IPA

valid until: December 14, 2028

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TESTED®
DEVICE

KUKA Deutschland GmbH
KMRiisy CR
Report No. KU 2302-1396

DUPLICATE

Statement of
Qualification

Single product
Particle Emission

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Statement of Qualification · Single product

Customer

KUKA Deutschland GmbH
Zugspitzstrasse 140
86165 Augsburg
Germany

Component tested

Category: Automation Components

Subcategory: Robotics

Product name: KMRiisy CR
(manufacturing date: 6/10/2023; article number: 16010348; serial number: 1041474)
in combination with:
- LBR iisy 11 R1300 (manufacturing date: 4/12/2023; serial number: 4561045) or LBR iisy 15 R930 (manufacturing date: 4/2023; article number: 10038534; serial number: 4561141)

Random sampling of particle emissions (airborne) at representative sites

Standards/Guidelines: ISO 14644-1, -14
The norms stated generally refer to the version valid at the time of the tests.

Test devices: Optical particle counter:
LasAir II 110 and LasAir III 110 with measuring ranges ≥ 0.1 µm, ≥ 0.2 µm, ≥ 0.3 µm, ≥ 0.5 µm, ≥ 1.0 µm and ≥ 5.0 µm

Test environment parameters:
- Cleanroom Air Cleanliness Class (according to ISO 14644-1): ..... ISO 1
- Airflow velocity: ..... 0.45 m/s
- Airflow pattern: ..... vertical laminar flow
- Temperature: ..... 22 °C ± 0.5 °C
- Relative humidity: ..... 45 % ± 5 %

Test procedure parameters:
- Acceleration: ..... 0.3 m/s²
- Deceleration: ..... -0.3 m/s²
- Parameter Set 1:
  – Velocity: ..... 80 % of maximum velocity
  – Attached Payload: ..... m = 200 kg
- Parameter Set 2:
  – Velocity: ..... 67 % of maximum velocity
  – Attached Payload: ..... m = 100 kg
- Parameter Set 3:
  – Velocity: ..... 80 % of maximum velocity
  – Attached Payload: ..... m = 150 kg

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Test result / Classification

When operated under the specified test conditions, the robot KMRiisy CR in combination with LBR iisy 11 R1300 or LBR iisy 15 R930 is suitable for use in cleanrooms fulfilling the specifications of the following Air Cleanliness Classes according to ISO 14644-1:

Test parameter(s)	Air Cleanlines Class
80 % of max. velocity, 150 mm above ground	1
80 % of max. velocity, 80 mm above ground	4
80 % of max. velocity, 10 mm above ground	4
80 % of max. velocity, at ground level*	5
67 % of max. velocity, at ground level*	5
Overall result	**5**

*If the KMRiisy CR is operated on a perforated raised floor in a cleanroom with a low-turbulence displacement flow, the particles at ground level are extracted and therefore not considered to be critical.

Please note: Transport damages, incorrect installation, oil leakage, aging behavior, corrosion etc. can influence the test result.

The measuring devices used for the qualification tests are calibrated at regular intervals; their results can be traced back to national and international standards. In cases where no national standards exist, the test procedure implemented complies with the technical regulations and norms applicable at the time of the test. The relevant documentation can be viewed on request at any time.

Detailed information and parameters of the test environment can be found in the Fraunhofer IPA test report.

Fraunhofer Institute for Manufacturing Engineering and Automation IPA

Department of Ultraclean Technology and Micromanufacturing

Nobelstrasse 12
70569 Stuttgart
Germany

KU 2302-1396 — Report No. first document
Stuttgart, December 14, 2023 — Place, date of first document issued
-- — Report No. current document
-- — Place, current date
on behalf of
Dr.-Ing. Frank Bürger, Project Manager Fraunhofer IPA

This document only applies to the named product in its original state and is valid for a period of 5 years from the date the first document was issued. The document can be verified under **www.tested-device.com**.