

SERVICE

GUIDE

2022



USER MANUAL

MICRO CAN CHILLER

THERMAL STORAGE BASE SYSTEM



Rapid Chilling



Energy Efficient



Eco-friendly



Smart Cooling

Promethean Spenta Technologies
Gate no.1021, Sr.No. 363, Hinjewadi Phase I Rd,
Opp. Bharat Petroleum, Pune, Maharashtra 411033.

1) Technical Specification and layout.

Chiller Unit	
Compressor	KCJ461CAL - 4 Can System
	KCJ484CAL- 6 Can System
Cooling Capacity	1.2 kWh- 4 Can System
	1.6 kWh- 6 Can System
Refrigerant	R 404 A
Heat Exchanger	Brazed Plate
Power Supply	1 Ph: 230/50 Volt/Hz

Table 1.1

System	Chilling Performance in 180 Min
4 Cans/ Shift - 320 LPD	35 °C to 4 °C without grid
6 Cans/ Shift - 480 LPD	35 °C to 4 °C with grid else ≤7°C

Table 1.2

Thermal Back Up	Thermal Battery Charging
4 Cans/ Shift	5 Hrs. / Shift
6 Cans/ Shift	6 Hrs. / Shift

Table 1.3

Electrical Component	For Operation of Control Panel
Inverter	900 VA/ 140 VA
Battery	100 AH/ 35 AH

Table 1.4

System	Ice Thickness
4 Can System / Shift	10 mm
6 Can System / Shift	12 mm

Table 1.5

Condensing Unit Working Space Requirement

Side	Minimum Clearance
Front	200 cm
Left	30 cm
Right	60 cm
Above	60 cm
Condenser Side	30 cm

Table 1.6



Fig 1.1 - Layout for Micro Can Chiller

PSTPL CU Minimum Clearance Distance for Working Space

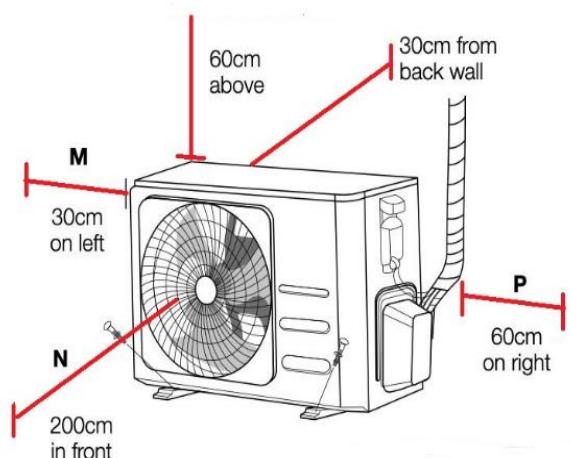


Fig 1.2 - Condensing Unit Working Space

2) Control Panel Display Settings

Display character	Description	Set Value
COOL	Cooling mode	-
CYCL	Cyclic mode	-
t1	Cool Time	180
t2	Cyclic ON Time	3
t3	Cyclic OFF Time	55
t4	Fault reset time in minutes	3
t5	R2 ON time in seconds	5
SP	Temperature Set Point	-9
Can	No of Cans	4 / 6
EXIT	EXIT	-
FLT	HP/LP Fault cap reached	-
RST	Reset	-
HPLP	HP/LP fault	-

Table 2.1

2.1 Micro Can Chiller Start Procedure

- a) Turn on power supply.
- b) OFF will be displayed in the beginning if SWITCH is off.



- c) COOL will be displayed on the display first after turning on the Switch.



- d) Hold SET button and enter the programming mode.



- e) Once SET is displayed, t1 will come on screen.



- f) Press SET button to enter t1 and now using UP and DOWN buttons set the desire value for t1. After that again press SET button to exit that



screen.

- g) Follow the same procedure for t2, t3, t4, t5 and SP.
- h) Set all values as mentioned in control panel setting table.
- i) Come to last check point of Can selection and select 4 or 6 Can system accordingly the milk availability.



- j) For 4 Can, compressor is in off during chilling time (t1) and in 6 can condition compressor run during chilling time.
- k) Now EXIT will be displayed on your screen. Press SET to exit the programming mode.



2.2 MODE:

- When SWITCH is

- a) OFF: Operation is off
- b) ON: Cooling Mode
Discharge pump is ON for t1 time

Note: After Cooling Mode, Cyclic Mode will turn ON automatically.

3) Thermal Battery Display –

- 3.1) Thermal Battery Discharged – When battery is discharged it shows Red Led on battery display.

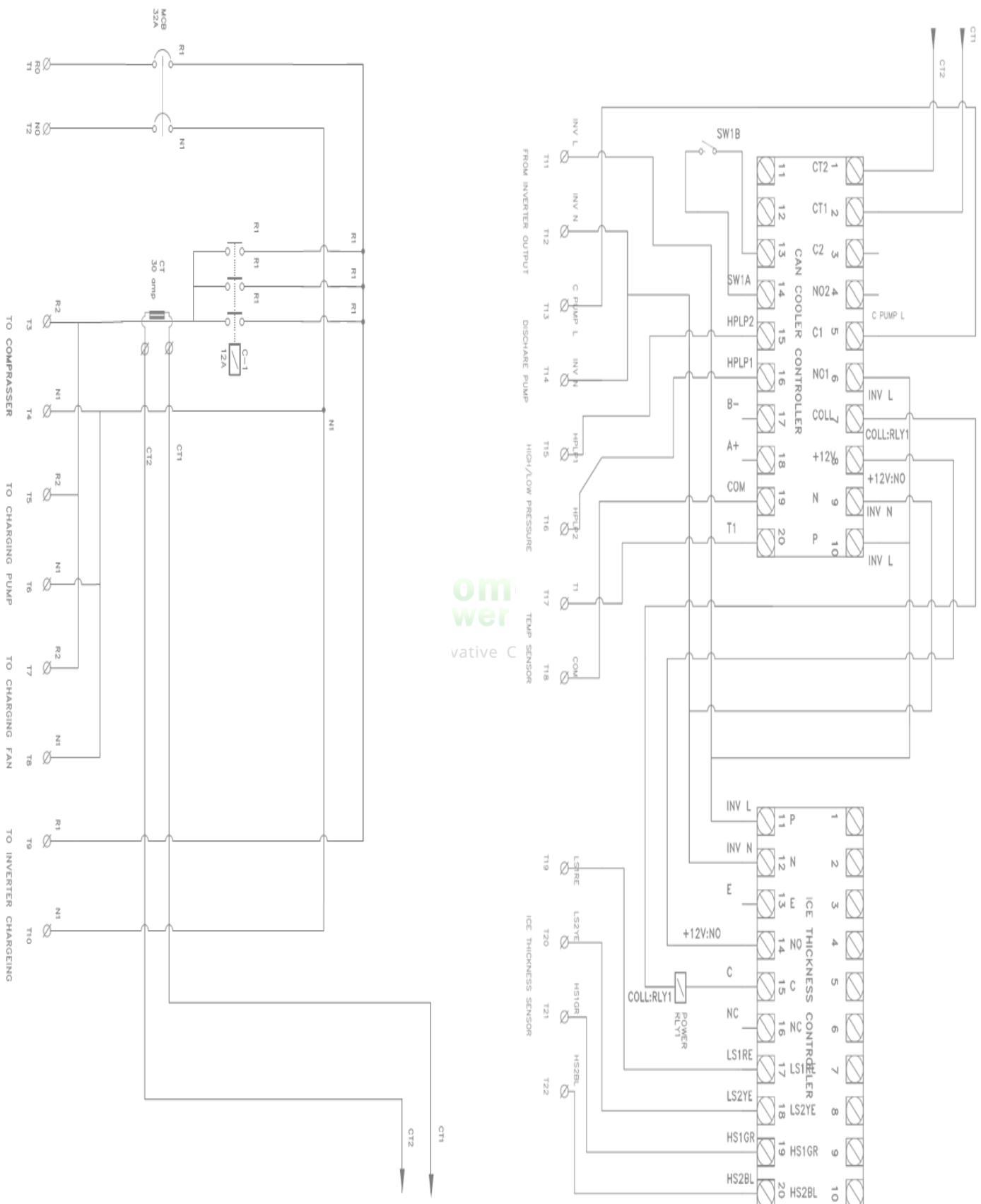


- 3.2) Thermal Battery Fully Charged – After complete charging of thermal battery display shows Green Led.



Note – Keep Thermal Battery Switch on Auto mode.

4) Control Panel Circuit Diagram -



Standard Operating Procedure for Micro Milk Chiller

1) Checkout / Process –

- a. Make sure micro milk chiller cooling switch in **OFF** condition before loading.
- b. Ensure **Green** indicator displayed on Thermal Battery Display.
- c. Ensure that Auto / Manual Switch is on Auto mode.

NOTE- If RED indicator displayed on Thermal Battery Display before loading the milk cans, immediately call to **Service Engineer**.

- d. Check for alarm Indicator. Ensure RED LED is not ON.
If alarm indicator is ON, immediately **call Service Engineer**.



2) Instructions for Material Loading and Unloading-

- a. Ensure that internal surface of box is clean before loading of cans.
- b. Ensure that milk cans are cleaned properly.
- c. Milk can lid is tightened properly before loading into box.
- d. Ensure that door of can cooler is closed properly after loading of cans.
- e. Switch on the micro can chiller cooling switch after loading of cans.

3) If required change water inside the blue tank on MONTHLY basis.

Training / Acknowledgement –

I have read, asked questions, and understand the hazards and safe working procedure for Micro Milk Chiller.

Name of Site Operator –

Signature -

ASSETS DETAILS

Name of the Customer			
Customer Type	Sale / Service		
Name of the Site			
Village		Post	
Via		District	
State		Country	
PIN			
Center In charge			
Contact Number			
Date of Installation		Warranty Status	WW/OW
Maintenance Supervisor			
Contact Number			
E mail ID			
Equipment Type			

ASSET DETAILS

Sr.No.	Description	Sr. No	Make	Model
A	CONDENSING UNIT			
1	Compressor			
2	Filter Drier			
3	Thermostatic Expansion Valve			
4	Solenoid Valve			
5	Plate Heat Exchanger			
B	THERMAL STORAGE SYSTEM			
1	TSS with Evaporator			
2	Charge Pump			
3	Discharge Pump			
C	Insulated Box			
1	Water Falling Mechanism			
E	ELECTRICALS			
1	DC Battery			
2	Inverter			
3	Control Panel			
4	Data Logger			
5	SIM Card			


 Innovative Cooling Solutions

Pre-requisites for Installation & Commissioning

Particulars	Micro Milk Chiller	
Building	:	1500 mm x 1500 mm X 2000 mm height
Window size	:	Window 1 - 1200 mm x 1200 mm in front of Condenser Fan. If not possible make sure ventilation done in specific area.
Main Door Size	:	Minimum 2000 mm x 3000 mm Height
Water	:	Potable drinking water for routine cleaning of equipment
Floor		Need proper leveled floor
Power Supply	:	230±10% V, 50 Hz, AC, Single Phase with Neutral up to our Panel Board
Earthing	:	Earthing as per local Electricity Board norms up to our panel board & One GI wire connected to panel
Connected Load/ Power Supply	:	7.5 Kw (2.5 Kw for our equipment and balance for Geyser, Fan, Light, etc. if required)
Supply Cable	:	4 mm ² 3 core Copper Insulated Cable from source of supply to our panel board.
Voltage Stabilizer	:	5 Kva, Single phase, Input Voltage: 130 – 260V, Output Voltage – 230 ±10% V to provide stable voltage. The input range may vary depending on actual site conditions.
Note:	1 :	
	2 :	
	3 :	
	4 :	
	5 :	
	6 :	



Micro Can Chiller Troubleshooting

Micro Can Chiller Troubleshooting: Common Problems

Even when regularly inspected and maintained, the performance of your system may degrade or deteriorate over time. Pumps can fail; process lines can clog; refrigerant can leak; any number of problems associated with component aging or changing environmental conditions may occur (Table I and Table II).

Here are some initial steps to take to help isolate the problem:

- 1. Make sure that the chiller is running.** loose wiring, Main Supply or simply a powerswitch that's been put in the 'off' position may be preventing the chiller from running.
- 2. Determine if the chiller is cooling.** Check the temperature of the coolant at the chiller's outlet to the process. If it isn't at or near the set point temperature, the evaporator may be iced up or the heat transfer properties of the coolant fluid may be deteriorating.
- 3. Confirm that the pump is running.** A closed or partially closed valve, failed pump, inadequate coolant/Brine volume, or process line restriction may be preventing the adequate flow of liquid through the ice bank coolant loop.
- 4. Check the process and environmental conditions.** Likewise, a change in the location of the chiller (near other heat generating equipment); loose, damaged, or missing insulation on the piping between the chiller or even fluctuations in line voltage may be compromising the chiller's heat removal capabilities.

Common Micro Can Chiller Faults

All Micro Can chillers display a fault or error code when conditions affecting performance are detected. These codes are usually specific and will help you quickly diagnose problems. Some of the more common alarms and faults are:

HP LP Fault

High Discharge Pressure Alarm

The refrigerant discharge pressure is too high. This may be due to a dirty or blocked condenser, dirty air filter, failing or failed cooling fan, high ambient temperature, or over-charging of the refrigerant system.

Low Discharge Pressure Alarm

The refrigerant discharge pressure is too low. This may be caused by refrigerant leakage, clogging of the condenser tubing, under-charging of the refrigerant system, or low ambient temperatures.

Regular preventative maintenance and knowing what to look for when the performance of your chiller deteriorates will help you optimize the uptime of both your chiller and the process it is cooling.



Micro Can Chiller Problems continued

Table I.
Common Chiller Problems in Charging Side and Possible Causes

Problem	Possible Causes
Chiller does not power up	Improper line voltage or loose connection
	Incorrect phase connection
	Blown circuit breaker or fuse
	Power switch in 'off' position
No pumping or insufficient fluid flow	Improper or fluctuating line voltage
	Insufficient fluid in process pipes
	Pinched or restricted process line
	Closed or partially closed process valve
	Coolant leak from level indicator
	Pump failure
No cooling or insufficient cooling	Improper or fluctuating line voltage
	Clogged condenser
	Coolant fluid unsuitable for temperature requirements
	Heat transfer properties of the coolant fluid have deteriorated
	Refrigerant leak
	High ambient temperature

Table II.
Common Problems in Discharge Side and Possible Causes

Problem	Possible Causes
No cooling or insufficient cooling of milk can	Check temperature of ice bank water below 1 deg c after fully charging of TSS
	Discharge pump failure
	Ice Thickness Sensor and Controller Malfunctioning, Check wiring connection.
	Recheck set values of t1, t2, t3, t4 and no of can system
Curdling of Milk	Ice bank/ Thermal Battery not charged.
	Caps of milk not tightened properly
	Discharge pump failure
	Change in cooling and cyclic mode time values.
	No of can selection not done in control panel setting
	Cooling switch not on
Water not falling on can	Closed or partially closed discharge valve
	Discharge pump failure
	Ice bank charged above the limit
	Inverter malfunctioning
	Blockage at suction side of discharge pump
	Check wiring connection

Ice Thickness Sensor Conditions

Sensor Position	Sensor Color	Condition	Indicator
Higher Side (17 & 18)	Green & Black	Ice / Air	Green & Orange
Lower Side (19 & 20)	Red & Yellow		
Higher Side (17 & 18)	Green & Black	Water	Orange
Lower Side (19 & 20)	Red & Yellow		
Higher Side (17 & 18)	Green & Black	Water	Red
Lower Side (19 & 20)	Red & Yellow	Water	
Higher Side (17 & 18)	Green & Black	Ice / Air	
Lower Side (19 & 20)	Red & Yellow	Water	False Condition/ will Never happen

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INSTRUCTION MANUAL

CONVENTIONAL MILK CHILLER





1.0 USER'S RESPONSIBILITY

The basic rules of safety set forth in this section are intended as a guide for the safe operation of Promethean Spenta Technologies Conventional Milk Chiller (CMC). This general safety information, along with explicit service, maintenance and operational materials for each specific model, make up the complete instruction manual.

All personnel, who will operate or service be involved with this equipment in any way, should become totally familiar with this information prior to start-up. It is the Buyer's responsibility to make certain that these procedures are followed and, should any major deviation or change in use from the original specifications be required, appropriate procedures should be established for the continued safe operation of the machine.

It is strongly recommended to contact Promethean Spenta Technologies to make certain the machine can be converted to the new use in a reasonably safe manner. If the machine is not purchased directly from Promethean Spenta Technologies or its representative, it is the responsibility of the purchaser to ensure that the machine is according to the valid safety regulations. It is strongly recommended that the purchaser contacts Promethean Spenta Technologies to safeguard that the machine can be operated in a reasonably safe manner.

2.0 INTRODUCTION

This manual provides the information necessary to operate and maintain the 1000 liters Conventional Milk Chiller (CMC). The system is manufactured and designed to chill 1000 liters of milk per day i.e. 50% of rated capacity in the morning & 50% in the evening.

The Conventional Milk Chiller (CMC) chilled the milk from 35°C to 4°C within 03 (Three) hours. The CMC system mainly comprises of following modules which are assembled at factory, interconnections of modules are made at site during installation.

01. Condensing Unit
02. Thermal Storage System (TSS)
03. Active Milk Cooling & Storage Tank
04. Control Panel

2.1 CONDENSING UNIT

The condensing unit has following main salient feature.

The Compressor is of **Emerson** make Scroll type and is suitable for charging the TSS within specified time when grid power is available. The model presently used is **ZB 21 KQE PFJ 524**.

Generously sized Air Cooled Condenser with condenser fan of 20" sweep for condenser cooling.

High Pressure / Low Pressure switch with safety device.

The refrigeration system works with environmental friendly **R-404a** refrigerant.

Accumulator of suitable size & capacity.

Liquid line Filter Drier, Sight Glass.

Thermostatic Expansion Vale with suitable Orifice.

Brazed type Plate Heat Exchanger forms the evaporator.

Control Panel comprising of necessary electrical fittings of suitable rating

Base Frame with MS Structure to accommodate all above in a compact manner.

2.2 THERMAL STORAGE SYSTEM

Thermal Storage System (TSS) is the heart of the system which stores the Thermal Energy during availability of grid power and releases same for chilling milk when required. This normally referred as battery too. The TSS unit comprises of the followings,

TSS Tank made of high grade LLDPE (Linear Low Density Ploy Ethylene) material and Insulated with PUF to prevent loss of stored Thermal Energy.

High performance Magnetic AC Pump for Coolant circulation

PCM Tubes

Black Gate Hose, Diffuser, Valves with Strainer ect.

2.3 ACTIVE MILK STORAGE TANK

Construction: Horizontal, Semi Cylindrical Open type Milk Tank fabricated out of AISI 304 material for both inner and outer shell in sanitary design with high density (40 Kg/Cu. M) injected PUF insulation. Tank will be provided with a single piece detachable un-insulated lid at the top. Tank is provided with adjustable ball feet.

Scope of supply includes :

- Energy efficient coolant circulation jacket made of stainless steel plates pressed and formed by spot welding, which forms the bottom of the tank.

- Self lubricating, 30 rpm, tight gear motored Agitator with specially designed blades efficiently operating at any filling level.
- Outlet connection with 51 mm Valve in SMS Standard.

2.4 CONTROL PANEL

Control Panel comprising of necessary electrical fittings of suitable rating to control and monitor the entire operation of the RMC. This controller is based on Battery Temperature, Milk Temperature and Auxiliary Temperature. It has following main features,

- A. Power supply** : 24VDC
- B. Analog Inputs** : Battery Temperature Sensor, Milk Temperature Sensor, Auxiliary Sensor
- C. Digital Inputs** : HP input, LP input, Power fail, Over Voltage / Under Voltage, Compressor under load / over load, Pump under load / over load Battery Low / High, Inverter fail
- D. Digital Outputs** : Compressor, Condenser, Pump, Agitator, Inverter, Shiva, Valve, Pump 2, Alarm
- E. User Interface:**

User interface has 16 X 2 LCD having Blue Back light, 3 digit seven segment display, LED's to indicate status of Outputs and Faults and 5 keys to navigate between different screens to view status of unit, to change set points and to reset alarms.

LCD displays various information like AC Voltage, AC Current of Compressor and Pump, Battery Voltage, Compressor run hours, open/close status of Shiva, Inverter Status.

In program mode it shows values and description of parameters.

Seven segment displays indicates the Battery Temperature, Milk Temperature and Auxiliary Temperature depending on the selection. LED's shows Current status of equipments like Compressor, PUMP and all Fault status.

Controller has 5 keys PRG, UP, DOWN, SET and RESET .These keys are used in normal mode to navigate different screens, in program mode to change various parameter values.



3.0 INSTALLATION

Ensure that the flooring is complete and strong enough to take care of Gross Weight of the Tank including product at full capacity. Install the tank on the leveled ground and ensure leveling of the Tank.

Enough space is to be maintained around the condensing unit so that each component can be reached easily for repairing/ maintenance.

Proper ventilation around the air cooled condenser is of importance for the refrigeration system to work without any trouble. The condenser should breathe fresh atmospheric air continuously. Condensing Unit fan should suck the air freely and deliver hot air to the surrounding without any obstruction in between the condensing unit. There should not be any obstruction in inlet and outlet air passages.

The wall should have a window for delivering hot air outside the room. The size of the window is to be @ 1400 x 1400 mm, and should be at the height of 350 mm from the floor.

Ensure that the condensing unit is not exposed to dust, direct sun, or any other heat emitting gadgets.

Provide grill door or shutter for main door with opening for good ventilation.

About 250 ltr of good quality RO Water (look for ISI mark) to be provided for 1st charging the TSS.

Use 4.0 sq. mm, 3-core armored insulated Copper cable for incoming supply

The distance between the supply point and the electric control panel should be maximum 05 meter. If the distance is more, select the higher size cable to compensate the voltage drop.

Connect earthing (minimum two numbers) at connector “E” in the electric control panel.

The voltage at the MAINS ON switch should be within the limit.

Ensure minimum distance between Milk outlet from SHIVA & inlet to Silo. At any case the distance should not be more than 500 mm.

3.1 CHILLER UNIT

Place the Chiller Unit such that the condenser fan faces the window for expelling the hot air ou.

Mount the Control Panel on the MS Structure. Ensure that the Panel is placed such that it is easily accessible to operator.

Fix the AC Pump base frame on the MS Structure and install the Pump on it.

Place the DC Battery, Inverter in the Frame and install them.

3.2 PREPARATION OF TSS

Clean the TSS Tank properly and position nearer to the CU.

Fix all diffuser Lines in respective SS Pipe ends inside the TSS.

Connect all the ¾" Ball Valve at Hot Discharge, Cold Suction & Cold Discharge Line and ensure leak proof.

Connect the Ball Valve at the TSS on Hot Suction Line and ensure leak proof.

Connect all interconnecting lines, Hot Suction Line – AC Pump Suction Line – AC Pump Discharge Line - PHE Inlet, PHE Outlet –Cold Discharge Line. Insulate properly with Aeroflex.

Fill RO water of 230 ltr and add 110 ltr of IPA to it, steer for about 30-40 min so that IPA mixed properly with the RO Water. Run the Coolant circulation pump for proper mixing of IPA with Water.

Put the PCM tubes inside the TSS, the PCM tubes floats vertically, after all the tubes are placed inside the TSS fix the wire mesh over them in the TSS. Ensure that no PCM Tubes comes above the mesh.

Top up RO Water in the TSS so that the mixture maintains the required level.

Run the AC Pump for at least 2-3 hours so that the IPA & RO Water mixed properly.

3.3 ACTIVE MILK STORAGE TANK

Install the AC Pump on the base frame provided..

Fix up the ¾" Ball Valve at the Inlet of Pump.

Connect the Pipe Lines between CMC & TSS Cold Suction – AC Pump Suction – AC Pump Discharge – Tank Inlet – Tank Outlet – Hot Discharge at TSS. Ensure all joints are leak proof. Insulate these lines with Insulation tubes, Ensure that the Vertex Breaker is placed in the Hooper.

Ensure the Hot & Cold lines are connected at appropriate terminal

3.4 CONTROL PANEL

Install the Control Panel on the frame at the Chiller Unit MS Structure.

Connect the Sensor wire (all Three) to the Control Panel and place the Sensor Tip at respective place.

Connect the DC Supply line from DC Battery to Panel Board and to complete all internal wirings.

Connect the Main Power Cable on the Control Panel Board and ensure that Phase & Neutral are connected to the proper connector.

4.0 STARTING THE UNIT

Before starting the unit, check the following

1. Main supply with specified Voltage and earthing is provided. 2. All parameters in the Control Panel as per factory set value
3. Lid of the electric control panel is closed and locked.
4. Valve in the Charging Line is opened
5. Switch ON the Power ON MCB, this will energize the Control Panel. After pre set delay period the Charging Pump will start, Coolant from TSS will start circulating to PHE & Back to TSS.
6. Switch ON the Chiller Unit MCB . This will make the compressor and condenser fan to start.
7. Note down the Battery Temp, Discharge Pressure & Suction Pressure and Current drawn by the compressor.
8. The CU will automatically stopped when the Battery Temperature reaches at its pre set temp. Checks the PCM Tube are frozen properly.
9. Now the CMC is ready for milking.
10. Fill the Tank with at least with 250 ltrs of water/milk
11. Switch ON the TANK Switch, the discharge pump will start, Battery Fluid will start flowing to Tank. Agitator will start
12. Continue till the temperature of the milk reached at 4 Deg C.
13. Keep the TANK switch ON until there is milk in the Tank so that the Discharge Pump will automatically start as and when the milk temperature goes above the set point
14. During milking the battery temperature will raise slowly and when it reaches to preset point the CU will start automatically.
15. Never put OFF the Power MCB.

5.0 CLEANING OF MILK TANK

After the milk dispatched, the tank must be carefully cleaned,

Luke warm water pre-rinse will wash away the majority of fat deposits

The best pre-rinse temperature is 45°C and the best cleaning temperature is 65°-80°C

Remove all the traces of milk left over dipstick

Use suitable dairy detergent along with hot water to clean the tank

Again rinse the tank with plenty of fresh water for complete removal of detergent

6.0 VERY IMPORTANT

During the cleaning milk agitator must be in OFF position

Never mix an acid with an alkaline detergent. This causes the formation of hazardous gases.

Tank should be cleaned immediately after it has been emptied

Never wet electrical elements during cleaning

Never use high pressure water jet for cleaning the exterior/interior of the tank



7.0 SAFETY DEVICES

Following are the protective and safety devices provided for the refrigeration system

MCB for the condensing unit

Glass fuse for control circuit

HP/ LP Cutouts

Compressor internal overload protector (IOLP)

Compressor internal High pressure relief valve (IPRV)

7.1 OVERLOAD FOR COMPRESOR

The Control Panel stops Power Supply to compressor if the Compressor takes more current than the pre set value. Found the reason for over current drawn and press the REST bottom on the Control Panel.

7.2 HIGH PRESSURE/ LOW PRESSURE CUTOUT (HP/ LP)

The device stops the electric supply to the compressor, if-

1. The discharge pressure exceeds the pre-set value (370 psig)
2. The suction pressure comes down below the pre-set value (30 psig)

The device is manual reset type, a push button on it is to be pressed for resetting.

7.3 COMPRESSOR INTERNAL OVERLOAD PROTECTOR (IOLP)

The IOLP is current and heat sensitive and is mounted at the star point of three windings of motor of the compressor

If the compressor current alone exceeds the limit or if the motor winding temperature alone exceeds the limit, or the combination of current and the motor winding temperature go beyond the safe operating limits, the IOLP trips.

After the IOLP trips, windings are open and no resistance is recorded by the Resistance Bridge/ Multi Meter. It may take as long as 45-60 minutes for the IOLP to reset. Allow enough time for resetting.

7.4 COMPRESSOR INTERNAL PRESSURE RELIEF VALVE (IPRV)

IPRV is mounted inside the compressor and on the discharge side

If the discharge pressure exceeds beyond the safe limits, the IPRV opens and delivers the hot discharge gas in the shell (suction side). This hot gas increases the ambient temperature around the IPRV and makes IPRV to trip.

IPRV opening is characterized by whistling sound from inside the compressor and excessive heating of the compressor shell.

Never bypass any of the safety devices provided. Find and rectify the cause of tripping instead.

8.0 MAINTENANCE

The Maintenance Schedule given below for ready reference.

Sn	Activities	Frequency		
		Monthly	Quarterly	Half yearly
1	Check IPA Level			
2	Check IPA Concentration			
3	Clean Condenser Filter & Fins			
4	Check Current drawn by both Pumps			
5	Check Current drawn by Compressor			
6	Check Discharge Pump Flow			
7	Check DC Batteries Voltage			
8	Check Charge Pump Flow			
9	Check Thermocouple readings			
10	Check Tubes for Physical Damage			
11	Check all fittings on TSS and CMC for leaks			
12	Agitator Gear Box Greasing			

13	Tighten all electrical terminals				
14	Check Insultion on coolant line				

8.1 CONDENSER & FILTER CLEANING

The air cooled condenser is to be cleaned at regular intervals since dust particles clog the air passages. The frequency of cleaning depends upon the level of dust at the location.

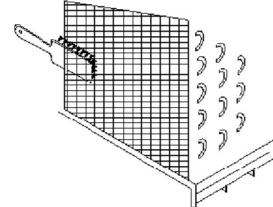
For cleaning the condenser air blowers are useful

Do not use acids or the cleaning agents for condenser cleaning

If the brush is to be used, ensure that it is soft and is applied gently over the fins

Never charge the lubricating oil to the compressor at any time. Doing so will damage the system permanently.

Check for oil traces at regular intervals on the compressor valves. If oil traces found at valves of the compressor, tighten the nuts of the valves. Valves & nuts will get loosen after some days/ weeks of operation due to continuous vibration of compressor



9.0 TROUBLE SHOOTING

TROUBLE SHOOTING				
Sn	Fault	Reasons	Symptoms	Remedy
01.	LP Fault (if the Suction Pressure of the Compressor goes below pre set value of 25 psi an Alarm with indication will be displayed in the Panel)	Brine Concentration Low	Auxiliary Temperature goes above pre set value of (-) 18°C	Check Brine Concentration & Top up with IPA & Water.
		Brine Level in TSS Low Holes in Top diffuser exposed to air	Noise/Vibration in Charging Pump	Add Brine Solution till the holes submerged fully.
		Charging Pump not working	Visual Inspection	Check Power supply at Pump terminal. Check Glass Fuse. No power supply from Motherboard Relay in Panel.
		Charging Pump Inlet/Outlet Valve Closed	Visual Inspection	Open both the Valves
		Air trapped in Charging Liquid Flow Line	Noise in Pump/Low Flow rate. Check whether air bubbles coming in TSS	Remove air from the system
		Service Valve in Suction Line Closed	Visual Inspection	Open the Valve fully
		Less/No Refrigerant in the CU	Check SP/DP & Current drawn by the CU. Check Flow of refrigerant in Sight Glass	Found Leakage in the system and recharge.
		Liquid Line Filter Drier Chocked	Manual Inspection, touch both end of the drier and feel difference in temperature if any. Check Flow of Refrigerant in Sight Glass	Replace the Drier
		Filter in TEV chocked	Observe "hiss" sound near the TEV	Clean the filter with Petrol, dry properly before use.
		Wrong TEV Bulb position Broken Bulb Capillary	Visual Inspection	Reset Bulb position and in case of broken capillary replace the TEV.
		Wrong setting of LP Sense in the Panel programme	Check by scroll key	Set LP FAULT ENABLE "OPEN- FAULT"

		Defective LP Switch	Check Continuity both during ON & OFF position	Replace if required.
02	HP Fault (if the Discharge Pressure of the Compressor goes above pre set value of 350 psi an Alarm with indication will be displayed in the Panel)	Obstructed air flow from condenser.	Window in front of condenser closed Something kept in front of Condenser	Open window / clear any obstruction in front of Condenser and ensure hot air expelled out of the room.
		High Ambient Temperature /Condenser exposed to direct sun Light	Visual Inspection	Try to avoid running of unit during peak temperature. Provide Air Cooler.
		Condenser Fan not working / Low RPM	Visual Inspection	Check Power Supply to Fan Check Capacitor-replace.
		Condenser Fins clogged	Visual Inspection	Clean with High pressure Air and Soft nylon brush by combing along the row of the Fins.
		Air/moisture entered in to the refrigeration system.	Check colour indicator in the Sight Glass and ensure that it matches with colour meant for "DRY"	Purge air from the system once or twice, check the colour if not satisfied replace the refrigerant.
		Solenoid Valve in closed position.	Check whether Valve open with the start of the Compressor.	Check Power supply and Solenoid Valve Coil, replace if coil burnt.
		Wrong setting of HP Sense in the Panel programme	Check by scroll key	Set HP FAULT ENABLE "OPEN- FAULT"
03	OL/UL Fault (When Current drawn by the CU goes above the preset value an Alarm with indication will be displayed in the Panel)	Defective HP Switch	Check Continuity both during ON & OFF position	Replace if required.
		Supply Voltage is Low	Check Voltage at Control Panel terminal and in case of low Voltage check fro source of supply and see where the problem lies.	Ensure proper Power supply
		Weak/Faulty Running Capacitor.	Check the Running Capacitor with Multi Meter	Replace if faulty/weak

	Check whether the indication is for OL (Over Load) or UL (Under Load)	High Ambient Temperature causing raise in discharge pressure	Compressor will run for few min and stop.	Ensure adequate ventilation so that hot air from condenser expels out of the room and condenser breath fresh air.
		Loose / burnt connection at all supply terminal for compressor.	Visual Inspection	Ensure proper connection.
		Faulty Compressor	Check continuity at the terminal of the compressor	Replace if found faulty
04	OL/UL Fault When Current drawn by the CU goes below the preset value an Alarm with indication will be displayed in the Panel)	No supply to Control Panel	Check Supply from the source.	Ensure proper Power supply Phase and Neutral connection is terminal sensitive.
		Supply Voltage low than the set value	Check with Multi meter	Ensure proper voltage
05	OV/UV Fault (when Voltage at the CP terminal goes above / below the pre-set value (180–260V) an Alarm with indication will be displayed in the Panel)	Supply Voltage at Control Panel terminal High/Low than he preset value	Visual Inspection & Alarm in Control Panel	Check Power supply from main source to Control panel terminal. Check Set points in the control panel
		MCB is put OFF	Visual Inspection	Put the MCB ON
06	Pump Trip (Charge Pump trips an Alarm with indication will display in the Control Panel)	Pump taking high current than the pre set value	Pump stops working	Check Voltage & current and rest if required.
		Compressor does not start	Visual Inspection	If compressor does not start, after five attempts Pump trips, press REST bottom for 10-20 sec.
07	Low Battery (when the voltage in DC battery goes below the pre-set value an Alarm with indication will be displayed in the DC Panel)	DC battery not charged or drained fully AC power supply is not available for at least 4-5 hrs between each milking.	Check Voltage with multi meter. The boost light will not switch ON during the charging.	Recharge battery at charging shop and re connect. Check Battery Charger in the Inverter supplies 24 V to battery. Check & tighten lugs in the battery terminals. Replace battery.

08	Compressor Not working	No supply to compressor terminal	Visual Inspection	Check complete power supply circuit, MCB- Contactor In-Contactor Out- Start Kit- Compressor Terminal)
		Start/Run Capacitor/ Potential Relay faulty	Visual Inspection	Check Capacitor, Potential Relay & run Capacitor
		Compressor Faulty	Check continuity at Compressors Terminal & Body earth	Replace Compressor Replace Filter Drier each time compressor replaced.
09	Milk not getting Chilled	Discharge pump flow rate low	Check Flow rate (should be 10-12 lpm)	Ensure Valves are fully open No air trapped in the flow line & pump DC Battery voltage low reducing RPM of Pump Length of Black Hose pipe is more Leakage in fittings.
		The Milk Storage Tank sensors showing faulty readings.	Cross check with Manually	Replace the Thermocouple.
		Agitator not working	Visual Inspection	Check Agitator functioning.
		Less quantity of milk in Active Storage Tank	Is adequate milk level is there in tank corresponding to the position of the sensor.	Ensure minimum quantity of milk(at least 150-200 ltr)
		Not	No supply to the agitator	Manual Inspection Check complete power supply circuit from Panel Board terminal to Agitator Check corresponding Glass Fuse
10	Agitator Working	Faulty Capacitor.	Manual Inspection	Replace the capacitor
		There may be an obstruction in the movement of the shaft, e.g. the cap or any foreign particles.	Visual Inspection, rotate shaft by hand check whether rotates freely	Remove obstruction
		The bearing may be damaged.	Visual Inspection, rotate shaft by hand check whether rotates freely	Replace the bearings
		The gear mechanism is damaged.	Visual Inspection, rotate shaft by hand check whether rotates freely	Replace broken gear/gear box as required

Note : The above trouble shooting are only guide lines for addressing the problems. In case of any difficulties contact Promethean Service Engineer. Do not allow any unskilled technician to handle the problem, he may damage the system.

10.0 DO'S

General

- Install the tank in wide, ventilated room with proper water supply and drainage
- Ensure perfect leveling of the tank by authorized personnel
- Clean the tank only with soft brushes and sponges suitable for stainless steel
- Ensure the inner tank is clean before taking the milk inside the tank



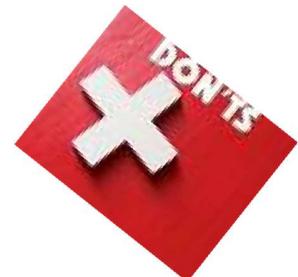
Refrigeration

- Ensure proper ventilation around the condensing unit
- Keep condenser free from dust and dirt- can be cleaned by means of brush or can be blown with compressed air
- Ensure the condenser fins are not bent **Electrical**
- Ensure proper earthing
- Ensure proper supply voltage & phase sequence.

11.0 DON'TS

General

- Do not enter the tank wearing either shoes or slippers
- Do not damage the surface by using files, steel wool, sand paper or similar abrasive material **Refrigeration**
- Do not switch on the condensing unit when TSS is empty
- Do not use any other refrigeration than recommended one
- Do not use wire mesh to clean the condenser
- Do not charge refrigerant or oil to the compressor
- Do not topple the machine. The compressor is hanging on the spring inside the shell.
- Do not puncture the condenser coil as the system is under pressure

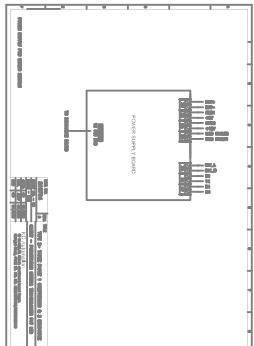
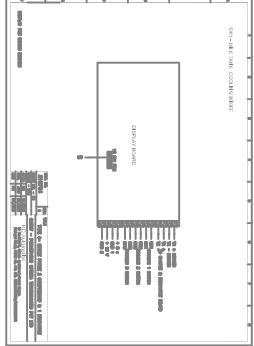
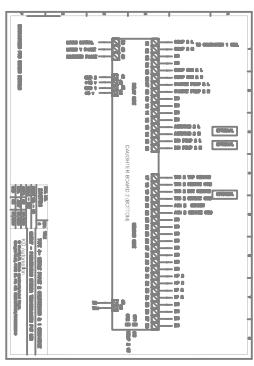
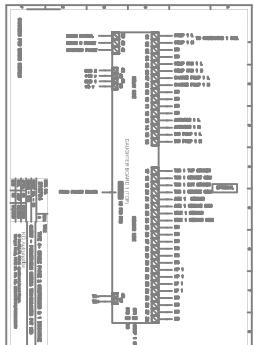
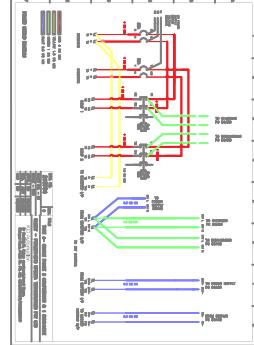


Electrical

- Do not service the equipment unless the mains supply is cut off
- Do not splash water on the control panel and do not bypass any safety and protective devices. Find out the faulty and rectify/ replace immediately

We thank you for your confidence in choosing Promethean Spenta Technology Conventional Milk Cooling System for eliminating Diesel Generator thus saving Fuel for the Nation and for a better pollution free Environment.

**TYPE 4 SINGLE PHASE 2 COMPRESSOR SINGLE DISCHARGE
MILK CHILLER**



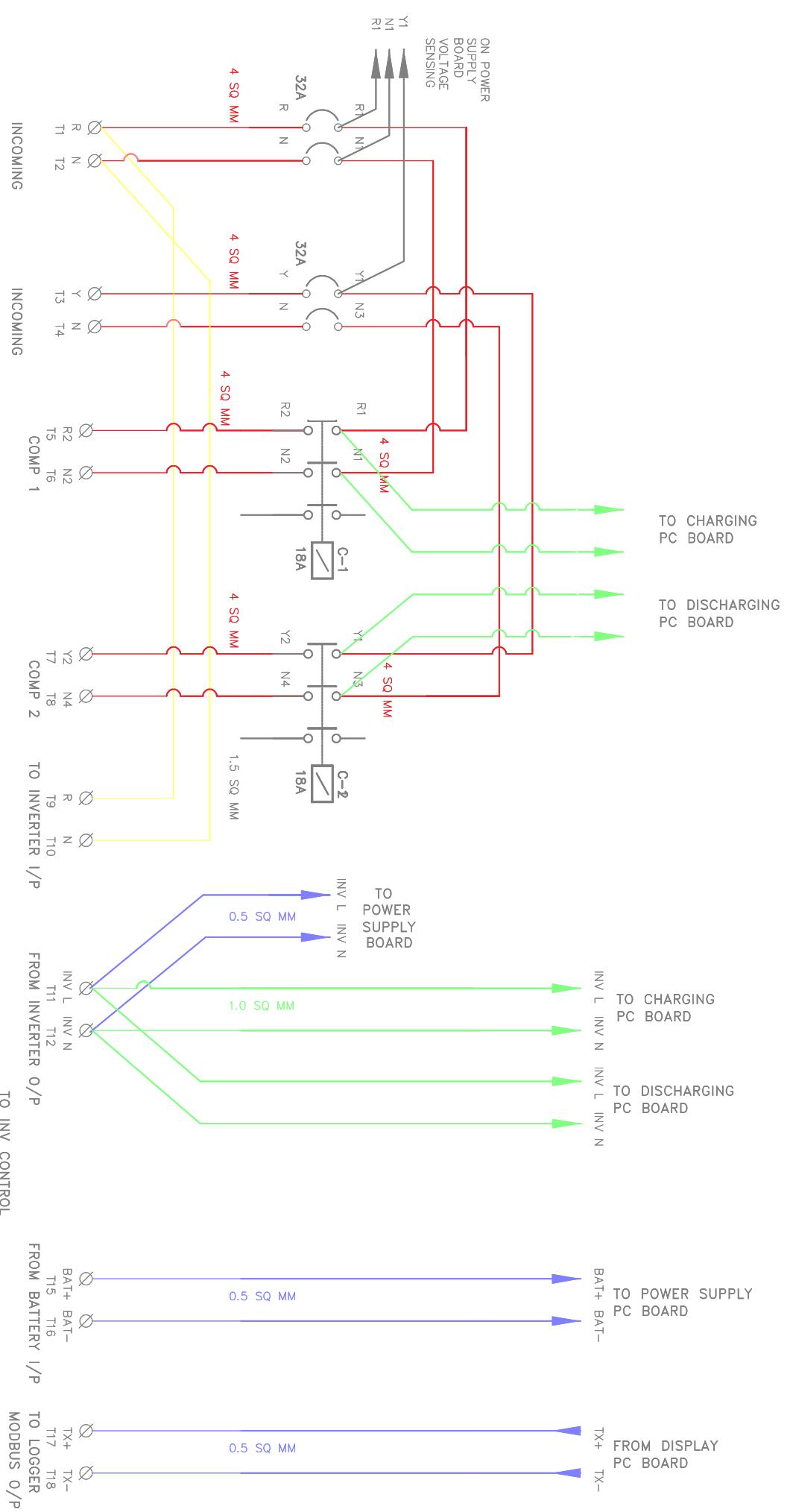
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3

4

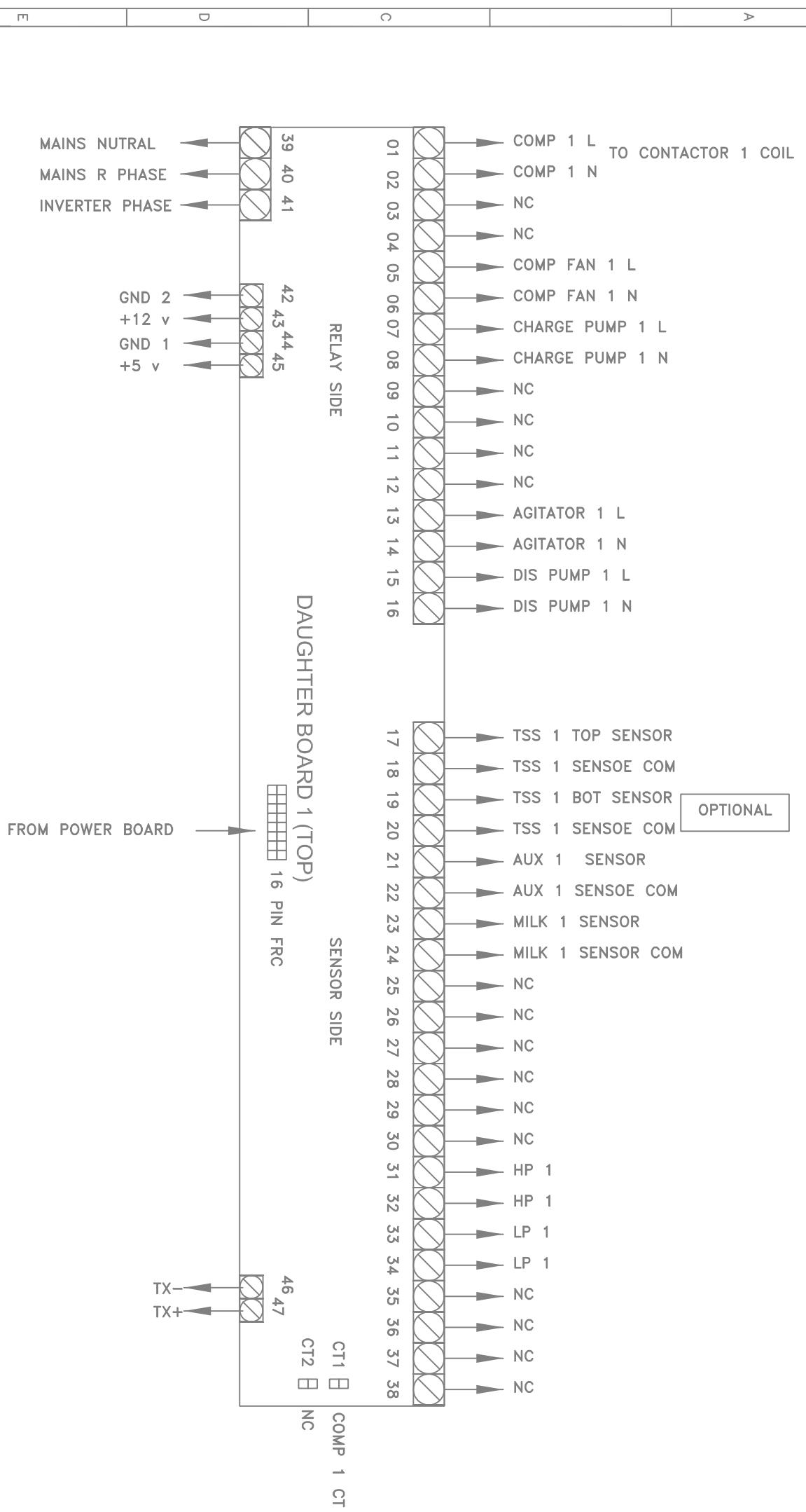
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6 7 8

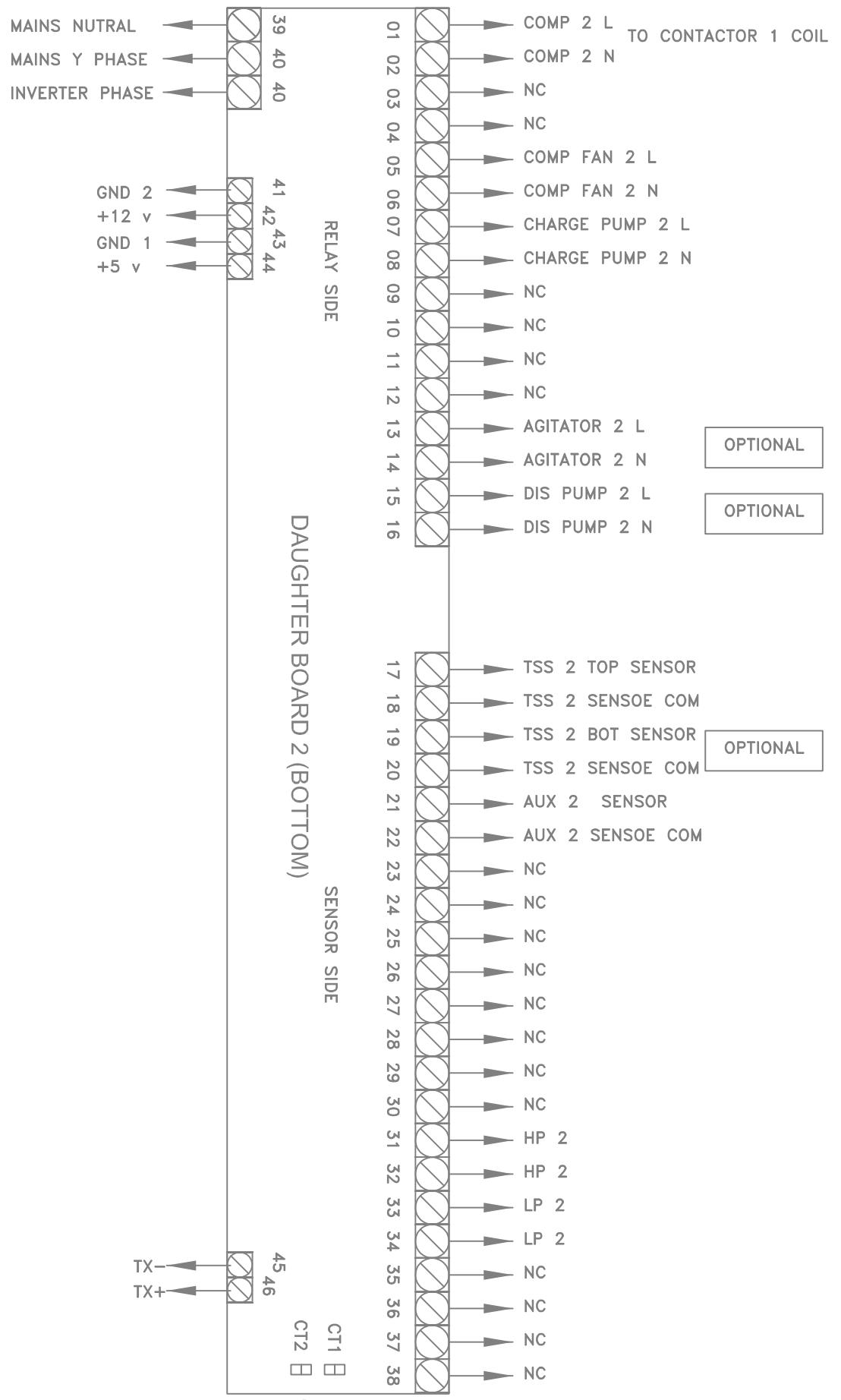


DRG. NO.	REV.	TITLE
210704	0	TYPE 4 – SINGLE PHASE 2 COMPRESSOR & 1 DISCHARGE
SHEET NO. – 01		
SCALE – NTS		
APPD. KD	07/2021	CLIENT – PORMETHEAN SPENTA TECHNOLOGIES PVT LTD
CHD. AMIT	07/2021	KD Automation Sr No.121/2, Rohan apartment, Anand Nagar, Sinhgad Road, PUNE 51. PH. NO. 02024349495 / 09822625619
CAD KD	07/2021	

1 2 3 4 5 6 7 8

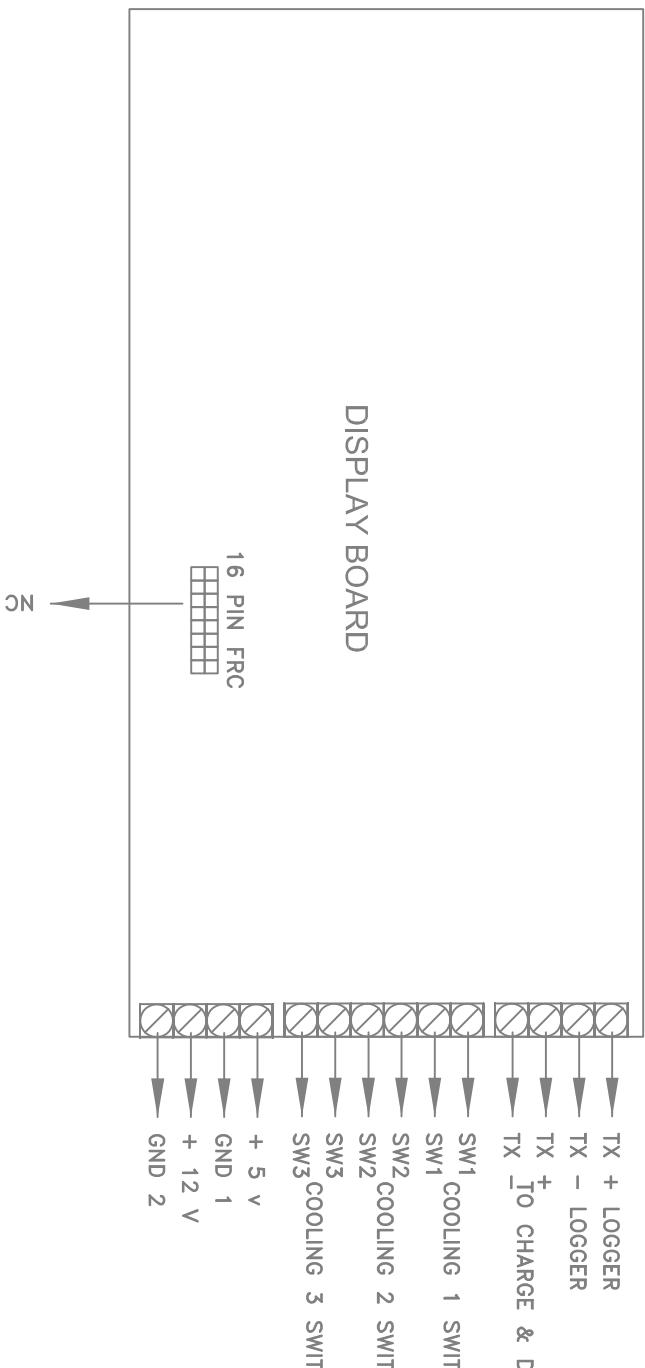


DRG. NO.	REV.	TITLE
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SCALE – NTS		
APPD. KD	07/2021	CLIENT – PORMETHEAN SPENTA TECHNOLOGIES PVT LTD
CHD. AMIT	07/2021	KD Automation Sr No.121/2, Rohan apartment, Anand Nagar, Sinhgad Road, PUNE 51. PH. NO. 02024349495/09822625619
CAD KD	07/2021	



DRG. NO. 210704	REV. 0	TITLE TYPE 4 – SINGLE PHASE 2 COMPRESSOR & 1 DISCHARGE
SHEET NO. – 03		
SCALE – NTS		
APPD.	KD	07/2021
CHD.	AMIT	07/2021
CAD	KD	07/2021
KD Automation Sr No.121/2, Rohan apartment, Anand Nagar, Sinhgad Road, PUNE 51. PH. NO: 02024349495/09822625619		CLIENT – PORMETHEAN SPENTA TECHNOLOGIES PVT LTD

A
1 2 3 4 5 6 7 8
SW1 - MILK TANK COOLING ON/OFF



E

D

C

A

F
DISPLAY PCB WIRING DETAILS

DRG. NO.	REV.	TITLE
210704	0	TYPE 4 – SINGLE PHASE 2 COMPRESSOR & 1 DISCHARGE
SHEET NO. – 04		
SCALE – NTS		CLIENT – PORMETHEAN SPENTA TECHNOLOGIES PVT LTD
APPD. CHD.	07/2021 AMIT	KD Automation Sr No.121/2, Rohan apartment, Anand Nagar, Sinhgad Road, PUNE 51. PH. NO. 02024349495 / 09822625619
CAD	07/2021	

A

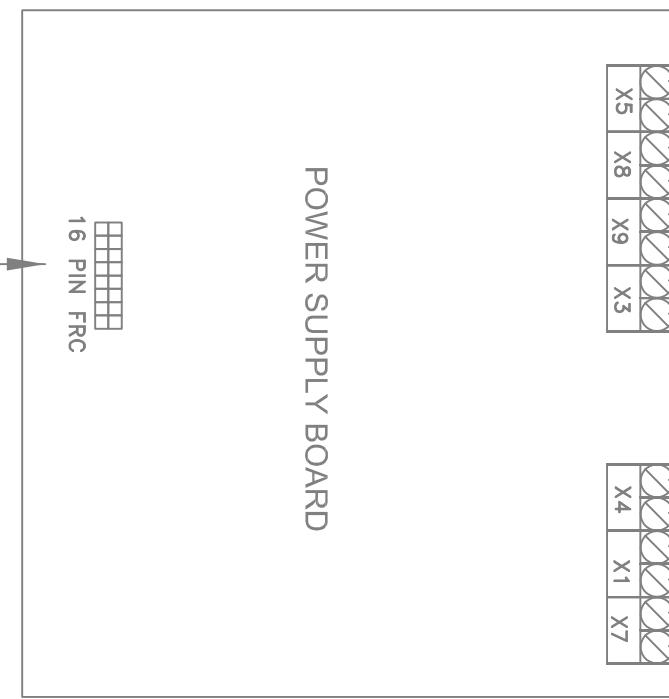
C

D

E

TO DISCHARGE BOARD

POWER SUPPLY BOARD



16 PIN FRC

DRG. NO.

210704

REV.

0

TITLE

TYPE 2 – THREE PHASE 1 COMPRESSOR & 2 DISCHARGE

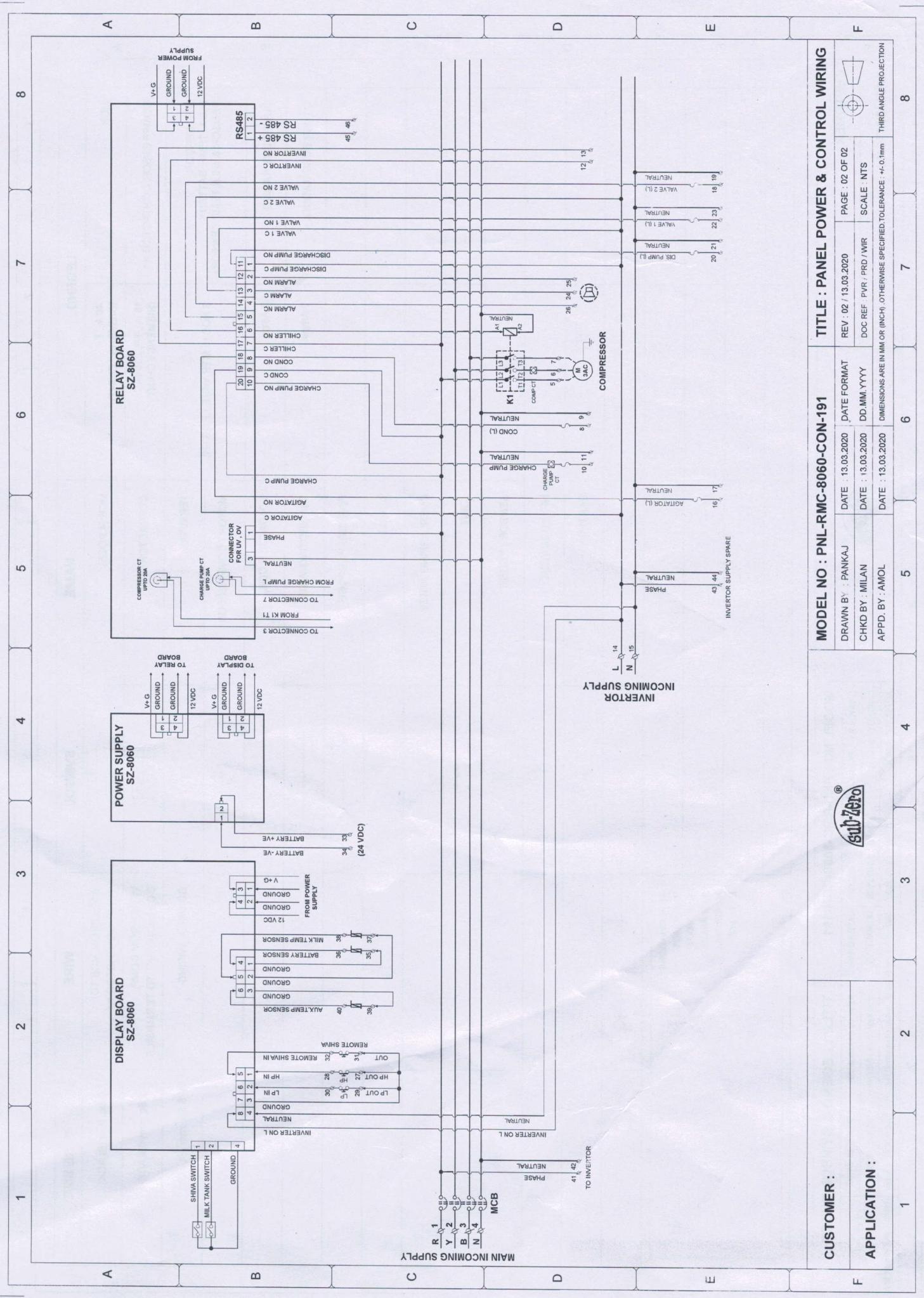
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CLIENT – PORMETHEAN SPENTA TECHNOLOGIES PVT LTD

SCALE – NTS

KD Automation

APPD. KD 07/2021
CHD. AMIT 07/2021
CAD KD 07/2021Sr No.121/2, Rohan apartment, Anand Nagar,
Sinhgad Road, PUNE 51. PH. NO. 02024349495 / 09822625619



Format no. PVR/PRD/WIR Rev No. 00 / 01.08.2017

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LEGEND		NAME	SYMBOL	WIRE	WIRE SIZE
A	40 A, FP (SIEMENS / CHINT)	MCB (4 POLE)		WIRE FROM MCB TO COMP. CONTACTOR K1	2.5 Sq. mm (BLACK)
	18 A, TP, 230VAC (SIEMENS / CHINT)	CONTACTOR		WIRE FROM COMP. CONTACTOR K1 TO TERMINALS	2.5 Sq. mm (BLACK)
	NTC SENSOR (AUX. TEMP. BATTERY SENSOR & MILK TEMP SENSOR)	TERMINAL		CONTROL WIRING	0.75 Sq. mm (BLACK)
B	3 NOS (5 MTR WIRE LENGTH)	MOTOR / COMPRESSOR			
	3 Amps	CONTACTOR COIL			
	2 Amps	CONNECTING WIRE			
C		FOR SITE PURPOSE			
		ALARM			
		OVERLAPPING WIRES			
D		JOINT			
		SENSOR / PROBE			
		HP / LP SWITCH			
E		EARTHING			
F		ABBREVIATIONS :			
		R : R PHASE Y : Y PHASE B : B PHASE N : NEUTRAL L : PHASE			

MODEL NO : PNL-RMC-8060-CON-191

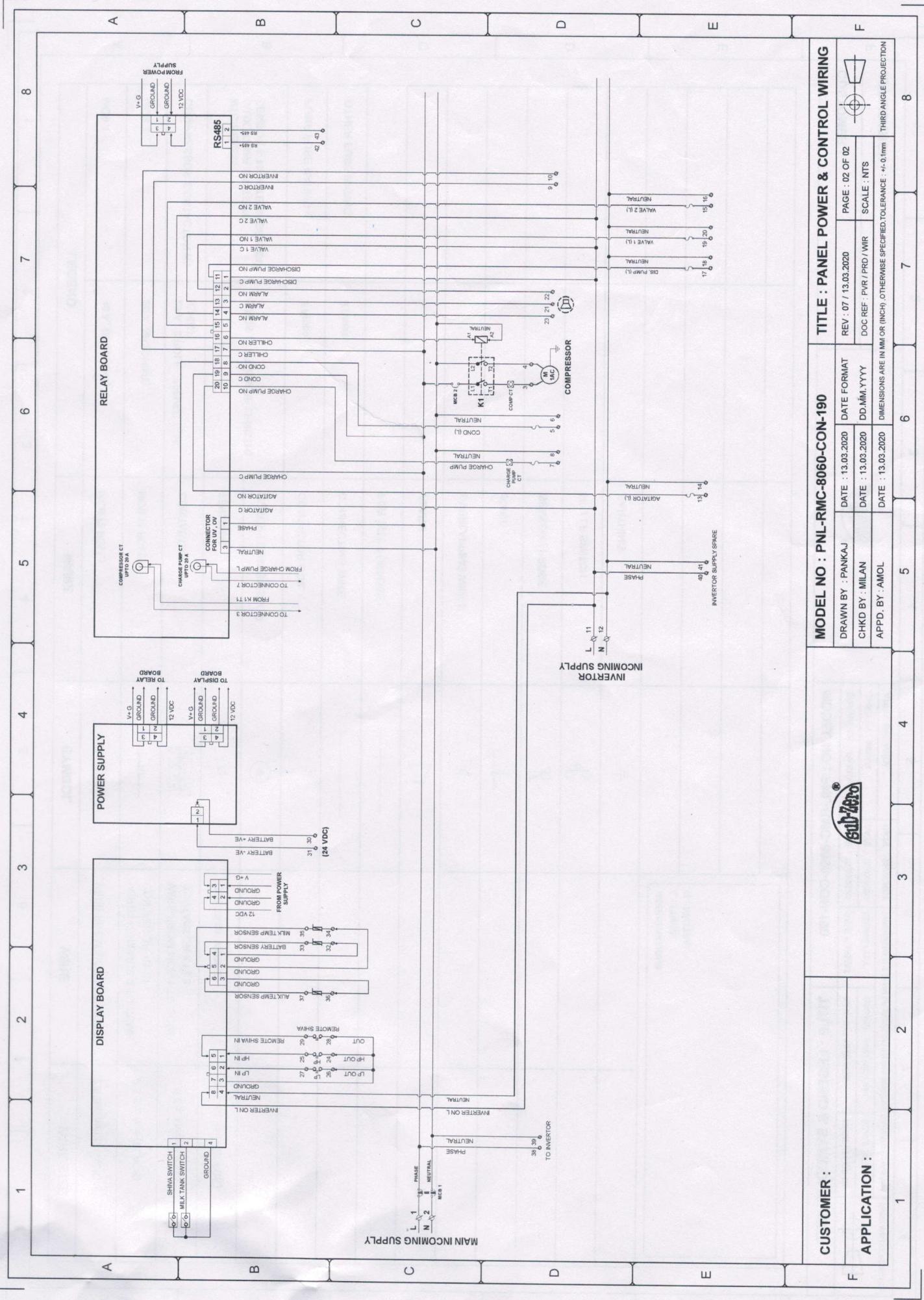
TITLE : LEGEND & SYMBOL SHEET

DRAWN BY : PANKAJ	DATE : 13.03.2020	-DATE FORMAT	REV : 02 / 13.03.2020	PAGE : 01 OF 02
CHKD BY : MILAN	DATE : 13.03.2020	DD.MM.YYYY	DOC REF : PVN / PRD / WIR	SCALE : -NTS
APPD. BY : AMOL	DATE : 13.03.2020	DIMENSIONS ARE IN MM OR INCH, OTHERWISE SPECIFIED TOLERANCE +/- 0.1mm		THIRD ANGLE PROJECTION



CUSTOMER :

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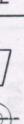
LEGEND		NAME	SYMBOL	WIRE	WIRE SIZE
A	MCB 1	40 A, DP (CHINT)	MCB (2 POLE)		WIRE FROM MCB 1 TO MCB 2 2.5 Sq. mm (BLACK)
	MCB 2	25 A, SP (CHINT)	MCB (1 POLE)		WIRE FROM MCB 2 TO COMP. CONTACTOR K1 L1 2.5 Sq. mm (BLACK)
	COMPRESSOR CONTACTOR K1	25 A, 2 POLE , 230VAC COIL (CHINT)	CONTACTOR		WIRE FROM MCB 1 TO COMP. CONTACTOR K1 L2 2.5 Sq. mm (BLACK)
B	NTC SENSOR (AUX. TEMP, BATTERY SENSOR & MILK TEMP SENSOR)	3 NOS (5 MTR WIRE LENGTH)	TERMINAL		CONTROL WIRING 0.75 Sq. mm (BLACK)
	PUMP FUSE RATING	3 Amps	MOTOR / COMPRESSOR		
C	OTHER FUSE RATING	2 Amps	CONTACTOR COIL		
			CONNECTING WIRE		
D			FOR SITE PURPOSE		
			ALARM		
E			OVERLAPPING WIRES		
			JOINT		
F			SENSOR / PROBE		
			HP / LP SWITCH		
G			EARTHING		
					ABBREVIATIONS: L : PHASE N : NEUTRAL

CUSTOMER :		MODEL NO : PNLL-RMC-8060-CON-190		TITLE : LEGEND & SYMBOL SHEET	
APPLICATION :					
1	2	3	4	5	6
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CUSTOMER :
APPLICATION :

DRAWN BY : PANKAJ DATE : 13.03.2020 PAGE : 01 OF 02
CHKD BY : MILAN DATE : 13.03.2020 DD.MM.YYYY DOC REF : PVR / PRD / WIR SCALE : NTS
APPD. BY : AMOL DATE : 13.03.2020 DIMENSIONS ARE IN MM OR (INCH), OTHERWISE SPECIFIED. TOLERANCE +/- 0.1mm THIRD ANGLE PROJECTION



SITE INSPECTION REPORT BMC		DocNo:SIBR0	
Equipment Type		Dt.	/ / 20
Capacity			
Name of the Customer			
Site Name			
Agent Name /Mobile			
Sn	Requirement	Available	Suitability (Y/N)
A BUILDING STASTUS			
1	Room Size: 5000X4000X3000MM		
2	Window 1 - 1200 mm x 1500 mm at 300 mm		
3	Window 2- 1200 mm x 1200 mm for ventilation		
4	Number of Window - At least 02		
5	Main Entrance - 1800 mm x 1800 mm height		
6	Ceiling Height from Floor - 3000 mm min.		
7	ceiling Type - RCC/Tin Sheet/Asbestos Sheet		
8	Floor Height from ground Level - 450 mm min		
9	Building Free from dust & moisture		
10	water availability for refill(TDS <300)		
B POWER SUPPLY STATUS			
1	Power Supply (1ph/3ph)		
2	Load capacity		
3	Power schedule		
4	Distance from Pole to EB Meter (< 30 ft)		
5	Distance from Transformer to pole (< 80 ft)		
6	Incoming Cable- 6 ² mm,3-core,coper insulated		
7	Incoming Fuse / MCB rating - 63 Amp DP		
8	Voltage Stabilizer		
9	Voltage Drop at starting of full load (not<190V)		
10	Number of Earthing - 02 nos		
11	Depth of earth Pit (min 8 ft - 10 ft)		
12	Voltage, Phase - Neutral (not < 230 V ±10%)		
13	Voltage, Phase - Earth (not < 230 V ±10%)		
14	Voltage, Neutral - Earth (< 5 V)		
15	Earth pit Resistance (< 5 ohms)		
16	Power availability between each milking (4 hr.)		
17	Chiller Unit Position		
18	Mobile Network (2G)& Service provider		
19	Whether site is suitable for M/c Installation (yes/No)		
for PSTPL(Name & Signature)		for Customer(Name & Signature)	
PROPOSED EQUIPMENT LAYOUT WITH REMARKS /SUGGESTION			

SITE INSPECTION REPORT-COLD ROOM		DocNo:SICR0	
Equipment Type	Dt. / / 20		
Capacity			
Name of the Customer			
Site Name			
Agent Name /Mobile			
Sn	Requirement	Available	Suitability (Y/N)
A BUILDING STATUS			
1	Room Size:		
2	Window 1 - 3x3 ft		
3	Window 2- 3x3feet		
4	Number of Window - At least 02		
5	Main Entrance - 5x7		
6	Flooring at uniform leveling (concrete)		
7	Ceiling Type - RCC/Tin Sheet/Asbestos Sheet		
8	Floor Height from ground Level - 1.5 ft		
9	Building Free from dust & moisture		
10	cu unit Fan facing should face the window or Grill Shutter - Ventilated/cu unit outdoor Location		
B POWER SUPPLY STATUS			
1	Power Supply (1Ph/3ph)		
2	Load Capacity		
5	Incoming Cable-		
6	Incoming Fuse / MCB rating - 63 Amp DP		
7	Voltage Stabilizer		
8	Voltage Drop at starting of full load (not<190V)		
9	Number of Earthing - 02 nos		
10	Depth of earth Pit (min 8 ft - 10 ft)		
11	Voltage, Phase - Neutral (not < 230 V ±10%)		
12	Voltage, Phase - Earth (not < 230 V ±10%)		
13	Voltage, Neutral - Earth (< 5 V)		
14	Earth pit Resistance (< 5 ohms)		
15	Power schedule		
16	Mobile Network (2G & 4G)		
17	Name of the Service Provider		
19	Whether site is suitable for M/C Installation(Yes/No)		
for PSTPL(Name & Signature)		for Customer(Name & Signature)	
PROPOSED EQUIPMENT LAYOUT WITH REMARKS /SUGGESTION			

SITE INSPECTION REPORT-CANCHILLER			DocNo:SICCR0
Equipment Type			Dt. / / 20
Capacity			
Name of the Customer			
Site Name			
Agent Name /Mobile			
Sn	Requirement	Available	Suitability (Y/N)
A	BUILDING STASTUS		
1	Room Size: 8x8x10		
2	Window 1 - 3x3 ft		
3	Window 2- 3x3feet		
4	Number of Window - At least 02		
5	Main Entrance - 5x7		
6	Flooring at uniform leveling (concrete)		
7	Ceiling Type - RCC/Tin Sheet/Asbestos Sheet		
8	Floor Height from ground Level - 1.5 ft		
9	Building Free from dust & moisture		
10	cu unit Fan facing should face the window or Grill Shutter - Ventilated		
B	POWER SUPPLY STATUS		
1	Power Supply - 230 V, 50 Hz AC Single Ph+Ne		
2	Connected Load 2.5 kw		
5	Incoming Cable- 2.5mm,3-core,coper insulated		
6	Incoming Fuse / MCB rating - 32 Amp DP		
7	Voltage Stabilizer 3 KVA Single Ph		
8	Voltage Drop at starting of full load (not<190V)		
9	Number of Earthing - 02 nos		
10	Depth of earth Pit (min 8 ft - 10 ft)		
11	Voltage, Phase - Neutral (not < 230 V ±10%)		
12	Voltage, Phase - Earth (not < 230 V ±10%)		
13	Voltage, Neutral - Earth (< 5 V)		
14	Earth pit Resistance (< 5 ohms)		
15	Power availability between each milking (4 hr.)		
16	Mobile Network (2G & 4G)		
17	Name of the Service Provider		
18	Any recommendation :		
19	Whether site is suitable for M/c Installation(yes/No)		
for PSTPL(Name & Signature)		for Customer(Name&Signature)	
PROPOSED EQUIPMENT LAYOUT WITH REMARKS /SUGGESTION			

INSTALLATION CHECK SHEET-BMC		DocNo:IBR0	Page1/2
Equipment Type		Dt.	/ / 20
Equipment Capacity			
Name of the Customer			
Site Name			
Agent Name /Mobile			
Sn	Check Points	OK /Not OK	Remarks if Not OK
1	Center Point of Window-1 & CDU matches perfectly		
2	Window Opening extended 150 mm both side of the CDU		
3	Additional Window for cross ventilation present		
4	Window -1 not facing to farm area with dust by animal feed		
5	No shutter provided in any of the window		
6	No open holes in the building for entry of rat/insects		
7	No match box / any inflammable material kept near TSS & CDU		
8	Power supply taken from separate MCB 63 A for BMC		
9	Power supply cable - 6 ² mm,3-core,coper insulated		
10	Cable laid properly and fixed with saddle/conduit pipe		
11	All Cable terminals fixed with appropriate lugs		
12	No joints in main power supply cable		
13	Any joint in sensor cable are soldered		
14	Sensor cable laid separately (not along with power cables)		
15	All Sensors fixed at proper position and tied properly		
16	No cables should lie on floor		
17	All screws & nuts inside stabilizer is tightened properly		
18	Any dust/foreign material inside stabilizer is cleaned		
19	Dimmers in the stabilizer cleaned properly		
20	Condition of the carbon brush (no wear & tear)		
21	No Physical Damage inside /body of the stabilizer		
22	Stabilizer Low Voltage set at 150V		
23	Stabilizer High Voltage set at 260 V		
24	Proper Ventilation for Stabilizer		
25	All additional holes for cable are blocked in panel		
26	IPA + Water Level in TSS (at least 1.5" above the diffuser)		
27	Gasket provided at the lead of TSS		
28	Damage in Caps of PCM Tube (specify no's if damaged)		
29	No physical Damage inside /body of the Inverter		
30	DC Battery are fully charged (12 V in each battery)		
31	Liquid level in Battery are at full level		
32	Liquid Level Indicator are intact		
33	Agitator motor gear box greases properly		
34	No bend / off set in Agitator Shaft		
35	All parameter in Control Panel are set within limit		
36	All internal wire terminals are fixed with lugs		
37	Electrical Drawing available inside the Control Panel		
38	No physical damage in condenser Fins		
39	No noise in Condenser Fan		
40	Two no's of earth pit provided		
41	GI Flat 25 mm x 3 mm the) bolted properly with GI Pipe		
42	Quantity of Charcoals & Salt added to earthing (50 kg each/pit)		
43	Earth Pit bricks wall done		
44	Earth Pit located at 03 meter from building (if not distance?)		
45	Body earthing to stabilizer,Inverter,All motors,Panels		
52	No cross of coolant flow pipe line		
for Promethean Spenta Technologies Pvt Ltd		for Customer	
Name & Signature		Name & Signature	

INSTALLATION CHECK SHEET-BMC

DocNo:SICCR0

Page2/2

Sn	Descriptions	Specif.	Actu	OK/Not OK	Remarks
A Before Stabilizer (At input to stabilizer)					
1	Phase to Neutral	180V - 250 V			
2	Phase to Earth	180V - 250 V			
3	Neutral to Earth	< 5 V			
4	Voltage in no load	180V - 250 V			
5	Voltage when CU unit is running	180V - 250 V			
6	Current in no Load	<3 Amp			
7	Current when CU unit running	<16 Amp			
B After Stabilizer (at input to our panel board)					
1	Phase to Neutral	230 V			
2	Phase to Earth	230 V			
3	Neutral to Earth	< 5 V			
4	Voltage in no load	230 V			
5	Voltage when CU unit is running	230 V			
6	Current in no Load	< 3 Amp			
7	Current when CU unit running	< 15 Amp			
C Control Panel Setting					
1	Reset count	5			
2	Milk Temperature Set Point	4° C			
3	Milk Temperature Dead Band	2			
4	Battery Temperature Set Point	(-) 6° C			
5	Battery Temp Dead Band	2			
6	High voltage	260 V			
7	Low voltage	180 V			
8	Compressor High current	16.0 A			
9	Compressor Low current	6.0 A			
10	Charge pump High current	2.0 A			
11	Agitator Motor Run Time	13 min			
12	Agitator Motor OFF Time	2 min			
D Condensing Unit (CU) when Battery Temp ° C					
1	Suction Pressure	40 - 75 psi			
2	Discharge Pressure	270 - 350 psi			
3	Starting Current				
4	Running Current	< 16 A			
5	Sight Glass (full/bubble)	Full			
E MISLENOIUS					
1	Current by Agitator Motor	0.35 A			
2	Current by Charge Pump	0.5 A			
3	Current by Discharge Pump	0.5 A			
4	Voltage in DC Battery	12 V each			
5	Specific Gravity of DC Battery Fluid	1.277 @80° F			
6	Concentration of IPA Mixture	30 at 30° C			
7	Charge Pump Flow Rate	12-14 lpm			
8	Discharge Pump Flow Rate	16-18 lpm			
9	Calibration of all Temperature Sensor	0			
10	Earth Pit Resistance	< 5 ohms			
11	Milking Time - 1st Milking	< 3 hrs.			
12	TSS Charging Time	< 4 hrs.			

Any pending work/remarks :

for Promethean Spenta Technologies Pvt Ltd	for Customer
Name & Signature	Name & Signature

INSTALLATION CHECK SHEET-COLDROOM

DocNo:ICR0

Pa

Equipment Type		Dt.	/	/ 20
Equipment Capacity				
Name of the Customer				
Site Name				
Agent Name /Mobile				

Sn	Descriptions	Specif.	Actual	OK/Not OK	Remarks
A Electricity					
1	Phase to Neutral	180V - 250 V			
2	Phase to Phase	415-440			
3	Phase to Earth	180V - 250 V			
4	Neutral to Earth	< 5 V			
5	Voltage in no load	180V - 250 V			
6	Voltage when CU unit is running	180V - 250 V			
7	Current in no Load				
8	Current when CU unit running				
9	FCU 1 current				
10	FCU 2 current				
11	charge pump current				
12	discharge pump current				
13	Inverter charging current				
14	Total current when cu running				
B Flow rate					
1	Charge Pump	18-20LPM			
2	Discharge pump1	6-12LPM			
3	Discharge Pump2	6-12LPM			
C INVERTER					
1	Battery voltage (B1,2,3,4)	12 V each			
2	Sp.Gravity (1,2,3,4)	1.277 @80° F			
3	run half an hour without EB power				
D Control Panel Setting					
1	Reset count	5			
2	Milk Temperature Set Point	4° C			
3	Milk Temperature Dead Band	2			
4	Battery Temperature Set Point	(-) 8° C			
5	Battery Temp Dead Band	2			
6	High voltage	260 V			
7	Low voltage	180 V			
8	Compressor High current	20			
9	Compressor Low current	6.0 A			
10	Charge pump High current	2.0 A			
E Condensing Unit (CU) when Battery Temp °C					
1	Suction Pressure	40 - 75 psi			
2	Discharge Pressure	270 - 350 psi			
3	Starting Current				
4	Running Current	< 16 A			
5	Sight Glass (full/bubble)	Full			
F MISLENOIUS					
1	Time Taken for TSS charging (-6 to -8)				
2	cutin time for discharge pump				
3	cutoff time for discharge pump				
4	Sensor joints should be soldered				
5	All wires are with Lugs				
6	Length of Discharge pump to FCU1				
7	Length of Discharge pump to FCU2				
8	Length of copper tube from Odu to Phe				
9	Size of cold room				
10	Size of Anteroom				
11	Any leakage in cold room				
12	Is door curtain available				

Any pending work/remarks :

for Promethean Spenta Technologies Pvt Ltd	for Customer
Name & Signature	Name & Signature

INSTALLATION CHECK SHEET-CANCHILLER

DocNo:ICCR0

Equipment Type		Dt. / / 20
Equipment Capacity		
Name of the Customer		
Site Name		
Agent Name /Mobile		

Sn	Check Points	OK /Not OK	Remarks if Not OK
1	Center Point of Window-1 & CDU matches perfectly		
2	Additional Window for cross ventilation present		
3	Window -1 not facing to farm area with dust by animal feed		
4	No shutter provided in any of the window		
5	No open holes in the building for entry of rat/insects		
6	No match box / any inflammable material kept near TSS & CDU		
7	Power supply taken from separate MCB 32 A for Can Cooler		
8	Power supply cable - 2.5mm,3-core,coper insulated		
9	Cable laid properly and fixed with saddle/conduit pipe		
10	All Cable terminals fixed with appropriate lugs		
11	No joints in main power supply cable		
12	Any joint of sensor cable are soldered		
13	Ice Thickness Sensor cable laid separately (not along with power cables)		
14	Ice Thickness Sensor Fitted at Backside of TSS in 3 Row		
15	Check Normal Start of Compressor on Led Red		
16	Check Green Led for 12 mm Ice		
17	Check Discharge Pump Working on Panel Switch		
18	No cables should lie on floor		
19	All screws & nuts inside stabilizer is tightened properly		
20	Any dust/foreign material inside stabilizer is cleaned		
21	Condition of the carbon brush (no wear & tear)		
22	No Physical Damage inside /body of the stabilizer		
23	Stabilizer Low Voltage set at 150V		
24	Stabilizer High Voltage set at 260 V		
25	Proper Ventilation for Stabilizer		
26	All additional holes for cable are blocked		
27	IPA + Water Level in level indicator is Full		
28	Water Falling Mechanism is Fitted Appropriately		
29	Damage in Drip Pipe Tube of TSS (specify no's if damaged)		
30	No physical Damage inside /body of the Inverter		
31	DC Battery are fully charged (12 V)		
32	Liquid level in Battery are at full level		
33	Liquid Level Indicator are intact		
34	Flow rate of Charge Pump set in Limit		
35	Flow rate of Discharge Pump set in Limit (5LPM per Nozzle)		
36	All parameter in Control Panel are set within limit (T1-180, T2-3, T3-55, T4-3, T5-5, SP -(-9)		
37	All internal wire terminals are fixed with lugs		
38	Electrical Drawing available inside the Control Panel		
39	No physical damage in condenser Fins		
40	No noise in Condenser Fan		
41	Two no's of earth pit provided		
42	Earth wire connected		
43	Rechilling working ok		
44	Chilling working ok		
45	Set High current 9 Amps -6cans and 6 Amps-4cans		
46	Gas Pressure Check at room temperature 25 deg , Suction Pres: 82 & Disch Pressure : 325		
47	Gas pressure at full charge Suction Pressure 32 & Disch pressure : 255		
48	LP/HP setting - 15 /400 PSIG		
49	Water flow from PHE - 5 LPM		
50	If any leakage after rectification fill 1.150 kg of R404A gas		
51	Compressor current When TSS is complete Discharge is 7.8 Amps & when Normal running 5.7 Amps		

Remarks if any :

for Promethean Spenta Technologies Pvt Ltd	for Customer
Name & Signature	Name & Signature

PREVENTIVE MAINTENANCE VISIT REPORT-BMC				DocNo:PMBR0	Date :
Customer				Site Name	
Capacity	No of TSS		No of CU	Installed on	
Attended by				Last Visited on :	
Time In		Time Out		Visit No	(1) (2) (3) (4)
Observations					
Sl	Description	Value	Remarks		
1	Supply Voltage at Panel				
2	Level of coolant				
3	Concentration of Coolant				
4	Condition of Insulation				
5	Leakage in coolant line				
6	Liquid Level in DC Battery				
7	Cleanliness, rusting in tank etc.				
8	Crosscheck of all three sensor				
9	Current Taken by the System				
Job Done					
Sl	Description	YES/NO	Qty	Remarks	
1	Cleaning of Condenser				
2	Checking & Tightening of wire connection terminals				
3	Checking of Gas in the Sight Glass				
4	Frosting at the Suction Line (outlet of PHE)				
5	Whether IPA added to TSS				
6	Whether RO Water added to the TSS				
7	Adding distilled water in DC Battery				
8	Checking of DC Battery Terminals				
9	Inverter Boost/Charging				
10	Specific Gravity Check				
Spares Usage					
Sl	Description	Qty	UOM	Remarks	
1					
2					
3					
Remarks					
Signature of Promethean's Engineer			Signature of Site In Charge		

PREVENTIVE MAINTENANCE VISIT REPORT-COLDROOM				DocNo:PMCR0	Date :
Customer			Site Name		
Capacity	No of TSS		No of CU	Installed on	
Attended by				Last Visited on :	
Time In		Time Out		Visit No	(1) (2) (3) (4)
Observations					
Sl	Description	Value	Remarks		
1	Supply Voltage				
2	Compressor Current R-Y-B Phase	R-	Y-	B-	
3	Level of Coolant				
4	Concentration of IPA				
5	TSS Temperature				
6	Auxiliary Temperature				
7	Conditions of Insulation				
8	Liquid Level in DC Battery				
9	Stabilizer out put (if installed)				
10	Current Drawn Cold Room Pump				
11	Current Drawn Anti chamber Pump				
12	Pipe Insulation Conditions				
13	Leakage in coolant line				
14	Abnormal Noise / Sound in FCU Fan				
15	Temp Sensor position in CR & AR				
16	FCU Fan Current - Cold Room (1 & 2)				
17	FCU Fan Current - Anti Room				
18	Leakage through Drain Pipe (CR & AR)				
19	Functioning of Temp. Indicator (CR)				
20	Functioning of Alarm				
21	Functioning of Data Logger				
22	Functioning of DC to DC Converter				
23	Leakage in coolant line				
24	Leakage through CR & AR Panel				
Notes if any :					
Job Done					
Sl	Description	YES/NO	Remarks		
1	Calibration of TSS temperature Sensor				
2	Calibration of Cold room Temperature Sensor				
3	Cleaning of FCU Evaporator Coil (both CR & AR)				
4	Cleaning of CU Condenser				
5	Checking & Tightening of electrical terminals				
6	Frosting at the Suction Line (outlet of PHE)				
7	Whether IPA added to TSS				
8	Whether RO Water added to the TSS				
9	Whether distilled water added in DC Battery				
10	Checking of DC Battery Terminals				
11	Inverter Boost/Charging AMPS				
Spares Replaced if any					
Sl	Description	Qty	UM	Remarks	
1					
2					
3					
4					
5					
Remarks :					
Signature of Promethean's Engineer			Signature of Site In Charge		

PREVENTIVE MAINTENANCE VISIT REPORT-CANCHILLER				DocNo:PMCCRO	Date :
Customer			Site Name		
Capacity	No of TSS		No of CU		Installed on
Attended by					Last Visited on :
Time In		Time Out		Visit No	(1) (2) (3) (4)

Sn	Descriptions	Specif.	Actual	OK/Not OK	Remarks
A	Before Stabilizer (At input to stabilizer)				
1	Phase to Phase	220 - 240 V			
2	Phase to Earth	180V - 250 V			
3	Neutral to Earth	< 5 V			
4	Voltage in no load	220 - 240 V			
5	Voltage when CU unit is running	220 - 240 V			
6	Current in no Load	< 3 Amp			
7	Current when CU unit running	< 9 Amp			
B	After Stabilizer (at input to our panel board)				
1	Phase to Neutral	230 V			
C	Control Panel Setting				
1	Chilling Mode T1	180 Min			
2	Cyclic Timer On T2	3 Min			
3	Cyclic Timer Off T3	55 Min			
4	Fault Reset Time in Min T4	3 Min			
5	R2 On Timer in Sec T5	5 Sec			
6	Temperature Set Point	-9			
7	EXIT	EXIT			
8	Reset	RST			
D	Condensing Unit (CU) when Battery Temp ° C				
1	Suction Pressure	40 - 75 psi			
2	Discharge Pressure	260 - 360 psi			
3	Starting Current	7.8 Amp			
4	Running Current	< 7 A			
5	Sight Glass (full/bubble)	Full			

E	MISLENOIUS				
1	Current by Charge Pump	0.2 Amp			
2	Current by Discharge Pump	0.2 Amp			
3	Voltage in DC Battery	12 V each			
4	Specific Gravity of DC Battery Fluid	1.277 @80° F			
5	Concentration of IPA Mixture	30 at 30° C			
6	Charge Pump Flow Rate	12-14 lpm			
7	Discharge Pump Flow Rate	18-20 lpm			
8	Earth Pit Resistance	< 5 ohms			
9	Milking Time - 1st Milking	3 hrs.			
10	TSS Charging Time	< 6 hrs.			
11	Rechilling	t2 t3 set			
12	Uniform Ice formation	Uniform			
13	Water change & check tds before & After cha	<300			

Any pending work/remarks :

Service Engineer	Customer Incharge
Name & Signature	Name & Signature

Stick this chart at site

Stick this chart at site

CLIT CHART -CANCHILLER												Doc No:CLCCR0
Site Name		Site Engineer										
Installation Date		Contact Details										
Date												
	IPA concentratio C & A											
	IPA level	Water Level	Water quality	Water change	Sensor clean	Water Leakage	IPA Leakage	Waterflow rate	Frosting at suction line	Site glass - check	Condensor Fins clean	
											Swelling of PHE	
											Pressure at Suction & Discharge	
											Check capacitor	
											Tighten all Terminals	
											Compressor current check	
											check input voltage	
											Fill Battery Distilled water	
											Compressor Manual run	
											compressor Auto run	
											Rechilling	
											chilling	
											Uniform Icing	
											T1T2T3T4,SP settings	
											Water TDS	
											Training customer	
											sensor continuity check	
											Remarks	

Stick this chart at site



ASSETS DETAILS					DocNo:ASR0
Name of the Customer					
Customer Type		Sale / Service			
Name of the Site					
Village		Post			
Via		District			
State		Country			
PIN					
Center Incharge					
Contact Number					
Date of Installation		Warranty Status		WW/OW	
Maintenance Supervisor					
Contact Number					
E mail ID					
Equipment Type					
ASSET DETAILS					
Sl	Description	Sr. No	Make	Model	
A	CONDENSING UNIT				
1	Compressor				
2	Filter Drier				
3	Thermostatic Expansion Valve				
4	Solenoid Valve				
5	Plate Heat Exchanger				
B	THERMAL STORAGE SYSTEM				
1	TSS Tank				
2	Charge Pump				
3	Discharge Pump				
C	SHIVA				
D	ACTIVE TANK				
1	Tank				
2	Agitator Motor				
E	ELECTRICALS				
1	DC Battery				
2	Inverter				
3	Control Panel				
4	Data Logger				
5	SIM Card				
D	OTHERS				
1	FCU				
2	Can Cooler Controller				
3	Ice Thickness controller				
Promethean Installation Engineer Name & Signature					

**BREAKDOWN ESCALATION**

DocNo:BDSR0

	NAME	CONTACT NO	EMAIL
SERVICE ENGINEER			
REGIONAL INCHARGE			
HEAD OFFICE			
Notes:			

Stick this chart at site

INSTALLATION AND COMMISSIONING CERTIFICATE

DocNo:ICR0

Date:

To,

Promethean Spenta Technologies Pvt. Ltd
Gat No. 1021, S.No. 363, Opp Bharat Petrol Pump
Hinjewadi, Phase- I Pune-411057

We the undersigned _____

certify that _____ Capacity _____ have installed and commissioned by your personnel Mr. _____ .
on _____ at our site _____

- > Your representative has conducted the cooling trial.
> We are satisfied with the performance of the equipment/system.
> Your representative has trained our personnel for necessary operations, maintenance
> cleaning of the equipment.

Customer**For Promethean Spenta Technologies Pvt. Ltd.****Signature and Seal****Authorized Signature**

Name _____
Mob _____