

## **USER AND MAINTENANCE MANUAL**

OF

## **SPRAY DRYER NOZZLE TEST BENCH – (P3426)**

Spray-dryer-nozzle-test-bench

### Document Prepared and Published By

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## 1. Packing List

The Supply consists of:

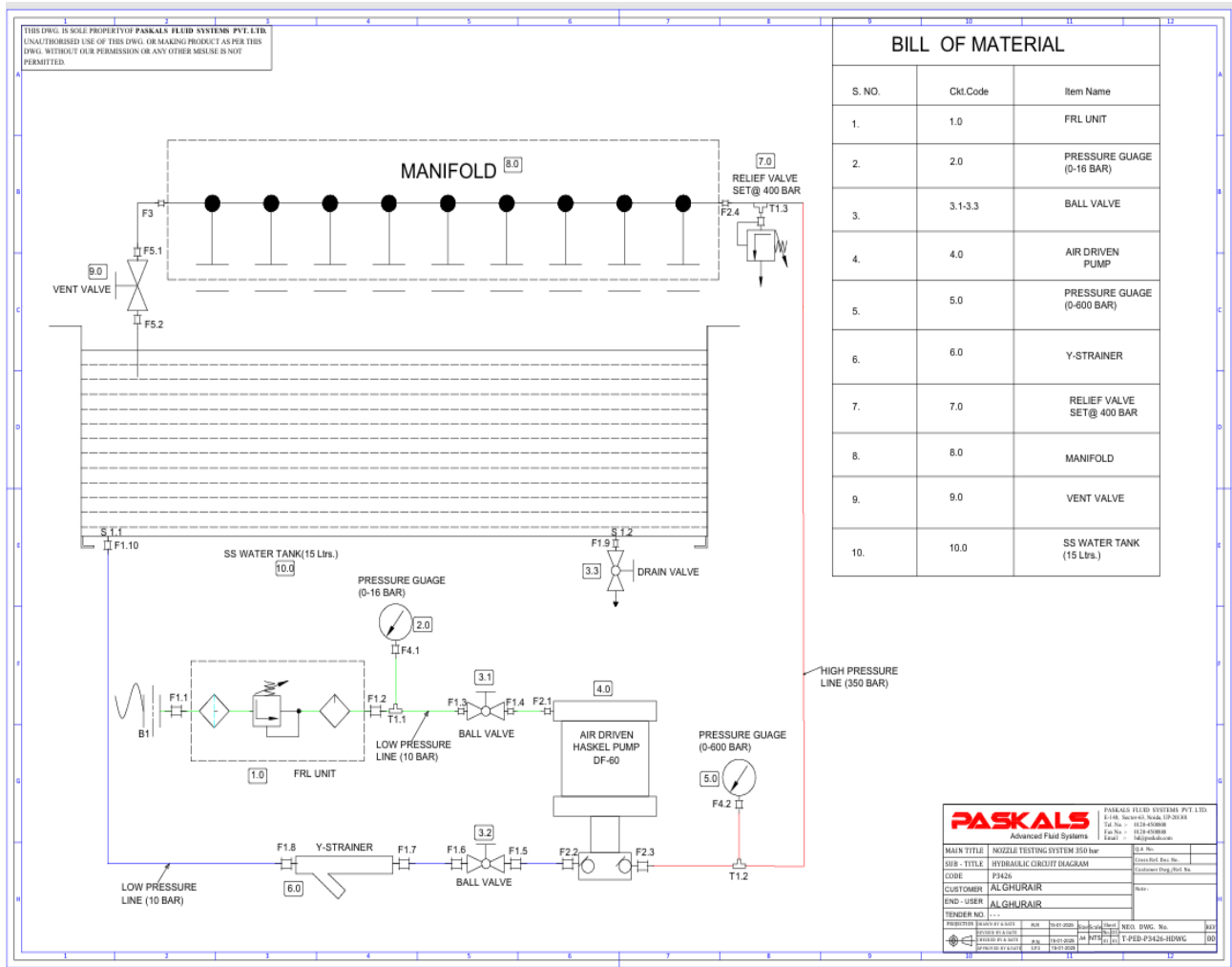
Pack- 1 : SPRAY DRYER NOZZLE TEST BENCH

Pack- 2 : Document Basket containing User Manual, Calibration Certificates & Catalogs.

## 2. Do's & Don'ts List (Reference Circuit Diagram)

**Spray Dryer Nozzle Test Bench is a High Pressure (350 bar) system and requires handling by trained personnel. Kindly go through the User Manual in detail before operating the equipment.**

- **Hydraulic Circuit :-**



## Do's

- ✓ Only trained personnel should operate the system.
- ✓ Ensure all connections are properly tightened before pressurizing the system.
- ✓ Always operate the system within the specified **pressure range (0-350 bar)**.
- ✓ Monitor pressure gauges continuously during operation.
- ✓ Follow the shutdown procedure properly after each test.
- ✓ Keep the work area well-ventilated and free of hazards.
- ✓ Before starting the test make sure **Drain Valve** should be in **CLOSE** position, if not please take it on **CLOSE** position, while **rotating it anticlockwise**.
- ✓ Ensure the pump is properly filled with the intended **liquid** to avoid damage from dry running.
- ✓ Please ensure that the drive Air must be @ **5.2 kg/cm<sup>2</sup> (Max.)**

## Don'ts

- ✗ Do not exceed 5.2 bar air supply to the booster pump.
- ✗ Do not exceed 350 bar operating pressure.
- ✗ Do not operate the system without proper safety gear.
- ✗ Do not modify or bypass any safety features.
- ✗ Do not leave the system pressurized when not in use.
- ✗ Do not use damaged or leaking hoses and fittings.
- ✗ Do not operate the system without proper training.
- ✗ Don't disconnect Test-Unit without draining the test pressure

### 3. Spray Dryer Nozzle Test Bench technical specifications

Technical Specifications		
S.no.	Name of Characteristic	Value of Characteristic
<b>1</b>	Drive Pressure (Air)	5.2 kg/cm <sup>2</sup> Max.
<b>2</b>	Purity of Drive Air	40 Micron
<b>3</b>	Output Pressure Range (for Pressure Testing)	<b>350 bar</b>
<b>5</b>	Working Media	Air & Water
<b>6</b>	Machine Pressure Range	<b>0-350 bar</b>
<b>8</b>	Outlet Gas flow rate	<b>Variable (As per requirement)</b>
<b>10</b>	Boosting Range	Input Pressure 100 PSI Output pressure 6000PSI (Variable & Controllable)
<b>11</b>	Drive Air pressure Gauge Range	16 bar , Lest count 0.5 bar
<b>13</b>	Outlet pressure Gauge Range	600 bar , Lest count 10 bar
<b>14</b>	Gauge Type / Material /Design	Analogue / SS 316/ Bourdon tube design, Overpressure protection 15%
<b>16</b>	Body Structure MOC	Base Frame :-Profile Al (40mm x 40mm ), all sides Cover -MS Powder coated , Powder coating thickness 60-80 Micron ,RAL -5018

## 4). Spray Dryer Nozzle Test Bench detail

Paskals has developed Spray Dryer Nozzle Test Bench for boosting of Liquid pressure from low pressure up to 350 bar.

Whole system is divided into Three parts:-

A. **Air Drive Section:** - Dry & Filter Compressed Air  $5.2 \text{ Kg/cm}^2$  is required for the Spray Dryer Nozzle Test Bench to create Test Pressure up to 350 bar

**Please Note**

**When Drain Valve is close the Booster shall operate and shall BOOST the Water Pressure as per given Air drive input.**  
**Use Drive air Valve to start and stop Booster**

Drive air section consists of

I. **Drive air regulator:** - We can control drive air pressure using below shown regulator by rotating it clock wise pressure will increase & we can decrease pressure by rotating it anticlockwise direction.



**Fig: Air Drive Pressure Regulator**

- II. Drive air Open/Close Valve:** - We can Open or close drive air supply by using below valve. Booster will run if drive air valve is in open condition.



- B. Pressure of liquid Boosting Section:** This section comprises of Haskel Air Driven Pump to boost the Low pressure of Water to 350 bar pressure, can be seen over High Pressure Gauge to monitor the outlet pressure. Working pressure of system as 350 bar.

**Please Note**

**Drive Air Valve, Air driven Pump Inlet Valve and Drive Air Regulator should be in open condition**

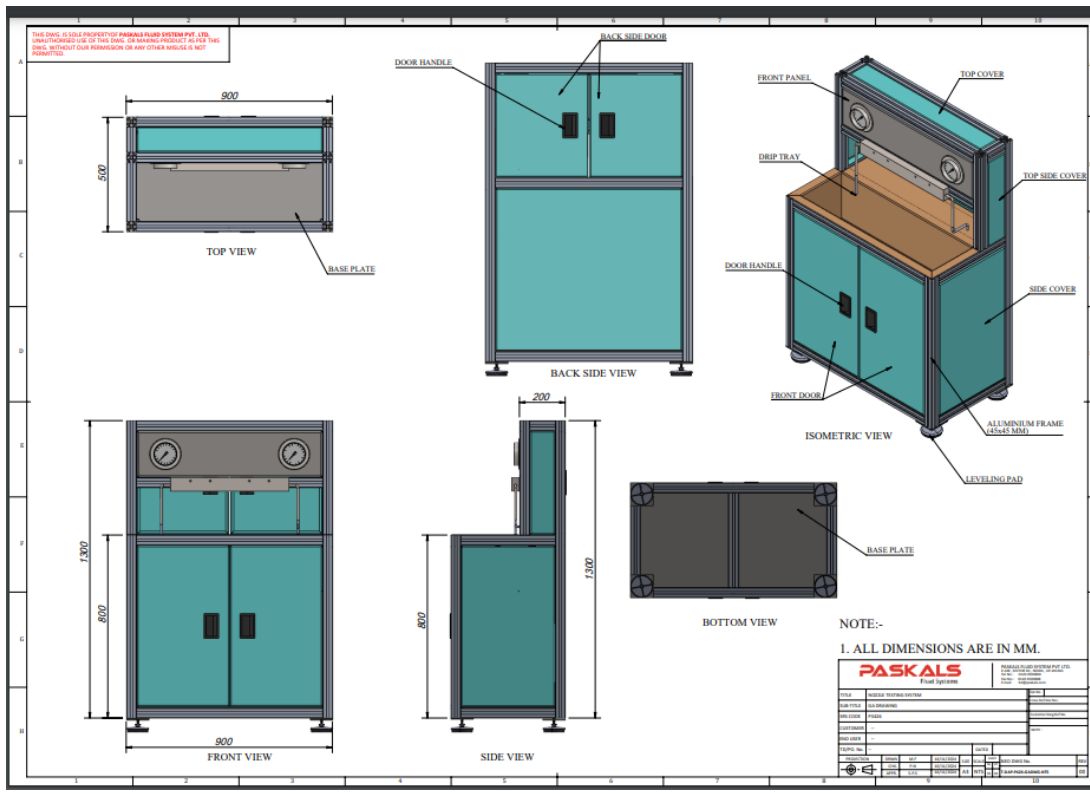


## 5). SPRAY DRYER NOZZLE TEST BENCH Dimensions

**LENGTH – 900 mm**

**WIDTH – 500 mm**

**HEIGHT – 1400mm**



**Fig: GA drawing of Spray Dryer Nozzle Test Bench**

## 6). Spray Dryer Nozzle Test Bench - Photograph showing User Interface Points



## **7. Unpacking & Installation**

1. Upon receipt of the system, visually inspect the shipping carton for signs of damage or mishandling. Immediately contact the carrier for an inspection if the shipping carton is damaged or evidence of mishandling exists.
2. Carefully remove the outer crafting materials. Care must be taken during unpacking to avoid enclosure damage or scratching.
3. Inspect the system for dents, scratches, or other evidence of mishandling during shipment. Request an immediate inspection from the carrier if damage is evident.
4. Connect the Outer Pressure Regulator to the System at Air Driven Port.



5. Connect Supply Air to the Air driven Port.
6. Check all Hose connections should be fully tightened.

## 8. Operation Procedure (Reference Circuit Diagram and Panel)

**Step- 1** after Connecting the Air Supply hose, Open the Drive Air Inlet Valve, & close Drain valve

**Step- 2** Rotate Drive air regulator anti clockwise to fully close it.



**Step- 3** Open the Drive Air Valve for Air supply to the Pump.



**Step- 4** Rotate Drive air regulator clockwise to start Air driven Pump, check pressure gauge and watch outlet pressure developed by Pump.



- When the Test is being done, you can drain the pressure with the Drain Valve.



## 9. Major Bill of Material

SI No.	PASKALS PART NO.	ITEM Name	ITEM DESCRIPTION	QTY
1	2P3426P0001	FRL unilt	Grade of Filtration: 40 micron meter End connection: 1/2" BSP (F) , Pressure Regulating Range : 0.5 bar to 12 bar , Working Pressure: 10 Bar Operating Medium: Air, Max. pressure hysteresis-0.2 bar , Standard nominal flow rate-3400 lpm ,Media temperature: -10 °C ... 60 °C	2
2	2P3426P0002	Pressure Gauge	Dial size: 4 ";Pressure range: 0-16 bar ;Scale: Both Bar and PSI Measuring System:SS316L;Movement: Stainless steel;Dial: White aluminium;Pointer: Black Aluminium Accuracy:1%of FS Connection: 1/2"BSP(M) Back connection with Panel Mounting Flange with Three hole .;Glycerin filling: Yes;Operating Medium: Air	1
3	2P3426P0003	Ball valve	Connection: 1/2"BSP (F) Working Pressure: 10 bar Operating Medium: Air/Water ; MOC-Brass, chrome-plated, Type of mounting -In-line installation	1
4	2P3426P0004	Air driven Liquid Pump	Power: 1.5HP; Air Head: single; Max Air Pressure: 150 PSIG ;Max cycles: 80/min.Nominal ratio ("dash number"):	1

			60:1; Actual area ratio: 69:1;Max outlet pressure (continuous): 9800 PSIG; Max outlet pressure (intermittent): 9800 PSIG;Displacement / cycle: 0.67 cu. in.;Max flow: 201 cu. in./min;Air inlet connection: 1/2" FNPTLiquid inlet connection: 1/2" FNPT; Liquid outlet connection: 1/2" FNPT	
5	2P3426P0005	Pressure gauge	Dial size: 4";Pressure range: 0-600 Kg/cm <sup>2</sup> ;Scale: Both Bar and PSI Measuring system:SS316L;Movement: Stainless steel;Dial: White Aluminium;Pointer: Black Aluminium;Accuracy:1%of FS Connection: 1/2"BSP(M) Back mount connection , Panel mount (With Panel Mounting Flange with Three hole .) Glycerin filling: Yes;Operating Medium: Water	1
6	2P3426P0006	Y- strainer	Size: 1/2 " BSPF , MOC: Brass , Filter element : SS304,Screen : 60 micron , working media: water ,Max Working Pressure 10 bar	1
7	2P3426P0007	Manifold	Material SS 304 , Working Port 9 Nos with 1/2 "F NPT	1
8	2P3426P0008	High Pressure Needle Valve	Max Working Pressure: 11,500 psi (790 Bar) Connection Type: 1/4" F NPT Operating Medium: Water, Set pressure 400 bar	1



9	2P3426P0009	Drip Tray (SS Tank)	S.S. Tank WATER Capacity: 15 L, Moc-ss 304,	1
10	2P3426P0010	Frame Body	MOC- profile Alluminum (40 x40 )	1
11	2P3426P0011	SS -Panel (Gauge Panel )	Moc-ss 304,	1
12	2P3426P0011	Panel Cover	Base palate, Back side cover, back side door, L&R side cover,Front cover, MOC-MS , Powder coating -RAL 5018 (Turquoise blue)	1

**Recommended list of spares for Scheduled Maintenance:**

- 1) Air Driven Pump Seal Kit. : 1 Set

## **10.) System- Safety Features**

- 1. All the Joints should be fully tightened.**
- 2. Please don't touch any high pressure hose & Tubes during Testing.**
- 3. Before starting the test make sure that NUT must be fully tightened**
- 4. Don't touch any component during testing.**
- 5. Don't change setting of internal Pressure regulator.**

## **11. Sales /Service/Support Contact Details**

**Paskals Fluid Systems (P) Limited.**

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