

# WORKING PRINCIPLE AND STRUCTURE

## Control Power Supply and Unit Electrical Enclosure

The CKBK unit electrical panel is designed to contain oil pump starter together with the control system in single enclosure for the ease of installation. The enclosure is NEMA 1 rated for indoor installation.

Design with single power termination point (3-phase power supply) to provide power supply for oil pump, oil heater(s) and controls. Step down transformer is built-in to step down the main voltage to the required control voltage.



Power consumption of oil heater and oil pump are as below.

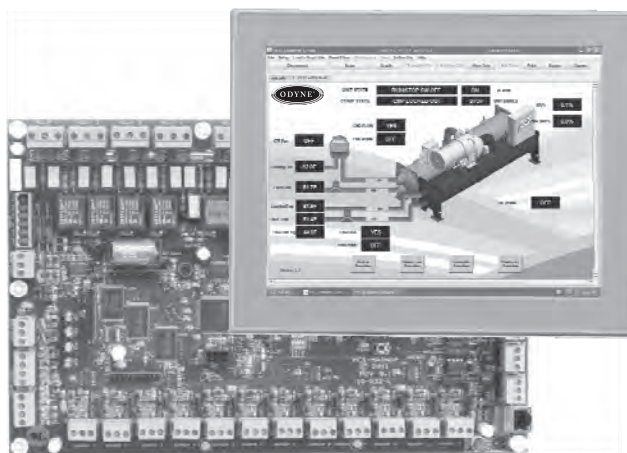
| Item       | Input Power kW |
|------------|----------------|
| Oil Heater | 1.0            |
| Oil Pump   | 1.5            |

The 3-phase power supply to the control panel can be any of below.

| Frequency of Power Supply | Voltage of Power Supply      |
|---------------------------|------------------------------|
| 50Hz                      | 380V; 400V; 415V             |
| 60Hz                      | 208V; 230V; 380V; 460V; 575V |

## Director Control System

CKBK series adopt the state of art **DIRECTOR** CCK (Direct Digital Control) control system which is proven for its reliability. ' **Smart logic** ' control theory is used in the CCK control system, through measurement of key parameters and the rate at which they change, the control system will anticipate operation trend and ensure the accurate stable and optimal control of the chiller.



**DIRECTOR** in the CKBK chiller is complete with RS485 communications port and all hardware and software necessary to remotely monitor and control the packaged chiller up to 1500m away (hard wired).

This valuable enhancement to the chiller system allows the ultimate in serviceability. **DIRECTOR** as standard is additionally equipped with history files which may be used to take logs which would be retrievable. This feature provides owners of multiple buildings with a simple and inexpensive method of investigating potential problems quickly and in a highly effective manner.

**DIRECTOR** is equipped with RS485 and Ethernet communication ports as standard. This user friendly design allows Building Management System (BMS) to interface directly with the chiller via either of Modbus RTU, Modbus IP, or BACnet IP communication protocol. LONworks or BACnet MSTP communication protocol can be established with installation of external adapter

**DIRECTOR** is equipped with 15.4" Touch Screen Color Display Panel as the user interface. This user friendly graphical interface providing following:

- Adjustment of chiller operation set point
- Real time inspection and supervising of chiller operation status
- Real time failure inspection
- Historical operation data storage

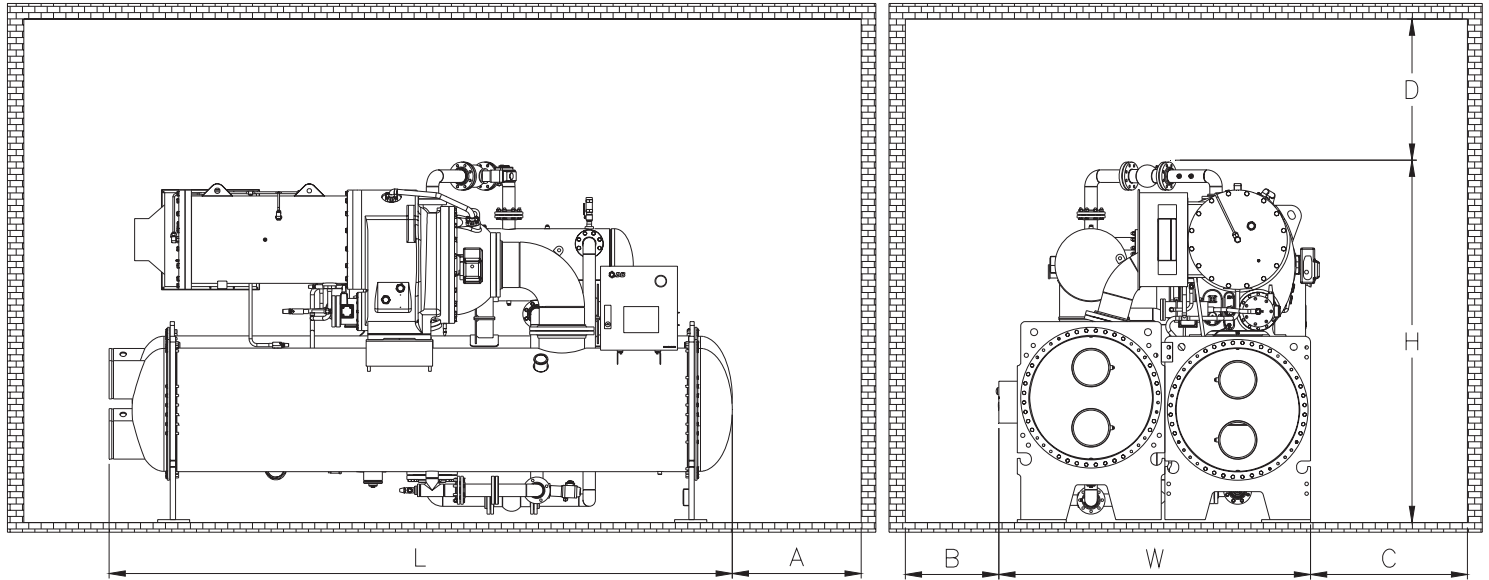
The screen displays parameters of chiller operation and to achieve constant monitoring. The start-stop and automatic control procedures can be adjusted, user can access the unit status and reliable start, stop, adjustable operation automatically through simply click on the button.

In addition, user can switch automatic and manual control mode easily. System has protection and malfunction used to ensure safe chiller operation, and it can retain record of up to 99 items of failure parameters for investigation. If the unit operation failed, the control system can carry out an initial diagnosis, indicating the possible cause of the malfunction automatically.

# CHILLER DIMENSIONS

## CKBKC Dimensions And Service Clearance

### CKBKC Dimensions And Service Clearance



#### Notes:

1. The above drawings show general construction of a CKBKC chiller with reference to chiller configuration published in **PRODUCT SPECIFICATIONS CKBKC Chiller Selection Sample**.
2. Chiller dimensions (W- width, L – Length, H – Height) can be refer from the same section with reference to unit dimensions as per selection sample published.
3. Recommended service clearance:  
Maintenance space (A) – 3400mm [134"] (CKBKC850 and below); 3800mm [150"] (CKBKC900 and above)  
Maintenance space (B) – 375mm [15"]  
Maintenance space (C) – 635mm [25"]  
Overhead service clearance (D) – 1350mm [53"]
4. The above constructions and dimensions are based on standard water side design pressure of 150PSIG [10.3BAR], with 2-pass evaporator and condenser.
5. Service access should be provided in accordance with American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) 15, latest edition, National Fire Protection Association (NFPA) 70, and local safety code.
6. Compressor motor starter panel is not shown in this drawing.
7. Certified drawings available upon request. Drawings included in this section are for preliminary layout purposes only. Detailed certified drawings are available from the local ODYNE® sales office. Do not use these input for final construction drawings.

# PRODUCT SPECIFICATIONS

## CKBKC Chiller Specifications (Typical)

|           |           |           |           |           |           |           |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| CKBKC500  | CKBKC550  | CKBKC600  | CKBKC650  | CKBKC700  | CKBKC750  | CKBKC800  |
| CKBKC900  | CKBKC950  | CKBKC1000 | CKBKC1100 | CKBKC1200 | CKBKC1300 | CKBKC1400 |
| CKBKC1500 | CKBKC1600 | CKBKC1700 | CKBKC1800 | CKBKC1900 | CKBKC2000 | CKBKC2100 |
| CKBKC2200 | CKBKC2300 | CKBKC2400 | CKBKC2500 |           |           |           |

| Model CKBKC              |                  | 500    | 550    | 600    | 650    | 700    | 750    | 800    | 850    | 900    | 950    | 1000   | 1100   | 1200   |
|--------------------------|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| UNIT PERFORMANCE         |                  |        |        |        |        |        |        |        |        |        |        |        |        |        |
| Nominal Cooling Capacity | TR               | 500    | 550    | 600    | 650    | 700    | 750    | 800    | 850    | 900    | 950    | 1000   | 1100   | 1200   |
|                          | kW               | 1759   | 1934   | 2110   | 2286   | 2462   | 2638   | 2814   | 2989   | 3165   | 3341   | 3517   | 3869   | 4220   |
| Nominal Power Input      | kW               | 267    | 288.5  | 315.5  | 335.3  | 367.3  | 394.3  | 420.6  | 442.0  | 467.5  | 496.8  | 519.5  | 579.00 | 628.80 |
| Energy Efficiency        | kW/TR            | 0.534  | 0.524  | 0.526  | 0.516  | 0.525  | 0.526  | 0.526  | 0.520  | 0.519  | 0.523  | 0.519  | 0.526  | 0.524  |
|                          | COP              | 6.59   | 6.71   | 6.69   | 6.82   | 6.70   | 6.69   | 6.69   | 6.76   | 6.78   | 6.72   | 6.77   | 6.69   | 6.71   |
| IPLV                     | kW/TR            | 0.49   | 0.50   | 0.49   | 0.48   | 0.49   | 0.49   | 0.49   | 0.49   | 0.49   | 0.49   | 0.49   | 0.51   | 0.50   |
|                          | COP              | 7.18   | 7.03   | 7.18   | 7.33   | 7.18   | 7.18   | 7.18   | 7.18   | 7.18   | 7.18   | 7.18   | 6.90   | 7.03   |
| EVAPORATOR               |                  |        |        |        |        |        |        |        |        |        |        |        |        |        |
| Flow Rate                | Usgpm            | 1195.7 | 1315.3 | 1434.9 | 1554.5 | 1674.0 | 1793.6 | 1913.2 | 2032.8 | 2152.3 | 2271.9 | 2391.5 | 2630.6 | 2869.8 |
|                          | L/S              | 75.33  | 82.86  | 90.40  | 97.93  | 105.46 | 113.00 | 120.53 | 128.07 | 135.59 | 143.13 | 150.66 | 165.73 | 180.80 |
| Pressure Drop            | ft.wg            | 19.0   | 22.4   | 15.8   | 16.1   | 18.4   | 16.1   | 16.4   | 22.9   | 22.9   | 25.2   | 26.8   | 25.7   | 25.8   |
|                          | kPa              | 56.8   | 66.9   | 47.2   | 48.1   | 55.0   | 48.1   | 49.0   | 68.4   | 68.4   | 75.3   | 80.1   | 76.8   | 77.1   |
| Water Connection         | Victaulic (inch) | 8      | 8      | 8      | 8      | 8      | 10     | 10     | 10     | 10     | 10     | 12     | 12     | 12     |
|                          | Flange           | DN200  | DN200  | DN200  | DN200  | DN200  | DN250  | DN250  | DN250  | DN250  | DN250  | DN300  | DN300  | DN300  |
| Number of Passes         |                  | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 2      |
| CONDENSER                |                  |        |        |        |        |        |        |        |        |        |        |        |        |        |
| Flow Rate                | Usgpm            | 1491.8 | 1641.0 | 1790.2 | 1939.4 | 2088.6 | 2237.7 | 2386.9 | 2536.1 | 2685.3 | 2834.5 | 2983.6 | 3282.0 | 3580.4 |
|                          | L/S              | 94.12  | 103.5  | 112.9  | 122.4  | 131.8  | 141.2  | 150.6  | 160.0  | 169.4  | 178.8  | 188.2  | 207.06 | 225.89 |
| Pressure Drop            | ft.wg            | 24.5   | 23.9   | 20.2   | 20.2   | 23.0   | 20.2   | 20.3   | 25.6   | 28.3   | 31.1   | 25.7   | 30.4   | 30.0   |
|                          | kPa              | 73.2   | 71.4   | 60.4   | 60.4   | 68.7   | 60.4   | 60.7   | 76.5   | 84.6   | 93.0   | 76.8   | 90.9   | 89.67  |
| Water Connection         | Victaulic (inch) | 10     | 10     | 10     | 10     | 10     | 10     | 10     | 10     | 10     | 10     | 12     | 12     | 12     |
|                          | Flange           | DN250  | DN250  | DN250  | DN250  | DN250  | DN250  | DN250  | DN250  | DN250  | DN250  | DN300  | DN300  | DN300  |
| Number of Passes         |                  | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 2      |
| GENERAL                  |                  |        |        |        |        |        |        |        |        |        |        |        |        |        |
| Length (L)               | inch             | 174.1  | 174.1  | 174.1  | 174.1  | 174.1  | 174.7  | 174.7  | 195.2  | 195.2  | 195.2  | 199.4  | 199.4  | 199.4  |
|                          | mm               | 4420   | 4420   | 4420   | 4420   | 4420   | 4440   | 4440   | 4960   | 4960   | 4960   | 5070   | 5070   | 5070   |
| Width (W)                | inch             | 78.5   | 78.5   | 78.5   | 78.5   | 78.5   | 82.5   | 82.5   | 82.5   | 82.5   | 82.5   | 95.5   | 95.5   | 95.5   |
|                          | mm               | 1990   | 1990   | 1990   | 1990   | 1990   | 2100   | 2100   | 2100   | 2100   | 2100   | 2430   | 2430   | 2430   |
| Height (H)               | inch             | 100.0  | 100.0  | 100.0  | 100.0  | 100.0  | 102.0  | 102.0  | 102.0  | 102.0  | 102.0  | 115.4  | 116.9  | 116.9  |
|                          | mm               | 2540   | 2540   | 2540   | 2540   | 2540   | 2590   | 2590   | 2590   | 2590   | 2590   | 2930   | 2970   | 2970   |
| Shipping Weight          | lbs              | 19985  | 20205  | 21197  | 21528  | 21528  | 22851  | 23182  | 24291  | 24548  | 24553  | 29355  | 32534  | 33830  |
|                          | kg               | 9065   | 9165   | 9615   | 9765   | 9765   | 10365  | 10515  | 11018  | 11135  | 11137  | 13315  | 14757  | 15345  |
| Operating Weight         | lbs              | 23539  | 23847  | 25380  | 25955  | 25955  | 27886  | 28431  | 30075  | 30450  | 30455  | 36427  | 39919  | 41692  |
|                          | kg               | 10677  | 10817  | 11512  | 11773  | 11733  | 12649  | 12896  | 13642  | 13812  | 13814  | 16523  | 18107  | 18911  |
| R134a Charge (Approx.)   | lbs              | 1451   | 1451   | 1605   | 1706   | 1706   | 1874   | 1942   | 2205   | 2253   | 2253   | 2646   | 2789   | 2959   |
|                          | kg               | 658    | 658    | 728    | 774    | 774    | 850    | 881    | 1000   | 1022   | 1022   | 1200   | 1265   | 1342   |

| Model CKBKC              |                  | 1300   | 1400   | 1500   | 1600   | 1700   | 1800   | 1900   | 2000   | 2100   | 2200   | 2300   | 2400   | 2500   |
|--------------------------|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| UNIT PERFORMANCE         |                  |        |        |        |        |        |        |        |        |        |        |        |        |        |
| Nominal Cooling Capacity | TR               | 1300   | 1400   | 1500   | 1600   | 1700   | 1800   | 1900   | 2000   | 2100   | 2200   | 2300   | 2400   | 2500   |
|                          | kW               | 4572   | 4924   | 5276   | 5627   | 5979   | 6331   | 6682   | 7034   | 7386   | 7737   | 8089   | 8441   | 8793   |
| Nominal Power Input      | kW               | 672.3  | 728.3  | 771.6  | 823.9  | 875.6  | 919.4  | 972.1  | 1027.9 | 1051.8 | 1101.9 | 1138.0 | 1195.3 | 1244.4 |
| Energy Efficiency        | kW/TR            | 0.517  | 0.520  | 0.514  | 0.51   | 0.51   | 0.51   | 0.51   | 0.51   | 0.50   | 0.50   | 0.49   | 0.50   | 0.50   |
|                          | COP              | 6.80   | 6.76   | 6.84   | 6.90   | 6.90   | 6.90   | 6.90   | 6.90   | 7.03   | 7.03   | 7.18   | 7.03   | 7.03   |
| IPLV                     | kW/TR            | 0.49   | 0.50   | 0.49   | 0.46   | 0.46   | 0.46   | 0.46   | 0.46   | 0.45   | 0.45   | 0.44   | 0.45   | 0.44   |
|                          | COP              | 7.18   | 7.03   | 7.18   | 7.65   | 7.65   | 7.65   | 7.65   | 7.65   | 7.82   | 7.82   | 7.99   | 7.82   | 7.99   |
| EVAPORATOR               |                  |        |        |        |        |        |        |        |        |        |        |        |        |        |
| Flow Rate                | Usgpm            | 3108.9 | 3348.1 | 3587.2 | 3826.4 | 4065.5 | 4304.7 | 4543.8 | 4783.0 | 5022.1 | 5261.3 | 5500.4 | 5739.5 | 5978.7 |
|                          | L/S              | 195.86 | 210.93 | 225.99 | 241.41 | 256.49 | 271.58 | 286.67 | 301.76 | 316.85 | 331.94 | 347.02 | 362.11 | 377.20 |
| Pressure Drop            | ft.wg            | 23.5   | 26.8   | 26.3   | 24.7   | 22.1   | 24.4   | 22.3   | 24.3   | 20.7   | 19.5   | 21.0   | 19.8   | 21.3   |
|                          | kPa              | 70.2   | 80.1   | 78.6   | 73.8   | 66.1   | 72.9   | 66.7   | 72.6   | 61.9   | 58.3   | 62.8   | 59.2   | 63.7   |
| Water Connection         | Victaulic (inch) | 14     | 14     | 14     | 16     | 16     | 16     | 16     | 16     | 18     | 18     | 18     | 18     | 18     |
|                          | Flange           | DN350  | DN350  | DN350  | DN400  | DN400  | DN400  | DN400  | DN400  | DN450  | DN450  | DN450  | DN450  | DN450  |
| Number of Passes         |                  | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 2      |
| CONDENSER                |                  |        |        |        |        |        |        |        |        |        |        |        |        |        |
| Flow Rate                | Usgpm            | 3878.7 | 4143.1 | 4439.0 | 4773.8 | 5072.2 | 5370.6 | 5668.9 | 5967.3 | 6214.6 | 6510.5 | 6806.4 | 7102.4 | 7398.3 |
|                          | L/S              | 244.71 | 261.39 | 280.06 | 301.18 | 320.01 | 338.83 | 357.65 | 376.48 | 392.08 | 410.75 | 429.42 | 448.09 | 466.76 |
| Pressure Drop            | ft.wg            | 27.9   | 27.2   | 30.7   | 29.0   | 32.2   | 28.7   | 31.5   | 29.8   | 27.4   | 29.8   | 27.2   | 29.3   | 26.9   |
|                          | kPa              | 83.4   | 81.3   | 91.8   | 86.7   | 96.2   | 85.8   | 94.2   | 89.1   | 81.9   | 89.1   | 81.3   | 87.6   | 80.4   |
| Water Connection         | Victaulic (inch) | 14     | 14     | 14     | 16     | 16     | 16     | 16     | 16     | 20     | 20     | 20     | 20     | 20     |
|                          | Flange           | DN350  | DN350  | DN350  | DN400  | DN400  | DN400  | DN400  | DN400  | DN500  | DN500  | DN500  | DN500  | DN500  |
| Number of Passes         |                  | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 2      |
| GENERAL                  |                  |        |        |        |        |        |        |        |        |        |        |        |        |        |
| Length (L)               | inch             | 201.9  | 201.9  | 201.9  | 209.06 | 209.06 | 209.06 | 209.06 | 209.06 | 217.72 | 217.72 | 217.72 | 217.72 | 217.72 |
|                          | mm               | 5130   | 5130   | 5130   | 5310   | 5310   | 5310   | 5310   | 5310   | 5530   | 5530   | 5530   | 5530   | 5530   |
| Width (W)                | inch             | 110.2  | 110.2  | 110.2  | 122.05 | 122.05 | 122.05 | 122.05 | 122.05 | 144.09 | 144.09 | 144.09 | 144.09 | 144.09 |
|                          | mm               | 2800   | 2800   | 2800   | 3100   | 3100   | 3100   | 3100   | 3100   | 3660   | 3660   | 3660   | 3660   | 3660   |
| Height (H)               | inch             | 119.0  | 119.0  | 119.0  | 125.39 | 125.39 | 125.39 | 125.39 | 125.39 | 137.60 | 137.60 | 137.60 | 137.60 | 137.60 |
|                          | mm               | 3010   | 3010   | 3010   | 3185   | 3185   | 3185   | 3185   | 3185   | 3495   | 3495   | 3495   | 3495   | 3495   |
| Shipping Weight          | lbs              | 38797  | 39238  | 39727  | 48378  | 48923  | 49712  | 50283  | 51019  | 59926  | 60543  | 61458  | 62098  | 62891  |
|                          | kg               | 17598  | 17798  | 18020  | 21944  | 22191  | 22549  | 22808  | 23142  | 27182  | 27462  | 27877  | 28167  | 28527  |
| Operating Weight         | lbs              | 48387  | 49011  | 49842  | 60045  | 61088  | 62322  | 63383  | 64461  | 75674  | 76767  | 78141  | 79256  | 80522  |
|                          | kg               | 21948  | 22231  | 22608  | 27236  | 27709  | 28269  | 28750  | 29239  | 34325  | 34821  | 35444  | 35950  | 36524  |
| R134a Charge (Approx.)   | lbs              | 3287   | 3287   | 3474   | 3915   | 4125   | 4222   | 4427   | 4502   | 5229   | 5428   | 5527   | 5728   | 5831   |
|                          | kg               | 1491   | 1491   | 1576   | 1776   | 1871   | 1915   | 2008   | 2042   | 2372   | 2462   | 2507   | 2598   | 2645   |

Notes:

- The units are rated in accordance with AHRI Standard 550/590. The above data are rated with following conditions:  
Chilled Water Inlet/Outlet Temperature 54/44°F [12.2/6.7°C]; Cooling Water Inlet/Outlet Temperature 85/94.3°F [29.4/34.6°C]; Evaporator fouling factor 0.0001hr.ft².°F/Btu [0.000018 m².°C/W]; Condenser fouling factor 0.00025 hr.ft².°F/Btu [0.0000144 m².°C/W]; 2-pass evaporator and condenser.
- The Sample Specification above is for reference only. With variety of main components combination, the same cooling capacity can have many different models. Contact local ODYNE® office to choose the appropriate chiller for the User's practical requirements.
- Dimensions lengths, width, height in mm are rounded to closest zero.