



**उत्पाद मैनुअल**  
**दिष्ट धारा चलित कुंडली गैल्वनोमीटर - विशिष्टि (पहला पुनरीक्षण)**  
**आई एस 2442 : 2023 के अनुसार**

**PRODUCT MANUAL**  
**d.c. Moving Coil Galvanometers - Specification (First Revision)**  
**ACCORDING TO IS 2442 : 2023**

*विभिन्न उत्पादों के लिए भारतीय मानक ब्यूरो (अनुरूपता मूल्यांकन) विनियम, 2018 की योजना- I के तहत प्रमाणन के संचालन में एकरूपता और पारदर्शिता के लिए इस उत्पाद मैनुअल का उपयोग सभी क्षेत्रीय / शाखा कार्यालयों और लाइसेंसधारियों द्वारा संदर्भ सामग्री के रूप में किया जाएगा। दस्तावेज़ का उपयोग बीआईएस प्रमाणन प्राप्त करने के इच्छुक संभावित आवेदकों द्वारा भी किया जा सकता है।*

*This Product Manual shall be used as reference material by all Regional/Branch Offices & licensees to ensure uniformity of practice and transparency in operation of certification under Scheme-I of Bureau of Indian Standards (Conformity Assessment) Regulations, 2018 for various products. The document may also be used by prospective applicants desirous of obtaining BIS certification.*

|    |                                                 |   |                                                                    |
|----|-------------------------------------------------|---|--------------------------------------------------------------------|
| 1. | मानक संख्या<br>IS No.                           | : | IS 2442 : 2023                                                     |
|    | शीर्षक<br>Title                                 | : | d.c. Moving Coil Galvanometers -<br>Specification (First Revision) |
|    | संशोधनों की संख्या<br>No. of amendments         | : | NIL                                                                |
| 2. | नमूना दिशानिर्देश<br>Sampling Guidelines:       |   |                                                                    |
| a) | कच्चा माल<br>Raw material                       | : | As per Cl. 4                                                       |
| b) | समूहीकरण दिशानिर्देश<br>Grouping Guidelines     | : | Please refer <a href="#">ANNEX – A</a>                             |
| c) | नमूने का परिमाण<br>Sample Quantity              | : | 2 numbers                                                          |
| d) | परीक्षण अनुरोध में घोषित किए जाने वाले पैरामीटर | : | As per the parameters defined in the Scope of Licence              |

|    |                                                                                         |                                |                                        |
|----|-----------------------------------------------------------------------------------------|--------------------------------|----------------------------------------|
|    | Parameters to be Declared in Test Request                                               |                                |                                        |
| 3. | परीक्षण उपकरणों की सूची<br>List of Test Equipment                                       | :                              | Please refer <a href="#">ANNEX – B</a> |
| 4. | निरीक्षण और परीक्षण की स्कीम<br>Scheme of Inspection and Testing                        | :                              | Please refer <a href="#">ANNEX – C</a> |
| 5. | एक दिन में संभावित परीक्षण<br>Possible tests in a day:                                  | :                              | All tests                              |
| 6. | लाइसेंस का दायरा /Scope of the Licence                                                  | :                              |                                        |
|    | Licence is granted to use Standard Mark as per IS 2442 : 2023 with the following scope: |                                |                                        |
|    | Name of the Product                                                                     | d.c. Moving Coil Galvanometers |                                        |
|    | Type of Galvanometer                                                                    | Pivoted/ Suspended             |                                        |
|    | Type of pointer                                                                         | Mechanical/ Optical            |                                        |
|    | Galvanometer Resistance                                                                 |                                |                                        |
|    | Sensitivity                                                                             |                                |                                        |
|    | Periodic Time                                                                           |                                |                                        |

## **ANNEX – A**

### **समूहीकरण दिशानिर्देश Grouping Guidelines**

- 1) Manufacturer shall declare the parameters defined in scope of licence for each variety of d.c. Moving Coil Galvanometers manufactured by them.
- 2) Each type of Galvanometer with each type of pointer shall be tested to cover that type of Galvanometer in the Scope of Licence.
- 3) The Firm shall declare the each type(s) of Galvanometers they intend to cover in the Licence. The Scope of Licence may be restricted based on the manufacturing capability and testing facilities of the Manufacturer.
- 4) During the operation of the Licence, BO shall ensure that all the varieties covered in the Licence are tested in rotation to the extent possible.

**ANNEX – B**

परीक्षण उपकरणों की सूची

**List Of Test Equipment***(INDICATIVE LIST, FOR GUIDANCE ONLY)****Major test equipment required to test as per the Indian Standard***

| <b>Sl. No.</b> | <b>Tests Used In With Clause Reference</b>                                | <b>Test Equipment/Chemical</b>                                              |
|----------------|---------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1.             | High Voltage Test, Cl 8.1.2                                               | High Voltage Tester, Voltmeter, Ammeter                                     |
| 2.             | Insulation Resistance Test Cl 8.1.1                                       | Mega Ohmmeter, DC Source ( Min. 500 V)                                      |
| 3.             | Sensitivity Test Cl 8.1.3                                                 | Arrangement for Measuring Angle (e.g., Angle Protector)                     |
| 4.             | Test for Optical System (for Galvanometer with Optical Pointer) Cl. 8.1.7 | Measuring Microscope / Travelling Microscope (with least count ~0.01 mm) or |
| 5.             | Needle Balance Test (for Pivoted Type Galvanometer Only) Cl. 8.1.7        | Inclined Plane or Arrangement for Measuring Angle (e.g., Angle Protector)   |

***Note: The above list is indicative only and may not be treated as exhaustive.***

## **ANNEX – C**

### निरीक्षण और परीक्षण की स्कीम

### **Scheme Of Inspection And Testing**

#### **1. QUALITY ASSURANCE PLAN:**

**1.1** It is expected that during operation of BIS licence, manufacturers will implement a Quality Assurance Plan (QAP) i.e. a plan of regular testing and in-process controls, designed to ensure that the product bearing the Standard Mark conforms to all requirements of the Indian Standard.

**1.2** The manufacturers shall define a Quality Assurance Plan (QAP) defining the control unit (i.e. lot/batch etc.), the levels of control (i.e. the frequency and number of samples for conducting the different tests as per the Indian Standard) and declare the arrangement for testing i.e. whether in-house or subcontracting/sharing for each applicable test and submit the same to BIS Branch Office for information. The manufacturer shall comply with the QAP and maintain test records in accordance with para 2.1.

#### **1.3 RECOMMENDED LEVELS OF CONTROL/CONTROL UNIT:**

**1.3.1** For the guidance of manufacturers, the recommended definition of control unit is : **All d.c. Moving Coil Galvanometer of same type and having same type of pointer manufactured in a day under similar conditions from same set of raw materials shall constitute a control unit.**

**1.3.2** For the guidance of manufacturers in preparing the Quality Assurance Plan, recommended levels of control are given in Table 1. Manufacturer has the discretion of declaring their own levels of control or accept the levels of control given in this document.

**1.3.3** The manufacturer shall ensure inspection and testing as per the Quality Assurance Plan submitted by them on the whole production of the factory which is covered by this plan.

#### **2. ENSURING COMPLIANCE THROUGH TESTING-** Manufacturers shall ensure compliance of their products to all the requirements of the Indian Standard for which they may have in-house test facilities. However, there is no obligation to maintain in-house laboratory. Licensee may use alternative arrangements for tests of the production as per the declared QAP. Various alternatives are available for operation of BIS certification as given below and the relevant guidelines for availing such relaxations by the manufacturers, as amended from time to time, are to be referred:

- i) Shared testing resources like common facility,
- ii) Cluster based testing facility,
- iii) Sub-contracting to outside laboratories which may either be:
  - a) BIS recognised/empanelled laboratories, or
  - b) Any accredited laboratory as per ISO/IEC 17025.

**2.1 TEST RECORDS-** The manufacturers shall maintain test records for the tests carried out (either in-house or at a sub-contracted or at shared test facility) to establish conformity of the product to the Standard for operation of licence. For the tests being subcontracted or

conducted at a shared test facility, test results issued by the laboratories or test facilities, shall be made available for inspection by BIS.

3. **MARKING** - The Standard Mark as given in the Schedule of the licence shall be incorporated legibly and indelibly on d.c. Moving Coil Galvanometers provided always that the material so marked conforms to each requirement of the specification.
  - 3.1 Packing and Marking shall be done as per the IS 2442 : 2023.
  - 3.2 Additional Marking requirements: Additionally, the following shall also be marked on product or package or both:
    - a) “For BIS certification details please visit [www.bis.gov.in](http://www.bis.gov.in)”
4. **REJECTION** - The production which conforms to the Indian Standard and covered under the scope of this licence shall be marked with the Standard Mark. Disposal of non-conforming product shall be done in such a way so as to ensure that there is no violation of provisions of BIS Act, 2016.

**TABLE 1**  
**(Recommended Levels of Control by BIS- For Guidance Only)**

| (1)            |                                                                 |              |           |                                                                        |                                     |
|----------------|-----------------------------------------------------------------|--------------|-----------|------------------------------------------------------------------------|-------------------------------------|
| Test Details   |                                                                 |              |           | Levels                                                                 |                                     |
| Cl. of IS 2442 | Requirement                                                     | Test Methods |           | No. of Sample                                                          | Frequency                           |
|                |                                                                 | Clause       | Reference |                                                                        |                                     |
| 4              | General Requirements                                            | 4.1 to 4.3   | IS 2442   | Each consignment of components received                                | Further test with BIS : certificate |
| 5              | Workmanship and Finish                                          | 5.1 to 5.10  | IS 2442   | Firm should exercise adequate control and should meet the requirements |                                     |
| 7              | Marking and Instructions                                        | 7.1          | IS 2442   |                                                                        |                                     |
| 8.1.1          | Insulation Resistance Test                                      | 8.1.1        | IS 2442   | One                                                                    | Each Con                            |
| 8.1.3          | Sensitivity Test                                                | 8.1.3        | IS 2442   | One                                                                    | Each Con                            |
| 8.1.6          | Needle Balance Test (for Pivoted Type Galvanometer Only)        | 8.1.6        | IS 2442   | One                                                                    | Each Con                            |
| 8.1.7          | Test for Optical System (for Galvanometer with Optical Pointer) | 8.1.7        | IS 2442   | One                                                                    | Each Con                            |
| 8.1.2          | High Voltage Test                                               | 8.1.2        | IS 2442   | One                                                                    | Each Con                            |
| 8.1.4          | Periodic Time Test                                              | 8.1.4        | IS 2442   | One                                                                    | Each Con                            |
| 8.1.5          | Zero Shift Test (for Suspended Type Galvanometer Only)          | 8.1.5        | IS 2442   | One                                                                    | Each Con                            |