

Functional Safety

Inspection Certificate No. FS/SHFS2605000361MD

Applicant: SHENZHEN DOBOT CORP LTD
Room 1003, Building 2, Chongwen Park, Nanshan iPark,
No.3370, Liuxian Blvd, Fuguang Community, Taoyuan Street,
Nanshan District, Shenzhen, China.

Manufacturer: SHENZHEN DOBOT CORP LTD
Room 1003, Building 2, Chongwen Park, Nanshan iPark,
No.3370, Liuxian Blvd, Fuguang Community, Taoyuan Street,
Nanshan District, Shenzhen, China.

Trademarks: 

Product Name: Collaborative Robot

Model (s) No. / Series: Nova 2, Nova 5
More detail information refers to APPENDIX II

Assessment Performed: ISO 13849-1:2023, ISO 13849-2:2012

Conclusion: The safety architecture and performance level meet PL d with Cat.3 for SF1, SF2, SF8~SF10, SF13 and SF28; PL d with Cat.2 for SF3~SF7, SF11~SF12 and SF14~SF27 according to ISO 13849-1:2023, detail information of safety function items is shown in APPENDIX I/II.

As shown in the technical report number(s): SHFS260500036171

This certificate confirms the achievement of the requirements of functional safety based on proof of the safety-related parameters (failure rate, DC / PFH, safety architecture etc), proofs that processes, and methods are established at the manufacturer guaranteeing that unexceptionable processes in terms of risk analysis, design, production, validation, modification and quality management comply with the standard.

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Approved by:



Andrew Zhai
Technical Manager

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APPENDIX I

Supplementary of Functional Safety Certificate

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Summary of Assessment Result in ISO 13849-1 report:

General Technical Safety Parameters	Assessment Result
Performance Level	PL d
Diagnostic Coverage	DC ≥ 90%
Common Cause Failure	CCF = 75

Detail technical safety parameters for each safety functions are listed in the following table:

SF	Safety Functions Name	Category	MTTF _D (years)	PFH (1/h)	Safe State
SF1	Emergency Stop (System)	Category 3	142	4.29×10^{-8}	Stop category 1
SF2	Emergency Stop (User)	Category 3	142	4.29×10^{-8}	Stop category 1
SF3	Safeguard Stop	Category 2	99	2.61×10^{-7}	Stop category 2
SF4	Safeguard Reset Input	Category 2	96	2.61×10^{-7}	Stop category 2
SF5	Reduced Mode Input	Category 2	99	2.61×10^{-7}	Stop category 1
SF6	Mode Switch Input	Category 2	99	2.61×10^{-7}	Stop category 2
SF7	3 Position Enabling Device Input	Category 2	81	3.40×10^{-7}	Stop category 1
SF8	Estop Digital Output	Category 3	149	4.29×10^{-8}	DO output low level
SF9	System Estop Digital Output	Category 3	148	4.29×10^{-8}	DO output low level
SF10	Safeguard Stop Status Output	Category 3	436	4.29×10^{-8}	DO output low level
SF11	Reduced Digital Output	Category 2	103	2.29×10^{-7}	DO output low level
SF12	Moving Digital Output	Category 2	107	2.29×10^{-7}	DO output low level
SF13	Not stopping Digital Output	Category 3	518	4.29×10^{-8}	DO output low level
SF14	Safe Home Position Output	Category 2	107	2.29×10^{-7}	DO output low level
SF15	Joint Position Limit (soft axis limiting)	Category 2	284	2.29×10^{-7}	Stop category 1
SF16	Pose Limit (Safety Zone)	Category 2	103	2.29×10^{-7}	Stop category 1
SF17	Joint Speed Limit	Category 2	284	2.29×10^{-7}	Stop category 1
SF18	TCP Speed Limit	Category 2	103	2.29×10^{-7}	Stop category 1
SF19	TCP Speed Limit in Teaching Mode	Category 2	103	2.29×10^{-7}	Stop category 1
SF20	Momentum Limit	Category 2	103	2.29×10^{-7}	Stop category 1
SF21	Stopping time limiting	Category 2	103	2.29×10^{-7}	Stop category 0
SF22	Stopping Distance Limit	Category 2	103	2.29×10^{-7}	Stop category 0
SF23	Power Limit	Category 2	107	2.29×10^{-7}	Stop category 1
SF24	TCP Force Limit	Category 2	107	2.29×10^{-7}	Stop category 1
SF25	Force torque Limit	Category 2	289	2.29×10^{-7}	Stop category 1

APPENDIX II

Supplementary of Functional Safety Certificate

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Detail technical safety parameters for each safety functions are listed in the following table

SF	Safety Functions Name	Category	MTTF _D (years)	PFH (1/h)	Safe State
SF26	TCP Position Deviation Limit	Category 2	103	2.29×10^{-7}	Stop category 1
SF27	Start/Restart Interlock	Category 2	103	2.29×10^{-7}	Stop category 1
SF28	Normal Stop	Category 3	377	4.29×10^{-8}	Stop category 1
SF29	Hand guided control (HGC)	Category 2	71	3.90×10^{-7}	Stop category 2
SF30	Hold-to-run control	Category 2	71	3.90×10^{-7}	Stop category 2

Model supplement description:

Robot System Model	Manipulator Model	Control Cabinet Model	Teach Pendant Model
Nova 2	DT-NV020-0	DT-DSC-0D	DT-TP10-3PE-N
Nova 5	DT-NV050-0	DT-DSC-0D	DT-TP10-3PE-N