



Project name: 100588

File date: 23.07.2026 13:54:22 Report date: 23.07.2026 Checksum: 4a84ea0fea2849704168f7cfa4357d4f

PR Project name: 100588**Project file name:** C:\Users\jkh\Documents\Projects\20240719-001 PUS Cat2 bistable valves\100588 Sistema Project - V3.0.4 - EN.ssm**Creation date:** 14.12.2021 07:07:57**Project status:****Project number:****Project version:****Authors:****Project managers:****Inspectors:****Dangerous point/machine:****Documentation:****Document:****Version of software:** 3.0.4 build 3**Version of standard:** ISO 13849-1:2023, ISO 13849-2:2012**Checksum:** 4a84ea0fea2849704168f7cfa4357d4f**Options:** ☒ Use DC intermediate levels for calculation of PFH (more precise)
☐ MTTFD capping for category 4 lower from 2500 to 100 years.**Status:** ☒ green**Note:** There are no warnings listed for this project (or it's subordinate basic elements).**Print options**

- | | |
|--|---|
| ☒ Show device details | ☒ Show requirements on PL and Category |
| ☒ Show documentations on SF, SB, BL and EL | ☒ Show parameter documentations on PLr, PL, Category, CCF, MTTFD and DC |
| ☐ Show CCF and DC measures in detail | ☒ Show messages |

Contained safety functions**SF** Name: PUS**Required: PLr d** **Reached: PL d** **PFH [1/h]: 2,29E-7** **Status: green****List of documented messages:**

- No messages known -

List of devices with a permissible operation time (T10D) of less than 20 years:

- No devices known -



Project name: 100588

File date: 23.07.2026 13:54:22 Report date: 23.07.2026 Checksum: 4a84ea0fea2849704168f7cfa4357d4f

SF Safety function: PUS

Identifier of the Safety function:

Safety function type:

Triggering event:

Reaction and
Behaviour on power failure:

Safe state:

Operation mode:

Interfaces:

Demand rate:

Running-on time:

Priority:

Documentation:

Document:

Required Performance Level Safety function

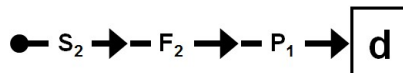
PLr (by risk graph): d

Severity of injury (S): Serious (normally irreversible) injury or death

Frequency / exposure times to hazard (F): Frequent to continuous / exposure time is long

Possibility of avoiding (P): Possible under specific conditions

Risk graph:



Documentation:

Document:

Performance Level Safety function

Reached PL: d

PFH [1/h]: 2,29E-7

*Electromagnetic immunity, EMI (Annex L) Safety function*Route for fulfilment
of EMI measures: n/a

Documentation:

Document:

List of devices with a permissible operation time (T10D) of less than 20 years:

Device list:



Project name: 100588

File date: 23.07.2026 13:54:22 Report date: 23.07.2026 Checksum: 4a84ea0fea2849704168f7cfa4357d4f

SF Safety function: PUS

Status / Messages Safety function

Status: green

Subsystems (1 / 1)

SB Name: Output

Reference designator:

Inventory number:

Device details Subsystem

Device Manufacturer:

Device Identifier:

Device group:

Part number:

Revision:

Function:

☐ Input

☒ Output

☐ Logic

☐ unknown

Use case:

Description of the use case:

Documentation Subsystem

Documentation:

Document:

Performance Level Subsystem

PL determination: Determine PL/PFH from Category, MTTFD and DCavg

Qualitative aspects (e.g. software, see sections 7, 10.3) Subsystem

Qualitative aspects suitable up to PL: n/a

Documentation:

Document:

Electromagnetic immunity, EMI (Annex L) Subsystem

Route for fulfilment of EMI measures: The fulfilment of the measures for electromagnetic immunity (EMI) was documented in the associated safety function.

PL requirements: fulfilled

The PL shall be determined by the estimation of the following aspects (section 6.1.1):

- Behaviour of the safety function under fault conditions [fulfilled]
- Safety-related software according to clause 7 and Annex J or no software included [fulfilled]
- Systematic failure (see clause 6.1.7 and Annex G) [fulfilled]
- Ability to perform a safety function under expected environmental conditions [fulfilled]



Project name: 100588

File date: 23.07.2026 13:54:22 Report date: 23.07.2026 Checksum: 4a84ea0fea2849704168f7cfa4357d4f

SF Safety function: PUS

Reached PL:	d	PFH [1/h]:	2,29E-7
-------------	---	------------	---------

Documentation:*Category Subsystem*

Cat.:	2
-------	---

Category requirements:	fulfilled
------------------------	-----------

Requirements for the category:

- Accordance with relevant standards to withstand the expected influences. [fulfilled]
- Basic safety principles are being used. [fulfilled]
- Well-trying safety principles are being used. [fulfilled]
- The requirements for the test frequency are satisfied. [fulfilled]
- MTTFD is at least Low. [fulfilled]
- Each part (I, L, O) shall be at least DC Low. [fulfilled]
- The MTTFD of the test channel is greater than or equals half of the tested systems MTTFD. [fulfilled]
- The achieved score of the CCF-rating is at least 65. [fulfilled]

Documentation:**Source (e.g. standard) Category:****File:***MTTFD and Mission time Subsystem*

MTTFD [a]:	100 (High)
------------	------------

Mission time [a]:	20	Shortest mission time [a]:	20
-------------------	----	----------------------------	----

Diagnostic coverage Subsystem

DCavg [%]:	90 (Medium)
------------	-------------

Common cause failure Subsystem

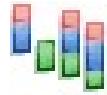
CCF Points:	95 (fulfilled)
-------------	----------------

CCF Measures:

- 15 Points | Separation/segregation
- 20 Points | Diversity
- 15 Points | Protection against over-voltage, over-pressure, over-current, over-temperature
- 5 Points | Assessment/analysis
- 5 Points | Training
- 25 Points | Prevention of EMI or impurity of fluidic medium
- 10 Points | Other influences

Documentation:**Document:***Status / Messages Subsystem*

Status:	green
---------	-------



Project name: 100588

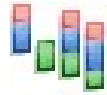
File date: 23.07.2026 13:54:22 Report date: 23.07.2026 Checksum: 4a84ea0fea2849704168f7cfa4357d4f

SF Safety function: PUS**Channels / Test channels (1 / 2)****CH** Name: Channel 1

MTTFD [a]: 100

Blocks (1 / 1)**BL** Name: 5/2 Directional control valve**Reference designator:** Q2**Inventory number:***Device details Block***Device Manufacturer:****Device Identifier:****Device group:****Part number:****Revision:****Function:**☐ Input
☒ Output☐ Logic
☐ unknown**Technology:** unknown**Category:** -**Use case:****Description of the use case:***Documentation Block***Documentation:****Document:***MTTFD and Mission time Block***MTTFD [a]:** 380,5 (High)**Mission time [a]:** 20**Shortest mission time [a]:** 20**B10 [cycles]:** 10000000**RDF [%]:** 50**B10D [cycles]:** 20000000**nop [cycles/a]:** 525600**Documentation:****Document:***Diagnostic coverage Block***DC [%]:** 90 (Medium)**Measure:**

Indirect monitoring (e.g. monitoring by pressure switch, electrical position monitoring of machine actuators)



Project name: 100588

File date: 23.07.2026 13:54:22 Report date: 23.07.2026 Checksum: 4a84ea0fea2849704168f7cfa4357d4f

SF Safety function: PUS**Documentation:****Document:***Status / Messages Block***Status:** green**Channels / Test channels (3 / 2)****TE** Name: Test channel

MTTFD [a]: 100

Blocks (1 / 3)**BL** Name: Limit switch**Reference designator:** B1**Inventory number:***Device details Block***Device Manufacturer:****Device Identifier:****Device group:****Part number:****Revision:****Function:**☒ Input
☐ Output☐ Logic
☐ unknown**Technology:** unknown**Category:** -**Use case:****Description of the use case:***Documentation Block***Documentation:****Document:***MTTFD and Mission time Block***MTTFD [a]:** 182648,4 (High)**Mission time [a]:** 20 **Shortest mission time [a]:** 20**B10 [cycles]:** 10000000 **RDF [%]:** 50**B10D [cycles]:** 20000000 **nop [cycles/a]:** 1095



Project name: 100588

File date: 23.07.2026 13:54:22 Report date: 23.07.2026 Checksum: 4a84ea0fea2849704168f7cfa4357d4f

SF Safety function: PUS

Documentation:

Document:

*Status / Messages Block***Status:** green**Blocks (2 / 3)****BL** Name: Limit switch**Reference designator:** B2**Inventory number:***Device details Block***Device Manufacturer:****Device Identifier:****Device group:****Part number:****Revision:****Function:**☒ Input
☐ Output☐ Logic
☐ unknown**Technology:** unknown**Category:** -**Use case:****Description of the use case:***Documentation Block***Documentation:**

Document:

*MTTFD and Mission time Block***MTTFD [a]:** 182648,4 (High)**Mission time [a]:** 20**Shortest mission time [a]:** 20**B10 [cycles]:** 10000000**RDF [%]:** 50**B10D [cycles]:** 20000000**nop [cycles/a]:** 1095**Documentation:**

Document:

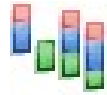
Status / Messages Block



Project name: 100588

File date: 23.07.2026 13:54:22 Report date: 23.07.2026 Checksum: 4a84ea0fea2849704168f7cfa4357d4f

SF Safety function: PUS**Status:** green**Blocks (3 / 3)****BL** Name: 3/2 Directional control valve**Reference designator:** Q1**Inventory number:***Device details Block***Device Manufacturer:****Device Identifier:****Device group:****Part number:****Revision:****Function:**☐ Input
☒ Output☐ Logic
☐ unknown**Technology:** unknown**Category:** -**Use case:****Description of the use case:***Documentation Block***Documentation:****Document:***MTTFD and Mission time Block***MTTFD [a]:** 182648,4 (High)**Mission time [a]:** 20**Shortest mission time [a]:** 20**B10 [cycles]:** 10000000**RDF [%]:** 50**B10D [cycles]:** 20000000**nop [cycles/a]:** 1095**Documentation:****Document:***Status / Messages Block***Status:** green



Project name: 100588

File date: 23.07.2026 13:54:22 Report date: 23.07.2026 Checksum: 4a84ea0fea2849704168f7cfa4357d4f

EXCLUSION OF LIABILITY

Care has been taken in production of the software SISTEMA, which corresponds to the state of the art. It is made available to users free of charge.

Die Haftung des Institut für Arbeitsschutz der DGUV (IFA) ist damit auf Vorsatz und grobe Fahrlässigkeit (§ 521 BGB) bzw. bei Sach- und Rechtsmängel auf arglistig verschwiegene Fehler beschränkt (523, 524 BGB).

The Institute for Occupational Safety and Health of the German Social Accident Insurance undertakes to keep its website free of viruses; nevertheless, no guarantee can be given that the software and information provided are virus-free. The user is therefore advised to take appropriate security precautions and to use a virus scanner prior to downloading software, documentation or information.

German Social Accident Insurance (DGUV)
Glinkastraße 40
D-10117 Berlin

E-mail: info@dguv.de
Internet: www.dguv.de

NOTE

This document is not a complete technical documentation according to EN ISO 13849-1:2023, clause 12.

CONTACT

Company contact details unknown

Name in block letters

Date, signature

Authors

Authors

Inspectors

Inspectors