

SAFETY COMPONENTS FOR MACHINERY

DIRECTIVE 2006/42/EC

EC TYPE EXAMINATION CERTIFICATE

N° 0080.5507.520.12.18.0072 Ext 001.05.19

The INERIS, a public industrial and commercial organization, established by decree No. 90-1089 of 7 December 1990, listed in the Official Journal of the European Communities on 25 October 1995 with identification No. 0080, and accredited by COFRAC under number 5-0045 for certification of products and services (scope of accreditation available on the website www.cofrac.fr):

Dénomination / <i>Designation :</i>	STO, SLS, SS1, SMS and SFO/GDL Safety functions of the Variable speed drives product ranges <ul style="list-style-type: none"> • 8174 product range • 8166 product range • 8176 product range.
Fabricant / <i>Manufacturer :</i>	B&R Industrial Automation GmbH B&R Strasse 1 A-5142 Eggelsberg, (Austria)
Type / <i>Type :</i>	STO, SLS, SS1 SMS and SFO/GDL safety functions
Version :	Hardware <ul style="list-style-type: none"> • Hardware based on certificate number 0080.5454.520.07.10.0046 EXT 005.05.19 • 8166, 8176 and 8174 - power range: 0,18 KW to 15 KW- Voltage supply: 200/240 V, 380/500 V, 525/600 Vac. Firmware <ul style="list-style-type: none"> • 8166 : SK_MC : V1.4 & SK_APP : V1.10#1 • 8176 : SK_MC : V1.4 & SK_APP : V1.10#1 • 8174 : SK_MC : V1.2 & SK_APP : V1.8#1
Demandeur de l'attestation / <i>Applicant :</i>	B&R Industrial Automation GmbH B&R Strasse 1 A-5142 Eggelsberg, (Austria)

Those safety functions, after examination and tests included in the following INERIS certification report - DSC-19-182378-04014A - dated May 2019 -are declared :

- to comply with health and safety requirements of appendix 1 of the directive applicable for this type of safety device

The rules of certification are available on the website www.ineris.fr

1. Functional Safety

The safety function complies with functional safety levels and is declared classified as follows:

Standard: EN ISO 13849-1 (2015)
Level of compliance: Category 2 PLc / Category 3 PLd / Category 4 PLe

Standard: NF EN 62061 (July 2005) NF EN 62061 (July 2005) + NF EN 62061/A1 (2013-05-10) + NF EN 62061/A2 (2015)
Level of compliance: SILCL 1 / SIL CL 2 / SIL CL 3.

Product satisfy the requirements to be used for designing safety functions according IEC EN FR 62061 up to SIL 3 CL

Standard: EN 61508 (2010)
Level of compliance: SIL1 / SIL 2 / SIL 3

Standard: EN 50495 (2010)
Level of compliance: SIL1 / SIL 2 / SIL 3

Standard: IEC 61800-5-2: IEC 61800- part 5-2 ed1 2007 Adjustable speed electrical power drive systems
Level of compliance: SIL1 / SIL 2 / SIL 3

Standard: NF EN 60204-1 - 2006+ corrigendum 2010:
Level of compliance: STOP category 0 and category 1

The level of SIL, category, PL, SIL CL depends of the connecting schemes for the STO, SLS, SS1, SMS and SFO-GDL safety function as defined hereafter. The wiring certified configuration are identified in the safety manual and in the INERIS certification report identified previously.

Function	Standard	Input	STO input	STO Input & LI3	LI3 & LI4 or LI5 & LI6
STO	IEC 61508	SFF	96%	96%	95%
		PFD _{10y} (4)	$8 * 10^{-4}$	$5 * 10^{-4}$	$3 * 10^{-3}$
		PFD _{1y}	$8 * 10^{-5}$	$5 * 10^{-5}$	$3 * 10^{-4}$
		PFH _{equ_1y}	9 FIT (1 FIT = $1 * 10^{-9}$)	6 FIT	34 FIT
		Type	B	B	B
		HFT	1	1	0
		DC	92%	90%	88%
		SIL capability	2	3	2
	IEC 62061 (1)	SIL CL capability	2	3	2
	IEC 60204-1	Category stop	0	0	0
	ISO 13849-1 (3)	PL	d	e	d
		Category	3	3	3
		MTTFd in years	14000	"L1" 3000 "L2" 31000	4000
SS1 Type C (With Preventa XPS ATE or XPS AV or equivalent)	IEC 61508	SFF	96%	96%	95%
		PFD _{10y} (4)	$8 * 10^{-4}$	$5 * 10^{-4}$	$3 * 10^{-3}$
		PFD _{1y}	$8 * 10^{-5}$	$5 * 10^{-5}$	$3 * 10^{-4}$
		PFH _{equ_1y}	9 FIT	6 FIT	34 FIT
		Type	B	B	B
		HFT	1	1	0
		DC	92%	90%	88%
		SIL capability	2	3	2
	IEC 62061 (1)	SIL CL capability	2	3	2
	IEC 60204-1	Category stop	1	1	1
	ISO 13849-1 (3)	PL	d	e	d
		Category	3	3	3
		MTTFd in years	14000	"L1" 3000 "L2" 31000	4000
SS1 type B SLS SMS	IEC 61508	SFF			90%
		PFD _{10y}			$4 * 10^{-3}$
		PFH _{equ_10y}			43 FIT
		Type			B
		HFT			0
		DC			74%
		SIL capability			2
	IEC 62061 (1)	SIL CL capability			2
	IEC 60204-1	Category stop			1 (for SS1 type B)
	ISO 13849-1 (3)	PL			d
Category				3	
MTTFd in years				2000	

Function	Standard	Output	Logical Output LO+ LO-	Relay Outputs R1 R2
GDL	IEC 61508	SFF	91%	94%
		PFD _{1y}	2x10⁻²	2x10⁻²
		PFD _{10y}	2x10⁻³	2x10⁻³
		PFH _{equ_10y}	52 FIT	37 FIT
		Type	B	B
		HFT	0	0
		DC	72%	78%
		SIL capability	1	1
	IEC 62061 (1)	SIL CL capability	1	1
	ISO 13849-1 (3)	PL	e	e
		Category	2	2
MTTFd in years		600	600	
<p>(1) Because the standard IEC 62061 is an integration standard, this standard distinguishes the global safety function (which is classify SIL2 or SIL3 according to schematic from the user's manual chapter 6 – "Safety functions") from components which constitute the safety function (which is classify SIL2 CL or SIL3 CL)</p> <p>(3) According to table 4 of EN 13849-1 (2015)</p> <p>(4) Lifetime of Safety Functions is 20 years but Lifetime of the Drive is 10 years</p> <p>FIT = Failure In Time = 1 x 10⁻⁹/h</p>				

Safety calculations and SFF for B&R 8166, 8174 and 8176 series safety functions for products ranges: single phase 230 V & 3 phases 230 V & tri phases 400 V & 3 phases 600 V.

The **STO** and **SS1** safety functions are warranted to perform a stop **category 0** and **category 1** related to the **EN 60204-1** standard. This mode corresponds to the removal of power from the motor for **STO** safety function and controlled stop for **SS1** safety function, which are therefore allowed to freewheel.

2. Safety for use

The regulations of use are detailed in the users' manual¹ referenced

- ACOPOSinverter P66 - User's manual_V1.0 (October 2018) - (German edition is the original edition) and,
- ACOPOSinverter P76-User's manual_V1.0, (October 2018) - (German edition is the original edition).

These instruction notices define the different wirings and all relevant information necessary for the safe use of the Safety functions.

3. Validity

The present EC type examination certificate is valid up to 2024 05 28

Verneuil-en-Halatte, 2019 05 28

Dominique CHARPENTIER
Responsable Pôle Certification
Certification Division, Manager



The Chief Executive Officer of INERIS
By delegation
D. CHARPENTIER
Certification Division,
Manager

¹ The original instructions, according to requirement of chapter 1.7.4. Instructions, of Annex I of machinery directive 2006/42/EC, are the German editions.

Liste des références / reference list
B&R 8I66, B&R 8I76 and B&R 8I74 Safety products references

The list of references covered by the present EC type examination certificate is provided hereafter :

B&R 8I66 references

200-240V 1PH
8I66S200018.*
8I66S200037.*
8I66S200055.*
8I66S200075.*
8I66S200110.*
8I66S200150.*
8I66S200220.*

380 - 480V 3PH
8I66T400037.*
8I66T400055.*
8I66T400075.*
8I66T400110.*
8I66T400150.*
8I66T400220.*
8I66T400300.*
8I66T400400.*

525-600V 3PH
8I66T600075.*
8I66T600150.*
8I66T600220.*
8I66T600400.*
8I66T600550.*
8I66T600750.*
8I66T601100.*
8I66T601500.*

200-240V 3PH
8I66T200018.*
8I66T200037.*
8I66T200055.*
8I66T200075.*
8I66T200110.*
8I66T200150.*
8I66T200220.*
8I66T400300.*
8I66T400400.*
8I66T400550.*
8I66T400750.*
8I66T401100.*
8I66T401500.*

B&R 8I76 references

200-240V 1PH
8I76S200018.*
8I76S200037.*
8I76S200055.*
8I76S200075.*
8I76S200110.*
8I76S200150.*
8I76S200220.*

380 - 480V 3PH
8I76T400037.*
8I76T400055.*
8I76T400075.*
8I76T400110.*
8I76T400150.*
8I76T400220.*
8I76T400300.*
8I76T400400.*
8I76T400550.*
8I76T400750.*
8I76T401100.*
8I76T401500.*

B&R 8I74 references

200-240V 1PH
8I74S200018.*
8I74S200037.*
8I74S200055.*
8I74S200075.*
8I74S200110.*
8I74S200150.*
8I74S200220.*

380 - 480V 3PH
8I74T400037.*
8I74T400055.*
8I74T400075.*
8I74T400110.*
8I74T400150.*
8I74T400220.*
8I74T400300.*
8I74T400400.*
8I74T400550.*
8I74T400750.*
8I74T401100.*
8I74T401500.*