

केन्द्रीय खनन अनुसंधान संस्थान  
( वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद् )  
बरवा रोड, धनबाद-828 001  
बिहार, भारत



CMRI

Central Mining Research Institute

( Council of Scientific & Industrial Research )  
BARWA ROAD, DHANBAD-828 001  
BIHAR, INDIA

NO. CMRI/TC/ H426 .....

Dated: ... March 1996.

30/04

To,  
M/s. HANSU CONTROLS LIMITED  
A-420, T.T.C. IND. AREA, MIDC MAHAPE  
NEW BOMBAY - 400 701.

Sub:- Flameproof Testing as per IS:2148-1981 of your Flameproof  
cum Weatherproof Enclosure for 4-Way JUNCTION BOX in cast  
Aluminium Alloy LM-6 construction, designated by Type :  
HA-52. - REPORT ON.

Your Ref.No. L/CMRS/1695 Dated : 29/01/1996.

Dear Sirs,

Please find enclosed the test report (Prototype) of the  
above Junction Box, submitted by you.

Charges of Rs. 5075/- (Rupees Five thousand Sevetyfive) only  
including contingency 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 CMRI would dispose  
off the sample by public auction without further notice.

Kindly acknowledge receipt.

Thanking you.

Yours faithfully,

(C. Bandopadhyay)  
Scientist-in-charge  
Testing Cell

Encl : As above.

Test Report in Triplicate.

Copy to (1) Sri. L. Achari, Sec. F-II

फोन-निदेशक, Director, पी. ए. एम्स, PAX  
Phone - Off. 822186 832067, 832098, 832101

ठार - मिनसर्ष, धनबाद  
Gram : MINSEARCH, Dhanbad

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0328-822214

कार्यालय के दिन : सोमवार से शुक्रवार तक Working days : Monday to Friday



CMRI

के. आ. प्र. सं. परीक्षण प्रयोगशाला CMRI TESTING CELL

केन्द्रीय खनन अनुसंधान संस्थान

**CENTRAL MINING RESEARCH INSTITUTE**

(Council of Scientific & Industrial Research)

बरवा रोड, धनबाद-826001 (भारत) BARWA ROAD, DHANBAD-826001 (India)

परीक्षण प्रमाण पत्र **TEST CERTIFICATE**



FIRST SCHEDULE

[For association with the report of tests sent (under cover of this office letter No. CMRI/TC/.. *HA 26*.. dated. *30/4*.. March '1996) to M/s. Hansu Controls Limited, A-420 TTC Ind. Area MIDC Mahape, New Bombay-400 701, in respect of the equipment mentioned below submitted to CMRI for test.]

APPARATUS :

Cast aluminium alloy LM-6 constructed flameproof cum weatherproof Enclosure for JUNCTION BOX is having 4-way cable entries and is designated by Type : HA-52.

It is in circular shape. The size of the junction box is 120  $\phi$  x 76 mm. (without top cover). It has a top circular spigoted cover, fixed to the body by 4 nos. M6 x 25 mm long socket head cap screws with spring washers. The heads of these bolts are all effectively shrouded. Endless neoprine 'O'-ring gasket is placed the flange, out side the effective flamepath for IP-65 protection.

The name, ratings and warning plate made of brass/ss is fixed permanently on the cover by revets stating "Isolate Else Where Before Opening".

The external / exits cable entries shall be made by the certified flameproof double compression type cable glands.

The size and number of such entries shall be 4 nos. 1/2" or 3/4" NPT / BSP on four side of the junction box.

the rating of the junction box as declared by the applicant is as :- 63 amps; 500 volts AC.

For further details the drawing mentioned below may be consulted.

D R A W I N G :

The unit is designed and constructed as flameproof in accordance with the following drawing conforming to the requirements of IS:2148-1981.

DRG. NO. : HA 52 Rev.'0' Dated 20/10/95.

MANUFACTURER & APPLICANT : M/S. HANSU CONTROLS LIMITED,  
A-420 T.T.C. IND. AREA, MIDC MAHAPE,  
NEW BOMBAY-400 701.



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TEST CERTIFICATE

Continuation Sheet

SCOPE OF CERTIFICATION :

Certificates issued by the certifying authority testify only that the apparatus has been found to comply with the Definitions of Flameproof Enclosure contained in the relevant Indian Standard specification. 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.

SECOND SCHEDULE

The following are alternative permissible variation to otherwise identical unit covered by this Test Report :

1. The alternate material of construction of the 4-Way Junction box may be cast iron instead of cast aluminium alloy LM-6 for application in Groups I, IIA & IIB atmosphere.

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TEST CERTIFICATE

**ROUTINE TEST**

(Preliminary Pressure Test and Final External Ignition Test)

[Accompanies this office letter no. CMRI/TC/4426...dt. 30/06/....  
 March, 1996 and pertains to cast aluminium alloy LM-6 constructed  
 flameproof enclosure for 4-Way JUNCTION BOX, Type : HA-52,  
 manufactured & submitted for test by M/s. Hansu Controls Ltd.,  
 A-420 TTC Ind. Area MIDC Mahape, New Bombay-400 701.]

Date(s) of Test: 01/03/1996

Conditions of Test :

- |                                 |          |          |
|---------------------------------|----------|----------|
| 1. Explosive mixture used       | Gas      | % in air |
| (a) Preliminary Test - Internal | Hydrogen | 31       |
| (b) Final Test - Internal       | -do-     | 28       |
|                                 | External | 28       |
2. Ignition by inductive break spark : Location as stated .
3. Pressure recorded by "COMPUTER" through "PIEZO ELECTRIC TRANSDUCER and CHARGE AMPLIFIER manufactured by "KISTLER" of SWITZERLAND. Position as shown.

Test Ref.No.	Ignition	Gauge Position	Max. Pressure Kg/cm <sup>2</sup>	Time of Pressure rise in milliseconds	Remarks
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(A) Test for observation & pressure recording :

(i) Enclosure for 4-Way Junction Box :

PPM/131721	Body	Body	6.01	3	No evidence of distress
PPM/131722	Body	Body	4.62	3	-do-
PPM/131723	Body	Body	4.25	3	-do-

(B) Tests with surrounding explosive atmosphere :

(i) Enclosure for 4-Way Junction Box :

EIT/131724  
 EIT/131725  
 EIT/131726  
 EIT/131727  
 EIT/131728



No external Ignition.  
 No external Ignition.  
 No external Ignition.  
 No external Ignition.  
 No external Ignition.

*Signature*

**EXCESS PRESSURE TEST (STATIC METHOD)**

Date(s) of Test: 01/03/1996

1. Pressure applied hydraulically.
2. Pressure recorded by "Pressure-Gauge" of the Hydraulic Testing Machine.
3. Position of application of Pressure : As stated.

Test Ref.No.	Position of application of pressure	Max. Pressure (Kg/sq.cm)	Remarks
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(i) Enclosure for 4-Way Junction Box :

OPM/131729	Body	18.0	No evidence of distress
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4. **Details of Test:** The tests were made on the above enclosures of the unit as per clause 25.4.2.3 of IS:2148-1981.

(a) The pressure of 18.0 Kg/cm<sup>2</sup> was applied hydraulically to the above enclosures, and the pressure being maintained for one minute in each case, as required by clause 25.4.2.3 of IS: 2148-1981.

(b) The above pressure applied on plug enclosure was equal to the pressure specified in Table 4 of IS:2148-1981, as it is more than 1.5 times reference pressure (PPM).

5. **OBSERVATIONS :**

The enclosures of the unit withstood the pressures applied without any visual evidence of distress.

6. **COMMENTS :**

The enclosures of the unit satisfy the test requirements of clause 25.4.2.3 of IS:2148-1981.

7. **NOTE :**

As a result of the tests the manufacturer will be required to test the enclosure to a static pressure of 18.0 Kg/cm<sup>2</sup> as mentioned in column III of above Table. The enclosures of the unit should not suffer any damage or deformation as a result of static pressure applied.



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GENERAL OBSERVATIONS ON THE BEHAVIOUR OF THE ENCLOSURES DURING TEST :

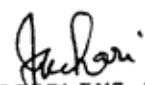
The Flameproof cum Weatherproof 4-Way JUNCTION BOX in cast aluminium alloy LM-6 construction, designated by Type : HA-52, sustained no damage as a result of the routine tests applied and the surrounding flammable atmosphere was not ignited. The structure also withstood the excess pressure test, when applied hydraulically, without any visual evidence of distress.

NOTE :

THE UNIT IS ONLY FLAMEPROOF WHEN ALL CABLE ENTRIES HAVE EITHER A CORRECTLY FITTED FLP BLANKING PLUG OR FLP CABLE GLAND, COMPLETE WITH CABLE TERMINATED IN THE PROPER MANNER CABLE GLANDS AND BLANKING PLUGS FITTD MUST BE OF A TYPE APPROVED FOR USE WITH THIS UNIT.


  
( TESTING OFFICER )



  
( DISCIPLINE HEAD )

Dated: 14..March' 1996

Flame and Explosion Research Laboratory,  
Central Mining Research Institute (CSIR)  
Barwa Road, Dhanbad-826 001 (Bihar State)

  
रवारी पर्याप्त  
शोधक कोष्ठ  
SCIENTIST-IN-CHARGE  
TESTING CELL

  
DEPTW DIRECTOR  


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**TEST FOR IP-65 DEGREE OF PROTECTION**

[Accompanies this office letter No. CMRI/TC/4426 Date March'1996 and pertains to cast aluminium alloy LM-6 constructed flameproof enclosure for 4-Way Junction Box, Type : HA-52, manufactured & submitted for test by M/s. Hansu Controls Ltd., A-420 TTC Ind. Area, MIDC Mahape, New Bombay-400 701.]

1. TEST AGAINST INGRESSES OF DUST AS PER REQUIREMENTS LAID DOWN AGAINST FIRST CHARACTERISTIC NUMERAL NO. 6 OF IP-65 OF IS:2147-1962 :

The test was conducted on the 4-Way Junction Box in a closed Test Chamber in which talcum powder (passing 1575 micron sieve) was maintained in suspension by an air current. The amount of talcum powder used was 2 Kg. per cubic metre of the Test Chamber. The equipment under test was hung inside the Test Chamber and was connected to a vacuum pump of the Testing set-up. The vacuum maintained inside the enclosures was a differential pressure equivalent to 200 mm column of water. This condition within the enclosures was maintained for 2 continuous hours during which time air were drawn through the joints in the enclosures. The test was then stopped.

The test was repeated three times on each enclosure and on examination after each test it was observed that no dusts had entered inside the enclosures.

2. TEST AGAINST INGRESSES OF WATER AS PER REQUIREMENTS LAID DOWN AGAINST SECOND CHARACTERISTIC NUMERAL NO. 5 OF IP-65 OF IS:2147-1962 :

The test was performed by washing down the 4-Way Junction Box from every direction by means of a hose nozzle of 12.5 mm inside diameter which was held 1.5 metre away from the equipment under test with a water pressure corresponding to a head of about 10 metre of water. The duration of the test was 15 minutes.

The test was repeated three times and on examination after each test it was observed that no water entered the enclosures.

**CONCLUSION :** The Flameproof-cum-Weatherproof 4-Way Junction box Type : HA-52 under reference meets the test requirements of IS:2147-1962 in respect of IP-65 Degree of Protection.

( TESTING OFFICER )

Dated 14 March, 1996.

Flame and Explosion Laboratory,  
Central Mining Research Institute (CSIR),  
Barwa Road, Dhanbad-826 001 (Bihar State).

शुभम कुमार  
प्रयोग कक्ष,  
सेन्ट्रल-मिनिंग-रिसर्च-इन्स्टीट्यूट  
TESTING CELL

( DISCIPLINE HEAD )

DEPUTY DIRECTOR