PHARMA DEVILS

ENGINEERING DEPARTMENT

STANDARD OPERATING PROCEDURE	
Department: Engineering	**SOP No.:**
Title: Operation of Non-lubricated Air Compressor and Refrigerated Air dryer	**Effective Date:**
Supersedes: Nil	**Review Date:**
Issue Date:	**Page No.:**

1.0 OBJECTIVE

To lay down the procedure for the operation of non-lubricated air compressor and Refrigerated air dryer.

2.0 SCOPE

This standard operating procedure (SOP) is applicable for the operation of non-lubricated air compressor and refrigerated air dryer.

Equipment ID Air Compressor and Refrigerated Air Dryer: U/012, U/013, U/014, U/015.

MACHINE DETAILS	
Type	Non lubricated Reciprocating Type
Model	HXIT 25NI-P
FAD	100CFM
Motor detail	25HP 4pole 440v
MODEL NO	
S.No	

3.0 RESPONSIBILITY.

Engineering Supervisor/technician will operate the Non-lubricated air compressor and refrigerated air dryer and maintained the daily log sheet.
Executive Engineering will check the daily log sheet.
Manager Engineering will verify the daily log sheet.

4.0 PROCEDURE

4.1 STARTING OF NON LUBRICATED AIR COMPRESSOR

4.1.1 The air compressor and condenser pump and cooling tower marked “1” start on ODD dates and Air compressor and condenser pump marked “2” start on EVEN dates.

4.1.2 Ensure All Valves and electrical mains of the standby equipment is “off”. Incase of Break down of pump1 and 2 starts pump No.3.

4.1.3 Ensure drain valve is closed.

4.1.4 Ensure cooling water in sump up to full level.

4.1.5 Open cooling tower suction valve.

4.1.6 Open cooling tower discharge valve.

4.1.7 Open the suction valve and discharge valve of the condenser water pump1/2.

4.1.8 Open suction Valve, and discharge valve of cooling water line.

4.1.9 Start cooling tower fan motor of by pressing the push button from main electrical panel.

4.1.10 Start condenser water pump Nos 1 & 2 by pressing push button from drive panel.

4.1.11 Ensure cooling water pressure from gauges that is between 1.5 to 3 Kg/cm$^{2.}$

4.1.12 Open suction valve and discharge valve of Air Compressor cooling water line .

4.1.13 Put main switch 'ON' from electrical panel and ensure RYB LED indication from panel.

4.1.14 Put toggle switch upward direction for unload condition.

4.1.15 Put control switch 'ON' from operator panel.

4.1.16 Start the Air Compressor by pressing the START push button from operator panel.

4.1.17 Ensure compressor motor switchover from star to delta mode within 5-10 second.

4.1.18 Put toggle switch in downward direction for auto loading and unloading of Comp. 1and 2.

4.1.19 Check lubricating oil pressure from pressure gauge is within 1.5 to3 Kg/cm^{2}

4.1.20 Observe discharge air pressure from receiver tank pressure gauge is gradually increases upto set pressure 7.0Kg/cm^2

4.1.21 Open Air receiver discharge valve.

4.1.22 Observe loading and unloading of air compressor at set pressure.

4.1.23 Observe discharge air temperature from temperature gauge.

4.1.24 Ensure the system is running satisfactory and record the data in logbook as per Annexure –II.

4.2 STARTING OF REFRIGERATED AIR DRYER:

4.2.1 The Air Dryer marked "1" start on ODD dates and Air Dryer marked "2"start on EVEN dates. Ensure All Valves and electrical mains of the standby equipment is "OFF".

4.2.2 Ensure an air inlet valve to dryer is close.

4.2.3. Put red switch ON from dryer and ensure green line lamp illuminates.

4.2.4 Wait about 5 min to stabilize the operating temperature and pressure.

4.2.5 Slowly open the air inlet valve.

4.2.6 Slowly open-air discharge valve .

4.2.7 Observe air pressure from main receiver tank pressure gauge is around 6-7Kg/cm^2.

4.2.8 Ensure the dryer is running satisfactory and record the data in logbook as per Annexure –II.

4.2.9 In case of breakdown for changeover open valve to run the dryer1/2.

4.3 STOPPING OF NON LUBRICATED AIR COMPRESSOR:

4.3.1 Put toggle switch upward direction to unload the compressor.

4.3.2 Switch 'OFF' control supply by operating selector switch from control panel.

4.3.3 Close Air receiver discharge valve.

4.3.4 Close suction valve and discharge valve of Air Compressor cooling water line.

4.3.5 Close Valve of suction and discharge cooling water line.

4.3.6 Stop condenser water pump by pressing from drive panel panel.

4.3.7 Close the suction valve and discharge valve of the condenser water pump.

4.3.8 Stop cooling tower fan motor by pressing the push button.

4.3.9 Close cooling tower discharge valve.

4.3.10 Close cooling water suction valve.

4.4 STOPPING OF REFRIGERATED AIR DRYER:

4.4.1 Close air inlet valve to dryer.

4.4.2 Put red switch towards zero position from dryer to stop the dryer.

4.4.3 Close air discharge valve.

5.0 SAFETY AND PRECAUTIONS:

5.1 Ensure compressor motor belt guard are in place and securely fastened.

5.2 All hoses inside the unit are in good condition.

5.3 All electrical leads are secure and in good order

5.4 Safety valves and other pressure-relief devices are not obstructed by dirt or paint.

5.5 There is no leakage.

5.6 All fasteners are tight.

5.7 Ensure proper earthing for compressor motor.

6.0 REVISION HISTORY

Revision No.	Reason for Revision	Superseded from & date
00	New	

7.0 REFERENCES

Manufacturer Manual of non-lubricated air compressor and Refrigerated air dryer.

8.0 ABBREVIATIONS

SOP: Standard Operating Procedure.

9.0 ANNEXURE

Annexure I: Valves, pressure gauge and Push button details

Annexure II: Daily log sheet of Non-lubricated Air Compressor and Refrigerated Air Dryer

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Annexure I

Valves, Pressure gauge and Push button details

VALVES DETAILS:

CWV21: Cooling tower1 drain valve
CWV22: Cooling tower2 drain valve
CWV17: Cooling tower1 suction valve
CWV18 Cooling tower 2suction valve
CWV19: Cooling tower 1 discharge valve
CWV20: Cooling tower 2 discharge valve
CWV08: Cooling water pump 1 discharge valve
CWV10: Cooling water pump 2 discharge valve
CWV09: Cooling water pump 1 suction valve
CWV11: Cooling water pump 2 suction valve
CWV05: Main cooling water discharge valve
CWV06: Main cooling water suction valve
CWV01: Suction of cooling water to air compressor 1
CWV02: Suction of cooling water to air compressor 2
CWV03: Discharge of cooling water from air compressor 1
CWV04: Discharge of cooling water from air compressor 2
AV01 : Air receiver Discharge valve of compressor 1
AV02 : Air receiver Discharge valve of compressor 2
AV03 : Discharge valve of refrigerated air dryer 1
AV04 : Discharge valve of refrigerated air dryer 2
AV05 : By pass valve of refrigerated air dryer

PRESSURE GAUGES DETAIL

CWPG05: Cooling tower pump 1
CWPG06: Cooling tower pump 2
APG05 : Air compressor 1
APG08 : Air compressor 2
APG01 : Air receiver of air compressor 1
APG02 : Air receiver of air compressor 2
APG04 : Temperature gauge of compressor 1
APG07 : Temperature gauge of compressor 2
APG03 : Main air receiver

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PUSH BUTTONS DETAIL

PB11 : Cooling tower fan 1 on push button
PB13 : Cooling tower fan 2 on push button
PB01 : Cooling tower pump 1 on push button
PB03 : Cooling tower pump 2 on push button
PB07 : Air compressor 1 on push button
PB15 : Air compressor 2 on push button
PB12 : Cooling tower fan 1 off push button
PB14 : Cooling tower fan 2 off push button
PB02 : Cooling tower pump 1 off push button
PB04 : Cooling tower pump 2 off push button

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ANNEXURE II

Daily Log Sheet of Non-lubricated Air Compressor and Refrigerated Air Dryer

	AIR COMPRESSOR NO-1						DRYER	AIR COMPRESSOR NO-2						DRYER	REMARKS
	AIR COMPRESSOR NO-1							AIR COMPRESSOR NO-2							
	AIR PRESS.	AIR TEMP	OIL PRESS.	C.WATER PRESS.		LOAD	NO-1	AIR PRESS.	AIR TEMP	OIL PRESS.	C.WATER PRESS.		LOAD	NO-2	
TIME	KG/CM2	0C	KG/CM2	IN	OUT	AMP	R/B/G	KG/CM2	0C	KG/CM2	IN	OUT	AMP	R/B/G	
07:00															
08:00															
09:00															
10:00															
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01:00															
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03:00															
04:00															
05:00															
06:00															
07:00															

	Air Compressor-1	Air Compressor-2	KWH	Air Compressor -1	Air Compressor-2	SHIFT	Operator Name
Running hrs:			**FINAL**			**A**	
Previous running hrs:			**INITIAL**			**B**	
Total Running hrs:			**CONS.**			**C**	

EXECUTIVE ENGINEER

MANAGER ENGINEERING