



**PRODUCT MANUAL FOR
EXPLOSIVE ATMOSPHERES - EQUIPMENT PROTECTION BY
INTRINSIC SAFETY "i"
ACCORDING TO IS/IEC 60079 (PART 11): 2011**

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.	Product	:	IS/IEC 60079 (PART 11): 2023
	Title	:	Explosive Atmospheres – Equipment Protection by Intrinsic Safety "i"
	No. of Amendments	:	NIL
2.	Sampling Guidelines:		
a)	Raw material	:	-
b)	Grouping guidelines	:	Please refer ANNEX – A
c)	Sample Size	:	Please refer 2 & 3 of ANNEX – A
3.	List of Test Equipment	:	Please refer ANNEX – B
4.	Scheme of Inspection and Testing	:	Please refer ANNEX – C
5.	Possible tests in a day :		
	(i) Compliance of the equipment to approved drawings/ Test reports as per IS/IEC 60079-11 (ii) Routine verifications and tests as per Cl. 10 of IS/IEC 60079-11		
6.	Scope of the Licence :		
	“Licence is granted to use Standard Mark as per IS/IEC 60079 (Part 11): 2023 with the following scope:		
	Name/ Description of the product	In terms of Product group as given in Annex A, Sl No 1 for products at 1(i) – 1(iv). For products falling under 1(iv), product name shall be mentioned in the scope	

ANNEX A**Grouping Guidelines**

1. Intrinsically safe equipment is classified in following product groups:
 - i) Intrinsically safe apparatus
 - ii) Intrinsically safe associated apparatus
 - iii) Intrinsically safe enclosures
 - iv) Others
2. Test reports and approved drawings of at least any one type designation of Intrinsically safe equipment from each product group mentioned above is required for the purpose of Grant of Licence/ Change in Scope of Licence. Only product group shall be endorsed and no separate endorsement needs to be issued based on individual Test Certificates. However, an undertaking shall be obtained from the manufacturer to the effect that the equipment with different type designations within that group will conform to the requirements of the ISS and that the firm, at the first instance of manufacturing these types and before applying the Standard Mark, shall get the equipment tested at third party laboratory. Such test reports, in original, along with the approved drawings shall be produced to BIS for records through Manakonline. The Grant of Licence letter/ any subsequent endorsement with product group shall clearly mention the details regarding submission of independent test reports by the licensee on the first instance of manufacturing of a new variety in a product group as mentioned above.
3. For grant of licence, if the firm submits complete test reports and approved drawings from a third party laboratory, containing all the details / declarations as required by the Standard, the product shall be verified in the factory for the design compliance with drawings/ test reports and the Standard. All the possible tests shall be conducted in the factory. One Verification sample shall be drawn for routine verification and tests only.
4. Alternatively, if the firm submits the drawings/declarations of the product only, samples shall be drawn and sent for all tests at a third party testing laboratory.
5. For considering grant of licence/ Change in Scope of licence, Test report submitted shall not be more than six months old. Revalidation reports issued by labs with reference to an old type test report are acceptable for Grant of Licence/Change in Scope of licence.
6. During the operation of the licence, samples may not be drawn for independent testing. Feedback from organized buyers maybe sought in lieu of Market samples. Sample shall be tested in factory during surveillance visits

ANNEX B**List Of Test Equipment**

Major test equipment required to test as per the Indian Standard

Sl. No.	Tests used in with Clause Reference	Test Equipment
1.	Construction Cl. 6 to 9 of IS/IEC 60079-11	a) Vernier Callipers b) Scale c) Micrometer d) Feeler Gauge e) Multimeter
2.	Routine verifications and tests (Cl 10)	a) High Voltage test Apparatus

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

ANNEX C

Scheme Of Inspection And Testing

1. QUALITY ASSURANCE PLAN

1.1 It is expected that manufacturers (licensees/applicants) will implement a Quality Assurance Plan 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 defining the control unit (i.e. lot/batch etc.) and the levels of control (i.e. the frequency and number of samples for conducting the different tests as per the Indian Standard) and submit the same to BIS Branch Office for information. The manufacturer shall comply with the same and maintain test records in accordance with para 2.4.

1.3 RECOMMENDED LEVELS OF CONTROL/CONTROL UNIT:

1.3.1 For the guidance of manufacturers, the recommended definition of control unit is: **All equipment's of same type manufactured in a day, shall constitute a control unit.** The manufacturer has the choice to define their own control unit/batch/lot and submit the same to the BIS.

1.3.2 For the guidance of manufacturers in preparing the Quality Assurance Plan, recommended levels of control are given in Table 1.

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. Alternatively, the manufacturer has the option of adherence to the quality plan as per levels of control recommended in column 3 of Table 1.

1.4 However, all manufacturers shall ensure compliance of their products to all the requirements of the Indian Standard.

2. ENSURING COMPLIANCE THROUGH TESTING- It is expected that manufacturers (licensees/applicants) will establish a suitably equipped and staffed in house laboratory (In house testing facility) for testing at least those parameters of the Indian Standard which require routine testing for ensuring quality of the product. This includes in-process controls as may be defined and put in place by the manufacturer and testing parameters/requirements which can only be performed in the factory. They shall also implement a calibration plan for the in-house test equipment.

2.1 For the guidance of manufacturers, Table 1 giving the recommended levels of control is given below. Column 2 of Table 1 indicates routine tests where test equipment is required in house as "R" or other tests which can be subcontracted as "S". Subcontracting for the requirements of Clause 9 as per IS/IEC 60079-11 is permitted to BIS recognized/empaneled laboratory

2.1.1 Large Scale manufacturers shall maintain an in-house laboratory equipped at least with test facilities for routine tests (indicated as "R" in Column 2 of Table 1), where different tests given in the specification shall be carried out in accordance with the method given in the specification. They shall also implement a calibration plan for the in-house test equipment.

2.1.2 Alternatively, in lieu of an in-house laboratory, large scale manufacturers can also utilize the provisions of Sharing of testing facilities as per the Guidelines for Grant of Licence available on BIS website www.bis.gov.in. (Under Conformity Assessment>Product Certification Process). Even for subcontracted tests, provisions for sharing of testing facilities can be utilized.

2.2 TEST RECORDS- The manufacturers maintaining an in-house laboratory or utilizing common cluster-based facilities or shared test facilities shall maintain test records for the tests carried out to establish conformity. For the tests being subcontracted to BIS recognized/empaneled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025, test reports issued by the laboratories shall be available for inspection by BIS.

3. MARKING –

- a) The Standard Mark as given in the Schedule of the licence shall be incorporated legibly and indelibly on **each equipment and also on its packaging** provided always that the material so marked conforms to each requirement of the specification.
- b) Marking shall also be done as per Cl. 11 of IS/IEC 60079 (part 11): 2023.

3.1 Additional Marking requirements: The product shall also be marked with the following additional requirement on packaging:

- a) “For BIS certification details please visit www.bis.gov.in”

4. REJECTION - All 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

(1)				(2)	(3)		
Test Details				Test equipment requirement R: required (or) S: Sub-contracting permitted	Levels of Control		
Cl.	Requirement	Test Methods			No. of Sample	Frequency	Remarks (Please see Note 1 also)
		Clause	Reference				
10	Routine verifications and tests	10	IS/IEC 60079-11	R	Each equipment		
11	Marking	11		R	Each equipment		
6	Apparatus Construction						
6.2	Enclosures	6.2	IS/IEC 60079-11	R	Each equipment	All equipment shall be manufactured in accordance with the approved/ certified drawings and test certificates. Only the materials/ components as per details listed in the Type Test Certificate shall be used.	
6.3	Connection facilities for external circuits	6.3		R	Each equipment		
6.4	Internal connections and connectors	6.4		R	Each equipment		
6.5	Separation of conductive parts	6.5		R	Each equipment		
6.6	Encapsulation	6.6		R	Each equipment		
6.9	Dielectric strength requirements	6.9		R	Each equipment		
7	Components and assemblies						
7.1	Rating of components on which intrinsic safety depends	7.1	IS/IEC 60079-11	R	Each equipment	All equipment shall be manufactured in accordance with the approved/ certified drawings and test certificates. Only the materials/ components as per details listed in the Type Test Certificate shall be used.	
7.4	Resistors	7.4		R	Each equipment		
7.5	Capacitors	7.5		R	Each equipment		
7.6	Inductors and windings	7.6		R	Each equipment		
7.7	Semiconductors	7.7		R	Each equipment		
7.8	Transformers	7.8		R	Each equipment		
7.9	Relays	7.9		R	Each equipment		
7.10	Signal isolators	7.10		R	Each equipment		
7.11	Fuses	7.11		R	Each equipment		
7.12	Primary and secondary cells and batteries	7.12		R	Each equipment		
7.13	Piezoelecric devices	9.11		R	Each equipment		
7.14	Cells for the detection of gases	7.14		R	Each equipment		
7.15	Supercapacitors	7.15		R	Each equipment		
7.16	Thermal devices	7.16		R	Each equipment		
7.17	Mechanical switches	7.17		R	Each equipment		

(1)				(2)	(3)		
Test Details				Test equipment requirement R: required (or) S: Sub-contracting permitted	Levels of Control		
Cl.	Requirement	Test Methods			No. of Sample	Frequency	Remarks (Please see Note 1)
		Clause	Reference				
8	Supplementary requirements for specific apparatus	8	IS/IEC 60079-11	R	Each equipment		
9	Type verifications and type tests	9	IS/IEC 60079-11	S	One	5 years	
5.3	Spark ignition compliance	5.3	IS/IEC 60079-11	S	One	5 years	
5.4	Thermal ignition compliance	5.4	IS/IEC 60079-11	S	One	5 years	

Note-1: All equipment shall be manufactured in accordance with the approved/ certified drawings and design. Only the materials as per details listed in the Type Test Certificate shall be used. Testing of bought out components/ raw materials is not required if the bought out components/ raw materials are ISI marked or accompanied with a Test Certificate.

Note-2: Type test to be carried out after 5 years of last type approval of any one type designation from each product group listed at Sl No. 1 of Annex A. For a given product group, the period of 5 years for that product group may be counted from the date of Test Certificate which involves type-testing of that type/size/variety.