

**PRODUCT MANUAL FOR
EXPLOSIVE ATMOSPHERES PART 1 – EQUIPMENT PROTECTION
BY FLAMEPROOF ENLCOSURES “d”
ACCORDING TO IS/IEC 60079 (PART 1): 2014**

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 1): 2014
	Title	:	Explosive Atmospheres- Part 1 – Equipment Protection By Flameproof Enclosures “d”
	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) Possible dimensions of the enclosure and compliance to approved drawings/ Test reports as per Cl. 5 to 13 & 17 to 19 of IS/IEC 60079-1		
	(ii) Routine overpressure test as per Cl. 15.2.3 & 16 of IS/IEC 60079-1		
	(iii) Tests for resistance to impact as per Cl. 26.4.2 of IS/IEC 60079-0		
	(iv) Drop Test as per Cl. 26.4.3 of IS/IEC 60079-0		
6.	Scope of the Licence :		
	“Licence is granted to use Standard Mark as per IS/IEC 60079 (Part 1): 2014 with the following scope:		
	Name/ Description of the product		
	Type designation		
	Type of protection	“da”/ “db” / “dc”	
	Gas Group		
	Test Certificate No., Date Drawing No, Lab’s Name		

ANNEX A

Grouping Guidelines

1. Each variety of Flameproof Enclosure is to be tested for the purpose of Grant of Licence/ Change in Scope of Licence.
2. 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 dimensions and over-pressure tests only.
3. Alternatively, if the firm submits the drawings/declarations of the product only, requisite number of samples as per Cl. 26 of IS/IEC 60079-0 shall be drawn and sent for all tests at a third party testing laboratory.
4. For inclusion of new variety, the firm shall submit test report and approved drawings from a third party testing laboratory, containing all the details / declarations as required by the Standard.
5. For considering grant of licence/ inclusion, Test report submitted shall not be more than six months old.
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.

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

S. No.	Tests used in with Clause Reference	Test Equipment
1.	Dimensions As per approved drawings & Cl. 5-13 & 17-19 of IS/IEC 60079-1	a) Vernier Callipers b) Scale c) Micrometer d) Thread Gauge e) Ring Gauge f) Plug Gauge g) Feeler Gauge
2.	Routine overpressure test as per Cl. 15.2.3 & 16 of IS/IEC 60079-1	a) Hydro Test Pump set arrangement with pressure indicator
3.	Tests for resistance to impact as per Cl. 26.4.2 of IS/IEC 60079-0	a) 1 kg test mass with impact head b) Measuring Tape/ Scale
4.	Drop Test as per Cl. 26.4.3 of IS/IEC 60079-0	a) Measuring Tape/ Scale

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

ANNEX C

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.

3. LABELLING AND MARKING – In addition to the requirements of IS/IEC 60079-0 and IS/IEC 60079-1, the following shall be provided on the main part of the equipment either by ‘Raised lettering cast integrally with the body of the equipment’ or ‘attaching a plate having the details riveted to or otherwise permanently attached to the apparatus in a manner, which will not impair the flameproof nature of the enclosure’:

- a) Name of the manufacturer or his registered trade mark;
- b) Manufacturer’s type identification;
- c) Serial no. of the equipment assigned (for traceability of records);
- d) BIS Certification Marks licence number “CM/L”
- e) Markings required by the statutory authorities.

3.1 Manufacturer shall issue certificate of conformity as per clause 28 of IS/IEC 60079-0.

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.

4.1 All the production which conforms to the Indian Standard and covered by the licence should be marked with Standard Mark.

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 R: required (or) S: Sub-contracting permitted	Levels of Control		
Cl.	Requirement	Test Methods			No. of Sample	Frequency	Remarks
		Clause	Reference			(Please see Note 1 also)	
5	Flameproof Joints	5.1 to 5.5	IS/IEC 60079-1	R	Each enclosure		
6	Sealed Joints	6.1, 6.2	IS/IEC 60079-1	R	Each enclosure		Tests as per 6.1.2 shall be carried out along with type tests (Please see Note 2)
7	Operating rods	7	IS/IEC 60079-1	R	Each enclosure		
8	Supplementary requirements for shafts & bearings	8.1, 8.2	IS/IEC 60079-1	R	Each enclosure		
9	Light-transmitting parts	9, 19	IS/IEC 60079-1	S	One	Every 5 years	Applicable at the time of type tests. Please see Cl 15 of Table 1 of SIT.
10	Breathing & Draining devices which form part of a flameproof enclosure	10.1-10.7	IS/IEC 60079-1	R	Each enclosure		Type test to be carried out after 5 years of last type approval for any Breathing & Draining device. The period of 5 years may be counted from the date of grant/ the last inclusion which involves type-testing of a Breathing & Draining device. If any bought out Ex Components are used, further testing is not necessary if it is ISI marked or accompanied with a Test Certificate
		10.8		R	One	Once in a month	
		10.9.3		S	One	Every 5 years	
11	Fasteners and openings	11.1-11.5	IS/IEC 60079-1	S	One	Each lot received	
		11.6 – 11.9		R	Each enclosure		
12	Materials	12	IS/IEC 60079-1	S	One	Each lot received	

(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
		Clause	Reference				(Please see Note 1 also)
13	Entries for flameproof enclosures	13 (except Annex C.3)	IS/IEC 60079-1	S	One	Once in a month	If any bought out Ex Components are used, further testing is not necessary if it is ISI marked or accompanied with a Test Certificate. Type test to be carried out after 5 years of last type approval for any cable entry. The period of 5 years may be counted from the date of grant/ the last inclusion which involves type-testing of a cable entry.
		Annex C.3				One	
14	Verification and tests	14	IS/IEC 60079-1	S	One sample to be selected from each product group [*]		Please see Note 2
15	Type Tests	15	IS/IEC 60079-1				
16	Routine tests	15.2.3, 16	IS/IEC 60079-1	R	Each enclosure		
17	Switchgear for Group I	17	IS/IEC 60079-1	R	Each enclosure		
18	Lamp-holders and lamp-caps	18	IS/IEC 60079-1	S	One	Each lot received	
19	Non-metallic enclosures and non-metallic parts of enclosures	19	IS/IEC 60079-1	S	One	Every 5 years	Applicable at the time of type tests. Please see Cl 15 of Table 1 of SIT.
20	Marking	20	IS/IEC 60079-1	-	Each enclosure		Please also see Cl 3 of SIT.
		29	IS/IEC 60079-0				

Note-1: All equipment shall be manufactured in accordance with the approved/ certified drawings. 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 for any type/ size/ variety in that product group. For a given product group, the period of 5 years for that product group may be counted from the date of grant/ the last inclusion which involves type-testing of that type/size/variety. Test sequence as per Cl 15.1 of IS/IEC 60079-1 shall be followed. Over-pressure test in accordance with Cl. 15.2.3 of IS/IEC 60079-1 is to be carried out considering the explosion pressure determined at the time of prototype approval, hence, Explosion pressure or reference pressure need not be determined again.

Note-3: Sub-contracting is permitted to a laboratory recognized by the Bureau or Government laboratories empanelled by the Bureau.

Note-4: Levels of control given in column 3 are obligatory in nature.

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FLPs can be classified into the following product groups:

- i. Luminaires (all types of lighting fittings including fittings with well glass, flat glass, tubular glass; bulk head; flood light; hand lamp; etc.)
- ii. Rotating Electric Machines (all types of rotating machines including motors, generators, etc.)
- iii. General purpose enclosures (all types of control stations; control panels; control gears; switchgears; junction boxes; terminal boxes; transformers; empty flameproof enclosures; etc.)
- iv. Others (not covered in the above groups like instruments; telephones; heaters)