

SAFETY COMPONENTS FOR MACHINERY

# EC TYPE EXAMINATION CERTIFICATE

N° 0080.5454.520.07.10.0046 Ext 002.02.17

In execution of directive 2006/42/CE concerning the harmonization of Member States' legislation on machinery,

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](http://www.cofrac.fr))

issues the present extension of EC type examination certificate for the following model:

Designation : STO, SLS, SS1, SMS and SFO/GDL Safety functions of the Variable speed drives product ranges ATV32 / ATV 320

Manufacturer : **Schneider Electric Industries SAS**

Type : STO, SLS, SS1 SMS and SFO/GDL safety functions

Version : Firmware:

- safety Kernel Applicative : ATV32\_SK\_APP : V1.2 to V1.7
- Safety kernel Motor Control : ATV32\_SK\_MC : V1.1 to V1.2

Hardware:

- ATV 32 / ATV 320 - power range : 0,18 KW to 15 KW - Voltage supply : 200/240 V, 380/500 V, 525/600 Vac.

EC TYPE EXAMINATION CERTIFICATE request by :

**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 17 167536 01711A, 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](http://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.

**Standard:** EN 61508 (2001 and 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 report DSC 17 167536 01711A.

Function	Standard	Input	STO input	STO Input & LI3	LI3 & LI4 or LI5 & LI6
STO	IEC 61508	SFF	96,7%	96%	94,8%
		PFD10y	$7,26 \cdot 10^{-4}$	$4,00 \cdot 10^{-4}$	$2,44 \cdot 10^{-3}$
		PFD1y	$7,18 \cdot 10^{-5}$	$3,92 \cdot 10^{-5}$	$2,33 \cdot 10^{-4}$
		PFHequ_1y	8,20 FIT	4,47 FIT	26,6 FIT
		Technology Type	B	B	B
		HFT	1	1	0
		DC	93,1%	91,5%	90%
	SIL capability	2	3	2	
	IEC 62061	SIL CL capability	2	3	2
	ISO 13849-1	PL	d	e	d
		Category	3	4	3
		MTTFd in years	13900	"L1" 3850 "L2" 29300	4290
	IEC 60204-1	Category stop	Category stop 0	Category stop 0	Category stop 0
SS1 type B (by using STO function)	IEC 61508	SFF	96,7%	96%	94,8%
		PFD10y	$7,26 \cdot 10^{-4}$	$4,00 \cdot 10^{-4}$	$2,44 \cdot 10^{-3}$
		PFD1y	$7,18 \cdot 10^{-5}$	$3,92 \cdot 10^{-5}$	$2,33 \cdot 10^{-4}$
		PFHequ_1y	8,20 FIT	4,47 FIT	26,6 FIT
		Technology Type	B	B	B
		HFT	1	1	0
		DC	93,1%	91,5%	90%
	SIL capability	2	3	2	
	IEC 62061	SIL CL capability	2	3	2
	ISO 13849-1	PL	d	e	d
		Category	3	4	3
		MTTFd in years	13900	"L1" 3850 "L2" 29300	4290
	IEC 60204-1	Category stop	Category stop 1	Category stop 1	Category stop 1
SLS SMS	IEC 61508	SFF			93,3%
		PFD10y			$2,72 \cdot 10^{-3}$
		PFHequ_10y			31,1 FIT
		Technology Type			B
		HFT			0
		DC			78,7%
		SIL capability			2
	IEC 62061	SIL CL capability			2
	ISO 13849-1	PL			d
		Category			3
MTTFd in years				3670	

Function	Standard	Input	LO1
SFO/GDL	IEC 61508	SFF	85%
		PFD10y	8.2.10-4
		PFD1y	8.2.10-3
		PFHequ_1y	187 FIT
		Technology Type	B
		HFT	0
		DC	71%
		SIL capability	1
	IEC 62061	SIL CL capability	1
	ISO 13849-1	PL	c
		Category	2
		MTTFd in years	609

Safety levels for Schneider Electric ATV 32, ATV 320-B safety functions

Function	Standard	Input	STO input	STO Input & LI3	LI3 & LI4 or LI5 & LI6
<b>STO</b>	IEC 61508	SFF	96,53%	96,35%	95,56%
		PFD <sub>10y</sub> (4)	$7,02 * 10^{-4}$	$4,02 * 10^{-4}$	$2,37 * 10^{-3}$
		PFD <sub>1y</sub>	$7,02 * 10^{-5}$	$4,02 * 10^{-5}$	$2,37 * 10^{-4}$
		PFH <sub>equ. 1y</sub>	8,01 FIT	4,58 FIT	27 FIT
		Type	B	B	B
		HFT	1	1	0
		DC	93,16%	90,71%	88,63%
		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	14241	“L1” 3353 “L2” 31339	4225
<b>SSI Type C (With Preventa XPS ATE or XPS AV or equivalent)</b>	IEC 61508	SFF	96,53%	96,35%	
		PFD <sub>10y</sub>	$7,02 * 10^{-4}$	$4,02 * 10^{-4}$	
		PFD <sub>1y</sub>	$7,02 * 10^{-5}$ Target SIL 2: $\geq 10^{-3}$ to $< 10^{-2}$	$4,02 * 10^{-5}$	
		PFH <sub>equ. 1y</sub>	8,01 FIT	4,58 FIT	
		Type	B	B	
		HFT	1	1	
		DC	93,16%	90,71%	
		SIL capability	2	3	
	IEC 62061 (1)	SIL CL capability	2	3	
	IEC 60204-1	Category stop	1	1	
	ISO 13849-1 (3)	PL	d	e	
		Category	3	3	
		MTTFd in years	14241	“L1” 3353 “L2” 31339	
<b>SSI type B SLS SMS</b>	IEC 61508	SFF			90,90%
		PFD <sub>10y</sub>			$3,71 * 10^{-3}$
		PFH <sub>equ. 10y</sub>			42,3 FIT
		Type			B
		HFT			0
		DC			74,23%
		SIL capability			2
	IEC 62061 (1)	SIL CL capability			2

Function	Standard	Input	STO input	STO Input & LI3	LI3 & LI4 or LI5 & LI6
	IEC 60204-1	Category stop			1 (for SS1 type B)
		PL			d
	ISO 13849-1 (3)	Category			3
		MTTFd in years			2696

Function	Standard	Output	Logical Output LO+ LO-	Relay Outputs R1 R2
SFO/GDL	IEC 61508	SFF	91%	94%
		PFD <sub>1y</sub>	1,5x10 <sup>-3</sup>	1,4x10 <sup>-3</sup>
		PFD <sub>10y</sub>	1,5x10 <sup>-2</sup>	1,4x10 <sup>-2</sup>
		PFH <sub>equ_10y</sub>	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	612	667

(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 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)

(2) According to table 6 of IEC 62061 (2005)

(3) According to table 4 of EN13849-1 (2008)

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

Safety levels for Schneider Electric ATV 320-C 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 21 February 2022.

Verneuil-en-Halatte, 2017.02.21



The Chief Executive Officer of INERIS

By delegation

**D. CHARPENTIER**  
Certification Division,  
Manager