

certificate
no. **HSM 09079**
dated 2017-11-08

Translation In any case, the German original shall prevail.

EC Type-Examination Certificate

Name and address of the holder of the certificate (customer): Fotoelektrik Pauly GmbH
Wahrbrink 6
59368 Werne

Product designation: **Anti-collision and spacer systems for cranes**

Type: Systems CPV1037 and CPV1038 consisting of electronic transmitting and receiving unit(s) as well as reflector and shelter

Testing based on: - GS-HSM-30 "Electrical, electronic and programmable control systems and bus systems", 04/2015
- GS-HSM-31 "Electro-sensitive protective equipment" (for the testing of optical environmental influences), 04/2015

Test Report: No. 022/2015 dated 30.12.2015

Further details: Intended use:
Device for the purpose of providing protection against collisions and maintaining safe distances between cranes travelling on one shared and straight-lined runway.
The system is intended to be used exclusively in machines covered by the scope of DIN EN 60204-32 (Electrical equipment of cranes), DIN EN 15011 as well as DIN EN 12077-2.
The hazardous approach of cranes is detected; cut-off of the crane travelling movement is initiated.
For each crane, at least one device is required. The associated reflector is located on the respective opposite crane. Taking into account the information relating to assembly, operation and maintenance in the operating instructions, the system complies with the requirements of cat. 2 and PL=d of EN ISO 13849-1.

The type tested complies with the provisions laid down in the directive 2006/42/EC (**Machinery**).

The present certificate is valid until: **2018-12-31**

Further provisions concerning the validity, the extension of the validity and other conditions are laid down in the Rules of Procedure for Testing and Certification.




Dipl.-Ing. Berthold Heinke
Head of the Testing and Certification Body

TRANSLATION

Annex 1

EC-Type test certificate no.:

09079 dated 08.11.2017

Company: Fotoelektrik Pauly GmbH, 59368 Werne

Version 1.3
dated 08.11.2017

Product:
Anti-collision system for cranes

Changes to the previous version

| Cl. | Description | Version prev. | Version new |
|-----|---|---------------|-------------|
| 3 | Reflector equipped with supplemental, integrated heating system, Type 8R100BLH | 1.0 | 1.1 |
| all | - DC _{avg} added for CPV and heated reflector, - Remark relating to safety parameters added | 1.1 | 1.2 |

1. Parameters of CPV1037

| Designation | Value |
|---|------------------------|
| Category (CAT) in acc. with EN ISO 13849-1 | 2 |
| Performance Level (PL) in acc. with EN ISO 13849-1 | d |
| Safety integrity level (SIL) in acc. with EN IEC 62061 | 2 |
| Average value for diagnostic coverage DC _{avg} | 94% |
| Mean time to dangerous failure (MTTF _d) [a] | 75 |
| Average probability of a dangerous failure per hour (PFH _d) [1/h] | 3,4 x 10 ⁻⁷ |
| Mission time T _M [a] in acc. with EN ISO 13849-1 | 20 |

The evaluation is based on the following values:

| Designation | Value |
|---|--------|
| Mean operation hours per day (hop) [h] | 24 |
| Mean operation days per year (dop) [d] | 365 |
| Mean time between the beginning of two successive cycles in seconds (tcycle) [s] | 300 |
| Mean number of annual operations (nop) [n/a] | 105120 |
| Mean time between the beginning of two successive test cycles in milliseconds (tcycle) [ms] | 10 |

2. Parameters of CPV1038

| Designation | Value |
|---|----------------------|
| Category (CAT) in acc. with EN ISO 13849-1 | 2 |
| Performance Level (PL) in acc. with EN ISO 13849-1 | d |
| Safety integrity level (SIL) in acc. with EN IEC 62061 | 2 |
| Average value for diagnostic coverage DC_{avg} | 90% |
| Mean time to dangerous failure (MTTF _d) [a] | 74 |
| Average probability of a dangerous failure per hour (PFH _d) [1/h] | $3,4 \times 10^{-7}$ |
| Mission time T_M [a] in acc. with EN ISO 13849-1 | 20 |

The evaluation is based on the following values:

| Designation | Value |
|---|--------|
| Mean operation hours per day (hop) [h] | 24 |
| Mean operation days per year (dop) [d] | 365 |
| Mean time between the beginning of two successive cycles in seconds (tcycle) [s] | 300 |
| Mean number of annual operations (nop) [n/a] | 105120 |
| Mean time between the beginning of two successive test cycles in milliseconds (tcycle) [ms] | 10 |

3. Parameters of reflector with integrated heating system, Type 8R100BLH

| Designation | Value |
|---|-----------------------|
| Category (CAT) in acc. with EN ISO 13849-1 | 2 |
| Performance Level (PL) in acc. with EN ISO 13849-1 | d |
| Safety integrity level (SIL) in acc. with EN IEC 62061 | 2 |
| Average value for diagnostic coverage DC_{avg} | 99% |
| Mean time to dangerous failure (MTTF _d) [a] | 76 |
| Average probability of a dangerous failure per hour (PFH _d) [1/h] | $3,34 \times 10^{-7}$ |
| Mission time T_M [a] in acc. with EN ISO 13849-1 | 20 |

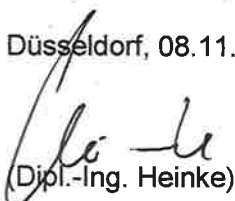
The evaluation is based on the following values:

| Designation | Value |
|---|-------|
| Mean operation hours per day (hop) [h] | 24 |
| Mean operation days per year (dop) [d] | 365 |
| Mean time between the beginning of two successive cycles in seconds (tcycle) [s] | 14400 |
| Mean number of annual operations (nop) [n/a] | 2190 |
| Mean time to dangerous failure (MTTF _d) [a] of the SPLC, required for diagnostics of the heating system | 100 |

Note:

The values indicated for PFH, MTTF, PL and SIL relate exclusively to aspects of the reliability of the hardware of the electronic subassemblies.

Düsseldorf, 08.11.2017


(Dipl.-Ing. Heinke)

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