



**VOLTAS LIMITED**  
ACnR Business Group

# ***Water-Cooled Chillers***

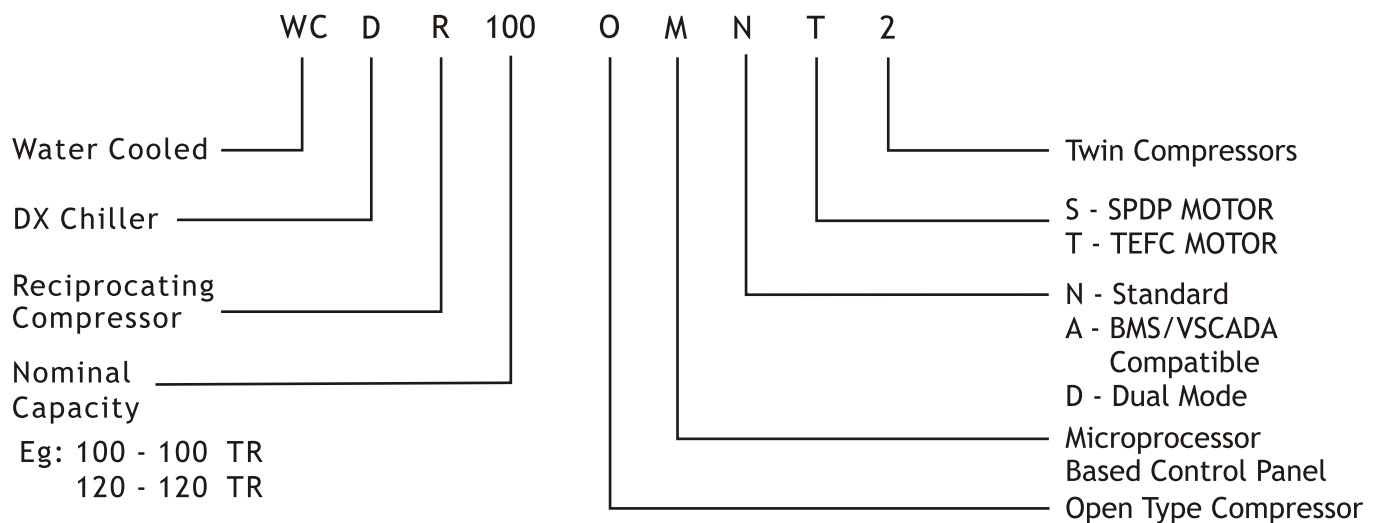
(Twin Reciprocating Compressors: 100 TR - 240 TR)



## I N D E X

Nomenclature	2
Features Of Chiller Package	3
Technical Details	4
G A Drawing & Point Load Diagram	5
Features of Microprocessor	7
VSCADA - Features and setup	8

## N O M E N C L A T U R E



## Features of Chiller Package

Factory made Reciprocating Packaged chiller with twin compressors using best in class components & offer higher range of capacity up to 240 TR. Single unit design with two independent refrigerant circuits offer flexibility of operation, improved efficiency and better matching of load.

## Reciprocating Compressors

- Open type compressor is a rugged workhorse proven under all climatic and duty conditions offering unmatched dependability.
- Saves power due to efficient design and motor is not refrigerant cooled resulting in lowest IKW/TR.
- Facilitates selection of appropriate motors suitable for grid supply characteristic including severity there by reducing electrical failure and downtime for repairs.
- Multistep loading/unloading actuated through microprocessor by sensing chilled water outlet temperature accurately with electronic temperature sensor.
- As an alternative, capacity control activated by variation in suction pressure can also be provided.
- Field serviceable, thus reduces down time due to repairs.

## Compressor Drive

- Squirrel cage induction motor of totally enclosed fan cooled (TEFC ) or screen protected drip proof (SPDP) construction are available.
- Factory aligned compressor & motor ensures trouble free operation.

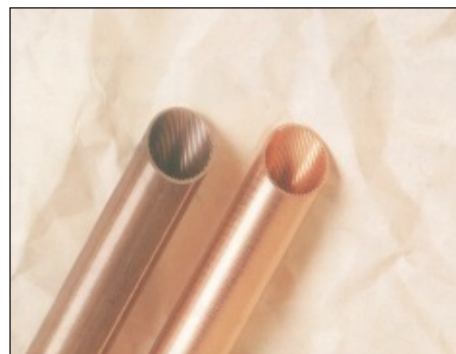
## Condenser & Chillers

- Manufactured incorporating latest technology from world renowned Standard Refrigeration, USA.
- State of art technology using most advanced heat exchanger tubes and baffle design makes the unit highly compact and heat transfer efficient.

- Imported tube for Condensor



- Imported tube for Chiller





# Features of Standard Microprocessor Panel

## User-friendly operation

- Three mode options available Auto, Semi Auto & Manual.
  - Auto Mode: Auto start & stop are programmable for entire year. This minimizes operator interface. Auto mode facilitates auto restart on power restoration after a load shedding or grid supply failure.
  - Semi Auto Mode: Manual single button start & stop, since further sequence is programmed.
  - Manual (Test) Mode: Facilitates testing of the unit under supervision.

## Displays with diagnostic capabilities

- Digital Display of all vital parameters such as
  - Outlet temperature of chilled water
  - Suction & discharge temperature of compressors
  - Suction, discharge and oil pressure of compressors
  - Current
  - Voltage
  - Compressor run hours

## Reduction in Energy cost through Precise and Accurate Controls

- The electronic pressure sensors and temperature sensor monitor the set points precisely and thereby save energy.
- Capacity control regulates in response to chilled water outlet temperature.
- Compressor staging programmed to save energy by running compressors as required to match load.

## Adaptive Controls

- Discharge / suction pressure limiting by unloaded operation to avoid tripping on HP / LP. This offers advantage of chiller running unloaded instead of tripping.

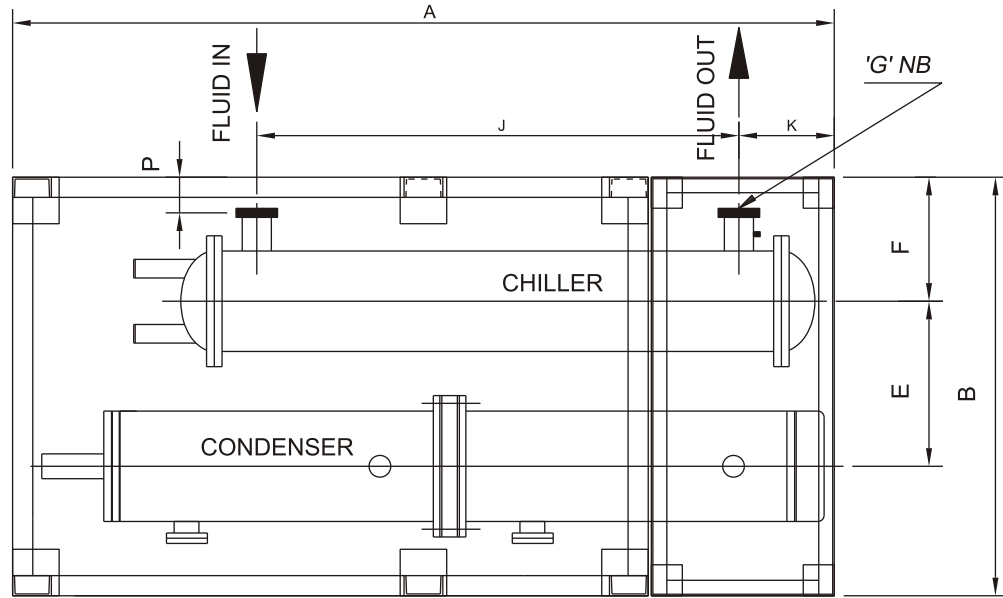
## Safety & Protection

- Microcomputer Motor Protection Device ( $\mu$ MPD) and Microcomputer Voltage Protection Device ( $\mu$ VPD) protect compressors from phase unbalance, current unbalance, phase loss, phase reversal, overload, under/over voltage and supply failure.
- Programmed safety features available using sensitive &
- accurate sensors which protect the system from
  - Freezing
  - High Pressure
  - Low Pressure
  - Low Oil Pressure
  - Low Chilled Water Temperature
  - Low Water Flow in Chiller & condensor
  - Recycling of compressors
  - Sensor error
- Maintenance trip for compressors 50 hrs. before completion of 8000 hrs. of operation.
- Alarm history for last 20 faults with date, time and cause of failure.
- Compressor lead, log, programmed to safe guard motors by running them for equal hrs.

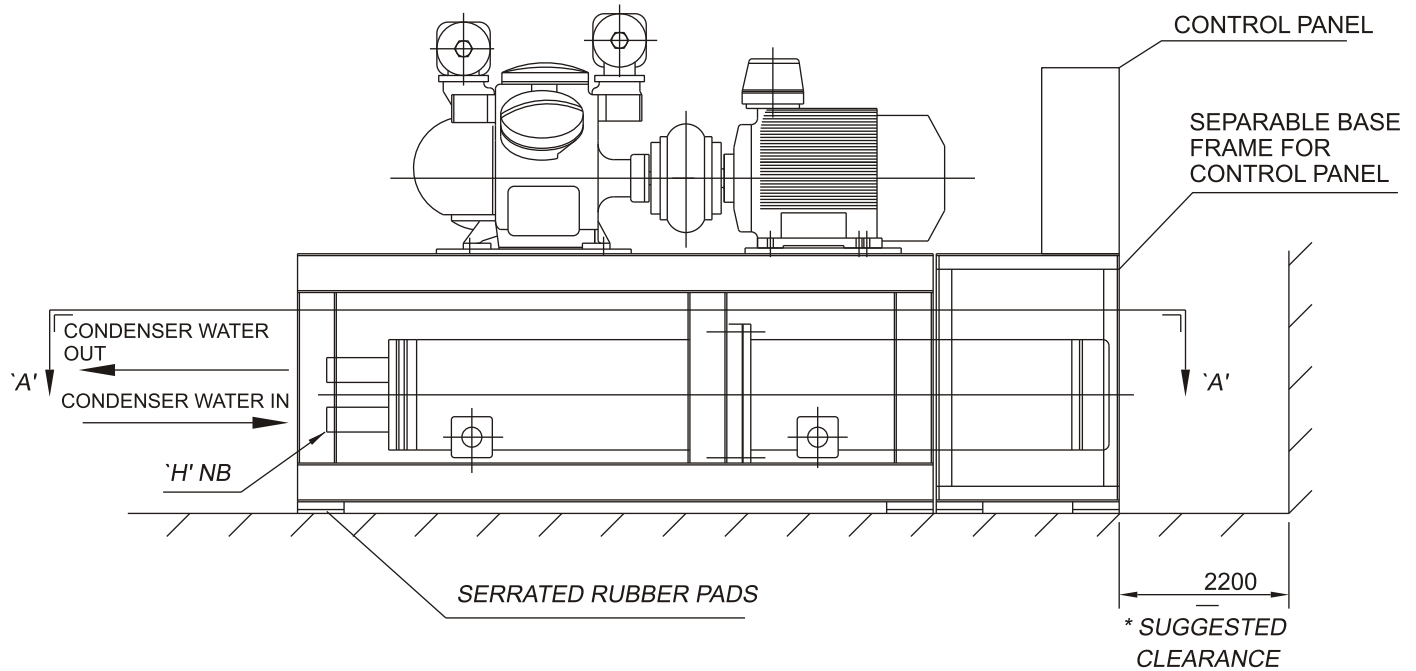


## Other Options

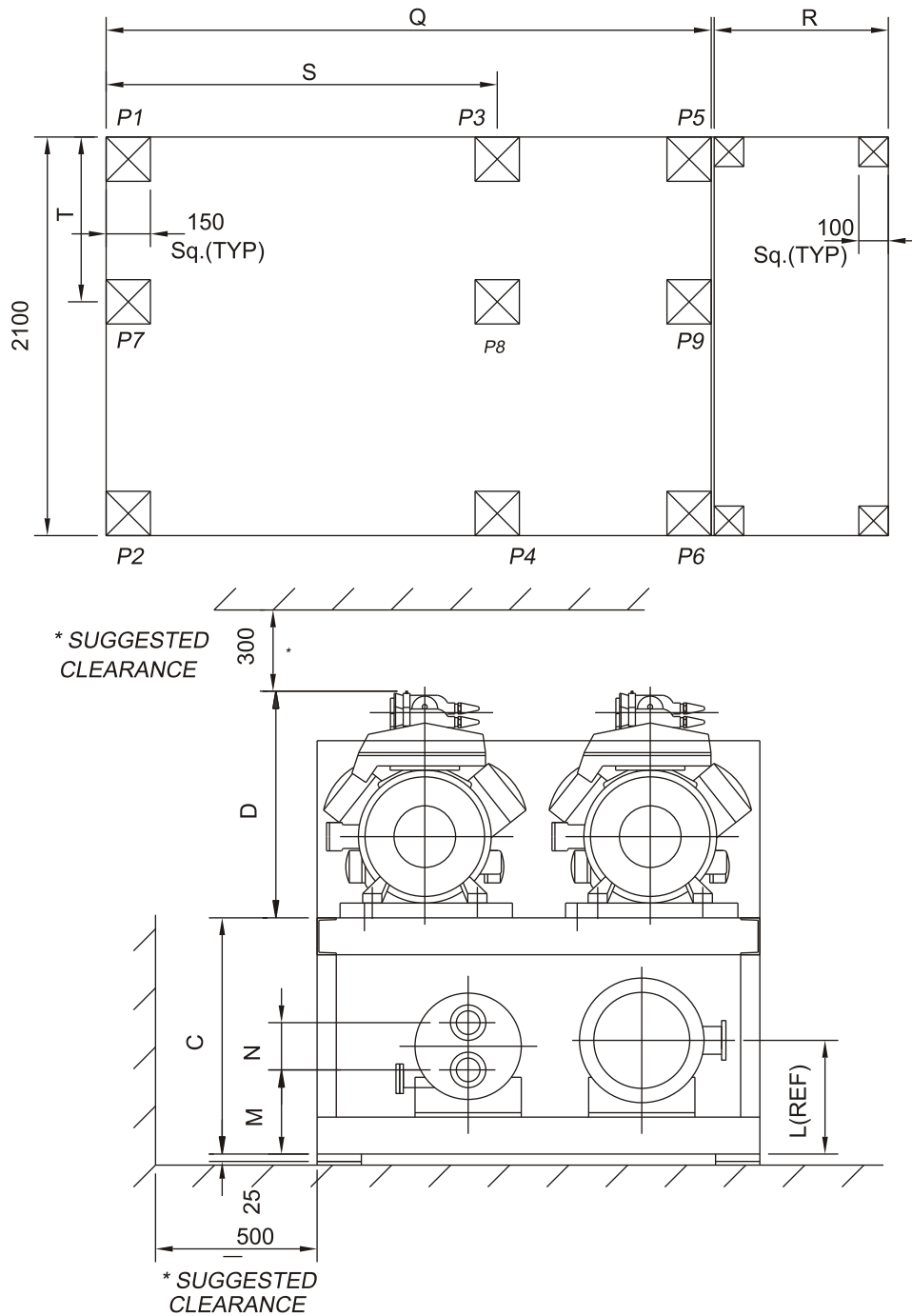
- Unless & otherwise specified chillers shall be provided with standard microprocessor.
- Patented VSCADA system to link battery of chillers with other equipment's like Pumps, AHU's to offer single point monitoring & control.
- BMS compatibility provides ability to communicate with Building Management System via control module.
- Dual mode chillers for thermal storage systems.



SECT. 'A-A'



MODEL	A	B	C	D	E	F	G	H	J	K	L	M	N	P
WCDR100MNS/T2	3100	1800	1000	800	585	463	6"	6"	1795	360	430	275	188	135
WCDR1200MNS/T2	3100	1800	1000	800	585	463	6"	6"	1795	360	430	275	188	135
WCDR1600MNS/T2	3200	1800	1025	875	580	493	8"	6"	1755	410	480	300	188	135
WCDR2400MNS/T2	3200	2100	1300	900	770	573	8"	8"	1396	435	555	380	350	145



APPROXIMATE POINT LOAD WEIGHT IN Kg.														
Q	R	S	T	SHIPPING WEIGHT(KG)	OPERATING WEIGHT(KG)	P1	P2	P3	P4	P5	P6	P7	P8	P9
2425	675	1550	750	4100	4300	420	385	485	475	440	440	420	465	470
2425	675	1550	750	4300	4500	445	390	500	450	530	480	420	475	510
2525	675	1600	800	5300	5500	400	380	640	570	775	690	400	610	735
2525	675	1600	960	7300	7600	485	500	1100	1045	850	885	495	1075	865

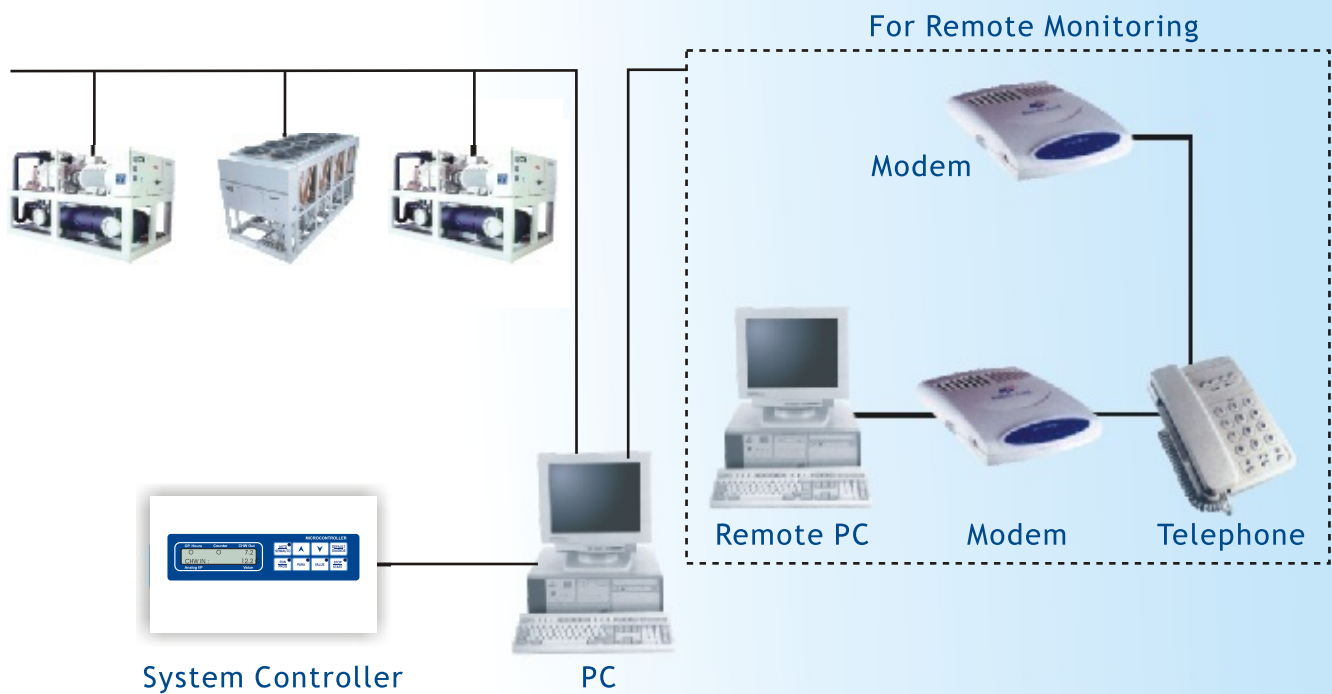
## Technical Details

WCDR-2 Series*		100	120	160	240
Nominal Capacity**	TR KW KCAL / HR	100 352 302400	120 422.4 362880	160 563.2 483840	240 844.8 725760
Compressor	Model No.	05060 2	05066 2	05086 2	05126 2
Compressor motor		Squirrel cage induction motor suitable for 415 +/-10 % volts, 3 phase, 50 HZ AC Power supply, TEFC or SPDP option is available.			
Type of starter		Star/Delta	Star/Delta	Star/Delta	Star/Delta
Capacity control steps % of full load capacity		100,91.7,83.3,66.7, 50,41.7,33.3,16.7	100,91.7,83.3,66.7, 50,41.7,33.3,16.7	100,87.5,75,62.5, 50,37.5,25,12.5	100,91.7,83.3,66.7, 50,41.7,33.3,16.7
Chiller	Model No.	10126-2 1	10126-2 1	10156-2 1	10246-2 1
Chiller Connection size	Inches NB MM	6 150	6 150	8 200	8 200
Chiller water flow rate	GPM L/S	240 15.14	288 18.17	384 24.23	576 36.34
Condenser	Model No.	09126 (In Two sect.) 1	09126 (In Two sect.) 1	09166 (In Two sect.) 1	09246 (In Two sect.) 1
Condenser connection Size	Inches NB MM	6 150	6 150	6 150	8 200
Condenser water flow rate	GPM L/S	366 23.09	425 26.81	561 35.39	845 53.31
Refrigerant R22 charge (app.)	LB KG	184.8 84	220 100	290.4 132	440 200
Unit dimensions					
Length	MM	3100	3100	3200	3200
Width	MM	1800	1800	1800	2100
Hight	MM	1825	1825	1925	2225
Operating weight (app.)	LB KG	9460 4300	9900 4500	12100 5500	16720 7600

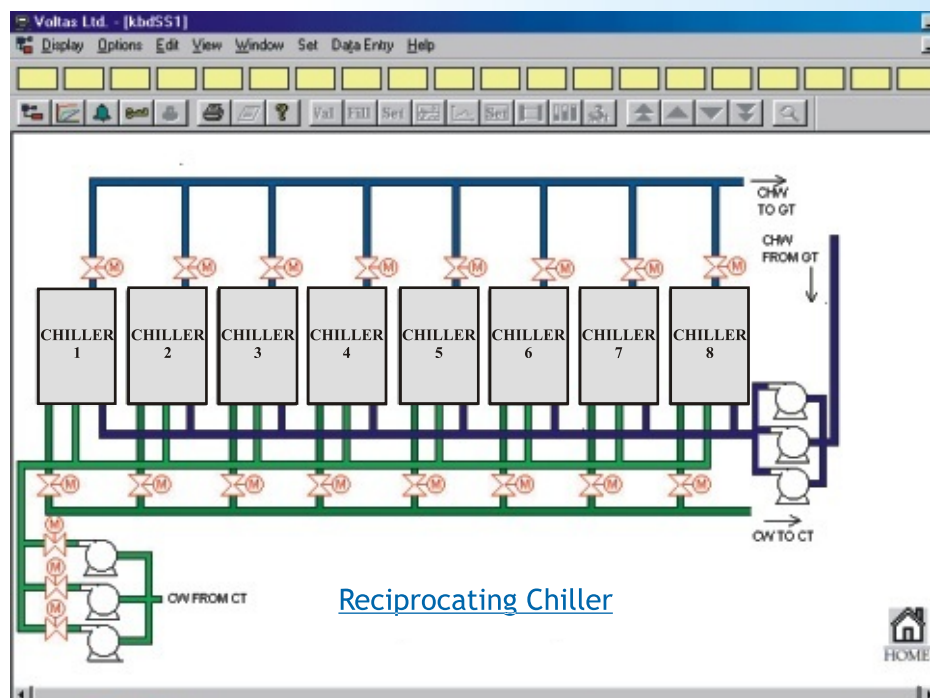
\* Full model specification and options as per nomenclature

\*\* Chiller performance at chiller inlet /outlet temperature of 12.7 °C/7.2 °C and condenser Inlet / outlet temperature at 32.2 °C/36.6 °C

## System Setup



## Graphical Display





## VSCADA - Voltas Supervisory Control & Data Acquisition

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

### Features

<b>Control Function</b>	Remote on/off of chillers and other equipment, sequencing of chillers & other equipment, ensure equal run hours, optimum starting & stopping of chillers as per load variation.
<b>Plant Viewer</b>	Live Mimic of full plant i.e. all chillers, fans, AHUs, pumps, cooling towers, motorised valves etc, giving online Real Time data.
<b>Chiller Viewer</b>	Live mimic of individual chiller with chilled water outlet temperature; saturated suction & discharge temperatures; compressor current; no. of load/unload stages; compressor operating hours; on/off status of safety protection, motors, compressor, motorized valves of chillers.
<b>Set Point Changing</b>	Value of various set points can be changed through keyboard.
<b>Log Viewer</b>	Data logging of above analog inputs, as storage in hard disk of PC or print form.
<b>Alarm Viewer</b>	Gives the list of alarms with cause of tripping, date, time.
<b>Trend Viewer</b>	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.
<b>Protection by Password</b>	Password protection for prevention of unauthorized or unwanted access
<b>Remote Access</b>	Remote monitoring facility with PSTN (Public switching telephone network) (Optional)
<b>Open System</b>	Standard system is with MODBUS ASCII Protocol. Capable of working with variety of protocols, supports Ethernet / TCPIP.
<b>Time Scheduling</b>	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.
<b>Graphic Interface</b>	Friendly and easy to operate.
<b>Graphic Engineering</b>	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.

OFFICE	TELEPHONE	FAX
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## NORTHERN REGION

DELHI (Branch)	(011)55505550	(011)26950022
	(011)55505570	(011)26950081
Chandigarh	(0172)2663669	(0172)2604625
Gurgaon	(0124) 5060504	
Jaipur	(0141)5179983	(0141)5179983
Ludhiana	(0161)2500223	
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	(0522)2237869	
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Aurangabad	(0240)2320510	

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	(0657)2434322	
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Raipur	(0771)5059303	
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	(033)22540300	
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## SOUTHERN REGION

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	(044)55510669	
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Visakhapatnam	(0891)2754051	(0891)2562096
KOCHI (Branch)	(0484)2359621	(0484)2357129
	(0484)2359648	
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Thiruvananthapuram	(0471)2338873	

Backed by: Voltas countrywide after sales service.



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