

SAFETY COMPONENTS FOR MACHINERY

DIRECTIVE 2006/42/EC

EC TYPE EXAMINATION CERTIFICATE

N° 0080.5454.520.07.10.0046 Ext 005.05.19

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 ATV32 / ATV 320 BOOK and ATV 320 COMPACT
Fabricant / <i>Manufacturer :</i>		Schneider Electric Industries SAS
Type / <i>Type :</i>		STO, SLS, SS1 SMS and SFO/GDL safety functions
Version :		Firmware: <ul style="list-style-type: none"> • safety Kernel Applicative : ATV32_SK_APP : V1.2 to V1.10#1 • Safety kernel Motor Control : ATV32_SK_MC : V1.1 to V1.4 Hardware: <ul style="list-style-type: none"> • ATV 32 / ATV 320 - power range : 0,18 KW to 15 KW- Voltage supply : 200/240 V, 380/500 V, 525/600 Vac.
Demandeur l'attestation / <i>Applicant :</i>	de	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-19-182378-04014A), 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 certification report DSC-19-182378-04014A.

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
Notes : numbers are given only for the drive modules	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
	SS1 type B SLS SMS	IEC 61508	SFF		
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	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

FIT = Failure In Time = $1 \times 10^{-9}/h$

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 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



Liste des références / reference list
ATV 32 / ATV 320 Safety products references

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

Product reference list :

- **200 - 240V single phase and**
- **380-500 V Three phases**

Size	Range – 200 - 240V single-phase	Catalog Number ¹	Range – 380 - 500V three-phases	Catalog Number
1	0.18 kW	ATV32H018M2 ATV320U02M2B		
1	0.37 kW	ATV32H037M2 ATV320U04M2B	0.37 kW	ATV32H037N4 ATV320U04N4B
1	0.55 kW	ATV32H055M2 ATV320U06M2B	0.55 kW	ATV32H055N4 ATV320U06N4B
1	0.75 kW	ATV32H075M2 ATV320U07M2B	0.75 kW	ATV32H075N4 ATV320U07N4B
1	X	X	1.1 kW	ATV32HU11N4 ATV320U11N4B
1	X	X	1.5 kW	ATV32HU15N4 ATV320U15N4B
2	1.1 kW	ATV32HU11M2 ATV320U11M2B	2.2 kW	ATV32HU22N4 ATV320U22N4B
2	1.5 kW	ATV32HU15M2 ATV320U15M2B	3 kW	ATV32HU30N4 ATV320U30N4B
2	2.2 kW	ATV32HU22M2 ATV320U22M2B	4 kW	ATV32HU40N4 ATV320U40N4B
	X	X	X	X
	X	X	X	X
4	X	X	5.5 kW	ATV32HU55N4 ATV320U55N4B
4	X	X	7.5 kW	ATV32HU75N4 ATV320U75N4B
5	X	X	11 kW	ATV32HD11N4 ATV320D11N4B
5	X	X	15 kW	ATV32HD15N4 ATV320D15N4B

¹ All references may be followed by 1 to 3 character

Product reference list :

- **IP 65 (with WS references) and**
- **IP66 (with W references)**

Size	Range – 200 - 240V single-phase	Catalog Number	Range – 380 - 500V three-phases	Catalog Number
A1	0.18 kW	ATV320U02M2W ATV320U02M2WS	X	X
A1	0.37 kW	ATV320U04M2W ATV320U04M2WS	X	X
A1	0.55 kW	ATV320U06M2W ATV320U06M2WS	X	X
A1	0.75 kW	ATV320U07M2W ATV320U07M2WS	X	X
A2	X	X	0.37 kW	ATV320U04N4W ATV320U04N4WS
A2	X	X	0.55 kW	ATV320U06N4W ATV320U06N4WS
A2	X	X	0.75 kW	ATV320U07N4W ATV320U07N4WS
A2	X	X	1.1 kW	ATV320U11N4W ATV320U11N4WS
A2	X	X	1.5 kW	ATV320U15N4W ATV320U15N4WS
A3	1.1 kW	ATV320U11M2W ATV320U11M2WS	2.2 kW	ATV320U22N4W ATV320U22N4WS
A3	1.5 kW	ATV320U15M2W ATV320U15M2WS	3 kW	ATV320U30N4W ATV320U30N4WS
A3	2.2 kW	ATV320U22M2W ATV320U22M2WS	4 kW	ATV320U40N4W ATV320U40N4WS
B	X	X	5.5kW	ATV320U55N4W ATV320U55N4WS
B	X	X	7.5 kW	ATV320U75N4W ATV320U75N4WS

Nota: WS = With Vario

References may be followed by additional letters

Product reference list :

- 200 - 240V single phase and
- 380 - 500 V Three phases
- 525 - 600 V Three phases

Size	Range 200V-240V single-phase	Catalog number*	Range 200 - 240V three-phases	Catalog number*	Range 380 - 500V three-phases	Catalog number*	Range 525 - 600 V three-phases	Catalog number*
1C	0.18 kW	ATV320U02M2C	0.18 kW	ATV320U02M3C				
1C	0.37 kW	ATV320U04M2C	0.37 kW	ATV320U04M3C				
1C	0.55 kW	ATV320U06M2C	0.55 kW	ATV320U06M3C				
1C	0.75 kW	ATV320U07M2C	0.75 kW	ATV320U07M3C				
2C					0.37 kW	ATV320U04N4C		
2C					0.55 kW	ATV320U06N4C		
2C					0.75 kW	ATV320U07N4C	0.75 kW	ATV320U07S6C
2C	1.1 kW	ATV320U11M2C			1.1 kW	ATV320U11N4C		
2C	1.5 kW	ATV320U15M2C			1.5 kW	ATV320U15N4C	1.5 kW	ATV320U15S6C
2C	2.2 kW	ATV320U22M2C						
2F			1.1 kW	ATV320U11M3C				
2F			1.5 kW	ATV320U15M3C				
2F			2.2 kW	ATV320U22M3C				
3C					2.2 kW	ATV320U22N4C	2.2 kW	ATV320U22S6C
3C					3 kW	ATV320U30N4C		
3C					4 kW	ATV320U40N4C	4 kW	ATV320U40S6C
3F			3 kW	ATV320U30M3C				
3F			4 kW	ATV320U40M3C				
4C			5.5 kW	ATV320U55M3C	5.5 kW	ATV320U55N4C	5.5 kW	ATV320U55S6C
4C			7.5 kW	ATV320U75M3C	7.5 kW	ATV320U75N4C	7.5 kW	ATV320U75S6C
5C			11 kW	ATV320D11M3C	11 kW	ATV320D11N4C	11 kW	ATV320D11S6C
5C			15 kW	ATV320D15M3C	15 kW	ATV320D15N4C	15 kW	ATV320D15S6C

¹ All references may be followed by 1 to 3 character