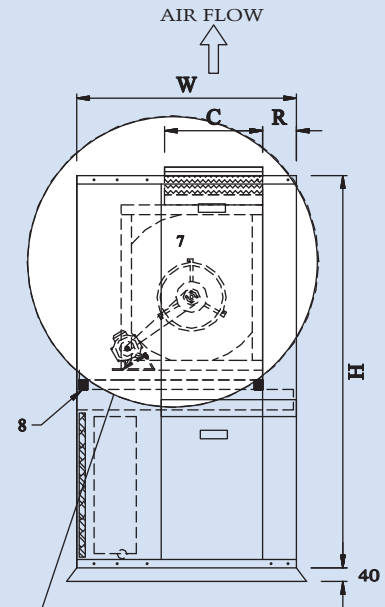
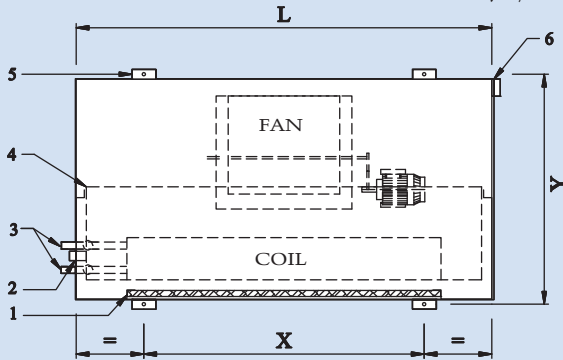
NO.	LEGEND
1	Flat Filter 1 inch Thick
2	Drain Connection
3	Gas Connection
4	Drain Pan
5	Mounting Holes
6	Electrical Connection Box
7	Access Panel
8	Anti-Vibration Mounting

Alternate discharge construction  
(H) Horizontal construction with vertical discharge

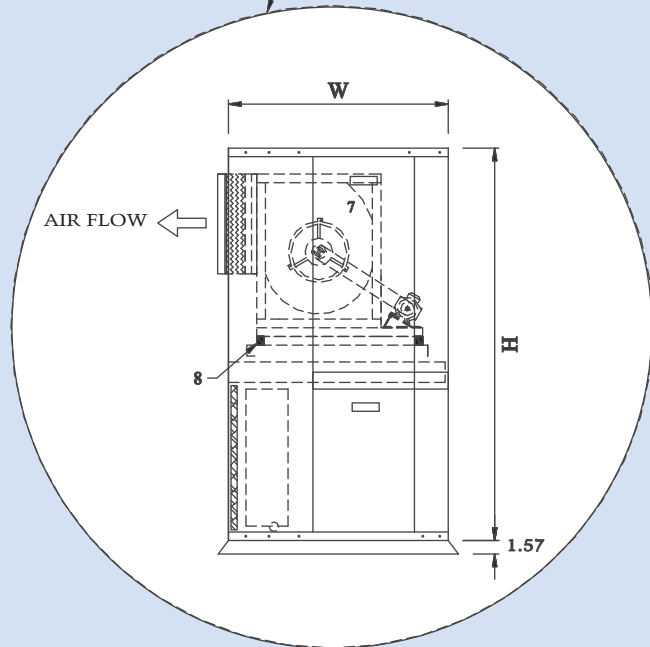
# MODELS LAYOUT – CM

## Indoor Units

(V) Vertical construction with Vertical discharge



Alternate discharge construction  
(V) Vertical construction with Vertical discharge



NO.	LEGEND
1	Flat Filter 1 inch Thick
2	Drain Connection
3	Gas Connection
4	Drain Pan
5	Unit Mounting
6	Electrical Connection Box
7	Access Panel
8	Anti-Vibration Mounting

MODEL	L	W	H	F	C	R	X	Y
CMV 15	38.8	26.5	45.7	13.0	11.4	2.4	23.6	26.8
CMV 20	45.8	25.6	45.7	13.0	11.4	3.9	30.1	26.8

All dimensions are in inch





## FAN PERFORMANCE TABLES-INDOOR UNITS

### Aluminum Mesh Filter – 4 Rows

Celining Basic with Plenum [CBP]		Air flow rate [CFM]			
		External static pressure [Inch of Water]			
MODEL	Fan speed	0.1	0.15	0.2	0.25
RAC 5	High	555	447	398	350
	Medium	476	395	350	304
	Low	377	320	300	266
RAC 6	High	603	490	442	384
	Medium	539	439	390	341
	Low	441	370	353	294
RAC 8	High	700	586	535	455
	Medium	601	490	431	382
	Low	509	425	378	328
RAC 10	High	1037	838	765	658
	Medium	916	750	666	581
	Low	741	625	592	503
RAC 12	High	1177	983	862	734
	Medium	1010	814	730	639
	Low	880	725	643	560



NOTA

All data are based on wet coil conditions with a 2-pipe system coil [Single cooling coil] and includes 15 mm aluminum mesh flat filter pressure drop.

### Aluminum Mesh Filter – 4 Rows

MODEL	Fan speed	Air flow rate [CFM]								
		External static pressure [Inch of water]								
		0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50
CMD 6	High	691	683	674	658	642	623	599	560	508
	Medium	569	564	555	544	537	523	510	492	433
	Low	482	466	454	444	434	425	414	403	381
CMD 8	High	893	872	849	829	802	769	723	675	623
	Medium	691	683	674	658	642	623	599	560	508
	Low	569	564	555	544	537	523	510	492	443
CMD 10	High	1062	1033	1003	969	912	846	800	757	729
	Medium	893	872	849	829	802	769	723	675	623
	Low	691	683	674	658	642	623	599	560	509
CMD 12	High	1300	1287	1257	1228	1194	1153	1098	1010	910
	Medium	1077	1064	1039	1028	1006	980	951	898	803
	Low	904	872	856	833	819	801	777	763	688
CMD 14	High	1581	1542	1505	1465	1409	1340	1262	1173	1092
	Medium	1235	1226	1201	1172	1142	1105	1063	978	884
	Low	1022	1011	990	976	958	934	908	867	776
CMD 16	High	1712	1671	1628	1571	1502	1417	1331	1241	1191
	Medium	1364	1343	1312	1281	1244	1200	1130	1041	935
	Low	1130	1113	1089	1078	1052	1062	994	926	829
CMD 18	High	1909	1864	1816	1763	1708	1642	1516	1395	1313
	Medium	1568	1541	1507	1468	1427	1389	1332	1249	1157
	Low	1197	1176	1162	1149	1120	1092	1058	1015	931
CMD 20	High	2040	1191	1938	1877	1819	1707	1579	1477	1394
	Medium	1691	1658	1619	1574	1534	1482	1414	1322	1221
	Low	1293	1274	1262	1239	1209	1177	1138	1091	988

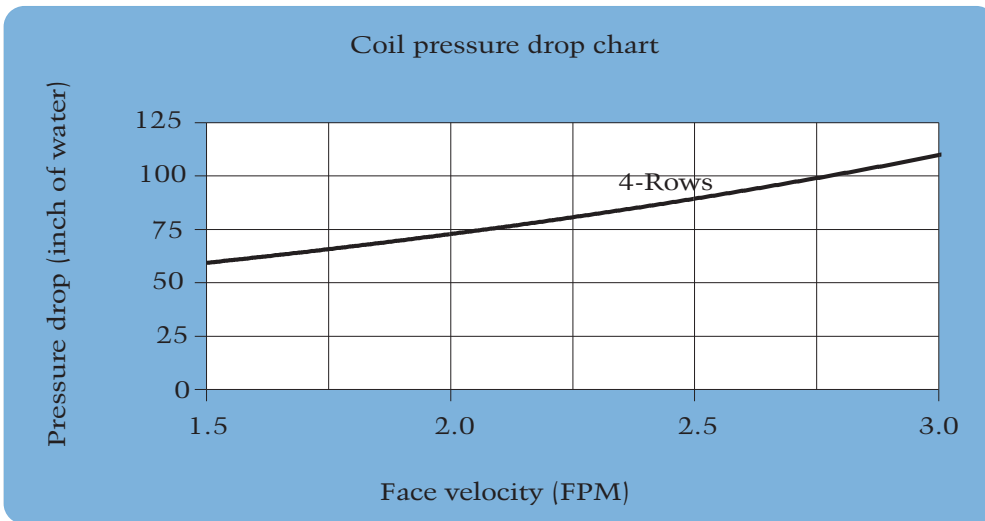
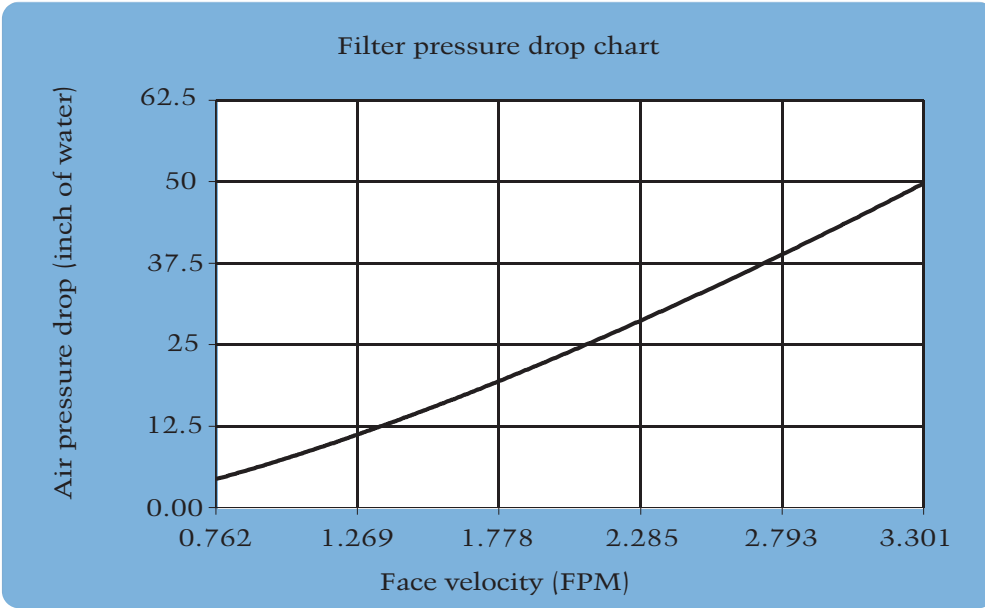


NOTA

All data are based on wet coil conditions with a 2-pipe system coil [Single cooling coil] and includes 15 mm aluminum mesh flat filter pressure drop.

# FILTER & COIL PRESSURE DROP CHARTS-INDOOR UNITS

For CM Type



## ELECTRICAL DATA TABLES

MODEL	Power Supply [Volt/Phase/Hz]	Compressor			CFM			MCA	MOP
		No.	LRA	RLA	No.	kW	FLA		
<b>DSP15</b>	220-240 / 1 / 50	1	42.0	6.0	1	0.025	0.4	7.9	15
<b>DSP 18</b>	220-240 / 1 / 50	1	42.0	6.0	1	0.025	0.4	7.9	15
<b>DSP 24</b>	220-240 / 1 / 50	1	52.0	9.0	1	0.053	0.76	12.0	20
<b>DSP 30</b>	220-240 / 1 / 50	1	52.0	11.0	1	0.053	0.76	14.5	25
<b>DSP 36</b>	380-420 / 3 / 50	1	44.8	4.4	1	0.186	1.1	6.6	15
<b>DSP 48</b>	380-420 / 3 / 50	1	55.0	10.4	2	0.075	0.7	14.4	20
<b>DSP 60</b>	380-420 / 3 / 50	1	55.0	10.4	2	0.075	0.7	14.4	20

### Legend:

Ist: Maximum Instantaneous Current  
**kW**: Nominal Output Power  
**RLA**: Rated Load Ampere  
**FLA**: Full Load Ampere  
**MOP**: Maximum Overcurrent Protection

**MDS**: Non-Fused Main Disconnect Switch  
**LRA**: Locked Rotor Ampere  
**MCA**: Minimum Circuit Ampacity  
**CFM**: Condenser Fan Motor



NOTA

- \* **MCA** is based on 125% of the **RLA** for the largest motor plus 100% of the **RLA/FLA** for all other loads included in the circuit (NEC-Article 430-24).
- \* **MOP** is based on 225% of the **RLA** for the largest motor plus 100% of the **RLA** for all other loads included in the circuit (NEC-Article 440-22).
- \* **MDS** is based on 115% of the total summation of **RLA/FLA** for all loads included in the circuit (NEC-Article 440- 12A1).

## ELECTRICAL DATA TABLES

MODEL	Power supply Volt/Phase/Hz	No.	Nominal motor power (Each) [kW]	FLA [Amp]	MCA [Amp]	MOP [Amp]
<b>RAC 5</b>	220 - 240 / 1 / 50	1	0.05	0.85	1.06	15
<b>RAC 6</b>	220 - 240 / 1 / 50	1	0.05	0.85	1.06	15
<b>RAC 8</b>	220 - 240 / 1 / 50	1	0.05	0.85	1.06	15
<b>RAC 10</b>	220 - 240 / 1 / 50	2	0.05	0.85	1.91	15
<b>RAC 12</b>	220 - 240 / 1 / 50	2	0.05	0.85	1.91	15

### Legend

MCA: Minimum Circuit Ampacity  
MOP: Maximum Over current Protection  
FLA: Full Load Ampere



NOTA

- MCA is based on 125% of the FLA for the largest motor plus 100% of FLA for all other loads included in the circuit (NEC-Article 430-24).
- MOP is based on 225% of the FLA for the largest motor plus 100% of the FLA for all other loads included in the circuit (NEC-Article 440-22).



## ELECTRICAL DATA TABLES

MODEL	Power supply Volt/Phase/Hz	No.	Nominal motor power (Each) [kW]	FLA [Amp]	MCA [Amp]	MOP [Amp]
<b>CMD 6</b>	220 - 240 / 1 / 50	1	0.19	1.4	1.75	15
<b>CMD 8</b>	220 - 240 / 1 / 50	1	0.19	1.4	1.75	15
<b>CMD 10</b>	220 - 240 / 1 / 50	1	0.19	1.4	1.75	15
<b>CMD 12</b>	220 - 240 / 1 / 50	2	0.19	1.4	3.15	15
<b>CMD 14</b>	220 - 240 / 1 / 50	2	0.19	1.4	3.15	15
<b>CMD 16</b>	220 - 240 / 1 / 50	2	0.19	1.4	3.15	15
<b>CMD 18</b>	220 - 240 / 1 / 50	2	0.19	1.4	3.15	15
<b>CMD 20</b>	220 - 240 / 1 / 50	2	0.19	1.4	3.15	15

### Legend

MCA: Minimum Circuit Ampacity  
MOP: Maximum Over current Protection  
FLA: Full Load Ampere



- MCA is based on 125% of the FLA for the largest motor plus 100% of FLA for all other loads included in the circuit (NEC-Article 430-24).
- MOP is based on 225% of the FLA for the largest motor plus 100% of the FLA for all other loads included in the circuit (NEC-Article 440-22).

## ELECTRICAL DATA TABLES

MODEL	Power supply Volt/Phase/Hz	No.	Nominal motor power (Each) [kW]	FLA (Each) [Amp]	MCA [Amp]	MOP [Amp]
CM 15	380 - 420 / 3 / 50	1	0.55	1.7	2.1	15
CM 20	380 - 420 / 3 / 50	1	0.55	1.7	2.1	15

### Legend

CFM: Condenser Fan Motor  
 FLA: Full Load Ampere  
 MOP: Maximum Over current Protection  
 MCA: Minimum Circuit Ampacity

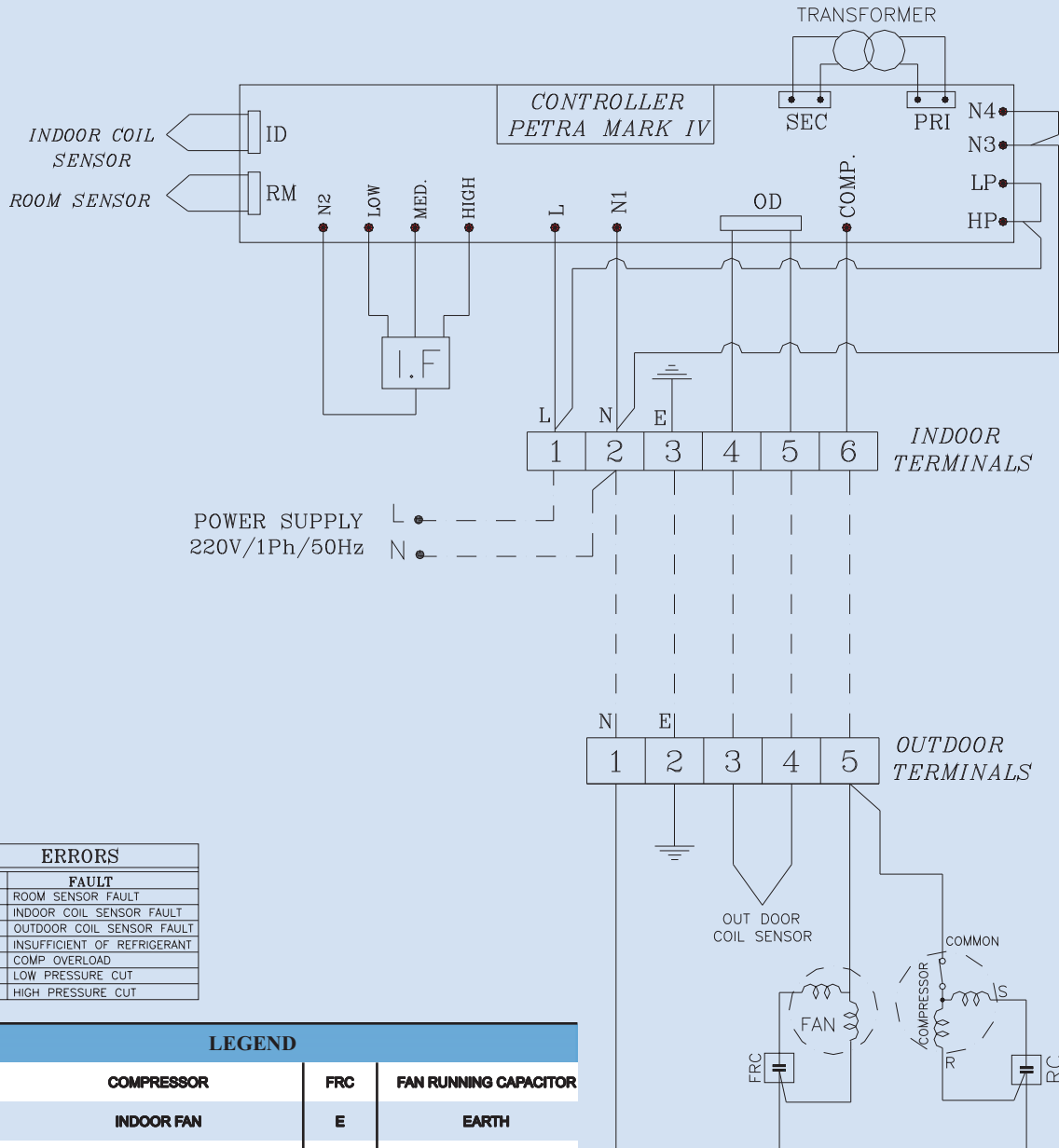


#### NOTA

- Electrical data is for both horizontal and vertical construction units
- MCA is based on 125% of the FLA for the largest motor plus 100% of the FLA for all other loads included in the circuit (NEC-Article 430-22).
- MOP is based on 225% of the FLA for the largest motor plus 100% of the FLA for all other loads included in the circuit (NEC-Article 440-22).
- All data are based on:
  - 124.5 Pa external static pressure
  - Wet coil surface (4 Rows)
  - 25 mm thick flat filter
  - Nominal air flow rate

# TYPICAL WIRING DIAGRAMS

For DSP (15 - 18 - 24 - 30) One Stage Single Phase

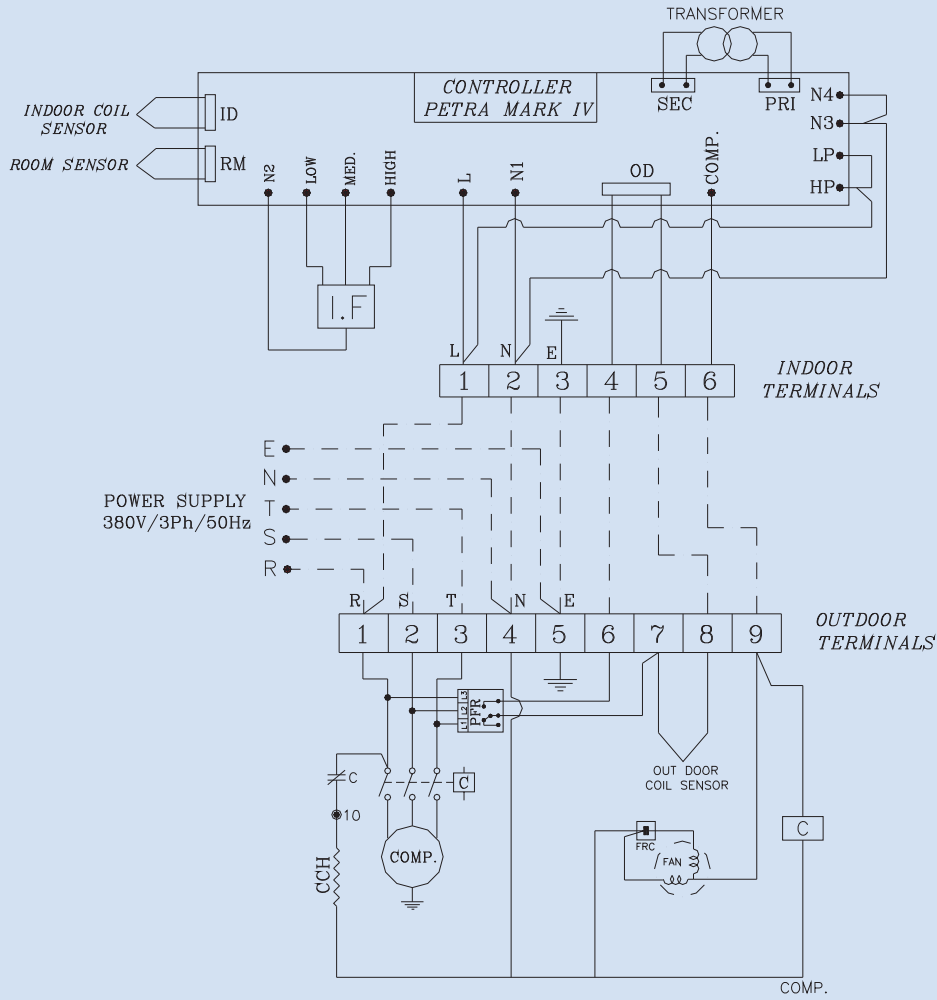


ERRORS	
CODE	FAULT
E1	ROOM SENSOR FAULT
E2	INDOOR COIL SENSOR FAULT
E3	OUTDOOR COIL SENSOR FAULT
E4	INSUFFICIENT OF REFRIGERANT
E5	COMP OVERLOAD
E6	LOW PRESSURE CUT
E7	HIGH PRESSURE CUT

LEGEND			
COMP.	COMPRESSOR	FRC	FAN RUNNING CAPACITOR
IF	INDOOR FAN	E	EARTH
RC	RUNNING CAPACITOR	—	FEILD CONNECTION

# TYPICAL WIRING DIAGRAMS

For DSP (36) One Stage Three Phase



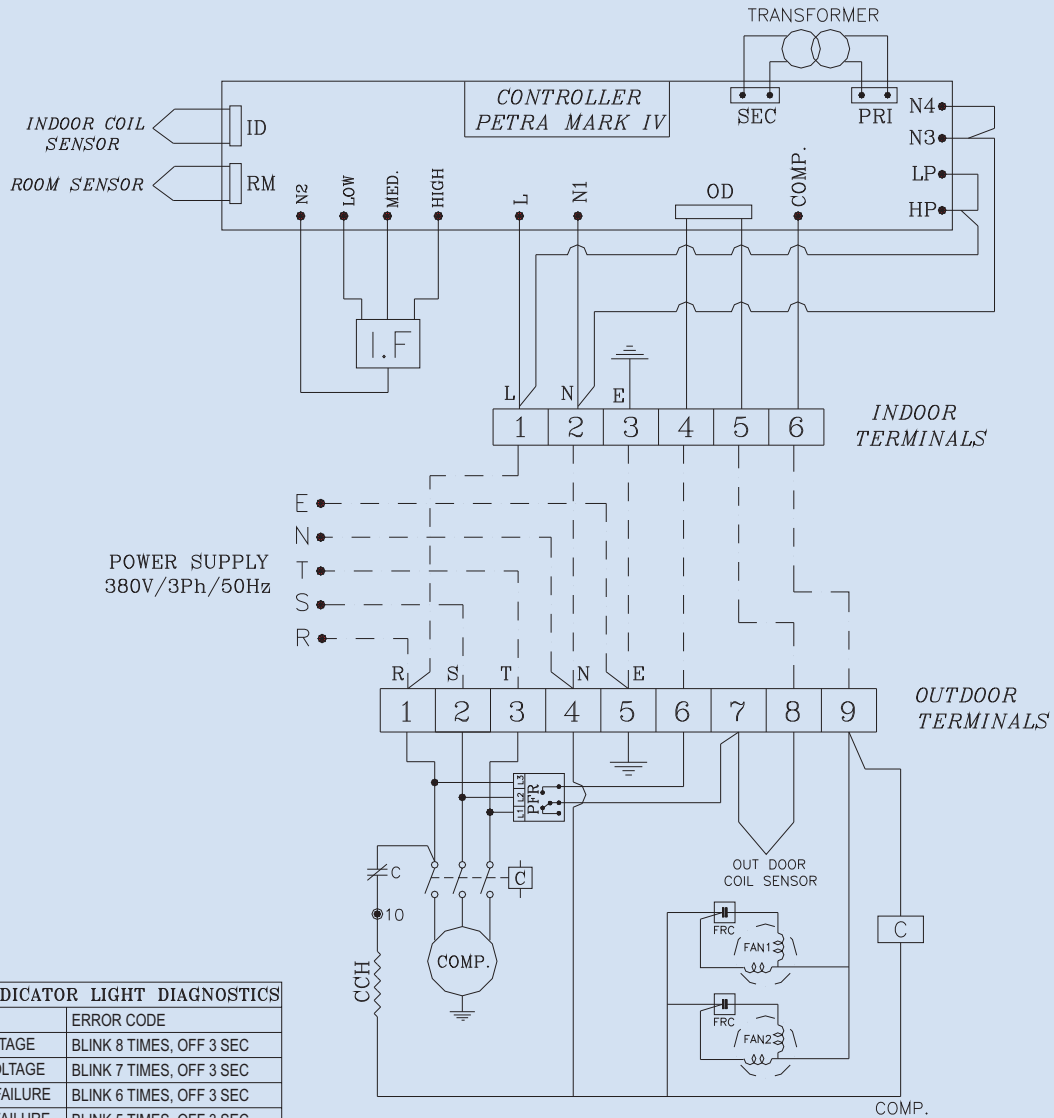
LEGEND			
COMP.	COMPRESSOR	E	EARTH
IF	INDOOR FAN	—	FIELD CONNECTION
C	CONTACTOR		
PFR	PHASE FAILURE RELAY		
CCH	CRANKCASES HEATER		
FRC	FAN RUNNING CAPACITOR		

PFR INDICATOR LIGHT DIAGNOSTICS	
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

ERRORS	
CODE	FAULT
E1	ROOM SENSOR FAULT
E2	INDOOR COIL SENSOR FAULT
E3	OUTDOOR COIL SENSOR FAULT,PFR
E4	INSUFFICIENT OF REFRIGERANT
E5	COMP OVERLOAD
E6	LOW PRESSURE CUT
E7	HIGH PRESSURE CUT

# TYPICAL WIRING DIAGRAMS

For DSP (48 - 60) One Stage Three Phase

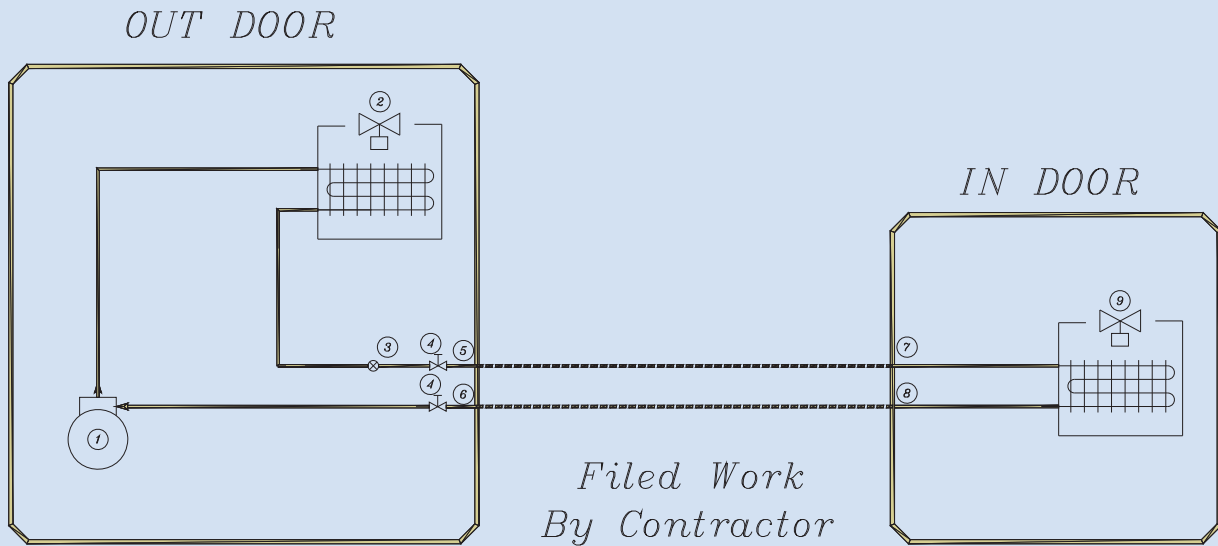


PFR INDICATOR LIGHT DIAGNOSTICS	
FAULT	ERROR CODE
OVER VOLTAGE	BLINK 8 TIMES, OFF 3 SEC
UNDER VOLTAGE	BLINK 7 TIMES, OFF 3 SEC
R PHASE FAILURE	BLINK 6 TIMES, OFF 3 SEC
S PHASE FAILURE	BLINK 5 TIMES, OFF 3 SEC
T PHASE FAILURE	BLINK 4 TIMES, OFF 3 SEC
PHASE REVERSAL	BLINK 3 TIMES, OFF 3 SEC

ERRORS	
CODE	FAULT
E1	ROOM SENSOR FAULT
E2	INDOOR COIL SENSOR FAULT
E3	OUTDOOR COIL SENSOR FAULT,PFR
E4	INSUFFICIENT OF REFRIGERANT
E5	COMP OVERLOAD
E6	LOW PRESSURE CUT
E7	HIGH PRESSURE CUT

LEGEND			
COMP.	COMPRESSOR	FRC	FAN RUNNING CAPACITOR
IF	INDOOR FAN	E	EARTH
C	CONTACTOR	—	FEILD CONNECTION
CCH	CRANKCASES HEATER		

# REFRIGERATION SCHEMATIC DIAGRAM



Model	Suction Line O.D. (inch)	Liquid Line O.D. (inch)
DSP 15	1/2"	1/4"
DSP 18	1/2"	1/4"
DSP 24	5/8"	3/8"
DSP 30	5/8"	3/8"
DSP 36	3/4"	1/2"
DSP 46	3/4"	1/2"
DSP 60	3/4"	1/2"

9	Evaporator Coil.
8	Suction Line(Solder Joint)
7	Liquid Line(Solder Joint)
6	Suction Line
5	Liquid Line
4	Shut Off Valve.
3	Expansion Devise
2	Condenser Coil.
1	Hermetic Compressor.
#	ITEM

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Marketing Tel: (962 6) 4050940 Fax: 4050975  
Jordan Sales Tel: (962 6) 4051425 Fax: 4051248

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