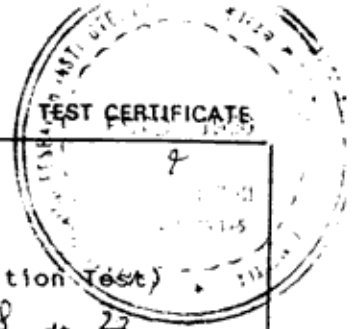


के० ख० अ० स० परीक्षण प्रकोष्ठ  
CMRI TESTING CELL

Continuation Sheet



**R O U T I N E T E S T**

(Preliminary Pressure Test and Final External Ignition Test)

[Accompanies this office letter no. CMRI/TC/408...dt. 23... July 1997 and pertains to Flameproof 18 WAY PUSH BUTTON PENDENT/STATION OR 18 WAY INDICATING LAMP, or any combination of push button & indicating lamp upto 18, in cast aluminium alloy LM-6 construction, designated as TYPE HX 51, rated at upto 16 Amps 500 Volts upto 9 Watts 230 Volts single phase, 50 HZ, manufactured & submitted for test by M/s. HANSU CONTROLS LIMITED, A-420 T.T.C. IND. AREA, M.I.D.C., MAHAPE, NAVI MUMBAI-400 701.]

Date(s) of Test : 16/07/97

Conditions of Test :

- |  |                          |              |
|--|--------------------------|--------------|
| 1. Explosive mixture used                | Group IIB Gas            | % in air     |
| (a) Preliminary Pressure - Internal Test | Hydrogen/Methane (85:15) | 24.0         |
| (b) Final External Ignition Test         | - Internal - External    | 20.0<br>18.0 |
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 Bar	Time of Pressure rise in milliseconds	Remarks
--------------	----------	----------------	-------------------	---------------------------------------	---------

(A) Test for observation & pressure recording as per clause 25.4.1 of IS: 2148-1981 :

(i) Main Enclosure :

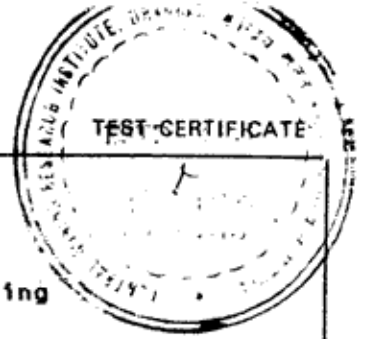
PPM/139764	Body	Body	5.56	12.5	No evidence of distress
PPM/139765	Body	Body	5.29	13.2	-do-
PPM/139766	Body	Body	4.52	13.5	-do-

(ii) Terminal Enclosure :

PPM/139770	Body	Body	4.86	20.5	-do-
PPM/139771	Body	Body	5.52	18.8	-do-
PPM/139772	Body	Body	4.64	23.3	-do-

*Signature*

के० स० अ० स० परीक्षण प्रकोष्ठ  
CMRI TESTING CELL



Continuation Sheet

VARIATIONS

Main Enclosure with main cover having  
18 way indicating lamps :

PPM/139767	Body	Body	4.39	13.1	-do-
PPM/139768	Body	Body	4.26	14.1	-do-
PPM/139769	Body	Body	4.48	14.6	-do-

(B) Tests with surrounding explosive atmosphere as per clause 25.5 of IS:2148-1981

(i) Main Enclosure :

EIT/139773	No external Ignition.
EIT/139774	No external Ignition.
EIT/139775	No external Ignition.
EIT/139776	No external Ignition.
EIT/139777	No external Ignition.

(ii) Terminal Enclosure :

EIT/139783	No external Ignition.
EIT/139784	No external Ignition.
EIT/139785	No external Ignition.
EIT/139786	No external Ignition.
EIT/139787	No external Ignition.

VARIATIONS

Main Enclosure with main cover having  
18 way indicating lamps :

EIT/139778	No external Ignition.
EIT/139779	No external Ignition.
EIT/139780	No external Ignition.
EIT/139781	No external Ignition.
EIT/139782	No external Ignition.

\*\*\*\*\*

*A. Aman*

के० ख० अ० स० परीक्षण प्रकोष्ठ  
CMRI TESTING CELL

Continuation Sheet



**EXCESS PRESSURE TEST (STATIC METHOD)**

Date(s) of Test : 16/07/97

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
--------------	-------------------------------------	-------------------------	---------

(i) Main Enclosure :

OPM/139788	Body	10.0	No evidence of distress
------------	------	------	-------------------------

(ii) Terminal Enclosure :

OPM/139790	Body	10.0	-do-
------------	------	------	------

**VARIATIONS**

Main Enclosure with main cover having 18 way indicating lamps :

OPM/139789	Body	10.0	-do-
------------	------	------	------

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) A pressure of 10.0 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.

5. **OBSERVATIONS :**

The enclosures of the unit withstood the pressure 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 each and every enclosure to a static pressure of 10.0 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.

*Ar Arun*

के० ख० अ० स० परीक्षण प्रकोष्ठ  
CMRI TESTING CELL

Continuation Sheet

TEST CERTIFICATE

GENERAL OBSERVATIONS ON THE BEHAVIOUR OF THE ENCLOSURES DURING TEST :

The FLAMEPROOF 18 WAY PUSH BUTTON PENDENT/STATION AND 18 WAY INDICATING LAMP, and its associated FLP enclosures in cast aluminium alloy LM-6 construction, designated as Type HX 51, 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 :

Computer print outs on "Reference Pressure Curves" for above mentioned enclosures, obtained through "KISTLER PIEZO ELECTRIC TRANSDUCER" and "CHARGE AMPLIFIER", are enclosed for your reference.

*A. Kumar*

( TESTING OFFICER )

Dated: 21 July 1997



*J. Kumar*  
( DISCIPLINE HEAD )

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

*[Signature]*  
हजार प्रमुख  
कर्मियों द्वारा  
संयोजित है  
द्वारा

*[Signature]*  
ORDINARY SCIENTIST