



**Title:** Operation of Chiller

<b>SOP No.:</b>		<b>Revision No.:</b>	00
<b>Effective Date:</b>		<b>Supersedes No.</b>	Nil
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**1.0 OBJECTIVE:**

To lay down a procedure for Operation of Chiller.

**2.0 SCOPE:**

This SOP is applicable for Operation of Chillers (Voltas & Daiken).

**3.0 RESPONSIBILITY:**

Officer / Executive - Engineering

**4.0 ACCOUNTABILITY:**

Head – Engineering

**5.0 ABBREVIATIONS:**

HMI	Human Machine Interface
ID No.	Identification Number
LT	Low Tension
LTD.	Limited
No.	Number
PVT.	Private
QA	Quality Assurance
Temp.	Temperature
SOP	Standard Operating Procedure
°F	Degree Fahrenheit
Suc.	Suction
Dis.	Discharge
Psi	Pounds per square inch

**6.0 PROCEDURE (Voltas):**

**6.1 Checks Before Running:**

- 6.1.1 Make sure that all pressure gauges are indicating proper pressure before start.
- 6.1.2 Make sure that cooling tower sump is filled with water and make up inlet is open.
- 6.1.3 Check for the cooling tower water circulation valves in open condition.
- 6.1.4 Check that crankcase heaters have operated for 24 hours prior to start up.
- 6.1.5 Make sure that all refrigerant valves are opened.
- 6.1.6 Make sure proper input power supply voltage.



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**6.1.7** Switch on power supply of local electrical control panel to start cooling tower pumps, and chilled water pumps, from LT panel of utility after that switch on the fans of cooling tower as required.

**6.1.8** Switch on the required compressors by moving selector switch to relative position by running compressor no.1, compressor no. 2.

**6.1.9** Wait for the Start up screen to appear on the HMI of chiller.

**6.1.10** Check on local control panel of chiller that green light emitting device (LED) glows.

**6.1.11** The unit shall start automatically to meet system demand based on set points stored in the controller.

**6.1.12** Maintain records in Chiller System operation record.

**6.2 At The Time of Stopping Chiller:**

**6.2.1** Turn the compressor stop selector switch to 0 positions. The compressor shall pump down & the respective compressor shall stop when suction pressure reaches lower than the low suction pressure set point.

**6.2.2** After the circuit have pump down, stop the condenser & chiller pumps.

**6.2.3** Now stop the cooling tower fans and power supply of panel can be switched “OFF” as per requirement.

**6.3** Record the Operation Details of Chiller System in **Annexure-I**, Titled “**Chiller System Operation Record**”.

**6.4 Procedure:**

**6.4.1 Check Before Operation:**

**6.4.1.1** Check and ensure that all the measuring device/instrument are in calibrated stage.

**6.4.1.2** Check and ensure that inlet pressure at chiller from condenser pump is NMT 3.0 kg/cm<sup>2</sup>.

**6.4.1.3** Check and ensure that outlet pressure from condenser pump is NMT 2.5 kg/cm<sup>2</sup>.

**6.4.1.4** Check and ensure that inlet pressure at chiller from evaporator pump is NMT 6.0 kg/cm<sup>2</sup>.

**6.4.1.5** Check and ensure that outlet pressure from evaporator pump is NMT 5.0 kg/cm<sup>2</sup>.

**6.4.1.6** Make sure that all pressure gauges are indicating proper pressure before start.



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**6.4.1.7** Make sure that cooling tower sump is filled with water and make up inlet is open.

**6.4.1.8** Check and ensure that all the line valves of circulation of chilled water & cooling tower are in open condition.

**6.4.1.9** Before starting chiller, check and ensure that crankcase heaters have operated.

**6.4.1.10** Check the refrigerant system for any leakage by the use of soap solution.

**6.4.1.11** Ensure that power supply is available at the main electrical panel for the operation of chiller.

**6.4.1.12** Switch on the power supply of local electrical panel to start cooling tower pumps and chilled water circulation pumps from LT panel.

**6.4.1.13** Switch on the required compressor by moving selector switch towards manual side.

**6.4.1.14** Check on local control panel of chiller that green light emitting device (LED) which indicates that the chiller is in operation.

**6.4.1.15** The unit shall start automatically.

## **6.5 Operation Procedure (Daikin):**

**6.5.1** Check that the chiller system is running normally.

**6.5.2** Check and ensure net oil pressure, it should not less than 105psi.

**6.5.3** Check and ensure oil feed temperature, It should be in between 90 to 115 °F.

**6.5.4** Check and ensure the inlet temperature of water in condenser, it should be in-between 55 to 110 °F.

**6.5.5** Check and ensure the outlet temperature of water from condenser, it should be in between 60 to 115 °F.

**6.5.6** Check and ensure the discharge pressure from condenser, it should not be less than 65 psi.

**6.5.7** Check and ensure saturated temperature, it should be in-between 60 to 120 °F.

**6.5.8** Check and ensure that discharge temperature of condenser, it should be in-between 65 to 140 °F..



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**6.5.9** Check and ensure the liquid line temperature of condenser, it should be on between 60 to 100 °F.

**6.5.10** Check and ensure the sub cooling of condenser, it should be in-between 02 to 10 °F.

**6.5.11** Check and ensure that suction pressure of evaporator, it should be in-between 30 to 50 psi.

**6.5.12** Check and ensure the saturated temperature of evaporator, it should be in-between 30 to 55 °F.

**6.5.13** Check and ensure the suction temperature of evaporator, it should be in-between 40 to 55 °F.

**6.5.14** Check and ensure that inlet temperature of chilled water in chiller, it should be in-between 40 to 55 °F.

**6.5.15** Check and ensure that outlet temperature of chilled water for chiller, it should be in-between 40 to 50 °F.

**6.5.16** Check and ensure VFD ampere, it should be not more than 600amp.

**6.6 Checks the Fault Alarms During Operation:**

**6.6.1** Check whether any unusual sound is coming from moving parts.

**6.6.2** Check for the “High Pressure alarms” for low water flow and high condenser water temperature.

**6.6.3** Check for the “Load Alarm” if compressor stops suddenly. To rectify check the High pressure & low pressure transducer.

**6.6.4** Check for “Low Oil Pressure Alarms”. Check for low condenser water temperature and oil filter pressure sensor.

**6.7 At The Time Of Stopping Chiller:**

**6.7.1** To stop the chiller, press the push button of compressors.

**6.7.2** After stoppage of chiller, stop the respective condenser and chiller pump.

**6.7.3** Now stop the cooling tower fans and switch off the power supply from electrical panel.

**6.7.4** Record the Operation Details of Chiller System in **Annexure-II**, Titled as “**Operation Record of chiller (Daikin)**”.



# PHARMA DEVILS

ENGINEERING DEPARTMENT

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## 7.0 ANNEXURES:

ANNEXURE No.	TITLE OF ANNEXURE	FORMAT No.
Annexure-I	Chiller System Operation Record	
Annexure – II	Operation Record of Chiller (DAIKIN)	

**ENCLOSURES:** SOP Training Record

## 8.0 DISTRIBUTION:

- Controlled Copy No. 01                      Quality Assurance
- Controlled Copy No. 02                      Engineering
- Master Copy                                      Quality Assurance

## 9.0 REFERENCES:

- Operation & Maintenance Manual of Chiller.

## 10.0 REVISION HISTORY:

### CHANGE HISTORY LOG

Revision No.	Change Control No.	Details of Changes	Reason for Change	Effective Date	Updated By





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<b>Cooler</b>	Chilled Water Supply	Comp.	°F												
	EEV Opening	Circuit 1	%												
Circuit 2		%													
<b>Others</b>	EEV Output Voltage	Circuit 1	V												
		Circuit 2	V												
	Refrigerant Level	Circuit 1	mm												
		Circuit 2	mm												
	Oil Level	Comp'r 1													
		Comp'r 2													
	Chilled Water inlet temperature		°C												
	Chilled Water Outlet temperature		°C												

**REMARKS :**

Checked By  
Operator Sign/ Date:.....

Shift A:.....

Shift B:.....

Review By  
Sign/ Date:.....

