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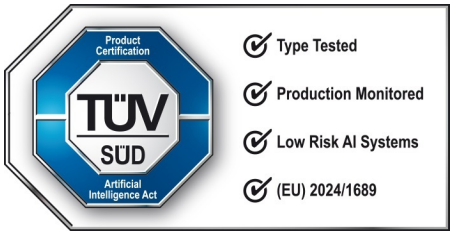
Product Service

C E R T I F I C A T E

No. Z2 058029 0067 Rev. 00

Holder of Certificate: **ASSA ABLOY Entrance Systems AB**
Lodjursgatan 10
261 44 Landskrona
SWEDEN

Certification Mark:



Product: **Powered pedestrian doors**

(ecoLOGIC saves energy, reduces losses by optimizing doors with live weather & traffic data)

Model(s): **ecoLOGIC**

Parameters: see next page

Tested according to: PPP 17025A:2025

The product was tested on a voluntary basis and complies with the essential requirements. The certification mark shown above can be affixed on the product. It is not permitted to alter the certification mark in any way. In addition, the certification holder must not transfer the certificate to third parties. This certificate is valid until the listed date, unless it is cancelled earlier. All applicable requirements of the Testing, Certification, Validation and Verification Regulations of TÜV SÜD Group have to be complied. For details see: www.tuvsud.com/ps-cert

Test report no.: 713341401
Valid until: 2030-07-14

Date, 2025-08-14

(Benedikt Pulver)

TÜV SÜD Product Service GmbH • Certification Body • Ridlerstraße 65 • 80339 Munich • Germany

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Aspect	Technical specification (excerpted from documentation)
Data sources	Door sensors, Open-Meteo weather, and building logs; data ingested hourly (historical) or live, visitor frequency.
Raw data types & units	Time-stamped tables: f32/f64 numerics, int counters, binary flags, ISO-8601 times; units °C, %RH, m s^{-1}, W m^{-2}, hPa/Pa, m^3 s^{-1}, kWh.
Data organization	> 500 000 records per door, 5-minute base resolution (configurable). Feature expansion: 2000 + derived columns.
Feature engineering	Gradients, cross terms, rolling stats, log/power transforms; RFE selects ≈ 15 edge variables.
Model architecture	Directed acyclic pipeline, five chained layers: 1. Meteorological Pre-processor 2. Occupancy & Door-cycle predictor (FSM) 3. Flow-sign classifier (GBTClassifier) 4. Air-flow regressor (GBTRegressor / ExtraTrees) 5. Energy-loss calculator
Algorithms & parameters	GBTRegressor (10 / 32 / 100) for pressure-wind models; ExtraTrees & LightGBM for speed-critical paths; all exported to ONNX for edge inference.
Training configuration	90/10 split; critical models get 5-fold CV + grid search with early-stop; trained on data from large retail stores in SE and NL.
Evaluation & success criteria	Targets – $R^2 \geq 0.85$ (airflow), RMSE ≤ 10 % (energy loss), F1 ≥ 0.90 (flow direction). Achieved – airflow $R^2 = 0.99$; wind R^2 0.66–0.73 on the 10 % hold-out; metrics logged for drift.
Versioning & deployment	Saved as .pkl/ONNX with dated semver; registry retrains on drift ≤ 6 months.

Remarks:

- ecoLOGIC reduces building's energy losses by continuously and dynamically optimizing door settings through a remote algorithm. The algorithm can also reduce opening cycles up to 7%. This algorithm is based on real-time data gathered from the door and as well uses external sources like weather and traffic data.
- This product complies with the European Union Artificial Intelligence Act, meeting all applicable legal and ethical standards for AI development and deployment.
- The test specification is a TÜV SÜD Test program based on (EU) 2024/1689

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