HSB AUTOMATION

Sigma® ZRX - Weather-proof. Corrosion-proof. Robust.

HSB-SIGMA® ZRX OUTDOOR UNIT

The **HSB-sigma® ZRX outdoor unit** has been specifically engineered for long-term operation in demanding environmental conditions.

While conventional linear units quickly reach their limits when exposed to intense sunlight, rain, severe temperature fluctuations, and contamination, the ZRX sets new standards for robust outdoor applications.

Its combination of a high-performance toothed belt drive and a precision roller guide system ensures exceptional dynamics, operational reliability, and repeat accuracy, even under harsh climatic influences.

The performance of the HSB-sigma® ZRX was validated by an independent testing laboratory under realistic, industry-relevant conditions. Despite extreme stress scenarios, the unit remained fully functional throughout all test cycles, clear evidence of its suitability for use in exposed and demanding environments.

Toothed Belt Drive with Roller Guide System

The outdoor unit combines high dynamic performance with precise positioning accuracy and extended system lengths. Its durability was validated through sun simulation and cyclic corrosion testing.

Technische Daten:

- Max. speed: 3,00 m/s
- Max. acceleration: 10 m/s²
- Repeat accuracy: ± 0,08 mm
- Max. total length: 6000 mm (longer on request)

SUN SIMULATION AND CORROSION TEST

Sun Simulation Based on DIN 75220 (Z-OUT-T/-F)
The sun simulation test evaluated the unit's resistance to UV radiation, intense thermal exposure, and cyclic humidity stress. Particular attention was given to material fatigue, crack formation, and visual surface changes.

Test Parameters:

- Total duration: 600h (15 dry cycles, 10 humid cycles)
- Irradiation: 1000 ± 100 W/m²
- Temperature range: –10 °C to 80 °C
- Relative humidity: < 30% (dry phase), > 60% (humid phase)

Result:
Despite visible signs of surface stress, the unit remained fully operational throughout the entire testing period. No functional failures occurred.

Corrosion Test with Salt Spray Exposure
Subsequently, the unit was subjected to a corrosion test to assess its behavior in an aggressive, salt-laden atmosphere, comparable to winter service operating conditions.

Test Parameters:

- Total duration: 1008h (6 cycles of 7 days each; 42 days total)
- Cycle sequence:: BACABBA
  - A: 3h salt spray exposure
  - B: evaluation phase
  - C: freezing phase

Result:
Even under corrosive stress, no functional failures were observed. The final component evaluation — including rollers and ball bearings — was conducted in close cooperation with the respective suppliers.

The results confirm the unit's suitability for long-term outdoor applications in corrosive environments.