



TEST REPORT

DUNCAN ENGINEERING LIMITED

REPORT NUMBER: TUVB/PTL/23-24/REL/0007

JOB CARD NUMBER: TUVB/23-24/REL/0007

JOB ORDER NUMBER: 8121224494

TESTING LABORATORY:

TUV INDIA PRIVATE LIMITED

Plot No.105, Sy.no 90, 92 & 93
Peenya Village, Peenya 3rd
Phase, Yeshwanthpura Hobli,
Bangalore North, Bangalore –
560058, Karnataka, India.
Tel No: 080-28376571/72
Website: WWW.TUVNORD.COM

SERVICE REQUESTED BY:

DUNCAN ENGINEERING LIMITED

F-33, RANJANGEON MIDC,
KAREGAON, SHIRUR, PUNE,
MAHARASHTRA-412220

REPORT ISSUED TO:

DUNCAN ENGINEERING LIMITED

F-33, RANJANGEON MIDC,
KAREGAON, SHIRUR, PUNE,
MAHARASHTRA-412220


This test report consists of 11 pages including cover letter

Report No: TUVB/PTL/23-24/REL/0007

Issue Date 18 April 2023

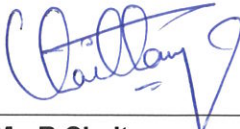
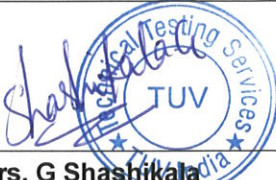
DISCIPLINE: ELECTRICAL
GROUP: ENVIRONMENTAL TEST FACILITY

Product Details:

| | |
|--|--|
| Test item | SOLENOID COILS |
| Make | DUNCAN™ ENGINEERING LIMITED |
| Model Number | G25 & G50N |
| Serial No. | G50N-DS114PL08W0, DS114PL08W20, DS114PL08W12, DS114PL08W22, G25-DS009PL08W20, DS009PL08W14, DS009PL08W12, DS009PL08W22 |
| Trademark |  |
| Sample ID | TUV/BLR230411-0001 to 0008 |
| Number of Samples | 08 |
| Date of receipt | 11 April 2023 |
| Condition of EUT on receipt | Good |
| Applicable Standard/ test specification/ regulations | IP65 & IP67 Test refer with EN 60529 and EN 61010-1 (Cl. No.11.6.3 and 11.6.4) |
| Test Result | Refer Page No. 5 to 7 |
| Declaration of Conformity | Declaration of conformity of results is based on as per standard limits or criteria. |
| Other Aspects | This test report relates to the test sample submitted |



Note: # Marks represents the details Specified / given by Customer only.

| | | | |
|------------------------------|--|----------|---------------|
| Testing (Start date) | 11 April 2023 | End Date | 17 April 2023 |
| Laboratory Ambient Condition | Temperature in °C | 25 °C | |
| | Relative humidity in % RH | 60 % RH | |
| | Atmospheric pressure in hPa (If applicable) | 905 hPa | |

| | |
|---|---|
| Approved by / Authorized Signatory: | Issued by: |
|  |  |
| Mr. R Chaitanya (Senior Quality Engineer) | Mrs. G Shashikala (Customer Relation Officer) |
| Date: 12 April 2023 | Date: 12 April 2023 |

Report No: TUVB/PTL/23-24/REL/0007

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| | | |
|---|--|---|
| Product Ratings (Rated Voltage) | 24VDC,230VAC | |
| Dimensions (L x W x H) | 45mmX40mmX60mm | |
| Weight | Max 1kg | |
| Photo Documentation | Refer Page No. 8 to 11 | |
| Any other Document attached | N/A | |
| Test witnessed by (If any) | N/A | |
| <input checked="" type="checkbox"/> Testing Laboratory | TUV India Private Limited | |
| Testing location/ address: | Plot No.105, Sy. No 90, 92 & 93 Peenya Village, Peenya 3 rd Phase, Yeshwanthapura Hobli, Bangalore North, Bangalore – 560058, Karnataka, India. | |
| Tested by: (Name + Designation + Signature): | Mr. Raja S (Test Engineer) |  |
| Approved by: (Name + Designation + Signature) | Mr. R Chaitanya (Senior Quality Engineer) |  |

Note: # Marks represents the details Specified / given by Customer only.

TUV India Private Limited has the following Accreditations/ Recognition:

| S.L No | Accreditation Bodies | Certificate Number |
|--------|--|--------------------|
| 1 | National Accreditation Board for Testing and Calibration Laboratories (NABL) | TC-9424 |
| 2 | Bureau of Indian Standards (BIS) | OSL-6169526 |

Disclaimer

1. The Released Test Report/s relates ONLY to the specific sample/s submitted for testing and under the stated conditions
2. Any corrections/erasures invalidate the Test Reports. TUV India does not accept any liability whatsoever for the tampering or any unlawful or inadvertent alteration of documents that have been handed over to the Customer.
3. Any discrepancy in the Test report should be brought to the notice of TUV India within 1 (One) Month from the date of issue unless the query raised by regulatory or accreditation body.
4. Test Reports / Certificates or/and any associated attachments shall NOT be copied/reproduced, except IN FULL, without the prior written consent of TUV India.
5. All services rendered by TUV India will be treated as strictly Confidential.
6. TUV India will respond to clarifications requested by the Customer for a maximum period of 1 (One) Month from the date of receipt by the Customer. Samples will not be retained by TUV India after testing is completed or as applicable regulatory requirements
7. For any Complaints / Suggestions please email to: gshashikala@tuv-nord.com

Report No: TUVB/PTL/23-24/REL/0007

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Description of equipment under test

The description of the equipment under test is "PLUG IN SOLENOID COILS G25 & G50N".

Marking Label



Reviewed by:




Mr. R Chaitanya

(Senior Quality Engineer)

Report No: TUVB/PTL/23-24/REL/0007

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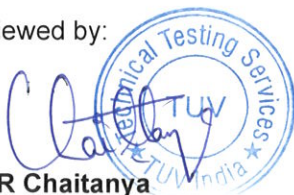
Summary of Test Results:

| Test No. | Test Parameter | Standard & Clause Number | Result |
|----------|---|---|---|
| 1 | Test for first characteristic numeral 6 (IP6X) | As per Customer requirement IEC 60529:2013, Edition 2.2, Clause No. 13.4 & 13.6 | No Dust ingress observed on external body of Solenoid coils. |
| 2 | Test for second characteristic numeral 5 (IPX5): Protected against water jets | As per Customer requirement IEC 60529:2013, Edition 2.2, Clause No. 14.2.5 & 14.3 | No water ingress observed on external body of Solenoid coils. |
| 3 | Test for second characteristic numeral 7 (IPX7): Temporary Immersion | As per Customer requirement IEC 60529:2013, Edition 2.2, Clause No. 14.2.7 & 14.3 | No water ingress observed on external body of Solenoid coils. |

Equipment used during Tests:

| Serial No. | Test Equipment | Equipment ID | Calibration Due Date |
|------------|---------------------------------|------------------|----------------------|
| 01 | IP X5 Nozzle | TUVB-PTL-IP-003A | 10-12-2023 |
| 02 | Test Probe | TUVB-PTL-SAF-064 | 31-05-2023 |
| 03 | Water Supply Control Unit | TUVB-PTL-IP-008 | 10-12-2023 |
| 04 | IP6X Test Set up (Dust Chamber) | TUVB-PTL-IP-006 | 10-12-2023 |
| 05 | Measuring Scale | TUVB-PTL-SAF-151 | 29-03-2023 |
| 06 | Stop Watch | TUVB-PTL-SAF-152 | 28-03-2023 |
| 07 | Digital Thermo-Hygrometer | TUVB-PTL-GEN-006 | 14-10-2023 |
| 08 | Altitude Meter | TUVB-PTL-SAF-045 | 14-10-2023 |
| 09 | IPX7(Water Tank) Test Setup | TUVB-PTL-IP-004 | 10-12-2023 |

Reviewed by:



Mr. R Chaitanya

(Senior Quality Engineer)

Test Result/Observations:

1) Test Name: Dust Test for first characteristic numeral 6 (IP6X)

1.1 Test Procedure/Specification:

- Protection against Ingress of solid foreign objects - Dust Tight.
- The test is made using a dust chamber, the talcum powder used shall be able to pass through a square-meshed sieve, the nominal wire diameter of which is 50µm and the nominal width of a gap between wires 75µm.
- The enclosure under the test is supported in its normal operating position inside the test chamber, but it is not connected to a vacuum pump.
- The test wire of 1.0mm Ø, 100mm length, will be inserted through all the opening of the enclosure, with the force of 1N±10%.
- The duration of the test is 8 hours.

1.2 Compliance Criteria:

- The test wire of 1.0mm Ø, 100mm length, shall not pass through any opening of the enclosure, when force of 1N±10% applied.
- The protection is satisfactory if, no deposit of dust is observed inside the enclosure at the end of test.

1.3 Results / Observation:

- Test wire didn't pass through any opening of the sample.
- No Dust ingress observed on external body of Solenoid coils.

2) Test Name: Test for second characteristic numeral 5: Protected against water jets (IPX5)

2.1 Test Procedure/Specification:

- The enclosure will be sprayed in actual use from all practicable directions with a stream of water from a standard test nozzle internal diameter of 6.3 mm.
- The distance from nozzle to enclosure surface: between 2.5 m and 3 m.
- The water flow rate is 12.5 l/min ± 5 %.
- The duration of the test is 3 min.

2.2 Compliance Criteria:

- The enclosure shall be inspected for ingress of water.

2.3 Results / Observation:

- No Water ingress observed on external body of Solenoid coils.

Reviewed by:



Mr. R Chaitanya

(Senior Quality Engineer)

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3) Test Name: Test for second characteristic numeral 7: Protected against temporary immersion (IPX7)

3.1 Test Procedure/Specification:

- The enclosure will be completely immersed in water in its service position/actual use.
- The lowest point enclosures with a height less than 850mm is located 1000mm below the surface of the water.
- The duration of the test is 30mins.

3.2 Compliance Criteria:

- The enclosure shall be inspected for ingress of water. The protection is satisfactory if, no deposit of water is observed inside the enclosure at the end of test.

3.3 Results / Observation:

- No Water ingress observed on external body of Solenoid coils.

Reviewed by:

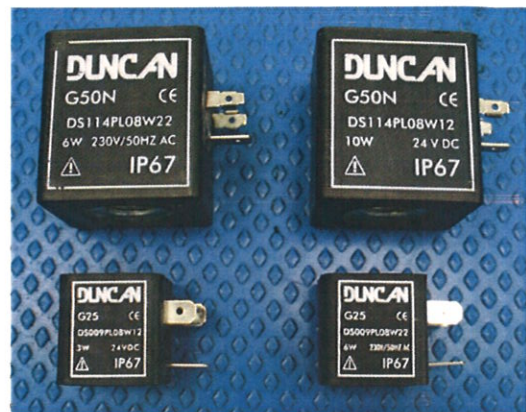


Mr. R Chaitanya

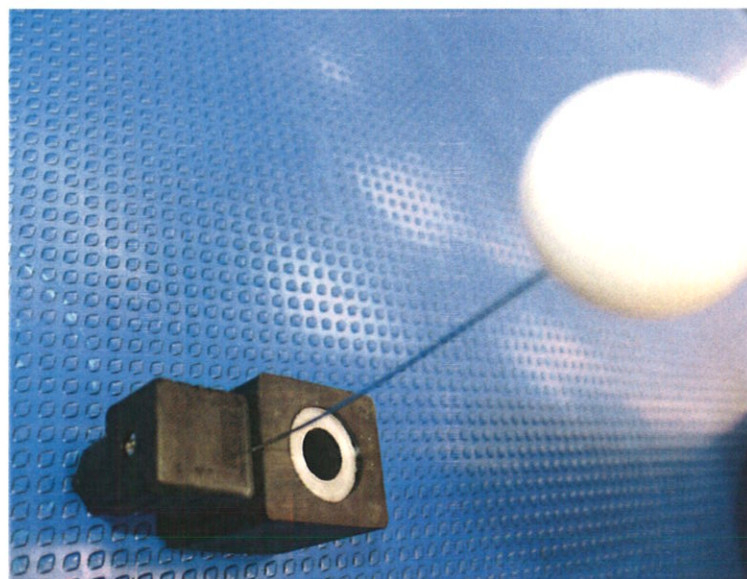
(Senior Quality Engineer)

Photo Documentation:

Overall View of Equipment Under Test



Accessibility Test - Test wire didn't pass through any opening of the enclosure



Reviewed by:



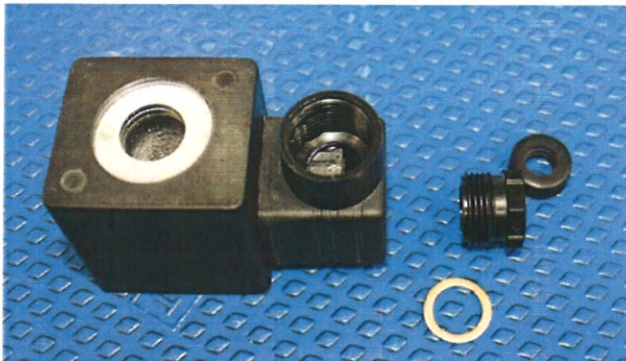
Mr. R Chaitanya

(Senior Quality Engineer)

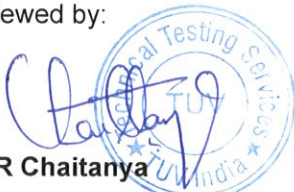
IP6X Test Setup



IP6X Post Test Observation photos for Solenoid coils



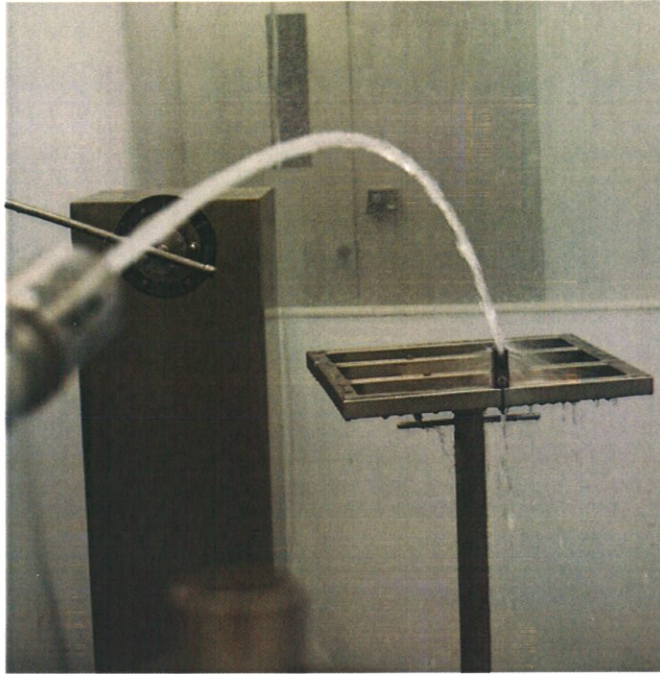
Reviewed by:



Handwritten signature of Mr. R Chaitanya in blue ink, overlaid on a circular blue stamp that reads "TUV India Special Testing Services".

Mr. R Chaitanya
(Senior Quality Engineer)

IPX5 Test Setup



IPX5 Post Test Observation photos for Solenoid coils



Reviewed by:



Handwritten signature of Mr. R Chaitanya in blue ink, overlaid on a circular blue stamp that reads "TUV India" and "Technical Testing Services".

Mr. R Chaitanya

(Senior Quality Engineer))

Report No: TUVB/PTL/23-24/REL/0007

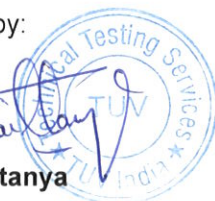

Issue Date 18 April 2023

IPX7 Setup View



*****End of Report*****

Reviewed by:



The seal is circular with the text "TUV India" in the center and "Technical Testing Services" around the perimeter. There are stars on either side of the "TUV India" text.

Mr. R Chaitanya
(Senior Quality Engineer))

Amendment No. 1

As per client mail dated: 23/10/2023, stating that the equipment's calibration date, mentioned in test report no. TUVB/PTL/23-24/REL/0007, dated: 18/04/2023 is wrong.

IP6X, IPX5 & IPX7 test used equipment's SI No.05- Measuring Scale & SI No.06- Stop watch calibration date is Measuring scale-27-03-2024 and Stop watch-26-03-2024, but typographical error mentioned the equipment calibration date in test report Measuring scale-29-03-2023 and Stop watch-28-03-2023. Hence the following amendment has been issued.

(Page no. 5, (Equipment used during tests, sl. No. 5, equipment calibration date): Substitute "27-03-2024" in place of "29-03-2023".

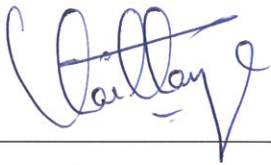
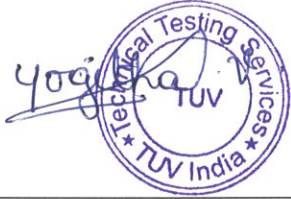
(Page no. 5, (Equipment used during tests, sl. No. 6, equipment calibration date): Substitute "26-03-2024" in place of "28-03-2023".

Tested By:



Manoj N

(Junior Test Engineer)

| Approved by / Authorized Signatory: | Issued by: |
|---|--|
|  |  |
| <p>Mr. R. Chaitanya (Senior Quality Engineer)</p> | <p>Mrs. V. Yogitha (Customer Relationship Officer)</p> |
| <p>Date: 9 November 2023</p> | <p>Date: 9 November 2023</p> |