

Air-Cooled Chillers

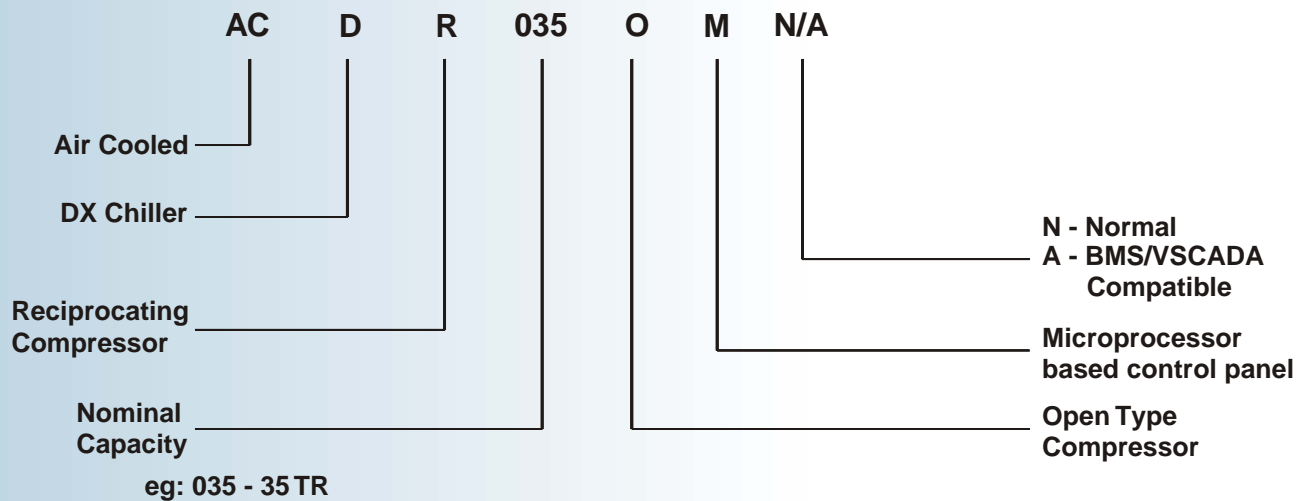
(Reciprocating Compressor: 30 TR-105TR)



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NOMENCLATURE



Air-Cooled Chillers: Reciprocating Compressors

FEATURES

The factory made Reciprocating Packaged Chillers use best in class components and offer the following features:

Compressor

- 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 per TR
- Facilitates selection of appropriate motor 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 of repairs
- Epoxy based powder coating on frames, sheet metal panels and microprocessor panel makes the chiller weather resistant

Drive Motor for Compressor

- Totally enclosed fan cooled (TEFC) squirrel

cage induction motor from reputed manufacturers

Condensers

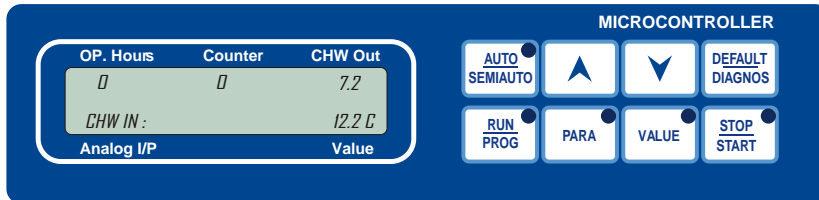
- Smallest footprint saves you space by V configuration of coil section
- Compact coils made using latest and most advanced cross hatch tubes with lanced fins on state of the art manufacturing equipment
- Each coil pneumatically tested to 410 PSIG under water
- High efficiency multiple fans driven by IP 55 motor and controlled by microprocessor based on discharge pressure
- Independent sub cooling circuit improves EER

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

Advanced Microprocessor provided as a standard feature has the following benefits

LCD Display and Key pad of Microprocessor



User-friendly operation

- Three mode options available Auto, Semi Auto and Manual
 - ▶ **Auto Mode:** Auto start 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 and stop, since further sequence is programmed
 - ▶ **Manual (Test) Mode:** Facilitates testing under supervision

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
 - ▶ Operating hours of compressor
 - ▶ Maintenance trip for compressor 50 hours before completion of 8000 hours of operation
- 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 precisely and thereby save energy.

- Capacity control regulates in response to chilled water outlet temperature

Safety and Protection

- Microcomputer Motor Protection Device (μ MPD) and Microcomputer Voltage Protection Device (μ VPD) protect chiller from phase unbalance, current unbalance, phase loss, phase reversal, overload, under/over voltage and supply failure
- Programmed safety features available using sensitive and accurate temperature and Pressure transducers which protect the system from:
 - Freezing
 - High Pressure
 - Low Pressure
 - Low Oil Pressure
 - Low Chilled Water Temperature
 - Low Water Flow in Chiller
 - Anti recycle
 - Sensor error



Differential Pressure Switch

Other Options

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

Technical Details

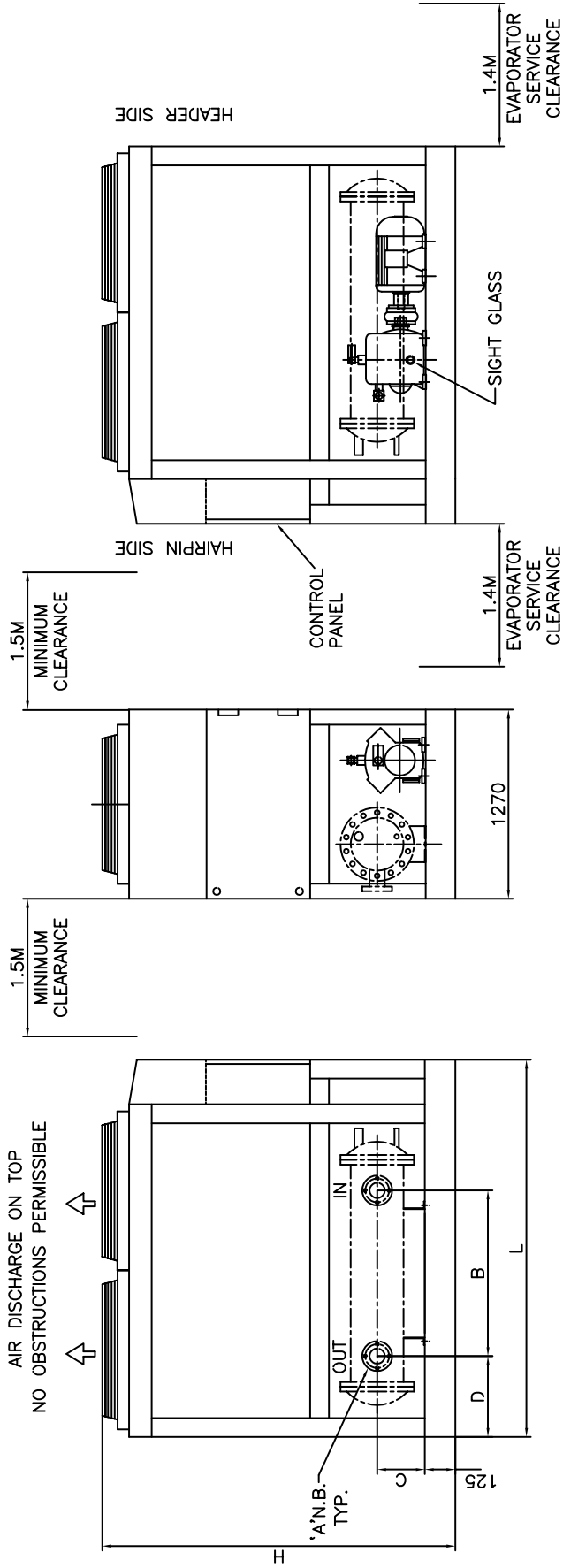
ACDR Series*		030	035	055	070	105
Nominal Capacity**TR		30	35	55	70	105
	KW	105.5	123.0	193.4	246.2	369.3
	KCAL/HR	90720	105840	166320	211680	317520
Compressor model		05040	05046	05066	05086	05126
Number of compressors		1	1	1	1	1
Compressor motor	IP 55 TEFC Squirrel cage induction motor suitable for 415 +/- 10% Volts, 3 phase 50 HzAC power supply					
Type of starter		Star/Delta	Star/Delta	Star/Delta	Star/Delta	Star/Delta
Capacity control steps % of full capacity		100/75/ 50/25	100/75/ 50/25	100/83.3/ 66.7/33.3	100/75/ 50/25	100/83.3/ 66.7/33.3
Chiller model		10036LR1	10036LR1	10066	10070LR1	10126-2
No. of chillers		1	1	1	1	1
Chillers inlet/outlet nozzle						
	NB inches	3	3	4	5	6
	NB mm	80	80	100	125	150
Nominal chilled water flow rate						
	GPM	72	84	132	168	252
	Lts. per sec	4.55	5.30	8.33	10.61	15.91
Condenser module		9AV 30	9AV 35	9AV 30	9AV 35	9AV 35
Number of condenser modules		1	1	2	2	3
Condenser fan Diameter						
	inches	31-1/2	31-1/2	31-1/2	31-1/2	31-1/2
	mm	800	800	800	800	800
Number of condenser fans		2	2	4	4	6
Refrigerant R 22 charge (approx.)						
	Lb	66	77	132	154	220
	Kg.	30	35	60	70	100
Unit Dimensions (in mm)	Length	2535	2535	2950	2950	3710
	Width	1270	1270	2235	2235	2235
	Height	2470	2470	2575	2575	2600
Op.Weight (App.)	Lb.	4851	5188	7144	8514	11363
	Kg.	2205	2358	3247	3870	5165

*Full model specification and options be specified as per NOMENCLATURE

**Performance at 7/12°C water temperature and ambient of 35°C

AIR COOLED WATER CHILLING PACKAGE.

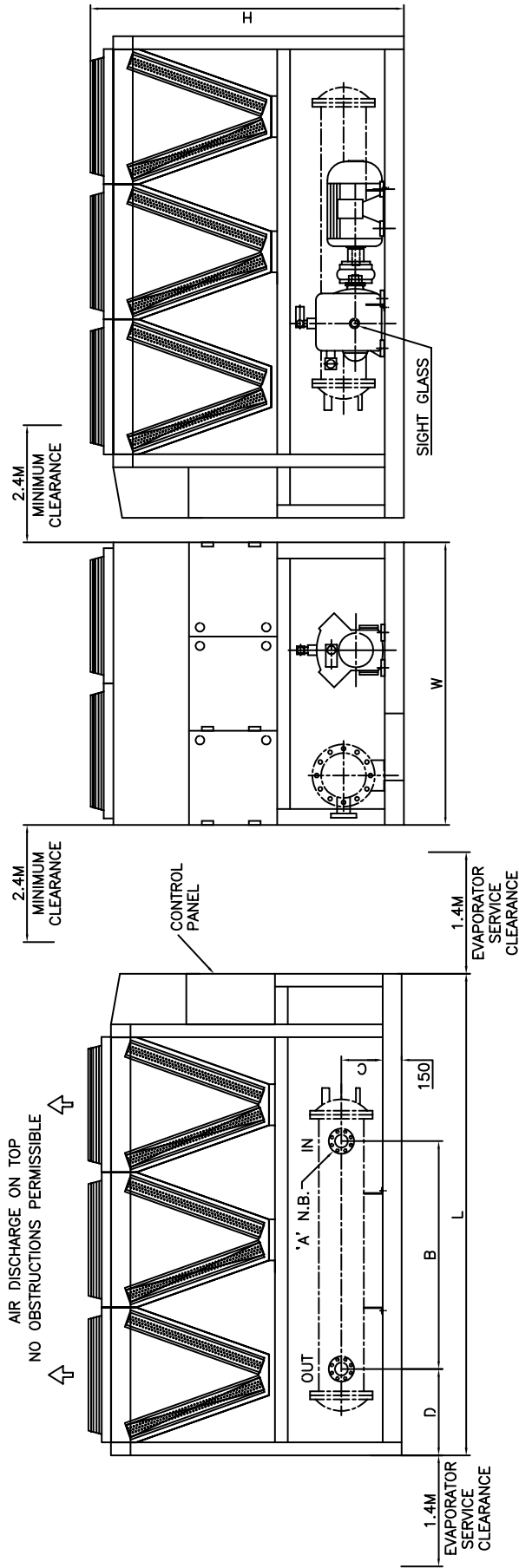
G A DRAWING - 1



ACDR	L mm	W mm	H mm	A NB	B mm	C mm	D mm
030	2535	1270	2470	3"	1247	260	270
035	2535	1270	2470	3"	1247	260	270

AIR COOLED WATER CHILLING PACKAGE.

G A DRAWING - 3



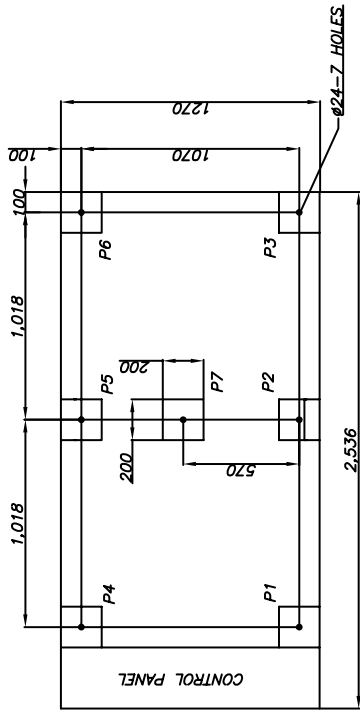
ACDR	L mm	W mm	H mm	A NB	B mm	C mm	D mm
105	3710	2235	2600	6"	1794	302	600

DRAWING FOR POINT LOADING OF A/C RECIP. CHILLER PACKAGE

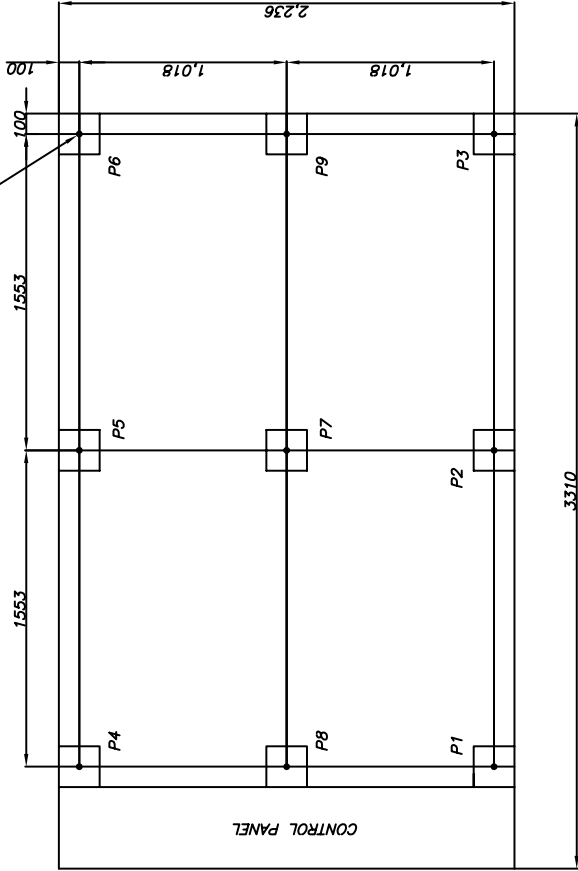
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REV. NO. 2

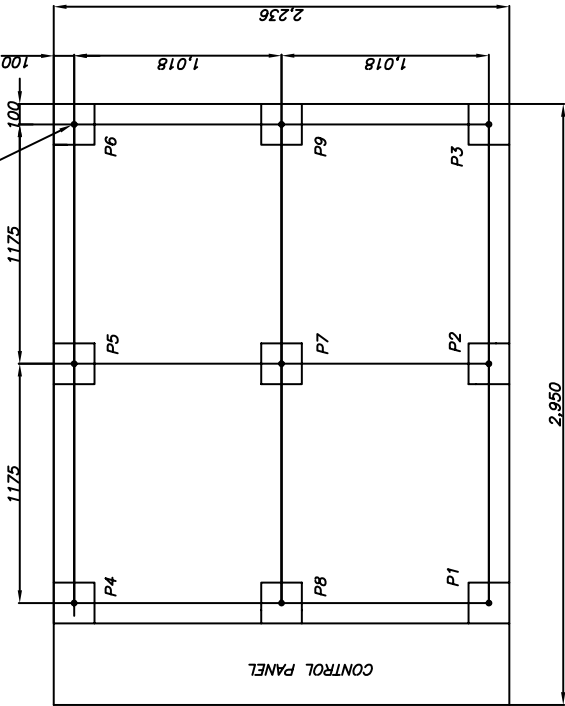
DATE :21/11/01



MODEL
ACDR0300MN
ACDR0350MN



MODEL
ACDR1050MN

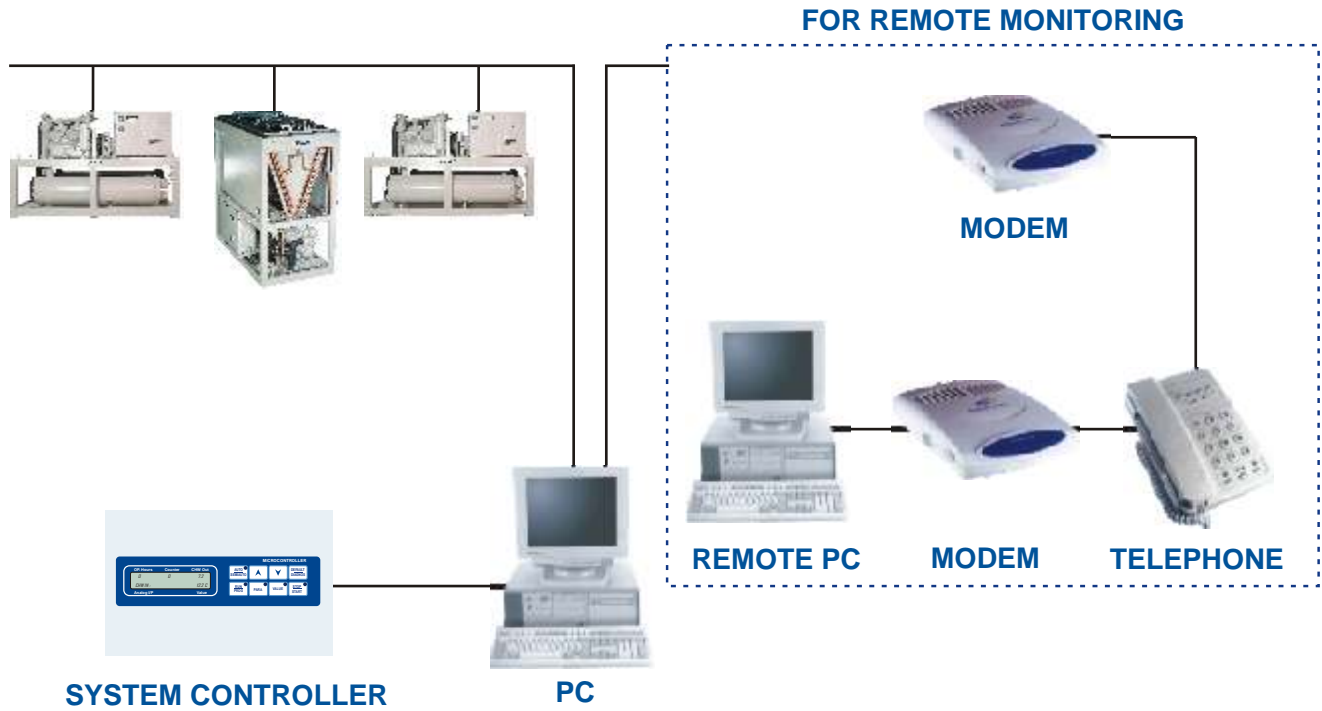


MODEL
ACDR0550MN
ACDR0700MN

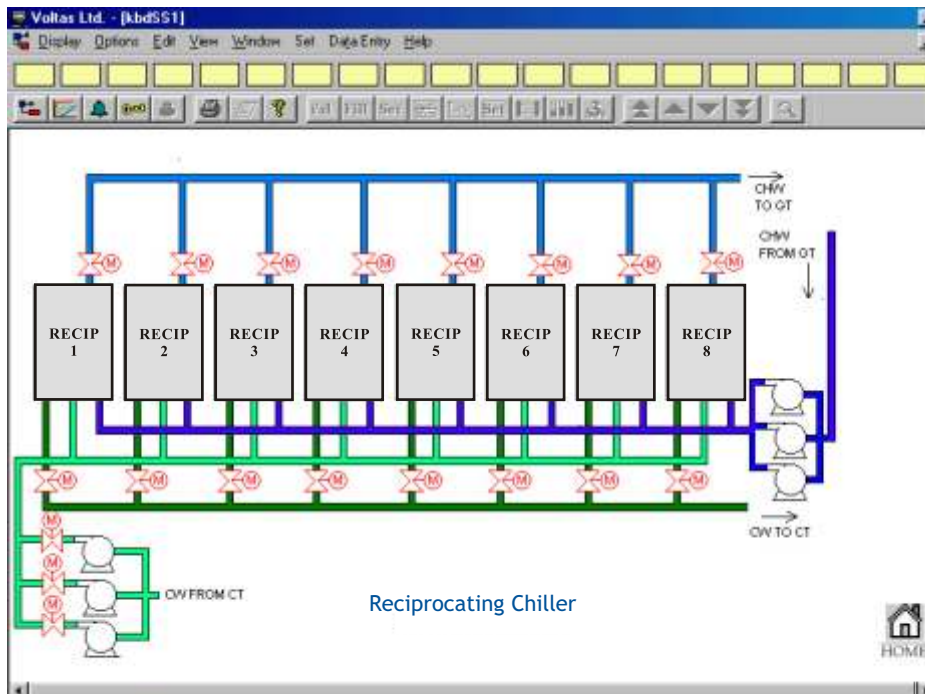
MODEL	LOAD PER POINT - KG.								
	P1	P2	P3	P4	P5	P6	P7	P8	P9
ACDR300MN	321	305	322	332	291	283	501	-	-
ACDR350MN	321	305	322	332	291	283	501	-	-
ACDR500MN	361	344	326	355	312	268	427	452	402
ACDR700MN	436	412	390	449	367	325	490	524	458
ACDR1050MN	323	292	261	508	461	414	968	1079	858

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 and 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, motorized valves etc, giving online Real Time data.
Chiller Viewer	Live mimic of individual chiller with (air) with chilled water inlet/outlet temperature; condenser air inlet /outlet temperature; suction, discharge, oil, net oil pressure; saturated suction & saturated discharge temperature; compressor current; No. of load/unload stages; compressor operating hours and No. of starts; on/off status of safety, 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 and 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 passwords 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.



A **TATA** Enterprise

(Product development is a continuous process in Voltas, hence specifications and technical data are subject to alterations without notice.)