

CURRENT SENSOR

PRODUCT SERIES: STB-LF5
STB-500LF5
PRODUCT PART NUMBER: STB-500LF5-A
STB-500LF5-B
STB-622LF5-S
VERSION: Ver 1.9



Sinomags Technology Co., Ltd.

Web site: www.sinomags.com

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1. Description

STB-LF5 series current sensors are based on close loop principle. The sensor can detect the current with DC, AC, pulse and irregular wave shape with current output.

Typical application

- Windmill inverters
- Test and measurement
- AC variable speed and servo motor drives
- Battery supplied applications
- Uninterruptible Power supplies (UPS)
- Switched Mode Power Supplies (SMPS)
- Power supplies for welding applications
- Static converts for DC motor drives

General parameters

Parameter	Symbol	Unit	Value
Sensor operating temperature	T_A	°C	STB-500LF5 : -40 ~ 85 STB-500LF5-A: -40 ~ 85 STB-500LF5-B: -40 ~ 85 STB-622LF5-S: -40 ~ 85
Storage temperature	T_S	°C	STB-500LF5 : -50 ~ 90 STB-500LF5-A: -50 ~ 90 STB-500LF5-B: -50 ~ 90 STB-622LF5-S: -50 ~ 90
Mass	m	g	STB-500LF5 : 240 STB-500LF5-A: 240 STB-500LF5-B: 240 STB-622LF5-S: 230

Absolute parameters

Parameters	Symbol	Unit	Value
Supply voltage (-40°C...85°C)	V_{CCmax}	V	± 25.2
Maximum primary conductor temperature	T_{Bmax}	°C	100
Maximum steady state primary current (-40°C...85°C)	I_{PNmax}	A	STB-500LF5 : 500 STB-500LF5-A: 500 STB-500LF5-B: 500 STB-622LF5-S: 622

Ratings

Parameter	Unit	Value
Primary involved potential	V AC/DC	STB-500LF5 : 600 STB-500LF5-A: 600 STB-500LF5-B: 600 STB-622LF5-S: 1700
Maximum surrounding air temperature	°C	85
Primary current	A	STB-500LF5 : 0...500 STB-500LF5-A: 0...500 STB-500LF5-B: 0...500

		STB-622LF5-S: 0...622
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Isolation parameters

Parameter	Symbol	Unit	Value	Remark
RMS voltage for AC test 50Hz/1 min	U_d	kV	STB-500LF5 :3.8 STB-500LF5-A:3 STB-500LF5-B:3 STB-622LF5-S:3	
Impulse withstand voltage 1.2/50μs	U_w	kV	STB-500LF5 :12.5 STB-500LF5-A:10.6 STB-500LF5-B:10.6 STB-622LF5-S:10.8	
Clearance distance (pri. -sec)	d_{CI}	mm	STB-500LF5 :14.6 STB-500LF5-A:12.2 STB-500LF5-B:12.2 STB-622LF5-S:12.25	Shortest distance through air
Creepage distance (pri. -sec)	d_{Cp}	mm	STB-500LF5 :15.6 STB-500LF5-A:18 STB-500LF5-B:18 STB-622LF5-S:13.3	Shortest path along device body
Case material	-	-	V0	According to UL 94
Comparative tracking index	CTI		STB-500LF5 : 600 STB-500LF5-A: 600 STB-500LF5-B: 600 STB-622LF5-S:175	

STB-622LF5-S Isolation parameters

According to EN 50178 and CEI 61010-1 standards and following conditions :

- Over voltage category OV 3
- Pollution degree PD2
- Non-uniform field

	EN 50178	IEC 61010-1
$d_{Cp}, d_{CI}, \hat{V}_w$	Rated isolation voltage	Nominal voltage
Single isolation	1250 V	Cat III 1250 V rms
Reinforced isolation	630 V	Cat III 630 V rms

2. STB-500LF5 Electrical parameters

Condition: $V_{CC} = \pm 14.25V \sim \pm 25.2V$, $T_A = 25^\circ C$, unless specified.

Parameters	Symbol	Unit	Min	Typ	Max	Remark
Primary nominal RMS current	I_{PN}	A			500	
Primary current measuring range	I_{PM}	A	-800		800	
Measuring resistance	R_M	Ω			70	@ $\pm 500A$ with $\pm 14.25V$
	R_M	Ω			18	@ $\pm 800A$ with $\pm 14.25V$
	R_M	Ω			95	@ $\pm 500A$ with $\pm 17.1V$
	R_M	Ω			35	@ $\pm 800A$ with $\pm 17.1V$
	R_M	Ω			155	@ $\pm 500A$ with $\pm 22.8V$
	R_M	Ω			70	@ $\pm 800A$ with $\pm 22.8V$
Secondary nominal RMS current	I_{SN}	A	-0.1		0.1	
Turns ratio	N_S	NT		5000		
Resistance of secondary winding	R_S	Ω			52.8	$T_A = 15^\circ C$
Supply voltage	V_{CC}	V	± 14.25		± 25.2	
Current consumption	I_{CC}	mA		$26 + I_S$ $39 + I_S$		$V_{CC} = \pm 15V$ $V_{CC} = \pm 25.2V$
Nominal sensitivity	S_N	mA/A		0.2		
Offset current, referred to primary	I_O	A	-1		1	
Offset current temperature drift, referred to primary	I_{OT}	A	-0.6		0.6	
Total error at I_{PN}	ε_{tot}	% of I_{PN}	-0.5		0.5	$25 \dots 70 \dots 85^\circ C$
			-0.6		0.6	$-40^\circ C \dots 85^\circ C$
Linearity error	ε_L	% of I_{PN}	-0.1		0.1	
RMS noise current referred to pri.	I_{no}	mA		90		1Hz to 20kHz
Reaction time @10% of I_{PN}	t_{ra}	μs			0.5	0 to 500A 200 A/us
Response time @90% of I_{PN}	t_r	μs			0.5	0 to 500A 200 A/us
Frequency bandwidth (-3dB)	BW	kHz		200		Small Signal bandwidth

3. STB-500LF5-A Electrical parameters

Condition: $V_{CC} = \pm 14.25V \sim \pm 25.2V$, $T_A = 25^\circ C$, unless specified.

Parameters	Symbol	Unit	Min	Typ	Max	Remark
Primary nominal RMS current	I_{PN}	A			500	
Primary current measuring range	I_{PM}	A	-800		800	
Measuring resistance	R_M	Ω	0		60	@ $\pm 500A$ with $\pm 15V$
	R_M	Ω	0		11	@ $\pm 800A$ with $\pm 15V$
	R_M	Ω	0		92	@ $\pm 500A$ with $\pm 18V$
	R_M	Ω	0		30	@ $\pm 800A$ with $\pm 18V$
	R_M	Ω	5		149	@ $\pm 500A$ with $\pm 24V$
	R_M	Ω	5		65	@ $\pm 800A$ with $\pm 24V$
Secondary nominal RMS current	I_{SN}	A	-0.1		0.1	
Turns ratio	N_S	NT		5000		
Resistance of secondary winding	R_S	Ω			52.8	$T_A = 25^\circ C$
Supply voltage	V_{CC}	V	± 15		± 24	$\pm 5\%$
Current consumption	I_{CC}	mA		$26 + I_S$ $39 + I_S$		$V_{CC} = \pm 15V$ $V_{CC} = \pm 25.2V$
Nominal sensitivity	S_N	mA/A		0.2		
Offset current	I_O	mA	-0.4		0.4	$I_P = 0$ $T_A = 25^\circ C$
Offset current temperature drift	I_{OT}	mA	-0.5	± 0.3	0.5	$-40^\circ C \sim 85^\circ C$
Total error at I_{PN}	ε_{tot}	% of I_{PN}	-0.6		0.6	$T_A = 25^\circ C$
Linearity error	ε_L	% of I_{PN}	-0.1		0.1	
Reaction time	t_{ra}	μs			1	10% of I_{PN}
Response time	t_r	μs			1	90% of I_{PN}
di/dt accurately followed	d_i/d_t	A/us	100			
Frequency bandwidth (-3dB)	BW	kHz		200		Small Signal bandwidth

4. STB-500LF5-B Electrical parameters

Condition: $V_{CC} = \pm 14.25V \sim \pm 25.2V$, $T_A = 25^\circ C$, unless specified.

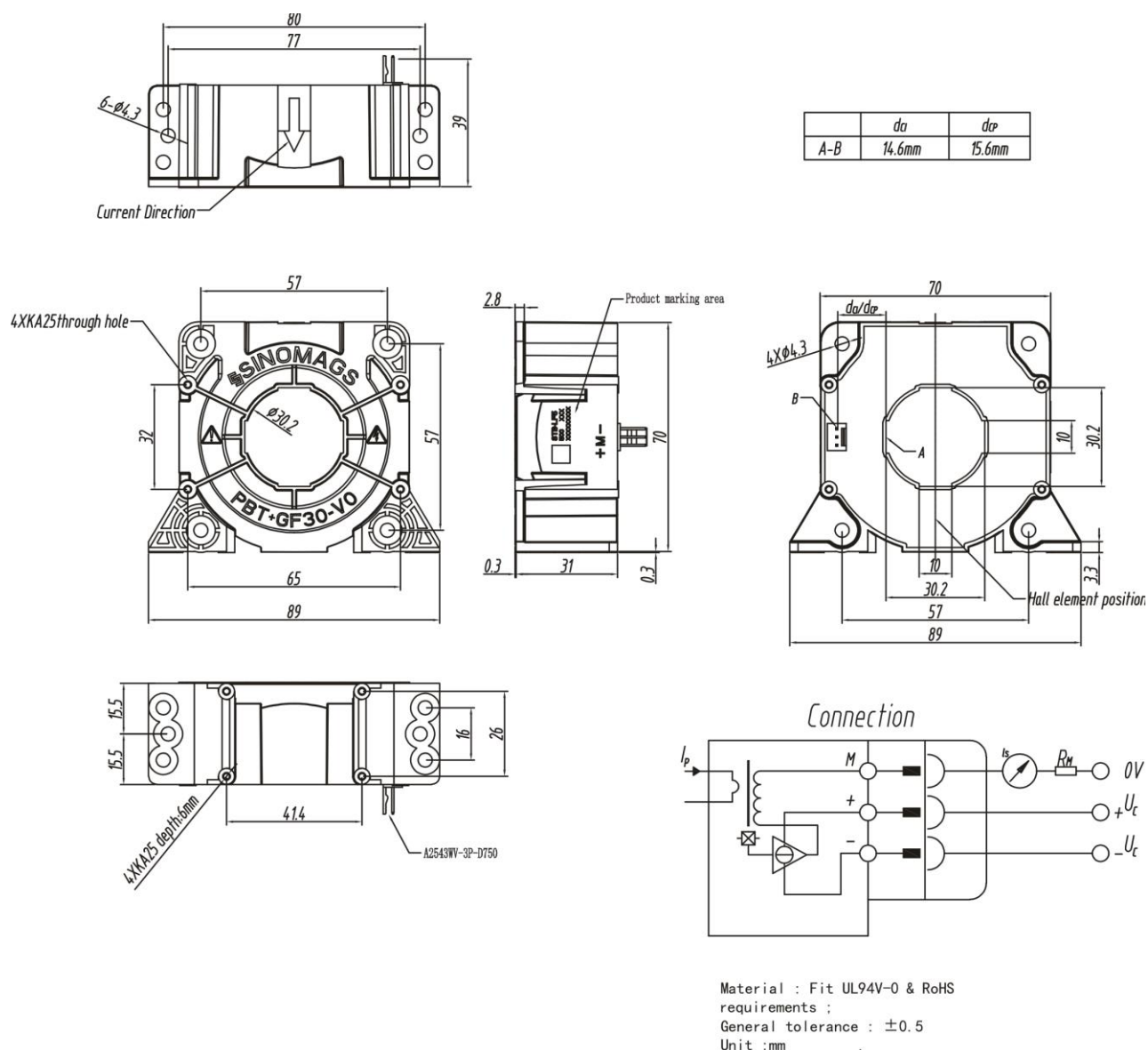
Parameters	Symbol	Unit	Min	Typ	Max	Remark
Primary nominal RMS current	I_{PN}	A			500	
Primary current measuring range	I_{PM}	A	-800		800	
Measuring resistance	R_M	Ω	0		60	@ $\pm 500A$ with $\pm 15V$
	R_M	Ω	0		11	@ $\pm 800A$ with $\pm 15V$
	R_M	Ω	0		92	@ $\pm 500A$ with $\pm 18V$
	R_M	Ω	0		30	@ $\pm 800A$ with $\pm 18V$
	R_M	Ω	5		149	@ $\pm 500A$ with $\pm 24V$
	R_M	Ω	5		65	@ $\pm 800A$ with $\pm 24V$
Secondary nominal RMS current	I_{SN}	mA	-100		100	
Turns ratio	N_S	NT		5000		
Resistance of secondary winding	R_S	Ω			52.8	$T_A = 25^\circ C$
Supply voltage	V_{CC}	V	± 15		± 24	$\pm 5\%$
Current consumption	I_{CC}	mA		$26 + I_S$ $39 + I_S$		$V_{CC} = \pm 15V$ $V_{CC} = \pm 25.2V$
Nominal sensitivity	S_N	mA/A		0.2		
Offset current	I_O	mA	-0.4		0.4	$I_P = 0$ $T_A = 25^\circ C$
Offset current temperature drift	I_{OT}	mA	-0.5	± 0.3	0.5	$-40^\circ C \sim 85^\circ C$
Total error at I_{PN}	ε_{tot}	% of I_{PN}	-0.6		0.6	$T_A = 25^\circ C$
Linearity error	ε_L	% of I_{PN}	-0.1		0.1	
Reaction time	t_{ra}	μs			1	10% of I_{PN}
Response time	t_r	μs			1	90% of I_{PN}
di/dt accurately followed	d_i/d_t	A/us	100			
Frequency bandwidth (-3dB)	BW	kHz		200		Small Signal bandwidth

5. STB-622LF5-S Electrical parameters

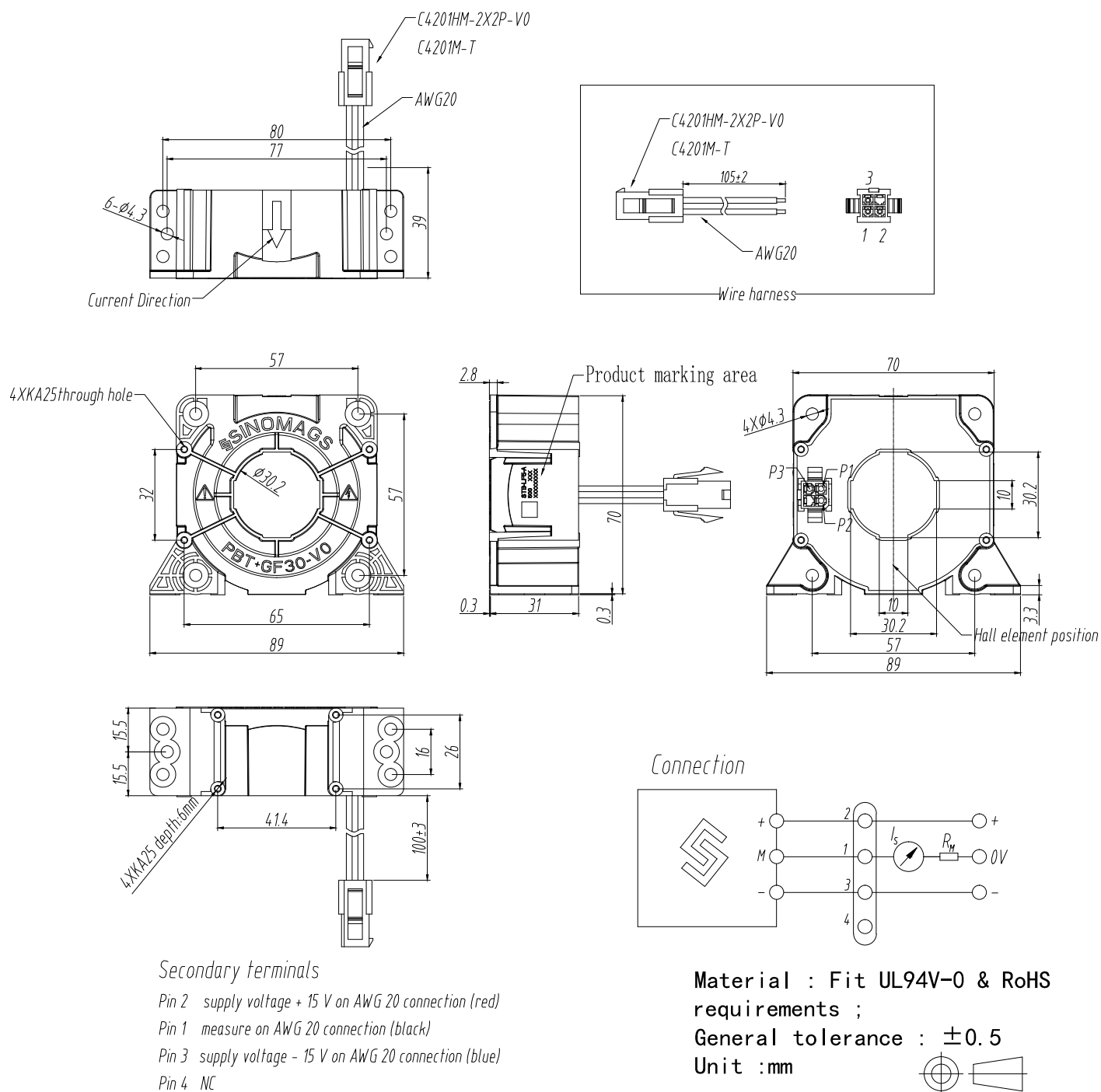
Condition: $V_{CC} = \pm 24V$, $T_A = 25^\circ C$, unless specified.

Parameters	Symbol	Unit	Min	Typ	Max	Remark
Primary nominal RMS current	I_{PN}	A		622		
Primary current measuring range	I_{PM}	A	-1700		1700	
Measuring resistance	R_M	Ω	2.5		115	@ $\pm 622A$ with $\pm 24V$
	R_M	Ω	2.5		60	@ $\pm 825A$ with $\pm 24V$
	R_M	Ω	2.5		5	@ $\pm 1700A$ with $\pm 24V$
Secondary nominal RMS current	I_{SN}	mA		155.5		
Turns ratio	N_S	NT		4000		
Resistance of secondary winding	R_S	Ω			43	@ $T_a = 70^\circ C$
Supply voltage	V_{CC}	V		± 24		
Current consumption	I_{CC}	mA		$33 + I_S$		@ $\pm 24V$
Offset current	I_O	mA			± 0.4	$I_p = 0 @ 25^\circ C$
Offset current temperature drift	I_{OT}	mA	± 0.3		± 0.6	$-40^\circ C \dots 85^\circ C$
Total error at I_{PN}	ε_{tot}	% of I_{PN}	-0.6		0.6	
Linearity error	ε_L	% of I_{PN}	-0.1		0.1	
di/dt accurately followed	di/dt	A/ μs		100		
Response time @ 90 % of I_{PN}	t_{ra}	μs			1	
Frequency bandwidth (-1dB)	BW	kHz		100		-3dB, small signal bandwidth

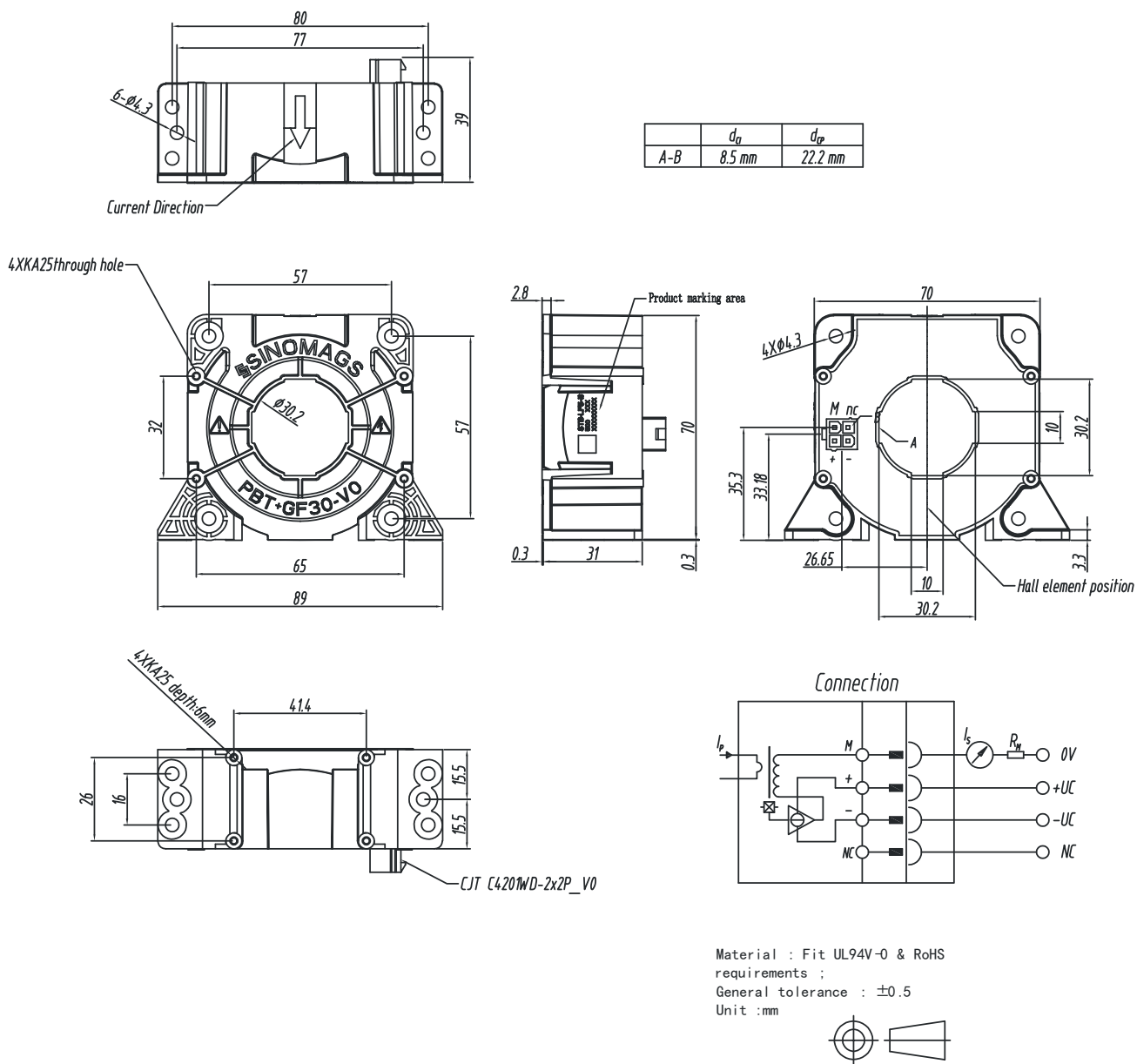
6. STB-500LF5 Dimensions



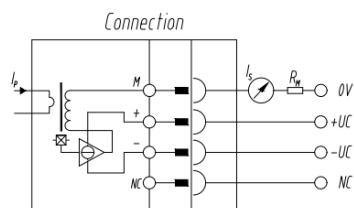
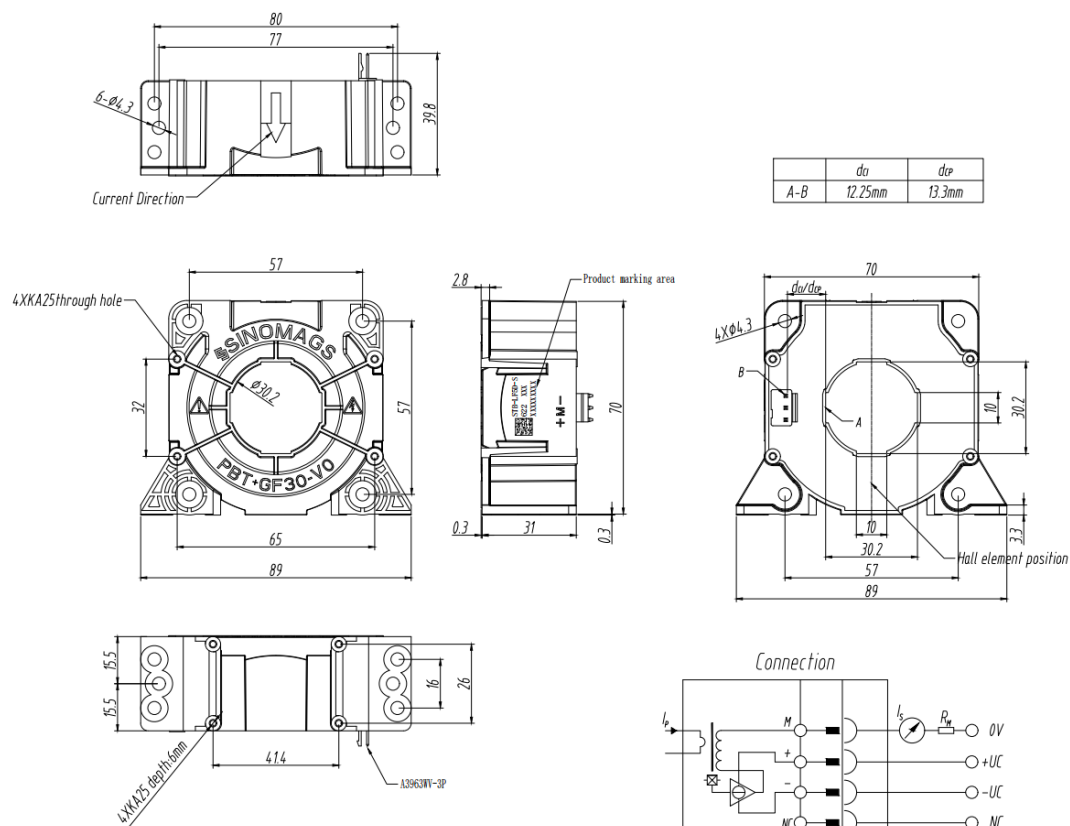
7. STB-500LF5-A Dimensions



8. STB-500LF5-B Dimension



9. STB-622LF5-S Dimension



Material : Fit UL94V-0 & RoHS
 requirements :
 General tolerance : ± 0.5
 Unit : mm



10. Mechanical characteristics

- General tolerance ± 0.5 mm
- Transducer fastening
 - Vertical position
 - 6 holes $\varnothing 4.3$ mm
 - 6 M4 steel screws
 - Recommended fastening torque 2.1 N·m($\pm 10\%$)
- Primary through-hole
 - $\varnothing 30$ mm
 - Or 30mm $\times$ 10mm
- Transducer fastening
 - Horizontal position
 - 4 holes $\varnothing 4.3$ mm
 - 4 M4 steel screws
- Connection of secondary
 - CJT A2543WV-3P-D750 (STB-500LF5)
 - CJT C420HM-2X2P-V0、C4201M-T(STB-500LF5-A)
 - CJT C4201WD-2x2P-V0 (STB-500LF5-B)
 - CJT A3963WV-3P (STB-622LF5-S)