



### उत्पाद मैनुअल

आई एस 12640 (भाग 2) : 2016/ आईईसी 61009-1 : 2012 के अनुसार  
घरेलु और समान प्रयोजनों के लिए अवशिष्ट करंट सर्किट वियोजक समेकित अतिधारा संरक्षण  
रहित नियोजक ( आर सी बी ओ एस ) भाग 2 सामान्य नियम (दूसरा पुनरीक्षण )  
के लिए

दस्तावेज संख्या – पीएम/आईएस 12640 (भाग 2)/ IEC 61009-1/2/ मई 2023  
भारतीय मानक ब्यूरो की स्कीम-I (अनुरूपता मूल्यांकन) विनियम, 2018 के तहत यह उत्पाद  
मैनुअल प्रमाणीकरण के प्रचालन में रीति और पारिश्रिता की सुसंगतता सुनिश्चित करने के लिए  
सभी क्षेत्रीय/शाखा कार्यालयों और लाइसेंसि द्वारा संदर्भ सामग्री के रूप में उपयोग किया जाएगा।  
बीआईएस प्रमाणीकरण लाइसेंस/ प्रमाणपत्र प्राप्त करने के इच्छुक भावी आवेदकों द्वारा भी इस  
दस्तावेज का उपयोग किया जा सकता है।

### PRODUCT MANUAL FOR

**Residual Current Operated Circuit-Breakers with Integral Overcurrent  
Protection for Household and Similar Uses (RCBOs) ( Second Revision )  
ACCORDING TO IS 12640 (Part 2) : 2016/ IEC 61009-1 : 2012**

Document No - PM/ IS 12640 (Part 2)/ IEC 61009-1/2/May 2023

*This Product Manual shall be used as reference material by all Regional/Branch Offices  
& licensees to ensure coherence 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 licence/certificate.*

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**PRODUCT MANUAL FOR  
RESIDUAL CURRENT OPERATED CIRCUIT BREAKERS WITH  
INTEGRAL OVERCURRENT PROTECTION FOR HOUSEHOLD  
AND SIMILAR USES (RCBOs)**

**ACCORDING TO IS 12640(Part 2):2016/IEC 61009-1:2012**

*This Product Manual shall be used as reference material by all Regional/Branch Offices & licensees to ensure coherence 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 licence/certificate.*

|    |                                                                                                                 |   |                                                                                                                      |
|----|-----------------------------------------------------------------------------------------------------------------|---|----------------------------------------------------------------------------------------------------------------------|
| 1. | <b>Product</b>                                                                                                  | : | IS 12640 (Part 2) : 2016/IEC 61009-1:2012                                                                            |
|    | <b>Title</b>                                                                                                    | : | Residual Current Operated Circuit Breakers With Integral Overcurrent Protection for Household & Similar Uses (RCBOs) |
|    | <b>No. of Amendments</b>                                                                                        | : | 3                                                                                                                    |
| 2. | <b>Sampling Guidelines:</b>                                                                                     |   |                                                                                                                      |
| a) | <b>Raw material</b>                                                                                             | : | -                                                                                                                    |
| b) | <b>Grouping guidelines</b>                                                                                      | : | As per Annex A of IS 12640 (Part 2) : 2016 / IEC 61009-1 : 2012                                                      |
| c) | <b>Sample Size</b>                                                                                              | : | As per Annex A of IS 12640 (Part 2) : 2016 / IEC 61009-1 : 2012                                                      |
| 3. | <b>List of Test Equipment</b>                                                                                   | : | Please refer <a href="#">ANNEX – A</a> .                                                                             |
| 4. | <b>Scheme of Inspection and Testing</b>                                                                         | : | Please refer <a href="#">ANNEX – B</a> .                                                                             |
| 5. | <b>Possible tests in a day :</b>                                                                                | : | Please refer <a href="#">ANNEX – C</a> .                                                                             |
| 6. | <b>Scope of the Licence :</b>                                                                                   |   |                                                                                                                      |
|    | “Licence is granted to use Standard Mark as per IS 12640 (Part 2) : 2016/IEC 61009-1 with the following scope:” |   |                                                                                                                      |

|  |                     |                                                                                                                     |
|--|---------------------|---------------------------------------------------------------------------------------------------------------------|
|  | Name of the product | Residual Current Operated Circuit Breakers With Integral Overcurrent Protection for Household & Similar Uses(RCBOs) |
|  | Classification      | As applicable according to IS 12640 (Part 2) : 2016/ IEC 61009-1 : 2012                                             |

**ANNEX A****List Of Test Equipment***Major test equipment required to test as per the Indian Standard*

| S. No. | Test Equipment                                        | Tests used in with Clause Reference       |
|--------|-------------------------------------------------------|-------------------------------------------|
| 1.     | 28 Day Test Panel                                     | Cl. 9.8, Cl. 9.22.2                       |
| 2.     | Endurance Panel                                       | Cl. 9.10                                  |
| 3.     | HV Test Panel                                         | Cl. 9.7.2, Cl. 9.7.3, Cl. 9.7.7.3         |
| 4.     | Leakage Current Test                                  | Cl. 9.7.7.3                               |
| 5.     | Glow Wire Test                                        | Cl. 9.14                                  |
| 6.     | Climatic Chamber                                      | Cl. 9.7.1, Cl. 9.13, 9.22.1               |
| 7.     | Data logger & thermometer for temperature measurement | Cl. 9.8, Cl. 9.22.2, Cl. 9.9.3, Cl. 9.9.4 |
| 8.     | Digital Multi meter                                   | Cl. 9.8, Cl. 9.16                         |
| 9.     | AC/DC Clamp Meter                                     | Cl. 9.8, Cl. 9.9, Cl. 9.10                |
| 10.    | Insulation Tester                                     | Cl. 9.7.2                                 |
| 11.    | RCBO Test Panel – D0 sequence                         | Cl. 8.5                                   |

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

**ANNEX B**

**Scheme Of Inspection And Testing**

**1. LABORATORY-** A laboratory shall be maintained which shall be suitably equipped (as per the requirement given in column 2 of Table 1) and staffed, where different tests given in the specification shall be carried out in accordance with the methods given in the specification.

**1.1** The manufacturer shall prepare a calibration plan for the test equipment.

**2. TEST RECORDS** - The manufacturer shall maintain test records for the tests carried out to establish conformity.

**1. LABELLING AND MARKING** - As per the requirements of IS 12640 (Part 2):2016/ IEC 61009-1:2012. In addition, each RCBO or the carton in which the RCBOs are packed shall carry the identification mark in code or otherwise for traceability. In addition, details of BIS website shall be marked as follows: “For details of BIS certification please visit [www.bis.gov.in](http://www.bis.gov.in) “.

**3. CONTROL UNIT** - All the RCBOs of the same fundamental design, as indicated in Annex A of IS 12640 (Part 2) : 2016/ IEC 61009-1 : 2012, manufactured in a shift shall constitute a control unit.

**4. LEVELS OF CONTROL** - The tests as indicated in column 1 of Table 1 and the levels of control in column 3 of Table 1, shall be carried out on the whole production of the factory which is covered by this plan and appropriate records maintained in accordance with paragraph 2 above.

**5. REJECTIONS** - 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**

| (1)             |                                                 |                             |                   | (2)                                                                         | (3)               |                                                            |                                                                                                                                                             |
|-----------------|-------------------------------------------------|-----------------------------|-------------------|-----------------------------------------------------------------------------|-------------------|------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Details    |                                                 |                             |                   | Test equipment requirement<br>R: required (or) S: Sub-contracting permitted | Levels of Control |                                                            |                                                                                                                                                             |
| Cl.             | Requirement                                     | Test Methods                |                   |                                                                             | No. of Sample     | Frequency                                                  | Remarks                                                                                                                                                     |
|                 |                                                 | Clause                      | Reference         |                                                                             |                   |                                                            |                                                                                                                                                             |
| 9.1.3           | Routine Tests                                   |                             |                   |                                                                             |                   |                                                            |                                                                                                                                                             |
| D.2             | Tripping test                                   | D.2                         | IS 12640 (Part 2) | R                                                                           | Each Piece        | —                                                          | RCBOs which fail in any of the routine test shall not be marked. A separate record of such failures shall be maintained with adequate traceability.         |
| D.3             | Electric Strength Test                          | D.3                         | IS 12640 (Part 2) | R                                                                           | Each Piece        | —                                                          |                                                                                                                                                             |
| D.4             | Performance of the test device                  | D.4                         | IS 12640 (Part 2) | R                                                                           | Each Piece        | —                                                          |                                                                                                                                                             |
| Test Sequence A |                                                 |                             |                   |                                                                             |                   |                                                            |                                                                                                                                                             |
| 6               | Marking (except indelibility of marking)        | 6                           | IS 12640 (Part 2) | R                                                                           | One               | Every Control Unit                                         | —                                                                                                                                                           |
| 8.1.1           | Mechanical Design (General)                     | 8.1.1                       | IS 12640 (Part 2) | R                                                                           | One               |                                                            | For compliance to tests as per Cl. 9.12.12.1 & Cl.9.12.12.2 the frequency of once in five years on RCBOs of the same fundamental design shall be applicable |
| 8.1.2           | Mechanical Design (Mechanism)                   | 8.1.2                       | IS 12640 (Part 2) | R/S (for Cl. 9.11)                                                          | One               |                                                            |                                                                                                                                                             |
| 6               | Indelibility of marking                         | 6,9.3                       | IS 12640 (Part 2) | R                                                                           | One               | Once in six months on RCBOs of the same fundamental design | —                                                                                                                                                           |
| 8.1.3           | Clearance & creepage distances (external parts) | 8.1.3, 9.7.7.4.1, 9.7.7.4.2 | IS 12640 (Part 2) | R                                                                           | One               |                                                            |                                                                                                                                                             |

| (1)          |                                                               |                                  |                   | (2)                                                                         | (3)               |                                                            |              |
|--------------|---------------------------------------------------------------|----------------------------------|-------------------|-----------------------------------------------------------------------------|-------------------|------------------------------------------------------------|--------------|
| Test Details |                                                               |                                  |                   | Test equipment requirement<br>R: required (or) S: Sub-contracting permitted | Levels of Control |                                                            |              |
| Cl.          | Requirement                                                   | Test Methods                     |                   |                                                                             | No. of Sample     | Frequency                                                  | Remarks      |
|              |                                                               | Clause                           | Reference         |                                                                             |                   |                                                            |              |
| 8.1.6        | Non-interchangeability                                        | 8.1.6                            | IS 12640(Part 2)  | R                                                                           | One               | Once in six months on RCBOs of the same fundamental design | —            |
| 8.1.2        | Trip-free mechanism                                           | 8.1.2,9.11                       | IS 12640 (Part 2) | R                                                                           | One               |                                                            |              |
| 8.1.4        | Reliability of Screws, current-carrying parts and connections | 8.1.4, 9.25, 9.4                 | IS 12640 (Part 2) | R                                                                           | One               |                                                            |              |
| 8.1.5        | Reliability of Terminals for external conductors              | 8.1.5, 9.4 & 9.5, Annex-J,K or L | IS 12640 (Part 2) | R                                                                           | One               |                                                            |              |
| 8.2          | Protection against electric shock                             | 8.2, 9.6                         | IS 12640 (Part 2) | R                                                                           | One               |                                                            |              |
| 8.9          | Resistance to heat                                            | 8.9, 9.14                        | IS 12640 (Part 2) | S                                                                           | One               |                                                            |              |
| 8.1.3        | Clearance & Creepage distances (internal parts)               | 8.1.3, 9.7.7.4.1, 9.7.7.4.2      | IS 12640 (Part 2) | R                                                                           | One               |                                                            |              |
| 8.1.4.4      | Resistance to rusting                                         | 8.1.4.4, 9.25                    | IS 12640 (Part 2) | S                                                                           | One               |                                                            |              |
| 8.10         | Resistance to abnormal heat and to fire                       | 8.10, 9.15                       | IS 12640 (Part 2) | S                                                                           | Three             |                                                            | Refer Note 1 |

**TABLE 1**

| (1)             |                                                                                                                    |                |                   | (2)                                                                         | (3)               |                                                            |              |
|-----------------|--------------------------------------------------------------------------------------------------------------------|----------------|-------------------|-----------------------------------------------------------------------------|-------------------|------------------------------------------------------------|--------------|
| Test Details    |                                                                                                                    |                |                   | Test equipment requirement<br>R: required (or) S: Sub-contracting permitted | Levels of Control |                                                            |              |
| Cl.             | Requirement                                                                                                        | Test Methods   |                   |                                                                             | No. of Sample     | Frequency                                                  | Remarks      |
|                 |                                                                                                                    | Clause         | Reference         |                                                                             |                   |                                                            |              |
| Test Sequence B |                                                                                                                    |                |                   |                                                                             |                   |                                                            |              |
| 8.1.3           | Resistance of the insulation of open contacts and basic insulation against an impulse voltage in normal conditions | 8.1.3, 9.7.7.4 | IS 12640 (Part 2) | R                                                                           | Three             | Once in six months on RCBOs of the same fundamental design | Refer Note 1 |
| 9.7.7.5         | Verification of the behavior of components bridging the basic insulation                                           | 9.7.7.5        | IS 12640 (Part 2) | R                                                                           | Three             |                                                            |              |
| 8.1.3, 8.3      | Resistance to humidity                                                                                             | 8.3, 9.7.1     | IS 12640 (Part 2) | R                                                                           | Three             |                                                            |              |
| 8.1.3, 8.3      | Insulation resistance of the main circuit                                                                          | 8.3, 9.7.2     | IS 12640 (Part 2) | R                                                                           | Three             |                                                            |              |
| 8.1.3, 8.3      | Dielectric Strength of the main circuit                                                                            | 8.3, 9.7.3     | IS 12640 (Part 2) | R                                                                           | Three             |                                                            |              |
| 8.1.3, 8.3      | Insulation resistance and dielectric strength of auxiliary circuits                                                | 8.3, 9.7.4     | IS 12640 (Part 2) | R                                                                           | Three             |                                                            |              |
| 8.1.3, 8.3      | Verification of clearances with the impulse withstand voltage                                                      | 8.3, 9.7.7.2   | IS 12640 (Part 2) | R                                                                           | Three             |                                                            |              |

| (1)             |                                                                                                      |                           |                   | (2)                                                                         | (3)               |                                                            |              |
|-----------------|------------------------------------------------------------------------------------------------------|---------------------------|-------------------|-----------------------------------------------------------------------------|-------------------|------------------------------------------------------------|--------------|
| Test Details    |                                                                                                      |                           |                   | Test equipment requirement<br>R: required (or) S: Sub-contracting permitted | Levels of Control |                                                            |              |
| Cl.             | Requirement                                                                                          | Test Methods              |                   |                                                                             | No. of Sample     | Frequency                                                  | Remarks      |
|                 |                                                                                                      | Clause                    | Reference         |                                                                             |                   |                                                            |              |
| 8.1.3, 8.3      | Secondary circuit of detection transformers                                                          | 8.3, 9.7.5                | IS 12640 (Part 2) | R                                                                           | Three             | Once in six months on RCBOs of the same fundamental design | Refer Note 1 |
| 8.1.3, 8.3      | Capability of control circuits connected to the main circuits                                        | 8.3, 9.7.6                | IS 12640 (Part 2) | R                                                                           | Three             |                                                            |              |
| 8.4             | Temperature rise                                                                                     | 8.4, 9.8                  | IS 12640 (Part 2) | R                                                                           | Three             |                                                            |              |
| 8.16            | Reliability at 40°C                                                                                  | 8.16, 9.22.2              | IS 12640 (Part 2) | R                                                                           | Three             | Once in a year on RCBOs of the same fundamental design     |              |
| 8.16            | Ageing of electronic components                                                                      | 8.16, 9.23                | IS 12640 (Part 2) | R                                                                           | Three             |                                                            |              |
| Test Sequence C |                                                                                                      |                           |                   |                                                                             |                   |                                                            |              |
| 8.6             | Mechanical and electrical endurance                                                                  | 8.6, 9.10                 | IS 12640 (Part 2) | R                                                                           | Three             | Once in a year on RCBOs of the same fundamental design     | Refer Note 1 |
| 8.7             | Performance at reduced short-circuit currents(Verification of the RCBO after the short circuit test) | 8.7, 9.12.11.2.1, 9.12.12 | IS 12640 (Part 2) | S                                                                           | Three             | Once in five years on RCBOs of the same fundamental design |              |

**TABLE 1**

| (1)             |                                                                                                                                      |                          |                   | (2)                                                                         | (3)               |                                                            |              |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-------------------|-----------------------------------------------------------------------------|-------------------|------------------------------------------------------------|--------------|
| Test Details    |                                                                                                                                      |                          |                   | Test equipment requirement<br>R: required (or) S: Sub-contracting permitted | Levels of Control |                                                            |              |
| Cl.             | Requirement                                                                                                                          | Test Methods             |                   |                                                                             | No. of Sample     | Frequency                                                  | Remarks      |
|                 |                                                                                                                                      | Clause                   | Reference         |                                                                             |                   |                                                            |              |
| 8.7             | Short circuit test for verifying the suitability of RCBOs for use in IT systems (Verification of the RCBO after short circuit tests) | 8.7, 9.12.11.2.2 9.12.12 | IS 12640 (Part 2) | S                                                                           | Three             | Once in five years on RCBOs of the same fundamental design | Refer Note 1 |
| Test Sequence D |                                                                                                                                      |                          |                   |                                                                             |                   |                                                            |              |
| 8.5, 8.15       | Operating characteristics under Residual current conditions                                                                          | 8.5, 9.9.1               | IS 12640 (Part 2) | R                                                                           | Three             | Once in six months on RCBOs of the same fundamental design | Refer Note 1 |
| 8.12            | Behavior in the case of failure of line voltages                                                                                     | 8.12, 9.17               | IS 12640 (Part 2) | R                                                                           | Three             |                                                            |              |
| 8.14            | Behavior in case of surge currents                                                                                                   | 8.14, 9.19               | IS 12640 (Part 2) | S                                                                           | Three             |                                                            |              |
| 8.7             | Performance at I <sub>Δm</sub>                                                                                                       | 8.7, 9.12.13             | IS 12640 (Part 2) | S                                                                           | Three             |                                                            |              |
| 8.11            | Test Device                                                                                                                          | 8.11, 9.16               | IS 12640 (Part 2) | R                                                                           | Three             |                                                            |              |

| (1)             |                                               |                             |                   | (2)                                                                         | (3)               |                                                            |              |
|-----------------|-----------------------------------------------|-----------------------------|-------------------|-----------------------------------------------------------------------------|-------------------|------------------------------------------------------------|--------------|
| Test Details    |                                               |                             |                   | Test equipment requirement<br>R: required (or) S: Sub-contracting permitted | Levels of Control |                                                            |              |
| Cl.             | Requirement                                   | Test Methods                |                   |                                                                             | No. of Sample     | Frequency                                                  | Remarks      |
|                 |                                               | Clause                      | Reference         |                                                                             |                   |                                                            |              |
| Test Sequence E |                                               |                             |                   |                                                                             |                   |                                                            |              |
| 8.5.2           | Overcurrent operating characteristics         | 8.5.2, 9.9.2                | IS 12640 (Part 2) | S                                                                           | Three             | Once in five years on RCBOs of the same fundamental design | Refer Note 1 |
| 8.8             | Resistance to mechanical shock and impact     | 8.8, 9.13                   | IS 12640 (Part 2) | R                                                                           | Three             | Once in a year on RCBOs of the same fundamental design     |              |
| 8.7             | Short-circuit performance at 1500A            | 9.12.11.3, 9.12.12          | IS 12640 (Part 2) | S                                                                           | Three             | Once in five years on RCBOs of the same fundamental design |              |
| Test Sequence F |                                               |                             |                   |                                                                             |                   |                                                            |              |
| 8.7             | Performance at service short-circuit capacity | 8.7, 9.12.11.4(b) 9.12.12   | IS 12640 (Part 2) | S                                                                           | Three             | Once in five years on RCBOs of the same fundamental design | Refer Note 1 |
| 8.7             | Performance at rated short-circuit capacity   | 8.7, 9.12.11.4(c) 9.12.12.2 | IS 12640 (Part 2) | S                                                                           | Three             |                                                            |              |

**TABLE 1**

| (1)                 |                               |              |                   | (2)                                                                         | (3)               |                                                            |              |
|---------------------|-------------------------------|--------------|-------------------|-----------------------------------------------------------------------------|-------------------|------------------------------------------------------------|--------------|
| Test Details        |                               |              |                   | Test equipment requirement<br>R: required (or) S: Sub-contracting permitted | Levels of Control |                                                            |              |
| Cl.                 | Requirement                   | Test Methods |                   |                                                                             | No. of Sample     | Frequency                                                  | Remarks      |
|                     |                               | Clause       | Reference         |                                                                             |                   |                                                            |              |
| Test Sequence G     |                               |              |                   |                                                                             |                   |                                                            |              |
| 8.16                | Reliability (climatic test)   | 8.16, 9.22.1 | IS 12640 (Part 2) | S                                                                           | Three             | Once in a year on RCBOs of the same fundamental design     | Refer Note 1 |
| Test Sequence H,I,J |                               |              |                   |                                                                             |                   |                                                            |              |
| 9.24                | Electromagnetic Compatibility | 9.24         | IS 12640 (Part 2) | S                                                                           | Three             | Once in five years on RCBOs of the same fundamental design | Refer Note 1 |

Note-1: In case of failure, repeat testing to be carried out as per Table A.2 of IS 12640 (Part 2) : 2016/ IEC 61009-1 : 2012.

Note-2: Sub-contracting is permitted to a laboratory recognized by the Bureau or Government laboratories empanelled by the Bureau.

Note-3: Levels of control given in column 3 are only recommendatory in nature. The manufacturer may define the control unit/batch/lot and submit his own levels of control in column 3 with proper justification for approval by BO Head.

## **ANNEX C**

### **Possible Tests in a day**

- Tripping Test
- Electric Strength Test
- Performance of the test device
- Indelibility of Marking
- Clearance & Creepage distance (only for item 1 & 3 of Table 7 of IS 12640(Part 2):2016)
- Trip free mechanism
- Reliability of screws, current carrying parts and connections
- Reliability of terminals for external conductors
- Protection against electric shock