FRANKA ROBOTICS

ESD Measurements

FRANKA RESEARCH 3

Franka Research 3 v2.0

ESD Measurements

Release Version: 2.0 (June 2025)
Document Number: R05015

Fundamentals of Testing

The Franka Production 3 robot was subjected to a test to determine the following parameters:

- Measurement of resistance to ground R_{GP} of the surfaces, contact surfaces and the flange surfaces (according to DIN IEC/TR 61340-5-1 and DIN EN 61340-5-2).
- Measurements of existing electric fields / surface voltages after rubbing the surface as well as during operation (according to DIN EN 61340-5-1).

Environmental conditions during measurement:

- Temperature: 24,2 °C
- Relative humidity: 44 %

Definition of ESD Measuring Points

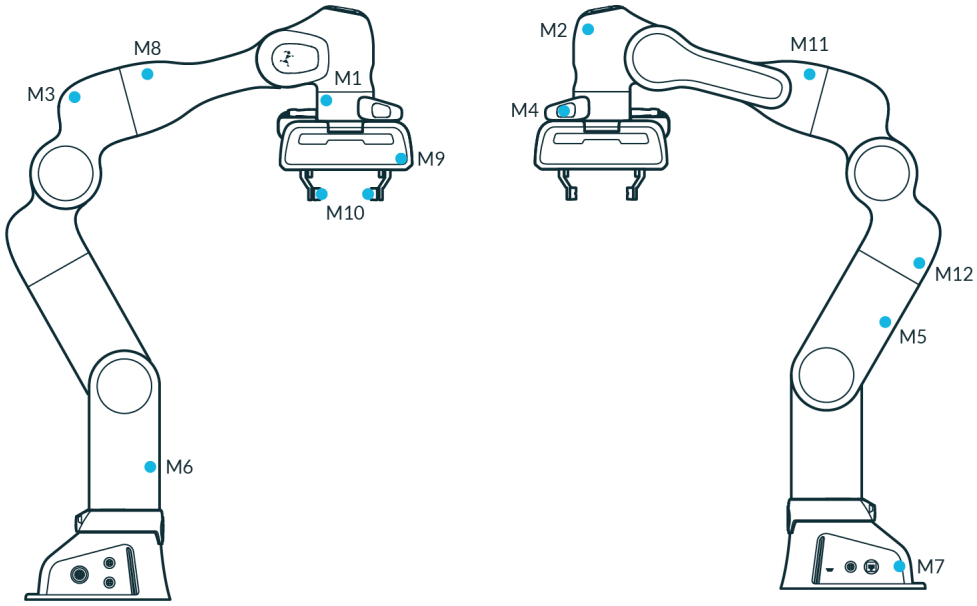

Figure 1: Measuring points

ESD Measurements

Measured Values				
	Resistance to ground RGP [Ohm]	**Electrostatic surface voltage [V]**		**Electrostatic field [V/m]**
		after friction	after 0,75 h operation	after 0,75 h operation
Limits	< 1 G Ω	< 125 V		< 5000 V/m
M1	$<50{,}0 \times 10^{3}$	10,0	0,0	0,0
M2	$27{,}7 \times 10^{9}$	220,0	0,0	1500,0
M3	$23{,}2 \times 10^{9}$	0,0	0,0	0,0
M4	$27{,}7 \times 10^{9}$	258,0	6,0	0,0
M5	$30{,}6 \times 10^{9}$	0,0	0,0	0,0
M6	$81{,}7 \times 10^{9}$	150,0	0,0	0,0
M7	$29{,}0 \times 10^{9}$	350	0,0	0,0
M8	$72{,}6 \times 10^{9}$	0,0	0,0	0,0
M9	$33{,}8 \times 10^{9}$	990,0	0,0	0,0
M10	$20{,}2 \times 10^{9}$	0,0	9,0	0,0
M11	$37{,}1 \times 10^{9}$	0,0	7,0	0,0
M12	$2{,}36 \times 10^{9}$	0,0	0,0	0,0

Considerations on ESD Measured Values

The measured values show that the robot complies with the requirements of DIN EN61340-5-1 (2017 edition) while maintaining the distances to ESD-sensitive electronics.

When integrating the robot into an ESD-sensitive environment, there must be no contact with ESD sensitive electronics. EN61340-5-1 specifies a minimum distance of 25 mm for the values listed.

The fingertips supplied with the Franka Hand must be replaced with a conductive material that is suitable for ESD. For creating new fingertips, you can use the fingertip-configurator at franka.world (https://franka.world/fingertip-configurator).

The real values of the integrated robot regarding the electrostatic surface voltage and the electrostatic field can deviate from the listed measured values due to different environmental conditions.

Therefore, a verifying measurement is recommended after integration.

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