Sabro

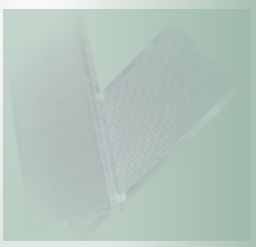
# Water-cooled Package Air conditioner

# WCP Series Catalogue

www.sabrotechnology.com

Sabro

# CONTENTS





**Available with Environmental Friendly Refrigerant-(R-407C/410A)+DC Inverter**

# 1. INTRODUCTION

- SABRO water cooled packaged air conditioners (series WCP) are designed for installation inside the building either in a plant room or directly in the conditioned space. These units have energy efficient design and are available in a wide range of capacity to meet the requirements of residential, commercial or industrial applications. These units can be installed in residences, apartments, offices, multi story buildings, supermarkets, restaurants, hotels, motels, computer rooms, electronic exchanges, pharmaceutical and other industrial buildings. The units are required to be connected with water-cooling tower and related system for the removal of heat from unit condenser.

- These units are completely charged and internally wired, the only work required at site is to mount the unit at place, connect the ducting, electric supply, drain connection and cooling tower piping system. The units can be supplied with optional discharge air plenum for free air discharge to space **(WCP040S TO 160D)** The units are provided with all necessary safety applications and control devices for dependable and trouble free operation and tested at factory for reliability. The WCP units are provided with operation switches, indication lights and pressure gauges at front panel for the ease of operation.

- These units can be used for winter heating by installing an electric duct heater in the supply air ducting. The heating operation is controlled through unit's operation panel. The units models with discharge air plenum that may be supplied with factory installed heaters. During heating cycle, only evaporator fan and heaters will be in operation.

- The maintenance of unit is very easy, all electrical components, piping, wiring and fan/drives etc are accessible by opening front and side access panels.

## 2. COMPONENTS DETAILS

- **Construction**

The basic WCP unit is made from heavy gauge galvanized steel sheets. The sheets are degreased,de-rusted, phosphated and finished with electrostatic baked powder paint. This ensures excellent corrosion resistance and thus ensuring long life of the unit. The evaporator compartment is provided with internal polyethylene (Jumbo lon) insulation to prevent the heat losses.

- **Compressor**

All WCP units are provided with one or two hermetic scroll - Copeland compressors. Each compressor is provided with completely independent refrigerant circuits The compressors are mounted on rubber vibration isolators.

- **Evaporator Fan & Motor**

The evaporator fans are forward curved centrifugal double width double inlet type. The fans are statically and dynamically balanced for noiseless operation. The fan shafts are provided with permanent lubricated ball bearings that are mounted on rubber housing. These fans are belt driven type using one or two "V" belts. The drive system is having adjustable motor pulley and motor base to adjust ±10% of factory adjusted fan speed. These fans are driven by totally enclosed fan cooled motors having class B insulation & IP-54 protection. The Motors are sufficient to handle duct static pressure as mentioned in specifications. High static fans can be provided on request.

- **Evaporator Coil**

The evaporator coils are made of seamless copper tubes and aluminum plate fins. The tubes are mechanically expanded to ensure rigid contact with fins for the greater heat transfer efficiency. These coils are tested under water at a nitrogen pressure of 250 Psig against leakage.

- **Air Filter**

All WCP unit are provided with 1" thick washable aluminum media air filters as standard. These filters are easily removable by opening front return air grill (for models up to WCP150D) or by opening hinged doors provided at the both sides of unit (for models WCP200 and above). High efficiency washable synthetic fiber media filters are available on clientele demand.

- **Condenser Shell**

The unit is provided with shell and through tube type water-cooled condenser made of mild steel shell and integral finned copper tubes. The refrigerant flows through the shell and water flows through the tubes. The shell is provided with removable head plates for internal cleaning of tubes. The condenser is tested at 450Psig pressure from refrigerant side and 100Psig pressure from water side against all leakages. A safety relief valve is provided at the shell to protect it in case of abnormally high pressure.

- **Electric Control Panel**

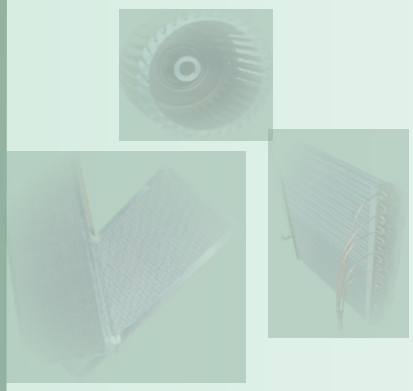
  The electric control panel is provided inside the unit and internally wired to all electrical components. The control panel consists of power failure relay, time delay relay (in multi compressor units),compressor contactors and thermal overload relays, evaporator fan motor contactors and thermal overload relays and fuse etc.

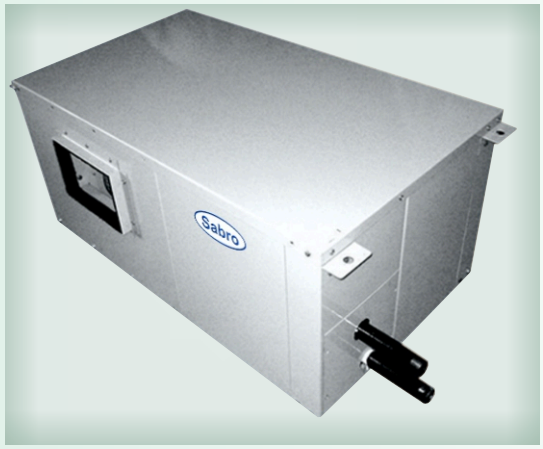
- **Front Operation Panel**

  The unit is provided with operation control panel at unit's front. The panel consists of operation switches, temperature adjustment knob, indication lights and pressure gauges. An electronic step thermostat can also be provided on requirement for all automatic operation of compressors (in multi compressor units).

## 3. SAFETY DEVICES

- **Compressor Internal Protector**
  To protect the compressor motor winding from over heating.
- **Compressor Overload Relay**
  To protect the compressor from over current operation.
- **Evaporator Fan Motor Over Load Relays**
  To protect them from over current operation.
- **Power Monitor/Power Failure Relay**
  To protect the unit in failure of any one phase (out of three phases), under voltage/phase reversal.
- **Time Delay Relay**
  To avoid simultaneous start of two compressors and resultant surge current.
- **High & Low Pressure Switch**
  To protect the compressor from any damage due to abnormal suction/discharge pressure.
- **Compressor Crank Case Heater**
  To keep the compressor's oil warm during period when it is not operating.





Sabro
Airconditioning

## *M*INI *W*ATER *C*OOLED *P*ACKAGED ACs

## 4. PHYSICAL DATA

| MODEL | COMPRESSOR KW | COMPRESSOR TYPE | AIR FLOW CFM | COOLING CAPACITY | |
|---|---|---|---|---|---|
| | | | | BTU/Hr | Kcal/Hr |
| WCP 009 | 0.80 | Rotary | 375 | 9000 | 2270 |
| WCP012 | 1.00 | Rotary | 450 | 12000 | 3026 |
| WCP015 | 1.20 | Rotary | 560 | 15000 | 3783 |
| WCP018 | 1.40 | Rotary | 675 | 18000 | 4539 |
| WCP024 | 2.30 | Rotary | 900 | 24000 | 6052 |
| WCP036 | 4.37 | Rotary | 1350 | 36000 | 9090 |

**The capacity is based on**
Evaporator entering air temperature at 80°F(26.6°C)DB & 67°(19.5°C)WB
Condenser entering water temperature at 85°F(29.4°C)DB

Due to continuous improvement in our products, specs may change without notice

# 4. PHYSICAL DATA

| ITEMS \ MODELS | | WCP 040-S | WCP 050-S | WCP 060-S | WCP 080-S | WCP 080-D | WCP 100-D | WCP 120-D | WCP 160-S |
|---|---|---|---|---|---|---|---|---|---|
| Cooling Capacity | Btu/Hr. | 44000 | 57000 | 63500 | 87500 | 88000 | 114000 | 127000 | 166500 |
| | Kcal/Hr. | 11087 | 14358 | 15995 | 22040 | 22166 | 28715 | 31990 | 41940 |
| Refrigerant | | R-22(Factory charged) | | | | | | | |
| Refrigerant Circuit | | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 1 |
| Refrigerant Flow Control | | Capillary tube | | | | | | | TXV |
| Power Supply | | 380/415-3-50Hz | | | | | | | |
| Compressor | Type | Hermetic Scroll | | | | | | | |
| | Quantity | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 1 |
| | Hp(Each) | 4.0 | 5.0 | 6.0 | 8.0 | 4.0x2 | 5.0x2 | 6.0x2 | 16.0 |
| | Amps | 6.6 | 7.6 | 7.8 | 10.7 | 6.6x2 | 7.6x2 | 7.8x2 | 22.0 |
| Condenser | Type | Shell and tube type | | | | | | | |
| Cond. Water Flow | Us Gpm | 11.0 | 14.3 | 16.0 | 21.52 | 22.21 | 28.80 | 32.07 | 42.04 |
| Cond. Water Connections | | 1-1/4" | 1-1/4" | 1-1/4" | 1-1/2" | 1-1/2" | 1-1/2" | 2" | 2" |
| Evap. Coil | Type | Copper tubes mechanically expanded to aluminum plate fins | | | | | | | |
| Evap. Fan | Type | Farward curved Centrifugal,belt drive | | | | | | | |
| | Cfm | 1200 | 1500 | 1800 | 2400 | 2300 | 3000 | 3600 | 4800 |
| | Esp(inch.WG) | 0.2-0.5 | 0.2-0.5 | 0.4-0.8 | 0.4-0.8 | 0.4-0.8 | 0.8-1.2 | 0.8-1.2 | 0.8-1.2 |
| Evap. Fan Motor | Watts | 375 | 375 | 750 | 1100 | 1115 | 1500 | 1520 | 2210 |
| | Amps | 0.8 | 0.9 | 1.35 | 2.1 | 2.15 | 2.4 | 2.8 | 3.55 |
| Air Filters | Type | 1" thick,cleanable,permanent aluminum media,air filters | | | | | | | |
| Condensate Drain Connection | | 3/4" ID | 3/4" ID | 3/4" ID | 3/4" ID | 3/4" ID | 3/4" ID | 3/4" ID | 3/4" ID |
| Dimensions,mm(inch) | Height | 1829(72) , VC MODEL-2126 (84) | | | | 1829(72),VC MODEL-2126 (84) | | | |
| | Width | 1397(55) , Same for VC MODEL | | | | 1625(64),Same for VC MODEL | | | |
| | Depth | 711(28) , Same for VC MODEL | | | | 711(28),Same for VC MODEL | | | |
| Weight | K.G | 315 | 375 | 400 | 425 | 640 | 700 | 740 | 790 |

| ITEMS \ MODELS | | WCP 160-D | WCP 200-D | WCP 240-D | WCP 320-D | WCP 370-D | WCP 420-D | WCP 480-T | WCP 500-D |
|---|---|---|---|---|---|---|---|---|---|
| Cooling Capacity | Btu/Hr. | 170500 | 226000 | 259000 | 334000 | 385000 | 433000 | 498000 | 510000 |
| | Kcal/Hr. | 42947 | 56927 | 65239 | 84131 | 96977 | 109068 | 125441 | 128463 |
| Refrigerant | | R-22(Factory charged) | | | | | | | |
| Refrigerant Circuit | | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 |
| Refrigerant Flow Control | | TXV | | | | | | | |
| Power Supply | | 380/415-3-50Hz | | | | | | | |
| Compressor | Type | Hermetic Scroll | | | | | | | |
| | Quantity | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 |
| | Hp | 8.0x2 | 10x2 | 12.0x2 | 16x2 | 22+15 | 21x2 | 16x3 | 25x2 |
| | Amps | 10.7x2 | 13.3x2 | 15.4x2 | 22x2 | 27.3+21 | 25.6x2 | 22x3 | 32x3 |
| Condenser | Type | Shell and tube type | | | | | | | |
| Cond. Water Flow | Us GPM | 43.1 | 57.0 | 65.4 | 84.4 | 97.2 | 109.4 | 125.8 | 129.6 |
| Cond. Water Connections | | 2" | 2" | 2-1/2" | 2-1/2" | 3" | 3" | 3" | 3" |
| Evap. Coil | Type | Copper tubes mechanically expanded to aluminum plate fins | | | | | | | |
| Evap. Fan | Type | Farward curved Centrifugal,belt drive | | | | | | | |
| | Cfm | 4900 | 6500 | 7500 | 9500 | 11000 | 12500 | 14500 | 15000 |
| | Esp(inch.WG) | 0.8-1.2 | 0.8-1.2 | 1.0-1.2 | 1.0-1.2 | 1.0-1.2 | 1.0-1.2 | 1.0-1.2 | 1.0-1.2 |
| Evap. Fan Motor | Watts | 2250 | 3700 | 5600 | 5700 | 7650 | 7700 | 7800 | 7810 |
| | Amps | 3.55 | 6.0 | 7.2 | 8.9 | 10.8 | 12.1 | 12.5 | 12.7 |
| Air Filters | Type | 1" thick,cleanable,permanent aluminum media,air filters | | | | | | | |
| Condensate Drain Connection | | 3/4" ID | 1.0" ID | 1.0" ID | 1.0" ID | 1.5" ID | 1.5" ID | 1.5" ID | 1.5" ID |
| Dimensions,mm(inch) | Height | 1829(72),VC MODEL-2126(84) | | 1931(76) | | 1931(76) | | | |
| | Width | 1625(64),Same for VC MODEL | | 1805(71) | | 2438(96) | | | |
| | Depth | 711(28),Same for VC MODEL | | 1346(53) | | 1346(53) | | | |
| Weight | K.G | 770 | 1050 | 1175 | 1220 | 1250 | 1340 | 1390 | 1415 |

**Note:**

The above specifications are based on following conditions:

evaporator entering air temperature=80 °F (26.6 °C) DB & 67 °F(19.5 °C)WB

condenser entering water temperature=85 °F(29.4 °C)DB

CFM=Air flow rate

ESP=External static pressure

# 5. COOLING PERFORMANCE DATA

| MODEL (CFM) | Evaporator inlet Air Temp.°F | | CONDENSER ENTERING WATER TEMP(°F) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 80 | | | 85 | | | 90 | | | 95 | | | 100 | | |
| | | | COOLING CAPACITY (MBH) | | | | | | | | | | | | | | |
| | DB | WB | TH | SH | KW | TH | SH | KW | TH | SH | KW | TH | SH | KW | TH | SH | KW |
| WCP 040-S (1200) | 80 | 62 | 41.9 | 37.7 | 3.20 | 40.2 | 36.1 | 3.26 | 38.5 | 34.6 | 3.41 | 36.6 | 32.9 | 3.50 | 35.1 | 31.6 | 3.60 |
| | | 67 | 46.6 | 29.8 | 3.30 | **44.0** | **28.1** | **3.40** | 43.0 | 27.5 | 3.52 | 41.2 | 26.3 | 3.64 | 39.3 | 25.1 | 3.70 |
| | | 72 | 51.8 | 26.4 | 3.40 | 49.9 | 25.4 | 3.50 | 47.9 | 24.4 | 3.63 | 46.0 | 23.5 | 3.74 | 44.0 | 22.4 | 3.80 |
| | 75 | 62 | 41.9 | 33.5 | 3.20 | 40.2 | 32.1 | 3.26 | 38.5 | 30.8 | 3.41 | 36.6 | 29.2 | 3.50 | 35.1 | 28.0 | 3.60 |
| | | 67 | 46.6 | 25.1 | 3.30 | 44.0 | 23.7 | 3.40 | 43.0 | 23.2 | 3.52 | 41.2 | 22.2 | 3.64 | 39.3 | 21.2 | 3.70 |
| | | 72 | 51.8 | 22.3 | 3.40 | 49.9 | 21.5 | 3.50 | 47.9 | 20.6 | 3.63 | 46.0 | 19.8 | 3.74 | 44.0 | 18.9 | 3.80 |
| WCP 050-S (1500) | 80 | 62 | 54.1 | 48.6 | 4.08 | 51.8 | 46.6 | 4.21 | 49.6 | 44.6 | 4.32 | 47.3 | 42.5 | 4.41 | 45.1 | 40.6 | 4.51 |
| | | 67 | 60.1 | 38.4 | 4.20 | **57.0** | **36.4** | **4.30** | 55.4 | 35.4 | 4.44 | 53.0 | 33.9 | 4.49 | 50.5 | 32.3 | 4.62 |
| | | 72 | 67.0 | 34.2 | 4.30 | 64.5 | 32.9 | 4.40 | 62.0 | 31.6 | 4.55 | 59.5 | 30.3 | 4.59 | 56.9 | 29.0 | 4.71 |
| | 75 | 62 | 54.1 | 43.2 | 4.08 | 51.8 | 41.4 | 4.21 | 49.6 | 39.6 | 4.32 | 47.3 | 37.8 | 4.41 | 45.1 | 36.0 | 4.51 |
| | | 67 | 60.1 | 32.4 | 4.20 | 57.0 | 30.7 | 4.30 | 55.4 | 29.9 | 4.44 | 53.0 | 28.6 | 4.49 | 50.5 | 27.2 | 4.62 |
| | | 72 | 67.0 | 28.8 | 4.30 | 64.5 | 27.8 | 4.40 | 62.0 | 26.7 | 4.55 | 59.5 | 25.6 | 4.59 | 56.9 | 24.5 | 4.71 |
| WCP 060-S (1800) | 80 | 62 | 60.5 | 54.4 | 3.81 | 59.0 | 53.0 | 4.01 | 57.4 | 51.6 | 4.30 | 55.8 | 50.2 | 4.55 | 54.0 | 48.5 | 4.86 |
| | | 67 | 66.5 | 42.5 | 3.90 | **64.0** | **41.4** | **4.12** | 63.0 | 40.3 | 4.40 | 61.3 | 39.2 | 4.66 | 59.4 | 38.0 | 4.95 |
| | | 72 | 73.3 | 37.4 | 4.01 | 71.5 | 36.5 | 4.22 | 69.6 | 35.5 | 4.50 | 67.8 | 34.6 | 4.76 | 65.6 | 33.4 | 5.06 |
| | 75 | 62 | 60.5 | 48.3 | 3.81 | 59.0 | 47.1 | 4.01 | 57.4 | 45.9 | 4.30 | 55.8 | 44.6 | 4.55 | 54.0 | 43.1 | 4.86 |
| | | 67 | 66.5 | 35.9 | 3.90 | 64.8 | 34.9 | 4.12 | 63.0 | 34.0 | 4.40 | 61.3 | 33.1 | 4.66 | 59.4 | 32.0 | 4.95 |
| | | 72 | 73.3 | 31.5 | 4.01 | 71.5 | 30.8 | 4.22 | 69.6 | 30.0 | 4.50 | 67.8 | 29.2 | 4.76 | 65.6 | 28.2 | 5.06 |
| WCP 080 - S & D (2400) | 80 | 62 | 83.8 | 75.3 | 6.40 | 80.4 | 72.3 | 6.52 | 77.0 | 69.2 | 6.82 | 73.2 | 65.8 | 7.00 | 70.3 | 63.1 | 7.20 |
| | | 67 | 93.1 | 59.5 | 6.60 | **88.0** | **56.2** | **6.80** | 85.9 | 55.0 | 7.04 | 82.3 | 52.7 | 7.28 | 78.7 | 50.2 | 7.40 |
| | | 72 | 103.6 | 52.8 | 6.80 | 99.7 | 50.9 | 7.00 | 95.8 | 48.8 | 7.26 | 91.9 | 46.9 | 7.48 | 88.0 | 44.9 | 7.60 |
| | 75 | 62 | 83.8 | 66.9 | 6.40 | 80.4 | 64.2 | 6.52 | 77.0 | 61.5 | 6.82 | 73.2 | 58.5 | 7.00 | 70.3 | 56.1 | 7.20 |
| | | 67 | 93.1 | 50.2 | 6.60 | 89.5 | 47.4 | 6.80 | 85.9 | 46.4 | 7.04 | 82.3 | 44.4 | 7.28 | 78.7 | 42.4 | 7.40 |
| | | 72 | 103.6 | 44.6 | 6.80 | 99.7 | 43.0 | 7.00 | 95.8 | 41.2 | 7.26 | 91.9 | 39.6 | 7.48 | 88.0 | 37.9 | 7.60 |
| WCP 100-D (3000) | 80 | 62 | 108.1 | 97.3 | 8.16 | 103.6 | 93.1 | 8.42 | 99.1 | 89.2 | 8.64 | 94.6 | 85.0 | 8.82 | 90.1 | 81.1 | 9.02 |
| | | 67 | 120.3 | 76.8 | 8.40 | **114.0** | **72.8** | **8.60** | 110.7 | 70.8 | 8.88 | 105.9 | 67.7 | 8.98 | 101.1 | 64.5 | 9.24 |
| | | 72 | 134.0 | 68.3 | 8.60 | 129.0 | 65.8 | 8.80 | 124.0 | 63.2 | 9.10 | 119.0 | 60.7 | 9.18 | 113.8 | 58.0 | 9.42 |
| | 75 | 62 | 108.1 | 86.4 | 8.16 | 103.6 | 82.7 | 8.42 | 99.1 | 79.2 | 8.64 | 94.6 | 75.6 | 8.82 | 90.1 | 72.0 | 9.02 |
| | | 67 | 120.3 | 64.8 | 8.40 | 114.0 | 61.5 | 8.60 | 110.7 | 59.7 | 8.88 | 105.9 | 57.1 | 8.98 | 101.1 | 54.4 | 9.24 |
| | | 72 | 134.0 | 57.7 | 8.60 | 129.0 | 55.5 | 8.80 | 124.0 | 53.4 | 9.10 | 119.0 | 51.2 | 9.18 | 113.8 | 49.0 | 9.42 |
| WCP 120-D (3600) | 80 | 62 | 121.0 | 108.8 | 7.62 | 118.0 | 106.0 | 8.02 | 114.8 | 103.2 | 8.60 | 111.6 | 100.3 | 9.10 | 108.0 | 97.1 | 9.72 |
| | | 67 | 133.0 | 85.0 | 7.80 | **127.0** | **82.8** | **8.24** | 126.0 | 80.5 | 8.80 | 122.5 | 78.3 | 9.32 | 118.8 | 75.9 | 9.90 |
| | | 72 | 146.5 | 74.8 | 8.02 | 143.0 | 72.9 | 8.44 | 139.3 | 71.0 | 9.00 | 135.5 | 69.1 | 9.52 | 131.3 | 66.9 | 10.12 |
| | 75 | 62 | 121.1 | 96.6 | 7.62 | 118.0 | 94.3 | 8.02 | 114.8 | 91.7 | 8.60 | 111.6 | 89.1 | 9.10 | 108.0 | 86.3 | 9.72 |
| | | 67 | 133.0 | 71.8 | 7.80 | 129.5 | 69.9 | 8.24 | 126.0 | 67.9 | 8.80 | 122.5 | 66.1 | 9.32 | 118.8 | 64.0 | 9.90 |
| | | 72 | 146.5 | 63.1 | 8.02 | 143.0 | 61.5 | 8.44 | 139.3 | 59.9 | 9.00 | 135.5 | 58.4 | 9.52 | 131.3 | 56.5 | 10.12 |
| WCP 160-S (4800) | 80 | 62 | 155.8 | 140.1 | 10.10 | 152.0 | 136.6 | 10.70 | 148.3 | 133.3 | 11.40 | 144.5 | 129.9 | 12.10 | 140.5 | 126.3 | 12.85 |
| | | 67 | 170.3 | 108.8 | 10.10 | **166.5** | **106.1** | **10.70** | 162.3 | 103.7 | 11.40 | 158.5 | 101.3 | 12.10 | 154.0 | 98.4 | 12.90 |
| | | 72 | 187.0 | 95.4 | 10.15 | 182.5 | 93.1 | 10.70 | 178.3 | 90.9 | 11.45 | 174.0 | 88.7 | 12.10 | 169.3 | 86.3 | 12.95 |
| | 75 | 62 | 155.8 | 124.5 | 10.10 | 152.0 | 121.4 | 10.70 | 148.3 | 118.5 | 11.40 | 144.5 | 115.4 | 12.10 | 140.5 | 122.2 | 12.85 |
| | | 67 | 170.3 | 91.8 | 10.10 | 166.0 | 89.5 | 10.70 | 162.3 | 87.5 | 11.40 | 158.5 | 85.5 | 12.10 | 154.0 | 83.0 | 12.90 |
| | | 72 | 187.0 | 80.5 | 10.15 | 182.5 | 78.6 | 10.70 | 178.3 | 76.7 | 11.45 | 174.0 | 74.9 | 12.10 | 169.3 | 72.9 | 12.95 |
| WCP 160-D (4900) | 80 | 62 | 159.5 | 143.4 | 10.10 | 155.5 | 139.8 | 11.10 | 151.3 | 136.0 | 11.25 | 147.0 | 132.2 | 12.7 | 141.8 | 127.5 | 12.80 |
| | | 67 | 175.3 | 112.0 | 10.25 | **170.5** | **109.3** | **11.10** | 166.3 | 106.3 | 11.25 | 161.5 | 103.2 | 12.7 | 157.0 | 100.3 | 12.90 |
| | | 72 | 192.0 | 98.0 | 10.45 | 188.5 | 96.1 | 11.10 | 183.5 | 93.6 | 11.35 | 178.5 | 91.0 | 12.7 | 173.0 | 88.2 | 12.95 |
| | 75 | 62 | 159.5 | 127.4 | 10.10 | 155.5 | 124.2 | 11.10 | 151.3 | 120.9 | 11.25 | 147.0 | 117.5 | 12.7 | 141.8 | 113.3 | 12.80 |
| | | 67 | 175.3 | 94.5 | 10.25 | 171.0 | 92.2 | 11.10 | 166.3 | 89.7 | 11.25 | 161.5 | 87.0 | 12.7 | 157.0 | 84.7 | 12.90 |
| | | 72 | 193.3 | 83.2 | 10.45 | 188.5 | 81.1 | 11.10 | 183.5 | 79.0 | 11.35 | 178.5 | 76.8 | 12.7 | 173.0 | 74.5 | 12.95 |

**See Note On Next Page**

# COOLING PERFORMANCE DATA

| MODEL (CFM) | Evaporator inlet Air Temp.°F | | CONDENSER ENTERING WATER TEMP(°F) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 80 | | | 85 | | | 90 | | | 95 | | | 100 | | |
| | | | COOLING CAPACITY(MBH) | | | | | | | | | | | | | | |
| | DB | WB | TH | SH | KW | TH | SH | KW | TH | SH | KW | TH | SH | KW | TH | SH | KW |
| WCP 200-D (6500) | 80 | 62 | 211.3 | 190.0 | 6.60 | 206.5 | 185.6 | 13.95 | 201.0 | 180.7 | 14.00 | 195.5 | 175.8 | 15.80 | 190.0 | 170.8 | 16.80 |
| | | 67 | 231.5 | 147.9 | 6.70 | **226.0** | **144.4** | **14.10** | 220.0 | 140.6 | 14.10 | 214.0 | 136.7 | 15.95 | 208.3 | 133.1 | 17.10 |
| | | 72 | 253.0 | 129.0 | 6.85 | 247.0 | 125.9 | 14.30 | 241.0 | 122.9 | 14.22 | 235.0 | 119.8 | 16.10 | 228.5 | 116.5 | 17.50 |
| | 75 | 62 | 211.3 | 168.8 | 6.60 | 206.5 | 165.0 | 13.95 | 201.0 | 160.6 | 14.00 | 195.5 | 156.2 | 15.80 | 190.0 | 151.8 | 16.80 |
| | | 67 | 231.5 | 124.8 | 6.70 | 226.0 | 121.9 | 14.10 | 220.0 | 118.6 | 14.10 | 214.0 | 115.4 | 15.95 | 208.3 | 112.3 | 17.10 |
| | | 72 | 253.0 | 108.9 | 6.85 | 247.0 | 106.3 | 14.30 | 241.0 | 103.7 | 14.22 | 235.0 | 101.1 | 16.10 | 228.5 | 98.3 | 17.50 |
| WCP 240-D (7500) | 80 | 62 | 242.0 | 217.6 | 15.24 | 236.0 | 212.0 | 16.04 | 229.6 | 206.4 | 17.20 | 223.2 | 200.6 | 18.20 | 216.0 | 194.2 | 19.44 |
| | | 67 | 266.0 | 170.0 | 15.60 | **259.0** | **165.6** | **16.48** | 252.0 | 161.0 | 17.60 | 245.0 | 156.7 | 18.64 | 237.5 | 151.8 | 19.80 |
| | | 72 | 293.0 | 149.6 | 16.04 | 286.0 | 145.8 | 16.88 | 278.5 | 142.0 | 18.00 | 271.0 | 138.3 | 19.04 | 262.5 | 133.8 | 20.24 |
| | 75 | 62 | 242.1 | 193.3 | 15.24 | 236.0 | 188.5 | 16.04 | 229.6 | 183.4 | 17.20 | 223.2 | 178.3 | 18.20 | 216.0 | 172.5 | 19.44 |
| | | 67 | 266.0 | 143.6 | 15.60 | 259.0 | 139.8 | 16.48 | 252.0 | 135.9 | 17.60 | 245.0 | 132.2 | 18.64 | 237.5 | 128.0 | 19.80 |
| | | 72 | 293.0 | 126.2 | 16.04 | 286.0 | 123.1 | 16.88 | 278.5 | 119.8 | 18.00 | 271.0 | 116.7 | 19.04 | 262.5 | 112.9 | 20.24 |
| WCP 320-D (9500) | 80 | 62 | 311.5 | 280.1 | 20.20 | 304.0 | 273.3 | 21.40 | 296.5 | 266.6 | 22.80 | 289.0 | 259.8 | 24.20 | 281.0 | 252.6 | 25.70 |
| | | 67 | 340.5 | 217.6 | 20.20 | **334.0** | **212.1** | **21.40** | 324.5 | 207.4 | 22.80 | 317.0 | 202.6 | 24.20 | 308.0 | 196.8 | 25.80 |
| | | 72 | 374.0 | 190.7 | 20.30 | 365.0 | 186.1 | 21.40 | 356.5 | 181.8 | 22.90 | 348.0 | 177.5 | 24.20 | 338.5 | 172.6 | 25.90 |
| | 75 | 62 | 311.5 | 248.9 | 20.20 | 304.0 | 242.8 | 21.40 | 296.5 | 236.9 | 22.80 | 289.0 | 230.8 | 24.20 | 281.0 | 244.5 | 25.70 |
| | | 67 | 340.5 | 183.6 | 20.20 | 332.0 | 179.0 | 21.40 | 324.5 | 175.0 | 22.80 | 317.0 | 170.9 | 24.20 | 308.0 | 166.0 | 25.80 |
| | | 72 | 374.0 | 161.0 | 20.30 | 365.0 | 157.1 | 21.40 | 356.5 | 153.5 | 22.90 | 348.0 | 149.8 | 24.20 | 338.5 | 145.7 | 25.90 |
| WCP 370-D (11000) | 80 | 62 | 359.0 | 323.5 | 23.33 | 351.0 | 315.7 | 24.72 | 341.5 | 307.9 | 26.33 | 333.0 | 300.1 | 27.95 | 324.0 | 291.8 | 29.68 |
| | | 67 | 392.0 | 250.8 | 23.28 | **385.0** | **244.5** | **24.66** | 373.5 | 239.0 | 26.28 | 365.0 | 233.5 | 27.89 | 355.0 | 226.8 | 29.73 |
| | | 72 | 430.0 | 219.8 | 23.40 | 420.0 | 214.5 | 24.66 | 410.0 | 209.5 | 26.39 | 401.0 | 204.5 | 27.89 | 390.0 | 199.0 | 29.85 |
| | 75 | 62 | 359.0 | 286.9 | 23.28 | 351.0 | 279.9 | 24.66 | 341.5 | 273.1 | 26.28 | 333.0 | 266.0 | 27.89 | 324.0 | 281.7 | 29.62 |
| | | 67 | 392.0 | 211.6 | 23.28 | 382.5 | 206.3 | 24.66 | 373.5 | 201.7 | 26.28 | 365.0 | 197.0 | 27.89 | 355.0 | 191.3 | 29.73 |
| | | 72 | 430.0 | 185.5 | 23.40 | 420.0 | 181.1 | 24.66 | 410.0 | 176.9 | 26.39 | 401.0 | 172.6 | 27.89 | 390.0 | 168.0 | 29.85 |
| WCP 420-D (12500) | 80 | 62 | 394.9 | 355.85 | 25.66 | 386.1 | 347.2 | 27.19 | 375.6 | 338.6 | 28.96 | 366.3 | 330.1 | 30.74 | 356.4 | 320.9 | 32.64 |
| | | 67 | 431.2 | 275.88 | 25.60 | **433.0** | **268.9** | **27.12** | 410.8 | 262.9 | 28.90 | 401.5 | 256.8 | 30.67 | 390.5 | 249.4 | 32.70 |
| | | 72 | 473 | 241.78 | 25.74 | 462.0 | 235.9 | 27.12 | 451.0 | 230.4 | 29.02 | 441.1 | 224.9 | 30.67 | 429.0 | 218.9 | 32.83 |
| | 75 | 62 | 394.9 | 315.59 | 25.60 | 386.1 | 307.8 | 27.12 | 375.6 | 300.41 | 28.90 | 366.3 | 292.6 | 30.67 | 356.4 | 309.8 | 32.58 |
| | | 67 | 431.2 | 232.76 | 25.60 | 420.7 | 226.9 | 27.12 | 410.8 | 221.87 | 28.90 | 401.5 | 216.7 | 30.67 | 390.5 | 210.4 | 32.70 |
| | | 72 | 473 | 204.05 | 25.74 | 462.0 | 199.2 | 27.12 | 451.0 | 194.59 | 29.029 | 441.1 | 189.86 | 30.67 | 429.0 | 184.8 | 32.83 |
| WCP 480-T (14500) | 80 | 62 | 467.3 | 420.2 | 30.30 | 456.0 | 409.9 | 32.10 | 444.8 | 399.9 | 34.20 | 433.5 | 389.7 | 36.30 | 421.5 | 378.9 | 38.55 |
| | | 67 | 510.8 | 326.5 | 30.30 | **498.0** | **318.2** | **32.10** | 486.8 | 311.1 | 34.20 | 475.5 | 303.9 | 36.30 | 462.0 | 295.2 | 38.70 |
| | | 72 | 561.0 | 286.1 | 30.45 | 547.5 | 279.2 | 32.10 | 534.8 | 272.7 | 34.35 | 522.0 | 266.2 | 36.30 | 507.8 | 259.0 | 38.85 |
| | 75 | 62 | 467.3 | 373.4 | 30.30 | 456.0 | 364.3 | 32.10 | 444.8 | 355.4 | 34.20 | 433.5 | 346.3 | 36.30 | 421.5 | 366.7 | 38.55 |
| | | 67 | 510.8 | 275.5 | 30.30 | 498.0 | 268.5 | 32.10 | 486.8 | 262.5 | 34.20 | 475.5 | 256.4 | 36.30 | 462.0 | 249.0 | 38.70 |
| | | 72 | 561.0 | 241.4 | 30.45 | 547.5 | 235.7 | 32.10 | 534.8 | 230.2 | 34.35 | 522.0 | 224.7 | 36.30 | 507.8 | 218.6 | 38.85 |
| WCP 500-D (15000) | 80 | 62 | 476.6 | 428.6 | 30.91 | 465.1 | 418.1 | 32.74 | 454.0 | 407.9 | 34.88 | 442.2 | 397.5 | 37.10 | 429.9 | 386.5 | 39.32 |
| | | 67 | 521 | 333.0 | 30.91 | **510.0** | **324.6** | **32.74** | 497.0 | 317.3 | 34.88 | 485.0 | 310.0 | 37.10 | 471.2 | 301.1 | 39.47 |
| | | 72 | 572.2 | 291.8 | 31.06 | 558.5 | 284.8 | 32.74 | 545.0 | 278.2 | 35.04 | 532.4 | 271.5 | 37.10 | 518.0 | 264.2 | 39.63 |
| | 75 | 62 | 476.6 | 380.9 | 30.91 | 465.1 | 371.6 | 32.74 | 454.0 | 362.5 | 34.88 | 442.2 | 353.2 | 37.10 | 429.9 | 374.0 | 39.32 |
| | | 67 | 521 | 281.0 | 30.91 | 508.0 | 273.9 | 32.74 | 497.0 | 267.8 | 34.88 | 485.0 | 261.5 | 37.10 | 471.2 | 254.0 | 39.47 |
| | | 72 | 572.2 | 246.2 | 31.06 | 558.5 | 240.4 | 32.74 | 545.0 | 234.8 | 35.04 | 532.4 | 229.2 | 37.10 | 518.0 | 223.0 | 39.63 |

**Note:**

Data at nominal conditions

TH= Total Capacity SH= Sensible Heat CFM= Air Flow Rate

MBH= 1000 Btu/Hr. KW= In put Power (For Compressor Only)

# 6. FAN PERFORMANCE DATA

| MODELS | CFM | MOTOR | EXTERNAL STATIC PRESSURE(Inch Wg) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0.0 | 0.2 | 0.4 | 0.6 | 0.8 | 1.0 | 1.2 | 1.4 | 1.6 | 1.8 | 2.0 | 2.2 |
| WCP040-S | 1100 | RPM | 430 | 480 | 605 | 700 | 795 | 870 | 940 | 1000 | 1040 | 1115 | 1170 | |
| | | BHP | 0.1 | 0.15 | 0.275 | 0.31 | 0.32 | 0.45 | 0.6 | 0.65 | 0.75 | 0.8 | 1.1 | |
| | 1200 | RPM | 470 | 520 | 650 | 740 | 830 | 910 | 980 | 1040 | 1100 | 1160 | 1220 | |
| | | BHP | 0.12 | 0.2 | 0.3 | 0.35 | 0.37 | 0.5 | 0.65 | 0.7 | 0.8 | 1 | 1.2 | |
| | 1400 | RPM | 510 | 580 | 690 | 785 | 870 | 950 | 1025 | 1090 | 1150 | 1210 | | |
| | | BHP | 0.15 | 0.25 | 0.35 | 0.38 | 0.42 | 0.6 | 0.65 | 0.75 | 0.9 | 1 | | |
| | 1600 | RPM | 550 | 630 | 740 | 830 | 920 | 1000 | 1075 | 1140 | 1200 | | | |
| | | BHP | 0.2 | 0.3 | 0.37 | 0.42 | 0.5 | 0.65 | 0.7 | 0.85 | 1 | | | |
| WCP050-S | 1200 | RPM | 470 | 520 | 650 | 740 | 830 | 910 | 980 | 1040 | 1100 | 1160 | 1220 | |
| | | BHP | 0.12 | 0.2 | 0.3 | 0.35 | 0.37 | 0.5 | 0.65 | 0.7 | 0.8 | 1 | 1.2 | |
| | 1400 | RPM | 510 | 580 | 690 | 785 | 870 | 950 | 1025 | 1090 | 1150 | 1210 | | |
| | | BHP | 0.15 | 0.25 | 0.35 | 0.38 | 0.42 | 0.6 | 0.65 | 0.75 | 0.9 | 1 | | |
| | 1600 | RPM | 550 | 630 | 740 | 830 | 920 | 1000 | 1075 | 1140 | 1200 | | | |
| | | BHP | 0.2 | 0.3 | 0.37 | 0.42 | 0.5 | 0.65 | 0.7 | 0.85 | 1 | | | |
| | 1800 | RPM | 590 | 640 | 765 | 855 | 945 | 1025 | 1090 | 1155 | 1210 | | | |
| | | BHP | 0.3 | 0.35 | 0.45 | 0.5 | 0.6 | 0.72 | 0.8 | 0.95 | 1.1 | | | |
| | 2000 | RPM | 610 | 670 | 785 | 875 | 960 | 1040 | 1105 | 1170 | 1230 | | | |
| | | BHP | 0.35 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 | 1 | 1.2 | | | |
| WCP060-S | 1600 | RPM | 550 | 630 | 740 | 830 | 920 | 1000 | 1075 | 1140 | 1200 | | | |
| | | BHP | 0.2 | 0.3 | 0.37 | 0.42 | 0.5 | 0.65 | 0.7 | 0.85 | 1 | | | |
| | 1800 | RPM | 590 | 640 | 765 | 855 | 945 | 1025 | 1090 | 1155 | 1210 | | | |
| | | BHP | 0.3 | 0.35 | 0.45 | 0.5 | 0.6 | 0.72 | 0.8 | 0.95 | 1.1 | | | |
| | 2000 | RPM | 625 | 710 | 810 | 895 | 975 | 1045 | 1115 | 1180 | 1240 | | | |
| | | BHP | 0.4 | 0.5 | 0.6 | 0.65 | 0.75 | 0.9 | 1 | 1.1 | 1.2 | | | |
| | 2200 | RPM | 660 | 750 | 845 | 935 | 1014 | 1080 | 1145 | | | | | |
| | | BHP | 0.5 | 0.8 | 0.7 | 0.8 | 0.9 | 1.1 | 1.2 | | | | | |
| | 2400 | RPM | 710 | 800 | 890 | 975 | 1050 | 1120 | 1190 | | | | | |
| | | BHP | 0.6 | 0.75 | 0.9 | 1 | 1.1 | 1.2 | 1.35 | | | | | |
| WCP080-S | 2000 | RPM | 625 | 710 | 810 | 895 | 975 | 1045 | 1115 | 1180 | 1240 | | | |
| | | BHP | 0.4 | 0.5 | 0.6 | 0.65 | 0.75 | 0.9 | 1 | 1.1 | 1.2 | | | |
| | 2200 | RPM | 660 | 750 | 845 | 935 | 1014 | 1080 | 1145 | | | | | |
| | | BHP | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 | 1.1 | 1.2 | | | | | |
| WCP080-D | 2400 | RPM | 710 | 800 | 890 | 975 | 1050 | 1120 | 1190 | | | | | |
| | | BHP | 0.6 | 0.75 | 0.9 | 1 | 1.1 | 1.2 | 1.35 | | | | | |
| | 2600 | RPM | 775 | 860 | 930 | 1035 | 1115 | 1190 | 1260 | | | | | |
| | | BHP | 0.75 | 0.25 | 0.95 | 1.1 | 1.2 | 1.3 | 1.4 | | | | | |
| | 2800 | RPM | 825 | 930 | 1025 | 1100 | 1180 | 1250 | | | | | | |
| | | BHP | 0.8 | 0.95 | 1.1 | 1.2 | 1.3 | 1.5 | | | | | | |
| WCP100-D | 2400 | RPM | 450 | 470 | 580 | 690 | 750 | 840 | 910 | 980 | 1040 | 1100 | 1150 | 1205 |
| | | BHP | 0.45 | 0.5 | 0.55 | 0.6 | 0.7 | 0.9 | 1.1 | 1.2 | 1.4 | 1.5 | 1.7 | 1.9 |
| | 2800 | RPM | 470 | 500 | 640 | 750 | 840 | 910 | 970 | 1040 | 1105 | 1165 | 1220 | 1260 |
| | | BHP | 0.48 | 0.55 | 0.6 | 0.65 | 0.8 | 1 | 1.15 | 1.35 | 1.5 | 1.65 | 1.8 | 2 |
| | 3200 | RPM | 500 | 550 | 690 | 815 | 918 | 950 | 1000 | 1070 | 1135 | 1200 | 1280 | 1310 |
| | | BHP | 0.52 | 0.6 | 0.65 | 0.7 | 0.9 | 1.1 | 1.3 | 1.5 | 1.6 | 1.8 | 2 | 2.2 |
| | 3600 | RPM | 520 | 590 | 725 | 840 | 940 | 990 | 1040 | 1110 | 1175 | 1235 | 1295 | 1340 |
| | | BHP | 0.54 | 0.7 | 0.75 | 0.8 | 1 | 1.2 | 1.4 | 1.6 | 1.75 | 2 | 2.2 | 2.4 |
| | 4000 | RPM | 545 | 600 | 740 | 855 | 960 | 1030 | 1080 | 1140 | 1210 | 1270 | 1320 | |
| | | BHP | 0.6 | 0.8 | 0.9 | 1 | 1.2 | 1.4 | 1.6 | 1.8 | 1.9 | 2.2 | 2.3 | |
| WCP120-D | 3000 | RPM | 490 | 525 | 665 | 785 | 880 | 930 | 985 | 1050 | 1120 | 1185 | 1240 | |
| | | BHP | 0.5 | 0.58 | 0.65 | 0.7 | 0.86 | 1 | 1.22 | 1.42 | 1.56 | 1.8 | 1.91 | |
| | 3400 | RPM | 510 | 570 | 710 | 830 | 930 | 970 | 1020 | 1090 | 1150 | 1220 | 1280 | |
| | | BHP | 0.53 | 0.65 | 0.72 | 0.85 | 0.92 | 1.15 | 1.3 | 1.65 | 1.72 | 1.9 | 2.1 | |
| | 3800 | RPM | 535 | 595 | 735 | 845 | 950 | 1005 | 1050 | 1130 | 1190 | 1250 | 1305 | |
| | | BHP | 0.57 | 0.75 | 0.85 | 0.92 | 1.1 | 1.4 | 1.5 | 1.7 | 1.82 | 2.1 | 2.25 | |
| | 4200 | RPM | 600 | 650 | 775 | 855 | 980 | 1040 | 1100 | 1160 | 1230 | 1290 | 1340 | |
| | | BHP | 0.7 | 0.8 | 1.1 | 1.25 | 1.35 | 1.5 | 1.6 | 1.6 | 2 | 2.3 | 2.4 | |
| | 4600 | RPM | 630 | 710 | 805 | 905 | 995 | 1060 | 1120 | 1120 | 1245 | 1305 | 1355 | |
| | | BHP | 0.8 | 0.9 | 1.15 | 1.3 | 1.45 | 1.65 | 1.8 | 1.8 | 2.2 | 2.6 | 2.9 | |
| WCP160-S | 4200 | RPM | 600 | 650 | 775 | 855 | 980 | 1040 | 1100 | 1160 | 1230 | 1290 | 1340 | |
| | | BHP | 0.7 | 0.8 | 1.1 | 1.25 | 1.35 | 1.5 | 1.6 | 1.8 | 2 | 2.3 | 2.4 | |
| | 4600 | RPM | 630 | 710 | 805 | 905 | 995 | 1060 | 1120 | 1180 | 1245 | 1305 | 1355 | |
| | | BHP | 0.8 | 0.9 | 1.1 | 1.2 | 1.45 | 1.65 | 1.8 | 1.95 | 2.2 | 2.6 | 2.9 | |
| WCP160-D | 5000 | RPM | 650 | 750 | 830 | 925 | 1015 | 1070 | 1140 | 1210 | 1280 | 1345 | | |
| | | BHP | 0.9 | 1 | 1.3 | 1.4 | 1.7 | 1.8 | 2 | 2.2 | 2.5 | 2.8 | | |
| | 5400 | RPM | 700 | 780 | 875 | 970 | 1060 | 1110 | 1185 | 1255 | 1320 | 1380 | | |
| | | BHP | 1.1 | 1.3 | 1.5 | 1.7 | 1.85 | 2 | 2.3 | 2.6 | 2.9 | 3.1 | | |
| | 5800 | RPM | 750 | 800 | 895 | 990 | 1075 | 1150 | 1220 | 1285 | 1350 | 1410 | | |
| | | BHP | 1.4 | 1.4 | 1.6 | 1.8 | 2 | 2.2 | 2.5 | 2.9 | 3.2 | 3.6 | | |

**See Note On Next Page**

# FAN PERFORMANCE DATA

| MODELS | CFM | MOTOR | EXTERNAL STATIC PRESSURE(Inch Wg) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0 | 0.2 | 0.4 | 0.6 | 0.8 | 1.0 | 1.2 | 1.4 | 1.6 | 1.8 | 2.0 | 2.2 |
| WCP200-D | 6200 | RPM | 475 | 510 | 550 | 590 | 650 | 695 | 745 | 790 | 835 | 870 | 900 | 930 |
| | | BHP | 1.6 | 2 | 2.3 | 2.4 | 2.6 | 2.8 | 3.4 | 3.8 | 4.1 | 4.6 | 5 | 5.3 |
| | 6700 | RPM | 490 | 530 | 570 | 630 | 680 | 720 | 770 | 810 | 850 | 885 | 920 | 950 |
| | | BHP | 1.8 | 2.2 | 2.4 | 2.6 | 2.9 | 3.2 | 3.7 | 4.2 | 4.7 | 4.9 | 5.3 | 5.6 |
| | 7200 | RPM | 510 | 545 | 590 | 640 | 700 | 735 | 785 | 825 | 860 | 895 | 940 | 970 |
| | | BHP | 2 | 2.4 | 2.7 | 2.9 | 3.1 | 3.5 | 4 | 4.5 | 4.8 | 5.1 | 5.5 | 5.8 |
| | 7700 | RPM | 540 | 575 | 635 | 685 | 720 | 760 | 800 | 845 | 890 | 925 | 960 | 995 |
| | | BHP | 2.5 | 2.8 | 3.1 | 3.2 | 3.5 | 4 | 4.5 | 4.9 | 5.2 | 5.4 | 5.8 | 6 |
| | 8200 | RPM | 580 | 610 | 670 | 720 | 760 | 780 | 830 | 870 | 910 | 940 | 980 | 1010 |
| | | BHP | 2.9 | 3.3 | 3.7 | 3.9 | 4.4 | 4.8 | 5 | 5.2 | 5.4 | 5.7 | 6.1 | 6.5 |
| WCP240-D | 7400 | RPM | 520 | 550 | 600 | 645 | 700 | 740 | 790 | 830 | 870 | 900 | 950 | 980 |
| | | BHP | 2 | 2.5 | 2.7 | 2.9 | 3.2 | 3.6 | 4.1 | 4.6 | 4.9 | 5.2 | 5.6 | 6 |
| | 7800 | RPM | 550 | 580 | 640 | 695 | 725 | 760 | 815 | 850 | 890 | 920 | 965 | 1000 |
| | | BHP | 2.6 | 2.9 | 3.1 | 3.3 | 3.6 | 4.2 | 4.5 | 5 | 5.2 | 5.5 | 5.9 | 6.2 |
| | 8200 | RPM | 590 | 615 | 675 | 725 | 760 | 780 | 835 | 875 | 910 | 945 | 990 | 1000 |
| | | BHP | 3 | 3.4 | 3.8 | 4 | 4.4 | 4.8 | 5 | 5.3 | 5.5 | 5.8 | 6.2 | 7.4 |
| | 8800 | RPM | 625 | 660 | 690 | 735 | 780 | 820 | 855 | 880 | 925 | 955 | 995 | 1050 |
| | | BHP | 3.5 | 3.9 | 4.4 | 4.7 | 5 | 5.5 | 5.8 | 6 | 6.4 | 6.7 | 7 | 7.4 |
| | 9400 | RPM | 650 | 690 | 720 | 760 | 805 | 845 | 875 | 900 | 940 | 975 | 1015 | 1050 |
| | | BHP | 4 | 4.5 | 5 | 5.3 | 5.6 | 6.2 | 6.5 | 6.8 | 7.2 | 7.6 | 7.8 | 8.2 |
| WCP320-D | 9000 | RPM | 496 | 550 | 605 | 660 | 700 | 720 | 750 | 780 | 810 | 870 | 900 | 940 |
| | | BHP | 1.9 | 2.1 | 2.4 | 3 | 3.4 | 3.6 | 4 | 4.5 | 5 | 5.5 | 5.8 | 6.3 |
| | 9700 | RPM | 500 | 565 | 620 | 670 | 720 | 740 | 780 | 810 | 830 | 890 | 920 | 960 |
| | | BHP | 2.1 | 2.4 | 2.8 | 3.4 | 3.8 | 4.2 | 4.8 | 5.3 | 5.7 | 6.4 | 6.8 | 7.4 |
| | 10500 | RPM | 500 | 585 | 640 | 695 | 750 | 770 | 810 | 850 | 880 | 920 | 960 | 980 |
| | | BHP | 2.1 | 2.9 | 3.4 | 3.9 | 4.4 | 4.9 | 5.5 | 6 | 6.5 | 7.3 | 7.8 | 8.4 |
| | 11200 | RPM | 530 | 600 | 670 | 725 | 775 | 810 | 850 | 870 | 905 | 945 | 980 | 1000 |
| | | BHP | 2.4 | 3.5 | 4 | 4.8 | 5.2 | 5.8 | 6.2 | 6.7 | 7.4 | 8.2 | 8.8 | 9.5 |
| | 12000 | RPM | 560 | 700 | 725 | 780 | 830 | 855 | 890 | 935 | 965 | 990 | 1030 | 1060 |
| | | BHP | 3 | 5 | 5.6 | 6.3 | 6.8 | 7.1 | 7.8 | 8.4 | 9.1 | 9.9 | 10.5 | 11 |
| WCP370-D | 10000 | RPM | 500 | 540 | 590 | 645 | 700 | 750 | 780 | 815 | 855 | 890 | 925 | 975 |
| | | BHP | 2 | 2.5 | 2.9 | 3.5 | 4 | 4.5 | 5 | 5.6 | 6.1 | 6.6 | 7.4 | 8 |
| | 11000 | RPM | 525 | 565 | 620 | 680 | 725 | 770 | 810 | 840 | 875 | 910 | 945 | 980 |
| | | BHP | 2.5 | 2.9 | 3.5 | 4 | 4.6 | 5 | 5.5 | 6.2 | 6.8 | 7.2 | 7.8 | 8.5 |
| | 12000 | RPM | 550 | 590 | 650 | 695 | 745 | 800 | 835 | 870 | 900 | 930 | 960 | 985 |
| | | BHP | 3 | 3.4 | 4.1 | 4.6 | 5.2 | 5.7 | 6.2 | 6.8 | 7.5 | 8 | 8.4 | 9.2 |
| | 13000 | RPM | 570 | 635 | 690 | 726 | 770 | 815 | 850 | 885 | 920 | 950 | 990 | 1010 |
| | | BHP | 3.6 | 4.1 | 4.8 | 5.4 | 6 | 6.5 | 7 | 7.6 | 8.2 | 9 | 9.9 | 10.5 |
| | 14000 | RPM | 590 | 660 | 705 | 735 | 790 | 840 | 865 | 900 | 945 | 975 | 1000 | 1040 |
| | | BHP | 4.2 | 4.8 | 5.5 | 6.2 | 6.6 | 7.2 | 7.9 | 8.3 | 9 | 9.8 | 10.4 | 10.8 |
| WCP420-D<br>WCP480-T<br>WCP500-D | 12000 | RPM | 550 | 590 | 650 | 695 | 745 | 800 | 835 | 870 | 900 | 930 | 960 | 985 |
| | | BHP | 3 | 3.4 | 4.1 | 4.6 | 5.2 | 5.7 | 6.2 | 6.8 | 7.5 | 8 | 8.4 | 9.2 |
| | 13000 | RPM | 570 | 635 | 690 | 726 | 770 | 815 | 850 | 885 | 920 | 950 | 990 | 1010 |
| | | BHP | 3.6 | 4.1 | 4.8 | 5.4 | 6 | 6.5 | 7 | 7.6 | 8.2 | 9 | 9.9 | 10.5 |
| | 14000 | RPM | 590 | 660 | 705 | 735 | 790 | 840 | 865 | 900 | 945 | 975 | 1015 | 1040 |
| | | BHP | 4.2 | 4.8 | 5.5 | 6.2 | 6.6 | 7.2 | 7.9 | 8.3 | 9 | 9.8 | 10.4 | 10.8 |
| | 15000 | RPM | 610 | 695 | 735 | 755 | 815 | 870 | 890 | 920 | 965 | 1000 | 1040 | 1070 |
| | | BHP | 4.8 | 5.5 | 6.2 | 6.9 | 7.2 | 7.7 | 8.6 | 8.9 | 9.7 | 10.6 | 10.9 | 11.3 |
| | 16000 | RPM | 630 | 730 | 770 | 790 | 845 | 890 | 930 | 945 | 990 | 1025 | 1070 | 1100 |
| | | BHP | 5.4 | 6.1 | 6.7 | 7.7 | 7.7 | 8.2 | 9.2 | 9.6 | 10.3 | 11.1 | 11.5 | 11.9 |

**Note**

Fan performance is based on wet coil and clean filter

RPM=Fan Speed

BHP=Brake Horse Power (minimum out put of motor)

shows operating range of factory supplied motor. Out of this range, change motor size.

# 7. CAPACITY CORRECTION FACTORS AND WORKING/TEST PRESSURES

**Condenser Fouling Factors**

The units are rated at 0.0005Ft2 .h. ° F/Btu

For other fouling factors, apply below Correction factors on cooling capacity and power input.

| Fouling factor | Capacity multiplier | Power multiplier |
|---|---|---|
| Clean | 1.03 | 1.01 |
| 0.00025 | 1.015 | 1.005 |
| 0.0005 | 1.00 | 1.00 |
| 0.001 | 0.97 | 0.99 |
| 0.002 | 0.92 | 0.97 |

**Altitude Correction Factors**

The unit capacities are rated at sea level. For areas above Sea level, apply below correction factors on cooling Capacity and power inputs.

| Altitude Ft. | Capacity multiplier | Power multiplier |
|---|---|---|
| 0 | 1.00 | 1.00 |
| 2000 | 0.99 | 1.01 |
| 4000 | 0.98 | 1.02 |
| 6000 | 0.97 | 1.03 |
| 8000 | 0.96 | 1.04 |
| 10000 | 0.95 | 1.05 |

**Range Correction Factors**

The unit capacities are rated at 10 °F water temp rise for other ranges, apply below correction factors on cooling capacities and power inputs

| Range °F | Capacity multiplier | Power multiplier |
|---|---|---|
| 8 | 0.985 | 0.994 |
| 10 | 1.00 | 1.00 |
| 12 | 1.015 | 1.006 |
| 14 | 1.03 | 1.012 |
| 16 | 1.04 | 1.02 |

**Working andTest Pressure**

| Condenser pressure | Refrigerant side | Water side |
|---|---|---|
| Max.working pressure | 300Psig | 70Psig |
| Test pressure | 450Psig | 100Psig |

| Evaporator pressure | Refrigerant side |
|---|---|
| Max.working pressure | 110Pasig |
| Test pressure | 250 Psig |

## CONDENSER WATER PRESSURE DROP (Feet of Water)

| Flow | MODELS WCP | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GPM | 040-S | 050-S | 060-S | 080 - S/D | 100-D | 120-D | 160-S | 160-D | 200-D | 240-D | 320-D | 370/420-D | 480T/500-D |
| 5 | 0.60 | | | | | | | | | | | | |
| 10 | 1.04 | 1.30 | 1.43 | 0.60 | | | | | | | | | |
| 15 | 1.52 | 1.90 | 2.09 | 0.82 | | | | | | | | | |
| 20 | 2.16 | 2.70 | 2.97 | 1.04 | 1.30 | 1.43 | | | | | | | |
| 25 | | 3.40 | 3.74 | 1.28 | 1.65 | 1.76 | 1.90 | 1.90 | | | | | |
| 30 | | 4.00 | 4.40 | 1.52 | 1.90 | 2.09 | 2.20 | 2.20 | | | | | |
| 35 | | | 5.06 | 1.85 | 2.20 | 2.53 | 2.50 | 2.50 | | | | | |
| 40 | | | | 2.16 | 2.70 | 2.97 | 2.90 | 2.90 | 1.40 | 1.54 | | | |
| 45 | | | | 2.45 | 3.15 | 3.36 | 3.30 | 3.30 | 1.70 | 1.87 | | | |
| 50 | | | | | 3.40 | 3.74 | 3.70 | 3.70 | 1.90 | 2.09 | 1.90 | | |
| 55 | | | | | 3.70 | 4.07 | 4.00 | 4.00 | 2.10 | 2.31 | 2.05 | | |
| 60 | | | | | 4.00 | 4.40 | 4.50 | 4.50 | 2.30 | 2.53 | 2.20 | 2.53 | |
| 65 | | | | | | 4.73 | 5.10 | 5.10 | 2.50 | 2.75 | 2.35 | 2.70 | |
| 70 | | | | | | | 5.80 | 5.80 | 2.90 | 3.19 | 2.50 | 2.88 | |
| 75 | | | | | | | 6.20 | 6.20 | 3.20 | 3.52 | 2.70 | 3.10 | 1.90 |
| 80 | | | | | | | 7.00 | 7.00 | 3.70 | 4.07 | 2.90 | 3.34 | 2.05 |
| 85 | | | | | | | | | 4.10 | 4.51 | 3.10 | 3.56 | 2.12 |
| 90 | | | | | | | | | 4.60 | 5.06 | 3.30 | 3.80 | 2.20 |
| 95 | | | | | | | | | | | 3.50 | 4.02 | 2.30 |
| 100 | | | | | | | | | | | 3.70 | 4.25 | 2.35 |
| 110 | | | | | | | | | | | 3.90 | 4.48 | 2.50 |
| 120 | | | | | | | | | | | | 4.73 | 2.90 |
| 130 | | | | | | | | | | | | 4.98 | 3.50 |
| 140 | | | | | | | | | | | | 5.23 | 4.10 |
| 150 | | | | | | | | | | | | | 4.60 |

# 6. ELECTRICAL DATA

| MODELS | COMPRESSOR(Each.) | | | | | | EVAPORATOR FAN MOTOR(Each.) | | | | TOTAL UNIT | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | HP | QTY | STARTING METHOD | RLA | FLA | LRA | MOTOR HP | QTY | RLA | FLA | RLA | FLA | MFA |
| **WCP040-S** | 4.0 | 1 | AL | 6.0 | 8.5 | 50 | 0.75 | 1 | 0.8 | 2.2 | 6.80 | 10.70 | 20.00 |
| **WCP050-S** | 5.0 | 1 | AL | 7.5 | 10.3 | 65 | 0.75 | 1 | 1.0 | 2.2 | 8.50 | 12.50 | 25.00 |
| **WCP060-S** | 6.0 | 1 | AL | 8.5 | 11.0 | 75 | 1 | 1 | 1.4 | 2.2 | 9.90 | 13.20 | 25.00 |
| **WCP080-D** | 4.0 | 2 | AL | 6.0 | 8.5 | 50 | 1 | 1 | 2.3 | 3.2 | 14.30 | 20.20 | 30.00 |
| **WCP080-S** | 8.0 | 1 | AL | 11.5 | 16.0 | 95 | 1 | 1 | 2.4 | 3.4 | 13.90 | 19.40 | 30.00 |
| **WCP100-D** | 5.0 | 2 | AL | 7.5 | 10.3 | 65 | 2 | 1 | 2.7 | 3.8 | 17.70 | 24.40 | 40.00 |
| **WCP120-D** | 6.0 | 2 | AL | 8.5 | 11.0 | 75 | 2 | 1 | 3.1 | 4.3 | 20.10 | 26.3 | 40.00 |
| **WCP160-S** | 16.0 | 1 | AL | 21.0 | 28.0 | 179 | 3 | 1 | 3.7 | 4.9 | 24.70 | 32.9 | 50.00 |
| **WCP160-D** | 8.0 | 2 | AL | 11.5 | 16.0 | 95 | 3 | 1 | 3.7 | 4.9 | 26.70 | 36.90 | 60.00 |
| **WCP200-D** | 10.0 | 2 | AL | 14.0 | 19.5 | 125 | 5 | 1 | 5.8 | 7.3 | 33.80 | 46.30 | 75.00 |
| **WCP240-D** | 12.0 | 2 | AL | 16.0 | 21.8 | 25 | 5 | 1 | 6.5 | 8.3 | 38.50 | 51.90 | 75.00 |
| **WCP320-D** | 16.0 | 2 | AL | 21.0 | 28.0 | 179 | 7.5 | 1 | 8.0 | 10.6 | 50.00 | 66.60 | 100.00 |
| **WCP370-D** | 21+16 | 2 | AL | 28+21 | 37+28 | 225+179 | 7.5 | 1 | 10.0 | 13.5 | 59.00 | 78.50 | 100.00 |
| **WCP420-D** | 21 | 2 | AL | 28.0 | 37.0 | 279 | 10 | 1 | 11.7 | 14.5 | 67.70 | 88.50 | 125.00 |
| **WCP480-T** | 16 | 3 | AL | 21.0 | 28.0 | 179 | 10 | 1 | 12.7 | 15.0 | 75.70 | 99.00 | 150.00 |
| **WCP500-D** | 25 | 2 | AL | 32.5 | 42.5 | 260 | 10 | 1 | 13.5 | 16.0 | 78.50 | 101.00 | 150.00 |

**Note:**

**AL** =Across the line starting
**MFA** =Max fuse amps
Rated power supply=415V-3PH-50HZ
Allowable voltage limit=360V to 415V

**RLA** =Rated load amps
**FLA** =Full load amps
**LRA** =Locked rotor amps

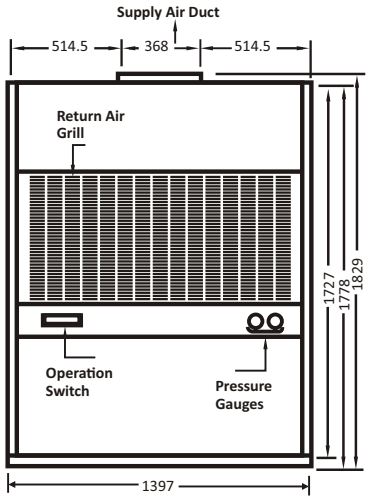
RLA values are at standard operating conditions(cond water in at 85°FDB(29.4°C) & evap air in at 80°FDB/67°FWB)
FLA values have been taken at maximum operating conditions cond water in at 100°F(38°C)
In multi compressors units,the compressor motors are starting sequence wise

**Due to continuous improvement in our products,** specs may change without notice

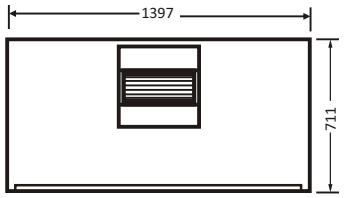
# 8. DIMENSIONAL DATA

## MODEL WCP 040-S, 050-S, 060-S, 080-S, 080-D

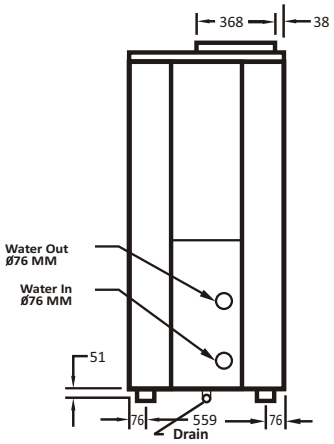
ALL DIMENSIONS IN MM




FRONT



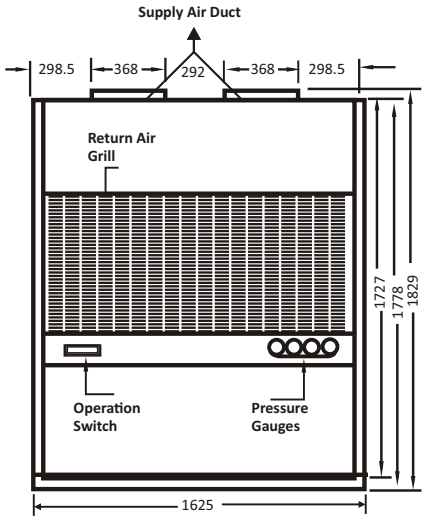

PLAN



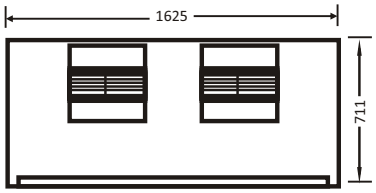

SIDE

## MODEL WCP 100-D, 120-D, 160-S, 160-D

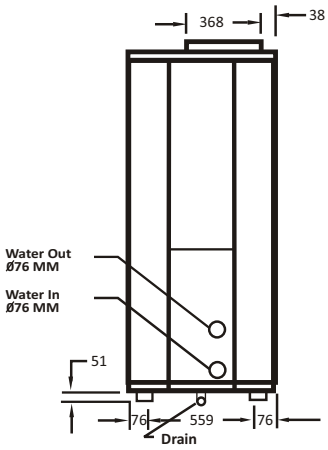
ALL DIMENSIONS IN MM




FRONT




PLAN

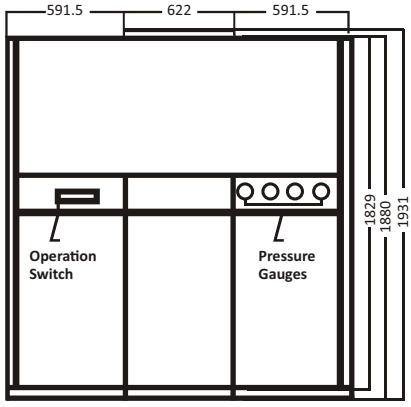



SIDE

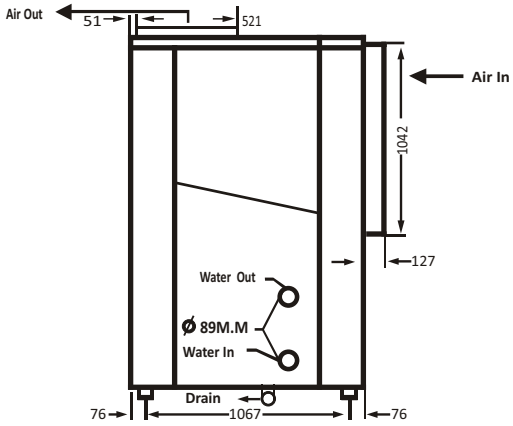
# DIMENSIONAL DATA

## MODEL WCP 200-D, 240-D

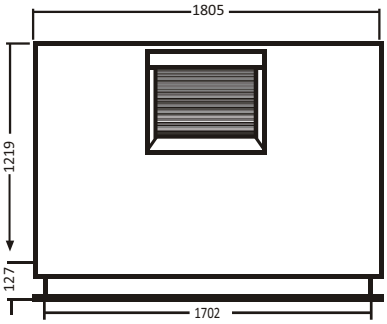
ALL DIMENSIONS IN MM




FRONT



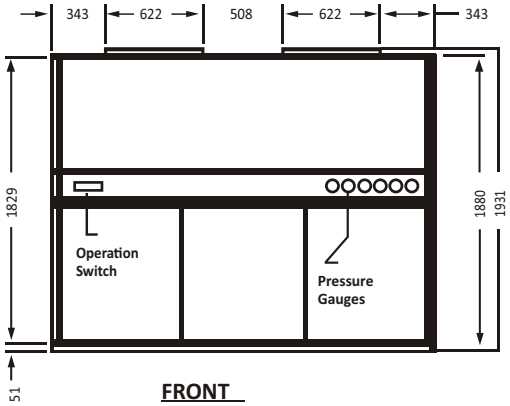

SIDE



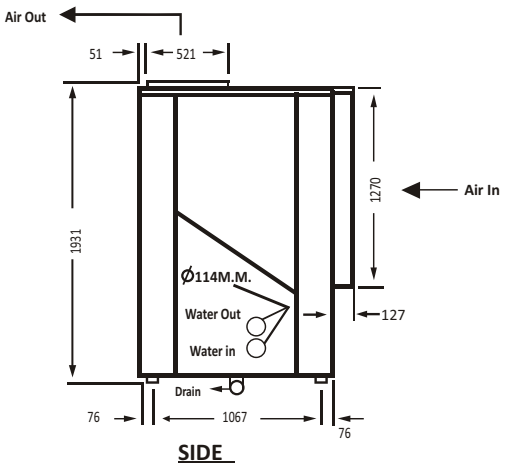

PLAN

## MODEL WCP 320-D, 370-D, 420-D, 480-T, 500-D

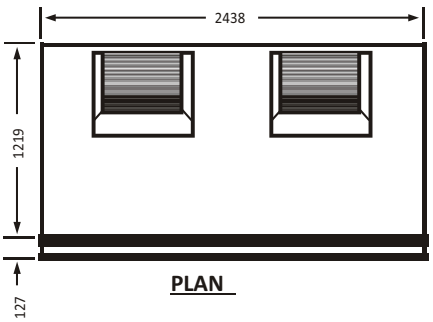
ALL DIMENSIONS IN MM




FRONT




SIDE




PLAN

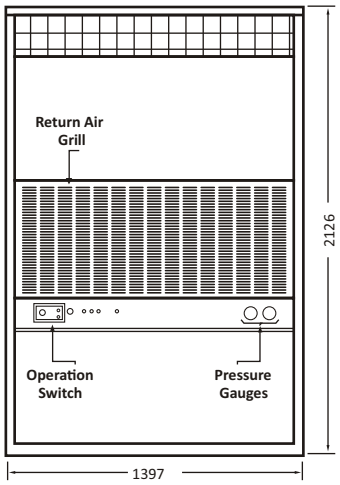
TOP DISCHARGE

WCP SERIES

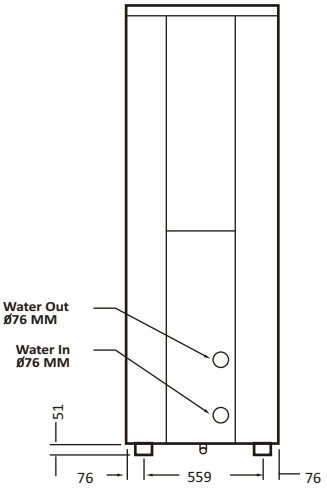
# DIMENSIONAL DATA

## MODEL WCP 040-S,050-S,060-S,080S, 080-D (VC)

ALL DIMENSIONS IN MM




FRONT



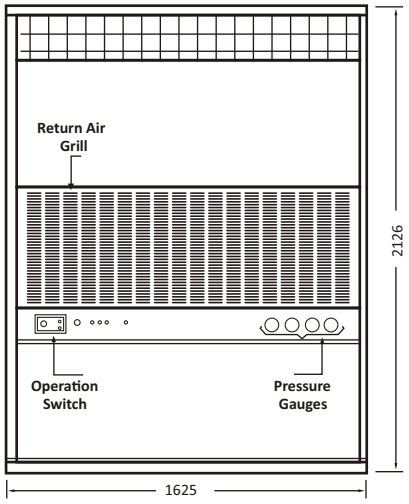

SIDE


PLAN

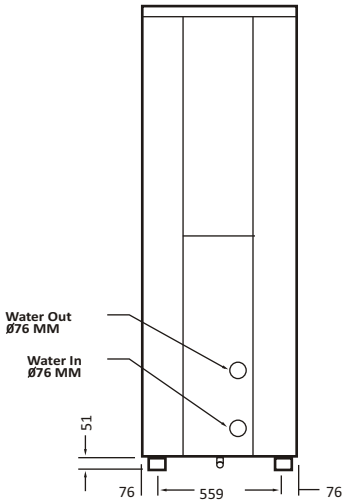
**Note: Unit with optional discharge plenum**

## MODEL WCP 100-D,120-D,160-S,160-D (VC)

ALL DIMENSIONS IN MM




FRONT




SIDE


PLAN

**Note: Unit with optional discharge plenum**

## NOTES

# CONVERSION TABLE

| Power | |
|---|---|
| kW = Kcal : 860 | Kcal = kW x 860 |
| kW = US ton of refrigeration : 0,284 | US ton of refrigeration = kW x 0,284 |
| kW = Btu / h : 3413 | Btu / h = kW x 3413 |
| Kcal / h = 1,163 W | W = kcal / h : 0.86 |
| US TR = 3,52 kW = 3024 kcal / h = 12000 Btu/ h | Btu / h = kcal / h : 0,252 = 0,00029311kW |
| kW = 860 kcal / h = 0,284 US TR | |
| **Temperature** | |
| C = (°F - 32) : 1.8 | °F = (°Cx 1.8) + 32 |
| **Pressure** | |
| I bar = 100 kPa = 14,5 psig = 1,01972 kgf / cm2 | 1 psig = 0,068948 bar = 0,070307 kgf / cm2 = 6,8948 kPa |

| Conversion Factors | | | |
|---|---|---|---|
| To Convert | From | To | Multiply By |
| Length | cm | inch | 0.3937 |
| | cm | metre | 0.01 |
| | feet | cm | 30.48 |
| | feet | metre | 0.3048 |
| | metre | cm | 100 |
| | metre | feet | 3.281 |
| | metre | inch | 39.37 |
| | metre | km | 0.001 |
| | mm | cm | 0.1 |
| | mm | inch | 0.03937 |
| Area | sq ft | sq m | 0.0929 |
| | sq in | sq cm | 65.4516 |

| Mass | | | |
|---|---|---|---|
| | Foot pound | BTU | $1.286x10^{-3}$ |
| | Foot pound | horsepower/hr | $5.050x10^{-7}$ |
| | Foot pound | kilogram calories | $3.241x10^{-4}$ |
| | Foot pound | kilogram metre | 0.1383 |
| | Foot pound | kilowatt/hr | $3.766x10^{-7}$ |
| | kgs/sq cm | atmosphere | 0.9678 |
| | kgs/sq cm | in of mercury | 28.96 |
| | kgs/sq cm | ibs/sq ft | 2048 |

| Temperature | | | |
|---|---|---|---|
| | Temp (°C) + 273 | Abs temp (°C) | 1 |
| | Temp (°C) + 17.78 | Temp (°F) | 1.8 |
| | Temp (°F) +460 | Abs temp(°F) | 1 |
| | Temp (°F) -32 | Temp (°C) | 5/9 |

| Pressure | | | |
|---|---|---|---|
| | atmosphere | cm of mercury | 76 |
| | atmosphere | in of mercury | 29.92 |
| | atmosphere | kg/sq cm | 1.0333 |
| | atmosphere | kpa | 101.325 |
| | BTU | kg calories | 0.252 |
| | BTU | horsepower/h | $3.927x\ 10^{4}$ |
| | BTU | kilowatt/hr | $2.928x10^{4}$ |
| | in of mercury | atmoshpere | 0.03342 |
| | in of mercury | kg/sq cm | 0.3453 |
| | in of mercury | ib/sq ft | 70.73 |

| Power/ Energy | | | |
|---|---|---|---|
| | horse-power | BTU/min | 42.44 |
| | horse-power | kg calories/min | 10.7 |
| | horse-power | kilowatts | 0.7457 |
| | horse-power | watts | 745.7 |
| | horse-power (boiler) | BTU/hr | 33.479 |
| | horse-power (boiler) | kilowatts | 9.803 |
| | kilowatts | BTU/min | 56.92 |
| | kilowatts | foot lb/min | $4.425x10^{4}$ |
| | kilowatts | horse-power | 1.341 |
| | kilowatts | kg calories/min | 14.34 |
| | kilowatts | watts | 1000 |
| | kilowatts-hrs | BTU | 3415 |
| | kilowatts-hrs | foot lbs | $2.665x10^{6}$ |
| | kilowatts-hrs | horse-power hrs | 1.341 |
| | kilowatts-hrs | kilogram calories | 860.5 |
| | kilowatts-hrs | kilogram metres | $3.671x10^{6}$ |
| | watts | BTU/min | 0.05692 |
| | watts | foot lb/min | 44.26 |
| | watts | foot lb/sec | 0.7376 |
| | watts | horse-power | $1.341x10^{-3}$ |
| | watts | kg calories/min | 0.01434 |
| | watts | kilowatts | 10-3 |
| | watts-hrs | BTU | 3.415 |
| | watts-hrs | foot lb | 2655 |
| | watts-hrs | horse-power/hr | $1.341x10^{-3}$ |
| | watts-hrs | kilogram calories | 0.8605 |
| | watts-hrs | kilogram metres | 367.1 |
| | watts-hrs | kilowatts hrs | 310-3 |

# Sabro Airconditioning

Inspired by the 'stimulus to grow' through knowledge, interlaced with the zeal and sheer commitment of an enthusiastic team and gripped by the obsession of three brothers of turning the dream-into reality, **Sabro** has evolved, grown and expanded **since its inception in 1969.**

**For over five decades, Sabro has been a trusted brand name** that has exceeded expectations nationwide & internationally, catering to the needs of both domestic as well international customers.

Sabro

Made In
PAKISTAN

Since 1969


Contact information:
contact@sabro.com.pk
Sabro Head Office:
#77/78, St: 10, I-9/2, Islamabad
+92 51 4433006
www.sabrotechnology.com


C_WCP_24-01