



LIDCO, Pars SEE Zone, Assaluyeh,  
Integrated Methanol and Ammonia  
Plant 3000 MTPD MeOH / 900 MTPD NH3 PROJECT



FAT Procedure (incl full unit mechanical run test procedure)

Document No. 17735-14

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M. Vakili

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## 1. Purpose

Checking the performance and functioning of the package against the approved documents and specifications.

Separate test reports for each test will be generated; however, this FAT procedure covers only the procedure to be performed on all skids.

## 2. Reference documents

### 2.1. Vendor documents




Please find below the reference vendor documents that will be used during this FAT.

N-278-VD-6019-PR-PID-0002-01	18841-03	P&ID
N-278-VD-6019-PR-GAD-0003-01	18841-04	General Arrangement Drawing
N-278-VD-6019-IN-DIA-0005-01	18841-05	Wiring Diagram (LCP and JB)
N-278-VD-6019-IN-DWG-0007-01	18841-07	Panel lay-out (LCP and JB)
N-278-VD-6019-GN-ITP-0008-01	18841-08	Inspection & Test Plan (ITP)
N-278-VD-6019-GN-PRO-0022-01	18841-21	Control Philosophy
N-278-VD-6019-GN-SF-0029-01	18841-27	Cause and Effect chart

### 2.2. Manufacturing data book

The manufacturing data book will also be available for review during the FAT. The MDB will be checked according to the approved MDB index and ITP.

The client or client TPI will sign the relevant pages as well as all relevant point of the ITP.

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Please mention somewhere in procedure that "package including all items on skid (including pulsation dampers, inter/after coolers, oil system, local panel, etc) will be tested."

### 3. Scope

One (1) Instrument air booster compressor with motor driver (101-M-001), outlet capacity 55 Nm<sup>3</sup>/hr, 50 bar(g) and inlet, 9,5 bar(g). 1 duty (1x100%). The compressor is water cooled at 4,5 bar(g) inlet pressure.

The compressor is equipped with:

- One (1) LPS (Local Push Button Station)
- One (1) JB (Junction Box)

### 4. HSE

Standard safety precautions have to be taken since we are working with pressurised air.

- Proper PPE has to be worn when working / testing the package
- All visitors for the FAT will be instructed before the FAT, about Airpack safety precautions, by Airpack Safety movie.
- All visitors will be asked to sign a disclaimer to be able to enter the hazardous area during the test.
- The test area is cordoned off to make sure non-authorized personnel does not enter this area.




### 5. FAT Kick off meeting

Before starting the FAT there will be a short kick off meeting, where Airpack will explain the safety rules and regulations as well as what activities and planning will be performed during the FAT.

Kick-Off Meeting (KOM) Agenda.

- i. Introduction/Sign in (along with the name, role/designation)
- ii. HSE Induction
- iii. FAT organization, roles and responsibilities of the personnel involved.
- iv. Briefing on duration and sequence of tests planned, timing etc.

Also proper PPE will be distributed as required.

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## 6. Roles and responsibilities

The project manager is responsible for the complete FAT. The project manager will arrange the persons who are required for each part of the FAT.

A qualified AIRPACK Technician who is familiar with the operational parameters of the Package will perform all FAT tasks

### 6.1. Problem resolution

If there are any problems during the FAT, they will be rectified immediately if possible, if not possible they will be recorded in the FAT punch list and resolved before shipment / commissioning of the package.

Please find attachment 1: Punch list format.

## 7. Test Instruments




The following test instruments will be used during the FAT, all instruments will have a valid calibration certificate which will be supplied as part of the FAT test results for checking and signing.

- Paint thickness meter
- Sound level meter
- Ambient pressure / temperature meter
- Multi meter (voltage check)

## 8. Utilities

The utilities that are available during FAT are:

- Power: 400V, 50Hz, 3ph and 230V, 50Hz, 1ph
- Cooling water supply: 4,5 bar(g), ~36 °C

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## 9. Test procedure

Test may not be done in below order; it is subject to availability of personnel and equipment.

### 9.1. Mechanical checks

The Following will be tested / checked and recorded as part of the FAT. All checks are mentioned in attachment 2: Equipment checklist

#### Quality

- 1 Verify all equipment are installed in accordance with approved P&ID and GAD.
- 2 Visual inspection of the complete package for quality.
- 3 Verify piping, tubing location, orientation in accordance with approved GA Drawing.

#### P&ID review

- 1 Verify all components are installed as per the GA Drawing.
- 2 Check that all components are tagged according to the P&ID.
- 3 Check that the location is of the components is as per the GAD.

#### Dimensions

- 1 Dimensional check of the complete package for compliance to approved GA Drawing.
- 2 Verification and dimensional check of Tie-in Point, lifting points
- 3 Verification and dimensional check of foundation holes.

#### Painting




- 1 Check the overall paint for damages and overall quality.
- 2 Randomly check the thickness as per the approved paint procedure.
- 3 Check the paint color as per the paint procedure.

#### LPS and JB

- 1 Check for any loose connection in the control panel
- 2 Verify all control panel BOM, GA, wiring, I/O etc., matches approved drawings.
- 3 Check the installation and type of cable glands
- 4 Check the installation of the cable trays
- 5 Check the cable type

#### Instruments

- 1 Check for any loose connection of cables or wires in the instruments
- 2 Check the installation of the instruments as per approved drawings
- 3 Check if all instruments are tagged
- 4 Check the quantity of the instruments

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4 hr (page 11/21 of datasheet and A.25 of TCL)

### 9.2. Performance test (two hours)

Test set-up for the package is as follows:

- The power from the package will come from internal power supply
- 400V / 50Hz / 3ph and 230V / 50Hz / 1ph
- Power is ON

The following measurements will be taken during the performance test.

- Sound level at 1 metre distance from skid (max. 85 dB(A))
- The performance test will be done with ambient air. Therefore provided with the related outlet pressure.
- Refer to Attachment 1 for an example of the performance test results which will be filled in during FAT.

Please provide the related calculation in this doc.

SPL shall be calculated at 1 m distance from each noisy part and whole package in full load condition (including drivers).

All in house instruments required / used during the test will have been certificated, which will be attached to the FAT test report.

The FAT recordings can be found in attachment 3: Performance test results

### 9.3. Noise level measurement

Noise test will be done during the performance test. Measuring points will be defined by a distance of 1 metre from the package and measured round the package. Final measuring point will be the same as start measure point. This is for checking correct functioning of the noise level meter.

Noise level shall not exceed 85 dB(A) for complete package at 1 metre distance (with package test blow off muffler closed).

The measurement will be recorded in attachment 4: Noise test results.

Please clarify about measuring vibration on compressor and its acceptance criteria



**Punch List Air Compressor Package**

**Project: 17735-GEN**

<b>Revision</b>	<b>01</b>
Dry Test	
Inhouse Test	
FAT	
F. Inspection	
Shipment	
Commissioning	

Item	Description	Point raised by	Action by	Completion before	Closed [date] [name]
001					
002					
003					
004					
005					
006					
007					
008					
009					
010					
011					
012					
013					
014					
015					
016					
017					
018					
019					
020					
021					
022					
023					
024					
025					
026					

## FAT TEST PROCEDURE

Equipment	K-020
Customer	Lavan Industry Development Company (LIDCO)
Serial number	T-2023-00799
Project name	Integrated Methanol and Ammonia Plant
Airpack reference number	17735-COM
Date	14-9-2023
Revision	01
Document number	17735-14 Attachment 2
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INSPECTION	DOCUMENT	COMPLETED	REMARKS
<b>Quality</b>			
1. Installation of main equipment	GAD / PID		
2. Visual inspection of overall quality	GAD / PID		
3. Piping, tubing location / orientation	GAD / PID		
<b>P&amp;ID review</b>			
1. Component check	P&ID		
2. Tagging of all components	P&ID		
3. Component location	P&ID		
<b>Dimensions</b>			
1. Overall skid dimensions	GAD		
2. Tie-in point dimensions	GAD		
3. Foundation bolt holes	GAD		
<b>Painting</b>			
1. Overall Paint quality	Paint procedure		
2. Paint DFT measurement	Paint procedure		
3. Paint color	Paint procedure		
<b>Control Panel</b>			
1. Loose connections	Wiring diagram / Panel lay-out		
2. BOM	Wiring diagram / Panel lay-out		
3. Cable glands	Wiring diagram / Panel lay-out		
4. Cable trays	Wiring diagram / Panel lay-out		
5. Cable type	Wiring diagram / Panel lay-out		
<b>Instruments</b>			
1. Loose connections	Wiring diagram		
2. Installation	P&ID		
3. Tagging	P&ID		
4. Quantity	P&ID		

Airpack Test Engineer	Client Inspector
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Notes:

## FAT TEST PROCEDURE

Equipment	K-020
Customer	Lavan Industry Development Company (LIDCO)
Serial number	T-2023-00799
Project name	Integrated Methanol and Ammonia Plant
Airpack reference number	17735-COM
Date	14-9-2023
Revision	01
Document number	17735-14 Attachment 3
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All these values will be finalized after finalizing datasheet.

to be specified.

Discrepancy with P&ID (intercooler operating pressure)

Performance Test Results												
		00:00	00:15	00:30	00:45	01:00	01:15	01:30	01:45	02:00	UNIT	OPERATING VALUES
101-PT-01	START										bar(g)	55-157
101-TT-01											°C	22.1
101-TT-02											°C	10-60
101-PT-02											bar(g)	50-116
101-TT-03											°C	...
101-TT-04											°C	...
101-TT-05											°C	...
101-PG-03											bar(g)	30
101-PT-03											bar(g)	30
101-PG-04											bar(g)	4.5
101-TG-05											°C	max 46
101-PT-04											bar(g)	...
Running test starting time:												
Humidity:												
Ambient temperature:												
Ambient pressure:												

Airpack Test Engineer	Client Inspector

Notes:

# Integrated Methanol and Ammonia Plant

Document n° : 17735-14 attachment 4

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## NOISE LEVEL

Unit : K-020  
 Service : Air booster compressor  
 Supplier : Airpack  
 Serial No. : T-2023-00799

Client: Lavan Industry Development Company (LIDCO)  
 Contractor: Nargan Company  
 Project: Integrated Methanol and Ammonia Plant

please note vendor shall prepare and submit the noise data sheet based on attached sample and consider the below items in addition to what has been closed on TCL:

- The SPL calculation shall be reported in full load condition(including driver)
- According to the attached noise data sheet, Lp and Lw shall be reported for all noisy sections and whole package.
- please check the attached noise data sheet sample(octave band frequency) and implement it here.
- No positive tolerance will accepted for noise estimation of whole package and each noisy part.

Supplier to Complete  
 Expected Noise Level Data

1

8

4

7

6

5

Noise test has been performed during performance test:

Procedure:  
 Measure point will be defined by a distance of 1 metre from the package and 1,5 metre above the ground level to measured round the package. Final measure points will be the same as start measure points. This is for checking correct functioning of the noise level meter. Noise shall not exceed 85 dB(A) for complete package. Noise meter calibration certificate is available during test

Points	Unit	Noise Estimated	Noise measured	Average of anti logs	Noise level (Logarithmic Avg)	Noise level (Arithmetic Avg)	Test Result:  -2									
P1	dB(A)	85		1	0	0										
P2	dB(A)	84														
P3	dB(A)	83														
P4	dB(A)	83														
P5	dB(A)	83														
P6	dB(A)	84														
P7	dB(A)	85														
P8	dB(A)	85														
Surrounding Noise measured (dB(A)) : 75 Noise level (After correction(if required) as per 5.3 of ISO 2151): <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2">Correction Factor</th> <th rowspan="3" style="text-align: center;">-2</th> </tr> <tr> <th>Level increase due to</th> <th>Value to be subtracted from measured</th> </tr> </thead> <tbody> <tr> <td>5</td> <td>2</td> </tr> <tr> <td>6 to 9</td> <td>1</td> </tr> </tbody> </table>							Correction Factor		-2	Level increase due to	Value to be subtracted from measured	5	2	6 to 9	1	Tested By :  Date:  NOTE:
Correction Factor		-2														
Level increase due to	Value to be subtracted from measured															
5	2															
6 to 9	1															
Test Condition : Noise level test as per ISO 2151																