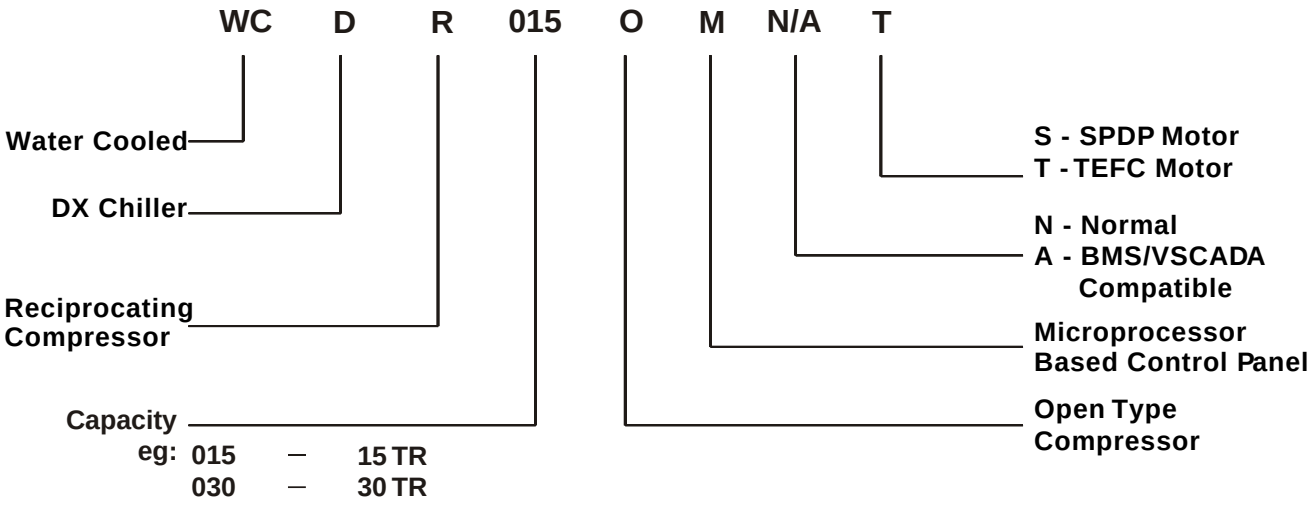
A TATA Enterprise

Water-Cooled Chillers

(Reciprocating Compressor: 15 TR-120 TR)

VOLTAS

NOMENCLATURE



Water-Cooled Chillers: Using Reciprocating Compressors

FEATURES

The factory made Reciprocating Packaged Chillers using best in class components offers the following features:

Open Type Compressor

- Rugged workhorse proven performance under all climatic and duty conditions
- Saves power as motor is not refrigerant cooled resulting in best IKW per TR
- Facilitates selection of appropriate motor to suit grid supply characteristic of the local power supply
- Lading/unloading is through, multi-step temperature controller supplied as standard. As an alternative, capacity control activated by variation in suction pressure can also be provided.
- Field serviceable, thus reduces down time of repairs

Compressor Drive Motor

- Squirrel cage induction motor of Totally Enclosed Fan Cooled (TEFC) or Screen Protected Drip Proof (SPDP) constructions are available.

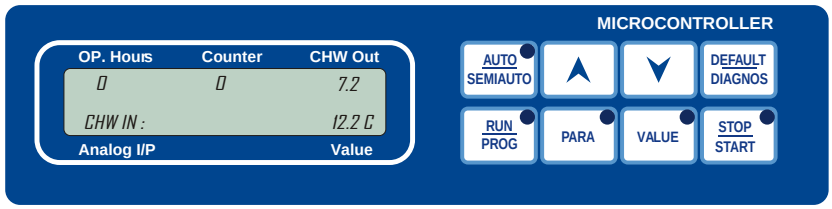
Condensers and Chillers

- Manufactured incorporating latest technology from world renowned Standard Refrigeration USA
- State of art technology makes the unit highly compact and heat energy efficient, using most advanced Imported Tubes.

Imported Tubes

Advanced Microprocessor provided as a standard feature has the following benefits

LCD and Touchscreen pad of microprocessor



User-friendly operation

- Three mode options available Auto, Semi Auto and Manual
  - **Auto Mode:** Auto starts and stop, programmable for entire year. Hence no need for any operator interface. Auto mode facilities auto restart on power restoration after a load shedding or grid supply failure
  - **Semi Auto Mode:** Manual single button start & stop, since further sequence and is programmed
  - **Manual (Test) Mode:** Facilities testing under supervision
- All operating parameters and safety limits can be preset

Displays with diagnostic capabilities

- **Digital Display** of all vital parameters such as
  - **Chilled Water In and Outlet temperature**
  - **Suction, Discharge and Oil Pressure of compressor**
  - **Condenser cooling water in and out temperature**
  - **Current**
  - **Voltage**
- Alarm history for last 5 trips with date, time and causes of failure

Reduction in Energy cost through Precise and Accurate Controls

- The electronic pressure sensors and temperature sensors monitor the set points accurately and precisely and thereby save energy.
- Capacity control regulates in response to chilled water outlet temperature
- Cooling tower switch off during off peak periods

Safety and Protection

- Microcomputer Motor Protection Device (MPD) and Microcomputer Voltage Protection Device (VPD) protect chiller from phase unbalance, single phasing, phase loss, phase reversal, overload, under/over voltage and supply failure

Electronic Pressure Transducers

- Programmed safety feature available using sensitive and accurate temperature and Pressure transducers which protects the system from:
  - Freezing
  - High Pressure
  - Low Pressure
  - Low Oil Pressure
  - Low Chilled Water Temperature
  - Low Water Flow in Chiller and Condenser
  - Anti recycle

Other Options

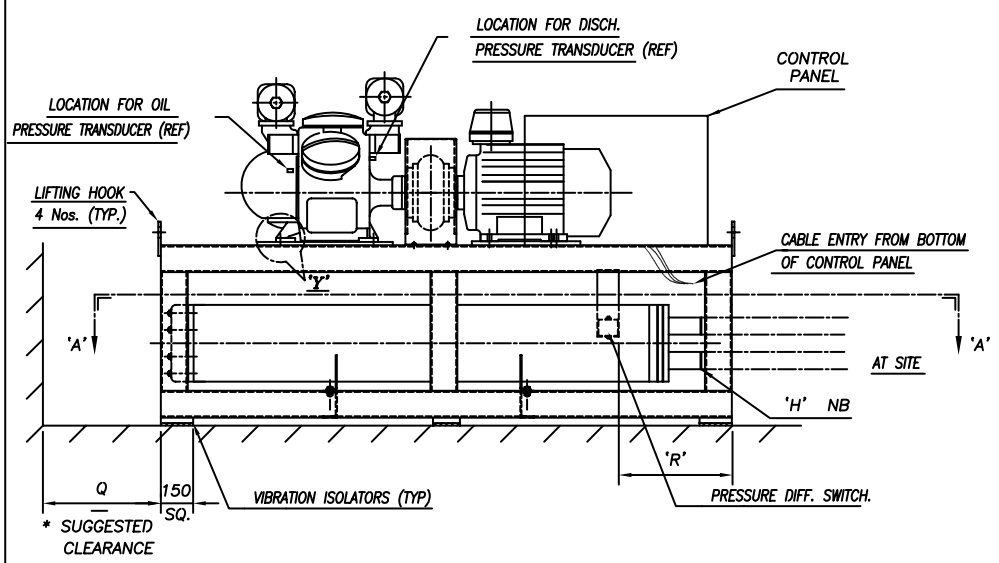
- Patented VSCADA system to link battery of chillers with other equipment's like Pumps, AHU's, with single point monitoring and control
- BMS Compatibility provides ability to communicate with any Building Management System via control module.

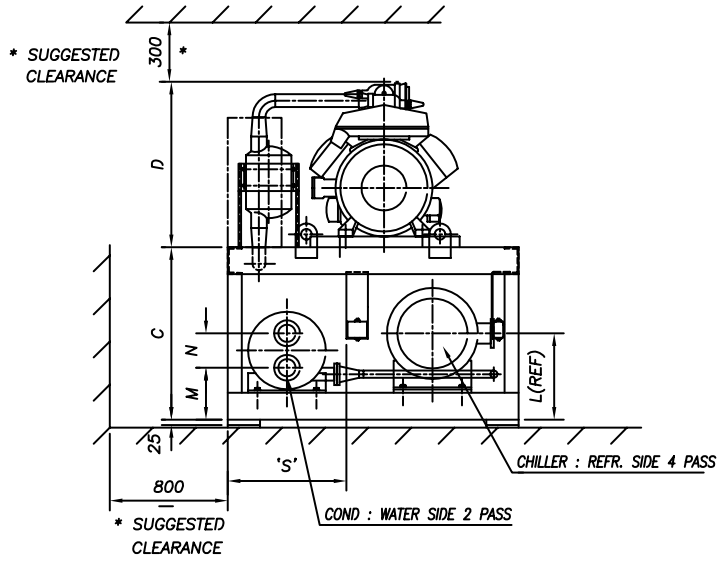
Technical Details

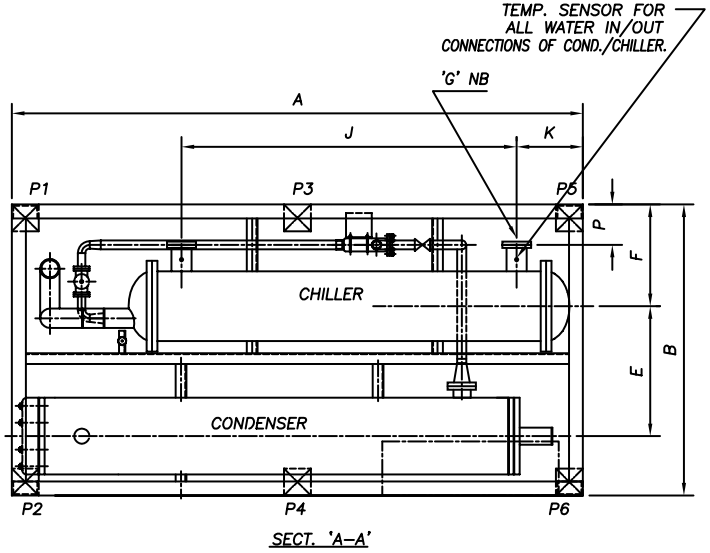
Model	WCDR015 OMNS/T	WCDR030 OMNS/T	WCDR040 OMNS/T	WCDR050 OMNS/T	WCDR060 OMNS/T	WCDR080 OMNS/T	WCDR120 OMNS/T
Nominal Capacity TR	15	30	40	50	60	80	120
KW	52.8	105.5	140.7	175.8	211.0	281.4	422.0
KCAL/HR	45360	90720	120960	151200	181440	241920	362880
Compressor model	05018	05040	05046	05060	05066	05086	05126
No. of compressors	1	1	1	1	1	1	1
Compressor motor	Squirrel cage induction motor suitable for 415+/- 10% Volts, 3 phase, 50 HZ AC power supply. TEFC and SPDP options available.						
Capacity control steps % of full capacity	100 /75/ 50	100 /75/ 50/25	100 /75/ 50/25	100 /83.3/ 66.7/ 33.3	100 /83.3/ 66.7/ 33.3	100 /75/ 50/25	100 /83.3/ 66.7/ 33.3
Chiller model	10026	10036 - 1	10046 - 1	10066 - 1	10066 - 1	10076 -1	10126 -2
No. of chillers	1	1	1	1	1	1	1
Chiller water flow rate (US GPM/ *lps)*	35 *2.21*	75 *4.73*	90 *5.68*	115 *7.26*	140 *8.84*	185 *11.68*	275 *17.36*
Chiller connection size (Inches NB / mm)	2 ½ *65*	3 *80*	3 *80*	4 *100*	4 *100*	5 *125*	6 *150*
Refrigerant R 22 charge Appx KG	13	25	33	42	50	66	100
Condenser model	09026	09036	09046	09066	09066	09076	09126
Condenser water flow rate (US GPM/ *lps)*	50 *3.16*	110 *6.94*	140 *8.84*	175 *11.05*	210 *13.26*	280 *17.68*	425 *26.83*
Condenser connection size (Inches NB / mm)	2 *50*	2 ½ *65*	2 ½ *65*	4 *100*	4 *100*	5 *125*	6 *150*

For physical data refer General Arrangement Drawing

GENERAL ARRANGEMENT DRAWING OF WATER COOLED CHILLER PACKAGE







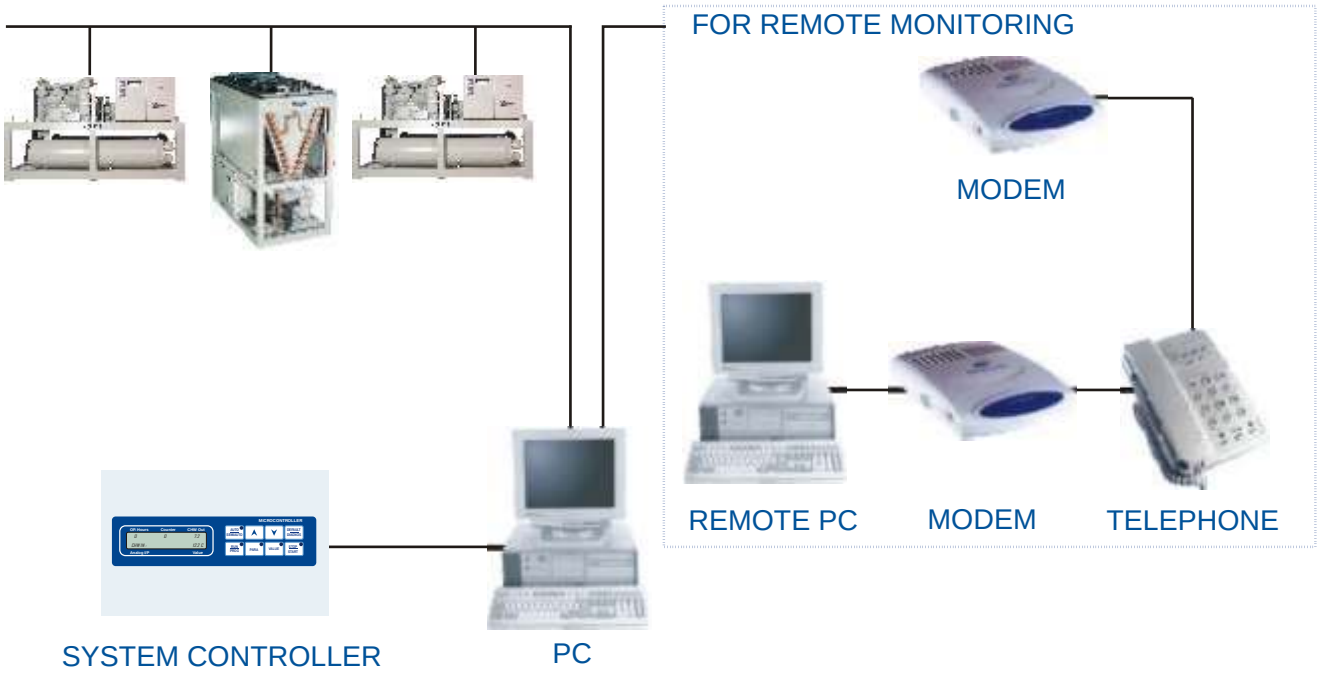
SECT. 'A–A'

MODEL	'A'	'B'	'C'	'D'	'E'	'F'	'G'	'H'	'J'	'K'	'L'	'M'	'N'
WCDR015	2300	900	600	600	376	350	2.5"	2"	1334	215	300	135	130
WCDR030	2600	1200	800	760	481	467	3"	2.5"	1294	370	345	185	140
WCDR040	2600	1200	800	760	524	417	3"	2.5"	1597	257	345	217	120
WCDR050	2600	1200	800	775	496	427	4"	4"	1553	295	370	223	140
WCDR060	2600	1200	800	800	496	427	4"	4"	1553	295	370	223	140
WCDR080	2900	1300	800	860	578	427	5"	5"	1832	325	370	240	160
WCDR120	3000	1450	875	870	570	555	6"	6"	1794	325	437	276	188

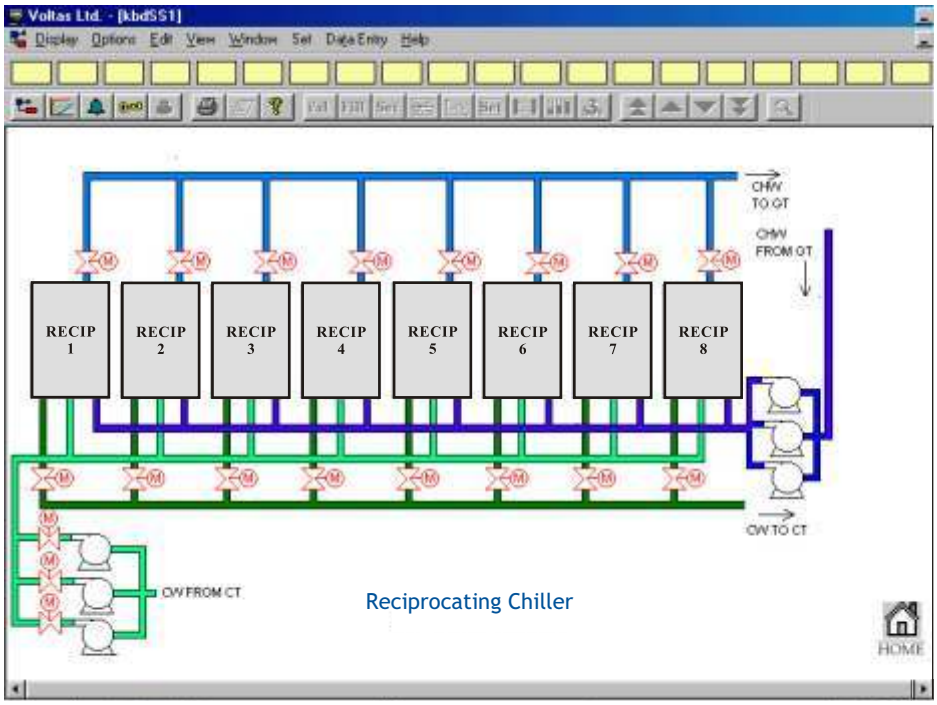
					APPROX. WEIGHTS.		APPROXIMATE POINT LOAD WEIGHT IN Kg.					
MODEL	'P'	'Q'	'R'	'S'	SHIPPING (KG.)	OPERATING (KG.)	'P1'	'P2'	'P3'	'P4'	'P5'	'P6'
WCDR015	115	1900	600	400	1100	1150	205	215	190	195	165	175
WCDR030	205	2000	600	525	1500	1600	255	250	265	270	275	290
WCDR040	155	2200	600	525	1800	1900	290	295	310	320	330	345
WCDR050	140	2200	600	525	2200	2350	380	360	395	380	410	395
WCDR060	140	2200	600	525	2300	2450	395	370	420	395	445	415
WCDR080	140	2200	600	625	2800	3000	490	470	505	495	525	520
WCDR120	225	2200	600	600	3800	4050	670	700	665	685	655	665

VSCADA- VOLTAS SUPERVISORY CONTROL AND DATA ACQUISITION

System Setup



Graphical Display



VSCADA- Voltas Supervisory Control and Data Acquisition

This is a system, which links machines to computer. Voltas Supervisory Control and Data Acquisition System monitors and controls operating parameters of chillers, pumps, AHUs etc.

Features

Control Function	Remote on /off of chillers and other equipment, sequencing of chillers & other equipment, ensure equal run hours, optimum starting and stopping of chillers as per load variation
Plant Viewer	Live Mimic of full plant i.e. all chillers, fans, AHUs, pumps, cooling towers, motorised valves etc, giving online Real Time data.
Chiller Viewer	Live mimic of individual chiller with chilled water inlet/outlet temperature; condenser water inlet /outlet temperature; saturated suction and saturated discharge temperature; compressor current; no of load/unload stages; compressor operating hours and no of starts; on/off status of safeties, motors, compressor, motorized valves of chillers.
Set Point Changing	Value of various set points can be changed through keyboard
Log Viewer	Data logging of above analog inputs, as storage in hard disk of PC or print form
Alarm Viewer	Gives the list of alarms with cause of tripping, date, time
Trend Viewer	Historical & real time processing of data for convenient analysis using time based selection. This identifies discrepancies, energy consumption, load pattern on chiller based on compressor current, etc
Protection by Password	3 level password used for prevention of unauthorized or unwanted access (i.e Process Level, Engg Level, Management Level)
Remote Access	Remote monitoring facility with PSTN (Public switching telephone network) (Optional)
Open System	Standard system is with MODBUS ASCII Protocol. Capable of working with variety of protocols, supports Ethernet /TCPIP, BACnet (Optional).
Time Scheduling	This allows central programming of all time-controlled functions. Operating schedule for one year using 7 days time program with additional overriding facilities for 15 holidays. This facility reduces day-to-day routine tasks of starting and stopping of plants.
Graphic Interface	Friendly and easy to operate
Graphic Engineering	The graphics package defines ability to define lines, boxes, circles, and arcs, free hand displays. It also allows to define points on the graphics where real time field data is displayed. Colours of symbols can be changed.

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