



Fraunhofer

**TESTED[®]
DEVICE**

Ergoswiss AG
SM 1440

Report No. ER 2305-1425

DUPLICATE

Statement of
Qualification

Single product
Particle Emission

Customer

Ergoswiss AG
Nöllenstrasse 15a
9443 Widnau
Switzerland

Component tested

Category:

Automation Components

Subcategory:

Positioning Systems

Product name:

Spindle lift column SM 1440
(manufacturing date: 6/2023; serial number: 902)
in combination with

- Controller Compact-3-eco 230V (manufacturing date: 6/2023; serial number: 124)

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 $\geq 0.1\text{ }\mu\text{m}$, $\geq 0.2\text{ }\mu\text{m}$, $\geq 0.3\text{ }\mu\text{m}$, $\geq 0.5\text{ }\mu\text{m}$, $\geq 1.0\text{ }\mu\text{m}$ and $\geq 5.0\text{ }\mu\text{m}$

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 \pm 0.5 °C

Test procedure parameters:

- Installation position:vertikal
- Cycle time: $t_c = 2/18$ (travel time: max 2 min; rest time: max 18 min)
- Pause (top/down): $t_b = 380\text{ s}$
- Payload:m = 200 kg
- Velocity (stroke up/down):.....v = 12 mm/s
- Stroke length:s = 400 mm
- Lowest position:..... $s_L = 0\text{ mm}$
- Highest position: $s_H = 400\text{ mm}$

Test result / Classification

When operated under the specified test conditions, the spindle lift column SM 1440 in combination with controller Compact-3-eco 230V 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 |
|-----------------------------------------------------------------------------------------------------------------|----------------------|
| Stroke: s = 400 mm Velocity (up/down) v = 12 mm/s Payload: m = 200 kg Cycle time: 2 min on/ 18 min off | 7 |
| Controller | 1 |
| Overall result | 7 |

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

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ER 2305-1425

Report No. first document

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Report No. current document

on behalf of

Dr.-Ing. Frank Bürger, Project Manager Fraunhofer IPA

Stuttgart, November 15, 2023

Place, date of first document issued

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Place, current date

