Functional safety
EN ISO 13849-1 (PL)

Safety Instrumented System SIS (Safety Loop)

Machine safety, e.g. start-up warning

Command device S1

Warning signal P1

Start-up control K1 (logic)

Diagnosis unit G1 (sensor)

Command device S2

Safety contactor Q1 (actor)

Machine control K2

PL/PFH [1/h] in comparison to SIL

<table>
<thead>
<tr>
<th>PL</th>
<th>PFH [1/h]</th>
<th>SIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>$\geq 10^{-8}$</td>
<td>no equivalent</td>
</tr>
<tr>
<td>b</td>
<td>$10^{-8} \ldots \geq 10^{-6}$</td>
<td>SIL 3</td>
</tr>
<tr>
<td>c</td>
<td>$10^{-6} \ldots \leq 10^{-5}$</td>
<td>SIL 2</td>
</tr>
<tr>
<td>d</td>
<td>$10^{-5} \ldots \geq 10^{-4}$</td>
<td>SIL 1</td>
</tr>
<tr>
<td>e</td>
<td>$10^{-4} \ldots \leq 10^{-3}$</td>
<td>SIL 0</td>
</tr>
</tbody>
</table>

PL bar chart according to ISO 13849-1

Simplified graphic determination of the PL reached. Relationship between the category, DC, MTTF_d and PL.

Calculation according to EN 13849-1

Calculation is done with a source of:
- Data from manufacturer
- Data from the application
- Calculation according to norm