SAFETY COMPONENTS FOR MACHINERY

DIRECTIVE 2006/42/EC

EC TYPE EXAMINATION CERTIFICATE

N° 0080.5454.520.07.10.0046 Ext 004.12.18

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 / *Designation :*	STO, SLS, SS1, SMS and SFO/GDL Safety functions of the Variable speed drives product ranges ATV32 / ATV 320 BOOK and ATV 320 COMPACT
Fabricant / *Manufacturer :*	**Schneider Electric Industries SAS**
Type / *Type :*	STO, SLS, SS1 SMS and SFO/GDL safety functions
Version :	Firmware: • safety Kernel Applicative : ATV32_SK_APP : V1.2 to V1.10#1 • Safety kernel Motor Control : ATV32_SK_MC : V1.1 to V1.3 Hardware: • ATV 32 / ATV 320 - power range : 0,18 KW to 15 KW- Voltage supply : 200/240 V, 380/500 V, 525/600 Vac.
Demandeur de l'attestation / *Applicant :*	**SCHNEIDER TOSHIBA INVERTER EUROPE SAS** Rue André Blanchet F-27120 Pacy sur Eure (France)

Those safety functions, after examination and tests included in the following report (DSC-18-177929-09957A), 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

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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 certification report DSC-18-177929- 09957A.

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 x 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) Notes : numbers are given only for the drive modules	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}	$2x10^{-2}$	$2x10^{-2}2$
		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	c	c
		Category	2	2
		MTTFd in years	600	600

(1) Because the standard IEC 62061 is an integration standard, this standard distinguishes the global safety function (which is classify SIL2 or SIL3 for ATV320 and SIL2 for VF-S15 according to schematic from the safety manual chapter "Process System SF – Case 1 & Case 2") from components which constitute the safety function (which is classify SIL2 CL or SIL3 CL for ATV320 and SIL2 for VF-S15)

(3) According to table 4 of EN13849-1 (2015)

(4) Lifetime of Safety Functions is 20 years but Lifetime of the Drive is 10 years

Safety calculations and SFF for Schneider Electric ATV32, ATV 320 BOOK & ATV 320 COMPACT 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 safety manual referenced Altivar 32 / 320 Variable speed drives for synchronous and asynchronous motors - Safety integrated functions manual. This instruction notice defines the different wirings and all information necessary for the safe use of the Safety functions.

3. Validity

The present EC type examination certificate is valid up to 03/12/2023

Verneuil-en-Halatte, 03/12/2018

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