

End Customer Details	User Manual For	Enquiry Details
BHEL VISAKHAPATNAM	TEST RIG FOR PRESSURE LOSS TEST & LEAK TEST	GEMC- 511687727113463, DATED : 02-JUN-2022

USER MANUAL OPERATION AND MAINTENANCE



Document Prepared and Published By

NEOMETRIX ENGINEERING PVT LTD

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Pressure Loss And Leak Test Rig -
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www.neometrixgroup.com

Dear User,

Neometrix is grateful for this opportunity provided to us to offer our products & services to you. We sincerely hope that you will be delighted to use our system and give us more opportunities to serve you.

Neometrix is very focused on Aviation and Railway industries and offers complete range of systems & services which can be of immense use to you. We specialize in Hydraulic/ Servo Hydraulic Test Rigs, Fuel System Test Rigs, Pneumatic System Test Rigs, Oxygen/ Special Gases system Test Rigs, Very High Pressure Systems, Electronic & Electrical Test Rigs. Our services include among others, the followings:

- State of the art Test Rig Design, Development, Fabrication, Installation, Commissioning, Training & Support.
- Refurbishment/ Up gradation of the Existing Test Rigs.
- Maintenance (AMC) contracts of Existing Test Rigs.
- Operations Contract for the Test Rigs.
- Setting up of complete Testing Infrastructure including civil infrastructure.

The following pages talk about some of our systems in brief. Please feel free to contact us for details of any particular system of your interest.

Neometrix is committed to offer its best solutions & services to you all the times

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and wish to become your preferred supplier for these services.

With Best Regards,

Shailendra Pratap Singh
CEO

Warnings:

1. Make sure that all electronic products are earth-grounded, to ensure Personal safety and proper operation.



2. All sensors are very sensitive; please never try to touch them.

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1. Neometrix Engineering Introduction:

Neometrix Engineering Pvt. Ltd. is a complete engineering solutions company based in New Delhi/ Noida.

We specialize in CUSTOM BUILT Turnkey Engineering Solutions.

We have expertise in various engineering domains like Hydraulics, Servo Hydraulics, ATF (Fuel), Mechanical, Pneumatic, Oxygen/ Helium (High Purity Gases), Electronics/ Electrical Test Benches, and Complete PC Based Automation Solutions.

We have experts in Mechanical Engineering, Chemical Engineering, Electrical/ Instrumentation Engineering, Software, Civil Engineering, Aeronautical engineering and other engineering fields.

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The company has a team of ~30 highly qualified engineers and has an experience of more than 75 successfully delivered projects. We are very closely working with **HAL, RDSO, Railways, Defense Establishments, Labs and Private Industries.**

The founders are graduates from IIT Kanpur and the company remains very closely linked with IITs. We utilize the expertise available there as and when required.

We have an exclusive relationship with Parker USA (www.parker.com) for supplying Hydraulic Systems to HAL. Parker is world leader in Hydraulics (Fluid Motion & Control).

We have an exclusive relationship with Haskel USA (www.haskel.com) for supplying very high pressure systems. Haskel is world leader in very High Pressure products.

We are alliance partners of **National Instruments USA** (www.ni.com), world leader in PC Based Test Measurement and Automation.

With such alliances and our own engineering capabilities, we are in a position to deliver you state of the art world class Test Rig.

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

Pressure Loss Test and leak Test Rig is a High Pressure system and requires handling by trained personnel. Kindly go through the User Manual in detail before operating the equipment.

Do's

1. Before starting the test make sure that oil tank must be filled.
2. Before starting the test make sure Suction Valve OPEN position, if not please take it on OPEN position.
3. Make sure that all joints with Hoses are properly tightened before starting the test.

Don'ts

1. Don't disconnect Test-Unit without Release test pressure.

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3. Introduction of the Test Rig:

PRESSURE LOSS TEST AND LEAK TEST RIG is designed to test the performance of **HEAT EXCHANGERS OF SECONDARY POWER SYSTEM (SPS)** of Light combat Aircraft-Tejas for Cooling of Hydraulic oil, Gear Box oil.

SPS consists of following two heat exchangers:

- 1) Hydraulic Oil-IDG Oil-Fuel Cooler(HE-1)
- 2) GBX oil-Hyd. Oil-Fuel Cooler (HE-2)

H.E-1 & H.E-2 have three circuit, Hydraulic oil circuit, Gear Box oil/IDG oil circuit & Aviation Fuel circuit.

PRESSURE LOSS TEST AND LEAK TEST RIG consist three following circuits to test the pressure loss and Leak Test

- 1. HYDRAULIC OIL POWER PACK**
- 2. GEAR BOX OIL POWER PACK**
- 3. AVIATION OIL POWER PACK**

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1. HYDRAULIC OIL POWER PACK

Technical Specifications		
S.no.	Name of Characteristic	Value of Characteristic
1	Motor Power	Input Voltage 415 V, Three Phase
2	Max Flow	90 LPM
4	Output Pressure Range (for Pressure Testing)	Up to 70 bar
5	Working Media	Hydraulic
6	Machine Pressure Range	0-70 bar
7	Outlet flow rate	Variable (As per requirement)
9	Inlet pressure Gauge Range	100 BAR
10	Outlet pressure Gauge Range	100 BAR
11	Gauge Type / Material /Design	Analogue / SS 316/ Bourdon tube design, Overpressure protection 15%
12	Supply Hose	Length 6 Meter, Dia.: 1/4" Inch, Hose Working pressure 150 bar, End Connection: OF QDC coupling.
13	SKID MOC	MS Powder coated , Powder coating thickness 60-80 Micron

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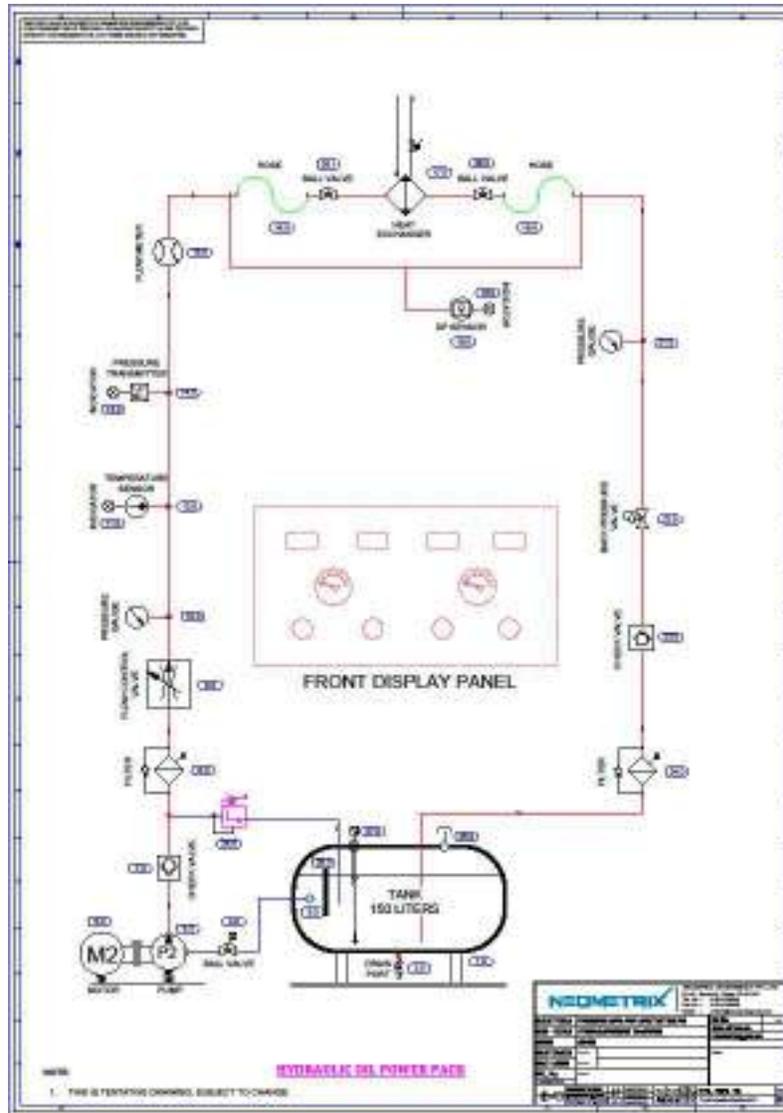
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T-PED-A3495-BOM-REV-02							
TEST EQUIPMENT AND MATERIALS IN HYDRAULICS OIL POWER PACK							
S. No	Nx Part No	Circuit Code	Item Name	Item Specification	Make	Model	Qty.
1	2A3495P0001	1	Hydraulic Oil Reservoir	MOC : SS 304 Useable Tank Volume: 150 Ltr, For Hydraulic Oil MIL-H-5606E,	Neometrix	Fabricated	1
2	2A3495P0001	2	Tank Drain Cock	MS with plug, 1/2" BSPF,	Festo	QH 1/2	1
3	2A3495P0002	3	Suction Strainer	Pump Suction Strainer, Filtration:149 Micron,	Hydroline	SC3-030	1
4	2A3495P0003	4	Suction ball Valve	Pump Suction line Ball Valve with limit switch , MS Size: 1.1-1/2" BSPF , with Limit Switch	Cair	VP-WP-01	1
5	2A3495P0004	5	Pump	Flow: 0-90 lpm, 0-70 Bar Fixed Displacement Pump Type- VANE Pump	Vickers	35V-25-A-1C-22	1
6	2A3495P0005	6	Electric Motor	15 kW(20HP) Three Phase, 4 Pole Induction Motor, Speed - 1450 RPM, foot cum Flange Mounting	SIEMENS	1LE75011DB4351 A4	1
7	2A3495P0006		Bell housing and Coupling	suitable for above motor + pump	Neometrix	Standard	1
8	2A3495P0007	7,23	Check Valve	Maximum Operating Pressure 100 bar, Cracking Pressure 0.5 bar/1.5 BAR Connection G1	Rexroth	S20A05-1X	2
9	2A3495P0008	8	Pressure Line Filter	10 Micron Flow-100 LPM Max Pressure 100 bar, connection 1" BSP(F)	Argo hytos	HD 172-156	1
10	2A3495P0009	9	Flow Control Valve	Flow range of 0-125 LPM, MOC :- SS 304 PERSSURE :- up to 100 BAR	FLUTEC	DV- SERIES	1
11	2A3495P0010	10, 21	Analog Pressure Gauge	Range 0 - 100 Kg/cm2 with psi, Nominal size: 100 mm, Measuring system: SS 316 L Movement: stainless steel, Case: SS with case vent, Window safety Glass, Dial: White aluminium Pointer: Black Aluminium, Accuracy: 1% of FS, Con: 1/2" BSP(M)	WIKA	233.50.100	2
12	2A3495P0011	11	Digital Temperature Indicator	Range: 0-100 °C Resolution: 0.01 °C	MASIBUS	IBUS/ 409-G-N-U1	1
13	2A3495P0012	12	Temperature Sensor	Temperature Range-(0-200) Degree Celsius , Output: 4-20mA/ 0-10V DC	Artech	TX-05	1
14	2A3495P0013	13,14	Pressure Transducer with Digital Display Unit	Range 0 - 100 Bar, Signal output: 4-20 mA 2wire, Power supply: 8 36 VDC Accuracy: 0.25% of BFSL, Display unit Resolution: 0.01 Kg/cm2(g)	WIKA	S-20	1
15	2A3495P0014	15	Flow meter with Digital Display Unit	Range: 0-100 LPM Screwed 1/2" BSP (M) ±1% of the reading End Connections Linearity Display unit Resolution: 0.01 LPM	ROCKWIN	TFM 1020 BS	1
16	2A3495P0015	16, 20	Flexible hose	Pressure Range: 0-150 Kg/cm2(g) Size: 19mm ID-6 m Long with end connection of QDC coupling of 5600 Series (NPT) -steel /EQUIVALENT Female part	Parker	U.K. IAZ series	2
17	2A3495P0016	18,19	Differential Pressure Transducer with Digital Display Unit	Line Pressure: 0-100 Kg/cm2 Differential Pressure Range: 0-10 Kg/cm2 End connection Thread specification: M16 x 2mm pitch (External Thread) Display unit resolution: 0.01 Kg/cm2(g)	SIEMENS	7MF4433	1
18	2A3495P0017	22	Back Pressure Valve	Flow Control Valves - 1"BSPF Flow range of 0-125 LPM. MOC :- SS 304 PERSSURE :- up to 100 BAR	FLUTEC	DV- SERIES	1
19	2A3495P0018	24	Return FILTER	Flow to 150 LPM, BYPASS STANDARD 1 BAR MAX TEMP-UP TO 80 °C	Hydroline	HFR	1
20	2A3495P0019	25	Filler Breather	40 Micron Filtration	Hydroline	FSB25	1
21	2A3495P0020	26	Pressure Relief Valve	Set Pressure Upto 0-70 Bar	REXROTH	DBDH 20 P1X/100	1

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2. GEAR BOX OIL POWER PACK

Technical Specifications		
S.no.	Name of Characteristic	Value of Characteristic
1	Motor Power	Input Voltage 415 V, Three Phase
2	Max Flow	50 LPM
4	Output Pressure Range (for Pressure Testing)	Up to 50 bar
5	Working Media	Hydraulic
6	Machine Pressure Range	0-50 bar
7	Outlet flow rate	Variable (As per requirement)
9	Inlet pressure Gauge Range	70 BAR
10	Outlet pressure Gauge Range	70 BAR
11	Gauge Type / Material /Design	Analogue / SS 316/ Bourdon tube design, Overpressure protection 15%
12	Supply Hose	Length 6 Meter, Dia.: 1/4" Inch, Hose Working pressure 150 bar, End Connection: OF QDC coupling.
13	SKID MOC	MS Powder coated , Powder coating thickness 60-80 Micron

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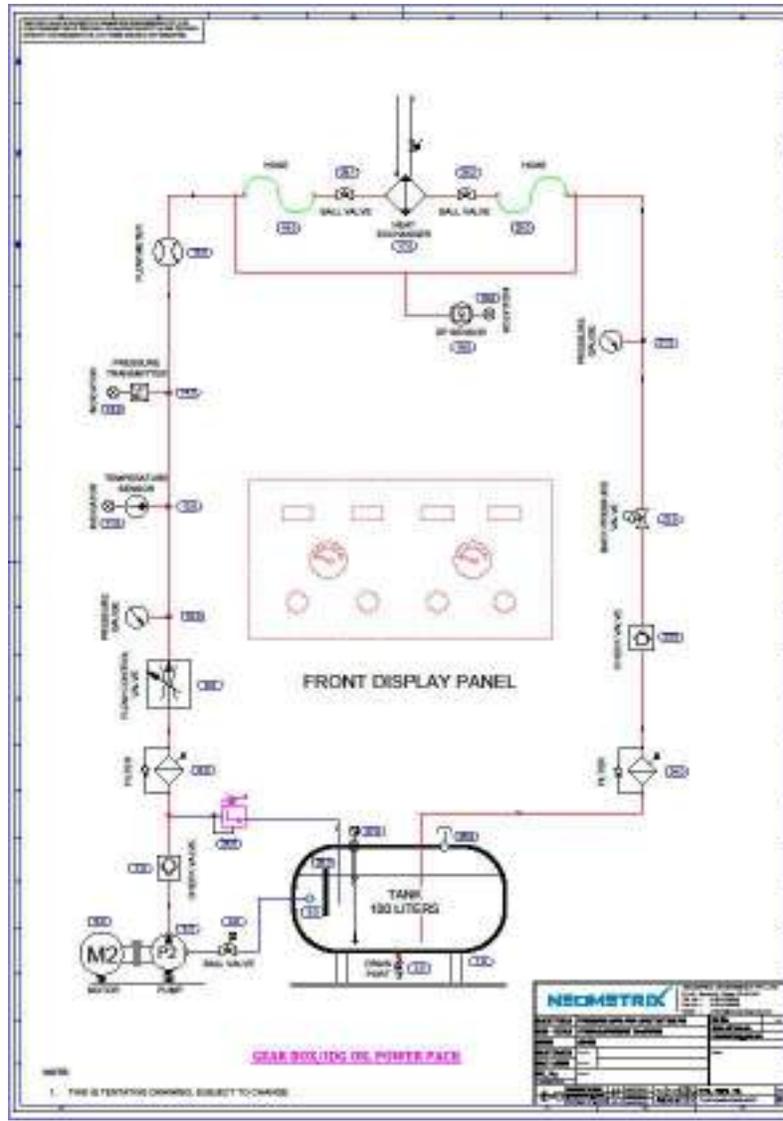
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TEST EQUIPMENT AND MATERIALS IN GEAR BOX OIL / IDG OIL POWER PACK

S. No.	Nx Part No	Circuit Code	Item Name	Item Specification	Make	Model	Qty.
22	2A3495F0001	1	Hydraulic Oil Reservoir	SS 304 , Tank Volume: 100 Ltr, Hydraulic Oil MIL-L-23699	Neometrix	Fabricated	1
23	2A3495P0001	2	Tank Drain Cock	MS with plug, 1/2" BSPF,	Festo/Parker	Q 1/2	1
24	2A3495P0002	3	Suction Strainer	Pump Suction Strainer, Filtration:149 Micron,	Hydroline	SC3-030	1
25	2A3495P0003	4	Suction ball Valve	Pump Suction line Ball Valve, MS Size: 1 1-1/2" BSPF	Festo/Parker/Cait	VP-WP-01	1
26	2A3495P0021	5	Pump	Flow: 0-50 lpm, 0-50 Bar Fixed Displacement Pump Type- VANE PUMP	Vickers	25V-14-A-1C-22	1
27	2A3495P0022	6	Electric Motor	5.5 kW(7.5 HP) Three Phase, 4 Pole Induction Motor, IE2 Speed - 1450 RPM, foot cum Flange Mounting, Frame Size: 132S	SIEMENS	1LE7503-1CB03-5AA4	1
28	2A3495P0023		Bell housing and Coupling	suitable for above motor + pump	Neometrix	Standard	1
29	2A3495P0024	7,23	Check Valve	Maximum Operating Pressure 100 bar, Cracking Pressure 0.5 bar/1.5 BAR Connection G1	Rexroth/Polyhy dron	S20A05-1X	2
30	2A3495P0025	8	Pressure Line Filter	10 Micron Max Pressure 100 bar, connection 3/4" BSP(F) Working Flow: 50 lpm with spare Element (V3.0520-06)	Argo hytos	HD-069-156	1
31	2A3495P0026	9	Flow Control Valve	Flow range of 0-50 LPM. MOC :- SS 304 PERSSURE :- up to 100 BAR	FLUTEC	DV- SERIES	1
24	2A3495P0027	10, 21	Analog Pressure Gauge	Range 0 - 70 Kg/cm2 with psi, Nominal size: 100 mm, Measuring system: SS 316 L Movement: stainless steel, Case: SS with case vent, Window safety Glass, Dial: White aluminium Pointer: Black Aluminium, Accuracy: 1% of FS, Con: 1/2" BSP(M) Back with 3 hole front flange Glycerin Filling : Yes)	WIKA	233.50.100	2
26	2A3495P0028	11	Digital Temperature Indicator	range: 0-100 °C Resolution: 0.01 °C	MASIBUS	IBUS/ 409-G-N-U1	1
25	2A3495P0029	12	Temperature Sensor	Temperature Range-(0-200) Degree Celsius	Artech	TX-05	1
27	2A3495P0030	13, 14	Pressure Transducer with Digital Display Unit	Range 0 - 50 Bar, Signal output: 4-20 mA 2wire, Power supply: 8- 36 VDC Accuracy: 0.25% of BFSL, Display unit Resolution: 0.01	WIKA	S-20	1
28	2A3495P0031	15	Flow meter with Digital Display Unit	Range: 0-50 LPM End Connections Screwed 1/2" BSP (M) Linearity ±1% of the reading Display unit Resolution: 0.01 LPM	ROCKWIN	TFM 1020 BS	1
29	2A3495P0032	16, 20	Flexible hose	Pressure Range: 0-150 Kg/cm2(g) Size: 19mm ID-6 m Long with end connection of QDC coupling of 5600 Series (NPT) -steel /EQUIVALENT Female part	Parker + Holmbry	U.K. IAZ series	2
30	2A3495P0033	18, 19	Differential Pressure Transducer with Digital Display Unit	Line Pressure: 0-50 Kg/cm2 Differential Pressure Range: 0-10 Kg/cm2 End connection Thread specification: M16 x 2mm pitch (External Thread) Display unit resolution: 0.01 Kg/cm2(g)	SIEMENS	7MF4433	1
31	2A3495P0034	22	Back Pressure Valve	Flow Control Valves - 1" BSPF Flow range of 0-50 LPM. MOC :- SS 304 PERSSURE :- up to 100 BAR	FLUTEC	DV- SERIES	1
32	2A3495P0035	24	RETURN LINE FILTER	Flow to 150 LPM, BYPASS STANDARD 1 BAR MAX TEMP-UP TO 80 °C, FILTER-25 MICRONS	Hydroline	HFR	1
33	2A3495P0036	25	Filler Breather	40 Micron Filtration	Hydroline	FSB25	1
34	2A3495P0037	26	Pressure Relief Valve	Set Pressure Upto 0-50 Bar	REXROTH	DBDH 20 P1X	1

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1. AVIATION OIL POWER PACK

Technical Specifications		
S.no.	Name of Characteristic	Value of Characteristic
1	Motor Power	Input Voltage 415 V, Three Phase
2	Max Flow	30 LPM
4	Output Pressure Range (for Pressure Testing)	Up to 30 bar
5	Working Media	Hydraulic
6	Machine Pressure Range	0-30 bar
7	Outlet flow rate	Variable (As per requirement)
9	Inlet pressure Gauge Range	70 BAR
10	Outlet pressure Gauge Range	70 BAR
11	Gauge Type / Material /Design	Analogue / SS 316/ Bourdon tube design, Overpressure protection 15%
12	Supply Hose	Length 6 Meter, Dia.: 1/4" Inch, Hose Working pressure 150 bar, End Connection: OF QDC coupling.
13	SKID MOC	MS Powder coated , Powder coating thickness 60-80 Micron

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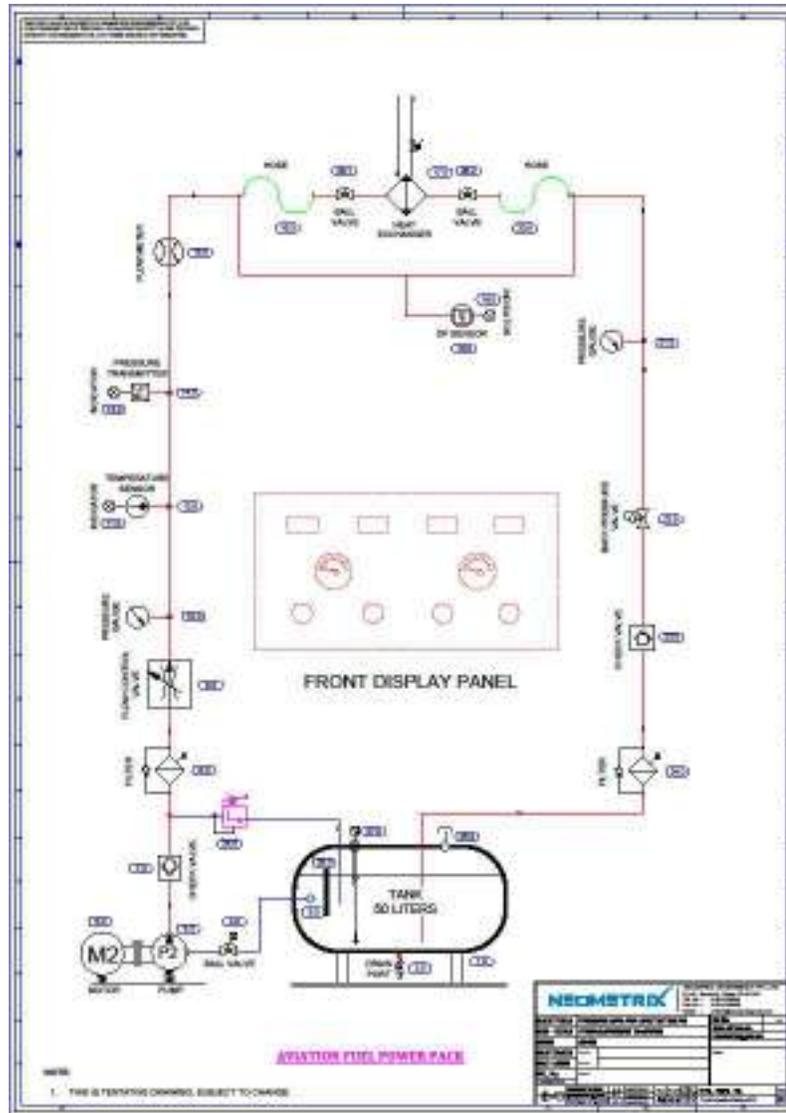
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TEST EQUIPMENT AND MATERIALS IN AVIATION FUEL POWER PACK							
S. No.	Nx Part No	Circuit Code	Item Name	Item Specification	Make	Model	Qty.
37	2A3495F0001	1	Hydraulic Oil Reservoir	SS 304 , Tank Volume: 50 Ltr, Hydraulic Oil DERD 2494	Neometrix	Fabricated	1
38	2A3495P0001	2	Tank Drain Cock	MS with plug, 1/2" BSPF,	Festo	QH-1/2	1
39	2A3495P0002	3	Suction Strainer	Pump Suction Strainer, Filtration:149 Micron,	Hydroline	SC3-030	1
40	2A3495P0038	4	Suction ball Valve	Pump Suction line Ball Valve with Limit Switch MS Size: 1.1-1/2" BSPF	Cair	1-1/2"	1
41	2A3495P0039	5	Pump	Working Pressure:0-30 Bar Fixed Displacement Pump	Roto Fluid	FIGB-F03	1
42	2A3495P0040	6	Electric Motor	3.7 kW(5 HP) Three Phase, 4 Pole Induction Motor, IE2 Speed - 1450 RPM, foot Mounting	SIEMENS	1LE75031B235A A4	1
43	2A3495P00041		Bell housing and Coupling	suitable for above motor + pump	Neometrix	Standard	1
44	2A3495P00042	7,23	Check Valve	Maximum Operating Pressure 100 bar, Cracking Pressure 0.5 bar/1.5 BAR Connection G1	Rexroth	S20A1.0	2
45	2A3495P00025	8	Pressure Line Filter	10 Micron Max Pressure 30 bar, connection 3/4" BSP(F), working Flow : 30 LPM with spare Element	Argo hytos	HD 069 156	1
46	2A3495P00044	9	Flow Control Valve	Flow range of 0-30 LPM. MOC :- SS 304 PRESSURE :- up to 100 BAR	FLUTEC	DV- SERIES	1
47	2A3495P0045	10, 21	Analog Pressure Gauge	range 0 - 70 kg/cm2 with psi, nominal size: 100 mm, measuring system: SS 316 L Movement: stainless steel, Case: SS with case vent, Window safety Glass, Dial: White aluminium Pointer: Black Aluminium, Accuracy: 1% of FS, Con: 1/2" BSP(M) Back with 3 hole front flange Glycerin Filling : Yes	WIKA	233.50.100	2
48	2A3495P0046	11	Digital Temperature Indicator	range: 0-100 °C Resolution: 0.01 °C	MASIBUS	IBUS/ 409-G-N-U1	1
49	2A3495P0047	12	Temperature Sensor	Temperature Range: (0-200) Degree Celsius	Artech	TX-05	1
50	2A3495P0048	13, 14	Pressure Transducer with Digital Display Unit	Range 0 - 30 Bar, Signal output: 4-20 mA 2wire, Power supply: 8- 36 VDC Accuracy: 0.25% of BFSL, Display unit Resolution: 0.01 Kg/cm2(g)	WIKA	S-20	1
51	2A3495P0049	15	Flow meter with Digital Display Unit	Range: 0-30 LPM End Connections Screwed 1/2" BSP (M) Linearity ±1% of the reading Display unit Resolution: 0.01 LPM	ROCKWIN	TFM 1020 BS	1
52	2A3495P0050	16, 20	Flexible hose	Pressure Range: 0-150 Kg/cm2(g) Size: 19mm ID-6 m Long with end connection of QDC coupling of 5600 Series (NPT) -steel /EQUIVALENT Female part	Parker	U.K. IAZ series	2
53	2A3495P0051	18, 19	Differential Pressure Transducer with Digital Display Unit	Line Pressure: 0-30 Kg/cm2 Differential Pressure Range: 0-10 Kg/cm2 End connection Thread specification: M16 x 2mm pitch (External Thread) Display unit resolution: 0.01 Kg/cm2(g)	SIEMENS	7MF4433	1
54	2A3495P0052	22	Back Pressure Valve	Flow Control Valves - 1" BSPF Flow range of 0-30 LPM. MOC :- SS 304 PRESSURE :- up to 100 BAR	FLUTEC	DV- SERIES	1
55	2A3495P0053	24	FILTER	Flow to 30 LPM, BYPASS STANDARD 1 BAR MAX TEMP-UP TO 80 °C, FILTER-25 MICRONS	Hydroline	HFR	1
56	2A3495P0054	25	Filler Breather	40 Micron Filtration	Hydroline	FSB25	1
57	2A3495P0055	26	Pressure Relief Valve	Set Pressure Upto 0-30 Bar	REXROTH	DBDH 20 P1X	1

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BHEL VISAKHAPATNAM	TEST RIG FOR PRESSURE LOSS TEST & LEAK TEST	GEMC- 511687727113463, DATED : 02-JUN-2022

Spare List:

SPARE COMPONENTS							
S. No.	Nx Part No	Circuit Code	Item Name	Item Specification	Make	Model	Qty.
53	2A3495P0012		Temperature Sensor	Temperature Range-(0-200) Degree Celsius	Artech	TX-05	1
54	2A3495P0011		Digital Temperature Indicator	range: 0-100 °C Resolution: 0.01 °C	MASIBUS	IBUS/ 409-G-N-U1	1
55	2A3495P0013		Pressure Transducer with Digital Display Unit	Range 0 - 100 Bar, Signal output: 4-20 mA 2wire, Power supply: 8-36 VDC Accuracy: 0.25% of BFSL, Display unit Resolution: 0.01 Kg/cm2(g)	WIKA	S-20	1
56	2A3495P0014		Flow meter with Digital Display Unit	Range: 0-100 LPM End Connections Screwed 3/8" BSP (M) Linearity ±1% of the reading Display unit Resolution: 0.01 LPM	ROCKWIN	TFM 1020 BS	1
57	2A3495P0016		Differential Pressure Transducer with Digital Display Unit	Line Pressure: 0-100 Kg/cm2 Differential Pressure Range: 0-10 Kg/cm2 End connection Thread specification: M16 x 2mm pitch (External Thread) Display unit resolution: 0.01 Kg/cm2(g)	SIEMENS	7MF4433	1
58	2A3495P0029		Temperature Sensor	Temperature Range-(0-200) Degree Celsius	Artech	TX-05	1
59	2A3495P0028		Digital Temperature Indicator	range: 0-100 °C Resolution: 0.01 °C	MASIBUS	IBUS/ 409-G-N-U1	1
60	2A3495P0030		Pressure Transducer with Digital Display Unit	Range 0 - 50 Bar, Signal output: 4-20 mA 2wire, Power supply: 8-36 VDC Accuracy: 0.25% of BFSL, Display unit Resolution: 0.01 Kg/cm2(g)	WIKA	S-20	1
61	2A3495P0031		Flow meter with Digital Display Unit	Range: 0-50 LPM End Connections Screwed 3/8" BSP (M) Linearity ±1% of the reading Display unit Resolution: 0.01 LPM	ROCKWIN	TFM 1020 BS	1
62	2A3495P0033		Differential Pressure Transducer with Digital Display Unit	Line Pressure: 0-50 Kg/cm2 Differential Pressure Range: 0-10 Kg/cm2 End connection Thread specification: M16 x 2mm pitch (External Thread) Display unit resolution: 0.01 Kg/cm2(g)	SIEMENS	7MF4433	1
63	2A3495P0047		Temperature Sensor	Temperature Range-(0-200) Degree Celsius	Artech	TX-05	1
64	2A3495P0046		Digital Temperature Indicator	range: 0-100 °C Resolution: 0.01 °C	MASIBUS	IBUS/ 409-G-N-U1	1
65	2A3495P0048		Pressure Transducer with Digital Display Unit	Range 0 - 30 Bar, Signal output: 4-20 mA 2wire, Power supply: 8-36 VDC Accuracy: 0.25% of BFSL, Display unit Resolution: 0.01 Kg/cm2(g)	WIKA	S-20	1
66	2A3495P0049		Flow meter with Digital Display Unit	Range: 0-30 LPM End Connections Screwed 3/8" BSP (M) Linearity ±1% of the reading Display unit Resolution: 0.01 LPM	ROCKWIN	TFM 1020 BS	1
67	2A3495P0051		Differential Pressure Transducer with Digital Display Unit	Line Pressure: 0-30 Kg/cm2 Differential Pressure Range: 0-10 Kg/cm2 End connection Thread specification: M16 x 2mm pitch (External Thread) Display unit resolution: 0.01 Kg/cm2(g)	SIEMENS	7MF4433	1

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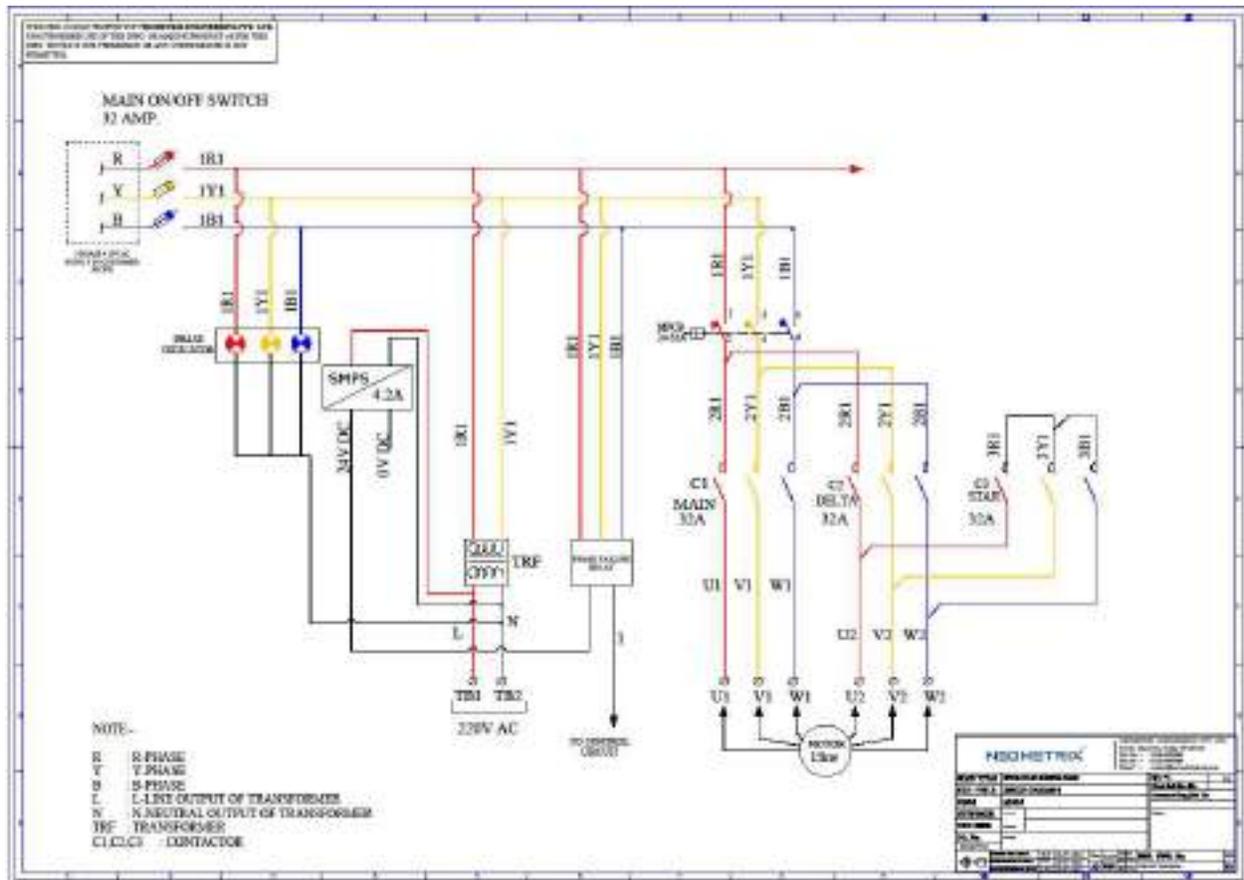
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7. ELECTRICAL WIRING DIAGRAM

7.1. HYDRAULIC POWER PACK

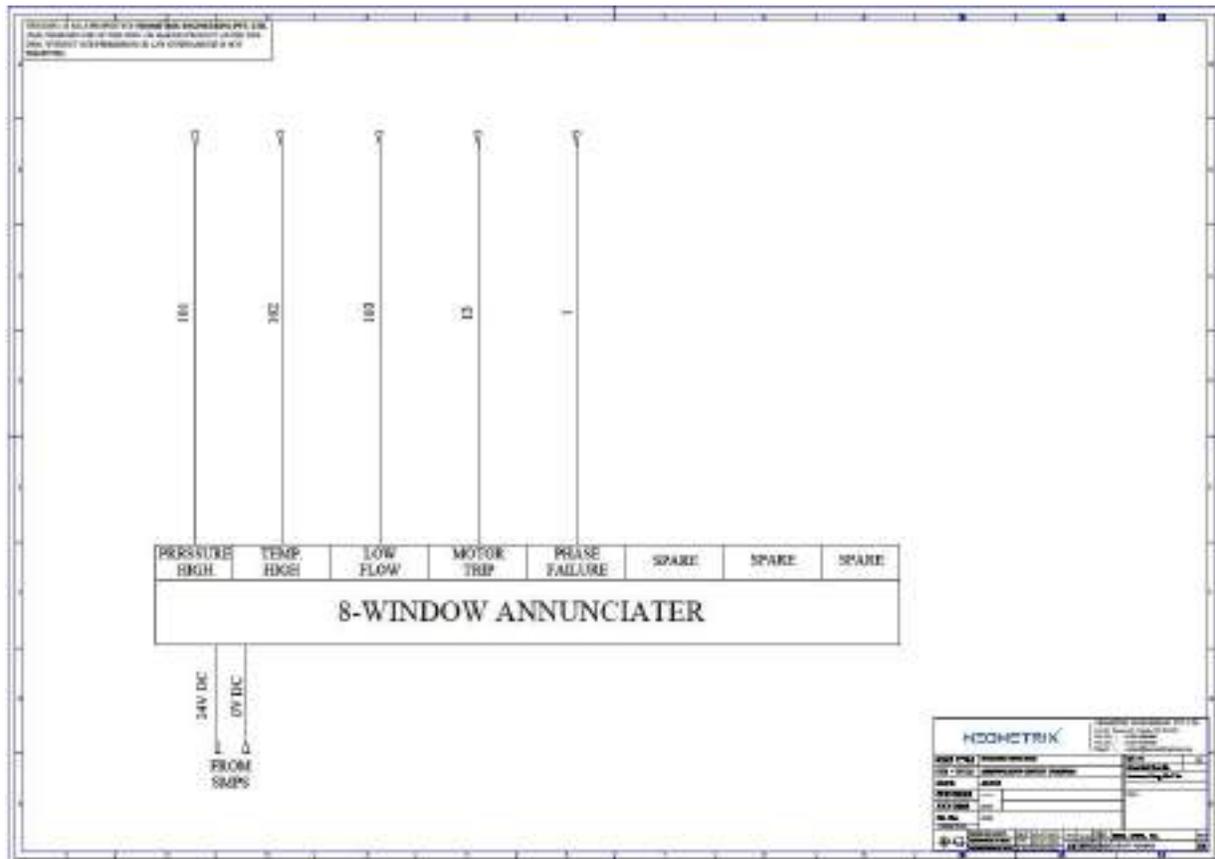
7.1.A-POWER WIRING



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7.1.B-ANNUNCIATOR WIRING

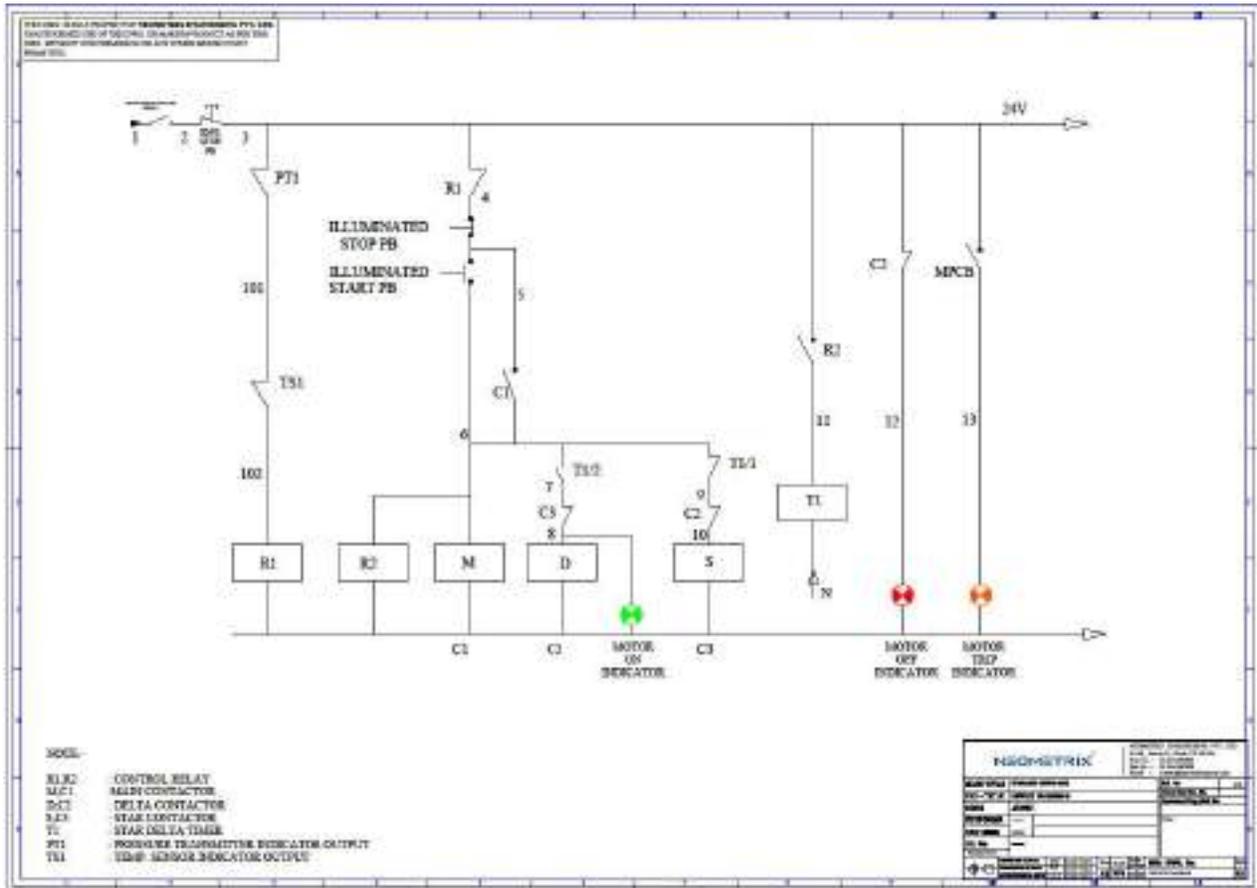


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7.1.C-CONTROL WIRING

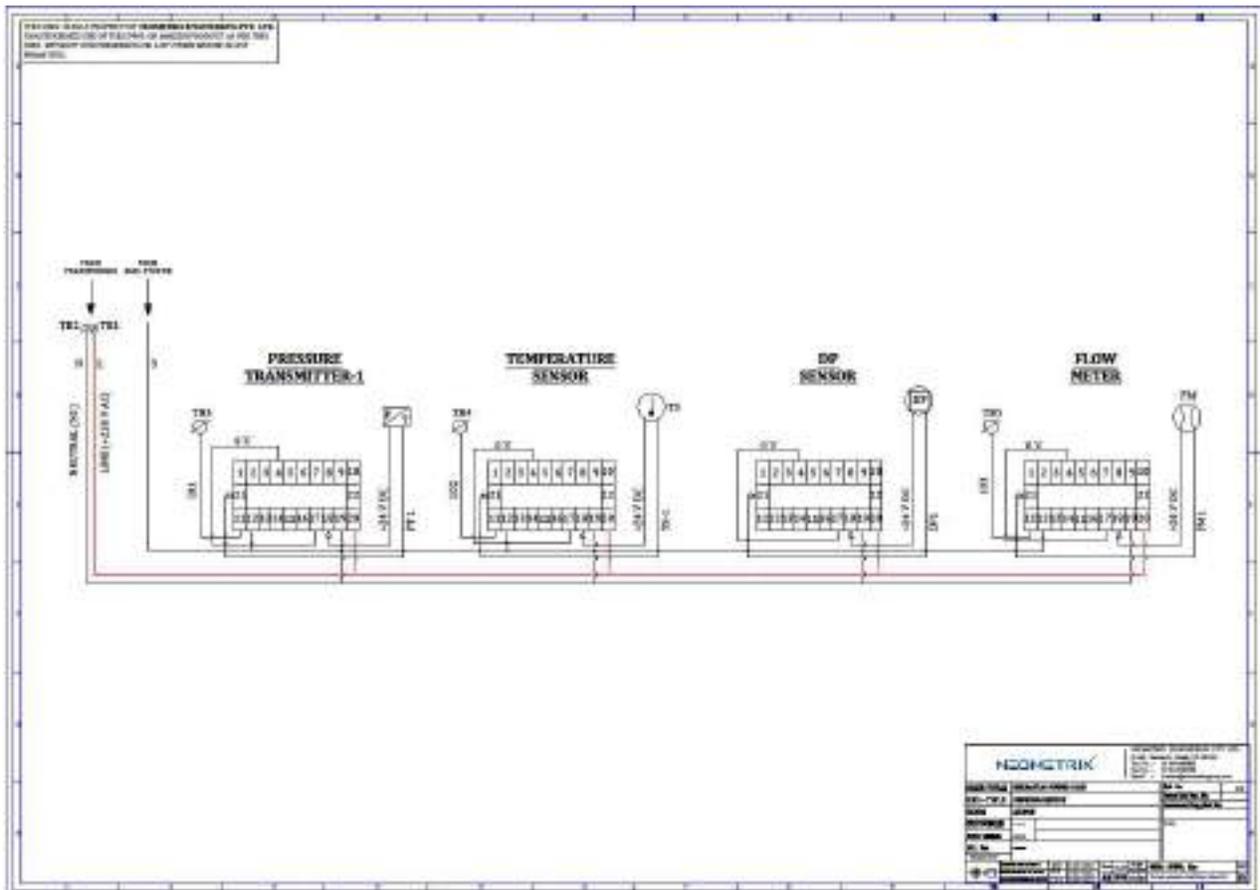


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7.1.D-DIGITAL INDICATOR WIRING

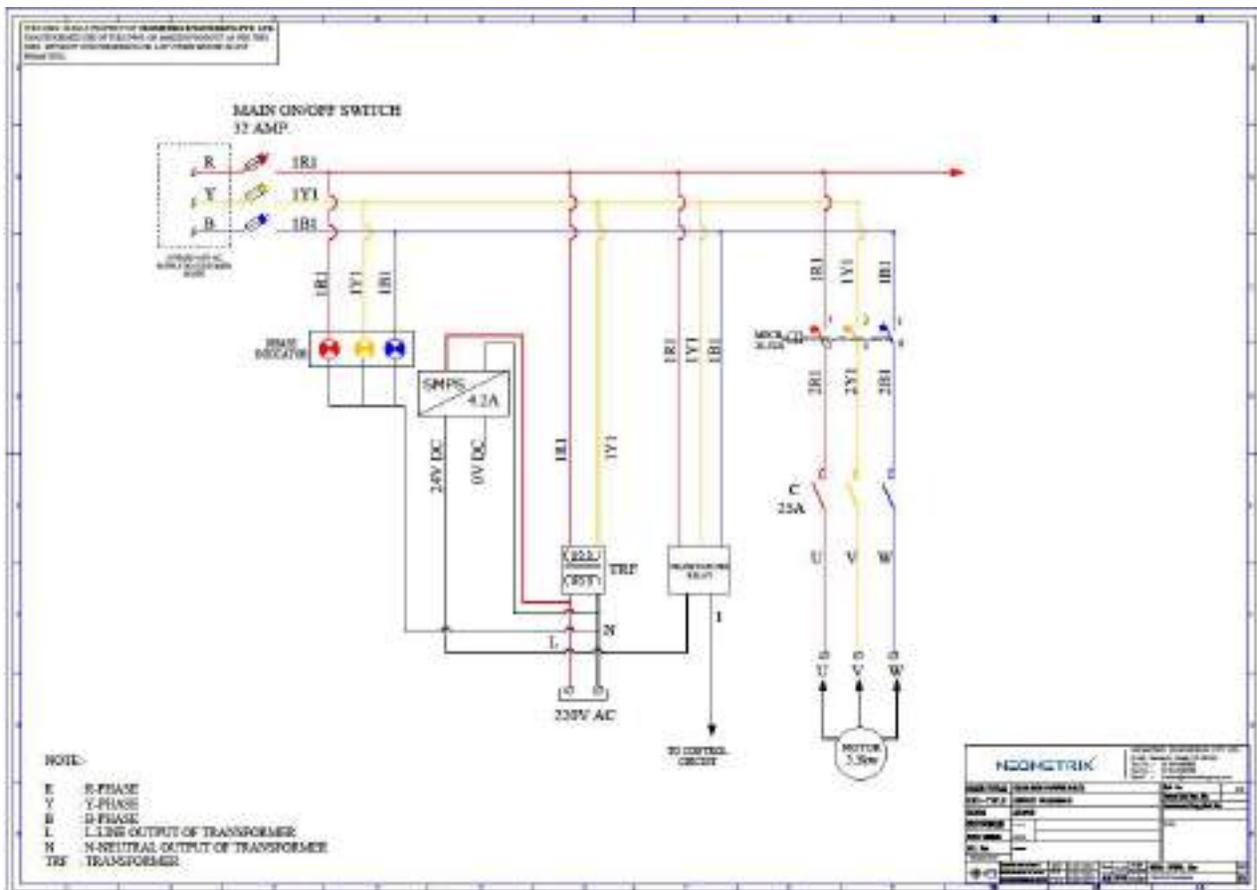


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7.2.GEAR BOX OIL POWER PACK

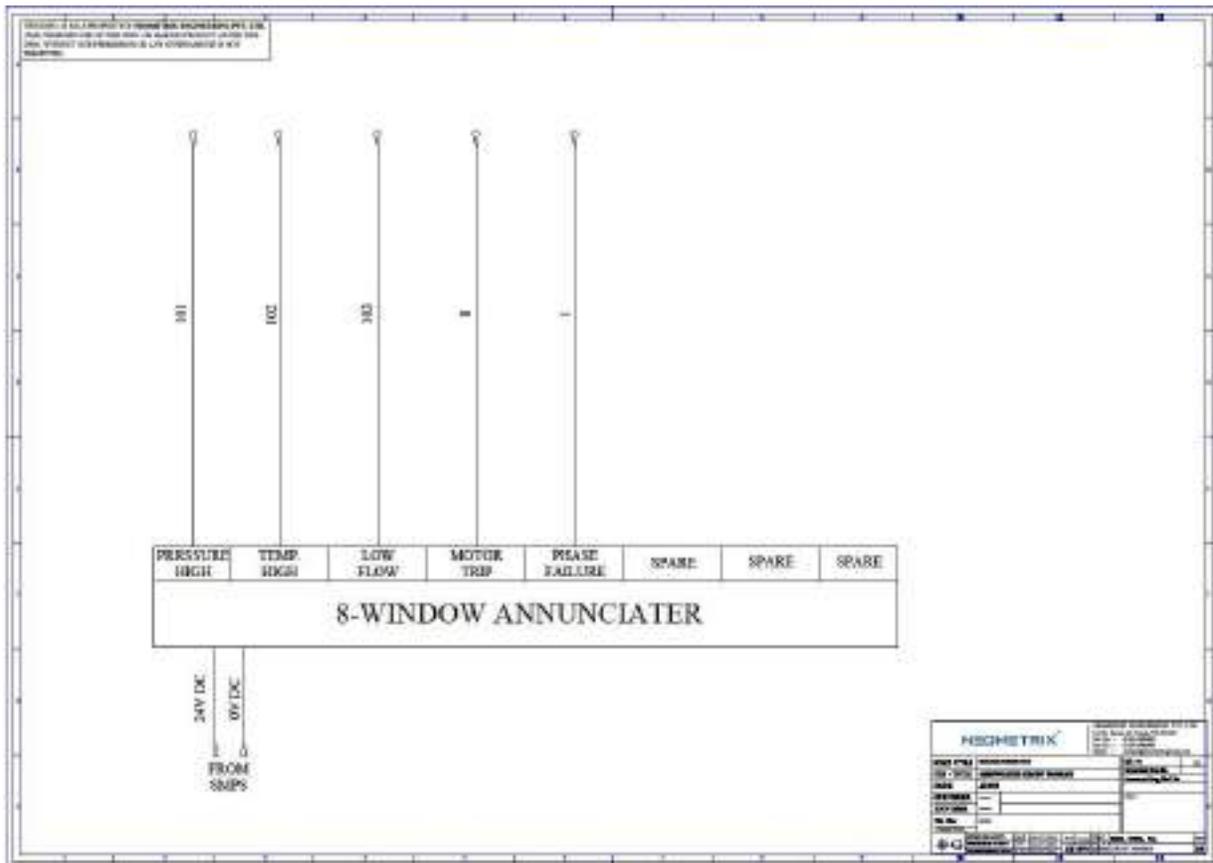
7.2.A.POWER WIRING



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7.2.B. ANNUNCIATOR WIRING

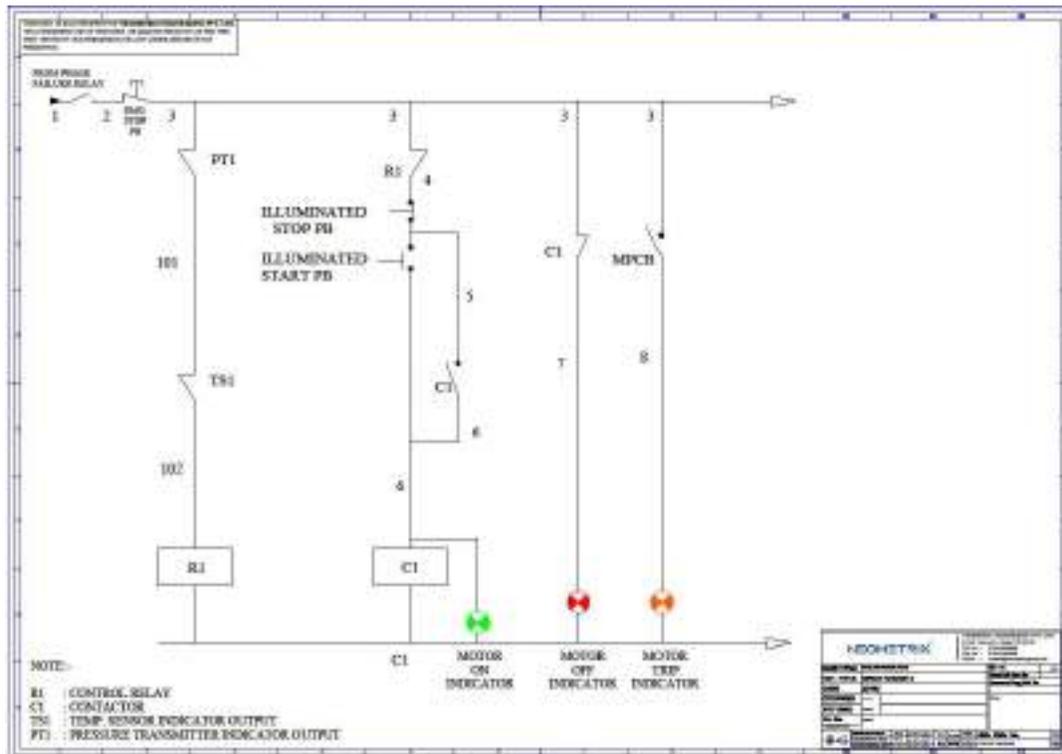


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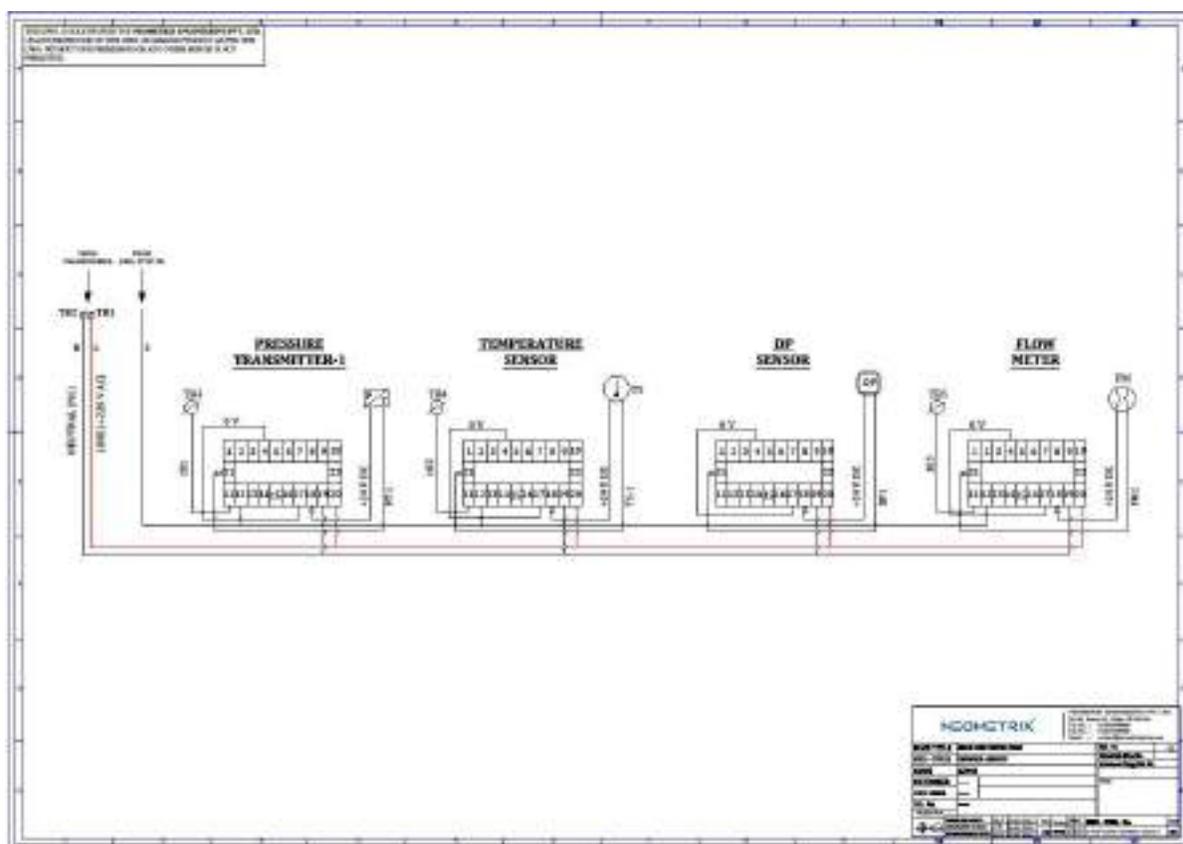
7.2.C. CONTROL WIRING



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7.2.D. DIGITAL INDICATOR WIRING



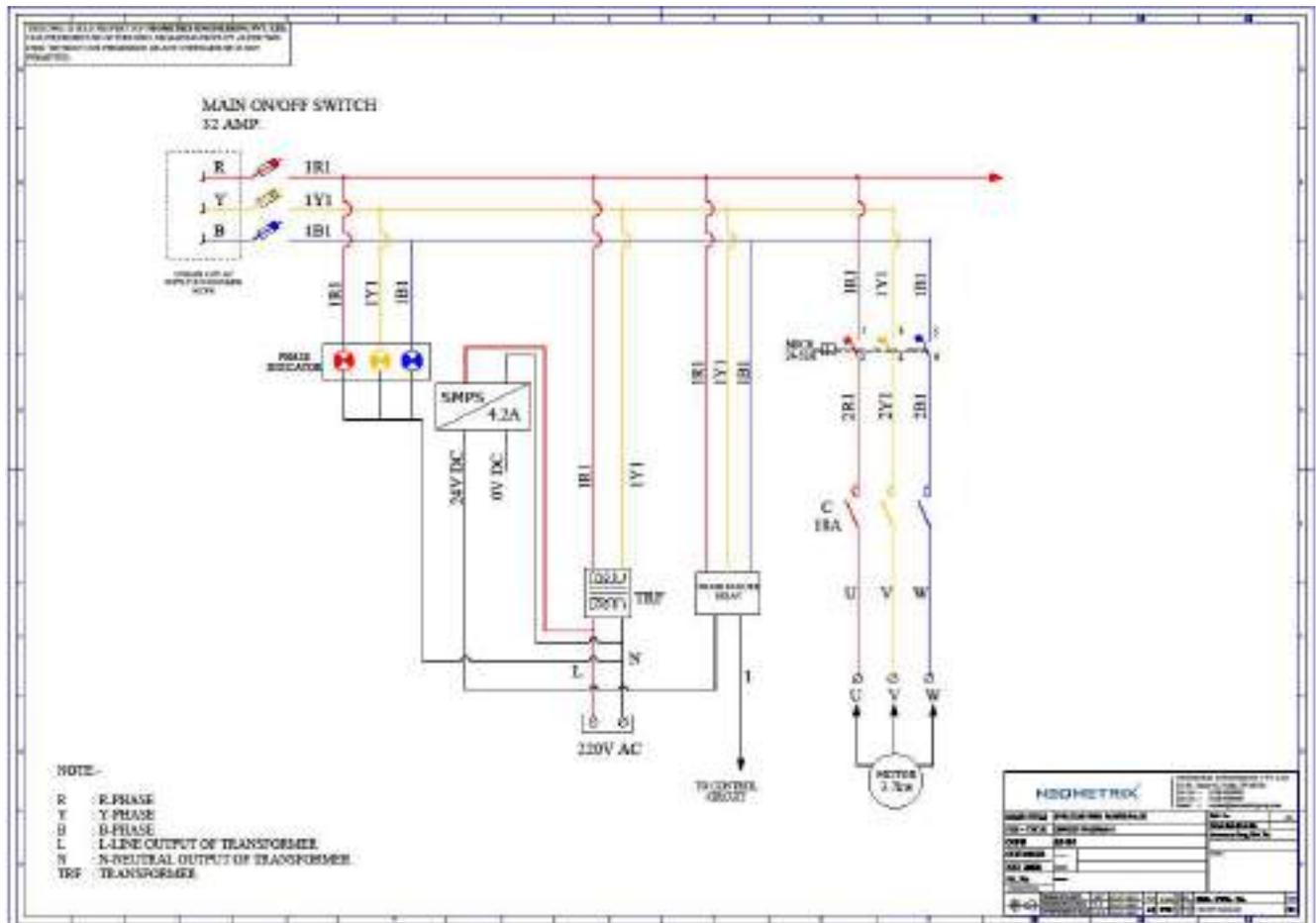
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7.3 AVIATION FUEL POWER PACK

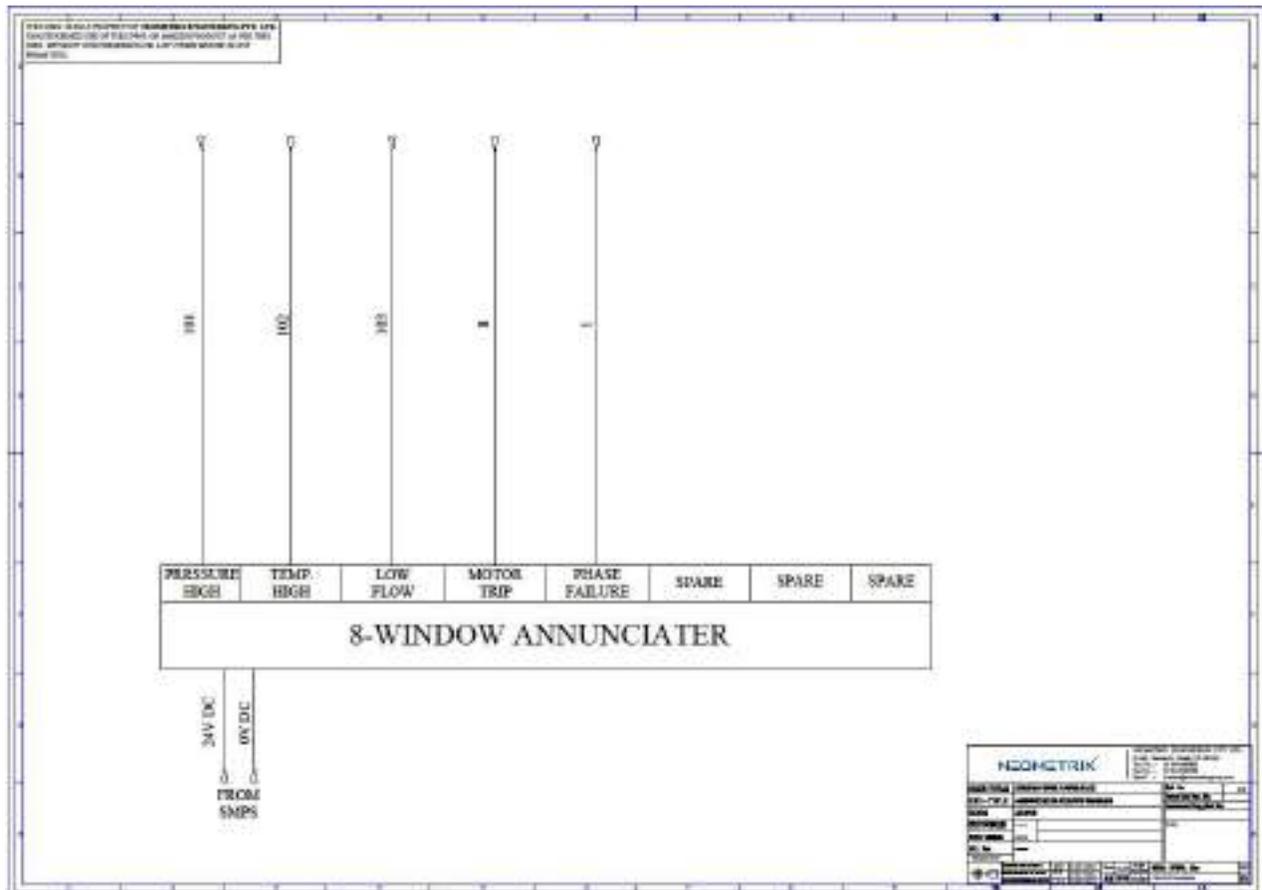
7.3.A-POWER WIRING



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7.3.B- ANNUNCIATOR WIRING

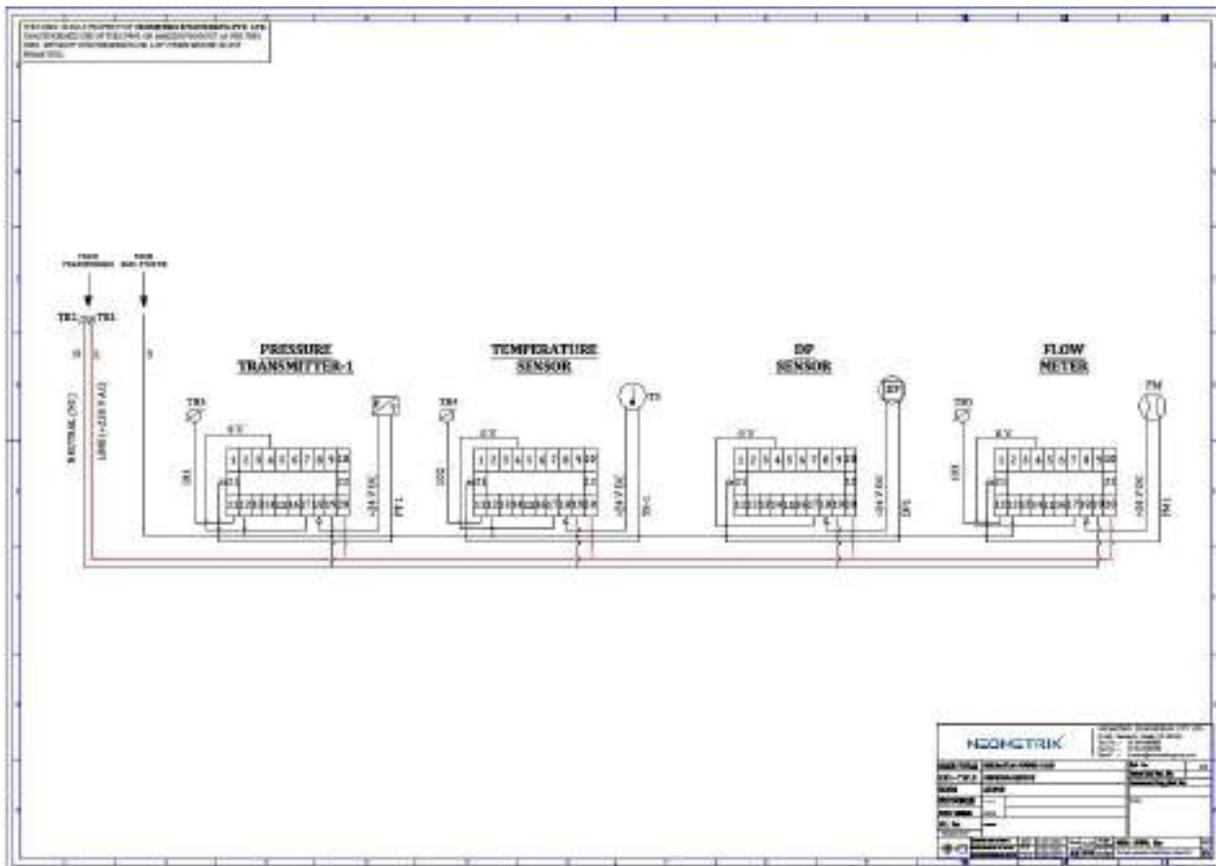


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7.3.C. DIGITAL INDICATOR WIRING

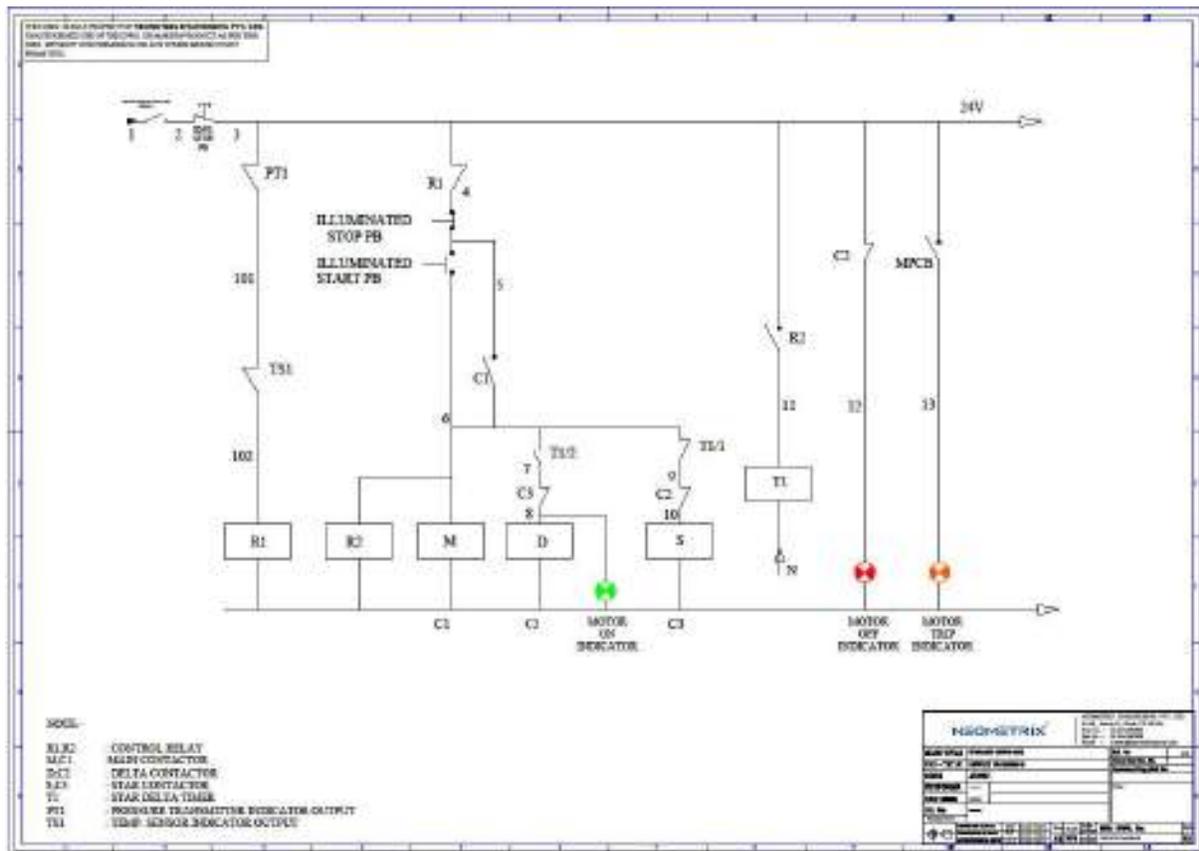


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7.3.D- CONTROL WIRING



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8. TROUBLESHOOTING GUIDELINES

8.1-MOTOR TRIPPING

- If there is tripping alarm on annunciator display then Acknowledge the alarm by clicking “ack” button and then reset the alarm by “reset” button.
- Check the power supply of motor. Proper power supply should be available at motor terminals.
- Check the wire connection of motor and all the wire should be properly connected. Wire should not touch to each other.
- Check the Over Load setting of MPCB.
- Check the voltage of supply between phase to phase and phase to neutral.
- Check for Phase Sequence

8.2-PHASE FAILURE RELAY

- If there is Phase Failure alarm seen in annunciator display. Acknowledge the alarm by “ack” button and then reset the alarm by “reset” button.
- Check the phase sequence of power supply and if proper phase supply is not available then interchange the phase sequence of power supply between any two phase.
- Check the voltage supply between two phase and phase to neutral.

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- If phase supply is proper then check the working of Phase Failure Relay. Check its wiring and there should be no short circuit between wire.

8.3- ALARM ACKNOWLEDGE AND RESET

- If high pressure, high temperature and low potential flow alarm are coming. First of all check the annunciator display and check the alarm. Acknowledge the alarm by clicking on “ack” button then reset the alarm by “reset” button.

8.4- DIGITAL DISPLAY

- If there is any fault in Digital Indicator then check the power supply first. And the match the value with analog meter for its proper working.

8.5- CONTROL PANEL

- If panel is not giving supply and system is not getting power. Check the main MPCB working. Check all the wiring and connection. All the switchgear items checked according to its connection.

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9. MAINTENANCE SCHEDULE

The maintenance schedule should be done Quarterly Basis.

- Motor connection should be checked and connection should be made tight if any loose connection found.
- Check the insulation of motor and its voltage supply at its input point.
- Check the connection of control panel. Connection of wiring should be tightened. If found any wire faulty then it should be changed.
- Check the connection of Digital Indicator pressure transmitter and temperature transmitter and tighten the loose connection if found.
- Check the working of Flow meter and Digital Indicator and also check its wiring and power connection with proper power supply.
- Check the proper earthing of control panel and test rig.
- Check the working and connection of Switchgear item. If any faulty wire found then it should be changed.

NOTE:-

- Check all the connection and proper supply before running the system.
- Please follow the user manual book for troubleshooting. Without studying user manual don't touch the system. It will lead to cause fault in system.
- Always use proper safety for troubleshooting.

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Complete Engineering Solutions Company

An ISO 9001 2008 Company

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CALIBRATION CERTIFICATE

ASIAN TECHNOLOGY
(A HOUSE OF CALIBRATION)

CALIBRATION CERTIFICATE

Customer Name And Address	M/S. Pyramidal Control System Pvt. Ltd. 143 Mathura Road, Bhubaneswar, Odisha	Service request No. & date	ATC-011996223-3-01022
		MAN No.	EE-201922008-00018
		Doc. No.	AT-2009010061
		Date of Receipt of (M/I)	18-06-2022
		Date of Test/Service	18-06-2022
		Valid till date	06-09-2022
		Suggested frequency	06-09-2022

General Details			
Instrument name	Pressure Gauge	S. No.	90814005
Make / Make No.	W&A	Location	
Range / Flow	0 to 70 kg/cm ²	Accuracy	
Load Cell	None	Serial No. of probe	08
Lot No.	90814		

Point of reference standards or other equipment used

Equipment Name	0.25 Pressure Gauge		
Make	W&A		
Model / S. No.	1108141		
Certificate No.	ATC-011996223-00001		
Valid till date	06-09-2022		
Reference by	None		

Environmental Condition	Temperature: 23-25°C	Relative Humidity: 60-70%	Calibration Standard	0.25 Pressure Gauge	ATC-011996223-00001
	None for Humidity		Pressure Gauge	W&A	ATC-011996223-00001

Calibration Results			
Serial No.	Standard Value in (kg/cm ²)	Observed Value in (kg/cm ²)	Accuracy in % of F.S. (tolerance factor 1-2)
01	0	0.00	
02	10	10.10	
03	20	20.10	±0.5%
04	30	30.10	
05	40	40.10	

Remarks: Not observed to repair.

Calibrated By: Calibration Team - TME (R.A. JAIN)

Approved By: (Rajesh Kumar) (Rajesh Kumar) (Auth. No. 1 of 1)

Form No: PYS-07

Lab: P.O. - MET, S.O. - NAGAR, NEAR RAJA CHOWK, N.T. PARIBARAE-121 001 (HARYANA)

Customer Care : 9826330338, E-mail : www@neom2011@gmail.com

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ASIAN TECHNOLOGY
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CALIBRATION CERTIFICATE

Customer Name and Address	M/S. Pyramid Control System Pvt. Ltd. 105 Madhav Park, Park Road, Haridwar.	System/Model No. & Range 111 B. No. 0.001 MPa Range of Scale of IIRG Date of Calibration Date of Issue Expiry Date/Valid Till	ASIAN TECHNOLOGY & CALIBRATION ISO 9001:2008/15000 N/A #4998302 #4998302 #4998302
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Specimen Details

Identification No.	Pressure Gauge	S. No.	100000001
Manufacturer's No.	Wika	Location	
Range / Size	0 to 20 bar	Scale	
Scale / Unit	1 bar	Mount / Orientation	100
I.I.A. No.	15-01		

Details of reference standards used for the calibration

Equipment Name	Max. Pressure Gauge		
Model / I.I.A. No.	Wika		
Certificate No.	ASIAN TECHNOLOGY		
Calibration Facility	ASIAN TECHNOLOGY		
Calibration by	100000001		

Uncertainty of Calibration

Temperature	(20 ± 0.5) °C	Calibration Reference	100000001
Relative Humidity	(50 ± 5) %	Pressure Standard	ASIAN TECHNOLOGY

Calibration Results

Scale No.	Reference Value (kg/cm ²)	Observed Value (kg/cm ²)	Uncertainty At 95% C.I. (Coverage Factor 2=U)
01	0	0.00	
02	10	11.00	
03	20	20.00	
04	40	42.00	
05	60	60.00	

Remarks: Pressure Gauge

Calibrated by: (Signature) / Date: 02/06/2022 / Page No: 01/01

Approved By: (Signature) / Date: 02/06/2022 / Page No: 01/01

Printed Report

LAB: PCA-3014, S.O. No. 10042, NEAR RAJA CHOWK, N.E.T. MARGIDHARA, (2) 001 BHARUWAH /
Customer Care: 984484256, E-mail: sales@at2011@gmail.com

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(A HOUSE OF CALIBRATION)

CALIBRATION CERTIFICATE

Customer Name (and Address)	M/S. Pyramidal Controls Systems Pvt. Ltd. 14th Main Road, Park Road, Mysore.	Measurement No. & Date	A-202010622 & 04/06/22
		U.I. No.	00714250001004/P
		Serial No.	A-1000010007
		Date of Receipt (I/C)	03/05/2022
		Date of Issuance	02/06/2022
		Inspector	00000101
		Specialist	00000101

Instrument Details			
Instrument Name	Pressure Gauge	St. No.	0001004
Manufacturer's Name	SWEG	Location	
Range/Scale	0 to 1.20 MPa	Accuracy	
Scale Code	7 MPa	Mounting position	180°
U.I. No.	071001		

Detail of reference standards @ Rigour Equipment's site

Equipment Name	SWEG Pressure Gauge	
Model No.	SWEG 7 MPa	
Manufacturer's Name	SWEG	
Location	SWEG	
Calibration by	SWEG	

Calibration Certificate No.	00000101	Calibration Reference	00000101
Serial No.	00000101	Mounting position	180°

Calibration Results			
Serial No.	Measured Value (kPa)	Reference Value (kPa)	Accuracy (±0.25% U.L. coverage, Error Amp)
01	0.00	0.00	
02	0.00	0.00	
03	0.00	0.00	
04	0.00	0.00	
05	0.00	0.00	

Remarks: The instrument is found to be in conformance with the requirements of the calibration certificate.

Calibrated by: (Tb) (MA/10/22)
From New Delhi

Approved by: (Tb) (MA/10/22)
Page No. 1/01

Head of Report:

LAB: P.O. 2014, 4-D, W. ROAD, NEAR RAJA CHOWK, N.I.E. FARIDABAD-121 005 (HARYANA)
Customer Care: 965450256, E-mail: sales@neometrix.com

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End Customer Details	User Manual For	Enquiry Details
BHEL VISAKHAPATNAM	TEST RIG FOR PRESSURE LOSS TEST & LEAK TEST	GEMC- 511687727113463, DATED : 02-JUN-2022

ASIAN TECHNOLOGY
(A HOUSE OF CALIBRATION)

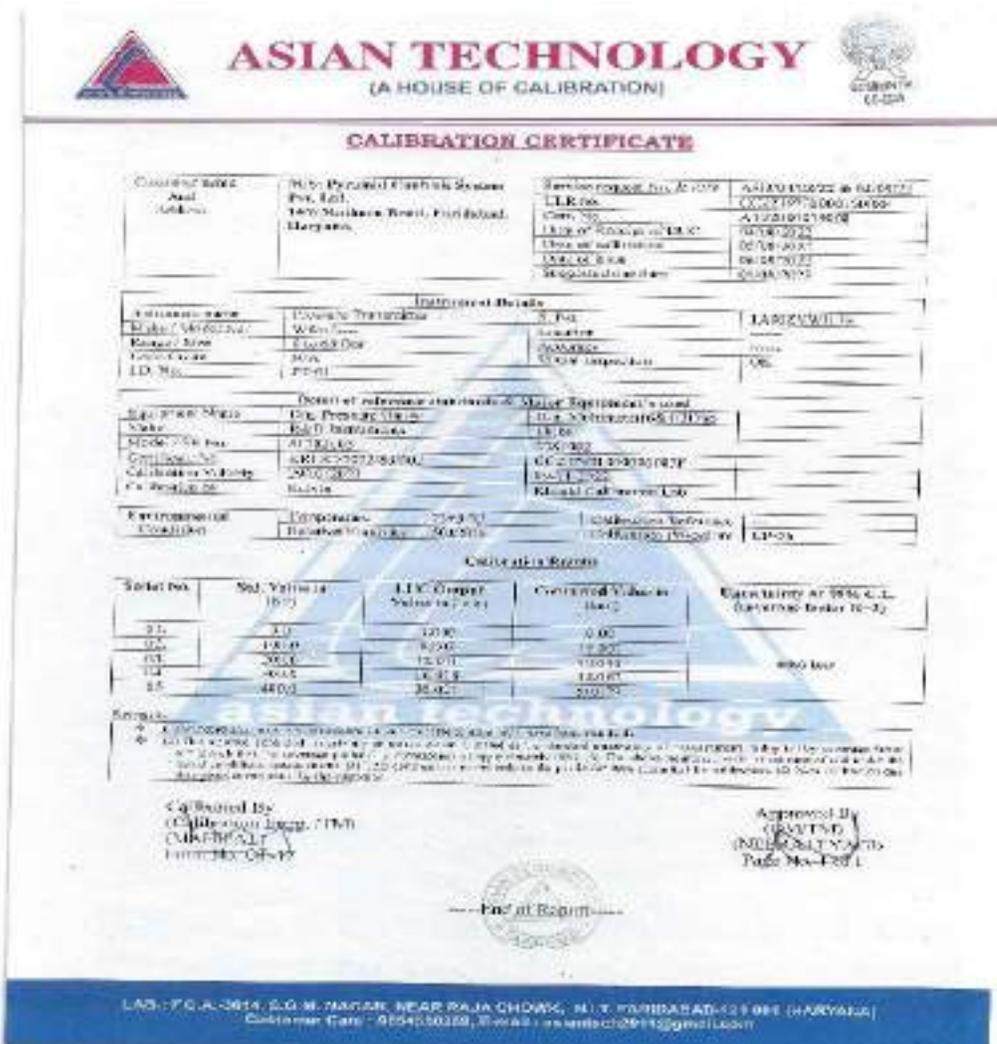
CALIBRATION CERTIFICATE

Customer name Add Address	ASIS Physical Control System Plot 148, 1405 Mathura Road, Faridkot, 141004.	Serial No./Lot No./Mfg. No. C.E.R. No. Cat. No. Date of Receipt of DOC Date of Calibration Date of Issue Signature/Signature	A/1300/02022 & H/48125 C/2739/27390219022 AT/2300/013106 04/08/2022 03/08/2022 03/08/2022 04/08/2022
Instrument Details			
Instrument name	Pressure Loss Test Rig	S. No.	9000022
Make/Model No.	0 to 100 kg/cm ²	Location	-----
Range/Scale	2 kg/cm ²	Name of Operator	-----
Scale/Units	kg/cm ²	Final Inspector	-----
C.T. No.	AT-02		
Details of reference standards & Major Equipment's used			
Equipment name	High Pressure Gauge		
Make	ASIS Instrumentation		
Serial/LOT No.	31782100		
Calibration No.	ASIS/AT/2020/0000000		
Calibration Validity	2000/1000		
Calibration By	ASIS		
Environmental Condition	Temperature: 27.00°C Relative Humidity: 45.00%	Operator/Inspector	ASIS/AT/2022/0000000 ASIS/AT/2022
Calibration Results			
Serial No.	Measured Value (kg/cm ²)	Reference Value (kg/cm ²)	Uncertainty (kg/cm ²)
01	0	0	0.01
02	20	20	0.01
03	40	40	0.01
04	60	60	0.01
05	80	80	0.01
06	100	100	0.01

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ASIAN TECHNOLOGY
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CALIBRATION CERTIFICATE

Client Name BHEL	Client Address BHEL, VISAKHAPATNAM	Service Requested Pressure Loss Test	Instrument ID T-PED-A3495-REV-01
Instrument Name Pressure Transducer	Model No. PT-1000	Manufacturer OMEGA	Calibration Due 2022-08-01
Serial No. 1000	Lot No. 1000	Calibration Method ASME B31.3	Calibration Standard NIST 1013

Serial No.	Set Value (kPa)	LLC Output Value (kPa)	Corrected Value (kPa)	Uncertainty at 95% C.L. (kPa)
01	0.0	0.00	0.00	±0.05
02	10.0	9.98	10.00	±0.05
03	20.0	19.96	20.00	±0.05
04	30.0	29.94	30.00	±0.05
05	40.0	39.92	40.00	±0.05

Calibrated By: CHAITANYA SINGH
Approved By: CHAITANYA SINGH
Date: 02-JUN-2022

End of Report

LAB: P.O. A-3614, P.O. M. NAGAR, NEAR RAJA CHOWK, M.T. PURSABAD-201301 (HARYANA)
Customer Care: +91-120-450880, Email: sales@neometrix.com

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ASIAN TECHNOLOGY
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CALIBRATION CERTIFICATE

Customer Name and Address	BHEL Pyramidal Control System Plot. 144, BHEL, Markapur Road, Warangal, Haryana	Serial Number No. & Date	A-1004462714-01/02/22
Instrument Name	Pressure Transmitter	Model No.	PT-1000-001
Manufacturer	PT-1000-001	Scale	0 to 1000
Calibration Standard	Pressure Transmitter	Accuracy	±0.1%
Calibration Method	Pressure Transmitter	Method Description	0%

Serial No.	Std. Value (kPa)	Ind. Output Value (kPa)	Corrected Value (kPa)	Accuracy (±0.5% F.S., Temperature factor 10-2)
01	0	0.00	0.00	±0.1%
02	100.0	99.94	99.94	
03	200.0	199.9	199.90	
04	300.0	299.8	299.80	
05	400.0	399.7	399.70	

Remarks:

Calibrated By: (Signature) / (Name) / (Date)

Approved By: (Signature) / (Name) / (Date)

End of Report

LAB : ECA-2014, S.O.B. BANSAL, NEAR RAJA CHOWK, N.T. PARLIAMENTARY COLONY (HARYANA)
Customer Care : 0124488875, E-mail : asian@neometrix.com

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Hydraulic Testing System Dimensions

LENGTH – 1103 ±6 mm

WIDTH – 1250 ±6 mm

HEIGHT – 2000 ±6 mm

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11. Hydraulic Testing System - Photograph showing User Interface Points



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12. 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 relief valve.**
- 6. Please ensure that door of the System must be close during testing.**

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13. 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 Outlet Test Hose to UUT
5. Check all Hose connections should be fully tightened.

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Complete Engineering Solutions Company

An ISO 9001 2008 Company

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14. Sales /Service/Support Contact Details

Neometrix Engineering Pvt. Ltd.

E-148, Sector-63, NOIDA, UP-201301

Office: Phone: +91-120-4500800 (100Lines)

Fax: +91-1204500888 | Mob: +917777876876

email: contact@neometrixgroup.com

www.neometrixgroup.com

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