

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.

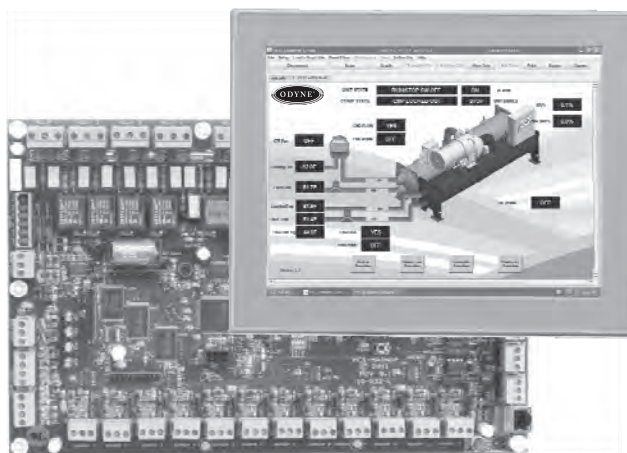
Item	Input Power kW
Oil Heater	1.0
Oil Pump	1.5

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:

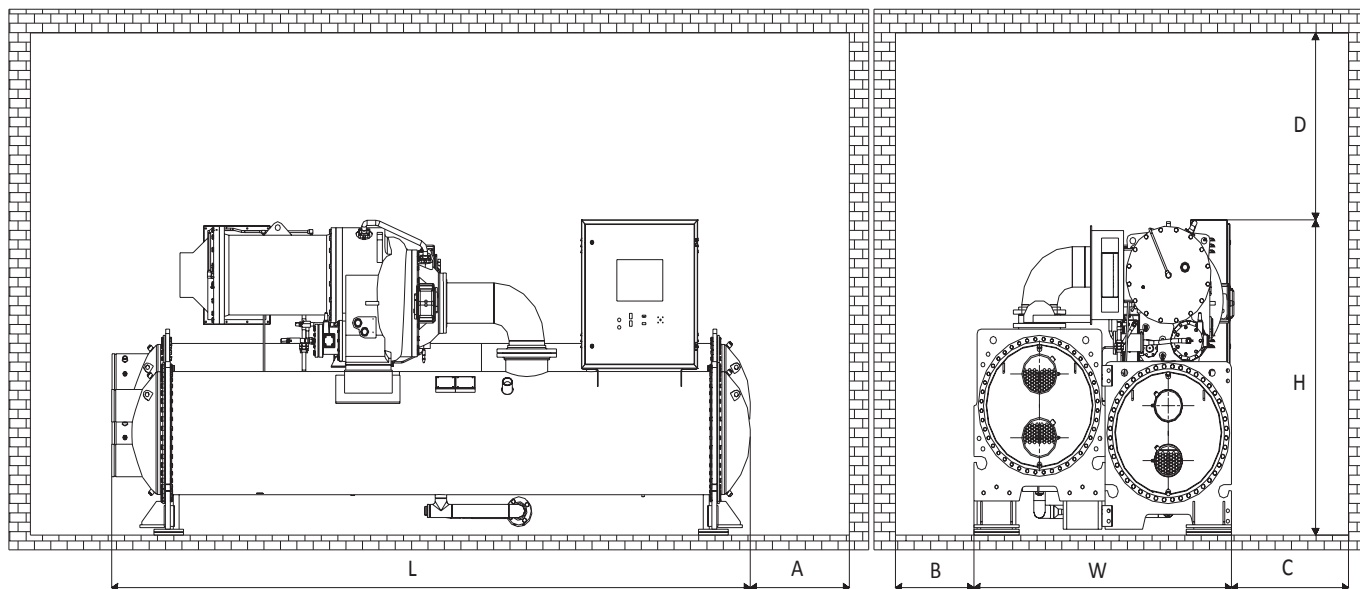
- Adjustment of chiller operation set point
- Real time inspection and supervising of chiller operation status
- Real time failure inspection
- Historical operation data storage

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

CKBK Dimensions And Service Clearance



Notes:

1. The above drawings show general construction of a CKBK chiller with reference to chiller configuration published in PRODUCT SPECIFICATIONS– *CKBK 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) – 3800mm [150"] (CKBK800 and below); 4300mm [169"] (CKBK850 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

CKBK Chiller Specifications (Typical)

CKBK300	CKBK350	CKBK400	CKBK450	CKBK500	CKBK550	CKBK600	CKBK650	CKBK700	CKBK750
CKBK800	CKBK850	CKBK900	CKBK950	CKBK1000	CKBK1100	CKBK1200	CKBK1300	CKBK1400	
CKBK1500	CKBK1600	CKBK1700	CKBK1800	CKBK1900	CKBK2000				

Model CKBK		300	350	400	450	500	550	600	650	700	750	800	850	900
UNIT PERFORMANCE														
Nominal Cooling Capacity	TR	300	350	400	450	500	550	600	650	700	750	800	850	900
	kW	1055	1231	1407	1583	1759	1934	2110	2286	2462	2638	2814	2989	3165
Nominal Power Input	kW	178.87	203.82	232.00	261.00	288.66	311.99	339.90	364.30	388.40	421.80	447.70	470.40	500.90
Energy Efficiency	kW/TR	0.596	0.582	0.580	0.580	0.577	0.567	0.566	0.560	0.555	0.562	0.560	0.553	0.556
	COP	5.90	6.04	6.06	6.06	6.10	6.20	6.21	6.28	6.34	6.26	6.28	6.36	6.33
IPLV	kW/TR	0.53	0.52	0.49	0.50	0.50	0.48	0.53	0.53	0.51	0.52	0.52	0.51	0.51
	COP	6.64	6.76	7.18	7.03	7.03	7.33	6.64	6.64	6.90	6.76	6.76	6.90	6.90
EVAPORATOR														
Flow Rate	Usgpm	717.4	837.0	956.6	1076.2	1195.7	1315.3	1434.9	1554.5	1674.0	1793.6	1913.2	2032.8	2152.3
	L/S	45.20	52.73	60.27	67.80	75.33	82.86	90.40	97.93	105.46	113.00	120.53	128.07	135.59
Pressure Drop	ft.wg	4.7	6.2	10.9	11.7	16.1	19.0	22.1	20.7	20.9	20.9	20.6	20.1	22.3
	kPa	14.0	18.5	32.6	35.0	48.1	56.8	66.0	61.9	62.4	62.4	61.6	60.1	66.6
Water Connection	Victaulic (inch)	8	8	8	8	8	8	8	8	8	10	10	10	10
	Flange	DN200	DN200	DN200	DN200	DN200	DN200	DN200	DN200	DN200	DN250	DN250	DN250	DN250
Number of Passes		2	2	2	2	2	2	2	2	2	2	2	2	2
CONDENSER														
Flow Rate	Usgpm	900.0	1050.0	1200.0	1350.0	1500.0	1650.0	1804.8	1955.2	2105.6	2256.0	2406.4	2556.8	2707.2
	L/S	56.70	66.15	75.60	85.05	94.50	103.95	113.87	123.35	132.84	142.33	151.82	161.31	170.80
Pressure Drop	ft.wg	6.0	7.9	11.4	10.7	14.7	23.4	23.3	23.3	26.5	26.4	26.1	19.6	21.7
	kPa	17.9	23.6	34.1	32.0	43.9	69.9	69.6	69.6	79.2	78.9	78.0	58.6	64.9
Water Connection	Victaulic (inch)	8	8	8	8	8	8	10	10	10	10	10	10	10
	Flange	DN200	DN200	DN200	DN200	DN200	DN200	DN250	DN250	DN250	DN250	DN250	DN250	DN250
Number of Passes		2	2	2	2	2	2	2	2	2	2	2	2	2
GENERAL														
Length (L)	inch	194.7	194.7	194.7	174.1	194.7	194.7	194.7	194.7	194.7	195.2	195.2	199.4	199.4
	mm	4940	4940	4940	4420	4940	4940	4940	4940	4940	4960	4960	5070	5070
Width (W)	inch	78.5	78.5	78.5	78.5	78.5	78.5	78.5	78.5	78.5	82.5	82.5	95.5	95.5
	mm	1990	1990	1990	1990	1990	1990	1990	1990	1990	2100	2100	2430	2430
Height (H)	inch	83.9	83.9	83.9	83.9	83.9	83.9	83.9	88.2	88.2	90.8	90.8	109.5	109.5
	mm	2130	2130	2130	2130	2130	2130	2130	2240	2240	2310	2310	2780	2780
Shipping Weight	lbs	20915	20951	20338	19403	20657	20243	20507	24725	24945	25717	26164	31493	31497
	kg	9487	9503	9225	8801	9370	9182	9302	11215	11315	11665	11868	14285	14287
Operating Weight	lbs	24668	24703	23731	22432	24134	23543	23900	28371	28698	29778	30433	36882	36826
	kg	11189	11205	10764	10175	10947	10679	10841	12869	13017	13507	13804	16730	16704
R134a Charge (Approx.)	lbs	1173	1173	1065	853	1065	1065	1065	1133	1173	1254	1296	1556	1556
	kg	532	532	483	387	483	483	483	514	532	569	588	706	706

Model CKBK		950	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000
UNIT PERFORMANCE													
Nominal Cooling Capacity	TR	950	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000
	kW	3341	3517	3869	4220	4572	4924	5276	5627	5979	6331	6682	7034
Nominal Power Input	kW	557.30	569.60	622.70	686.70	728.70	782.80	833.70	908.60	958.70	1015.60	1068.50	1126.50
Energy Efficiency	kW/TR	0.586	0.569	0.566	0.572	0.560	0.559	0.556	0.568	0.564	0.564	0.562	0.563
	COP	6.00	6.18	6.21	6.15	6.28	6.29	6.33	6.19	6.24	6.24	6.26	6.25
IPLV	kW/TR	0.55	0.53	0.51	0.52	0.50	0.50	0.50	0.51	0.51	0.51	0.50	0.50
	COP	6.40	6.64	6.90	6.76	7.03	7.03	7.03	6.90	6.90	6.90	7.03	7.03
EVAPORATOR													
Flow Rate	Usgpm	2271.9	2391.5	2630.6	2869.8	3108.9	3348.1	3587.2	3826.4	4065.5	4304.7	4543.8	4783.0
	L/S	143.13	150.66	165.73	180.80	195.86	210.93	225.99	241.06	256.13	271.20	286.26	301.33
Pressure Drop	ft.wg	22.7	24.8	25.3	29.4	31.1	30.6	30.0	24.7	27.4	24.4	26.9	24.3
	kPa	67.8	74.1	75.6	87.8	92.9	91.4	89.6	73.8	81.9	72.9	80.4	72.6
Water Connection	Victaulic (inch)	10	12	12	12	14	14	14	16	16	16	16	16
	Flange	DN250	DN300	DN300	DN300	DN350	DN350	DN350	DN400	DN400	DN400	DN400	DN400
Number of Passes		2	2	2	2	2	2	2	2	2	2	2	2
CONDENSER													
Flow Rate	Usgpm	2857.6	3008.0	3308.8	3609.6	3910.4	4211.2	4475.5	4812.7	5113.5	5414.3	5715.1	6015.9
	L/S	180.29	189.78	208.75	227.73	246.71	265.69	282.36	303.63	322.61	341.59	360.57	379.54
Pressure Drop	ft.wg	23.1	25.2	29.8	34.7	32.2	31.9	35.5	29.4	26.3	29.1	27.6	30.2
	kPa	69.1	75.3	89.1	103.7	96.3	95.4	106.1	87.9	78.6	87.0	82.5	90.3
Water Connection	Victaulic (inch)	10	12	12	12	14	14	14	16	16	16	16	16
	Flange	DN250	DN300	DN300	DN300	DN350	DN350	DN350	DN400	DN400	DN400	DN400	DN400
Number of Passes		2	2	2	2	2	2	2	2	2	2	2	2
GENERAL													
Length (L)	inch	223.4	223.4	223.4	223.4	225.9	225.9	225.9	209.1	209.1	209.1	209.1	209.1
	mm	5680	5680	5680	5680	5740	5740	5740	5310	5310	5310	5310	5310
Width (W)	inch	95.5	95.5	95.5	95.5	110.2	110.2	110.2	122.1	122.1	122.1	122.1	122.1
	mm	2430	2430	2430	2430	2800	2800	2800	3100	3100	3100	3100	3100
Height (H)	inch	109.5	109.5	116.1	116.1	116.3	116.3	116.3	125.0	125.0	125.0	125.0	125.0
	mm	2780	2780	2950	2950	2960	2960	2960	3180	3180	3180	3180	3180
Shipping Weight	lbs	34077	34077	37881	37860	41277	42208	42657	46522	46165	47851	48513	49042
	kg	15457	15457	17183	17173	18723	19146	19349	21102	20940	21705	22005	22245
Operating Weight	lbs	40563	40563	44555	44604	48671	50078	50812	54917	54750	56824	57686	58656
	kg	18399	18399	20210	20232	22077	22715	23048	24910	24835	25775	26166	26606
R134a Charge (Approx.)	lbs	1951	1951	2070	2070	2141	2271	2392	2255	2255	2509	2509	2762
	kg	885	885	939	939	971	1030	1085	1023	1023	1138	1138	1253

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.