



# Fraunhofer

## TESTED<sup>®</sup> DEVICE

TOX Pressotechnik  
EXe-K xxx.555.300.002  
**Report No. TO 2404-1513**

DUPLICATE

Statement of  
Qualification

Product series  
Particle Emission

# Statement of Qualification · Product series

## Customer

TOX PRESSOTECHNIK GmbH & Co. KG  
Riedstrasse 4  
88250 Weingarten  
Germany

## Component tested

Category: Automation Components

Subcategory: Linear Units

Product name: EXe-K xxx.555.300.002  
Tested Products:  

- EXe-K 030.555.300.002 ElectricPowerDrive (manufacturing date: 5/2022)
- EXe-K 200.555.300.002 ElectricPowerDrive (manufacturing date: 2/2024)

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

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
- Relative humidity: ..... 45 %  $\pm$  5 %

Test procedure parameters:

- Maximum velocity: .....  $v_{\text{max}} = 80 \text{ mm/s}$  and  $280 \text{ mm/s}$
- Minimum velocity: .....  $v_{\text{min}} = 5 \text{ mm/s}$  and  $15 \text{ mm/s}$
- Parameter Set 1:
  - Extension with max. velocity: .....240 mm and 250 mm
  - Extension with min. velocity: ..... 10 mm and 17.61 mm
  - Pressing force: ..... 25 kN and 6 kN
- Parameter Set 2:
  - Extension with max. velocity: .....240 mm and 250 mm
  - Extension with min. velocity: .....13.75 mm and 20.68 mm
  - Pressing force: ..... 50 kN and 10 kN
- Parameter Set 3:
  - Extension with max. velocity: .....240 mm and 250 mm
  - Extension with min. velocity: .....17.50 mm and 25.61 mm
  - Pressing force: ..... 75 kN and 15 kN

## Test result / Classification

When operated under the specified test conditions, the linear unit partial series EXe-K xxx.555.300.002 is suitable for use in cleanrooms fulfilling the specifications of the following Air Cleanliness Class according to ISO 14644-1:

Test parameter(s)	Air Cleanliness Class
$v_{\text{max}} = 80$ and $280 \text{ mm/s}$ $v_{\text{min}} = 5$ and $15 \text{ mm/s}$ Pressing force: various	<b>5</b>
<b>Overall result</b>	

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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Department of Ultraclean Technology and Micromanufacturing

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on behalf of   
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