

Ingress Protection (IP) Testing Laboratory at CWPRS

Ingress Protection (IP) Test Laboratory established under NHP at CWPRS, Pune and has been in operation since January 2025. The Lab can carry out the IP tests ranging from **IP 11 to IP 69K** to test is the endurance or degree of protection provided by electrical, electronic equipment, hydro-meteorological instruments against ingress of solid objects like dust particles and liquids like water while operating on electric supply or power.

This IP Laboratory has been developed with latest state-of art and automated testing facility can undertake entire IP tests according to national/international standard IS/IEC /NEMA/ISO. The lab setups are designed in such a way to meet the customers demand and to fully comply IEC 60034-5(hydro turbines & pumps) and IEC 60529 for enclosures for different equipment. The Lab. Houses following facilities.

I) WATER TEST FACILITY (IPX1 TO IPX9)

- Drip tank of size **1.7m x 1.7m** for **IP X1 & X2** tests for protection against liquids.
- A VFD controlled turn table with adjustable speed and height of 1 rpm and above have the capacity to withstand weight of test sample up to 1000kg. The test table also have tilting facility up to 15° to perform **IP X2** test.
- Hassle free mechanically operated test setups to perform **IP X3 to IP X6** tests.
- Dip tank of size **2m x 2m x 2m** (W x L x H) for **IP X7 and IPX8** water immersion tests.
- To meet the customers demand and to fully comply IEC 60529 standard, IP X9 test facility is also established. This test is performed with water having temperature up to **80° (±5°)** Celsius and pressure up to **100bar**.

II) SOLID OBJECT & DUST SPRAY TEST FACILITY (IP1X TO 6X)

- The lab at CWPRS is equipped with a huge Dust chamber size 3m x 3m x 3m that facilitates testing of samples having sizes upto **2.5m x 2.5m x 2.5m**(W x L x H) & weight up to 1000kg for **IP 5X & 6X** tests.
- Lab is also equipped with test fingers to perform for **IP 1X to 4X** tests for protection against solid objects.



Fig 1: Ingress Protection Laboratory at CWPRS, Pune

III) SCOPE OF IP ACCEPTANCE ELECTRICAL TEST (IP11 TO 69)

To ensure the endurance of the equipment for operation under electric stress post exposure to water (IPX1-X6) and dust test (IP1X-6X) an arrangement has been made available to subject the equipment to various electric voltage as per the standard code of practices. The electrical test facility can provide AC/DC voltage 0 to 100,000 volt to check the healthiness as part of IP acceptance test. A special facility to inject

impulse of 200k, 20kJ for simulating lighting impulse to test equipment is also available.



Fig 1: Test probes (IP 1X -4X)



Fig 2: Dust Chamber (IP 5X & 6X)



Fig 3: Water testing facility (IP X1- IP X6)



Fig 4: Immersion tank for IP X7 & X8



Fig 5: IP X9K testing facility



Fig 6: Dielectric test facilities for IP acceptance

Additional facilities available

- Lab is equipped with huge sample storage space for storing of test samples meant for IP tests.
- Test probes and test fingers to perform for **IP 1X to 4X** tests for protection against solid objects.
- Drip tank of size 1.7m x 1.7m to perform IP X1 and X2 tests.
- A turntable with 1rpm, load capacity up to 1000 kg. The test table shall have the tilt facility for 15° to perform IP X2 test.

- Hassle free PLC based auto test setups to perform IP X3 to IP X6 tests
- Water tank of size 2m x 2m x 2m for IP X7 and X8 water immersion tests.
- The lab is also equipped with a **2 tonne crane** for handling samples brought for IP test carefully and precisely for loading /unloading during test procedures.
- High voltage/dielectric test facilities with **0-100 kV AC/ DC, 0-200 kV, 20 kJ** Impulse injection facility to check the healthiness of all range of Electrical /Electronic equipment for **IP XX** acceptance test.
- Uninterrupted power supply with DG backup for unhindered completion of test cycles
- To sum-up, CWPRS has developed state of art IP test facility to perform tests ranging from **IP 11 to IP 69**.

Rate Chart for IP XX Tests at CWPRS, Pune

Sl. No.	Name of work	Rate per unit
IP Lab		
1.	Testing for IP 1X-4X rating	Rs.2050
2.	Testing for IP 5X-6X rating	Rs.13780
3.	Testing for IP X1 rating	Rs.6720
4.	Testing for IP X2 rating	Rs.7070
5.	Testing for IP X3 rating	Rs.7900
6.	Testing for IP X4 rating	Rs.8090
7.	Testing for IP X5 rating	Rs.8810
8.	Testing for IP X6 rating	Rs.8810
9.	Testing for IP X7 rating	Rs.9510
10.	Testing for IP X8 rating	Rs.9980
11.	Testing for IP X9K rating	Rs.7940

Note: 1.The above mentioned rates are for Government Organizations. For Private organizations add 25% over the above rates.
2. GST, if applicable, will be as per extant rules.

TEST PROCEDURES :

✓ IP 1X-6X

✓ IP X1-X8

✓ IP X9K



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NOTE: services are provided to State and Central agencies, Start-ups, Manufacturers and Suppliers of all Electrical/Electronics Equipments.



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