

सीएसआईआर- केन्द्रीय खनन एवं ईंधन अनुसंधान संस्थान

(वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद)
बरवा रोड, धनबाद - 826015, झारखण्ड, भारत



CSIR-Central Institute of Mining & Fuel Research
(Council of Scientific & Industrial Research)
Barwa Road, Dhanbad - 826015, Jharkhand, India

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SPEED POST/COURIER SERVICE

Test & Assessment Report No.: IN/CIMFR/TR20/ 435

Dated: 07 February, 2020

ID No. 137/19

ULR No.: TC59622000000218F

TC CODE NO. FES/87D/19-20

To
M/S. KESHKAMAT & COMPANY
9/129, ADARSH NAGAR, PRABHADEVI,
MUMBAI - 400 025

Subject: Type Examination Certificate along with test assessment report of Flameproof cum Weatherproof LED/Fish Eye Camera Enclosure, in cast aluminium Alloy LM-6 construction designated by Model: KK/FE/LED/19, as per IS/IEC 60079-1:2014 for use in Gas Group: IIB, EPL Gb atmosphere.

Your Ref. Appli. No.: KK/CIMFR/19/05

- (Test Report)
Dated: 07/07/2019

Dear Sir,

Please find the enclosed Type Examination Certificate along with test assessment report of the above sample submitted by you.

This Institute reserves the right to review, amend or withdraw this 'Revalidation Test Report' at any time, if considered necessary in the interest of safety.

Charges of Rs. 41,194/- (Rupees Forty One Thousand One Hundred Ninety Four Only) including applicable GST involved towards the testing have been adjusted against the advance deposit made by you.

Kindly arrange to collect the sample within 90 days from the date of receipt of this letter failing which CIMFR would dispose of the samples by public auction without any further NOTICE to you.

Kindly acknowledge the receipt.

Thanking you.

Yours faithfully,

S. K. Mondal
06/02/2020

(S. K. MONDAL)
HOS
TESTING CELL

Encl: As above.

1. Test assessment report in Four copies

2. Type Examination Certificate

Copy to: 1. Head, Flameproof & equipment Safety

2. Bill section

KK/FE/LED/19 (2)



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Barwa Road, Dhanbad-826015, Jharkhand, India

ज्वालासह एवं उपकरण सुरक्षा / FLAMEPROOF & EQUIPMENT SAFETY
परीक्षण प्रमाण पत्र / TEST CERTIFICATE



NABL Certificate No.: TC-5962

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FORMAT NO.: (CIMFR: DQM: FLP02: F-01:REV-01)
(Flameproof & Equipment Safety)

Equipment ID No.: 137/19 ULR No.:TC596220000000218F Code No. FES/87 D/19-20

Test & Assessment Report No.: IN/CIMFR/TR20/ 435	Dated: 07 February, 2020
Application Ref. No.: KK/CIMFR/19/05	Dated: 07/07/2019

- 1. Applicant : M/S. KESHKAMAT & COMPANY
9/129, ADARSH NAGAR, PRAJHADEVI,
MUMBAI - 400 080.
- 2. Manufacturer : Same as above
- 3. Equipment : Flameproof cum Weatherproof LED/Fish Eye Camera Enclosure.
- 4. Designated by : Model: KK/FE/LED/19.
- 5. Type of Protection : Group ; IIB atmosphere, EPL Gb.
- 6. Electrical ratings : Rated 10W LED at 240V AC/DC.
- 7. Temperature Class : T6
- 8. Degree of Ingress Protection : IP-66
- 9. Material of Construction : Cast aluminium Alloy LM-6 construction.

10. Description of the equipment: Flameproof cum Weatherproof LED/Fish Eye Camera Enclosure.

A.

Description	Volume in cc		Min. Wall Thickness (mm)	Nos. & Size of Bolts/Pasteners
	Gross	Net		
Single Enclosure	2500	370	10mm	NIL

B.

Glass details	Max no. of aperture on cover
Size - Ø203mm, Shape - Circular Type - Toughened Polished, Thickness = 10mm Cement path = 28mm, Sealing compound = Epoxy Resin + Hardener COT = -20°C to 120°C	One No.

Handwritten signature and date: 05/02/2020

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परीक्षण रिपोर्ट / TEST REPORT



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FORMAT NO.: (CIMFR: DQM: FLP02: P-01:REV-01)

(Flameproof & Equipment Safety)

Equipment ID No.: 137/19 ULR No.:TCS9622000000218F Code No. FES/87 D/19-20

11. Nature of Flameproof Joint: Type of joints and gaps (Spigot joint, Threaded joint, Cylindrical joint for Gas Gr. IIB)

Sr. No.	Location of flamepath	Type of Joint	Min. length of flamepath (in mm)		Max. gap (in mm)/no. of threads (pitch)	
			Req.	Spec.	Req.	Spec.
1.	Between Main enclosure body and front cover	Threaded				
2.	Between enclosure body and top cover					

Max No. & size of external/exit cable entries: Maximum threaded entry is provided for attachment of certified and approved FLP/WP double compression type cable glands as follows.

Sr. No.	Max. Size of Cable Entries	Nos. of Cable entries provided in test sample			
		Side - A	Side - B	Side - C	Side - D
1	M20X1.5P (L = 14mm, T=8nos.)	01	---	---	---
2	M25X1.5P (L = 14mm, T=8nos.)	01	---	---	---

12. Name plate and warning inscription: The name-cum-warning inscription plate and rating plate made of Brass/SS is permanently fixed on the cover of enclosure by hammer driven rivets leaving min. 3mm material thickness below the rivets. The warning inscription shall read as "ISOLATE SUPPLY BEFORE OPENING".

13. Drawing: The unit is designed and constructed as flameproof and weatherproof in accordance with the following drawing conforming to the requirements of IS/IEC 60079-0:2011, IS/IEC 60079-1: 2014 & IS/IEC 60529: 2001 (Reaffirmed 2014).

Sl. No.	Drg. No.	Title	Rev.	Sheet	Date
1.	KK/FE/LED/2019/01	FLAMEPROOF CUM WEATHERPROOF LED/FISH EYE CAMERA ENCLOSURE	0	1 of 4 To 4 of 4	20/05/2019

14. Any other relevant information:

- As per Clause 4.2 Note - 2 of IS/IEC 60079-0:2011 the equipment mark IIB is suitable for application requiring IIA equipment.
- The material of construction of the enclosure may be CI/MS/SS instead of die cast aluminum alloy LM-6 construction.
- Equal and equivalent medium class fit NPT threads conforming to requirements of ANSI/ASME B1.20.1 may be used instead of metric threads conforming to ISO 965-1 & 965-2 as per Clause No. 5.3 & 13 of IS/IEC 60079-1:2014.

AK
05/07/2020

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ज्वालासह एवं उपकरण सुरक्षा / FLAMEPROOF & EQUIPMENT SAFETY

परीक्षण रिपोर्ट / TEST REPORT



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(Flameproof & Equipment Safety)

Equipment ID No.: 137/19 ULR No.:TC596220000000218F Code No. FES/87 D/19-20

15. Declaration by the Applicant/Manufacturer:

- (i) As to standards with which the equipment complies in respect of:
- Electrical equipment for Potentially Explosive atmosphere – General requirements: IS/IEC 60079-0: 2011
 - As to flameproof protection IS/IEC 60079-1: 2014
 - Ingress protection as per IS/IEC 60529: 2001(Reaffirmed 2014)

(ii) Composition of the cast aluminum alloy LM-6 declared by the manufacturer: Composition of cast aluminum alloy LM-6 purported to be forming the material of construction of the enclosure has been declared by the manufacturer in the drawing having Mg, 0.1%. If constructed of copper or copper alloy should be less than 60% of copper content.

However no sample of the alloy was drawn from the prototype enclosure for verifying its chemical composition declared by the manufacturer.

16. Documents Submitted :

- Application form
- Drawings
- Prototype/test sample

17. Compliance of prototype or sample with documents: The test sample of electrical equipment submitted for the type tests complies with the manufacturers documents referred above.

18. Condition of sample on receipt: Good

Note: CIMFR has however not checked and tested the compliance of the equipment to any standard other than the above standards.

SCOPE OF THE TEST CERTIFICATE

The Test Certificate issued by CIMFR testifies that the equipment has been found to comply with the definition of flameproof cum weatherproof EQUIPMENT contained in the relevant Standard specifications. They do not vouch for the quality of the equipment in any other respect.

This Institute reserves the right to review amend or withdraw this Test Report at any time if considered necessary in the interest of safety.

[Signature]
05/02/2020

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(Flameproof & Equipment Safety)

Equipment ID No.: 137/19 ULR No.: TC596220000000218F Code No. FES/87 D/19-20

REPORT OF TEST

Date of Test: 29/08/2019

Test Equipment Used:

Computer, Kistler Piezo Electric Transducer and Charge Amplifier for conducting Explosion Pressure Tests, Impact test setup, Ingress protection (IP) test setup, Temperature class test setup, Overpressure Test Setup.

Result #A: Tests as per IS/IEC 60079-0: 2011:

Type Tests		Remarks	Results (Complies, P- Pass, NA-Not Applicable, F-Fail) References
1	Scope		Complies
2	Normative references		Complies
3	Terms and definitions		Complies
4	Equipment grouping and temperature classification	Gas Group: IIB, EPL Gb.	Complies
5	Temperatures		
5.1.1	Ambient temperature	-20°C to 40°C Amb.	Complies
6	Requirements for all electrical Equipment		Complies
6.6	Electromagnetic and ultrasonic energy radiating equipment		NA
7	Non-metallic enclosures and non-metallic parts of enclosures		NA
7.2	Thermal Endurance		NA
8	Metallic Enclosure and metallic part of End	Cast aluminium Alloy LM-6 construction	Complies
9	Fasteners		Complies
10	interlocking devices		NA
11	Bushings		NA
12	Materials used for cementing	Sealing compound = Epoxy Resin COT = -20°C to 120°C	Complies
13	Ex components		NA
14	Connection facilities and terminal compartments		NA
15	Connection facilities for earthing or bonding conductors		Complies
16	Entries into enclosures		Complies
17	Supplementary requirements for rotating electrical machines		NA
18	Supplementary requirements for switchgear		NA
19	Supplementary requirements for fuses		NA
20	Supplementary requirements for plugs and sockets		NA

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05/09/2019

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 (Council of Scientific & Industrial Research)
 बरवा रोड, धनबाद - 826015, झारखण्ड, भारत
 Barwa Road, Dhanbad - 826015, Jharkhand, India



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Equipment ID No.: 137/19 ULR No.:TC596220000000218F Code No. PES/87 D/19-20

21	Supplementary requirements for luminaries		Complies
22	Supplementary requirements for caplights and handlights		NA
23	Equipment incorporating cells and batteries		NA
24	Documentation		Complies
25	Compliance of prototype or sample with documents		Complies
26	Type tests		Complies
26.3	Tests in explosive mixtures		
26.3	Tests for Flameproof (Ex 'd') protection	Verification for Compliance to Ex 'db' requirements as per IS/IEC 60079-1: 2014	Complies
26.4	Test of enclosures		
26.4.2	Test for resistance to impact		Complies
26.4.3/2	Drop test		NA
6.4.4		(Not a handheld equipment or portable device)	
26.4.5	Tests for the Degree of protection IP		
26.4.5	IP of equipment		Complies
26.5	Thermal tests		
26.5.1	Temperature measurement	T6	Complies
26.5.2	Thermal shock test - for glass parts		NA
26.6	Torque Test for bushings		
26.6	Torque test for bushings	-----	NA
26.7	Tests for non-metallic enclosures or of non-metallic parts of encl.		
26.8	Thermal endurance to heat	-----	NA
26.9	Thermal endurance to cold	-----	NA
26.10	Resistance to light	-----	NA
26.11	Resistance to chemical agents for Gr. I	-----	NA (Only applicable for Gr. I equipment)
26.12	Earth continuity test via non-metallic enclosure		NA
26.13	Surface resistance test of parts of enclosures of Non metallic materials	-----	NA
26.14	Charging test		NA
26.15	Measurement of Capacitance		NA
27	Routine verification and tests	Manufacturer's responsibility: Compliance to prototype of the product and physical measurement of gap and flamepath and overpressure test at the pressure 8kg/cm ² for every sample.	
28	Manufacturer's responsibility	Conformity of the equipment to the applicable standards	Complies
29	Marking		Ex d IB T6 Gb
30	Instructions	Instruction related to use, installation, maintenance, adjustment to be provided by the manufacturer along with the equipment.	

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 05/02/2020

KK/FE/LED/19 7

[Continuation Sheet]

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ज्वालासह एवं उपकरण सुरक्षा / FLAMEPROOF & EQUIPMENT SAFETY

परीक्षण रिपोर्ट / TEST REPORT



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(Flameproof & Equipment Safety)

Equipment ID No.: 137/19 ULR No.:TC596220000000218F Code No. FES/87 D/19-20

Result#A1: 1kg mass of hardened steel allow to fallen vertically on the surface of the enclosure & glass part to create impact energy for Gr. II equipment.

Result#A2: The surface temperature rise classification of the above equipment has been determined by supplying 240V AC to the camera along with adaptor (240V AC to 12V DC converter) and 10W LED (max.) mounted inside the enclosure and the surface temperature classification is considered as T6 at maximum ambient temperature of 40°C.

Result#A3: IP-Protection: Noprene 'O' ring gasket (Ø4mm thick) is provided at the end of joint for weatherproof IP-66 degree of protection. Tests have been conducted as per IS/IEC 60529:2001 as tabulated below for IP-66 degree of protection.

Sl. No	Type Tests		Results
1.	Dust Test (First Numeral 6)	Clause 13.4 & 13.6	No dust had accumulated inside the enclosure in harmful quantity. Pass
2.	Water Test (Second Numeral 6)	Clause 14.2.6	No water had accumulated inside the enclosure in harmful quantity. Pass

Signature
05/02/2020

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Equipment ID No.: 137/19 ULR No.:TC59622000000218F Code No. PES/87 D/19-20

Result #B: Tests in explosive mixtures: Tests for type of protection Ex db as per IS/IEC 60079-1:2014.

Type Tests			
Clause No.	Description and relevant tests	Remarks	Results (Complies,P- Pass,NA-Not Applicable, F-Fail) References
1	Scope		Complies
2	Normative references		Complies
3	Terms and definitions		Complies
4	Level of protection (Equipment Protection Level, EPL)	Gas Group IIB, EPL Gb	Complies
5	Flameproof joints	Threaded joint	Complies
6	Sealed joints		
6.1	Cemented joints		Complies
6.1.2	Mechanical strength:		Complies
7	Operating rods		NA
8	Supplementary requirements for shafts and bearings		NA
9	Light transmitting parts		NA
10	Breathing and draining devices which form part of a flameproof enclosure		NA
11	Fasteners and openings		Complies
12	Materials	Cast aluminium Alloy LM-6 construction	Complies
13	Entries for flameproof enclosures		Complies
14	Verification and tests		Complies
15	Type Tests		
15.1	General		Complies
15.2	Tests of ability of the enclosure to withstand pressure		
15.2.1	General		Complies
15.2.2	Determination of Explosion Pressure (Reference Pressure)		Complies
15.2.3	Overpressure Test	8kg/cm ²	Complies
15.3	Test for non-transmission of an internal ignition		
15.3.1	General		Complies
15.3.2	Electrical equipment of Groups IIB		Complies
15.3.3	Electrical equipment of Group IIC		NA
15.4	Tests of flameproof enclosures with breathing and draining devices		
15.4.1	General		NA
16	Routine tests	To be conducted by the manufacturer at pressure 8kg/cm ² for every sample	Complies
17	Switchgear for Group I		NA
18	Lamp holders and lamp caps		NA

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19	Non-metallic enclosures and non-metallic parts of enclosures		
19.1	General		NA
19.2	Resistance to tracking and creepage distances on internal surfaces of the enclosure walls		NA
19.3	Requirements for type test		NA
19.4	Test of erosion by flame		NA
20	Marking		Ex d IIB T6 Gb
20.2	Caution and warning markings	"ISOLATE SUPPLY BEFORE OPENING"	
21	Instruction	The manufacturer shall supply instruction manual regarding the equipment.	Complies

Result # B1: Determination of Explosion pressure (Reference Pressure Test) *:

Gas mixture: Test with 8% Ethylene in air.

No. of Tests: 3 nos. test with single enclosure.

Test Condition: Enclosure fitted with component and tested as per clause 15.2.2.2

Type of Test	Gas Group	Gas Mixture % in Air		No. of Tests	
Preliminary Test (reference pressure)	IIB	8% Ethylene in air		Three	
Test Ref. No.	Ignition	Gauge Position	Max. Pressure in Bar	Time of Pressure rise in millisecond	Remark
Single Enclosure					
PPM/1371901	Body	Body	4.34	14.82	No evidence of distress
PPM/1371902	Body	Body	3.93	15.68	-do-
PPM/1371903	Body	Body	3.78	16.68	-do-

*Results shown for the pressure time curve (enclosed) are the highest recorded value obtained in the test.

Result #B2: Overpressure Test (Static Method): Hydraulic pressure test is conducted as per Cl. 15.2.3.2 of IS/IEC 60079-1: 2014.

Enclosure	Test reference nos.*	Over pressure (kg/cm ²) maintained for 10 sec.	Remark
Single Enclosure	OPM/1371904	8.0 kg/cm ²	No damage or deformation

[Signature]
05/02/2020

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 Barwa Road, Dhanbad, Jharkhand, India

ज्वालामुखी एवं उपकरण सुरक्षा / FLAME PROTECT & EQUIPMENT SAFETY
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 परीक्षण प्रमाण पत्र / TEST CERTIFICATE

Test Date: 28/08/2019

Manufacturer Details: M/S KESHKAMAT & COMPANY

Manufacturer Address: MUMBAI - 400 30

Model / Type: MODEL NO. : KK/FE/LED/19

Category No. : CAT. NO. : KK/FE/LED/19 - 01

Gas: ETHYLENE

Gas Group: IIB

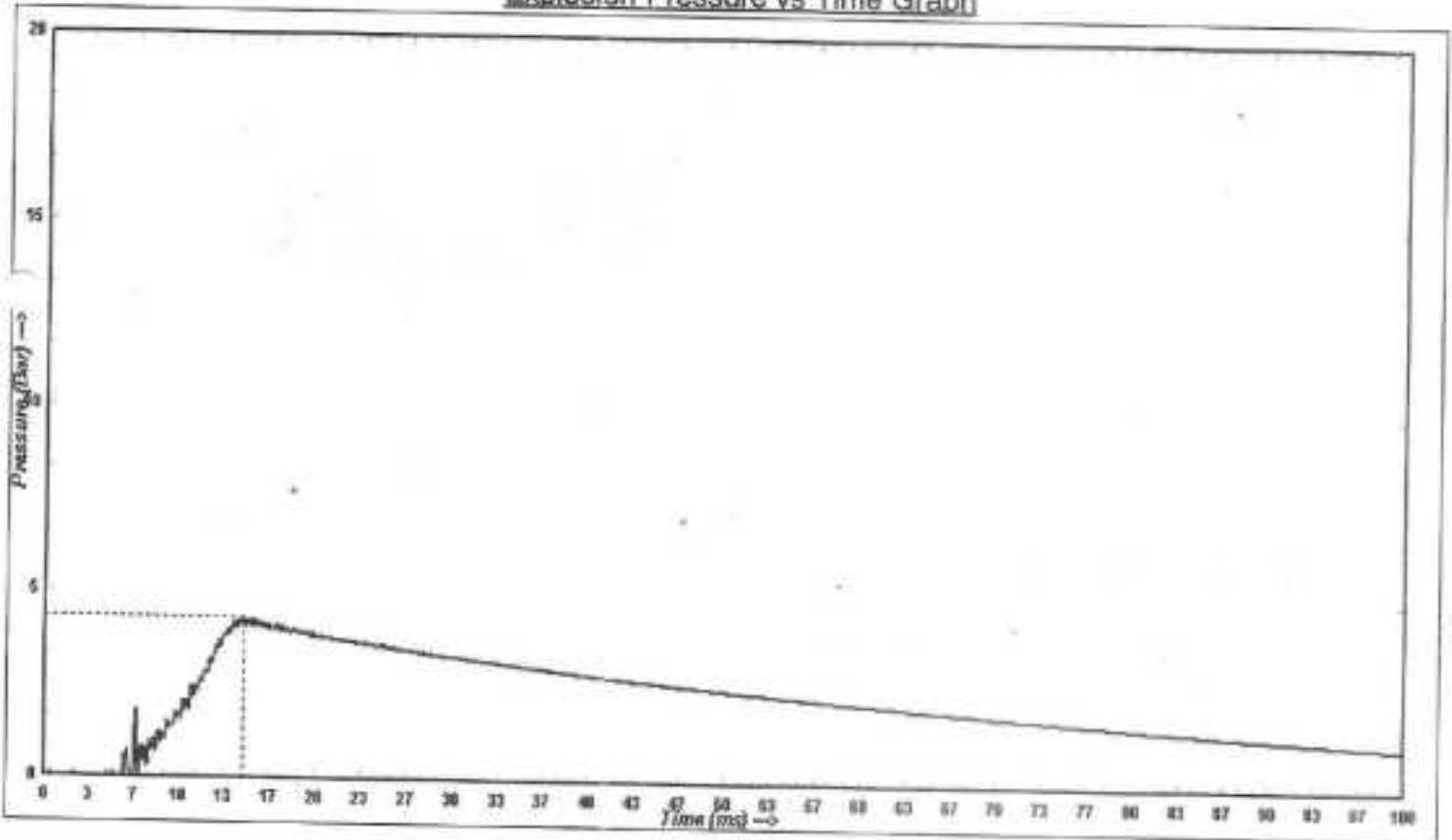
Equipment Details: FLPWP LED / FISH EYE CAMERA ENCLOSURE

Enclosure Details: SINGLE ENCLOSURE

Serial / Badge No. : NA

Peak Pressure: 4.34 Bar at 14.82 ms

Explosion Pressure vs Time Graph



Amal Kumar
 05/02/2020
 (Testing Officer)

Shyam
 05/02/2020
 (Discipline Head)

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(Flameproof & Equipment Safety)

Equipment ID No.: 137/19 ULR No.:TC596220000000218F Code No. FES/87 D/19-20

Result #B3: Test for Non transmission of internal ignition:

Gas Mixture: Test with 37% Hydrogen in air for Gas Gr. IIB

No. of Tests: 5 nos. tests with Single enclosure.

Test Condition: Table 12 and 15.3.2.1 (No precompression required)

Name of Enclosure	Test Ref. Nos.	Gas Group	Gas Mixture % in Air	No. of Test	Result
Single Enclosure	EIT/1371905 to EIT/1371909	IIB	37 % Hydrogen	Five	Pass

Conclusion: The Flameproof cum Weatherproof LED/Fish Eye Camera Enclosure, in cast aluminium Alloy LM-6 construction designated by Model: KK/FE/LED/19 meets the test requirements for flameproofness as per IS/IEC 60079-1: 2014, general requirements as per IS/IEC 60079-0: 2011, weatherproof (IP-66 degree) as per IS/IEC 60529:2001 (Reaffirmed 2014). Hence, the above mentioned equipment may be used for Gas Group: IIB Category EPL Gb atmosphere.

Reported By

A. Kumar

(A. KUMAR)

Technical Officer

Dated: 05th February, 2020

Flameproof & Equipment Safety

CSIR - Central Institute of Mining & Fuel Research,

Barwa Road, Dhanbad - 826 015,

(Jharkhand) India

Checked & Approved By

A. K. Singh

(A. K. SINGH)

Chief Scientist & HOS

Flameproof & Equipment Safety



सीएसआईआर-केन्द्रीय खनन एवं ईंधन अनुसंधान संस्थान

CSIR-Central Institute of Mining and Fuel Research

(वैज्ञानिक शिक्षा अनुसंधान एवं प्रदर्शन परिषद)

(Council of Scientific & Industrial Research)

बरवा रोड, नवमहाप्रदेश, भारत

Barwa Road, New Maharashtra, India

ज्वालासह एवं उपकरण सुरक्षा (AMEPR) & EQUIPMENT SAFETY

परीक्षण प्रमाण पत्र / TEST CERTIFICATE



NABL, Certificate No.: TC-5962

TYPE EXAMINATION CERTIFICATE

FORMAT NO.: (CIMFR: DQM: FLP02: F-01: REV-01)
(Flameproof & Equipment Safety)

Certificate No.: CMF 20 INEx 0100
ID. NO. 137/19

ULR No.: TC596220000000218F

Dated: 05/02/2020
(Issue No. 0)

1. Applicant : M/S. KESHKAMAT & CO.,
9/129, ADARSH NAGAR, PRABHADEVI,
MUMBAI - 400 030.
2. Manufacturer : Same as above
3. Equipment : Flameproof cum Weatherproof LED/Fish Eye Camera Enclosure.
4. Designated by : Model: KK/FE/LED/19.
5. Material of construction : Aluminium LM-6 Construction.
6. Type of protection : Ex d for Group: IIB atmosphere, EPL Gb.
7. Marking : Ex d IIB T6 Gb

This certificate is issued as verification that a sample/documentation was assessed and found to comply with the IS/IEC Standard list below. This certificate relates to only design and construction of the equipment. It does not cover requirement related to manufacturing process and usage.

8. Standard: The equipment and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

- IS/IEC 60079-0:2011 Explosive atmospheres - Part 0: General requirements.
IS/IEC 60079-1:2014 Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d".

This type test certificate does not indicate compliance with electrical safety and performance requirements other than those expressly included in the standards listed above.

9. Degree of ingress protection: IP-66 as per IS IEC 60529:2001

10. Test & Assessment Reports: A sample(s)/documents of the equipment listed have successfully meet the examination and test requirements as recorded in IN/CIMFR/TR20/435 Dated: 07 February, 2020.



सीएसआईआर-केन्द्रीय खनिज एवं ईंधन अनुसंधान संस्थान

CSIR-Central Institute of Mining and Fuel Research

(वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद)

(Council of Scientific & Industrial Research)

घरवा रोड, धनबाद-826015, झारखण्ड, भारत

Barwa Road, Dhanbad-826015, Jharkhand, India

ज्वालासह एवं उपकरण सुरक्षा / FLAMEPROOF & EQUIPMENT SAFETY

परीक्षण प्रमाण पत्र / TEST CERTIFICATE



NABL, Certificate No.: TC-5962

TYPE EXAMINATION CERTIFICATE

Certificate No.: CMF 20 INEx 0100

Dated: 05/02/2020

SCHEDULE

11. Description of equipment: Flameproof cum Weatherproof LED/Fish Eye Camera Enclosure Model No.: KK/FE/LED/19, Rated 10W LED at 240V AC/DC, material of construction Cast Aluminium Alloy L.M. - 6, Stainless Steel, Cast Iron, etc.

Enclosure Type	Volume (in cc).		Overall Dimension (mm)	Max. no. of aperture on cover	Rating / Temp. Class
	Gross	Nett			
Single enclosure	2500	370	Ø252x170	NIL	T6

12. Drawing and documents:

Sl. No.	Drg. No.	Title	Rev.	Sheet	Date
1.	KK/FE/LED/2019/01	FLAMEPROOF CUM WEATHERPROOF LED/FISH EYE CAMERA ENCLOSURE	0	1 of 4 to 4 of 4	20/05/2019

13. Routine Testing: A routine overpressure test in accordance with IS IEC 60079-1:2014 clause 16 shall be carried out at a pressure of 8 Kg/cm² for a period of at least 10 seconds and test results must be recorded. The overpressure test shall be considered satisfactory, if no permanent deformation or damage invalidating type of protection is observed, the joints shall in no place have been permanently enlarged and no leakage through the walls of the enclosure is observed.

14. Specific conditions of use: Not Applicable

15. Details of certificate changes (for issue 1 and above): Not applicable.

16. Additional Information: Not Applicable

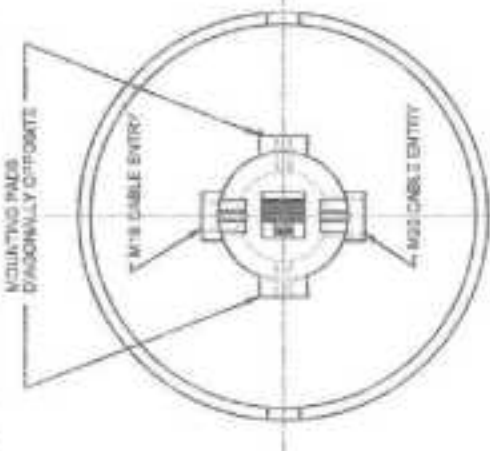
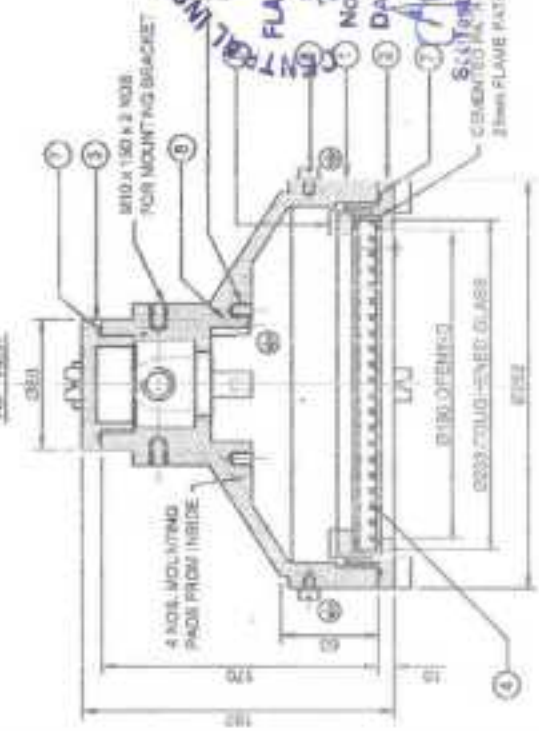
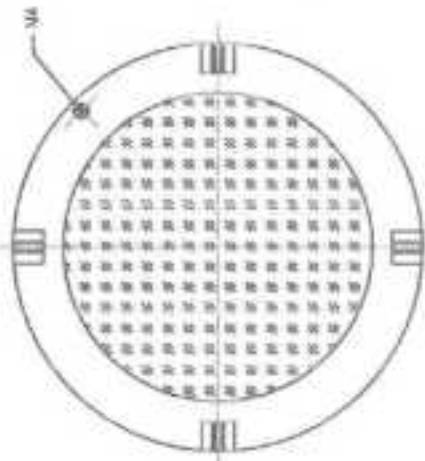
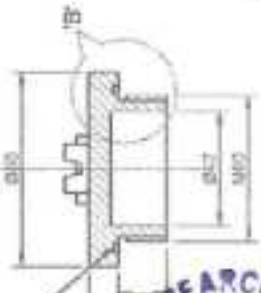
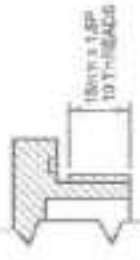
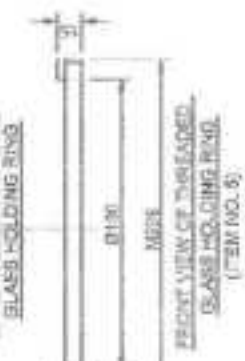
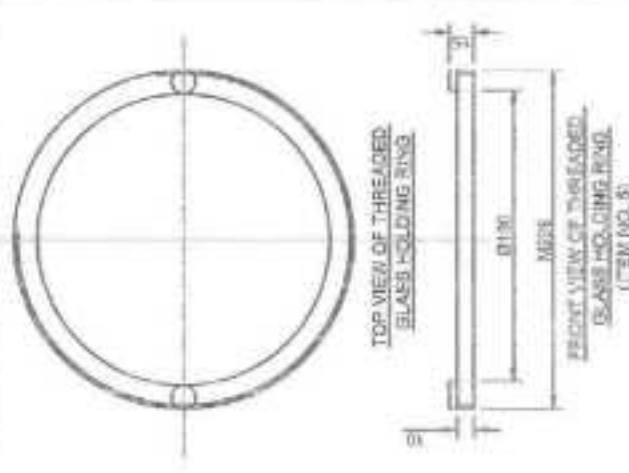
17. History: CMF 20 INEx 0100 Dated 05/02/2020 Issue 0.

Approved for issued on behalf of CIMFR
Position


Dr. A. K. Singh
Chief Scientist & HOS

This Institute reserves the right to review, amend or withdraw this Type Examination certificate at any time if considered necessary in the interest of safety.

KK/FE/LED/19



CENTRAL INSTITUTE OF MINING & FUEL RESEARCH (INDIA)
FLAME PROOF & EQUIPMENT SAFETY CERTIFIED VIDE TEST REPORT
 No. CIMFTR/2014/35 DATED 07/02/2020
 Sd/- *[Signature]* Safety Officer
 HOS

ALL DIMENSIONS ARE IN MM.
 TOLERANCE ± OVERALL DIMENSIONS ± 0.10mm.
 EXCEPT FOR FLAME PATH & GMP

TITLE: FLAMEPROOF OJM WEATHERPROOF LED / FISH EYE CAMERA ENCLOSURE (FCR GAS GROUP - I B ZONE - 1)

MODE: KK/FE/LED/19

AS PER S/IEC: 60079-1 (2014)
 S/IEC: 60079-0 (2011)
 S/IEC: 60529 (2001)

CAT NO KK/FE/LED/19

DRD. NO KK/FE/LED/2019/01

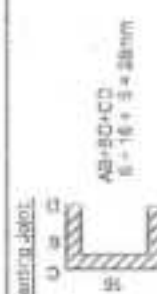
SHEET 1 OF 4
 SIZE B

REV. NO	REV. DATE	DOUG. GA	DIM. mm	SCALE	APPD.
0	20.03.2016			N.T.S.	

CHECKED *[Signature]*
 ENGINEER *[Signature]*

Keshkamat & Company
 MUMBAI - 400 088

Concentrg. material = Epoxy resin + Hardner
 Ratio = 1:1 (By volume)
 C.O.T = - 30° C to 120° C
 MAKE = MERALDITE



KSK/FE/LED/19 (13)

NOTE DETAILS :-

FLAMEPROOF GUM WEATHERPROOF JUNCTION BOX FOR CCTV SYSTEM IS MADE AS PER SPECIFICATIONS GIVEN BELOW

- MATERIAL OF CONSTRUCTION - IS LMS THE COMBINATION IS AS GIVEN BELOW.
 COPPER = 0.1 % MAX., MAGNESIUM = 0.1 %, IRON = 0.8 %
 ZINC = 0.1 % MAX., LEAD = 0.1 % MAX., MAGANESE = 0.5 % MAX.
 NICKEL = 0.1 % MAX., SILICON = 10 TO 13 %, TITANIUM = 0.2 % MAX.
 TIN = 0.05 % MAX., ALUMINIUM = 80 TO 88 % MAX., DIFFERENCE VARIATION.
 THE CONSTRUCTION MATERIAL CAN BE S.S.
 MAGNESIUM CONTENT NOT MORE THAN 0% IN TOTAL OF MAGNESIUM AND TITANIUM BY MASS.
 SURFACE FINISH - 6.3 MICRONS.
- 25mm IS MAINTAINED AS FLAME PATH ALONG THE THREADED JOINTS AND THE CLEARANCE BETWEEN THE BODY AND COVER IS 0.3mm.
 NEOPRENE O' RING GASKET IS PROVIDED ON THE FLANGED PORTIONS FOR WEATHERPROOFING. THESE ARE ONLY SUPPLEMENT AND DO NOT FORM PART OF FLAMEPROOF JOINTS. ANY DISPLACEMENT OR CHANGE OF THE GASKET WILL NOT HAMPER FLAMEPROOFNESS OF THE EQUIPMENT.
- THE MATERIAL THICKNESS AT THE BOTTOM AND AROUND THE TAPPED HOLES AND BLIND HOLES IS 5mm.
- THE ALLEN HEAD SCREWS/ BOLTS USED HAVE MINIMUM YIELD STRENGTH = 240 N/MS².
- ONE INSIDE AND TWO OUTSIDE EARTHING SCREWS ARE PROVIDED (SIZE M6 x 10).
 THE EARTHING OF THE JB IS DONE AT INSIDE AND OUTSIDE AS SHOWN.
 THE SCREWS HAVE FIRM THREADS AND NON CORROSIVE FINISHING.
 EARTHING CONDUCTOR USED SHALL BE 4mm² EXTERNALLY.
- NAUSE PLATE AND WARNING PLATES MADE OF S.S. MATERIAL. SCREWS AND NUTS AND ARE TIGHT WITH HAMMER DRIVE NUTS.
- MAX. CABLE ENTRY PORTS AS UNDER
 1. SIZE M20 x 1.5 PITCH = 1 NO. OR
 2. SIZE M25 x 1.5 PITCH = 1 NO.
- WALL THICKNESS IS MAINTAINED = 10mm MIN.
- HYDRO TEST PROCEDURE DETAILS:
 STATIC PRESSURE = 10 MPa OR 1.5 TIMES TEST PRESSURE OF INSTRUMENT.
 15 MINIMUM IS GREATER.
- INGRESS PROTECTION = IP 6E
- TUBEL

NO.	TOTAL VOLUME (C.C.)	EFFECTIVE ACTUAL VOLUME (C.C.)
1	2,500 C.C.	370 C.C.

DATE: 07/02/2019
 HOS
- TOTAL VOLUME (VOLUME OF THE JUNCTION BOX FROM INSIDE JB IN C.C. (CUBIC CENTIMETER))
 EFFECTIVE ACTUAL VOLUME (VOLUME LEFT AFTER KEEPING EQUIPMENT / SWITCHES / WIRES ETC. INSIDE THE JUNCTION BOX) IN C.C.
- TEMPERATURE CLASS = 15.
- MINIMUM THICKNESS AROUND ALL HOLES FOR BOLT / SCREW = 5mm.
- MAXIMUM WIDTH / GAP OF THE FLANGED PORTION OF THE THREADED JOINT = 0.3mm.
- THE TERMINATIONS ARE PROVIDED ON THE TERMINAL BLOCK AS THIS IS A DIRECT CABLE ENTRY IN TO THE JB. TERMINATION OF EQUIPMENT AND OUT-GOING ARE DONE ON THIS TERMINAL BLOCK ONLY.
- THE NEOPRENE GASKET IS 3mm O' RING ENDLESS IS USED FOR IP 6E PROTECTION. THE GASKET IS EVENLY COMPRESSED TO FULL EST BETWEEN THE COVER AND BODY. GASKET RING WILL BE RETAINED WITH COVER.
- DEPTH OF THREADS AND BOLT ENGAGEMENT IS MAINTAINED AS PER REQUIREMENT OF IS STANDARD.

BILL OF MATERIAL

SER. NO.	DESCRIPTION	MATERIAL	QTY.	REMARKS
1	MAIN BODY	LMS	1	
2	FRONT COVER	LMS	1	
3	TOP COVER	LMS	1	
4	TOUCHERED GLASS	GLASS	1	3203 x 10mm THK.
5	GLASS HOLDING RING	LMS	1	
6	FRONT COVER LOCKING SCREW	S.S.	1	M6 x 35 L
7	O' RING/GASKET / GASKET	NEOPRENE	1	ØM ENDLESS
8	CHEESE HEAD SCREW WITH SPRING WASHERS FOR EARTHING	BRASS	3	M6 x 10 L
9	NAUSE PLATE	B.S.	1	
10	WARNING PLATE	S.S.	1	
11	TERMINAL BLOCK	CHANNEL CLIP-ON CONNECTOR	1	NON TERMINATING WIRE / CABLE

ALL DIMENSIONS ARE IN mm. TOLERANCE IN OVERALL DIMENSIONS ± 0.3mm. EXCEPT FOR FLAME PATH & GAP	
TITLE	FLAMEPROOF GUM WEATHERPROOF LED / FISH EYE CAMERA ENCLOSURE (FOR GAS GROUP - II B ZONE - I)
MODEL	KK/FE/LED/19
AS PER	IS/IEC: 60079-1 (2014) IS/IEC: 60079-0 (2011) IS/IEC: 60529 (2001)
CAT NO.	KK/FE/LED/19
DRW. NO.	KK/FE/LED/2019/01
SIZE	B

REV. NO.	REV. DATE	ORIGINAL	APPRO.
0	30.08.2019	CHANGE	
DOC.	EN	mm	SCALE
CHECKED	EN	mm	N.T.E.
ENGINEER	[Signature]		
DRAWN	[Signature]		

Keshkamat & Company MUMBAI - 400 030	
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 KESHKAMAT & COMPANY B/129, ADARSH NAGAR, PRADEHDEV, MUMBAI-400 030, INDIA		
TYPE : FLAMEPROOF CUM WEATHERPROOF LED / FISH EYE CAMERA ENCLOSURE EX 'd' II B TB (+20° C TO +40° C) IP-65, T8		MODEL : KK/FE/LED/19
CAT NO. : KK/FE/LED/19	SR. NO. :	
DRG. NO. : KK/FE/LED/2019/01	AS PER : IS/IEC: 60079-1 (2014)	
CIMFR CERT. NO. :	IS/IEC: 60079-0 (2011)	
ISOLATE SUPPLY BEFORE OPENING		

50

100

NAME PLATE
(ITEM NO. 9)

 WARNING ISOLATE SUPPLY BEFORE OPENING

20

60

WARNING PLATE
 (ITEM NO. 10)
 CENTRAL INSTITUTE OF MINING & FUEL RESEARCH
 DHANBAD (INDIA)
 FLAME PROOF & EQUIPMENT SAFETY
 CERTIFIED VIDE TEST REPORT
 No. CIMFR/TP/20/135
 DATED 07/07/2020
Amit Kumar
 Scty Testing Officer
[Signature] HCS

ALL DIMENSIONS ARE IN mm.
TOLERANCE IN OVERALL DIMENSIONS +/-10mm.
EXCEPT FOR FLAME PATH & GAP

				TITLE : FLAMEPROOF CUM WEATHERPROOF LED / FISH EYE CAMERA ENCLOSURE (FOR GAS GROUP - II B ZONE - 1)	
				MODEL : KK/FE/LED/19	
				AS PER: IS/IEC: 60079-1 (2014) IS/IEC: 60079-0 (2011) IS/IEC: 60529 (2001)	
0	20.05.2019	ORIGINAL		CAT NO. KK/FE/LED/19	
REV. NO.	REV. DATE	CHANGE	APPD.	DRG. NO. KK/FE/LED/2019/01	
		DOC. GA	DIM mm	SCALE N.T.S.	SHEET 4 OF 4
DRAWN <i>Samson</i>		CHECKED <i>[Signature]</i>	ENGINEER <i>[Signature]</i>		SIZE B
 Keshkamat & Company MUMBAI - 400 030					

KK/FE/LED/19

17