



**GOVERNMENT ENGINEERING COLLEGE, DAMAN**  
**DEPARTMENT OF MECHANICAL**  
**FLUID MECHANICS AND HYDRAULIC MACHINES LABORATORY**

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**PELTON WHEEL TURBINE TEST RIG**



**Basic Details: -**

<b>Discharge</b>	: 400 litres per Minute (LPM)
<b>Water Circulation</b>	: 3 Phase 5-HP Centrifugal Pump rotating at a speed of 2800 RPM.
<b>Storage Tank</b>	: 200 litres
<b>Supply Head</b>	: 25 Meter
<b>Output Power</b>	: 1 kW
<b>Dynamometer</b>	: Rope Brake Dynamometer
<b>Discharge Measurement</b>	: Pitot Tube with Manometer



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**KAPLAN TURBINE TEST RIG**



**Basic Details: -**

<b>Discharge</b>	: 2500 litres per Minute (LPM)
<b>Water Circulation</b>	: 3 Phase 7.5-HP Centrifugal Pump.
<b>Pump Size</b>	: Suction and Discharge size of 100 mm.
<b>Supply Head</b>	: 7 Meter
<b>Output Power</b>	: 1 kW
<b>Nozzle Material</b>	: Stainless Steel
<b>Dynamometer</b>	: Rope Brake Dynamometer



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**FRANCIS TURBINE TEST RIG**



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**Basic Details: -**

Pump Type	:	Centrifugal Highspeed, Single suction volute.
Power Required	:	A.C. 15 HP, 3Phase 440 Volts
Speed	:	2880 RPM
Spring Balance	:	20 kg & 20 kg (set of 2)
Runner Diameter	:	0.330 m
Rated Speed	:	1500 RPM
Power Output	:	5.0 HP
Flow Measurement	:	Venturi Meter



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**CENTRIFUGAL PUMP TEST RIG**



**Basic Details: -**

<b>Pump</b>	: 1-HP Pump operating at approximately 2800 RPM
<b>Supply Head</b>	: 12 Meters
<b>Drive</b>	: 1-HP Thyristor Controlled DC Motor with Variable Speed
<b>Storage Tank</b>	: 110 litres
<b>Pressure Gauge</b>	: Bourdon type Pressure Gauge



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**RECIPROCATING PUMP TEST RIG**



**Basic Details: -**

<b>Pump</b>	: Double Acting Cylinder that can be operated at approximately 320 RPM
<b>Piston Stroke</b>	: 40 mm
<b>Piston Diameter</b>	: 45 mm
<b>Suction Pipe</b>	: 1 Inch
<b>Delivery Pipe</b>	: 3/4 Inch
<b>Pressure Gauge</b>	: 0-2 kg / cm <sup>2</sup>
<b>Vacuum Gauge</b>	: 0 – 760 mm Hg





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**CENTRIFUGAL COMPRESSOR TEST RIG**



**Basic Details: -**

<b>Compressor</b>	: Centrifugal Compressor having Forward Curved Impeller
<b>Motor</b>	: 0.5-HP Variable Speed Motor rotating at 2800 RPM
<b>Air Flow Measurement</b>	: Pitot Tube with U-Tube Manometer for measuring Air Flow
<b>Manometer</b>	: Inclined tube 0 – 100 mm of Water Column for Intake Pressure
<b>Piezometer</b>	: 0 – 150 mm of Water Column for Delivery Pressure
<b>Temperature Sensor</b>	: 2 Quantities of RTD PT-100 Sensor with Indicator (inlet & outlet)



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**RECIPROCATING COMPRESSOR TEST RIG**



**Basic Details: -**

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|------------------------|---|
| <b>Compressor</b>      | : Double Acting Cylinder                                  |
| <b>Motor</b>           | : Three Phase 2-HP Motor                                  |
| <b>Air Measurement</b> | : Orifice with Water Manometer for Air Intake Measurement |
| <b>Pressure</b>        | : Bordon type Pressure Gauge measuring 2 MPa              |



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**IMPACT OF JET**



**Basic Details: -**

<b>Storage Tank</b>	: 700 mm * 700 mm * 500 mm
<b>Measuring Tank</b>	: 400 mm * 260 mm * 380 mm
<b>Nozzle</b>	: 8 mm Diameter





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**HYDRAULIC RAM TEST RIG**



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**Basic Details: -**

<b>Ram</b>	: 50 mm * 15 mm
<b>Air Vessel</b>	: Of Suitable Capacity made of Stainless-Steel
<b>Delivery Line</b>	: The pipe should be of 50 mm Diameter and 6 Meter in Length
<b>Storage Tank</b>	: 150 litres
<b>Overhead Tank</b>	: 100 litres



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**BERNOULLI'S THEOREM APPARATUS**



**Basic Details: -**

Length of Channel	:	750 mm
Measuring tank	:	400 x 300 mm
Sump Tank	:	900 x 400 x 400 mm



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**META CENTRIC HEIGHT APPARATUS**



**Basic Details: -**

Ship Model	:	300 x 150 mm
Water Tank	:	700 x 700 x 300 mm
Sump Tank	:	900 x 400 x 400 mm



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**ORIFICE & MOUTHPIECE APPARATUS**



**Basic Details: -**

Diameter of Orifice	:	8.5 mm
Diameter of Mouthpiece	:	8.5 mm
Diameter of Nozzle	:	25 mm
Length of Nozzle	:	50 mm



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**NOTCH APPARATUS**



**Basic Details: -**

Set of Notches	:	V-Notch 60° & U-Notch 90°
Measuring tank	:	400 x 300 mm
Sump Tank	:	900 x 400 x 400 mm
Piping	:	PVC Piping with valves
Pump	:	Self-priming, Monobloc Centrifugal Pump





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**LOSSES IN PIPE FITTING APPARATUS**



**Basic Details: -**

- Pipe fitting. Pipe elbow. Pipe bends.
- Sudden expansion-1/2" to 1"
- Sudden contraction-1" to 1/2"
- Differential manometer.
- Flow control valve.
- Stop watch.
- Service floor space of 2 m. x 2 m.
- 230 V. A. C. single phase



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**REYNOLDS APPARATUS**



**Basic Details: -**

Diameter of conduit :	750 mm
Supply tank :	300 x 300 mm
Sump Tank :	400 x 400 x 700 mm



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**VENTURIMETER AND ORIFICEMETER APPARATUS**



**Basic Details: -**

- Measuring tank & stop watch.
- Basic piping-1"
- Orifice meter & Venturi Meter inlet & throat diameter 32- & 15-mm resp.
- Differential manometer.
- Flow control valve