Technical Construction File (TCF)

Applicant:	BORUNTE ROBOT CO., LTD.
Address:	No. 93, Shafu Road, Shabu Village, Dalang Town, Dongguan City, Guangdong Province
Manufacturer:	BORUNTE ROBOT CO., LTD.
Address:	No. 93, Shafu Road, Shabu Village, Dalang Town, Dongguan City, Guangdong Province
Product:	Industrial Robot
Model:	BRTIRXZ1005A,BRTIRUS3012C,BRTIRUS1820A,BRTIRUS2650A,BRTIRWD2110A,BRTIRPZ2035A,BRTIRUS1510A,BRTIRUS0805A,BRTIRUS0707A,BRTIRUS2110A,BRTIRSC0603A,BRTIRPZ1508A,BRTIRUS2030A,BRTIRWD1506A,BRTIRPZ1825A,BRTIRSC0810A,BRTIRUS0401A,BRTIRUS2550A,BRTIRSE2013A,BRTIRUS3050B,BRTIRXZ1515A,BRTIRSE2013F,BRTIRUS3030A,BRTIRUS2880A,BRTIRPL1203A,BRTIRPL1003A,BRTIRUS3511A,BRTIRWD2206A,BRTIRUS2520B,BRTIRPZ2080A,BRTIRPZ1865A,BRTIRPZ2465A,BRTIRPZ1210B,BRTIRUS2830B,BRTIRUS2924B,BRTIRUS2917B,BRTIRPZ2480A,BRTIRPL1608A,BRTIRPZ3116B,BRTIRPL1215A,BRTMD163001A,BRTMD193501A,BRTMD195001A,BRTIRPZ2080X,BRTIRPZ1865X,BRTIRPZ2465X,BRTMD248000A,BRTIRPH1920A,BRTXJ6201100,BRTFJ02H2200,BRTECM000000,BRTFP0106010,BRTSJ20811281,BRTSJ2040641,BRTDH5000110,BRTXJ1301100,BRTFZ1030010,BRTHF2001010,BRTQD032401A,BRTEYEDL210A,BRTTD12AA000,BRTTCP080250,BRTWY0600240,BRTEYEDX210A,BRTTQ0050020,BRTXB0202000,BRTCJ9520500,BRTMJ6420250,BRTHC100501A,BRTHC100502A,BRTCC0905000,BRTIRUS1210A,BRTIRUS2180A,BRTIRXZ1005B,BRTMD248000X,BRTMD193502A,BRTPZ150800A,BRTPZ182500A
Test standard:	EN IEC 61000-6-2: 2019; EN IEC 61000-6-4: 2019; EN IEC 61000-3-2:2019+A1:2021+A2:2024 EN 61000-3-3:2013+A1:2019+A2:2021+AC:2022
Conclusion:	The product tested conforms to the standards listed above.
Test date:	Jul 21-27,2026
Issue date:	Jul 27,2026
Reviewed by:	
Approved by :	
Prepared by:	OCT TECHNOLOGY TESTING CO., LTD.

Oct Technology Testing Co., Ltd.
Unit 1103-2, Yuefang Center Huangge Sub-district, Nansha District, Guangzhou City
TEL:020-28030279,888@oucetesting.com
www.oucetesting.com

Test Report
catalogue

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APPENDIX I (Photos of EUT)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Client Information

Applicant:	BORUNTE ROBOT CO., LTD.
Address:	No. 93, Shafu Road, Shabu Village, Dalang Town, Dongguan City, Guangdong Province
Product:	Industrial Robot
Model:	BRTIRUS1820A

1.2. Test Standards

Test Standards	
EN IEC 61000-6-2:2019	Electromagnetic compatibility(EMC)-part 6-2: Generic standards- Immunity standard for industrial environments
EN IEC 61000-6-4: 2019	Electromagnetic compatibility(EMC)-part 6-4: Generic standards- Emission standard for industrial environments
EN IEC 61000-3-2:2019+A1:2021+A2:2024	Electromagnetic compatibility(EMC)-Part 3-2:Limits-Limits for harmonic current emissions(equipment input current ≤16A per phase)
EN 61000-3-3:2013+A1:2019+A2:2021+AC:2022	Electromagnetic compatibility(EMC)-Part 3-3:Limits-Limitation of voltage changes,Voltage fluctuations and fliker in public low-voltage supply systems. For equipment with Rated current ≤16A per phase and not subject to conditional connection

1.3. Test Summary

Emission Part				
Item	**Standard**	**Method**	**Requirement**	**Result**
Conducted Emissions at AC Mains Power Port (150kHz-30MHz)	EN IEC 61000-6-4: 2019	CISPR 16-2-1: 2014+A1:2017	Table 4	Pass
Radiated Emissions (30MHz-1GHz)		CISPR 16-2-3: 2016	Table 3	Pass

Immunity Part				
Item	**Standard**	**Method**	**Requirement**	**Result**
Electrostatic Discharge	EN IEC 61000-6-2: 2019	EN 61000-4-2:2009	±4kV Contact Discharge, ±8kV Air Discharge	Pass
Radiated Immunity (80MHz-1GHz, 1.4GHz-6GHz)		EN IEC 61000-4-3: 2020	80 MHz–1 GHz / 10 V/m ; 1.4 GHz–6 GHz / 3 V/m	Pass
Electrical Fast Transients Burst at AC Mains Power Port		EN 61000-4-4:2012	2kV 5/50ns Tr/Td 5kHz or 100kHz Repetition Frequency	Pass
Surge at AC Mains Power Port		EN 61000-4-5:2014+A1:2017	1.2/50μs Tr/Td 1kV Line to Line; 2kV Line to Ground	Pass
Conducted Immunity at AC Mains Power Port (150kHz-80MHz)		EN IEC 61000-4-6:2023	10Vrms (emf),80%,1kHz Amp. Mod.	Pass
Voltage Dips and Interruptions		EN IEC 61000-4-11:2020	Voltage Dips : 0 % residual voltage for 1cycle, 40 % residual voltage for 10cycle, 70 % residual voltage for 25cycles, Interruptions: 0 % residual voltage for 250cycles	Pass

1.4. Test Methodology

All measurements contained in this report were conducted with CISPR 16-1, radio disturbance and immunity measuring apparatus, and CISPR16-2, Method of measurement of disturbances and immunity.

All measurement required was performed at laboratory of Oct Technology Testing Co., Ltd.

1.5. Test Facility

The test facility is recognized, certified, or accredited by the following organizations: The facility also complies with the radiated and AC line conducted test site criteria set forth in CISPR 16-1, CISPR16-2.

1.6. Measurement Uncertainty

Radiation Uncertainty : Ur = ±3.84 dB

Conduction Uncertainty : Uc= ± 2.72 dB

2. MEASURING DEVICE AND TEST EQUIPMENT

2.1. For Power Line Conducted Emission

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESCS30	828985/018	Dec. 20, 2025	1 Year
2.	L.I.S.N	Rohde & Schwarz	ESH2-Z5	834549/005	Dec. 20, 2025	1 Year
3.	50ΩCoaxial Switch	Anritsu	MP59B	M20531	N/A	N/A
4.	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100006	Dec. 20, 2025	1 Year
5.	Voltage Probe	Rohde & Schwarz	TK9416	N/A	Dec. 20, 2025	1 Year

2.2. For Radiated Emission Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	ANRITSU	MS2661C	6200140915	Dec. 20, 2025	1 Year
2.	Test Receiver	Rohde & Schwarz	ESCS30	828985/018	Dec. 20, 2025	1 Year
3.	Bilog Antenna	Schwarzbeck	VULB9163	142	Dec. 20, 2025	1 Year
4.	50 Coaxial Switch	Anritsu Corp	MP59B	6100237248	Dec. 20, 2025	1 Year
5.	EMI Power Line Filter	DUOJI EME	FNF 201 B16	N/A	Dec. 20, 2025	1 Year
6.	EMI Power Line Filter	JIANLI	DL-40C	N/A	Dec. 20, 2025	1 Year
7.	Cable	Schwarzbeck	AK9513	ACRX1	Dec. 20, 2025	1 Year
8.	Cable	Rosenberger	N/A	FP2RX2	Dec. 20, 2025	1 Year
9.	Cable	Schwarzbeck	AK9513	CRPX1	Dec. 20, 2025	1 Year
10.	Cable	Schwarzbeck	AK9513	CRRX2	Dec. 20, 2025	1 Year
11.	Signal Generator	HP	8648A	3625U00573	Dec. 20, 2025	1 Year

2.3. For Harmonic Current / Flicker Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Power Frequency Test System	HAEFELY	PHF555	080419-03	Dec. 20, 2025	1 Year
2.	PC	N/A	P2L97	N/A	Dec. 20, 2025	N/A

2.4. For Electrostatic Discharge Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	ESD Tester	HAEFELY	PESD1600	H708159	Dec. 20, 2025	1 Year

2.5. For RF Strength Susceptibility Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Signal Generator	HP	8648A	3625U00573	Dec. 20, 2025	1 Year
2.	Amplifier	AR	500A100	17034	NCR	NCR
3.	Amplifier	AR	100W/1000M1	17028	NCR	NCR
4.	Isotropic Field Monitor	AR	FM2000	16829	NCR	NCR
5.	Isotropic Field Probe	AR	FP2000	16755	Dec. 20, 2025	1 Year
6.	Biconic Antenna	EMCO	3108	9507-2534	NCR	NCR
7.	Log-periodic Antenna	AR	AT1080	16812	NCR	NCR
8.	PC	N/A	486DX2	N/A	N/A	N/A

2.6. For Electrical Fast Transient /Burst Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Burst Tester	HAEFELY	PEFT4010	080981-16	Dec. 20, 2025	1Year
2.	Coupling Clamp	HAEFELY	IP-4A	147147	Dec. 20, 2025	1Year

2.7. For Surge Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Surge Tester	HAEFELY	PSURGE4.1	080107-04	Dec. 20, 2025	1Year

2.8. For Injected Current Susceptibility Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Simulator	EMTEST	CWS500C	0900-12	Dec. 20, 2025	1Year
2.	CDN	EMTEST	CDN-M2	5100100100	Dec. 20, 2025	1Year
3.	CDN	EMTEST	CDN-M3	0900-11	Dec. 20, 2025	1Year
4.	Injection Clamp	EMTEST	F-2031-23 MM	368	Dec. 20, 2025	1Year
5.	Attenuator	EMTEST	ATT6	0010222A	Dec. 20, 2025	1Year

2.9. For Magnetic Field Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Magnetic Field Tester	HAEFELY	MAG100	250040.1	Dec. 20, 2025	1Year

2.10. For Voltage Dips and Interruptions Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Dips Tester	HAEFELY	Pline1610	083732-12	Dec. 20, 2025	1Year

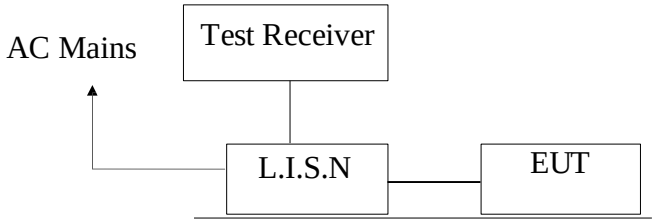
2	Three-phase Power amplifier	HAEFELY	Pline12	083732-14	Dec. 20, 2025	1Year
3	Waveform generator	HAEFELY	Pline11	083732-16	Dec. 20, 2025	1Year
4	Voltage interrupt generator	EMTEST	CWS500A	0920-15	Dec. 20, 2025	1Year

3. POWER LINE CONDUCTED EMISSION MEASUREMENT

Test Requirement: EN IEC 61000-6-4: 2019

Test Method: CISPR 16-2-1: 2014+A1:2017

3.1. Block Diagram of Test Setup



3.2. Measuring Standard

Power Line Conducted Emission Limits

Frequency (MHz)	Limit (dBμV)	
	Quasi-Peak Level	Average Level
0.15 ~ 0.50	79	66
0.50~5.00	73	60
5.00 ~ 30.00	73	60
NOTE1-The lower limit shall apply at the transition frequencies. NOTE2- Peak for pre-scan (9kHz resolution bandwidth) 150kHz to 30MHz.		

3.3. EUT Configuration on Measurement

The following equipments are installed on Conducted Emission Measurement to meet EN61000-6-4 requirements and operating in a manner which tends to maximize its emission characteristics in a normal application.

3.4. Operating Condition of EUT

3.4.1. Setup the EUT as shown on Section 3.1.

3.4.2.Turn on the power of all equipments.

3.4.3.Let the EUT work in measuring mode (On) and measure it.

3.5. Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and connected to the AC mains through Line Impedance Stability Network (L.I.S.N). This provided a 50ohm coupling impedance for the tested equipments. Both sides of AC line are investigated to find out the maximum conducted emission according to the EN61000- 6-4 regulations during conducted emission measurement.
The bandwidth of the field strength meter (R&S Test Receiver ESCS30) is set at 9KHz in 150KHz~30MHz and 200Hz in 9KHz~150KHz.
The frequency range from 150kHz to 30MHz is investigated

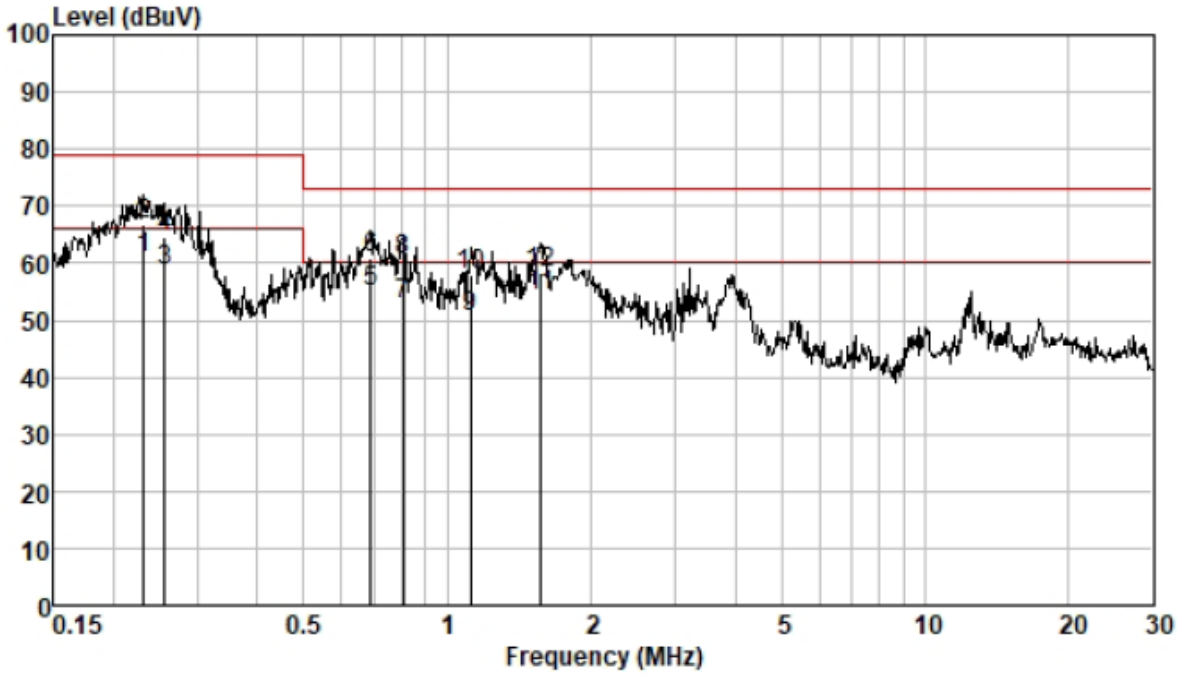
3.6 Measuring Results

PASS

Please reference to the following pages.

Conducted Emission

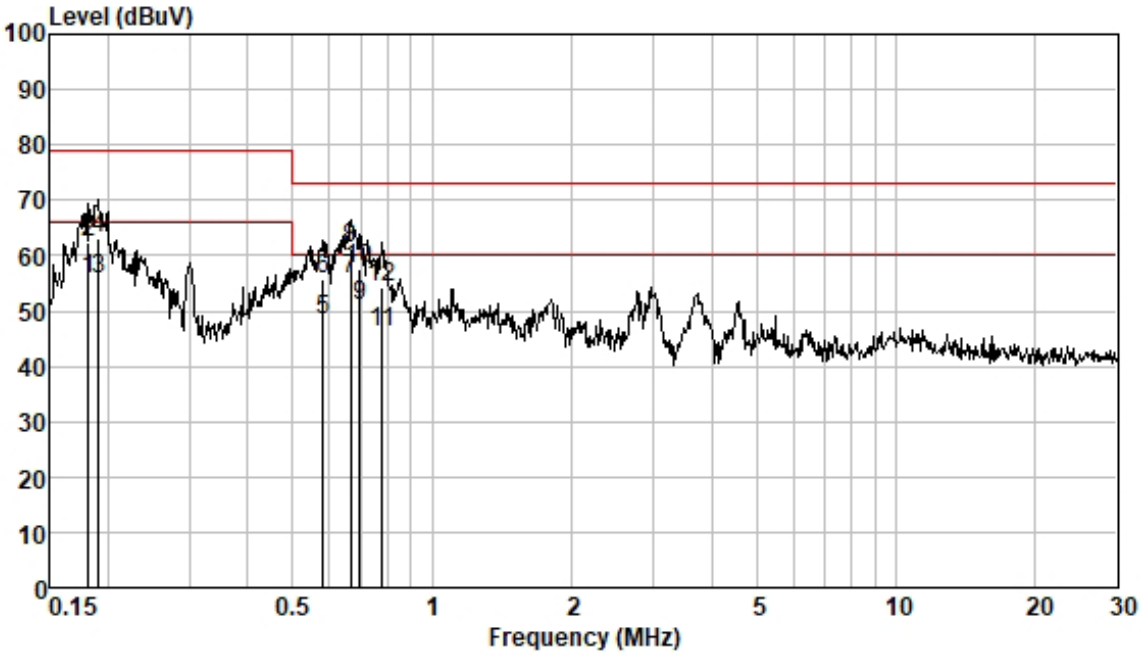
EUT :INDUSTRIAL ROBOT		
Model : BRTIRUS1820A	Temperature	: 23℃
Model : Normal Working	Phase	: L-PE



	Frequenc MHz	Read Level dBuV	Cable Loss dB	Voltage Probe Factor dB	Measured Level dBuV	Limit Line dBuV	Over Limit dB	Pol/Phase	Remark
1	0.23	20.63	0.07	40.16	60.86	66.00	-5.14	LINE	Average
2	0.23	26.55	0.07	40.16	66.78	79.00	-12.22	LINE	QP
3	0.26	18.59	0.10	40.16	58.85	66.00	-7.15	LINE	Average
4	0.26	24.39	0.10	40.16	64.65	79.00	-14.35	LINE	QP
5	0.69	14.54	0.10	40.17	54.81	60.00	-5.19	LINE	Average
6	0.69	20.58	0.10	40.17	60.85	73.00	-12.15	LINE	QP
7	0.81	12.56	0.10	40.17	52.83	60.00	-7.17	LINE	Average
8	0.81	20.13	0.10	40.17	60.40	73.00	-12.60	LINE	QP
9	1.12	10.37	0.10	40.18	50.65	60.00	-9.35	LINE	Average
10	1.12	17.55	0.10	40.18	57.83	73.00	-15.17	LINE	QP
11	1.57	13.87	0.10	40.19	54.16	60.00	-5.84	LINE	Average
12	1.57	18.20	0.10	40.19	58.49	73.00	-14.51	LINE	QP

Conducted Emission

EUT : INDUSTRIAL ROBOT	Date: Jul 27,2026
Model : BRTIRUS1820A	Temperature： 25 ℃ 50%RH
Phase : N-PE	Normal Working

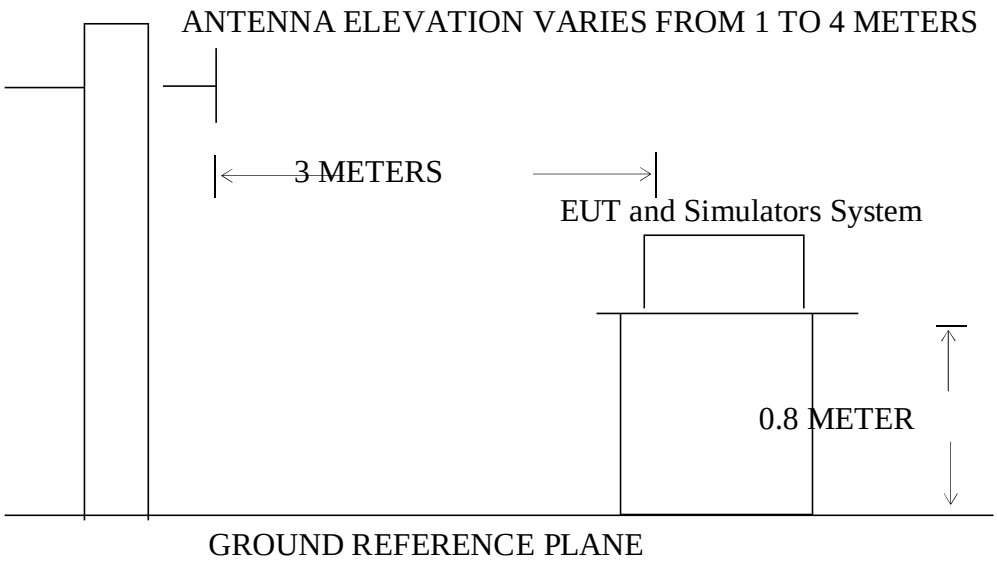


	Frequenc MHz	Read Level dBuV	Cable Loss dB	Voltage Probe Factor dB	Measured Level dBuV	Limit Line dBuV	Over Limit dB	Pol/Phase	Remark
1	0.18	15.53	0.00	40.16	55.69	66.00	-10.31	NEUTRAL	Average
2	0.18	22.27	0.00	40.16	62.43	79.00	-16.57	NEUTRAL	QP
3	0.19	15.57	0.00	40.16	55.73	66.00	-10.27	NEUTRAL	Average
4	0.19	22.87	0.00	40.16	63.03	79.00	-15.97	NEUTRAL	QP
5	0.58	8.24	0.10	40.16	48.50	60.00	-11.50	NEUTRAL	Average
6	0.58	15.38	0.10	40.16	55.64	73.00	-17.36	NEUTRAL	QP
7	0.67	15.34	0.10	40.17	55.61	60.00	-4.39	NEUTRAL	Average
8	0.67	21.11	0.10	40.17	61.38	73.00	-11.62	NEUTRAL	QP
9	0.70	10.65	0.10	40.17	50.92	60.00	-9.08	NEUTRAL	Average
10	0.70	17.40	0.10	40.17	57.67	73.00	-15.33	NEUTRAL	QP
11	0.78	5.87	0.10	40.17	46.14	60.00	-13.86	NEUTRAL	Average
12	0.78	14.00	0.10	40.17	54.27	73.00	-18.73	NEUTRAL	QP

4. RADIATED EMISSION MEASUREMENT

4.1. Block Diagram of Test

4.1.1. Block diagram of test setup (In chamber)



4.2. Measuring Standard

EN IEC 61000-6-4: 2019

Test Method: CISPR 16-2-3: 2016

4.3. Radiated Emission Limits

All emanations, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified below:

FREQUENCY (MHz)	DISTANCE (Meters)	FIELD STRENGTHS LIMIT (dBμV/m)
30 ~ 230	3	50
230 ~ 1000	3	57
1GHz-3GHz:	3	76 dB(μV/m) peak; 56 dB(μV/m) average
3GHz-6GHz:	3	80 dB(μV/m) peak; 60 dB(μV/m) average

Note**:** (1) The smaller limit shall apply at the combination point between two frequency bands.
(2) Distance refers to the distance in meters between the measuring instrument antenna
and the closed point of any part of the EUT.

4.4. EUT Configuration on Test

The EN61000-6-4 regulations test method must be used to find the maximum emission during radiated emission measurement.

4.5. Operating Condition of EUT

4.5.1. Turn on the power.

4.5.2. After that, let the EUT work in test mode (Normal) and measure it.

4.6. Test Procedure

The EUT is placed on a turn table which is 0.8 meter high above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. Bilog antenna (calibrated by Dipole Antenna) is used as a receiving antenna. Both horizontal and vertical polarization of the antenna are set on test.
The bandwidth of the Receiver (ESCS30) is set at 120kHz. The frequency range from 30MHz to 1000MHz is investigated.

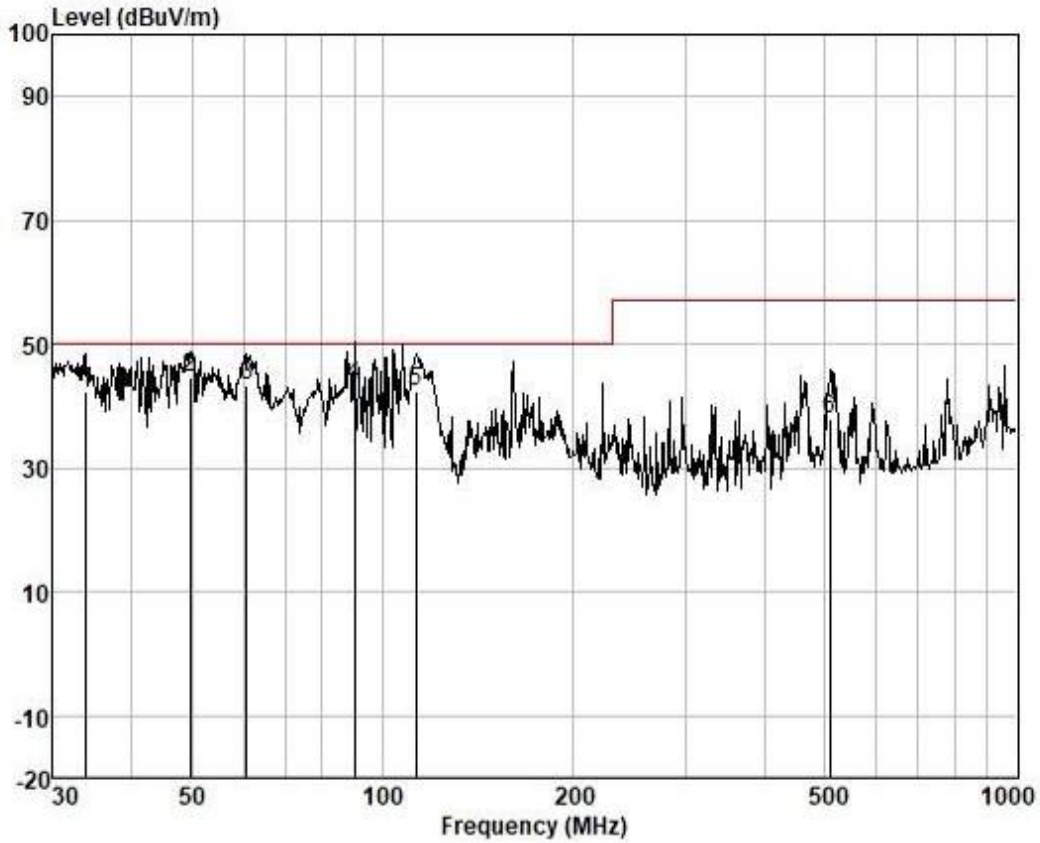
4.7. Measuring Results

PASS.

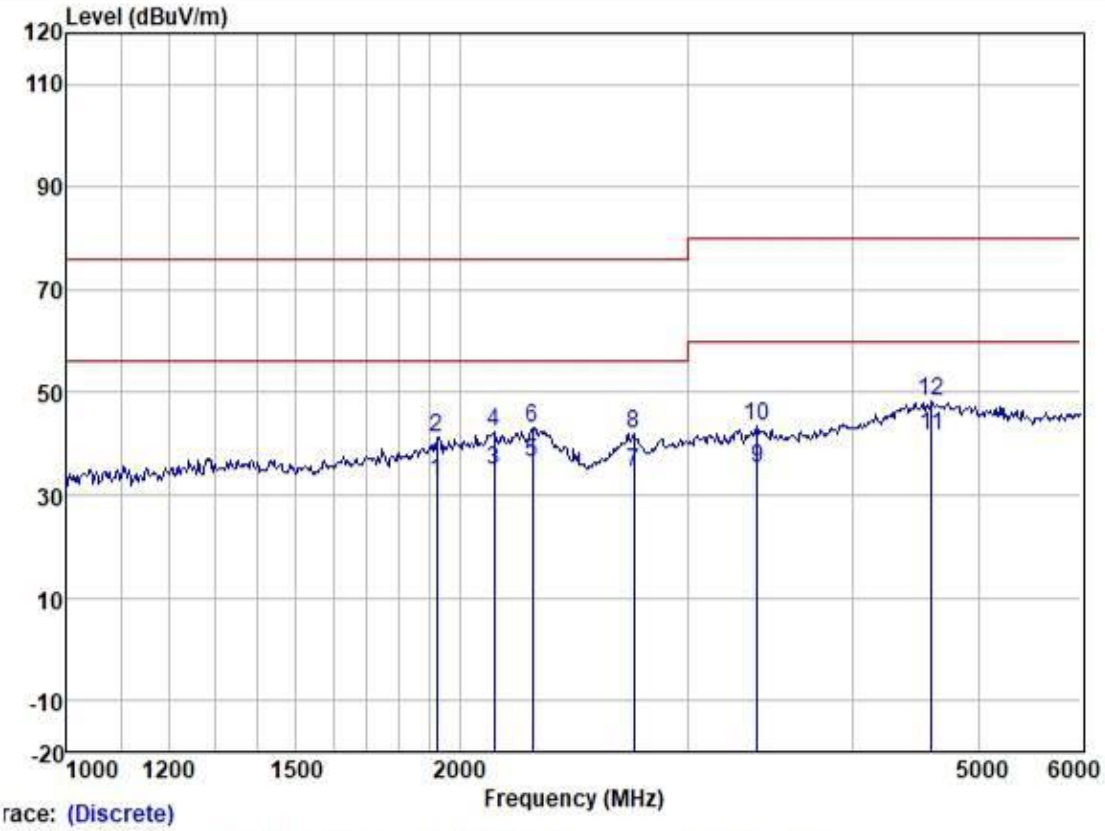
Please reference to the following pages

Radiated Emission Test Data

Standard:	EN61000-6-4	Polarization:	Horizontal
Test item:	Radiation Test	Date:	Jul 27,2026
EUT:	INDUSTRIAL ROBOT	Test By:	Mark
Model:	BRTIRUS1820A	Distance:	3m
Note:			



	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	33.799	29.17	42.15	0.60	29.56	42.36	50.00	-7.64	HORIZONTAL	QP
2	49.533	38.20	35.38	0.70	29.60	44.68	50.00	-5.32	HORIZONTAL	QP
3	60.704	39.75	32.54	0.80	29.59	43.50	50.00	-6.50	HORIZONTAL	QP
4	89.905	44.93	27.14	1.00	29.57	43.50	50.00	-6.50	HORIZONTAL	QP
5	112.524	46.34	24.41	1.17	29.53	42.39	50.00	-7.61	HORIZONTAL	QP
6	508.258	39.46	25.39	2.40	29.18	38.07	57.00	-18.93	HORIZONTAL	QP

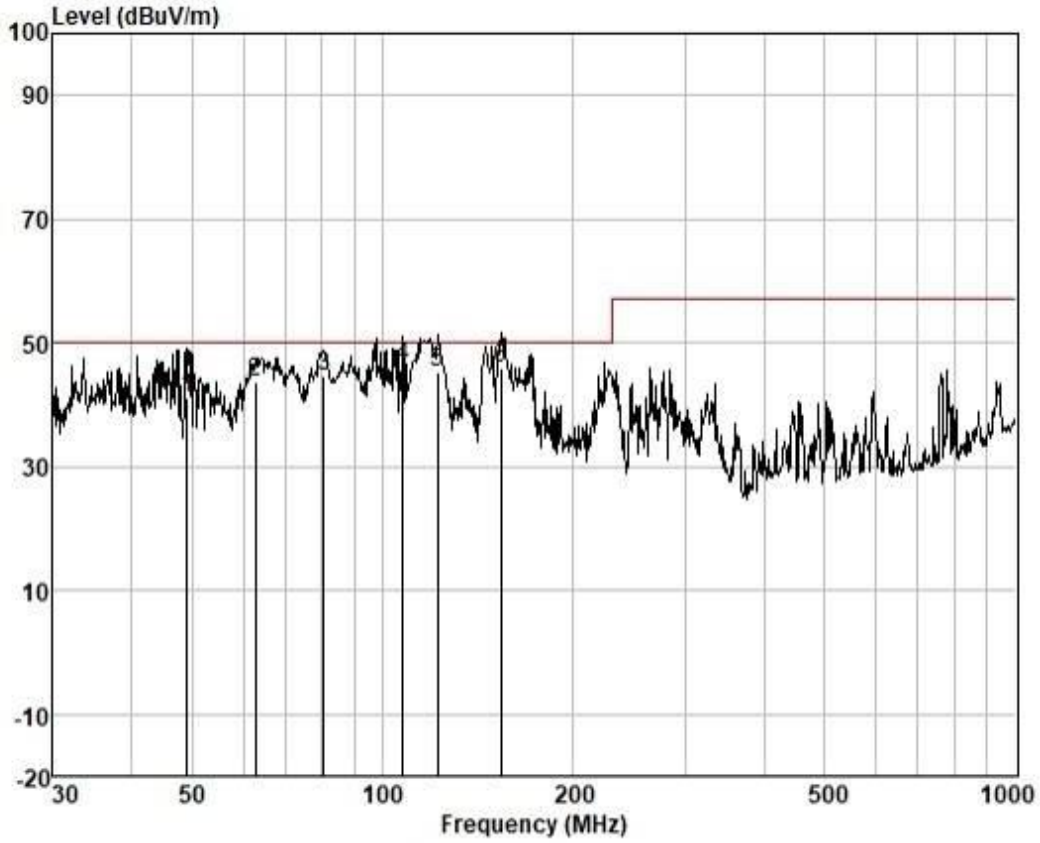


race: (Discrete)

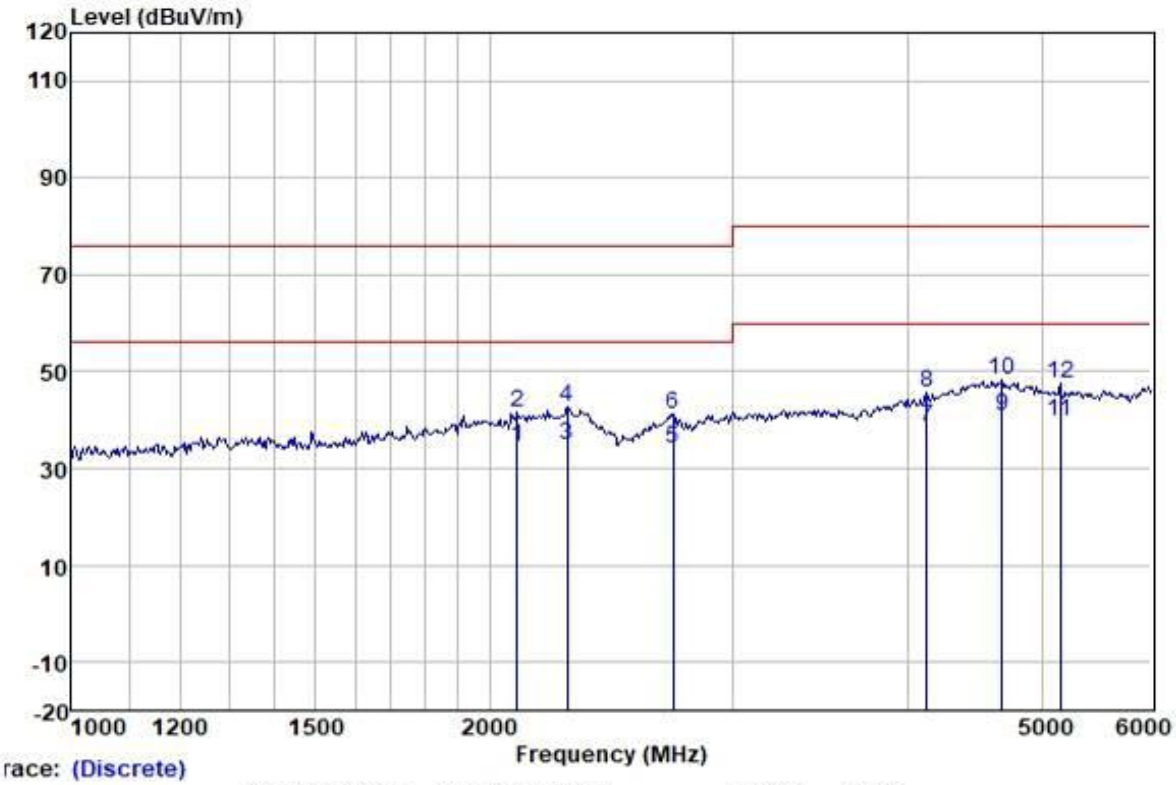
	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1923.203	39.29	26.24	4.96	37.91	32.58	56.00	-23.42	HORIZONTAL	Average
2	1923.203	47.81	26.24	4.96	37.91	41.10	76.00	-34.90	HORIZONTAL	Peak
3	2126.188	39.82	26.65	6.20	37.86	34.81	56.00	-21.19	HORIZONTAL	Average
4	2126.188	47.21	26.65	6.20	37.86	42.20	76.00	-33.80	HORIZONTAL	Peak
5	2275.996	41.31	27.37	5.61	37.81	36.48	56.00	-19.52	HORIZONTAL	Average
6	2275.996	48.10	27.37	5.61	37.81	43.27	76.00	-32.73	HORIZONTAL	Peak
7	2722.617	40.97	28.25	2.74	37.59	34.37	56.00	-21.63	HORIZONTAL	Average
8	2722.617	48.65	28.25	2.74	37.59	42.05	76.00	-33.95	HORIZONTAL	Peak
9	3387.825	38.92	28.98	4.22	37.02	35.10	60.00	-24.90	HORIZONTAL	Average
10	3387.825	47.21	28.98	4.22	37.02	43.39	80.00	-36.61	HORIZONTAL	Peak
11	4602.405	38.85	34.17	5.29	36.84	41.47	60.00	-18.53	HORIZONTAL	Average
12	4602.405	45.56	34.17	5.29	36.84	48.18	80.00	-31.82	HORIZONTAL	Peak

Radiated Emission Test Data

Standard:	EN 61000-6-4	Polarization:	Vertical
Test item:	Radiation Test	Date:	Jul 27,2026
EUT:	INDUSTRIAL ROBOT	Test By:	Mark
Model:	BRTIRUS1820A	Distance:	3m
Note:			



	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	48.843	33.94	35.98	0.70	29.60	41.02	50.00	-8.98	VERTICAL	QP
2	62.651	40.03	32.32	0.80	29.59	43.56	50.00	-6.44	VERTICAL	QP
3	80.362	44.34	29.00	1.00	29.58	44.76	50.00	-5.24	VERTICAL	QP
4	107.510	49.65	24.91	1.13	29.54	46.15	50.00	-3.85	VERTICAL	QP
5	121.976	51.11	22.64	1.20	29.52	45.43	50.00	-4.57	VERTICAL	QP
6	153.739	54.66	19.32	1.31	29.51	45.78	50.00	-4.22	VERTICAL	QP

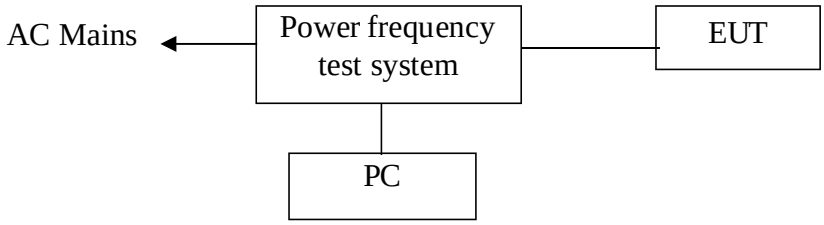


race: (Discrete)

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2095.928	39.74	26.57	6.03	37.87	34.47	56.00	-21.53	VERTICAL	Average
2	2095.928	46.75	26.57	6.03	37.87	41.48	76.00	-34.52	VERTICAL	Peak
3	2275.996	39.71	27.37	5.61	37.81	34.88	56.00	-21.12	VERTICAL	Average
4	2275.996	47.50	27.37	5.61	37.81	42.67	76.00	-33.33	VERTICAL	Peak
5	2712.878	40.89	28.20	2.68	37.61	34.16	56.00	-21.84	VERTICAL	Average
6	2712.878	47.86	28.20	2.68	37.61	41.13	76.00	-34.87	VERTICAL	Peak
7	4133.289	38.99	31.35	5.23	36.81	38.76	60.00	-21.24	VERTICAL	Average
8	4133.289	46.03	31.35	5.23	36.81	45.80	80.00	-34.20	VERTICAL	Peak
9	4685.613	38.09	34.16	5.35	36.85	40.75	60.00	-19.25	VERTICAL	Average
10	4685.613	45.72	34.16	5.35	36.85	48.38	80.00	-31.62	VERTICAL	Peak
11	5161.626	37.65	33.74	5.34	36.93	39.80	60.00	-20.20	VERTICAL	Average
12	5161.626	45.32	33.74	5.34	36.93	47.47	80.00	-32.53	VERTICAL	Peak

5. HARMONIC CURRENT EMISSION MEASUREMENT

5.1 Block Diagram of Test Setup



(EUT: N/A)

5.2 Measuring Standard

EN IEC 61000-3-2:2019+A1:2021+A2:2024

5.3 Operation Condition of EUT

Same as Section 3.4, except the test setup replaced as Section 5.1.

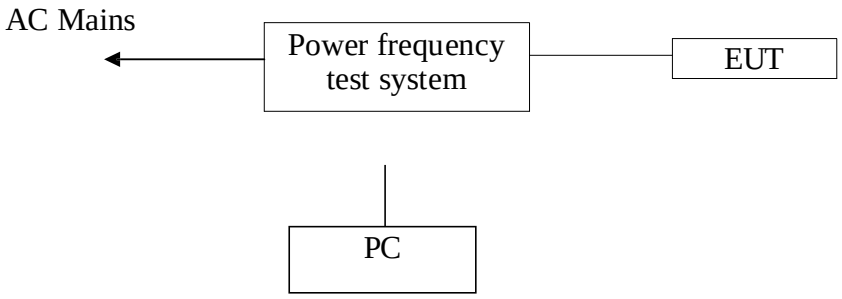
5.4 Measuring Results

PASS

Harmonic #	Harm(avg)	100%Limits	% of Limit	Harm (max)	150%Limit	% of Limit
2	0.12	1.08	11.1%	0.132	1.62	8.1%
3	1.68	2.3	73.0%	1.7	3.45	49.3%
4	0.08	0.43	18.6%	0.1	0.645	15.5%
5	0.31	1.14	27.2%	0.35	1.71	20.5%
6	0.03	0.3	10.0%	0.04	0.45	8.9%
7	0.21	0.77	27.3%	0.223	1.155	19.3%
8	0.03	0.23	13.0%	0.044	0.345	12.8%
9	0.11	0.4	27.5%	0.135	0.6	22.5%
10	0.04	0.18	22.2%	0.049	0.27	18.1%
11	0.1	0.33	30.3%	0.122	0.495	24.6%
12	0.03	0.15	20.0%	0.048	0.225	21.3%
13	0.08	0.21	38.1%	0.102	0.315	32.4%
14	0.03	0.131	22.9%	0.0403	0.1965	20.5%
15	0.02	0.15	13.3%	0.031	0.225	13.8%
16	0.02	0.115	17.4%	0.03	0.1725	17.4%
17	0.02	0.131	15.3%	0.032	0.1965	16.3%
18	0.01	0.102	9.8%	0.015	0.153	9.8%
19	0.01	0.118	8.5%	0.013	0.177	7.3%
20	0.01	0.092	10.9%	0.017	0.138	12.3%
21	0.01	0.107	9.3%	0.018	0.1605	11.2%
22	0.01	0.084	11.9%	0.012	0.126	9.5%
23	0.01	0.098	10.2%	0.015	0.147	10.2%
24	0.01	0.077	13.0%	0.012	0.1155	10.4%
25	0.01	0.09	11.1%	0.014	0.135	10.4%
26	0.01	0.071	14.1%	0.015	0.1065	14.1%
27	0.01	0.083	12.0%	0.015	0.1245	12.0%
28	0.01	0.066	15.2%	0.017	0.099	17.2%
29	0.01	0.078	12.8%	0.012	0.117	10.3%
30	0.01	0.061	16.4%	0.013	0.0915	14.2%
31	0.01	0.073	13.7%	0.012	0.1095	11.0%
32	0.01	0.058	17.2%	0.013	0.087	14.9%
33	0.01	0.068	14.7%	0.013	0.102	12.7%
34	0.01	0.054	18.5%	0.015	0.081	18.5%
35	0.01	0.064	15.6%	0.016	0.096	16.7%
36	0.01	0.051	19.6%	0.014	0.0765	18.3%
37	0.01	0.061	16.4%	0.016	0.0915	17.5%
38	0.01	0.048	20.8%	0.018	0.072	25.0%
39	0.01	0.058	17.2%	0.014	0.087	16.1%
40	0.01	0.046	21.7%	0.016	0.069	23.2%

6. VOLTAGE FLUCTUATION AND FLICKER MEASUREMENT

6.1 Block Diagram of Test Setup



6.2 Measuring Standard

EN 61000-3-3:2013+A1:2019+A2:2021+AC:2022

6.3 Operation Condition of EUT

6.3.1 Setup the EUT and simulators as shown in Section 6.1.

6.3.2 Turn on the power of all equipments.

6.3.3 Let the EUT work in test modes (Normal) and test it.

6.4 Measuring Results

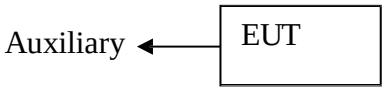
PASS

Flicker test Data L/N		
Item	Reading	Limit
Pst	0.011	1.0
PIt	0.004	0.65
Tdt	55	500ms
dmax	0.02	4%
dc	0.06	3.3%

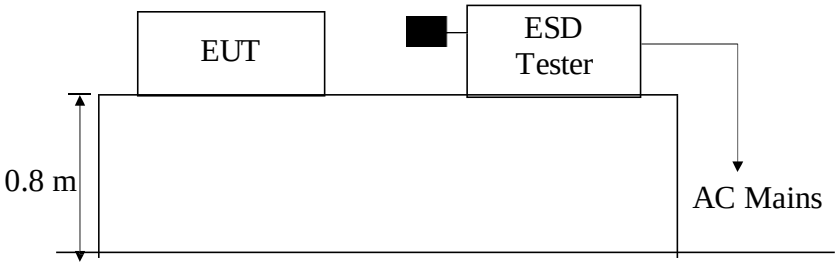
7. ELECTROSTATIC DISCHARGE IMMUNITY TEST

7.1 Block Diagram of Test Setup

7.1.1 Block Diagram of the EUT and the simulators



7.1.2 Block diagram of ESD test setup



7.2 Test Standard

Test Requirement: EN IEC 61000-6-2: 2019

Test Method: EN 61000-4-2:2009

7.3 Severity Levels and Performance Criterion

7.3.1 Severity level

Level	Test Voltage Contact Discharge (KV)	Test Voltage Air Discharge (KV)
1.	±2	±2
2.	±4	±4
3.	±6	±8
4.	±8	±15
X	Special	Special

7.3.2 Performance criterion: **B**

7.4 EUT Configuration

The configuration of EUT is listed in Section 3.3.

7.5 Operating Condition of EUT

Same as conducted emission measurement, which is listed in Section 3.4. Except the test set up replaced by Section 7.1.

7.6 Test Procedure

7.6.1 Air Discharge**:**

This test is done on a non-conductive surface. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

7.6.2 Contact Discharge**:**

All the procedure shall be same as Section 7.6.1. except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

7.6.3 Indirect discharge for horizontal coupling plane

At least 10 single discharges (in the most sensitive polarity) shall be applied at the front edge of each HCP opposite the center point of each unit (if applicable) of the EUT and 0.1m from the front of the EUT. The long axis of the discharge electrode shall be in the plane of the HCP and perpendicular to its front edge during the discharge.

7.6.4 Indirect discharge for vertical coupling plane

At least 10 single discharge (in the most sensitive polarity) shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

7.7 Test Results

PASS

Please refer to the following page

Electrostatic Discharge Test Result

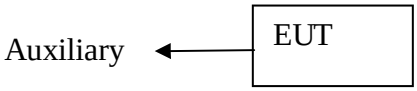
Applicant: BORUNTE ROBOT CO., LTD.	EUT: INDUSTRIAL ROBOT
M/N： BRTIRUS1820A	Temperature : 22℃
Air discharge：±2.0KV, ±4.0KV, ±8.0KV	Humidity : 50％
Contact discharge: ±2.0KV, ±4.0KV	Test Engineer : Mark

Location	**Kind** A-Air Discharge C-Contact Discharge	**Result**
Gap 10 points	A	PASS
Screw 10 points	C	PASS
Metal 10 points	C	PASS
HCP 4 points	C	PASS
VCP 4 points	C	PASS
Test Equipment: ESD Simulator (HAEFELY, PESD1600)		

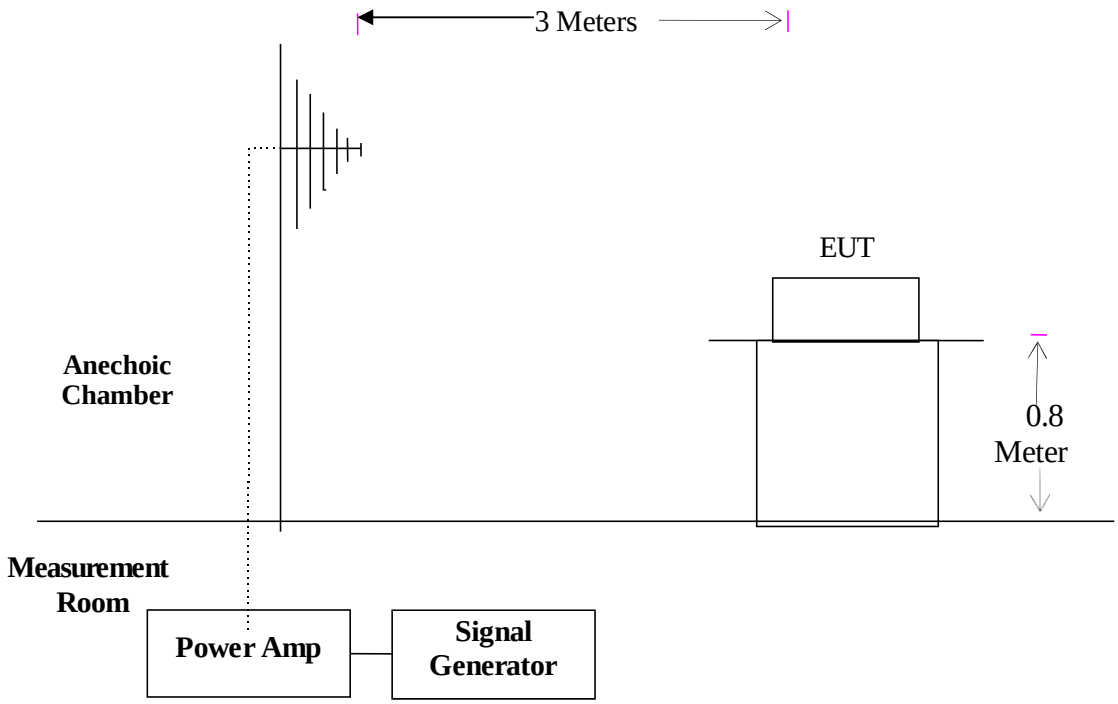
8. RF FIELD STRENGTH SUSCEPTIBILITY TEST

8.1 Block Diagram of Test

8.1.1 Block diagram of connection between the EUT and Load



8.1.2 Block diagram of RS test setup



8.2 Test Standard

Test Requirement: EN IEC 61000-6-2: 2019

Test Method: EN IEC 61000-4-3:2020

8.3 Severity Levels and Performance Criterion

8.3.1 Severity Levels

Level	Field Strength V/m
1.	1
2.	3
3.	10
X	Special

8.3.2 Performance Criterion : **A**

8.4 EUT Configuration on Test

The configuration of the EUT is same as Section 3.3.

8.5 Operating Condition of EUT

Same as radiated emission measurement which is listed in Section 3.4, except the test setup replaced as Section 8.1.

8.6 Test Procedure

The EUT are placed on a table which is 0.8 meter high above the ground. The EUT is set 3 meters away from the transmitting antenna which is mounted on an antenna tower. Both horizontal and vertical polarization of the antenna are set on test. Each of the four sides of the EUT must be faced this transmitting antenna and measured individually. In order to judge the EUT performance, a CCD camera is used to monitor its screen.

All the scanning conditions are as following:

Condition of Test	Remark
1. Fielded Strength	80-1000MHz,10V/m 80%AM; 1.4GHz to 6GHz ,3 V/m 80%AM;
2. Radiated Signal	Modulated
3. Scanning Frequency	80-1000MHz, 1.4GHz to 6GHz
4. Sweep time of radiated	0.0015 Decade/s
5. Dwell Time	1 Sec.

8.7 Test Results

PASS.

Please refer to the following page.

RF Field Strength Susceptibility Test Results

Applicant : BORUNTE ROBOT CO., LTD.	EUT : INDUSTRIAL ROBOT
M/N: BRTIRUS1820A	Temperature: 22℃
Test Engineer : Mark	Humidity : 50 %
Frequency Range: 80 MHz to1000 MHz, 1.4GHz to 6GHz	Field Strength : 80-1000MHz,10V/m 80%AM; 1.4GHz to 6GHz ,3 V/m 80%AM;

Criterion : A

Frequency (MHz)	Polarity	Position (V/m)	Field Strength	Observation
80~ 1000	V&H	Front/ Rear/Left/ Right	10	Note:■1□2□3.
1400 ~1800	V&H	Front/ Rear/Left/ Right	3	Note:■1□2□3.
1800 ~ 2600	V&H	Front/ Rear/Left/ Right	3	Note:■1□2□3.
2600 ~ 3400	V&H	Front/ Rear/Left/ Right	3	Note:■1□2□3.
3400 ~ 4600	V&H	Front/ Rear/Left/ Right	3	Note:■1□2□3.
4600 ~ 5000	V&H	Front/ Rear/Left/ Right	3	Note:■1□2□3.
5000 ~ 6000	V&H	Front/ Rear/Left/ Right	3	Note:■1□2□3.
Test result	PASS			

Note: 1) There was no change compared with initial operation during the test.

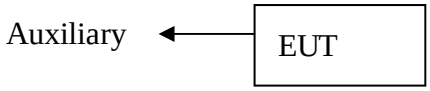
2) During the test the luminous intensity change ,and after the test the luminous intensity can be restored to its initial value within 1 min.

3) During the test, the luminous intensity change and after the test the luminous intensity can return to normal within 30 min.

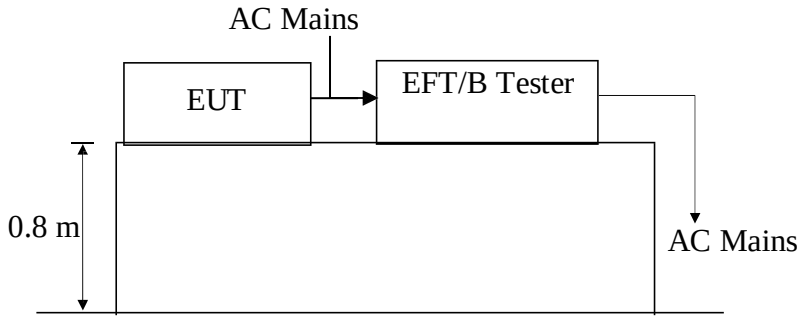
9. ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST

9.1 Block Diagram of Test Setup

9.1.1. Block Diagram of the EUT



9.1.2. EFT Test Setup



9.2 Test Standard

Test Requirement: EN IEC 61000-6-2: 2019

Test Method: EN 61000-4-4:2012

9.3 Severity Levels and Performance Criterion

9.3.1 Severity level

Open Circuit Output Test Voltage ±10%		
Level	On Power Supply Lines	On I/O (Input/Output) Signal data and control lines
1.	0.5 KV	0.25 KV
2.	1 KV	0.5 KV
3.	2 KV	1 KV
4.	4 KV	2 KV
X	Special	Special

9.3.2 Performance criterion **: B**

9.4 EUT Configuration

The configuration of EUT is listed in Section 3.3.

9.5 Operating Condition of EUT

9.5.1 Setup the EUT as shown in Section 9.1.

9.5.2 Turn on the power of all equipments.

9.5.3 Let the EUT work in test mode (Normal) and measure it.

9.6 Test Procedure

The EUT is put on the table which is 0.8 meter high above the ground. This reference ground plane shall project beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane beneath the EUT, shall be more than 0.5m.

9.6.1 For input and output AC power ports**:**

The EUT is connected to the power mains by using a coupling device which couples the EFT interference signal to AC power lines. Both polarities of the test voltage should be applied during compliance test and the duration of the test is 2 mins.

9.6.2 For signal lines and control

lines ports**:** No I/O ports. It's

unnecessary to test.

9.6.3 For DC output

line ports**:** It's

unnecessary to test.

9.7 Test Result

PASS

Please reference to the following page

Electrical Fast Transient/Burst Test Results

Standard	☉ IEC 61000-4-4 ☼ EN 61000-4-4	Result : ☼ PASS / ☉ FAIL

Applicant : BORUNTE ROBOT CO., LTD.

EUT : INDUSTRIAL ROBOT M/N : BRTIRUS1820A

Criterion : B Ambient Condition : 20 ℃ 50%RH

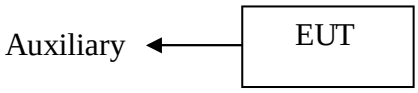
Operation Mode : Normal	
Line : ☉ AC Mains	Coupling : ☉ Capacitive
Test Time : 120s	

Inject Line	Voltage kV	Inject Time(s)	Inject Method	Results	Inject Line	Voltage kV	Inject Time(s)	Inject Method	Results
L1	±2	120	Direct	PASS					
L2	±2	120	Direct	N/A					
L3	±2	120	Direct	N/A					
L1+N	±2	120	Direct	PASS					
L2+N	±2	120	Direct	N/A					
L3+N	±2	120	Direct	N/A					
L1 +PE	±2	120	Direct	PASS					
L2 +PE	±2	120	Direct	N/A					
L3 +PE	±2	120	Direct	N/A					

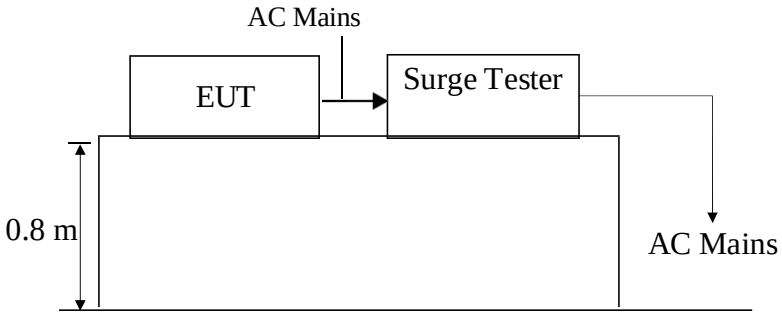
10. SURGE IMMUNITY TEST

10.1 Block Diagram of Test Setup

10.1.1 Block Diagram of the EUT



10.1.2. Surge Test Setup



10.2 Test Standard

Test Requirement: EN IEC 61000-6-2: 2019

Test Method: EN 61000-4-5:2014+A1:2017

10.3 Severity Levels and Performance Criterion

10.3.1.Severity level

Severity Level	Open-Circuit Test Voltage KV
1	0.5
2	1.0
3	2.0
4	4.0
*	Special

10.3.2 Performance criterion **: B**

10.4 EUT Configuration

The configuration of EUT is listed in Section 3.3.

10.5 Operating Condition of EUT

10.5.1 Setup the EUT as shown in Section 10.1.

10.5.2. Turn on the power of all equipments.

10.5.3.Let the EUT work in test mode (Normal) and measure it.

10.6 Test Procedure

1) Set up the EUT and test generator as shown on Section 10.1.2.
2) For line to line coupling mode, provide a 1.0 KV 1.2/50us voltage surge
   For line to earth coupling mode, provide a 2.0 KV 1.2/50us voltage surge
   (at open-circuit condition) and 8/20us current surge to EUT selected points.
3) At least 5 positive and 5 negative (polarity) tests with a maximum 1/min
   repetition rate are conducted during test.
4) Different phase angles are done individually.
5) Record the EUT operating situation during compliance test and decide the EUT
   immunity criterion for above each test.

10.7 Test Result

PASS

Please reference to the following page

Surge Immunity Test Result

Applicant : BORUNTE ROBOT CO., LTD. EUT : INDUSTRIAL ROBOT M/N : BRTIRUS1820A Test Engineer : Mark	Test Date : Jul 27,2026 Temperature : 22℃ Humidity : 50％ Test Mode : Normal Criterion : B

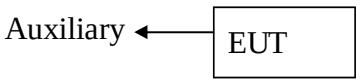
Location	Polarity	Phase Angle	Pulse Voltage (KV)	Result / Observations
L-N	±	0,90°,180°,270°	1.0	B
L1-L2	±	0,90°,180°,270°	1.0	N/A
L2-L3	±	0,90°,180°,270°	1.0	N/A
L3-L1	±	0,90°,180°,270°	1.0	N/A
L1-PE	±	0,90°,180°,270°	2.0	B
L2-PE	±	0,90°,180°,270°	2.0	N/A
L3-PE	±	0,90°,180°,270°	2.0	N/A

B: During test, the EUT degradation of performance. After test No degradation in the performance of the EUT was observed

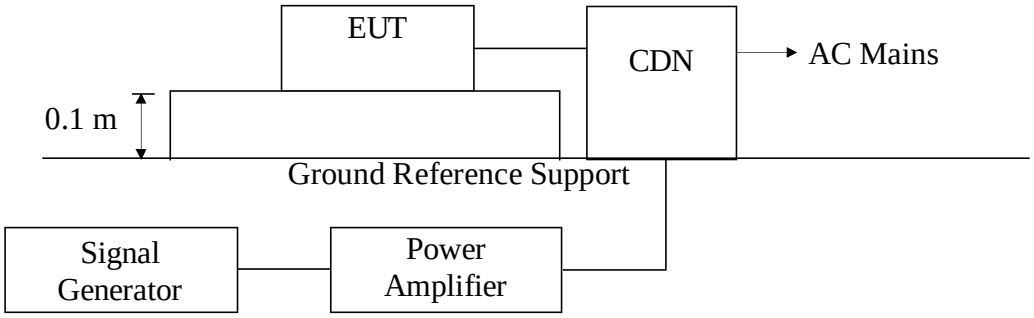
11. INJECTED CURRENTS SUSCEPTIBILITY TEST

11.1 Block Diagram of Test Setup

11.1.1 Block Diagram of the EUT



11.1.2 Block Diagram of Test Setup



11.2 Test Standard

EN IEC 61000-6-2: 2019
Test Method: EN IEC 61000-4-6:2023

11.3 Severity Levels and Performance Criterion

11.3.1 Severity level

Level	Field Strength V
1	1
2	3
3	10
X	Special

11.3.2 Performance criterion**: A**

11.4 EUT Configuration

The configuration of EUT is listed in Section 3.3.

11.5 Operating Condition of EUT

11.5.1 Setup the EUT as shown in Section 11.1.

11.5.2 Turn on the power of all equipments.

11.5.3 Let the EUT work in test mode (Normal) and measure it.

11.6 Test Procedure

1) Set up the EUT, CDN and test generators as shown on Section 11.1.2.
2) Let the EUT work in test mode and measure it.
3) The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).
4) The disturbance signal described below is injected to EUT through CDN.
5) The EUT operates within its operational mode(s) under intended climatic conditions after power on.
6) The frequency range is swept from 150KHz to80MHz using 10V signal level, and with the disturbance signal 80% amplitude modulated with a 1KHz sine wave.
7) The rate of sweep shall not exceed $1.5*10^{-3}$decades/s. Where the frequency is swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.
8) Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

11.7 Test Results

PASS

Please reference to the following page

Injected Currents Susceptibility Test Results

Oct Technology Testing Co., Ltd

Applicant : BORUNTE ROBOT CO., LTD. EUT : INDUSTRIAL ROBOT M/N : BRTIRUS1820A	Test Date: Jul 27,2026 Temperature : 22℃ Humidity : 58％ Test Engineer : Mark
Test Mode : Normal	

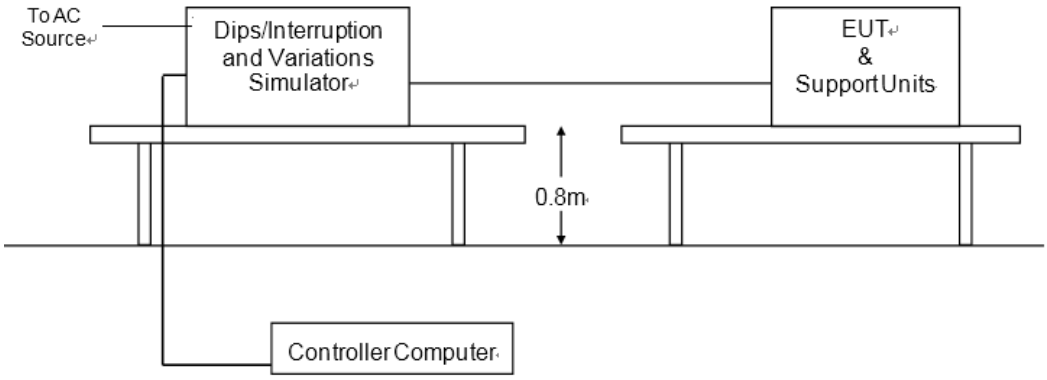
Performance Criterion: A
Frequency Range: 0.15MHz to 80MHz
Modulation: 80%, 1kHz Amplitude Modulation
Step Size 1%

Cable port	Level (Vrms)	CDN/Clamp	Dwell time	Result /Observations
AC power port	10	Clamp	2s	A

A: No degradation in the performance of the EUT was obse

12. VOLTAGE DIPS AND INTERRUPTIONS TEST

12.1Block Diagram of Test Setup



The EUT and support units were located on a wooden table, 0.8 m away from ground floor. Setting the parameter of tests and then perform the test software of test simulator.
Changes to the voltage level shall occur at 0 degree crossing point in the a.c. voltage waveform.

Record the test result in test record form.

Environmental Conditions
25.5℃, 54 % RH, 101.5 kPa

12.2Test Standard

EN IEC 61000-6-2: 2019
Test Method: EN IEC 61000-4-11:2020

12.3Test Result

Test Generator (max 500A ,50Hz)

L-N
VOLTAGE DIPS: (50Hz)
Test angles: 45°，90°，135°，180°，225°，270°, 315°
0% of residual voltage for 1 Cycle: B;
40% of residual voltage for 10 Cycle: C;
70% of residual voltage for 25 Cycles: C;
No. of Dips / Interruptions: 3 per Level
Time between dropout 10s
INTERRUPTIONS TEST (50Hz)
Test angles: 0°
0 % residual voltage for 250 cycles

Test	Test specifications	Duration	Result / Observations
Voltage Dips	0	1 Cycles	B
Voltage Dips	40	10 Cycles	C
Voltage Dips	70	25 Cycles	C
Interruptions	0	250 Cycles	C

Remark: B: During test, the EUT degradation of performance. After test No degradation in the performance of the EUT was observed
C: During test, the EUT stopped working. After test, it could be recovered manually.

APPENDIX I

(Photos of EUT)



**********THE END**********