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SAMM 086

TEST REPORT

REPORT NO.: 2025RE0367	PAGE : 1 OF 57

Applicant	:	DELAB SCIENTIFIC SDN. BHD. No. 20-22, Jalan Tembaga SD5/2D, Bandar Sri Damansara, 52200 Sri Damansara, Kuala Lumpur , Malaysia
Manufacturer	:	DELAB SCIENTIFIC SDN. BHD.
Product	:	Protective Relay
Reference Standards/ Method of test	:	IEC 61000-6-2 : 2016 IEC 61000-6-4 : 2018 IEC 60255-26 : 2023 - CISPR 11 & CISPR 32 - IEC 61000-4-2 , IEC 61000-4-3 , IEC 61000-4-4 , IEC 61000-4-5 - IEC 61000-4-6 , IEC 61000-4-8 , IEC 61000-4-11 , IEC 61000-4-16 - IEC 61000-4-17 , IEC 61000-4-18 IEC 60255-27 : 2023 - Clause 9.6.4.2 "Impulse Voltage Withstand" - Clause 9.6.4.3 "Dielectric Test"

Disclaimer: All the information stated above has been provided/agreed by the Applicant. SIRIM QAS International Sdn. Bhd. shall not be held responsible for the accuracy, completeness, or validity of the information provided by the Applicant which may affect the validity of the test results. The accuracy and reliability of the test results are contingent upon the integrity and accuracy of the information provided by the Applicant.

Description of Sample/ Description of Test Specimen	:	Brand Name	:	DELAB
		Model	:	DP-34,DP-53,DP-31,DP-33,DP-10,DP-23,DP-21 & TM-18c
		Rating	:	65-275 VAC 50/60Hz
		Serial Number	:	Refer Page 6 clause 2.1
Date received of Complete Application	:	8 SEPTEMBER 2025		
Job No.	:	J20251410386		
Description of Test Results/ Overall Test Result	:	The test results for submitted test sample as described in this test report complied with the requirement of the above Reference Standard		
Issue date	:	22 SEPTEMBER 2025		

Approved Signatories,

……
(AZIZUL AZMAN JAAFAR)
Group Leader
EMC Laboratory

SIRIM QAS International Sdn. Bhd. ★ RF & EMC TESTING SECTION

……..
(ZARISMAIL ABD RAHMAN)
Head
RF & EMC Testing Section
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1. SUMMARY OF TEST RESULTS

MEASUREMENT ITEM	BASIC STANDARDS	RESULTS	TEST DATE
IEC 60255-26 : 2023 , IEC 61000-6-2 : 2016 and IEC 61000-6-4 : 2018			
1. Conducted Emission	CISPR 11, CISPR 32 & CISPR 16-2-1	Pass	
2. Radiated Emission	CISPR 11, CISPR 32 & CISPR 16-2-3	Pass	
3. Immunity Against Electrostatic Discharge	IEC 61000-4-2	Pass	
4. Radiated RF Electromagnetic Fields Immunity Test	IEC 61000-4-3	Pass	
5. Immunity Against Electrical Fast Transient	IEC 61000-4-4	Pass	
6. Immunity Against Surge Voltage	IEC 61000-4-5	Pass	
7. Immunity to Conducted Disturbance Induced by R.F Fields	IEC 61000-4-6	Pass	08.09.2025
8. Immunity Against Power Freq. Magnetic Fields	IEC 61000-4-8	Pass	to
9. Immunity Against Voltage Dips and Short Interruptions	IEC 61000-4-11	Pass	19.09.2025
10. Immunity against conducted common mode disturbances in the frequency range 0Hz to 150 kHz.	IEC 61000-4-16	Pass	
11. 1 MHz damped oscillatory wave	IEC 61000-4-18	Pass	
12. Gradual shutdown and start-up	IEC 60255-26	Pass	
13. Immunity Against AC Component (Ripple) On Dc Supply	IEC 61000-4-17	Pass	
IEC 60255-27 : 2023			
14. Impulse Voltage Withstand	Clause 9.6.4.2	Pass	
15. Dielectric Test	Clause 9.6.4.3	Pass	

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2. OPERATING CONDITION

2.1 EUT (Equipment under test) Descriptions

No.	Item/Model Name	Remarks
1	Product Name	Protective Relay
2	Model No.	1) DP-34 2) DP-33 3) DP-10 4) DP-53 5) DP-23 6) DP-21 7) DP-31 8) TM-18c
3	Serial No	1) 182914-F 2) 100097-H 3) 121997-C 4) 1010768-E 5) 264828-A 6) 109325-D 7) 137688-B 8) 124311-G
4	Brand	DELAB
5	Highest frequency of Internal source of EUT	<1 GHz
6	Test Voltage	230 VAC 50Hz
7	Operating Mode	Normal Operating

3. TEST REFERENCE CONDITION

3.1 During the application of the type tests, the equipment shall be in the state specified in Table 11 of IEC 60255-1 unless specified in the test standards.

Influence quantity	Reference conditions
Operating temperature	15 °C to 25 °C
Relative humidity	25 % to 75 % RH
Atmospheric pressure	78 kPa to 106 kPa
Auxiliary power supply port voltage	Lowest rated power supply voltage ±1 %
Battery monitor port	Set to rated power supply voltage
Residual voltage [a]	≤ 1,0 %
External continuous magnetic field	Induction equal to or less than 50 µT
DC component on AC voltage and current	As specified in lower-level documents
Superimposed ripple on DC auxiliary supply voltage	Peak-ripple factor of 0 % to 15 % of rated DC values in accordance with IEC 60255-26
Waveform of AC energizing quantities	Sinusoidal, distortion factor 5 % [c]
Frequency	Rated frequency (16,7 Hz; 25 Hz; 50 Hz; 60 Hz) ± 0,2 %
Voltage inputs (VT, LPVT)	See Annex A
Current inputs (CT, LPCT)	See Annex A
Binary inputs (single rated operating voltage)[b]	50 % energized rated voltage (un-grounded source), 50 % non- energized (open circuit source with wiring connected)

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Binary inputs (multiple rated operating voltages)	25 % set to the lowest rated voltage, energized at rated voltage (un-grounded source). 25 % set to the lowest rated voltage, non-energized (open circuit source with wiring connected). 25 % set to the highest rated voltage, energized at rated voltage (un-grounded source). 25 % set to the highest rated voltage, non-energized (open circuit source with wiring connected).
Binary outputs	50 % energized at rated current, 50 % non-energized
Wired network ports (except service ports)	Active [d]
Service ports	Non-active [e]
Human machine interface HMI (display)	Visible
Earth connection	Connected in accordance with manufacturer's technical data

[a] The vector sum, in a multi-phase system, of all the line-to-earth voltages.

[b] If the threshold is selectable then testing shall be repeated at the lowest and highest threshold.

[c] Distortion factor: ratio of the harmonic content obtained by subtracting the fundamental wave from a non- sinusoidal harmonic quantity and the RMS value of the non-sinusoidal quantity. It is usually expressed as a percentage.

[d] Active data exchange, such that data stream is operating under normal conditions with an acceptable level of errors.

[e] Service ports are clearly defined as not having a permanent cable connection.

[f] Binary inputs can be connected in a range of configurations. To have a consistent test methodology an ungrounded input test configuration is used as this provides a safer test arrangement and reduces the possibility of introducing ground loops when carrying out EMC tests.

4. TEST METHODOLOGY

4.1 Emission Test

Emission test were performed according to the IEC 61000-6-4 and IEC 60255-26. Both reference standard test limit is identical it shall cover both requirements.

4.2 Immunity Test

Immunity test were performed according to the IEC 61000-6-2 and IEC 60255-26. IEC 60255-26 test level is more strengthen than IEC 61000-6-2 and it shall cover both requirements.

4.3 Description of Supporting Equipment Used During Test

NIL

4.4 Modification on EUT

NIL

4.5 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels has been estimated for tests performed on the EUT as specified in CISPR-16-4-2:

This measurement uncertainty (Table 2) represents an expanded uncertainty expressed approximately the 95% confidence level using a coverage factor of k=2

Measurement Uncertainty

Measurement	Frequency	CISPR Uncertainty, U_{CISPR} (dB)	Lab Uncertainty, U_{lab} (dB)
Conducted Emission	150kHz – 30MHz	± 3.4	± 2.25
Radiated Emission	30MHz – 1GHz	± 6.3	± 5.45

The listed uncertainties are the worst case uncertainty for the entire range of measurement. Please note that the measurement uncertainty values are provided for informational purposes only and are not used in determining the PASS/FAIL results in condition of U_{lab} is smaller than U_{CISPR} given in CISPR 16-4-2 (CISPR 11 : Clause 12 / CISPR 32 : Clause 11).

4.6 Performance criteria for immunity tests

Criteria A – The apparatus shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the apparatus if used as intended.

Criteria B – The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed. No change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.

Criteria C – Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls

5. CONDUCTED EMISSION

5.1 Test Specifications

The evaluations of Conducted Emission were performed according to CISPR 32 and CISPR 11 and shall meet the minimum performance of IEC 60255-26 and IEC 61000-6-4.

Table 1: Limit of Conducted Emission

Frequency range (MHz)	Limits (dBμV)	
	Quasi-peak	Average
0.15 to 0.5	79	66
0.5 to 30	73	60

5.2 Test Setup

5.2.1 The measurement of Conducted Emission was performed in accordance to the procedure set forth in the CISPR 32 and CISPR 11.

5.2.2 The test was performed in the shielded enclosure room measuring and properly grounded to a single point in the grounding system.

5.2.3 The power supply for the EUT was tapped from a 50Ω/50μH LISN, grounded to the shielded room via grounding straps. Main supply to the LISN was filtered by power line filters bonded to the external wall of the shielded room to reduce the ambient RF voltage.

5.2.4 The measurement was performed in EUT normal operating mode with external EMI filter has been installed at EUT power input terminal.

5.3 Test Results

The measurements of conducted emission for both terminal lines were complied with the test specification as shown in Table 2.

Table 2: Result of Conducted Emission

No.	Model	Mode	Phase	Result	Remarks
1.	DP-34	Normal operating	L & N	Pass	Appendix I
2.	DP-53	Normal operating	L & N	Pass	Appendix II
3.	DP-31	Normal operating	L & N	Pass	Appendix III
4.	DP-33	Normal operating	L & N	Pass	Appendix IV
5.	DP-10	Normal operating	L & N	Pass	Appendix V
6.	DP-23	Normal operating	L & N	Pass	Appendix VI
7.	DP-21	Normal operating	L & N	Pass	Appendix VII
8.	TM-18c	Normal operating	L & N	Pass	Appendix VIII

6. RADIATED EMISSION

6.1 Test Specifications

The evaluations of Radiated Emission were performed according to CISPR 11 and CISPR 32 and shall meet the minimum performance of IEC 60255-26 and IEC 61000-6-4.

Table 3 : Limit of Radiated RF Disturbances

Limit of Radiated RF Disturbances 30 MHz to 1000 MHz at 3m distance (CISPR 11)	
Frequency range (MHz)	**Quasi-peak Limits (dBμV/m)**
30-230 230-1000	50 57

Limit of Radiated RF Disturbances 1 GHz to 6 GHz at 3m distance (CISPR 32)		
Frequency range (GHz)	**Limits (dBμV/m)**	
	Quasi-peak	**Average**
1 - 3 3 - 6	76 80	56 60

6.2 Test Setup

6.2.1 The Radiated Emission measurement was performed according to the procedure set forth in the CISPR 11 and CISPR 32 at 3 m antenna distance.
6.2.2 The measurements were performed in 3m semi anechoic chamber.
6.2.3 The measurements were performed in EUT normal operating mode.

6.3 Test Results

The measurements of Radiated Emission were complied with the test specification as shown in Table below.

Table 4 : Results of radiated emission for all models

Frequency	Polarization	Result	Remark
30 MHz – 1 GHz	Vertical & Horizontal	Pass	Appendix IX
1GHz – 6 GHz	Vertical & Horizontal	Pass	Appendix X

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7. ELECTROSTATIC DISCHARGE (ESD)

7.1 Test Specifications

The evaluations of electrostatic discharge were performed according to IEC 61000-4-2 and shall meet the performance of IEC 60255-26.

Table 5 : ESD Specification

Type of discharge	Standard specifications	Requirement
Contact discharge	± 6 kV	Criteria B
Air discharge	± 8 kV	Criteria B

7.2 Test Setup

7.2.1 Electrostatic Discharges measurements were performed in the shielded enclosure according to IEC 61000-4-2.

7.2.2 The ESD gun was loaded with 150pF-storage capacitor and 330ohm-discharge resistor and connected to the ESD simulator.

7.2.3 The contact discharges were applied to all metal part and chassis and air discharges were applied to all insulation part, metal part and chassis. See Figure 1.

7.2.4 The EUT was operated in its normal operating mode and EUT's meter display and indicator was observed for evaluation of performance criteria.

7.3 Test Results

The measurements of Electrostatic Discharge were found to comply with the minimum performance requirements of IEC 60255-26 as shown in Table below.

Table 6: Results of contact discharge ESD test for models for all models

Test Level	Position	Test point	Results	Performance criteria
±6 kV	Top, Front, Left, Right, Rear	C1	No malfunction during and after test	Criteria A
		C2	No malfunction during and after test	Criteria A
		C3	No malfunction during and after test	Criteria A
		C4	No malfunction during and after test	Criteria A
		HCP	No malfunction during and after test	Criteria A
		VCP	No malfunction during and after test	Criteria A

Table 7: Results of air discharge ESD test for all models

Test Level	Position	Test point	Results	Performance criteria
±8 kV	Top, Front, Left, Right, Rear	A1	No malfunction during and after test	Criteria A
		A2	No malfunction during and after test	Criteria A
		A3	No malfunction during and after test	Criteria A
		A4	No malfunction during and after test	Criteria A
		A5	No malfunction during and after test	Criteria A
		A6	No malfunction during and after test	Criteria A
		A7	No malfunction during and after test	Criteria A
		A8	No malfunction during and after test	Criteria A
		A8	No malfunction during and after test	Criteria A
		A9	No malfunction during and after test	Criteria A
		A10	No malfunction during and after test	Criteria A

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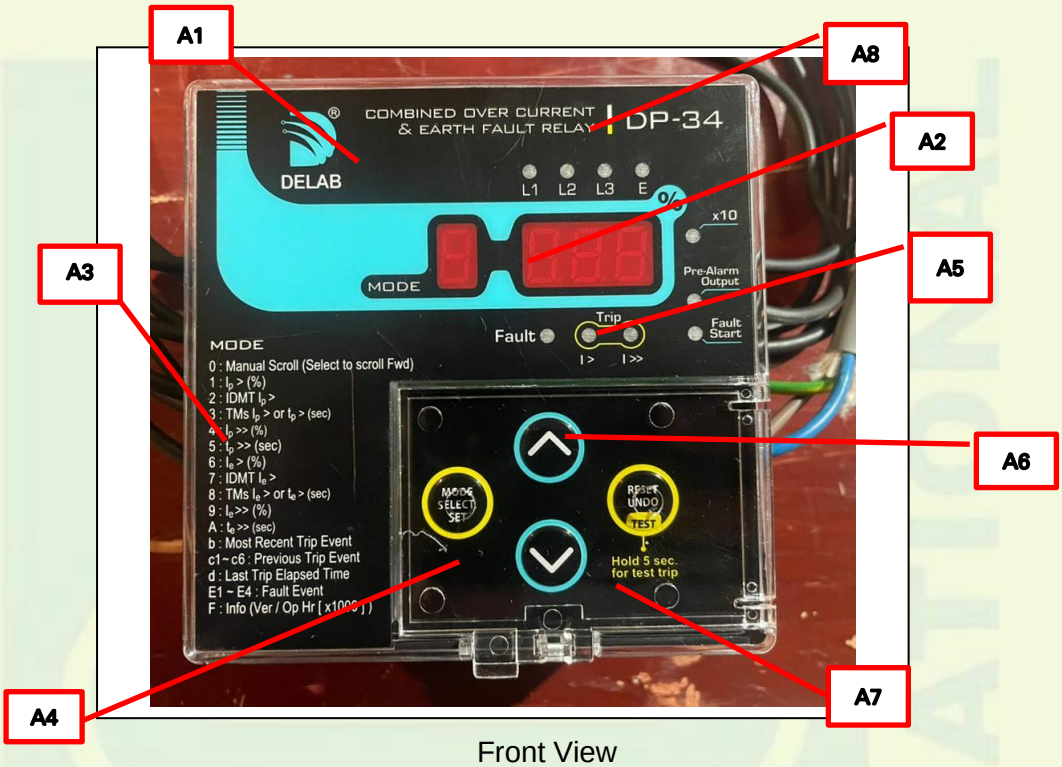
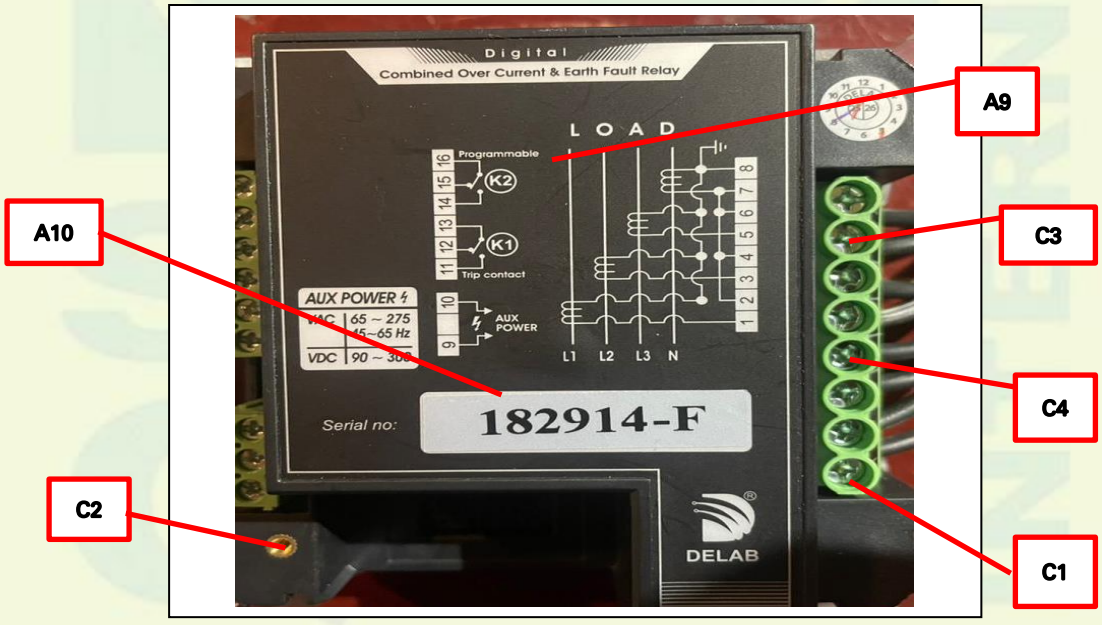
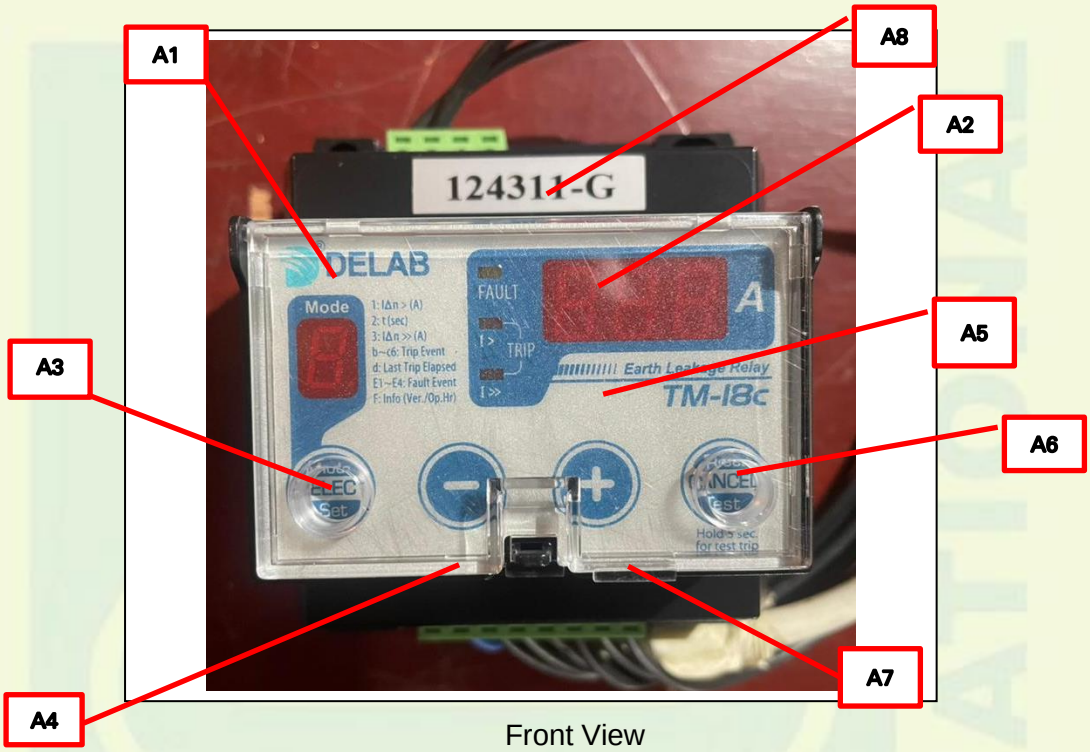


Front View

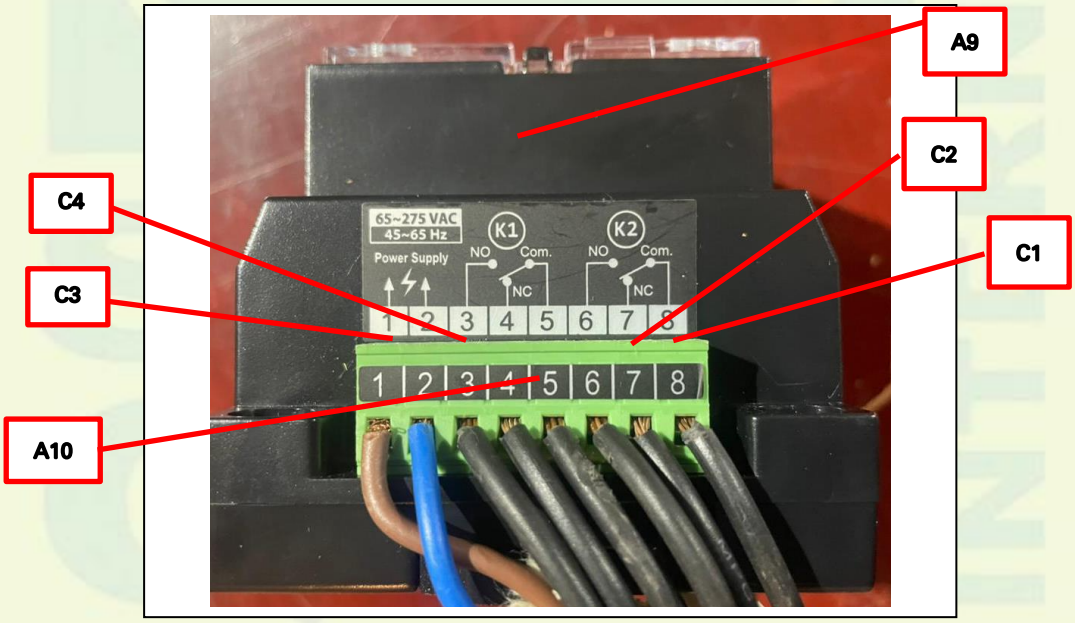


Rear View

Figure 1 : ESD point for Air Discharge and Contact Discharge for (DP-34,DP-53,DP-31,DP-33,DP-10,DP-23 & DP-21) model



Front View



Rear View

Figure 2 : ESD point for Air Discharge and Contact Discharge TM-18c model

8. RADIO-FREQUENCY ELECTROMAGNETIC FIELD. AMPLITUDE MODULATION

8.1 Test Specifications

The evaluations of radio-frequency electromagnetic field. Amplitude Modulation test were performed according to IEC 61000-4-3 and shall meet the minimum performance of IEC 60255-26.

Table 8: RF Electromagnetic Field test specification

Type of modulations	Level	Requirement
80 to 2700 MHz 1kHz 80%AM	10 V/m	A
2.7 GHz to 6 GHz 1kHz 80%AM	3 V/m	A

8.2 Test Setup

8.2.1. Radio-frequency electromagnetic field, Amplitude modulation test was performed in the 3m fully anechoic chamber in accordance to the procedure set forth in the IEC 61000-4-3.

8.2.2. The antenna was mounted on an antenna tripod and set at a distance 3m away from the EUT and the supporting equipment. The tests were done for both antenna polarities.

8.2.3. The EUT was operated in its normal operating mode and EUT's meter display and indicator was observed for evaluation of performance criteria.

8.3 Test Results

The evaluations of Radio-frequency electromagnetic field, Amplitude modulation test were found to comply with the minimum performance requirements of IEC 60255-26 as shown in Table below.

Table 9: Results of Radio-frequency electromagnetic field test

Test Description	Antenna Polarization	Level	Performance evaluation	Performance criteria
80 to 2700 MHz 1kHz 80%AM Include spot frequency : 409, 446, 462, 710, 836, 850, 900, 1732, 1750, 1880, 1950, 2535 MHz	Horizontal	10 V/m	No malfunction during and after the test	Criteria A
	Vertical	10 V/m	No malfunction during and after the test	Criteria A
2.7 GHz to 6 GHz 1kHz 80%AM	Horizontal	3 V/m	No malfunction during and after the test	Criteria A
	Vertical	3 V/m	No malfunction during and after the test	Criteria A

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9. FAST TRANSIENTS / BURST

9.1 Test specifications

The evaluations of fast transients were performed according to IEC 61000-4-4 and shall meet the minimum performance of IEC 60255-26

Table 10: Fast Transients test specification

Terminal	Test level	Test duration	Requirement
Mains	± 4 kV (Zone A) (5kHz) ± 2 kV (Zone B) (5kHz)	2 minutes	Criteria B
Communication Ports	± 4 kV (Zone A) (5kHz) ± 2 kV (Zone B) (5kHz)		Criteria B
Input and Output Ports	± 4 kV (Zone A) (5kHz) ± 2 kV (Zone B) (5kHz)		Criteria B
Earth Port	± 4 kV (Zone A) (5kHz) ± 2 kV (Zone B) (5kHz)		Criteria B

9.2 Test setup

9.2.1 Fast transients' measurements were performed in the shielded enclosure according to the procedure set forth in the IEC 61000-4-4.

9.2.2 The transient was introduced to the supply line of the EUT

9.2.3 The interference impulses (positive and negative) were coupled into the supply line for the time duration of 2 minutes.

9.2.4 The interference impulses (positive and negative) were coupled into the capacitive clamp for communication and input/output lines with test duration of 2 minutes.

9.2.5 The EUT was operated in its normal operating mode and EUT's meter display and indicator was observed for evaluation of performance criteria.

9.3 Test results

The evaluations of the EUT against fast transients were found to comply with the minimum performance requirements of IEC 60255-26 as shown in Table below.

Table 11: Result of Fast Transients (Mains) for all models

Test level	Terminal	Result	Performance criteria
± 2 kV & ± 4 kV	L	No malfunction during and after the test	Criteria A
	N	No malfunction during and after the test	Criteria A
	L-N-PE	No malfunction during and after the test	Criteria A

Table 12: Result of Fast Transients (Input and output port) for all models

Test level	Terminal	Result	Performance criteria
± 2 kV & ± 4 kV	Programmable Contact	No malfunction during and after the test	Criteria A
	Trip Contact	No malfunction during and after the test	Criteria A

Table 13: Result of Fast Transients (Communication port) for all models

Test level	Terminal	Result	Performance criteria
± 1 kV & ± 2 kV	Not applicable	-	-

Table 14: Result of Fast Transients (Earth port) for all models

Test level	Terminal	Result	Performance criteria
± 2 kV & ± 4 kV	Earth	No malfunction during and after the test	Criteria A

10. SURGES

10.1 Test Specifications

The evaluations of Surge test were performed according to IEC 61000-4-5 and shall meet the minimum performance of IEC 60255-26 requirement.

Table 15: Surge test specification

Terminal	Test Level	Test port	Requirement
Supply	± 2 kV (Zone A) ± 1 kV (Zone B)	Differential mode (Line – Line)	Criteria B
	± 4 kV (Zone A) ± 2 kV (Zone B)	Common mode (Line – Earth)	Criteria B
Communication	± 4 kV (Zone A) ± 2 kV (Zone B)	Communication Port	Criteria B
Input and Output	± 4 kV (Zone A) ± 2 kV (Zone B)	Input and Output Port	Criteria B

10.2 Test Setup

10.2.1 The Surge test was performed in the shielded enclosure according to the procedure set forth in the IEC 61000-4-5.

10.2.2 The EUT and its supporting equipment were setup its normal operating mode with a power supply tapped from couple decouple network of Surge generator for mains supply port.

10.2.3 The surge was introduced to the supply line of the EUT, Communication port and Input/output port respectively.

10.2.4 The EUT was operated in its normal operating mode and EUT's meter display and indicator was observed for evaluation of performance criteria.

10.3 Test Results

The evaluations of Surge test were found to comply with the minimum performance requirements of IEC 60255-26 as shown in Table below.

Table 16: Result of Surge (Supply port) test for all models

Zone	Test Level	Port	Result	Performance criteria
Zone A	± 2 kV	L-N	No malfunction during and after the test.	Criteria A
	± 4 kV	L-PE	No malfunction during and after the test.	Criteria A
	± 4 kV	N-PE	No malfunction during and after the test.	Criteria A
Zone B	± 1 kV	L-N	No malfunction during and after the test.	Criteria A
	± 2 kV	L-PE	No malfunction during and after the test.	Criteria A
	± 2 kV	N-PE	No malfunction during and after the test.	Criteria A

Table 17: Result of Surge (Input and output port) test for all models

Test level	Terminal	Result	Performance criteria
(Zone B) ± 2 kV & (Zone A) ± 4 kV	Programmable Contact	No malfunction during and after the test	Criteria A
	Trip Contact	No malfunction during and after the test	Criteria A

Table 18: Result of Surge (Communication port) for all models

Test level	Terminal	Result	Performance criteria
Zone B) ±2 kV & (Zone A) ± 4 kV	Not applicable	-	-

11. CONDUCTED DISTURBANCE INDUCED BY RADIO-FREQUENCY FIELDS

11.1 Test Specifications

The evaluations of Conducted Disturbance Induced by Radio-Frequency Fields were performed according to IEC 61000-4-6 and shall meet the minimum performance of IEC 60255-26 requirement.

Table 19: Conducted Disturbance Induced by Radio-Frequency Fields test specification

Test Level	Test port	Requirement
150kHz to 80MHz 80% AM 1kHz 10 V r.m.s.	Mains	Criteria A
150kHz to 80MHz 80% AM 1kHz 10 V r.m.s.	Communication	Criteria A
150kHz to 80MHz 80% AM 1kHz 10 V r.m.s.	Input and output	Criteria A
150kHz to 80MHz 80% AM 1kHz 10 V r.m.s.	Earth	Criteria A

11.2 Test Setup

11.2.1 Conducted Disturbance Induced By Radio-Frequency Fields was performed in the shielded enclosure room in accordance to the procedure set forth in the IEC 61000-4-6.

11.2.2 The filtered power supply for the CDN was tapped from the appropriate power socket.

11.2.3 10V field strength of the unmodulated signal was applied to the EUT through CDN module for mains power port.

11.2.4 10V field strength of the unmodulated signal was applied to the inductive clamp for communication and input/output ports.

11.2.5 The EUT was operated in its normal operating mode and EUT's meter display and indicator was observed for evaluation of performance criteria.

11.3 Test Results

The evaluations of Conducted Disturbance Induced By Radio-Frequency Fields were found to comply with the minimum performance requirements of IEC 60255-26 as shown in Table below.

Table 20: Results of Conducted Disturbance Induced by Radio-Frequency Fields (Supply port) for all models

Test Level	Terminal	Result	Performance criteria
150kHz to 80MHz 80% AM 1kHz 10 V r.m.s. Include spot frequency: 27 MHz	Input Voltage	No malfunction during and after the test	Criteria A

Table 21: Results of Conducted Disturbance Induced by Radio-Frequency Fields (Input and output port) for all models

Test level	Terminal	Result	Performance criteria
150kHz to 80MHz 80% AM 1kHz 10 V r.m.s. Include spot frequency: 27 MHz	Programmable Contact	No malfunction during and after the test	Criteria A
	Trip Contact	No malfunction during and after the test	Criteria A

Table 22: Results of Conducted Disturbance Induced by Radio-Frequency Fields (Communication port) for all models

Test level	Terminal	Result	Performance criteria
150kHz to 80MHz 80% AM 1kHz 10 V r.m.s. Include spot frequency 27 ± 0.5% MHz and 68 ± 0.5% MHz	Not applicable	-	-

Table 23: Results of Conducted Disturbance Induced by Radio-Frequency Fields (earth port) for all models

Test level	Terminal	Result	Performance criteria
150kHz to 80MHz 80% AM 1kHz 10 V r.m.s. Include spot frequency: 27 MHz	Earth	No malfunction during and after the test	Criteria A

12. POWER FREQUENCY MAGNETIC FIELDS

12.1 Test Specifications

The evaluations of Power frequency magnetic fields were performed according to IEC 61000-4-8 and shall meet the minimum performance of IEC 60255-26 requirement.

Table 24: Power frequency magnetic fields specification

Zone	Test Specification	Test Level	Requirement
A	Continuous	100 A/m	A
	1s to 3s	1000 A/m	B
B	Continuous	30 A/m	A
	1s to 3s	30 A/m	B

12.2 Test Setup

12.2.1 Power frequency magnetic fields were performed in accordance to the procedure set forth in the IEC 61000-4-8.
12.2.2 The EUT has been placed in the center of the induction coil.
12.2.3 The coil must be at least 1m away from any wall and from magnetic material.
12.2.4 The measurement has been performed with the EUT connected to the generator with the shortest power supply cable. The test duration is at least 10s.
12.2.5 The EUT was operated in its normal operating mode and EUT's meter display and indicator was observed for evaluation of performance criteria.

12.3 Test Results

The evaluations of the EUT against Power frequency magnetic fields were found to comply with the minimum performance requirements of IEC 60255-26 as shown in Table below.

Table 25: Results of Power frequency magnetic fields test for all models

Zone	Test Specification	Test Level	Test Results
A	Continuous	100 A/m	A
	1s to 3s	1000 A/m	A
B	Continuous	30 A/m	A
	1s to 3s	300 A/m	A

13. VOLTAGE DIPS AND SHORT INTERRUPTIONS

13.1 Test Specifications

The evaluation of immunity against the voltage dips and interruptions immunity test were performed according to IEC 61000-4-11 and shall meet the minimum performance of IEC 60255-26.

Table 24: Minimum requirement of Voltage dips and interruptions immunity

Test Specification	Cycles at (50 Hz)	Requirement
0 % 40% 70 % 0 %	1 10 25 250	A C C C

13.2. Test Setup

13.2.1 Voltage dips, short interruptions measurement was performed according to the procedure set forth in the IEC 61000-4-11.

13.2.2 The EUT was operated in its normal operating mode and EUT's meter display and indicator was observed for evaluation of performance criteria.

13.3 Test Results

The evaluations of the EUT against voltage dips and interruptions were found to comply with the minimum performance requirement of IEC 60255-26 as shown in Table below.

Table 25: Results of voltage dips and interruptions test for all models

Mode	Voltage reduction	Duration	Performance evaluation	Results
Normal operating	0%	1	No malfunction during testing and return to normal operation after the test.	Criteria A
	40%	10	No malfunction during testing and return to normal operation after the test.	Criteria A
	70%	25	No malfunction during testing and return to normal operation after the test.	Criteria A
	0%	250	EUT turn off during testing and return to normal operation after the test.	Criteria B

14. IMMUNITY AGAINST CONDUCTED COMMON MODE DISTURBANCES IN THE FREQUENCY RANGE 0Hz TO 150 kHz

14.1 TEST SPECIFICATIONS

The evaluations of conducted common mode disturbances in the frequency lower than 150kHz were performed according to IEC 61000-4-16 and shall meet the minimum performance in accordance to IEC 60255-26 as shown in Table below.

Table 26: Minimum performance requirement against short duration disturbance

Port	Differential Mode	Common Mode	**Requirement**
Supply input	Zone A		A
	150 Vr.m.s	300 Vr.m.s	
	Zone B		
	100 Vr.m.s	300 Vr.m.s	
Communication	Zone A		A
	150 Vr.m.s	300 Vr.m.s	
	Zone B		
	100 Vr.m.s	300 Vr.m.s	
Input and output	Zone A		A
	150 Vr.m.s	300 Vr.m.s	
	Zone B		
	100 Vr.m.s	300 Vr.m.s	
Test Duration : 1- 10sec as per manufacturer's spec			

14.2 TEST DESCRIPTION

14.2.1 Conducted common mode disturbances in the frequency lower than 150kHz was performed in the shielded enclosure room in accordance to the procedure set forth in the IEC 61000-4-16.

14.2.2 The EUT was connected to appropriate power socket AC source with required test voltage.

14.2.3 The EUT was operated in its normal operating mode and EUT's meter display and indicator was observed for evaluation of performance criteria.

14.2.4 The RMS voltage is injected thru coupling network CN16, was tapped to the appropriate terminal at AC source.

14.3 TEST RESULT

The evaluations of the EUT against Conducted common mode disturbances in the frequency lower than 150kHz were found to comply with the minimum performance requirement as shown in Table below.

Table 27: Results of Conducted common mode disturbances in the frequency lower than 150kHz (supply port) for all models

Port	Differential Mode	Common Mode	Performance criteria
	Zone A		
Supply input	150 Vr.m.s	300 Vr.m.s	A
	Zone B		
	100 Vr.m.s	300 Vr.m.s	A

Table 28: Results of Conducted common mode disturbances in the frequency lower than 150kHz (Input and output ports) for all models

Port	Differential Mode	Common Mode	Performance criteria
	Zone A		
Programmable Contact	150 Vr.m.s	300 Vr.m.s	A
Trip Contact			A
	Zone B		
Programmable Contact	100 Vr.m.s	300 Vr.m.s	A
Trip Contact			A

Table 29: Results of Conducted common mode disturbances in the frequency lower than 150kHz (Communication port) for all models

Port	Differential Mode	Common Mode	Performance criteria
	Zone A		
Not applicable	-	-	-
	Zone B		
	-	-	-

15. IMMUNITY AGAINST DAMPED OSCILLATORY WAVE (1 MHz) TEST

15.1 Test Specifications

The evaluations of immunity against damped oscillatory wave (1 MHz) test were performed according to IEC 61000-4-18 and shall meet the minimum performance of IEC 60255-26 requirement.

Table 30: Immunity against damped oscillatory wave (1 MHz) test requirement

Port	Test Level	Requirement
	(1 MHz)	
Supply Line	± 1.0 kV @ differential mode ± 2.5 kV @ common mode	Criteria B
	Zone A (3/10/30 MHz)	
Supply Line	± 2 kV @ common mode	Criteria B

Port	Test Level	Requirement
	(1 MHz)	
Communication	± 1 kV @ common mode	Criteria B
	Zone A (3/10/30 MHz)	
Communication	± 2 kV @ common mode	Criteria B

Port	Test Level	Requirement
	(1 MHz)	
Input and output	± 1.0 kV @ differential mode ± 2.5 kV @ common mode	Criteria B
	Zone A (3/10/30 MHz)	
Input and output	± 2 kV @ common mode	Criteria B

15.2 Test Setup

15.2.1 Immunity against damped oscillatory wave (1 MHz) test was performed in the shielded enclosure room in accordance to the procedure set forth in the IEC 61000-4-18.

15.2.2 The 1 MHz burst was induced to the input power terminals of the EUT.

15.2.3 The test was performed in a shielded enclosure, using a surge generator network coupler/decoupler compliant with IEC 61000-4-18.

15.2.4 The 1 MHz burst generator network was on the top of ground plane and connected to the positive earth.

15.2.5 The EUT was operated in its normal operating mode and EUT's meter display and indicator was observed for evaluation of performance criteria.

15.3 Test Results

The evaluations of Immunity against damped oscillatory wave (1 MHz) test were found to comply with the minimum performance requirements of IEC 60255-26 as shown in Table below.

Table 31: Result of Immunity against damped oscillatory wave (1 MHz) (supply port) for all models

Port	Phase	Level	Performance evaluation	Performance criteria
1MHz				
Supply input	Differential Mode	± 1.0 kV	No malfunction during and after the test	Criteria A
	Common Mode	± 2.5 kV	No malfunction during and after the test	Criteria A
3MHz				
Supply input	Common Mode	± 2 kV	No malfunction during and after the test	Criteria A
10MHz				
Supply input	Common Mode	± 2 kV	No malfunction during and after the test	Criteria A
30MHz				
Supply input	Common Mode	± 2 kV	No malfunction during and after the test	Criteria A

Table 32: Result of Immunity against damped oscillatory wave (1 MHz) (Input and output port) all models

Port	Phase	Level	Performance evaluation	Performance criteria
Programmable Contact	Differential Mode	± 1 kV	No malfunction during and after the test	Criteria A
Trip Contact			No malfunction during and after the test	Criteria A
Programmable Contact	Common Mode	± 2.5 kV	No malfunction during and after the test	Criteria A
Trip Contact			No malfunction during and after the test	Criteria A

Table 33: Result of Immunity against damped oscillatory wave (1 MHz) (Input and output port) at 3MHz, 10MHz and 30MHz for all models

Port	Phase	Level	Performance evaluation	Performance criteria
Programmable Contact	Common Mode	± 2 kV	No malfunction during and after the test	Criteria A
Trip Contact			No malfunction during and after the test	Criteria A

Table 34: Result of Immunity against damped oscillatory wave (1 MHz) (Communication port)

Port	Phase	Level	Performance evaluation	Performance criteria
Not applicable	-	-	-	-

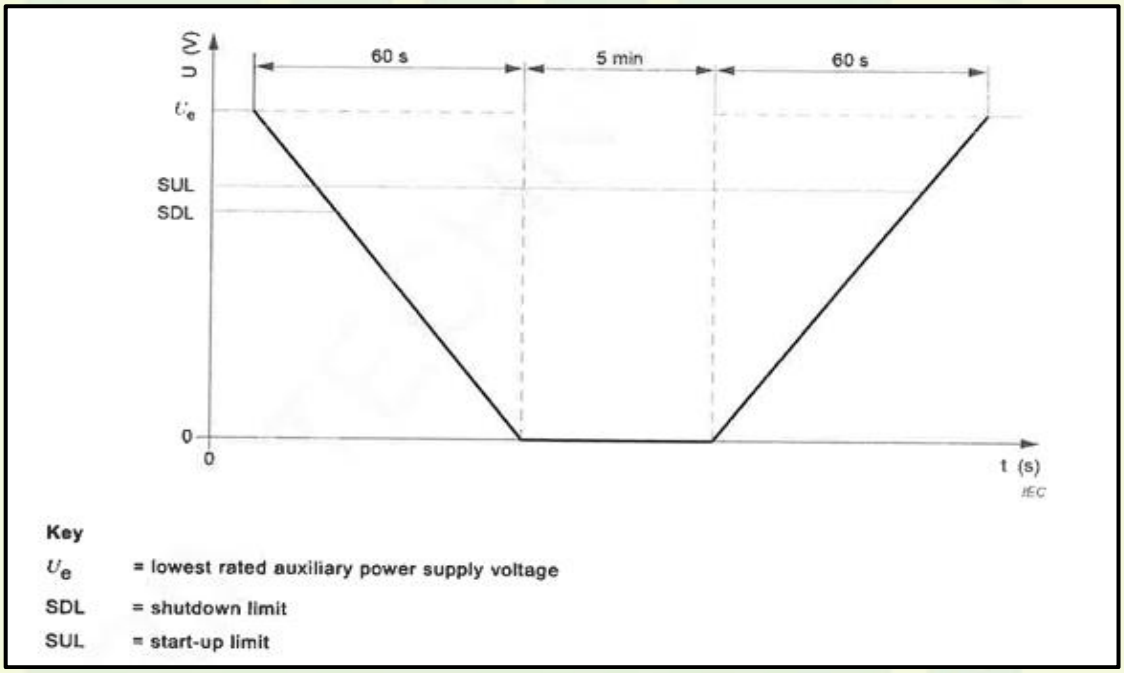
Table 35: Result of Immunity against damped oscillatory wave (1 MHz) (Communication port) at 3MHz, 10MHz and 30MHz

Port	Phase	Level	Performance evaluation	Performance criteria
Not applicable	-	-	-	-

16. GRADUAL SHUT-DOWN/START-UP TEST

16.1 Test Specifications

The evaluations of Gradual shut down/start-up test were performed and shall meet the minimum performance of IEC 60255-26 requirement. Acceptance criteria is Class C.



Gradual shut down/start-up test requirement.

16.2 Test Setup

16.2.1 The voltage in this standard uses the rated uses the rated for the EUT as a basis for voltage test level specification. Where the EUT has a rated voltage range.

16.2.2 The test shall be applied at the lowest voltage declared in the voltage range.

16.2.3 EUT was operated in its normal operating mode and EUT's meter display and indicator was observed for evaluation of performance criteria.

16.3 Test Results

The evaluations of Gradual shut-down/start up test were found to comply with the minimum performance requirements of IEC 60255-26 as shown in Table 39 below.

Table 36: Result of Gradual Shut-Down/Start-Up for all models

Input	Voltage	Test Mode	Performance Evaluation	Performance Criteria
AC	65V	Normal operating	EUT turn off during testing and return to normal operation after the test	B

17. IMMUNITY AGAINTS AC COMPONENT (RIPPLE) ON DC SUPPLY

17.1 TEST SPECIFICATIONS

The evaluations of immunity against AC Component (Ripple) On DC Supply were performed according to IEC 61000-4-17 and shall meet the minimum performance of IEC 60255-26 as shown in Table below.

Table 37: Minimum Requirement of AC Component (Ripple) On DC Supply

Terminal	Test level	Minimum performance criteria
DC input and output port	15% of nominal DC input	B

17.2 TEST DESCRIPTIONS

17.2.1 AC Component (Ripple) on DC Supply measurement were performed in the shielded enclosure in accordance to the procedure set forth IEC 61000-4-17.

17.2.2 The measurement has been performed with the EUT connected to the generator with the shortest power supply cable as specified by the manufacturer.

17.2.3 EUT was operated in its normal operating mode and EUT's meter display and indicator was observed for evaluation of performance criteria.

17.3 Test Result

The evaluations of the EUT against AC Component (Ripple) on DC Supply were found to comply with the minimum performance requirement of IEC 61000-6-5 as shown in Table below.

Table 38: Results of AC Component (Ripple) on DC Supply for all models

EUT Voltage	Test level	Performance Evaluation	Result
90Vdc	15% of nominal DC input	Criteria A	Pass
300Vdc	15% of nominal DC input	Criteria A	Pass

18. IMPULSE VOLTAGE WITHSTAND TEST

(Test is subcontracted to Domestic III Lab –EEST1)

18.1 Test Specifications

The evaluations of immunity against impulse voltage withstand were performed according to IEC 60255-27 Clause 9.6.4.2, as shown in table below.

Table 39: Impulse voltage withstand test requirement

Test Level	Performance Requirement
±5 kV	No disruptive discharge during test and after the test, EUT shall comply with all relevant performance requirements.

18.2 Test Setup

18.2.1 Impulse voltage withstand measurement was performed in the shielded enclosure in accordance to the procedure set forth in the IEC 60255-27 Clause 9.6.4.2.

18.2.2 The EUT was set into off operation mode and the performance was evaluated based on observation of any discharges occur during the test and EUT performance after the test

18.2.3 The impulse voltages were induced between each circuit and between independent circuits.

18.3 Test Results

The evaluations of the EUT against impulse voltage withstand were found to comply with the performance criteria A, as shown in table below.

Table 40: Results of Impulse voltage withstand

Test Terminal	Test Level	Test evaluation
between each circuit	±5 kV	No disruptive discharge during test and meet the relevant performance after the test
between independent circuit	±5 kV	

19. DIELECTRIC TEST

(Test is subcontracted to Domestic III Lab –EEST1)

19.1 Test Specifications

The evaluations of immunity against impulse voltage withstand were performed according to IEC 60255-27 Clause 9.6.4.3, as shown in table below.

Table 41: Dielectric test requirement

Test Level	Performance Requirement
± 2 kV	No breakdown or flashover shall occur

19.2 Test Setup

19.2.1 Dielectric measurement was performed in the shielded enclosure in accordance to the procedure set forth in the IEC 60255-27 Clause 9.6.4.3.

19.2.2 The EUT was set into off operation mode and the performance was evaluated based on observation of any breakdown or flashover occur during the test and EUT performance after the test.

19.2.3 The impulse voltages were induced between each circuit and between independent circuits.

19.3 Test Results

The evaluations of the EUT against impulse voltage withstand were found to comply with the performance criteria A, as shown in table below.

Table 42: Results of Dielectric Test

Test Terminal	Test Level	Test evaluation
between each circuit	± 2kV	No breakdown or flashover was occurred.
between independent circuit	± 2kV	

20. TEST INSTRUMENTS

No.	Equipment	Manufacturer	Model	Serial No.
1	EMI Receiver	Rohde & Schwarz	ESCI	100823
2	Line Impedance Stabilization Network (LISN)	Schwarzbeck	NSLK 8127	8127-916
3	Trilog Broadband Antenna	Schwarzbeck	VULB 9163	9163-567
4	ESD Generator	3C TEST	EDS30V	ES031000420016
5	EMC Compact Tester	Haefely	Axos8	181176
6	Signal Generator	Rohde & Schwarz	SMT 06	827424/005
7	Power Amplifier	Schaffner	CBA 9413B	4029
8	Logarithmic Periodic Dipole Antenna	Schwarzbeck	STLP 9128E	9128 E 043
9	RF Power Meter	Boonton	4232A	62901
10	Signal Generator	IFR	2032	203002/046
11	Power Amplifier	Schaffner	CBA 9425	1008
12	Coupling Decoupling Network	Schaffner	CDN M016	35844
13	Magnetic Field Coil	TESEQ	INA 702	289
14	Magnetic Field Generator	TESEQ	MFO 6501	205
15	Main Frame	Schaffner	NSG 2050	200130-589AR
16	Main Frame	Schaffner	NSG 2050	200130-589AR
17	Surge generator	Schaffner	PNW 2050	200116-023SC
18	Coupling and decoupling network	Schaffner	CDN 131/133	118

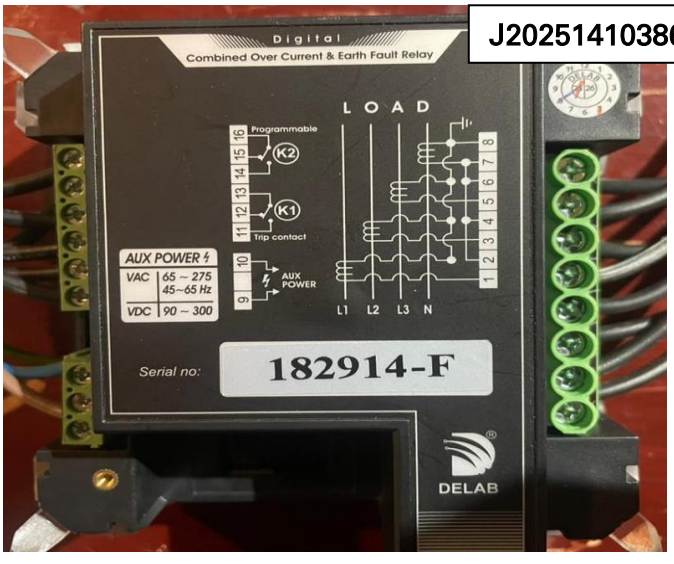
21. PHOTOGRAPHS

21.1 Photographs of test sample

J20251410386

Front view of test sample

J20251410386

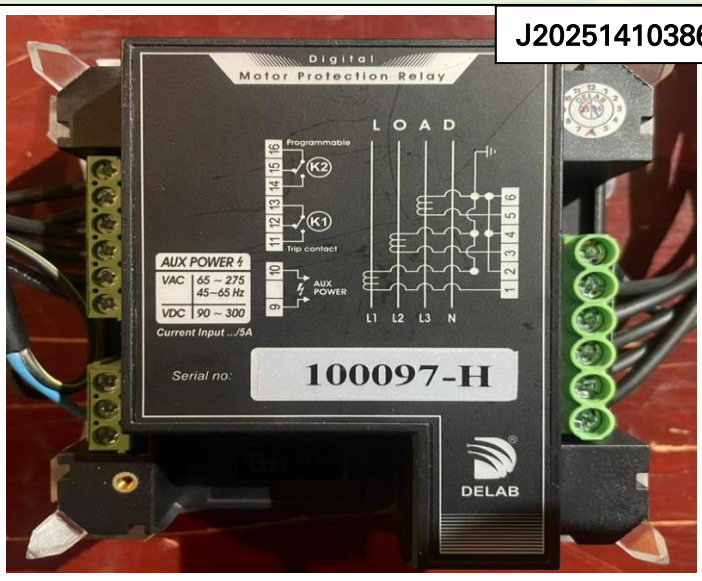


Rear view of test sample

J20251410386

Front view of test sample

J20251410386



Rear view of test sample

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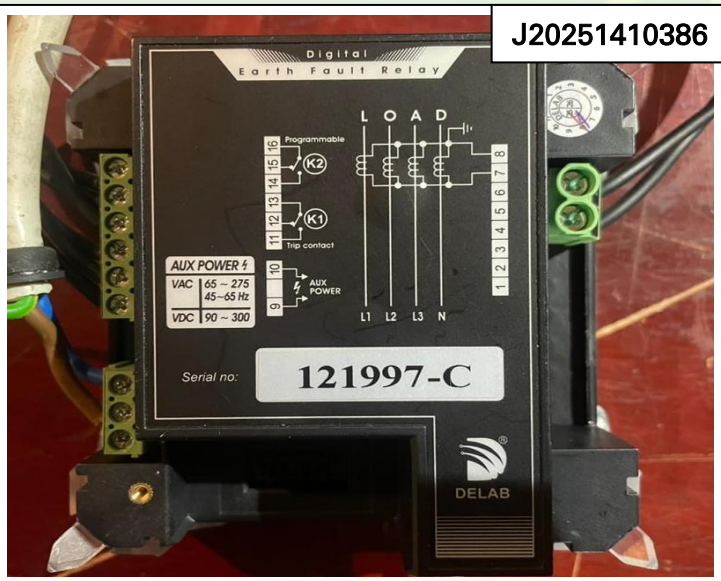
Front view of test sample

J20251410386



Rear view of test sample

J20251410386

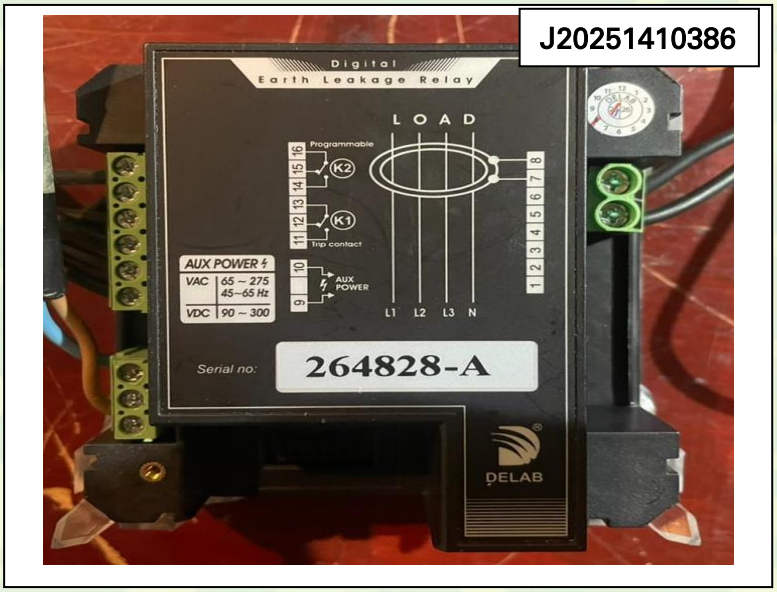
Front view of test sample

J20251410386

Rear view of test sample

SIRIM QAS International Sdn. Bhd.
RF & EMC TESTING SECTION

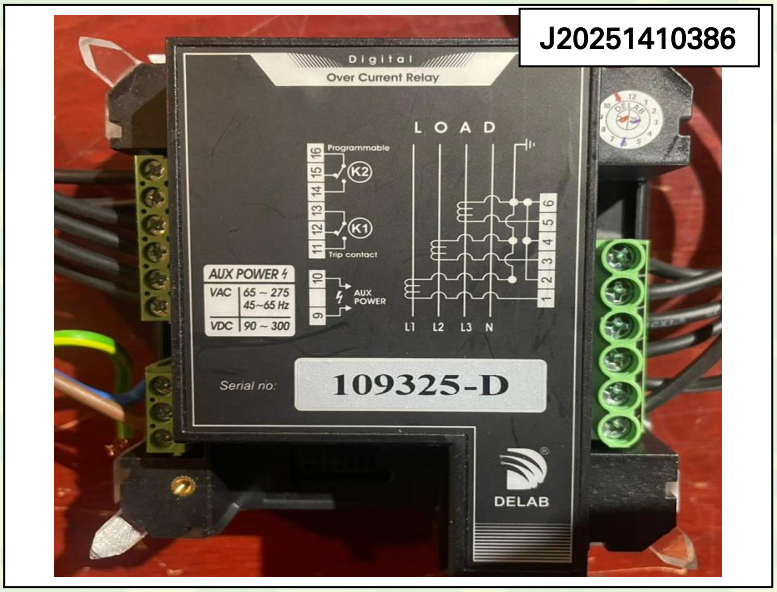
Front view of test sample



Rear view of test sample

SIRIM QAS International Sdn. Bhd.
RF & EMC TESTING SECTION

Front view of test sample

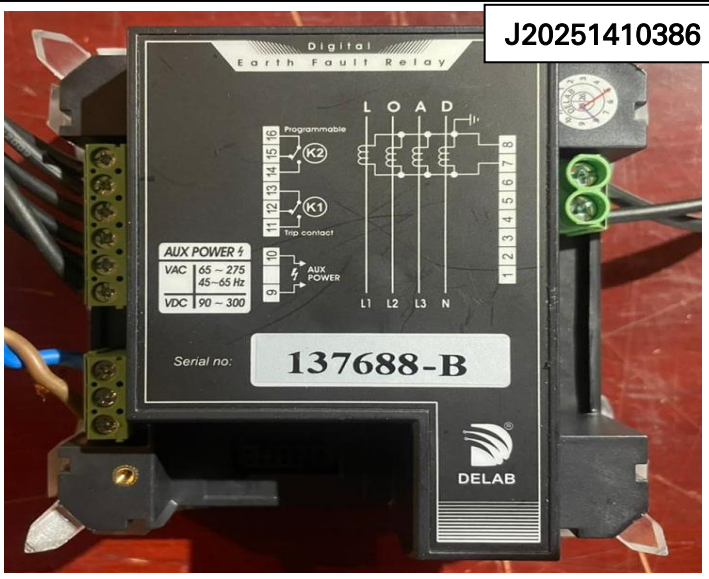


Rear view of test sample

J20251410386

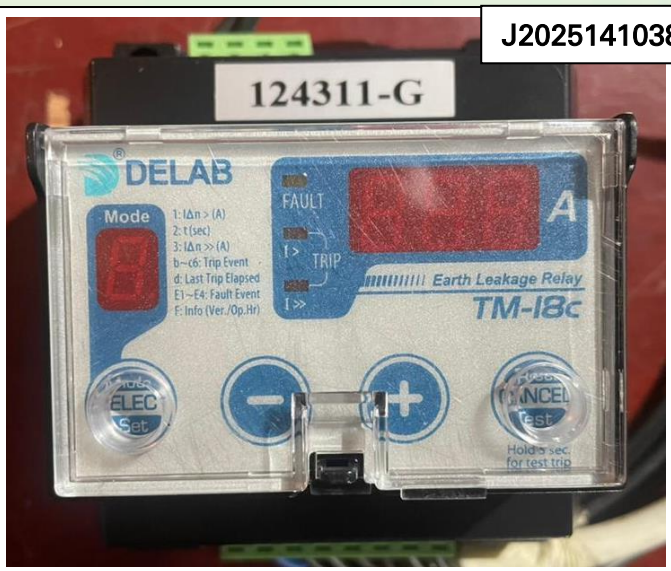
Front view of test sample

J20251410386

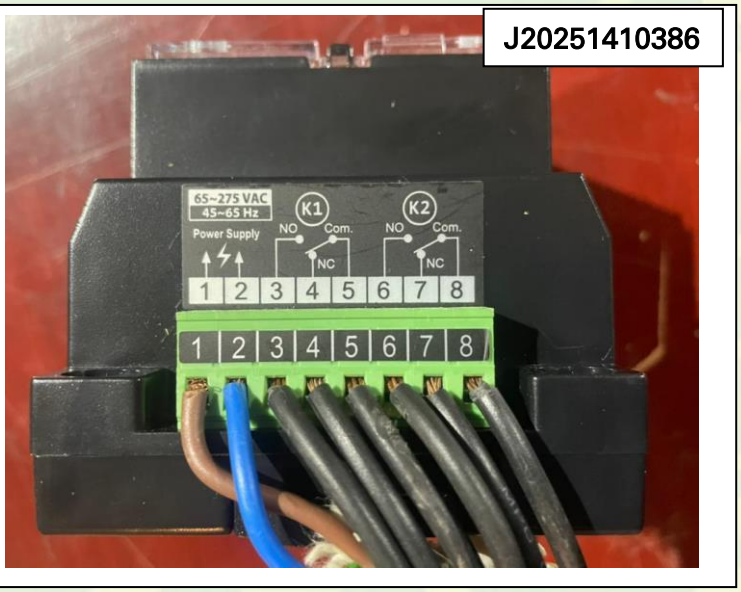


Rear view of test sample

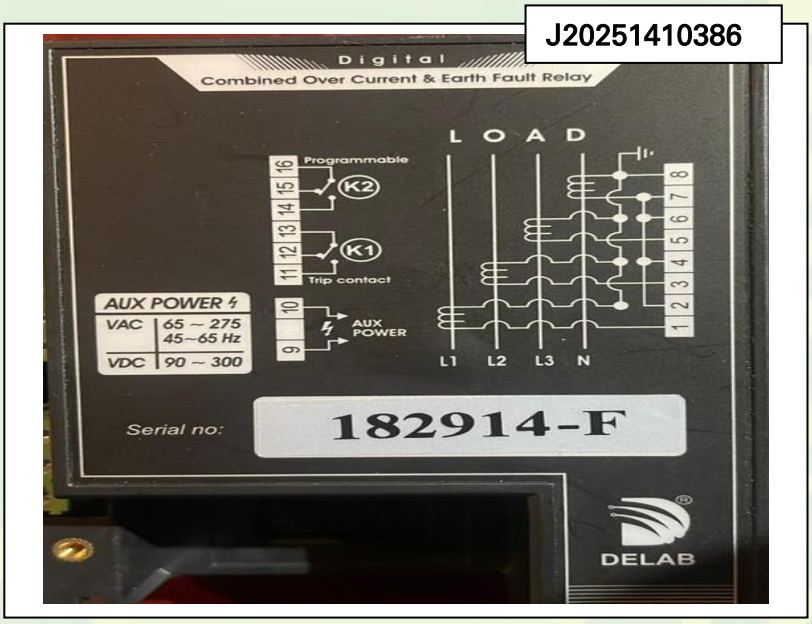
SIRIM QAS International Sdn. Bhd.
RF & EMC TESTING SECTION



Front view of test sample



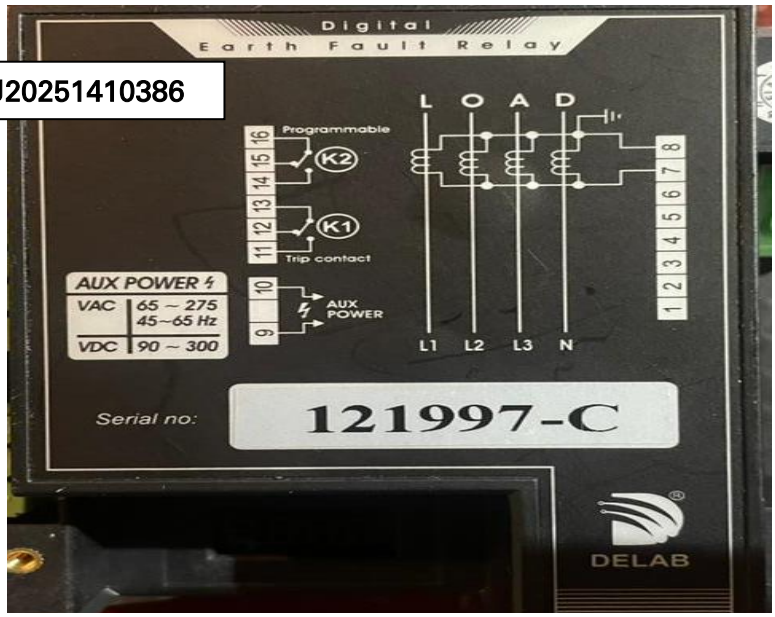
Rear view of test sample



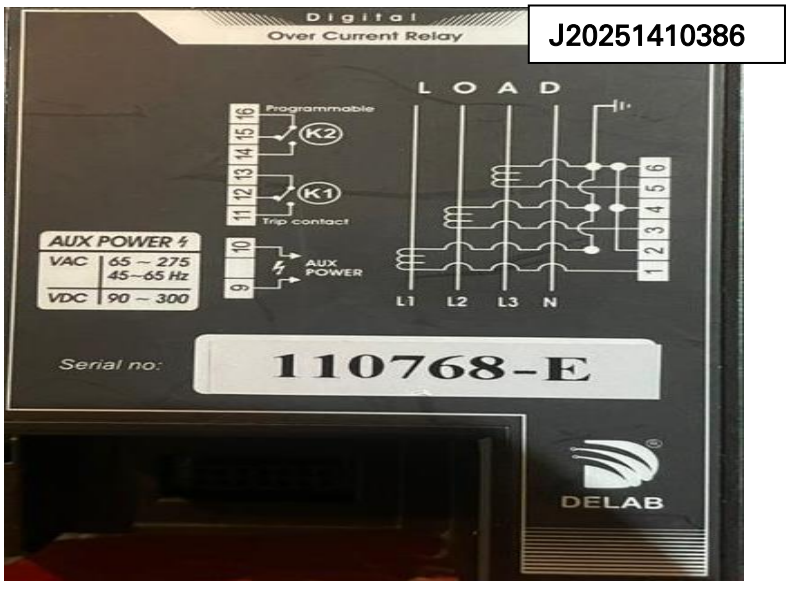
Product marking of test sample

Product marking of test sample

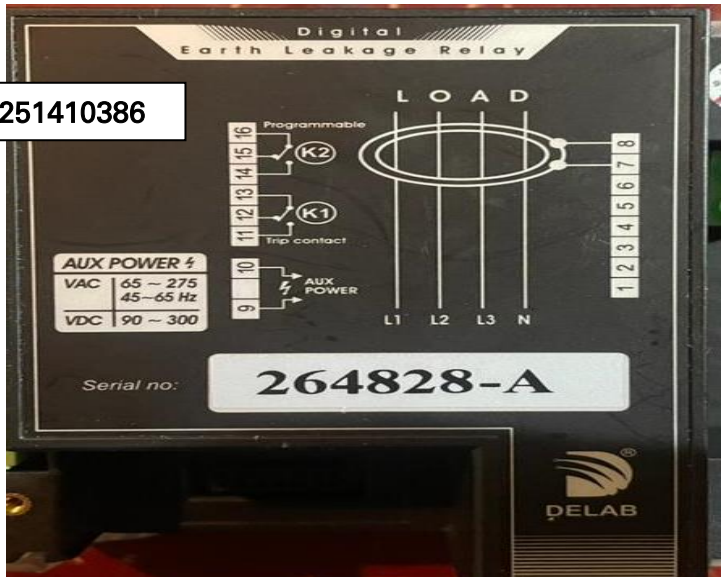
SIRIM QAS International Sdn. Bhd.
RF & EMC TESTING SECTION



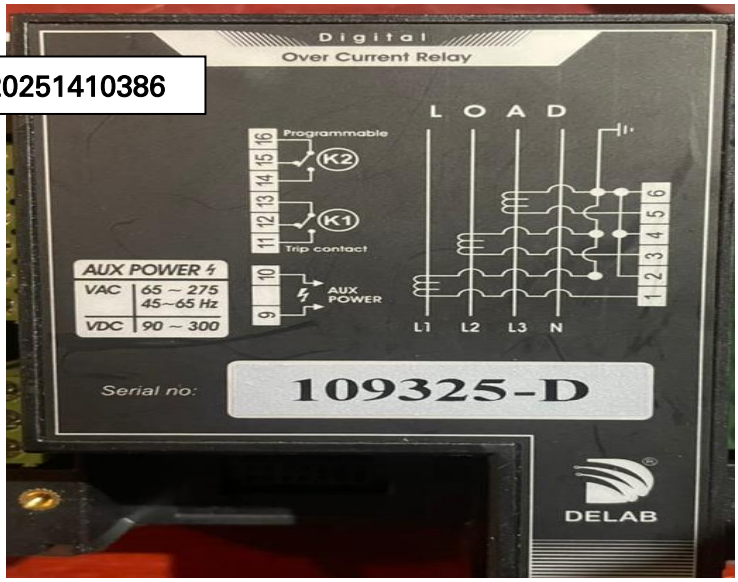
Product marking of test sample



Product marking of test sample

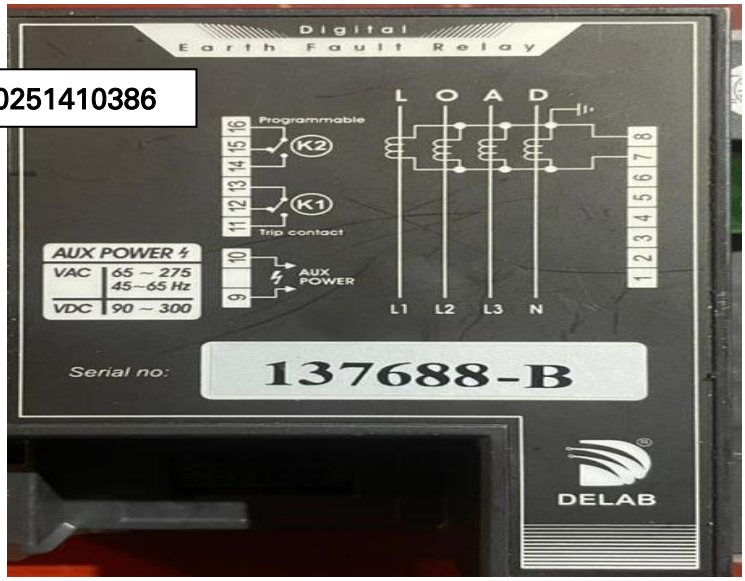


Product marking of test sample

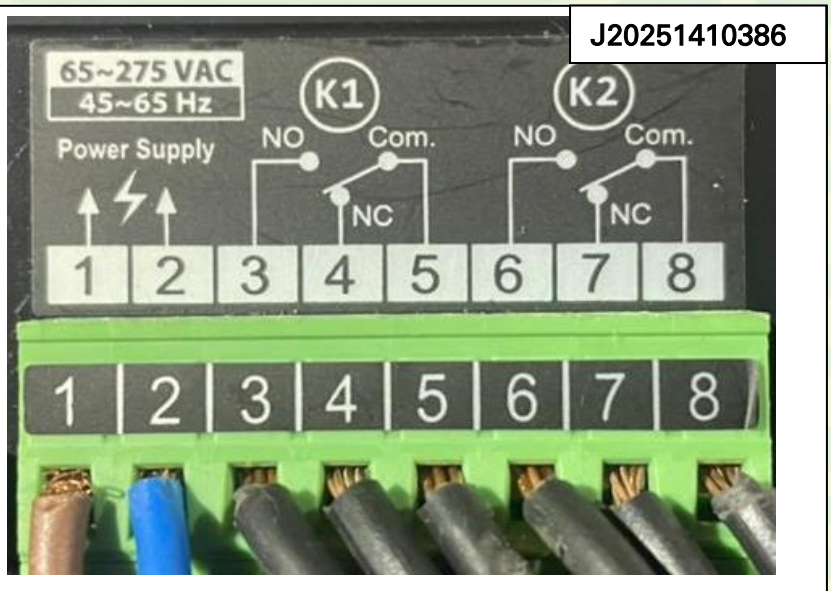


Product marking of test sample

SIRIM QAS International Sdn. Bhd.
RF & EMC TESTING SECTION



Product marking of test sample



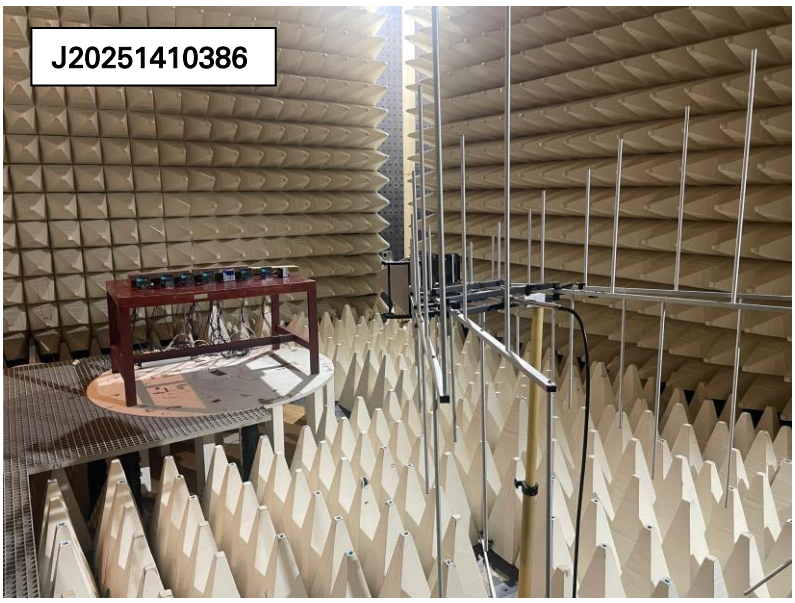
Product marking of test sample

21.2 Photograph of Conducted Emission measurement

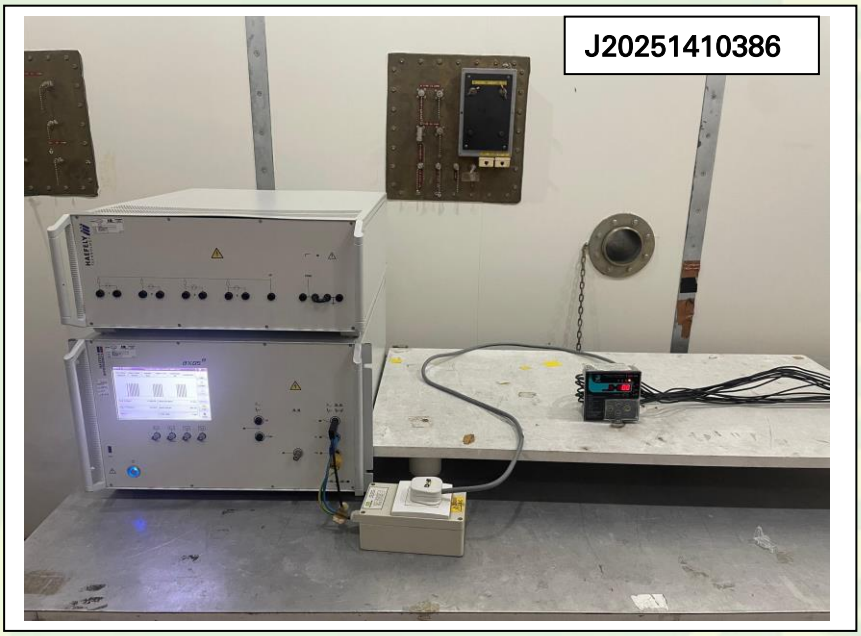
21.3 Photograph Radiated Emission for 30MHz – 1 GHz

21.4 Photograph of Electrostatic Discharge - ESD

21.5 Photograph of Radio-frequency electromagnetic field (Amplitude modulation)

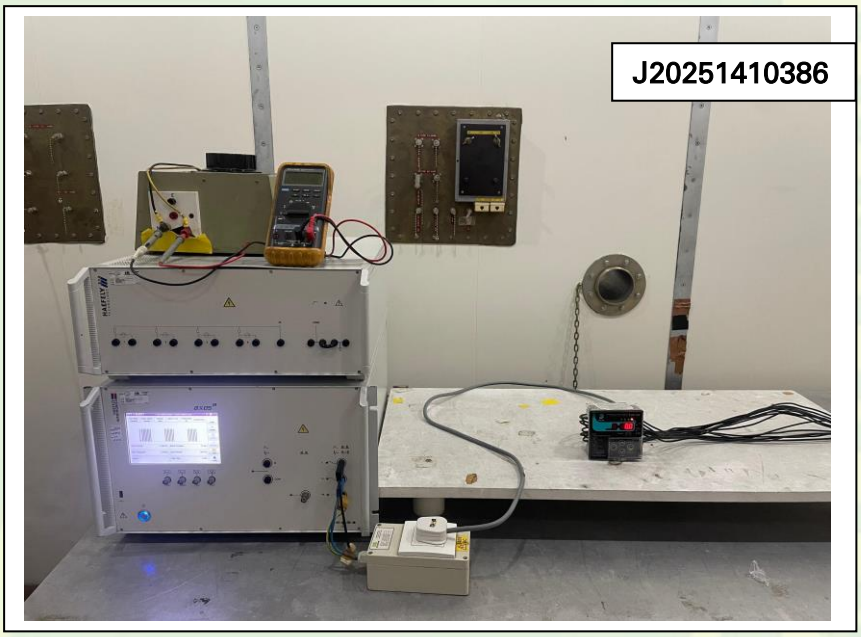


21.6 Photograph of Fast Transients and Surges

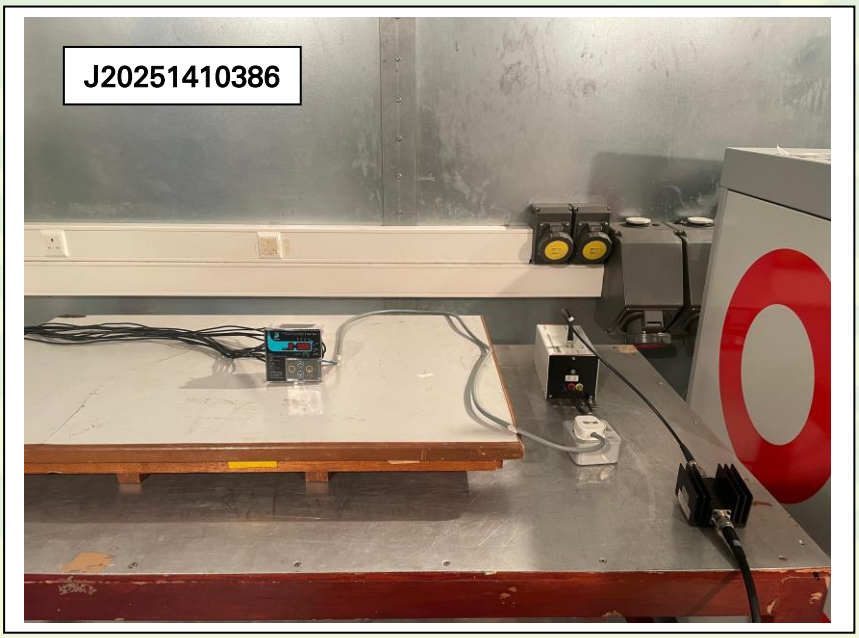


21.7 Photograph of Immunity Against Conducted Common Mode Disturbances In The Frequency Range 0hz To 150 Khz

21.8 Photograph of Voltage Dips and Interruption



21.9 Photograph of Conducted Disturbance Induced By Radio-Frequency Fields



21.10 Photograph of Power Frequency Magnetic Field

21.11 Photograph 1 MHz damped oscillatory wave

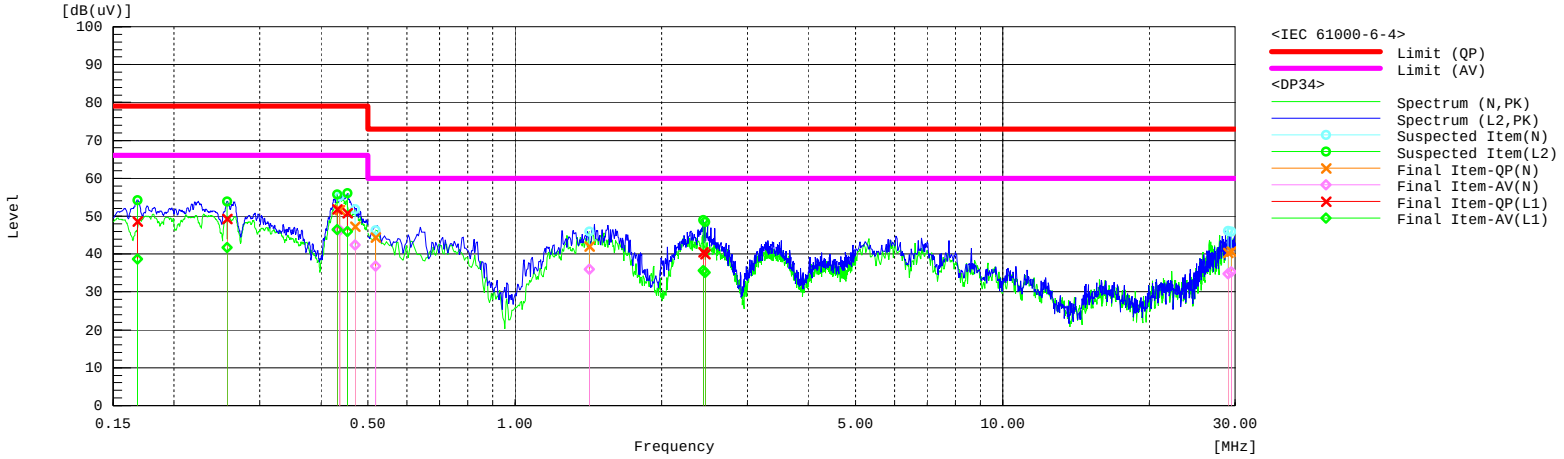
21.12 Photograph Gradual Shut-Down/Start-Up

RF&EMC SECTION
SIRIM QAS INTERNAT"L

<<COMBINED OVER CURRENT & EARTH FAULT RELAY>>

8 September,2025

Customer	: DELAB SCIENTIFIC SDN BHD	Standard	: IEC 61000-6-4
Model	: DP34	Remark1	: 230V 50Hz
Serial no	: -	Remark2	:
Tested by	: MUHD ZAREF	Remark3	:
Test Mode	: NORMAL OPERATING	Remark4	:



Final Result

--- N Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]	Remark
1	0.43665	30.9	25.6	20.7	51.6	46.3	79.0	66.0	27.4	19.7	
2	0.4699	26.6	21.6	20.7	47.3	42.3	79.0	66.0	31.7	23.7	
3	0.518	23.7	16.1	20.7	44.4	36.8	73.0	60.0	28.6	23.2	
4	1.4225	21.5	15.5	20.5	42.0	36.0	73.0	60.0	31.0	24.0	
5	29.050	19.3	13.7	21.1	40.4	34.8	73.0	60.0	32.6	25.2	
6	29.425	19.6	14.3	21.0	40.6	35.3	73.0	60.0	32.4	24.7	

--- L1 Phase ---

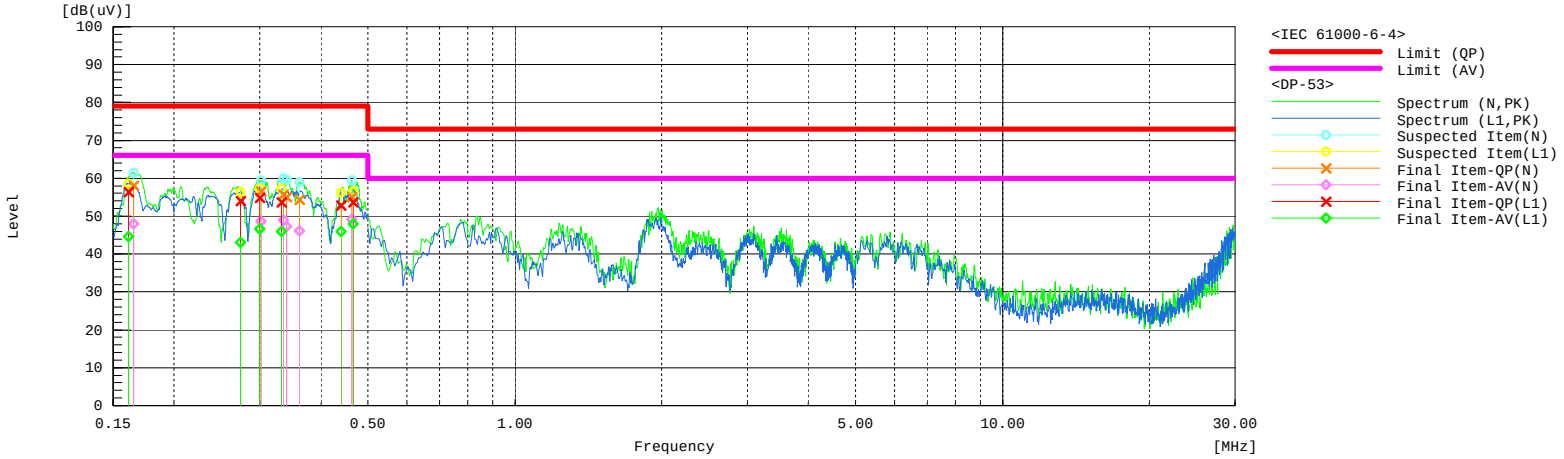
No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]	Remark
1	0.1682	28.0	18.1	20.6	48.6	38.7	79.0	66.0	30.4	27.3	
2	0.25675	28.8	21.2	20.6	49.4	41.8	79.0	66.0	29.6	24.2	
3	0.4321	31.3	25.8	20.6	51.9	46.4	79.0	66.0	27.1	19.6	
4	0.45345	30.2	25.4	20.6	50.8	46.0	79.0	66.0	28.2	20.0	
5	2.4305	20.2	15.2	20.4	40.6	35.6	73.0	60.0	32.4	24.4	
6	2.453	19.6	14.8	20.4	40.0	35.2	73.0	60.0	33.0	24.8	

RF&EMC SECTION
SIRIM QAS INTERNAT"L

<<MOTOR PROTECTION RELAY>>

8 September,2025

Customer	: DELAB SCIENTIFIC SDN BHD	Standard	: IEC 61000-6-4
Model	: DP-53	Remark1	: 230V 50Hz
Serial no	: -	Remark2	:
Tested by	: MUHD ZAREF	Remark3	:
Test Mode	: NORMAL OPERATING	Remark4	:



Final Result

--- N Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]	Remark
1	0.16505	37.4	27.2	20.8	58.2	48.0	79.0	66.0	20.8	18.0	
2	0.3019	35.9	28.0	20.7	56.6	48.7	79.0	66.0	22.4	17.3	
3	0.33515	35.0	28.2	20.7	55.7	48.9	79.0	66.0	23.3	17.1	
4	0.34005	34.4	26.6	20.7	55.1	47.3	79.0	66.0	23.9	18.7	
5	0.3614	33.7	25.5	20.7	54.4	46.2	79.0	66.0	24.6	19.8	
6	0.4629	34.4	28.4	20.7	55.1	49.1	79.0	66.0	23.9	16.9	

--- L1 Phase ---

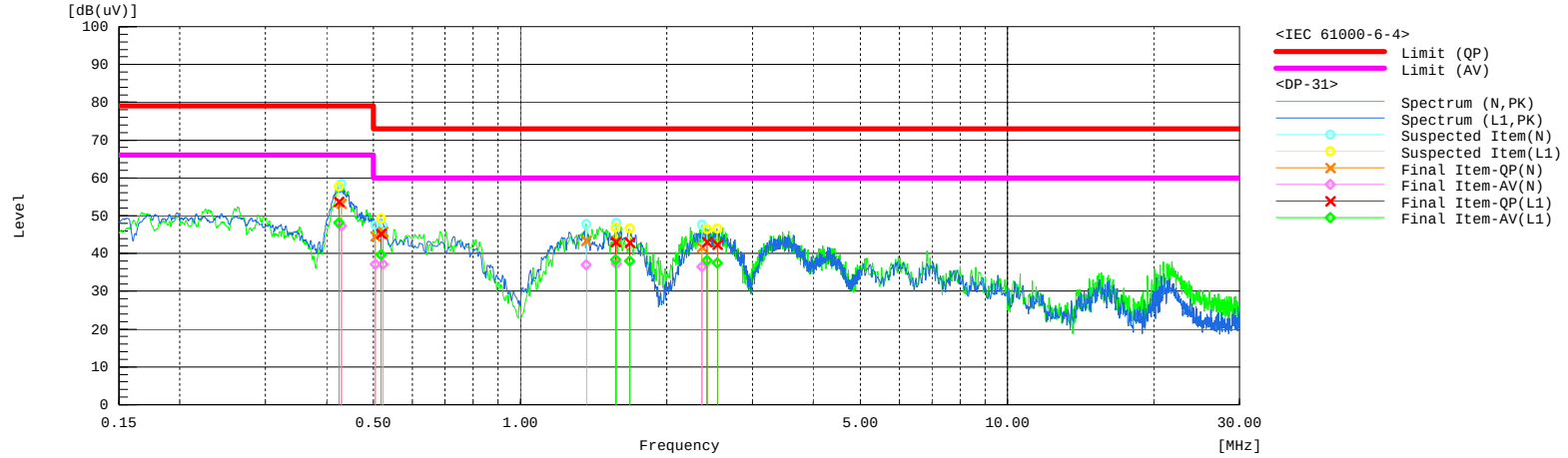
No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]	Remark
1	0.1612	35.8	23.9	20.6	56.4	44.5	79.0	66.0	22.6	21.5	
2	0.27355	33.5	22.4	20.6	54.1	43.0	79.0	66.0	24.9	23.0	
3	0.2998	34.3	26.1	20.6	54.9	46.7	79.0	66.0	24.1	19.3	
4	0.33235	33.2	25.3	20.6	53.8	45.9	79.0	66.0	25.2	20.1	
5	0.43945	32.2	25.4	20.6	52.8	46.0	79.0	66.0	26.2	20.0	
6	0.46605	33.0	27.4	20.6	53.6	48.0	79.0	66.0	25.4	18.0	

RF&EMC SECTION
SIRIM QAS INTERNAT"L

<<EARTH FAULT RELAY>>

8 September,2025

Customer	: DELAB SCIENTIFIC SDN BHD	Standard	: IEC 61000-6-4
Model	: DP-31	Remark1	: 230V 50Hz
Serial no	: -	Remark2	:
Tested by	: MUHD ZAREF	Remark3	:
Test Mode	: NORMAL OPERATING	Remark4	:



Final Result

--- N Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]	Remark
1	0.42895	32.5	26.7	20.7	53.2	47.4	79.0	66.0	25.8	18.6	
2	0.5045	23.9	16.4	20.7	44.6	37.1	73.0	60.0	28.4	22.9	
3	0.5225	25.1	16.4	20.7	45.8	37.1	73.0	60.0	27.2	22.9	
4	1.3685	23.0	16.5	20.5	43.5	37.0	73.0	60.0	29.5	23.0	
5	1.5755	22.9	16.8	20.5	43.4	37.3	73.0	60.0	29.6	22.7	
6	2.3585	21.1	15.9	20.6	41.7	36.5	73.0	60.0	31.3	23.5	

--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]	Remark
1	0.4237	33.2	27.6	20.6	53.8	48.2	79.0	66.0	25.2	17.8	
2	0.518	24.7	19.0	20.6	45.3	39.6	73.0	60.0	27.7	20.4	
3	1.571	22.6	18.0	20.4	43.0	38.4	73.0	60.0	30.0	21.6	
4	1.679	22.6	17.8	20.3	42.9	38.1	73.0	60.0	30.1	21.9	
5	2.4215	22.6	17.8	20.4	43.0	38.2	73.0	60.0	30.0	21.8	
6	2.5385	22.1	17.0	20.4	42.5	37.4	73.0	60.0	30.5	22.6	

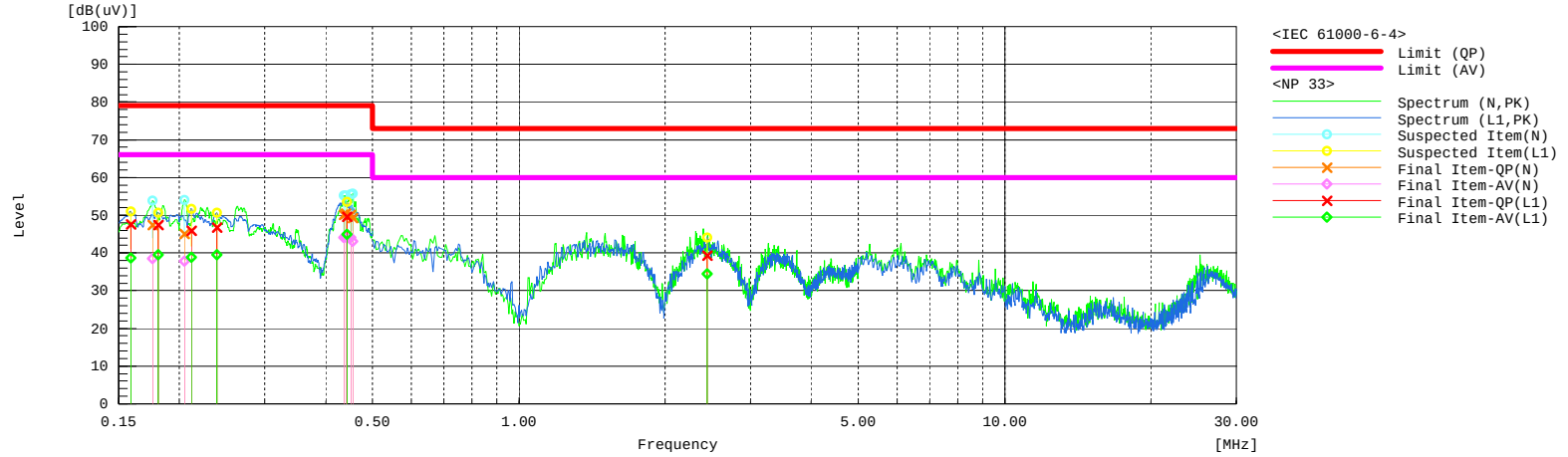
RF&EMC SECTION
SIRIM QAS INTERNAT"L

<<OVER CURRENT REALAY>>

8 September,2025

Customer : DELAB SCIENTIFIC SDN BHD
Model : DP 33
Serial no : -
Tested by : MUHD ZAREF
Test Mode : NORMAL OPERATING

Standard : IEC 61000-6-4
Remark1 : 230V 50Hz
Remark2 :
Remark3 :
Remark4 :



Final Result

--- N Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]	Remark
1	0.17625	26.7	17.7	20.8	47.5	38.5	79.0	66.0	31.5	27.5	
2	0.20495	24.3	17.1	20.7	45.0	37.8	79.0	66.0	34.0	28.2	
3	0.43595	29.5	23.5	20.7	50.2	44.2	79.0	66.0	28.8	21.8	
4	0.43945	29.8	23.6	20.7	50.5	44.3	79.0	66.0	28.5	21.7	
5	0.45065	29.5	23.3	20.7	50.2	44.0	79.0	66.0	28.8	22.0	
6	0.45485	28.6	22.4	20.7	49.3	43.1	79.0	66.0	29.7	22.9	

--- L1 Phase ---

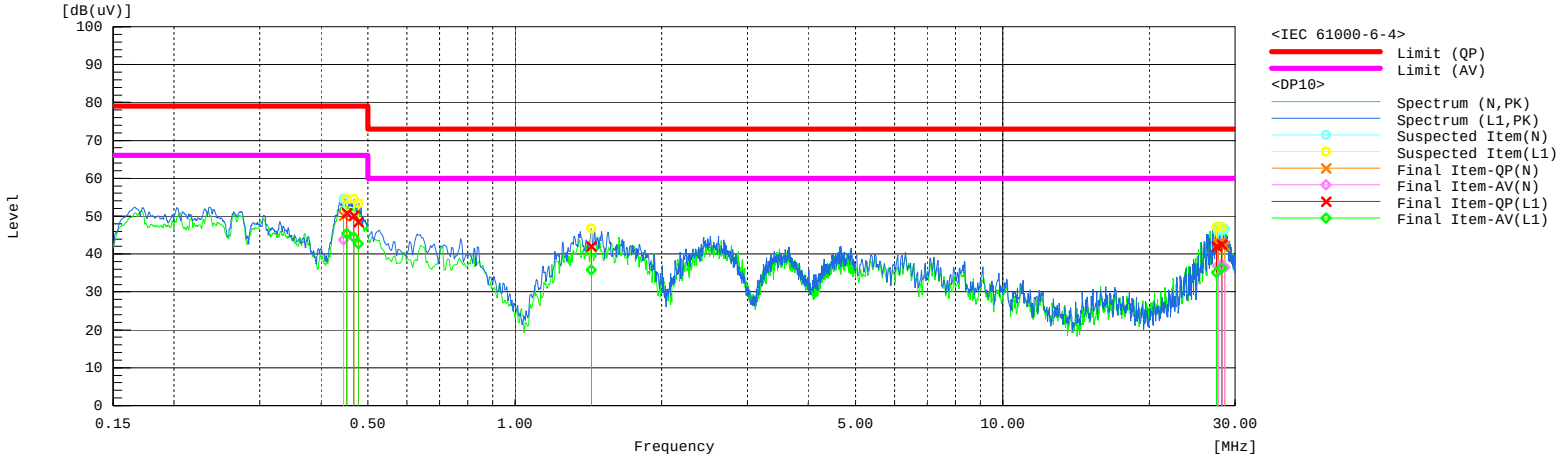
No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]	Remark
1	0.15875	27.1	18.1	20.6	47.7	38.7	79.0	66.0	31.3	27.3	
2	0.1808	26.9	19.0	20.6	47.5	39.6	79.0	66.0	31.5	26.4	
3	0.2116	25.3	18.3	20.6	45.9	38.9	79.0	66.0	33.1	27.1	
4	0.2389	26.1	18.9	20.6	46.7	39.5	79.0	66.0	32.3	26.5	
5	0.44225	29.1	24.3	20.6	49.7	44.9	79.0	66.0	29.3	21.1	
6	2.444	18.9	14.0	20.4	39.3	34.4	73.0	60.0	33.7	25.6	

RF&EMC SECTION
SIRIM QAS INTERNAT"L

<<EARTH LEAKAGE RELAY>>

8 September,2025

Customer	: DELAB SCIENTIFIC SDN BHD	Standard	: IEC 61000-6-4
Model	: DP-10	Remark1	: 230V 50Hz
Serial no	: -	Remark2	:
Tested by	: MUHD ZAREF	Remark3	:
Test Mode	: NORMAL OPERATING	Remark4	:



Final Result

--- N Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]	Remark
1	0.44575	29.5	23.0	20.7	50.2	43.7	79.0	66.0	28.8	22.3	
2	27.675	21.7	15.8	21.1	42.8	36.9	73.0	60.0	30.2	23.1	
3	27.750	21.8	15.8	21.1	42.9	36.9	73.0	60.0	30.1	23.1	
4	28.050	21.8	16.1	21.1	42.9	37.2	73.0	60.0	30.1	22.8	
5	28.250	21.6	15.9	21.1	42.7	37.0	73.0	60.0	30.3	23.0	
6	28.550	21.1	15.4	21.1	42.2	36.5	73.0	60.0	30.8	23.5	

--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]	Remark
1	0.45205	30.3	24.9	20.6	50.9	45.5	79.0	66.0	28.1	20.5	
2	0.46745	29.6	23.9	20.6	50.2	44.5	79.0	66.0	28.8	21.5	
3	0.47795	27.8	22.2	20.6	48.4	42.8	79.0	66.0	30.6	23.2	
4	1.436	21.7	15.4	20.4	42.1	35.8	73.0	60.0	30.9	24.2	
5	27.500	21.1	14.1	21.0	42.1	35.1	73.0	60.0	30.9	24.9	
6	28.125	21.6	15.3	21.0	42.6	36.3	73.0	60.0	30.4	23.7	

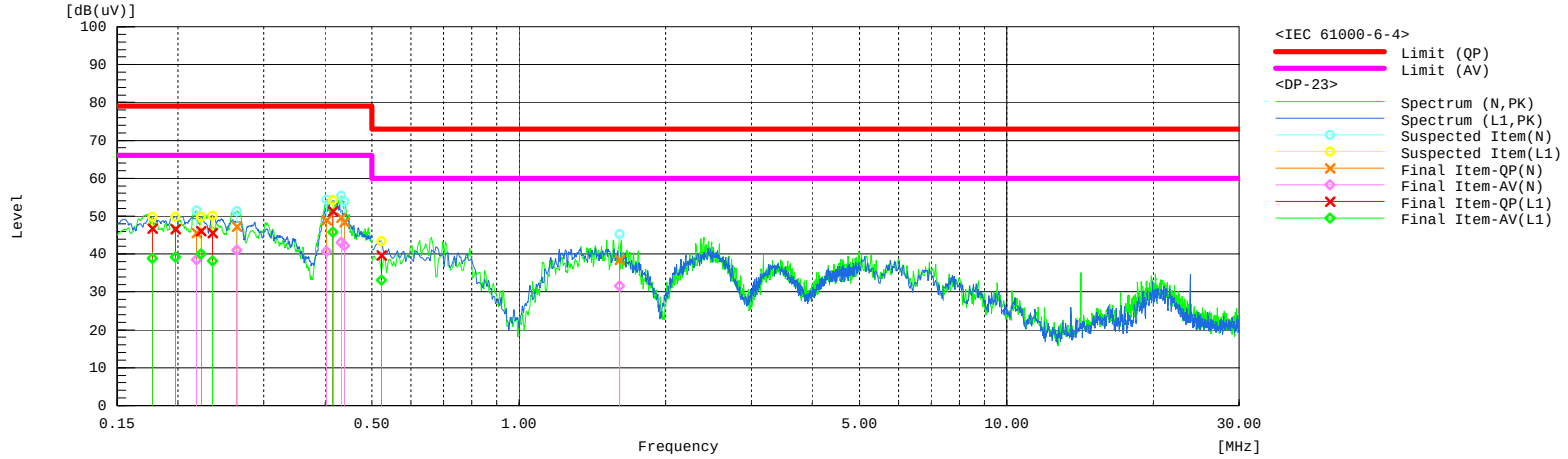
RF&EMC SECTION
SIRIM QAS INTERNAT"L

<<OVERCURRENT RELAY>>

8 September,2025

Customer : DELAB SCIENTIFIC SDN BHD
Model : DP-23
Serial no : -
Tested by : MUHD ZAREF
Test Mode : NORMAL OPERATING

Standard : IEC 61000-6-4
Remark1 : 230V 50Hz
Remark2 :
Remark3 :
Remark4 :



Final Result

--- N Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]	Remark
1	0.2179	24.8	17.8	20.7	45.5	38.5	79.0	66.0	33.5	27.5	
2	0.2641	26.6	20.3	20.7	47.3	41.0	79.0	66.0	31.7	25.0	
3	0.4034	28.3	20.0	20.7	49.0	40.7	79.0	66.0	30.0	25.3	
4	0.43245	28.9	22.4	20.7	49.6	43.1	79.0	66.0	29.4	22.9	
5	0.4384	27.7	21.6	20.7	48.4	42.3	79.0	66.0	30.6	23.7	
6	1.607	18.0	11.1	20.5	38.5	31.6	73.0	60.0	34.5	28.4	

--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]	Remark
1	0.17695	26.2	18.3	20.6	46.8	38.9	79.0	66.0	32.2	27.1	
2	0.19725	25.9	18.7	20.6	46.5	39.3	79.0	66.0	32.5	26.7	
3	0.2228	25.6	19.5	20.6	46.2	40.1	79.0	66.0	32.8	25.9	
4	0.23505	25.0	17.7	20.6	45.6	38.3	79.0	66.0	33.4	27.7	
5	0.41565	30.7	25.2	20.6	51.3	45.8	79.0	66.0	27.7	20.2	
6	0.5225	19.1	12.5	20.6	39.7	33.1	73.0	60.0	33.3	26.9	

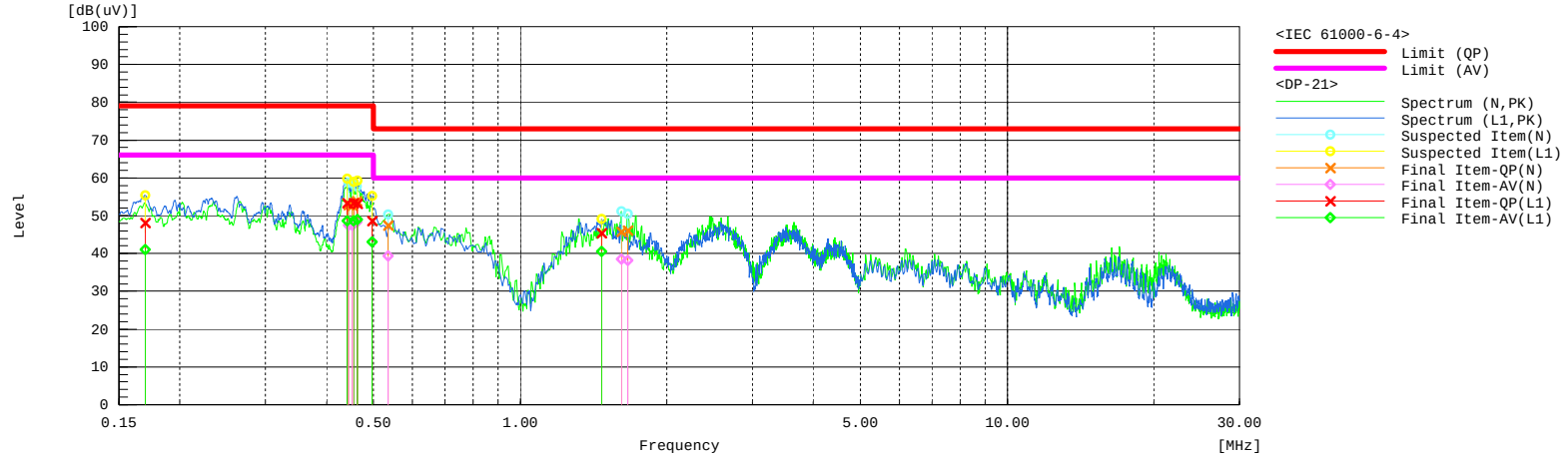
RF&EMC SECTION
SIRIM QAS INTERNAT"L

<<EARTH FAULT RELAY>>

8 September,2025

Customer : DELAB SCIENTIFIC SDN BHD
Model : DP-21
Serial no : -
Tested by : MUHD ZAREF
Test Mode : NORMAL OPERATING

Standard : IEC 61000-6-4
Remark1 : 230V 50Hz
Remark2 :
Remark3 :
Remark4 :



Final Result

--- N Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]	Remark
1	0.44435	32.2	26.8	20.7	52.9	47.5	79.0	66.0	26.1	18.5	
2	0.45205	32.0	26.7	20.7	52.7	47.4	79.0	66.0	26.3	18.6	
3	0.46115	33.1	27.6	20.7	53.8	48.3	79.0	66.0	25.2	17.7	
4	0.536	26.7	18.6	20.7	47.4	39.3	73.0	60.0	25.6	20.7	
5	1.6115	25.3	17.9	20.5	45.8	38.4	73.0	60.0	27.2	21.6	
6	1.661	25.6	17.6	20.5	46.1	38.1	73.0	60.0	26.9	21.9	

--- L1 Phase ---

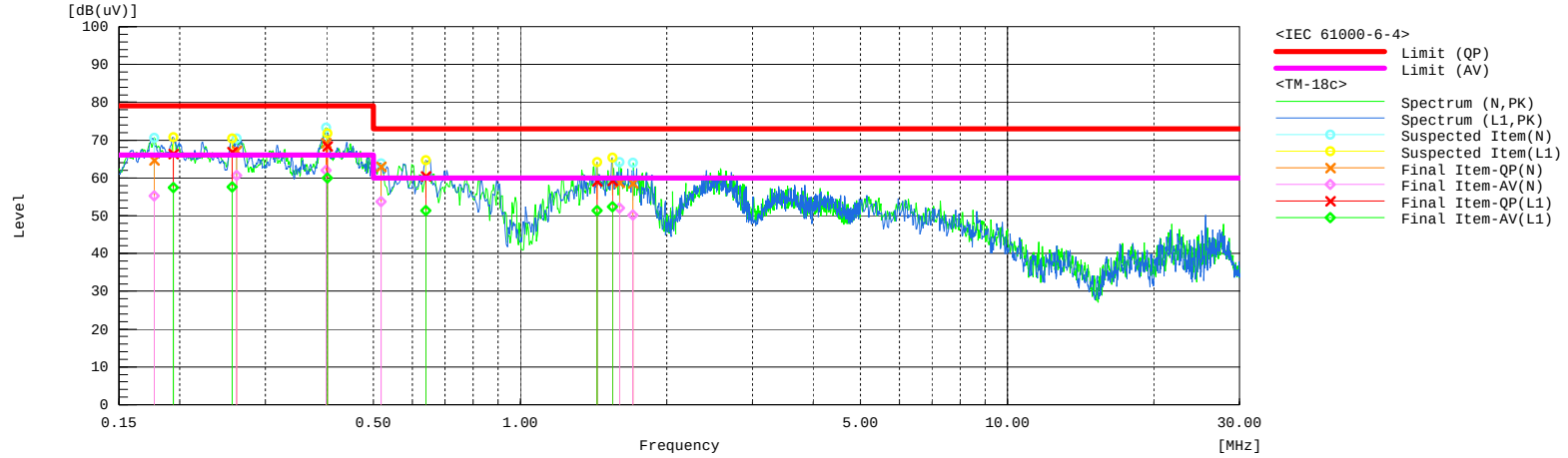
No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]	Remark
1	0.1696	27.5	20.4	20.6	48.1	41.0	79.0	66.0	30.9	25.0	
2	0.4412	32.7	28.0	20.6	53.3	48.6	79.0	66.0	25.7	17.4	
3	0.45485	32.8	28.0	20.6	53.4	48.6	79.0	66.0	25.6	17.4	
4	0.46255	32.6	28.3	20.6	53.2	48.9	79.0	66.0	25.8	17.1	
5	0.49685	28.1	22.4	20.6	48.7	43.0	79.0	66.0	30.3	23.0	
6	1.4675	25.0	20.2	20.4	45.4	40.6	73.0	60.0	27.6	19.4	

RF&EMC SECTION
SIRIM QAS INTERNAT"L

<<EARTH LEAKAGE RELAY>>

8 September,2025

Customer	: DELAB SCIENTIFIC SDN BHD	Standard	: IEC 61000-6-4
Model	: TM-18c	Remark1	: 230V 50Hz
Serial no	: -	Remark2	:
Tested by	: MUHD ZAREF	Remark3	:
Test Mode	: NORMAL OPERATING	Remark4	:



Final Result

--- N Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]	Remark
1	0.1773	43.9	34.4	20.8	64.7	55.2	79.0	66.0	14.3	10.8	
2	0.2613	46.5	40.0	20.7	67.2	60.7	79.0	66.0	11.8	5.3	
3	0.39955	48.5	41.4	20.7	69.2	62.1	79.0	66.0	9.8	3.9	
4	0.518	42.2	33.1	20.7	62.9	53.8	73.0	60.0	10.1	6.2	
5	1.598	38.3	31.5	20.5	58.8	52.0	73.0	60.0	14.2	8.0	
6	1.706	38.1	29.7	20.5	58.6	50.2	73.0	60.0	14.4	9.8	

--- L1 Phase ---

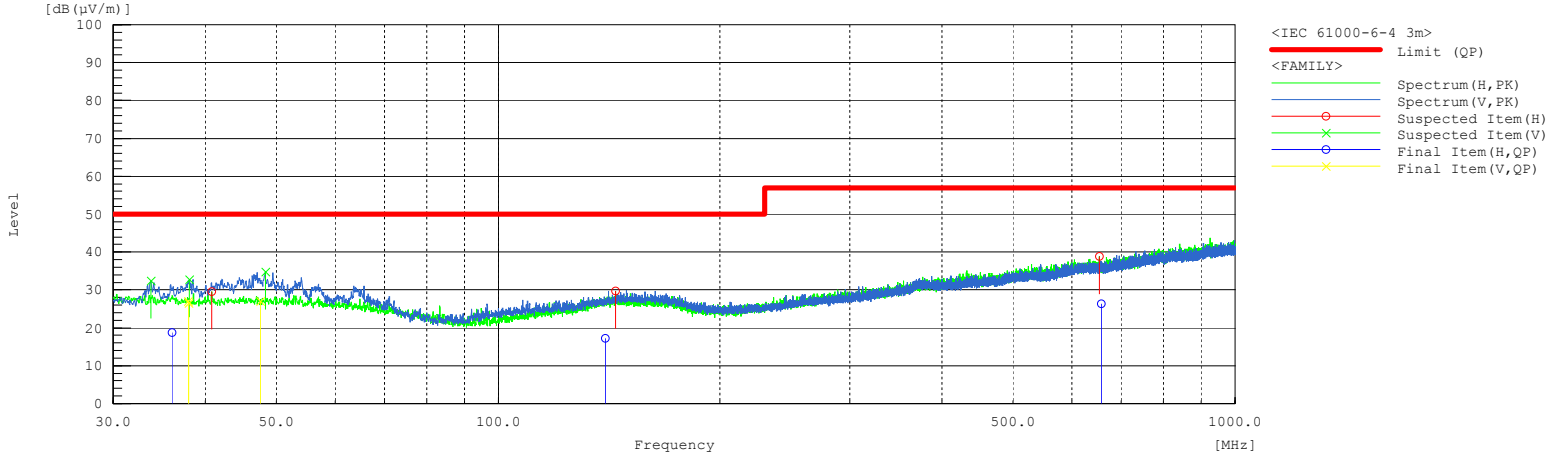
No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]	Remark
1	0.19375	45.8	36.8	20.6	66.4	57.4	79.0	66.0	12.6	8.6	
2	0.2564	46.4	37.0	20.6	67.0	57.6	79.0	66.0	12.0	8.4	
3	0.40235	47.8	39.4	20.6	68.4	60.0	79.0	66.0	10.6	6.0	
4	0.6395	40.0	30.9	20.5	60.5	51.4	73.0	60.0	12.5	8.6	
5	1.4405	38.7	30.9	20.4	59.1	51.3	73.0	60.0	13.9	8.7	
6	1.5485	38.8	31.9	20.4	59.2	52.3	73.0	60.0	13.8	7.7	

EMC Section
Sirim QAS Internat'l

<<PROTECTIVE RELAY>>

8 SEPT 2025

Customer	: DELAB SCIENTIFIC SDN BHD	Standard	: IEC 61000-6-4
Model	: DP34,DP10,D21,DP23,DP31,DP33,DP53,TM18c	Freq	: 30MHz - 1GHz
Serial no.	: -	Remark1	: 230V 50Hz
Tested by	: MUHD ZAREF	Remark2	:
Test Mode	: NORMAL OPERATING	Remark3	:



Final Result

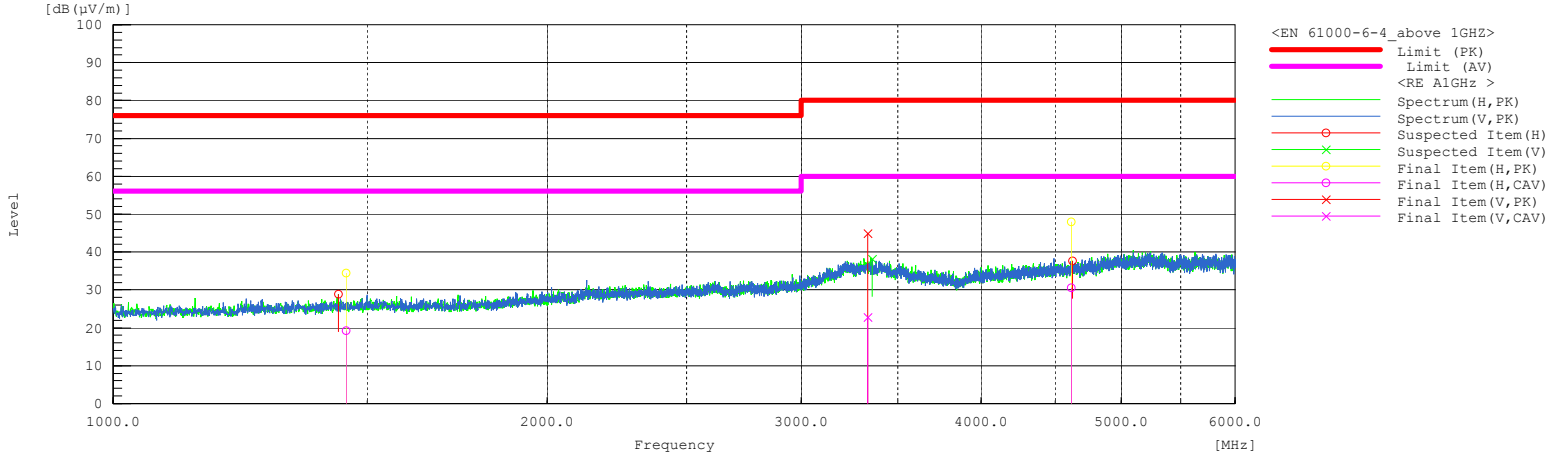
No.	Frequency [MHz]	(P)	Reading QP [dB(µV)]	c.f [dB(1/m)]	Result QP [dB(µV/m)]	Limit QP [dB(µV/m)]	Margin QP [dB]	Height [cm]	Angle [°]	Remark
1	36.039	H	4.3	14.5	18.8	50.0	31.2	232.0	170.0	
2	139.612	H	1.6	15.6	17.2	50.0	32.8	204.0	354.0	
3	658.538	H	2.3	24.0	26.3	57.0	30.7	297.0	132.0	
4	47.563	V	12.8	14.2	27.0	50.0	23.0	110.0	96.0	
5	37.920	V	14.0	13.1	27.1	50.0	22.9	100.0	110.0	
6	37.960	V	13.3	13.1	26.4	50.0	23.6	101.0	115.0	

EMC Section
Sirim QAS Internat'l

<<PROTECTIVE RELAY>>

8 SEPT 2025

Customer	: DELAB SCIENTIFIC SDN BHD	Standard	: IEC 61000-6-4
Model	: DP34,DP10,D21,DP23,DP31,DP33,DP53,TM18c	Rating	: 230V 50Hz
SerialNumber	: -	Anttena Pol.	:
Tested by	: MUHD ZAREF	Freq	: 1GHz - 6GHz
Test Mode	: NORMAL OPERATING	Remark4	:



Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(µV)]	Reading CAV [dB(µV)]	c.f [dB(1/m)]	Result PK [dB(µV/m)]	Result CAV [dB(µV/m)]	Limit PK [dB(µV/m)]	Limit AV [dB(µV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [°]	Remark
1	1451.104	H	34.8	19.6	-0.3	34.5	19.3	76.0	56.0	41.5	36.7	100.0	228.0	
2	4618.033	H	29.9	12.5	18.1	48.0	30.6	80.0	60.0	32.0	29.4	200.0	237.5	
3	3337.459	V	28.9	6.8	16.0	44.9	22.8	80.0	60.0	35.1	37.2	100.0	0.0	

CONDITIONS RELATING TO THE USE OF SIRIM QAS INTERNATIONAL TEST REPORT

1. A Test Report will be issued in respect of the Testing Services conducted and shall relate only to the sample actually tested by SIRIM QAS International. The results in the Test Report will be based on all the information provided by the Applicant, unless otherwise stated. SIRIM QAS International makes no warranties whatsoever, and the Applicant shall not represent in any manner that any duplication or mass production of the Product is identical to the Sample actually tested, or that SIRIM QAS International has tested any duplicated or mass-produced Product. Measurement uncertainty shall be included in the Test Report when no statement of conformity is required.

2. For quantitative test results (with values), when a statement of conformity to a specification or standard is applied, the Simple Acceptance Rule shall be used. Unless otherwise stated, the Acceptance Rule with Guard Band will be applied, and an additional charge will be incurred accordingly.

3. For qualitative test results (visual observation), when requested by the applicant, a statement of conformity shall be included in the Test Report. If there is no request by the Applicant, a statement of conformity can be included in the Test Report based on SIRIM QAS International Sdn. Bhd.'s discretion.

4. The Applicant shall not at any time misrepresent the content of any Test Report provided by SIRIM QAS International Sdn. Bhd., nor shall the Test Report be misused, amended, changed, varied, or modified in any manner whatsoever by the Applicant or otherwise.

5. The Test Report shall not be reproduced, except in full, without the written approval from the Head of Quality, Occupational Safety and Health & Environment (QOSHE) of SIRIM QAS International of No. 1, Block 8, Persiaran Dato' Menteri, Section 2, P.O. Box 7035, 40700 Shah Alam, Selangor Darul Ehsan.

6. The Applicant is not permitted to use any SIRIM QAS International Sdn. Bhd., SIRIM Berhad or other SIRIM subsidiaries logos or words on packaging, sample manuals, technical specifications, items and products.

7. Subject to consent and written approval from the Head of Quality, Occupational Safety and Health & Environment (QOSHE) of SIRIM QAS International Sdn. Bhd., the Applicant may use the SIRIM QAS International Sdn. Bhd. logo or word on promotional materials. The Applicant shall only include the phrase, "A sample of this product has been tested by SIRIM QAS International Sdn. Bhd. (Test Report No) ...(dated) ... (for what test) ... (to which standard)", or similar words emphasizing that only the sample was tested. This phrase shall only be used for product advertisements or promotions (e.g.: brochures, flyers, official website). For clarity, the statement shall not be used on the sample, packaging, items or products.

8. In the event there is an investigation from a Government Regulatory Agency concerning the Applicant's Test Report, SIRIM QAS International Sdn. Bhd. may disclose the information pertaining to the Test Report for the purposes of such investigation.

9. In the event that the Applicant is found in breach of this provision, SIRIM QAS International Sdn. Bhd., SIRIM Berhad and/or other SIRIM subsidiaries may, without prejudice to any other rights and remedies, take whatever actions are necessary including but not limited to:
   a) Informing and placing a notice in the media;
   b) Obtaining an injunction from the Court (costs on a solicitor-client basis to be borne by the Applicant);
   c) Refusing to accept any further Products for Testing Services from the Applicant or whosoever related to the Applicant, whether subsidiary or otherwise;
   d) Instructing the Applicant to withdraw and recall the advertisement, statement, or document in question and to publish a clarification and apology to SIRIM QAS International, SIRIM and/or other SIRIM subsidiaries twice in a national publication of SIRIM QAS International's choice at the Applicant's sole cost; and
   e) Informing or lodging a report pertaining to the Applicant's Test Report with the relevant authorities.

10. SIRIM QAS International is committed to supporting environmentally friendly business practices by reducing paper consumption. Therefore, we do not issue any hard copies of the Test Report to the Applicant. However, additional certified true copies or softcopies of the Test Report may be issued upon request by the Applicant, subject to payment of the relevant fee. Certified true copies or softcopies of the Test Report shall only be provided for Test Reports issued not more than **three (3) years** from the date of issuance.

11. The Issuance of an Amendment Report due to the following reasons is chargeable to the Applicant:
   (a) Typo or change[1] in details of the Applicant's name and/or address; or
   (b) Typo or change[1] in details of the Manufacturer's name and/or address; or
   (c) Typo or change[1] in details of the Factory location name and/or address; or
   (d) Typo or change[1] in details of the brand, size, model and/or type designation; or
   (e) Typo in details of the description of sample.
   Note: [1]Applicable only for electrical and electronic products based on IECEE OD-2020.

12. Any corrections and/or changes to the Report requested by the Applicant shall only be allowed if the date of issuance of the original Test Report has not exceeded six (6) months and shall be limited to a maximum of three (3) times. After either of these conditions is met, no further amendments to the Test Report shall be issued.

13. However, the issuance of a Supplementary Report due to the following reasons is free of charge (FOC):
   a) Misprints and typographical errors;
   b) Missing technical information as agreed in the PP1 form;
   c) Test data not reported; or
   d) Mistakes in the reporting of test data.