

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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Test & Assessment Report No.: IN/CIMFR/TR20/ 116

Dated: 10 January, 2020

ID. NO.: 141/19

ULR No.: TC59621900000193F

TC CODE NO. PES/87 G/19-20

To,
M/s. KESHKAMAT & CO.,
9/129, ADARSH NAGAR, PRABHADEVI,
MUMBAI - 400 030 (INDIA).

Subject: Type Examination Certificate along with test assessment report of Flameproof can Weatherproof Junction Box, Model: KKJB/19C Cat. No. KK/JB/60/C, in cast aluminium alloy LM-6 construction as per IS/IEC 60079-1:2014 for use in Gas Group: IIB, EPL Gh/Ds atmosphere.

-(Test Report)

Your Ref. Appli. No.: KK/CIMFR/19/08

Dated: 07/07/2019

Dear Sir,

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

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

Charges of Rs. 44,498/- (Rupees Forty Four Thousand Four Hundred & Ninety Eight Only) including applicable GST involved towards the testing have been adjusted against the advance deposit made by you.

Kindly acknowledge the receipt.

Thanking you.

Yours faithfully,

S. K. Mondal
10/01/2020

(S. K. MONDAL)

BOS

TESTING CELL

Encl: As above.

1. Test assessment report in Quadruplicate
 2. Type Examination Certificate
- Copy to: 1. Head, Flameproof & equipment Safety
2. BiH section



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ज्वालासह एवं उपकरण सुरक्षा / FLAMEPROOF & EQUIPMENT SAFETY

परीक्षण प्रमाण पत्र / TEST CERTIFICATE



SAIL, Certificate No.: TC-8962

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

(Flameproof & Equipment Safety)

Equipment ID No.: 141/19

ULR No.: TC596220000000193P

Code No.: FES/87 Q/19-20

Test & Assessment Report No.: IN/CIMFR/TR20/ 116	Dated: 10 January, 2020
Application Ref. No.: KK/CIMFR/19/08	Dated: 07/07/2019

1. Applicant : M/s. KESHKAMAT & CO.,
9/129, ADARSH NAGAR,
PRABHADEVI, MUMBAI - 400 030.
2. Manufacturer : Same as above
3. Equipment : Flameproof cum Weatherproof Junction Box.
4. Designated by : Model: KKJB/19C Cat. No. KK/JB/60/C.
5. Gas Group & EPL : Gas Group: IIB, EPL. Gh.
6. Electrical ratings : Rated 240V AC/250V DC, 200W.
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 Junction Box

Enclosure Type	Volume (cc).		Dimension (mm) LxBxH	Min. Wall Thickness (mm)	Nos. & Size of Bolts/Fasteners in (mm)
	Gross	Net			
Single enclosure	7350	950	200x200x150	10mm	12 Nos. M8x35mm Long

Glass details		Max no. of aperture on cover
NA		NA

11. Nature of Flameproof Joint: Type of joints and gaps (Spigot joint, Cylindrical, Flange Joint & Threaded Joint)

Sl. No.	Description (flamepath and location)	Type of joint	Min. Flamepath in mm		Maximum dia. Clearance/gap & Thd. in mm	
			Req.	Spec.	Req.	Spec.
1.	Between single enclosure body and cover.	Flange joint	L-12.5	L-15	0.20	0.15

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FORMAT NO.: {CIMFR: DQM: FLP02: F-01:REV-01}

(Flameproof & Equipment Safety)

Equipment ID No.: 141/19

ULR No.: TC59622000000193F Code No.: FES/87 G/19-20

Max. No. & size of cable entries: The maximum four number of following certified and approved FLP/WP double compression type cable gland/blanking plug can be used as following:

Sr. No.	Max. Size of Cable Entries	Nos. of Cable entries provided in test sample					
		Side - A	Side - B	Side - C	Side - D	Top	Bottom
1	M20X1.5P (L = 15mm, T=10nos.)	03	--	03	--	--	--
2	M25X1.5P (L = 15mm, T=10nos.)	--	03	--	03	--	--
3	M19X1.5P (L = 15mm, T=10nos.)	--	--	--	--	--	02
4	M25X1.5P (L = 15mm, T=10nos.)	--	--	--	--	--	02

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

13. Drawings: 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.

Sl. No.	Drwg. No.	Title	Rev.	Sheet	Date
1.	KK/JB/2019/20/C	FLAMEPROOF CUM WEATHERPROOF JUNCTION BOX (FOR GAS GROUP - IIB ZONE-1)	0	1 of 4 To 4 of 4	30/04/2019

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. As per Clause 4.3 Note of IS/IEC 60079-0:2011 the equipment mark IIIB is suitable for application requiring IIIA equipment.
- The material of construction of the enclosure may be CI/MS/SS/cast aluminium alloy instead of aluminum alloy LM-6 construction and lower electrical rating may be used for same temperature class.
- Equal and equivalent medium class fit NPT threads of medium class fit conforming to requirements of ANSI/ASME B1.20.1 may be used instead of metric threads conforming to ISO 965-1 & 965-3 as per Clause No. 5.3 & 13 of IS/IEC 60079-1:2014.
- The above equipment may also be used as Db area as per IS/IEC 60079-31: 2013 (Refer Table#C).

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)
- Dust ignition protection by enclosure 't' IS/IEC60079-31:2013

(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.

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परीक्षण रिपोर्ट / TEST REPORT



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ULR No.: TC59622000000193F

Code No.: FES/87 G/19-20

16. Documents/Samples Submitted: (i) Application form
(ii) Drawings
(iii) Prototype sample

17. Condition of sample received: Good

18. 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.

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 Report issued by CIMFR certifies that the equipment has been found to comply with the definition of Flameproof-Weatherproof equipment contained in the relevant Standard specifications. They do not vouch for the quality of the equipment in any other respect. The present test report pertains to the sample received only.

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

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

(Flameproof & Equipment Safety)

Equipment ID No.: 141/19

ULR No.: TC596220000000193F

Code No.: PES/87 G/19-20

Test & Assessment Report No.: IN/CIMFR/TR19/ 116

Dated: 10 January, 2020

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			
Clause	Tests	Remarks	Results (Complies, F- Pass, NA-Not Applicable, F-Fail) References
1	Scope		Complies
2	Normative references		Complies
3	Terms and definitions		Complies
4	Equipment grouping	Gas Group: IIB, EPL, Gb.	Complies
5	Temperature		
5.1.1	Ambient Temperatures	-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		Complies
7.2	Thermal Endurance		Complies
8	Metallic Enclosure and metallic part of End	Cast aluminium alloy LM-6 construction	Complies
9	Fasteners	Grade of fastener (declared 240N/m ²)	Complies
10	Interlocking devices		NA
11	Bushings		NA
12	Materials used for cementing		NA
13	Ex components		NA
14	Connection facilities and terminal compartments		NA
15	Connection facilities for earthing and bonding conductors		Complies
16	Entries into enclosures		Complies
17	Supplementary requirements for routing machines		NA
18	Supplementary requirements for switchgear		NA
19	Supplementary requirements for fuses		NA
20	Supplementary requirements for plugs and socket outlets and connectors		NA
21	Supplementary requirements for luminaries		NA
22	Supplementary requirements for cap lights and hand lights		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 test mixtures		
26.3	Tests for Flameproof (Ex 'd') protection		Complies

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परीक्षण रिपोर्ट / TEST REPORT

FORMAT NO.: (CIMPR: DQM: FLPO2: F-01:REV-01)

(Flameproof & Equipment Safety)

Equipment ID No.: 141/19

U.I.R No.: TC596220000000193F

Code No.: FES/87 G/19-20

26.4	Test of enclosures		
26.4.2	Resistance to Impact		Complies
26.4.3/26.4.4	Drop test	(not a handheld equipment or portable device)	NA
26.4.5	Degree of protection (IP) by Enclosures		
26.4.5	Test of IP of equipment	IP-66	Complies
26.5	Thermal tests		
26.5.1	Temperature measurement	T6	Complies
26.5.2	Thermal shock test		NA
26.6	Torque test for bushings		NA
26.7	Non-metallic enclosures or non-metallic parts of enclosures		
26.8	Thermal endurance to heat		Complies
26.9	Thermal endurance to cold		NA
26.10	Resistance to light		NA
26.11	Resistance to chemical agents for Group I Electrical Equipment		NA
26.12	Earth continuity test in non-metallic enclosure		NA
26.13	Surface resistance test of parts of enclosures of Non-metallic materials		NA
26.14	Measurement of capacitance		NA
26.15	Verification of ratings of ventilating fans		NA
26.16	Alternative qualification of elastomeric sealing O-rings		NA
27	Routine tests	Manufacturer's responsibility: Compliance to prototype of the product and physical measurement of gap and flamepath and overpressure at the pressure 7 kg/cm ² for every sample.	
28	Manufacturer's responsibility	Conformity of the equipment to the applicable standards	Complies
29	Marking	(Ex db IIB T6 Gb) (Ex tb IIC T85° Db)	
30	Instructions	Instruction related to use, installation, maintenance, adjustment to be provided by the manufacturer along with the equipment.	

Result#A1: 1kg mass of hardened steel fallen vertically on the surface of the Ex d aluminium alloy LM-6 enclosure to create impact energy for group II Equipment. No significant damage was observed.

Result#A2: The surface temperature-rise classification of the above Equipment has been determined by injecting 110% of rated current supply 1.8 Amp. (corresponding to 200W at 240V AC) into the bush mounted inside the enclosure and the surface temperature classification is considered as T6 at maximum ambient temperature of (40°C).

Result#A3: IP-Protection: Neoprene 'O' ring gasket (4mm thick) is provided at the end of the joint for weatherproof (IP-66) degree of protection. Tests have been conducted as per IS/IEC 60529:2001 (Re-affirmed 2014) 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. Pass
2.	Water Test (Second Numeral 6)	Clause 14.2.6	No water had accumulated inside the enclosure. Pass

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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	Flange Joint, Threaded joint	Complies
6	Sealed joints		
6.1	Cemented joints		NA
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		NA
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)	P (As per Result#B1)	Complies
15.2.3	Overpressure Test	P (As per Result#B2)	Complies
15.3	Test for non-transmission of an internal ignition		
15.3.1	General		Complies
15.3.2	Electrical equipment of Groups I, IIA & IIB	P (As per Result#B3)	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: As per Result #B3.	
17	Switchgear for Group I		NA
18	Lamp holders and lamp caps		NA
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 db IIB T6 Gb) (Ex tb IIC T85 Db)	
20.2	Caution and warning markings	"ISOLATE SUPPLY BEFORE OPENING"	
21	Instruction	The manufacturer shall supply instruction regarding flameproof etc. As per required by IS/IEC 60079-0:2011	



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परीक्षण रिपोर्ट / TEST REPORT

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

(Flameproof & Equipment Safety)

Equipment ID No.: 141/19

ULR No.: TC596220000000193F

Code No.: FES/87 G/19-20

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 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/1411901	Body	Body	4.34	24.48	No evidence of distress
PPM/1411902	Body	Body	3.59	36.72	-do-
PPM/1411903	Body	Body	3.59	35.40	-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 1 min.	Remark
Single enclosure	OPM/1411904	07 kg/cm ²	No damage or deformation

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: Clause 15.3.2.1 (No pre compression required)

Name of Enclosure	Test Ref. Nos.	Gas Group	Gas Mixture % in Air	No. of Test	Result
Single enclosure	EIT/1411905 to EIT/1411909	IIB	37% Hydrogen	Five	Pass

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ID Number: 141/19
ज्वालासह एवं उपकरण सुरक्षा / FLAMEPROOF & EQUIPMENT SAFETY
Code Number: FES/87G/19
Test Date: 29/09/2019
परिक्षण प्रमाण पत्र / TEST CERTIFICATE

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Manufacturer Details : M/S KESHKAMAT & COMPANY

Manufacturer Address : MUMBAI - 400 30

Model / Type : MODEL NO. : KKJB/19C

Category No. : CAT. NO. : KKJB/80/C

Gas : ETHYLENE

Gas Group : IIB

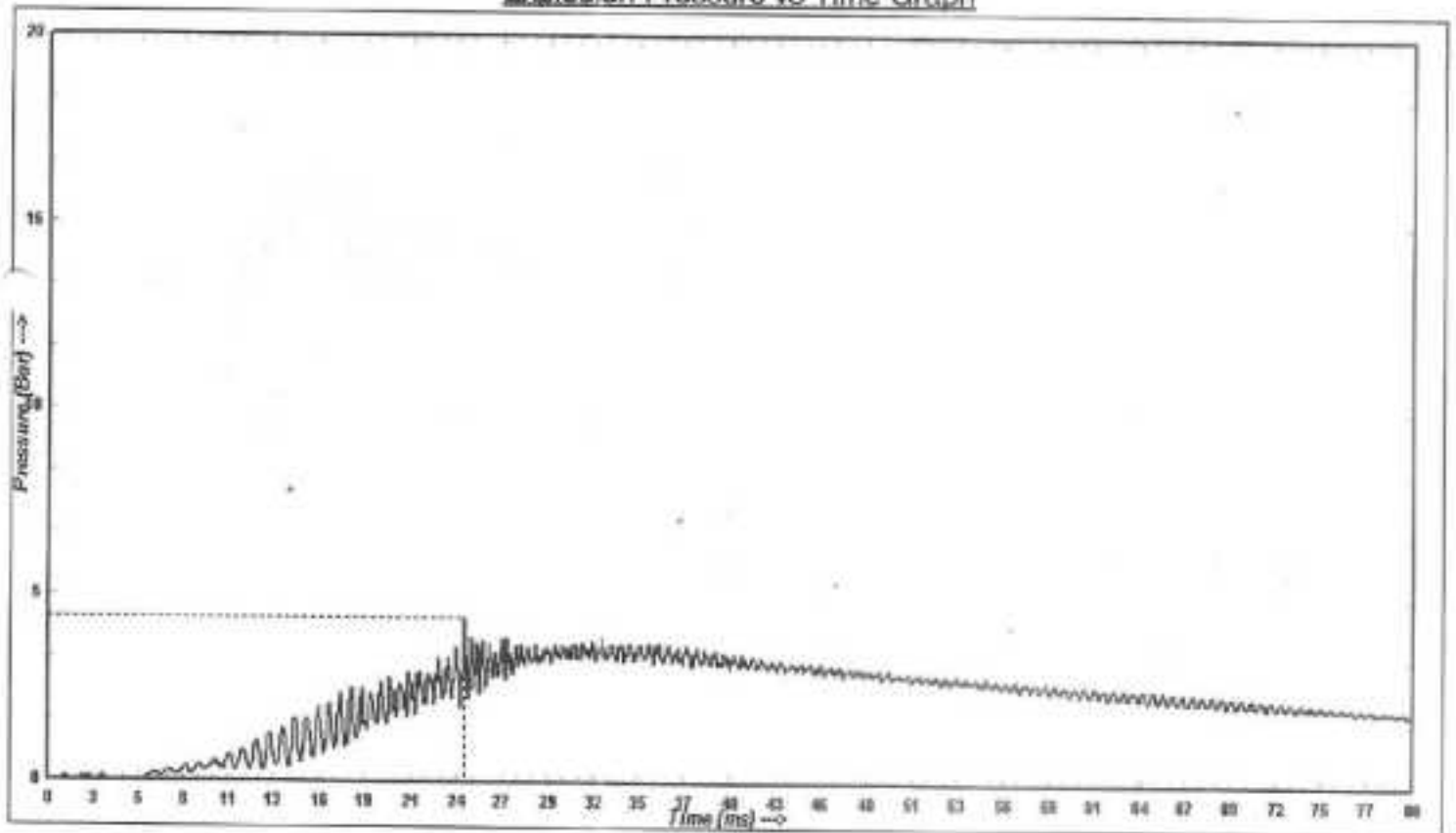
Equipment Details : FLPWP JUNCTION BOX

Enclosure Details : SINGLE ENCLOSURE

Serial / Badge No. : NA

Peak Pressure : 4.43 Bar at 24.48 ms

Explosion Pressure vs Time Graph



K. S. Keshkamat
09/10/2020

(Testing Officer)

[Signature]
09/10/2020

(Discipline Head)

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(Flameproof & Equipment Safety)

Equipment ID No.: 141/19

ULR No.: TC596220000000193F

Code No.: FES/87 G/19-20

Table #C: Tests of enclosure for dust ignition protection as per IS/IEC 60079-31: 2013:

Type Tests			
Clause No.	Description and relevant tests		Results (Complies, P- Pass, NA-Not Applicable, F-Fail) References
5.1.1	Nature of joint		Complies
5.1.2	Gasket and seals		Complies
5.1.3	Cemented joints		NA
5.1.4	Operating rods, spindles and shafts		NA
5.1.5	Windows		NA
5.2.1	Cable glands	Use only certified and approved cable gland	Complies
5.2.2	Threaded entries	Min. 5 threads	Complies
6.1.1	Type tests for dust exclusion by enclosures	IP-66	Complies
6.1.2	Thermal test	T6	Complies
6.1.3	Pressure test	7 kg/cm ²	Complies
6.2	Routine test	7kg/cm ²	To be done by manufacturer
7	Marking		(Ex d IIB T6 Gb) (Ex tb IIIC T85° C Db)

CONCLUSION: The Flameproof cum Weatherproof Junction Box, in cast aluminium alloy LM-6 construction, designated by Model: KKJB/19C Cat. No. KK/JB/60/C, meets the test requirement for flameproofness as per IS/IEC 60079-1:2014 & general requirements as per IS/IEC 60079-0:2011 and weatherproof (IP-66 degree) as per IS/IEC 60529:2001 (Reaffirmed 2014). Hence, the above mentioned equipment may be suitable for Gas Group: IIB atmosphere, having protection level EPL Gb and Db.

Reported By

M. K. Vishwakarma
09/01/2020

(M. K. VISHWAKARMA)

Sr. Technical Officer (I)

Dated: 09th January, 2020

Flameproof & Equipment Safety

CSIR - Central Institute of Mining & Fuel Research

Barwa Road, DHANBAD - 826 015,

(JHARKHAND), INDIA

Checked & Approved By

A. K. Singh
09/01/2020

(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 तथा औद्योगिक अनुसंधान परिषद)
(Council of Scientific & Industrial Research)

बरवा रोड, धनबाद-826015, झारखण्ड, भारत
Barwa Road, Dhanbad - 826015, Jharkhand, India

ज्वालासह एवं उपकरण सुरक्षा / FLAMEPROOF & EQUIPMENT SAFETY

परीक्षण प्रमाण पत्र / TEST CERTIFICATE

KKJB/19C (11)



NABL Certificate No.: TC-8962

TYPE EXAMINATION CERTIFICATE

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

Certificate No.: CMF 20 INEx 0076
ID. NO. 141/19

ULR No.: TC596219000000193F

Dated: 09/01/2020
(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 Junction Box.
4. Designated by : Model: KKJB/19C Cat. No. KK/JB/60°C.
5. Type of protection : Ex d for Gas Group IIB IFL Gb.
6. Marking : (Ex db IIB T6 Gb) (Ex tb IIB T85°C Db)

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.

7. 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".
IS/IEC 60079-31:2013 Explosive atmospheres - Part 31: Equipment Dust ignition protection by enclosure "t".

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

8. Degree of ingress protection: IP-66 as per IS IEC 60529:2001 (Reaffirmed 2014)

9. Test & Assessment Reports: A sample(s)/documents of the equipment listed have successfully meet the examination and test requirements as recorded in IN/CIMFR/TR20/116, Dated: 10 January, 2020.



सीएसआईआर-केन्द्रीय खनन एवं ईंधन अनुसंधान संस्थान

CSIR-Central Institute of Mining and Fuel Research

(वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद)
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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 0076

Dated: 09/01/2020

SCHEDULE

10. **Description of equipment:** Flameproof cum Weatherproof Junction Box, Model: KKJB/19C Cat. No. KKJB/60/C, Rated 240V AC/250V DC, 200W, Cast Aluminium Alloy LM-6 construction.

Enclosure Type	Volume (in cc)		Dimension (mm) LxBxH	Max. no. of aperture on cover	Rating / Temp. Class
	Gross	Nett			
Single enclosure	7350	950	200x200x150	NIL	T6

11. **Drawing and documents:**

Sl. No.	Drg. No.	Title	Rev.	Sheet	Date
1.	KK/JB/2019/20/C	FLAMEPROOF CUM WEATHERPROOF JUNCTION BOX (FOR GAS GROUP - III ZONE-1)	0	1 of 4 To 4 of 4	30/04/2019

12. **Routine Testing:** A routine overpressure test in accordance with IS IEC 60079-1:2014 clause 16 shall be carried out at a pressure of 7Kg/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.

13. **Specific conditions of use:** Not Applicable

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

15. **Additional Information:** Not Applicable

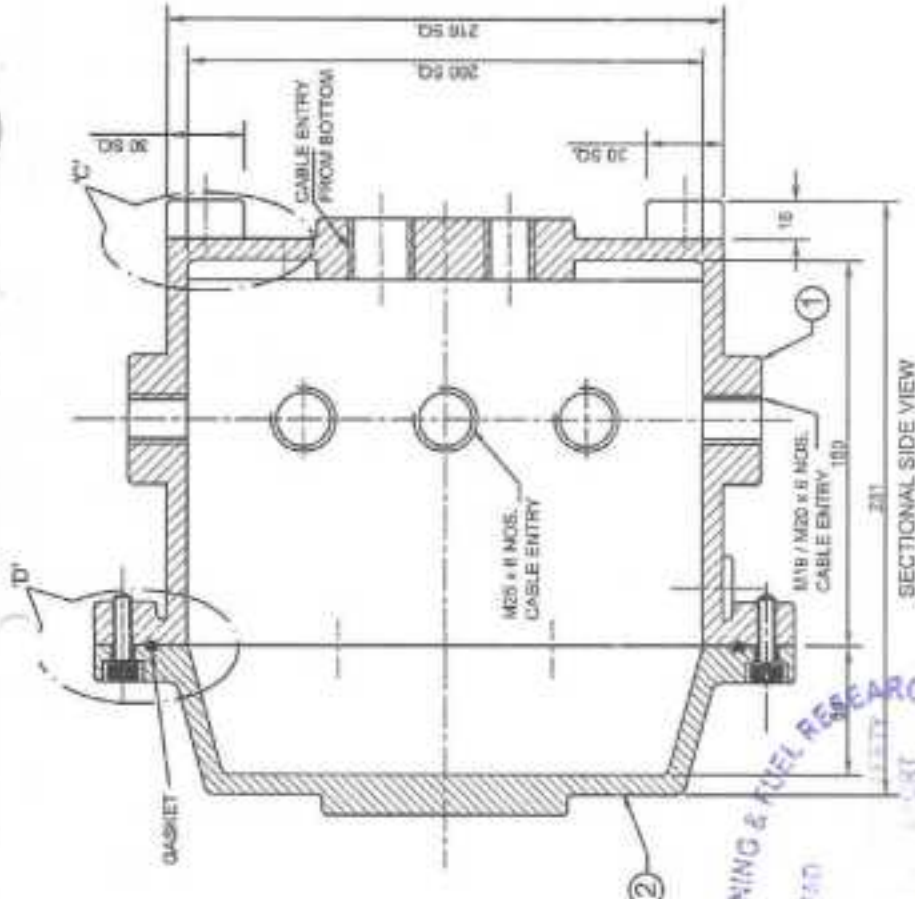
16. **History:** CMF 20 INEx 0076 Issue 0 dated 09/01/2020.

Approved & issued on behalf of CSIR-CIMFR

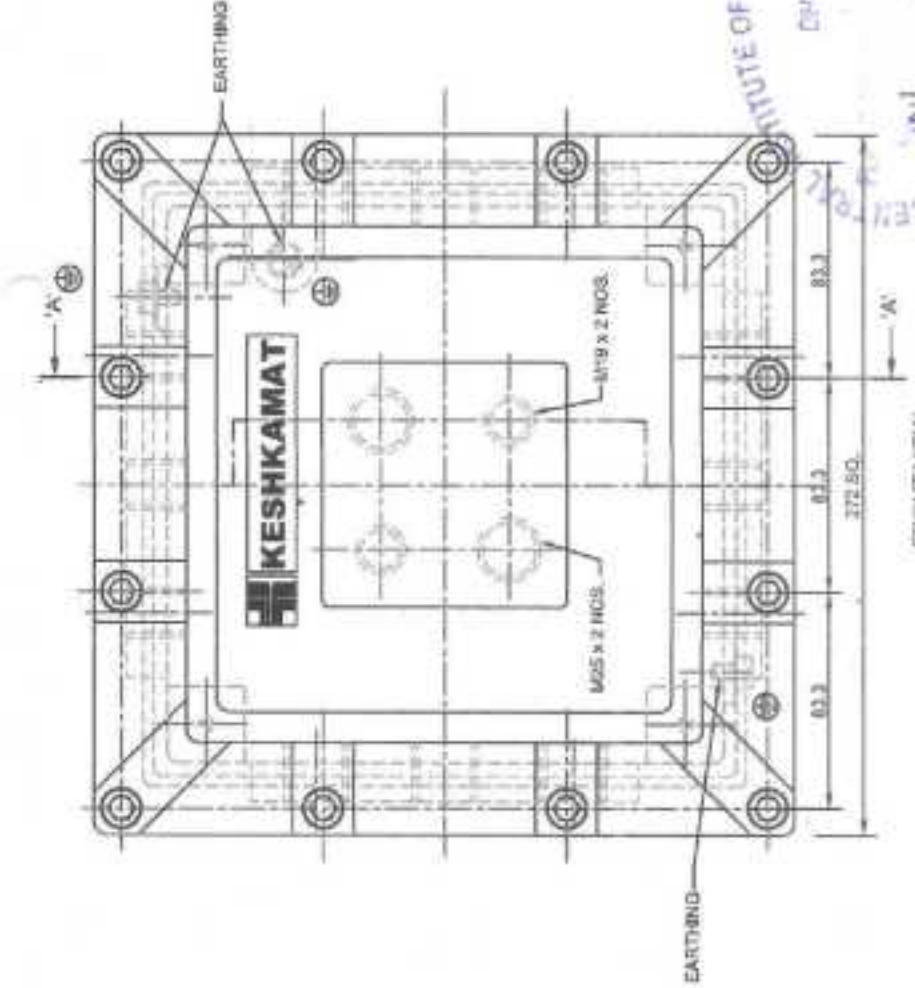

(Dr. A. K. Singh)
Chief Scientist & IOS

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.

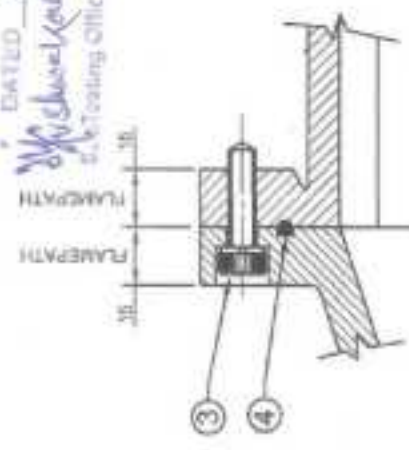
RKJG/19C (13)



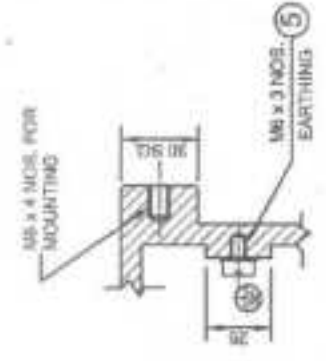
SECTIONAL SIDE VIEW SECTION A-A



FRONT VIEW



DETAIL 'D'



DETAIL 'C'

ALL DIMENSIONS ARE IN MM. TOLERANCE IN OVERALL DIMENSIONS +/- 0.10MM. EXCEPT FOR FLAME PATH & GAP.

TITLE : FLAMEPROOF CUM WEATHERPROOF JUNCTION BOX (FOR GAS GROUP - II B ZONE - 1)

MODEL : KK/JB/19C

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

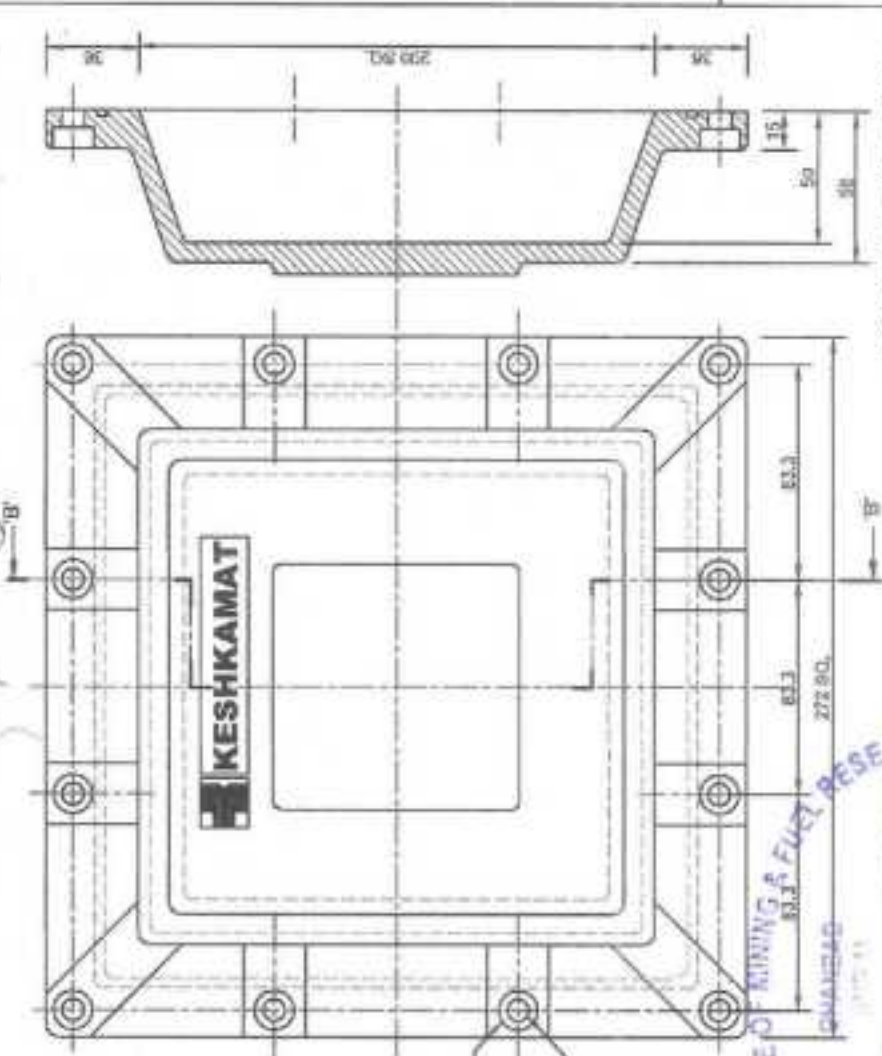
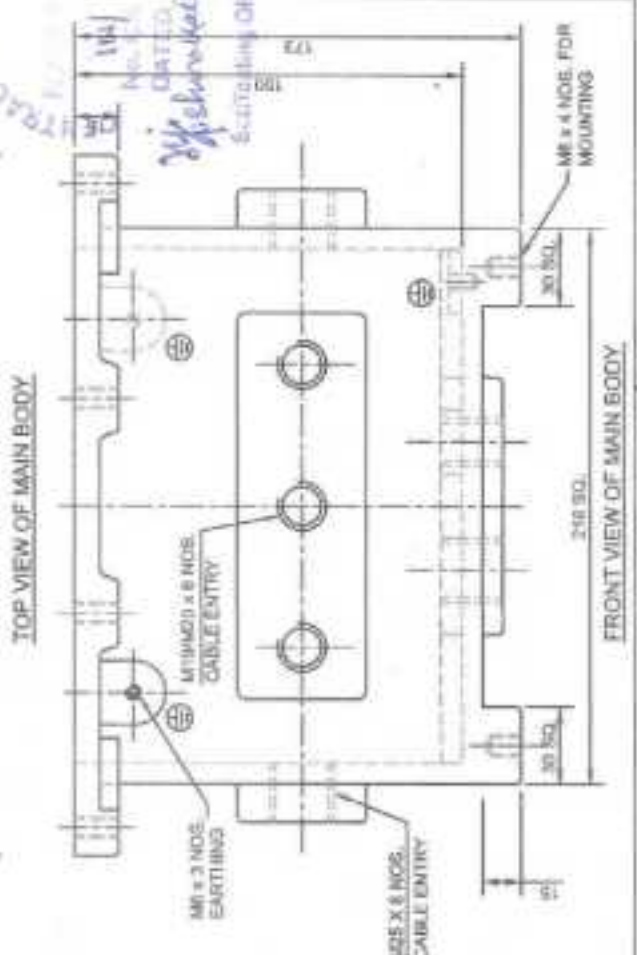
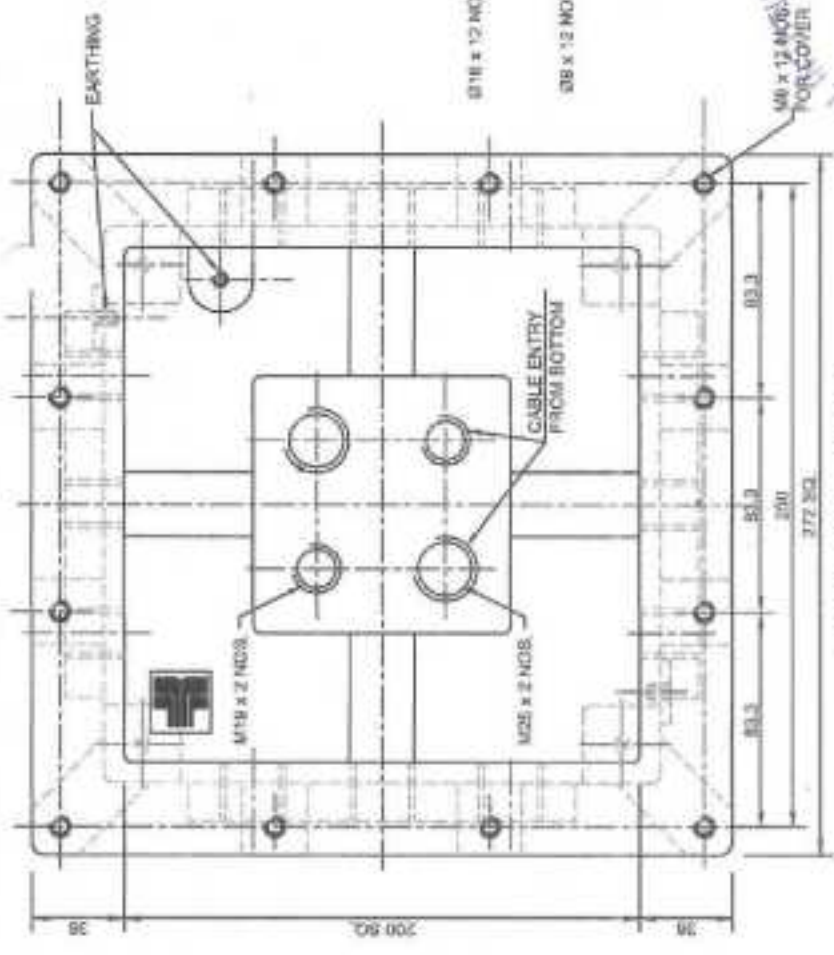
CAT. NO. KK/JB/60/C
DRG. NO. KK/JB/2019/20/C
SHEET 1 OF 4
SIZE B

INSTITUTE OF MINING & FUEL RESEARCH
DRAWN BY: [Signature]
DATE: 10/10/2019
CHECKED BY: [Signature]
DRAWN: [Signature]

REV. NO.	0	REV. DATE	30.04.2019	ORIGIN	ORIGINAL	SCALE	N.T.S.
DRAWN	[Signature]	CHECKED	[Signature]	DOC. GA	GA	DIM. REV	REV
ENGINEER	[Signature]						

Keshkamat & Company
MUMBAI - 400 031

EXP/192 (19)



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

TITLE: FLAMEPROOF CUM WEATHERPROOF JUNCTION BOX (FOR GAS GROUP - II B ZONE - 1)

MODEL: KK/JB/19C

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

DAT NO. KK/JB/60/C

DWG. NO. KK/JB/2019/20/C

SHEET 2 OF 4

SIZE B

REVISIONS

REV. NO.	REV. DATE	DESCRIPTION	APPD.
0	30.04.2019	ORIGINAL	
		CHANGE	

SCALE: N.T.S.

CHECKED: [Signature]

ENGINEER: [Signature]

DRAWN: [Signature]

DESIGNING OFFICER: [Signature]

DATE: 10/01/2020

NO.: 116

PROJECT: Rtd 116

RESEARCH: [Signature]

Keshkammat & Company
MUMBAI - 400 030

NOTE DETAILS :-

FLAMEPROOF CUM 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 = 0.5 %
 ZINC = 0.1 % MAX., LEAD = 0.1 % MAX., MAGNESIUM = 0.6 % MAX.,
 NICKEL = 0.1 % MAX., SILICON = 10 TO 15 %, TITANIUM = 0.2 % MAX.,
 TIN = 0.06 % MAX., ALUMINIUM = 40 TO 48 % 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 - 8.3 MICRONS.
- 12.3mm IS MAINTAINED AS FLAME PATH ALONG THE FLANGE / SURFACE JOINTS AND THE CLEARANCE BETWEEN BODY AND COVER IS 4.5mm.
 NEOPRENE 'O' RING / GASKET IS PROVIDED ON THE FLANGE PORTIONS FOR WEATHERPROOFING. THESE ARE ONLY SUPPLEMENT AND DO NOT FORM PART OF FLAMEPROOF JOINTS. ANY DISPLACEMENT 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 mm2.
- 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 NOW CORROSIVE BONDING. EARTHING CONDUCTOR USED SHALL BE 4mm² EXTERNALLY.
- NAME PLATE AND WARNING PLATES MADE OF S.S. MATERIAL ARE PROVIDED AND AIR FIXED WITH HAMMER DRIVE RIVETS.
- MAX. CABLE ENTRY PORTS AS UNDER:
 1. SIZE M20 x 1.5 PITCH = 6 NOS.
 2. SIZE M25 x 1.5 PITCH = 6 NOS.
 3. CABLE ENTRIES FROM BOTTOM M19 x 2 NOS. AND M25x 2 NOS. MAX. 4 GLANDS FROM BOTTOM.
- WALL THICKNESS IS MAINTAINED = 10mm MIN.
- HYDRO TEST PROCEDURE DETAILS:
 STATIC PRESSURE = 10kg/cm² OR 1.5 TIMES TEST PRESSURE, WHICHEVER IS GREATER.
 INGRESS PROTECTION = IP : 65/W.

MODEL	SIZE	TOTAL VOLUME G.C.	EFFECTIVE ACTUAL VOLUME G.C.
JB 19/C	200 x 200 x 150	7,350 C.C.	950 C.C.

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 JB IN C.C.

13. TEMPERATURE CLASS = T4

15. MINIMUM THICKNESS AROUND ALL HOLES FOR BOLT / SCREW = 5mm.

14. MAXIMUM WIDTH / GAP OF THE FLANGED PORTION OF THE FLANGE / SURFACE JOINT = 1.15mm.

16. THE TERMINATIONS ARE PROVIDED ON THE TERMINAL BLOCK AS THIS IS A DIRECT CABLE ENTRY IN TO THE J.B. TERMINATION OF EQUIPMENT AND OUTGOING ARE DONE ON THIS TERMINAL BLOCK ONLY.

15. THE NEOPRENE GASKET Ø 4mm 'O' RING ENDLESS USED FOR IP : 65 PROTECTION. THE GASKET IS EVENLY COMPRESSED TO FULLST 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.
- PITCH BETWEEN TWO CABLE GLAND ENTRY = 55mm. AS SHOWN IN THE DRAWING.
- TOLERANCE FOR ALL THREADS - AS PER IS / ISO 985, 1-3.
- ELECTRICAL RATING: 240 V AC / 240 V DC AND MAX. POWER UP TO 250 WATTS.

BILL OF MATERIAL

S.R. NO.	DESCRIPTION	MATERIAL	QTY.	REMARKS
1	MAIN BODY	LMS	1	
2	COVER	LMS	1	
3	ALLEN CAP HD SCREW / BOLTS WITH SPRING WASHERS	LMS	12	M6 x 35 L
4	'O' RING/GASKET / GASKET	NEOPRENE	1	Ø4 ENDLESS
5	CHEESE HEAD SCREW WITH SPRING WASHERS FOR EARTHING	BRASS	3	M6 x 10 L
6	NAME PLATE	S.S.	1	
7	WARNING PLATE	S.S.	1	
8	TERMINAL BLOCK	CHANNEL CUP-ON CONNECTOR	1	NON TERMINATING WIRE / CABLE

CENTRAL INSTITUTE OF MINING & FUEL RESEARCH
 FLAME PROOFING & SAFETY
 IN / No. CUM/19/C/2019/116
 DATED 10/01/2020
 S. J. Shinde
 S. J. Shinde
 S. J. Shinde

ALL DIMENSIONS ARE IN mm.
 TOLERANCE IN OVERALL DIMENSIONS ±10mm.
 EXCEPT FOR FLAME PATH & GAP

TITLE: FLAMEPROOF CUM WEATHERPROOF JUNCTION BOX (FOR GAS GROUP - II B ZONE - 1)

MODEL: KK/JB/19C

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

CAT NO. KK/JB/50/C

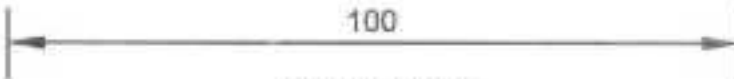
DRG. NO. KK/JB/2019/20/C
 SHEET 2 OF 4
 SIZE B

Keshkamat & Company
 MUMBAI - 400 030

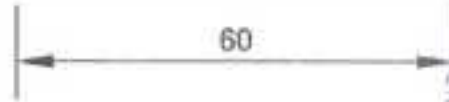
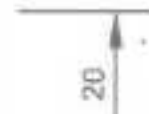
REV. NO. 01
 REV. DATE 30.04.2019
 ORIGINAL
 CHANGE
 APPD.
 SCALE N.T.S.
 ENGINEER
 CHECKED
 DRAWN
 S. J. Shinde

KKJB/19C (16)

 KESHKAMAT & COMPANY 9/126, ADARSH NAGAR, PRASADDEV, MUMBAI-400 033, INDIA	
TYPE : FLAMEPROOF CUM WEATHERPROOF JUNCTION BOX FOR CCTV SYSTEM EX 'II' II B TB (+20° C TO +40° C) IP-65, T8	MODEL : KKJB/19C
CAT NO. : KK/JB/60/C	SRL NO. :
DRG. NO. : KK/JB/2019/20/C	AS PER : IS/IEC: 60079-1 (2014) IS/IEC: 60079-0 (2011) IS/IEC: 60529 (2001)
CIMFR CERT. NO. :	
ISOLATE SUPPLY BEFORE OPENING	



NAME PLATE
(ITEM NO. 6)



WARNING PLATE
(ITEM NO. 7)

CENTRAL INSTITUTE OF MINING & FUEL RESEARCH
DHANBAD

IN/ R20/116
DATE 10/01/2020
S. J. Testing Officer
HOS

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

0	30.04.2019	ORIGINAL	
REV. NO.	REV. DATE	CHANGE	APPD.
		DOC. GA	DIM mm
DRAWN <i>Beemson</i>		CHECKED <i>Be</i>	ENGINEER <i>Keshkamat</i>

TITLE : FLAMEPROOF CUM WEATHERPROOF JUNCTION BOX (FOR GAS GROUP - II B ZONE - 1)	
MODEL :	KKJB/19C
AS PER :	IS/IEC: 60079-1 (2014) IS/IEC: 60079-0 (2011) IS/IEC: 60529 (2001)
CAT NO.	KK/JB/60/C

 **Keshkamat & Company**
MUMBAI - 400 033

DRG. NO.	KK/JB/2019/20/C	SHEET 4 OF 4
		SIZE B