



**Fraunhofer**

**TESTED<sup>®</sup>  
DEVICE**

Nanotec Electronic  
modified AS5918M2804-E  
**Report No. LA 1306-649**

DUPLICATE

Statement of  
Qualification

# Statement of Qualification

**Customer:** LANG GmbH & Co. KG  
Dillstraße 4  
35625 Hüttenberg  
Germany

**Test results / Classification:**  
(according to ISO 14644-1)

The modified stepper motor AS5918M2804-E (Nanotec Electronic GmbH & Co. KG) modified by Lang GmbH & Co. KG is suitable for use in clean-rooms fulfilling Air Cleanliness Class 1.

## Component tested:

Category: Automation Components  
Subcategory: Linear Units  
Type: Stepper motor AS5918M2804-E (Nanotec Electronic GmbH & Co. KG)  
modified by Lang GmbH & Co. KG

## Random check measurements of particle emission (airborne) at representative points

Test procedure: According to VDI 2083 – 9.1  
Each standard stated refers to the version valid at the time of testing.

Measuring instruments: Optical Particle Counter:  
LasAir II 110 with measuring channels of  
 $\geq 0.1 \mu\text{m}$ ,  $\geq 0.2 \mu\text{m}$ ,  $\geq 0.3 \mu\text{m}$ ,  $\geq 0.5 \mu\text{m}$ ,  $\geq 1.0 \mu\text{m}$  and  $\geq 5.0 \mu\text{m}$

Test parameters of the test environment:

- Cleanroom Air Cleanliness Class (according to ISO 14644-1):..... ISO 1
- Air flow velocity:..... 0.45 m/s
- Air flow guidance: ..... vertical unidirectional air flow
- Temperature: .....  $22 \text{ }^\circ\text{C} \pm 0.5 \text{ }^\circ\text{C}$  ( $71.6 \text{ }^\circ\text{F} \pm 0.9 \text{ }^\circ\text{F}$ )
- Relative humidity: .....  $45\% \pm 5\%$

Test parameters of the test execution:

Operated with:

- Liner axis CTV 110-1616-ISO7-510-L-0-1 (Hypex d.o.o.)
- Controller L-Step Express 19" 480VA (LANG GmbH & Co. KG)

- Mounting position:..... horizontal
- Stroke length:.....  $s = 450 \text{ mm}$
- Load of the linear axis:.....  $m = 4.75 \text{ kg}$
- Parameter set: .....  $s = 0.43 \text{ m}$  ;  $v = 0.25 \text{ m/s}$  ;  $a = 1 \text{ m/s}^2$

The measuring equipment used for the qualification is regularly calibrated and is based on national and international standards. In the case where no national standards exist, the measuring procedure used corresponds with technical regulations and norms valid at the time of the measurement. The documents drawn up for this procedure are available for viewing.

The validity of this certificate applies only to the mentioned product in this particular condition for a duration of 5 years.  
Further information: [www.tested-device.com](http://www.tested-device.com).

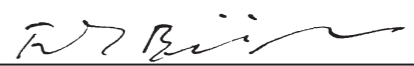
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Stuttgart, Oktober 9, 2013

Place, Date

  
i. A.   
Project manager