


Customer	
Equipment Name	HELIUM DECANTING AND BOOSTING SYSTEM (Model No.: P1253-PressurePAC)

User Manual



Helium Decanting and Boosting System (Model no. – P1253-PressurePAC)

Document Prepared and Published By

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Customer	
Equipment Name	HELIUM DECANTING AND BOOSTING SYSTEM (Model No.: P1253-PressurePAC)

Table of Content

S. No.	Item Description	No. of Pages
1	Packing List	3
2	Do's & Don'ts List	4-5
3	Pressure PAC Technical Specifications	6
4	Pressure PAC System Detail	7-9
5	Pressure PAC- Photograph showing User Interface Points	9-11
6	Pressure PAC- Unpacking & Installation	12
7	Pressure PAC- Operation Procedure	13-18
8	Pressure PAC- Safety Features	19
9	Bill Of Material	20-23
10	Circuit Diagram of Pressure PAC	24
11	Panel MIMIC Diagram	25
12	Sales/Service/Support Contact Details	26

Customer	
Equipment Name	HELIUM DECANTING AND BOOSTING SYSTEM (Model No.: P1253-PressurePAC)

1.Packing List

The Supply consists of:

Pack- 1 : Pressure PAC UNIT, Storage UNIT and Hose


Pack- 2 : Document Basket containing User Manual
Calibration Certificates of Pressure Gauges, inlet, outlet hose adaptor

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

Helium Decanting and Boosting systems require HANDLING by TRAINED PERSONNEL only. Please STUDY the Operation & Maintenance manual carefully before operating the Boosting System.

Do's


1. Before starting the Boosting/Decanting make sure that Pressure PAC unit must be connected with Drive Air, (V1) is Open manually or by HMI.
2. Supply of gas and storage unit must be connected with inlet port and outlet port by Hose.
3. Valve (V3) must be in open condition.
4. Make sure that all joints with Hoses are properly tightened before starting the test.
5. Please ensure that the drive Air must be 4-5 kg/cm².

Customer	
Equipment Name	HELIUM DECANTING AND BOOSTING SYSTEM (Model No.: P1253-PressurePAC)

6. Pressure Regulator (13.0) is use to regulate 0 to 25 bar range for Amplifire (17.0).
7. Haskel Booster (20) use for Boosting, when boosting is done then close the valve (V1, V2).
8. During Boosting valve (V5) must be close.


Don'ts

1. Don't open the door of Pressure PAC during oxygen boosting.
2. Never change the relief valve / Pilot valve settings as these are factory set at said point.
3. Do not attempt to change PLC program without any expert advice.
4. Do not attempt to repair without proper authorization & proper procedure in proper clean environment. Consult to Earth hydraulics always.

Customer	
Equipment Name	HELIUM DECANTING AND BOOSTING SYSTEM (Model No.: P1253-PressurePAC)

3. Pressure PAC Technical Specifications

Pressure PAC SPECIFICATIONS for the proposed SYSTEM		
S.no.	Name of Characteristic	Value of Characteristic
1	Drive Pressure (Air)	5 kg/cm ²
2	Purity of Drive Air (1)	40 Micron
	Purity of helium	5 Micron
3	Inlet pressure switch and Pressure Transmitter set at	25 kg/cm ²
4	Pilot Switch set at	4000Psi
5	Pressure Relief Valve	4100 Psi
6	Inlet gas pressure	0-350Psi
7	Output Oxygen pressure	As required
8	Buffer storage capacity	47.5 L
9	Working Media	Helium and Nitrogen
10	Outlet Gas flow rate	Variable (As per requirement)
11	Movement Control of Trolley	Portable on 4 wheels and No Electrical connection
		"

Customer	
Equipment Name	HELIUM DECANTING AND BOOSTING SYSTEM (Model No.: P1253-PressurePAC)

4. Pressure PAC System Detail

Paskals has developed Pressure PAC for High Pressure boosting system. Whole system is divided into four parts:-

A. **Air Drive Section:** - Dry & Filter Air @ 5 Kg/cm² is required for drive the Pressure PAC.

Please Note


When Valve (V1, V2 and V4) is in SUPPLY condition, the Gas Booster shall operate and shall BOOST the Pressure, If gas supply is less than 25 Kg/cm². When User wants to STOP the gas Booster, this Valve (V1, V2) should be manually CLOSED or by HMI.

Return Line can be operated by valve (V5)

B. **Helium inlet Section:** - Helium inlet section comprises of (16.2) Pneumatic actuated valve for inlet and also supply by Amplifire (17.0) to main booster (20.0) Pressure Gauge (14.1) to read the Helium supply pressure, Maximum inlet gas pressure should be 25 kg/cm² .

C. **Helium Boosting Section:** This Helium boosting section comprises of Haskel Booster (20.0) to boost the available helium as required Pressure. it has High Pressure Gauge (14.2) to monitor the outlet pressure.


D. **Helium Outlet Section:** This section comprises of high pressure regulator and Pressure transmitter. Regulated outlet pressure is shown on HMI. the safety & controlling components of the Pressure PAC along with measuring devices to measure performance parameters of the Pressure PAC. This section has following key components:

Customer	
Equipment Name	HELIUM DECANTING AND BOOSTING SYSTEM (Model No.: P1253-PressurePAC)

- Air pilot switch (21.0), the function of air pilot switch is that, when it senses the pressure more than the required pressure, it will cut the supply of air to the gas booster .By this action booster will stop working. When desired pressure attain.
- Safety relief valve (22.0), a safety valve is a safety device and in many cases the last line of defense. It is important to ensure that the safety valve is capable to operate at all times and under all circumstances. A safety valve is not a process valve or pressure regulator and should not be misused as such. It should have to operate for one purpose only: overpressure protection.
- Pressure gauges (14.2)-We can monitor the high pressure of helium after the booster and after valve (V4) we can monitor regulated outlet Pressure For precise filling pressure.

Please Note

(V5) should be close when (V4) is opened. Similarly (V4) should be closed when (V5) is opened.

Customer	
Equipment Name	HELIUM DECANTING AND BOOSTING SYSTEM (Model No.: P1253-PressurePAC)

Paskals providing the Pressure PAC unit in a very compact design and considering all the standards regarding operation & unit performance.

Pressure PAC Dimensions

LENGTH – 1000mm


HEIGHT – 1067mm

WIDTH – 700mm

5.)Pressure PAC-Photograph showing user Interface Points

1. Air Drive Inlet Port




Customer	
Equipment Name	HELIUM DECANTING AND BOOSTING SYSTEM (Model No.: P1253-PressurePAC)

2. Gas Inlet Port



3. High pressure Outlet Port




Customer	
Equipment Name	HELIUM DECANTING AND BOOSTING SYSTEM (Model No.: P1253-PressurePAC)

4. Storage unit Port



6.) Pressure PAC- 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. Keep the Pressure PAC unit in well-ventilated area (Temperature not Exceed beyond 40 degree centigrade).

Customer	
Equipment Name	HELIUM DECANTING AND BOOSTING SYSTEM (Model No.: P1253-PressurePAC)


5. Connect the Pressure PAC unit with Industrial Air supply hose.
6. Connect the Pressure PAC unit with helium supply.
7. Connect Buffer storage with storage unit port.
8. Check all Hose connections should be fully tightened.

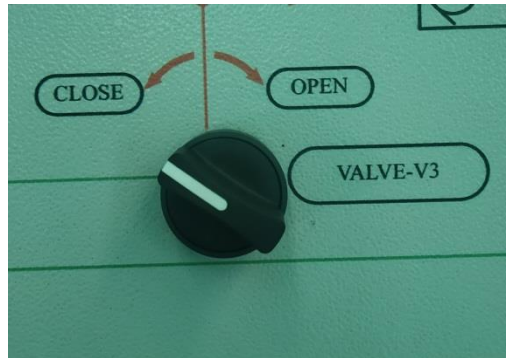
7. Pressure PAC- Operation Procedure (Reference Circuit Diagram and Panel)

Pressure PAC is specially designed for High pressure which needs to be careful operated.

A. Boosting Pressure (0 - 4000 psi):

- A. Connect the Compressed Air to Pressure PAC at Air Drive inlet port with the help of PU Tube.
- B. Connect the helium supply to Pressure PAC at Gas inlet port with the help of Hose.
- C. Connect one end of Outlet Hose to the bulk head (high pressure outlet) and other end with the filling cylinder.
- D. Open the valve (V3).

Customer	
Equipment Name	HELIUM DECANTING AND BOOSTING SYSTEM (Model No.: P1253-PressurePAC)




E. Supply drive air to the amplifier and booster by drive air valve (V1 and V2).



F. Regulate the air drive pressure to get the desire pressure (4.0)




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<p style="text-align: center;">Equipment Name</p>	<p>HELIUM DECANTING AND BOOSTING SYSTEM (Model No.: P1253-PressurePAC)</p>

G. Drive air Regulated air pressure shown on pressure gauge (3.2)



H. After valve V3 is open, pressure of Helium is shown on pressure gauge (14.1).



Customer	
Equipment Name	HELIUM DECANTING AND BOOSTING SYSTEM (Model No.: P1253-PressurePAC)


- i. Helium pressure regulator (13.0), it is mounted on inlet line of Amplifire and Regulate the desired pressure (0-400Psi) at the suction.

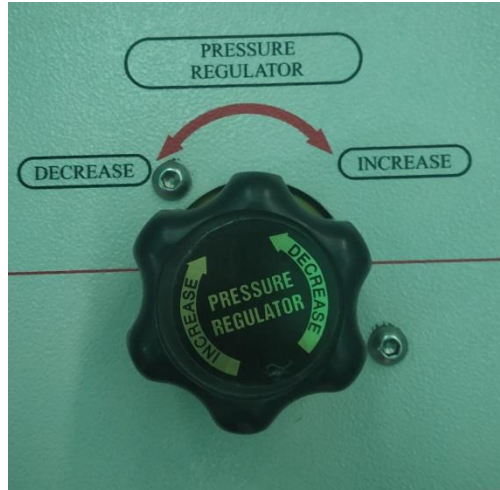


- j. Boosting pressure is shown on the pressure gauge (14.2)



- k. Boosting pressure at outlet is regulated by High pressure regulator (23).


Customer	
Equipment Name	HELIUM DECANTING AND BOOSTING SYSTEM (Model No.: P1253-PressurePAC)



- l. Regulated pressure shown on the HMI interface (6.3).
- m. Open the valve V5 for direct supply the helium from gas inlet to outlet.




- n. This machine is also operated by HMI with the above instruction. All the valve control is given on HMI interface.

Customer	
Equipment Name	HELIUM DECANTING AND BOOSTING SYSTEM (Model No.: P1253-PressurePAC)




Note: Please ensure that all connection should be fully tightened before Starting the Test.

Customer	
Equipment Name	HELIUM DECANTING AND BOOSTING SYSTEM (Model No.: P1253-PressurePAC)


8.) Pressure PAC- 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 safety relief valve and Pilot switch.**
- 6. Please ensure that door of the Pressure PAC must be close during testing**


Customer	
Equipment Name	HELIUM DECANTING AND BOOSTING SYSTEM (Model No.: P1253-PressurePAC)

9. List of Standard Components


He DECENTING & BOOSTING SYSTEM T-DAP-P1253-BOM-REV-00						
SI NO.	CKT CODE	PASKALS PART NO	ITEM DESCRIPTION	ITEM SPECIFICATIONS	MAKE	Qty
1	1	2P1253P0001	Moisture seperator	Grid dimension 62 mm End connection: 1/2" BSP Female Working Pressure: 10 Bar Operating Medium: Air	Festo	1
2	2	2P1253P0002	Filter	Grade of Filtration: 40 micron meter End connection: 1/2" BSP Female Working Pressure: 10 Bar Operating Medium: Air	Festo	1
3	3	2P1253P0003	Pressure Gauge	Dial size: 2.5" 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 with 3 hole front flange Glycerin filling: Yes Operating Medium: Air	Wika	2
4	4	2P1253P0004	Pressure Regulator	End connection: 1/2" Bsp Female Regulating range: 0- 10 Bar Working Pressure: 10 Bar Operating Medium: Air	Festo	1
5	5	2P1253P0005	Safty Relief valve	MOC : Brass , Set Pressure : 2 - 10 bar , Working Media : Air	Standard	1
6	6	2P1253P0006	Pnumatic Actuated Ball	Connection: 1/2" tube OD Working Pressure: 10 bar	Hamlet	2

Customer	
Equipment Name	HELIUM DECANTING AND BOOSTING SYSTEM (Model No.: P1253-PressurePAC)

			Valve Low Pressure	Operating Medium: Air		
7	7	2P1253P0007	Check Valves	Body Material: Stainless Steel 316 Connection Type: Let-Lok® Tube Fitting Connection Size: 1/4" Max Pressure: 3000 psi (207 bar) CV: 0.47	Hamlet	1
8	8	2P1253P0008	5 Liters Storage	Material : SS , Working Pressure : 16 Bar , Pneumatic connection : 1" BSPF , Material of air reservoir : High alloy steel, non-corrosive	Festo	1
9	9	2P1253P0009	Solenoid Valve	3/2 - 3 Way, 2 Position Valves, Medium : Air , Connection : 1/4" BSPF, Operating Pressure : 22.5 to 120 psi / 1.5 to 8 bar	Festo	5
10	10	2P1253P0010	Hose	1/4" Hose Max Working Pressure 300 Bar Length 2 Meters , End Connection 1/4" BSPF With D Type Nipple	spir star	2
11	11	2P1253P0011	Filter	Micron rating : 2 Micron ,Body Material: Stainless Steel 316 Connection Type: Let-Lok® Tube Fitting Connection Size: 1/4"	Hamlet	1
12	12	2P1253P0012	Pressure Transmitters/ Sensor	Positive Pressure Range 0-300 bar , , Accuracy 0.5 % or Better, Process Connection 1/2"BSP Male	WIKA	2
13	13	2P1253P0013	Pressure Regulator	Reducing Regulator : Hand/Spring Loaded End connection : 1/4 in. FNPT Regulating Pressure 0 to 400 psi out	Paskals	1
14	14	2P1253P0014	Pressure Gauge	Dial size: 4" Pressure range: 0-400 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 with 3 hole front flange Glycerin filling: Yes Operating Medium: Helium	Wika	2

Customer	
Equipment Name	HELIUM DECANTING AND BOOSTING SYSTEM (Model No.: P1253-PressurePAC)

15	15	2P1253P0015	Pressure Switch	Set Pressure 25 bar , Max Operating Pressure 260 bar , Supply Voltage 24 V , End connection 1/4" NPTF	Danfoss/ Switzer / Wika	1
16	16	2P1253P0016	Pnumatic Actuated Ball Valve High Pressure	Connection: 1/4" tube OD Working Pressure: 4000 PSI Operating Medium: Air	Hamlet	3
17	17	2P1253P0017	Gas Amplifier	Drive pressure Available : 5-6 bar; max. air drive pressure -10.3 bar , max inlet pressure-86 bar;max outlet pressure - 86 bar;compression ratio-5:1;Outlet Pressure at 5 Bar Air Drive : 20-25 bar , piston displacement/ cycle -19.3 Cu In	Haskel	1
18	18	2P1253P0018	Check valve	Cracking pressure @ 1 PSI Body Material: Stainless Steel 316 Connection Type: One-Lok® Tube Fitting Connection Size: 1/4" Max Pressure: 6000 psi (414 bar)	Hamlet	2
19	19	2P1253P0019	Receiver tank	Receiver tank 47 litre on the outlet of Air Amplifier , Working Media : Helium , Max working pressure 150 BAR .	EKC	2
20	20	2P1253P0020	Gas Booster	Drive pressure Available : 5-6 bar; max. air drive pressure -10.3 bar , max inlet pressure-345 bar;max outlet pressure - 86 bar;Outlet Pressure at 5 Bar Air Drive : 300 bar , piston displacement/ cycle -6.2 Cu In	Haskel	1
21	21	2P1253P0021	Pilot Switch	2 Way NO-, Range :750-4000 Psi, Sensig port : 1/4" Npt, Inlet : 1/8" NPTM , Out let : 1/4" Npt	Haskel	1
22	22	2P1253P0022	Safty Relief Valve	Connection Type: Let-Lok® Tube Fitting Connection Size: 1/4" Body Material: Stainless Steel 316 Set Pressure Range : 275 -344 Bar	HAMLET	1
23	23	2P1253P0023	Pressure Regulator	Reducing Regulator : Hand/Spring Loaded End connection : 1/4 in. FNPT Regulating Pressure 0 to 4000 psi out	Paskals	1
24	24	2P1253P0024	Receiver tank	Receiver tank 40 litre on the outlet of Air Amplifier , Working Media : Helium	EKC	15

Customer	
Equipment Name	HELIUM DECANTING AND BOOSTING SYSTEM (Model No.: P1253-PressurePAC)

				, Max working pressure 200 BAR .		
25	25	2P1253P0025	PU TUBE	Low Pressure Hose (PU PIPE) 12 MM OD Medium:Air , Length : 3 Meters Working Pressure: 10 BAR	Festo	1
26	26	2P1253P0026	PLC & HMI SCREEN	A/R	Schneider	1
27	27	2P1253P0027	Panel	As per drawing	Paskals	1

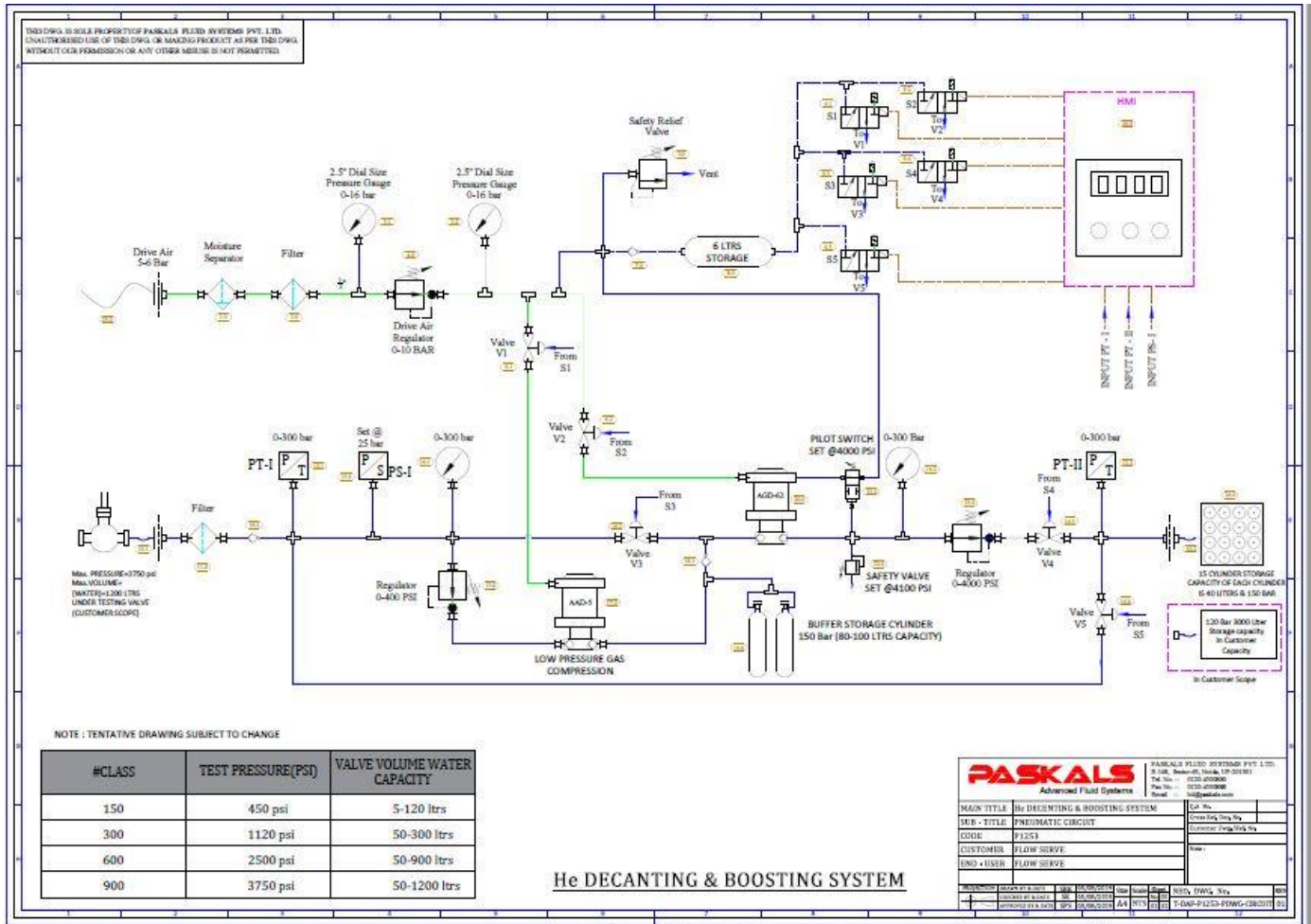
Customer




Equipment Name

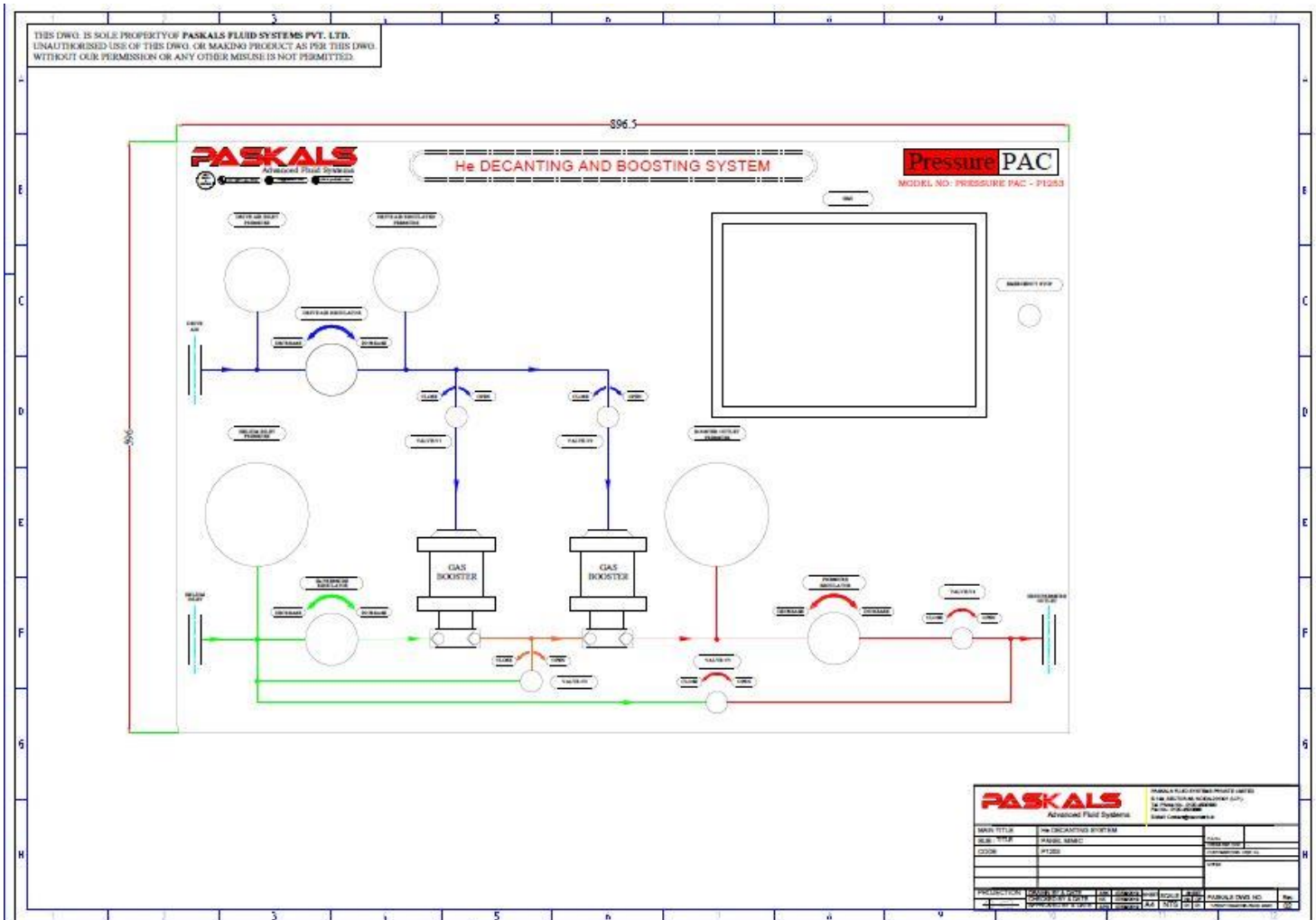
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(Model No.: P1253-PressurePAC)


10.Circuit Diagram of Pressure PAC



Customer	
Equipment Name	HELIUM DECANTING AND BOOSTING SYSTEM (Model No.: P1253-PressurePAC)

11. Panel MIMIC Diagram



Customer	
Equipment Name	HELIUM DECANTING AND BOOSTING SYSTEM (Model No.: P1253-PressurePAC)

13. Sales /Service/Support Contact Details

With Best Regard

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