

## SUMMARY OF TESTS

72129181

<b>Client</b>	Fanox Electronic S.L., Derio, Spain	
<b>Manufacturer</b>	Fanox Electronic S.L., Derio, Spain	
<b>Object tested</b>	Self + Auxiliary Powered OverCurrent and Earth Fault Protection Relay	
	Type	SIAB 110FC032AC
	Power supply voltage range	24 to 230 Vdc / Vac
	Mechanical class	1
	EMC emission class	A
	EMC immunity zone	A
	Ambient operating temperature range	-40 to 70 °C
<b>Date of tests</b>	20 November to 15 December 2018	
<b>Tested by</b>	DNV GL Netherlands B.V., Arnhem, The Netherlands	
<b>Tests were carried out by</b>	Marcel van Anholt Mihai Bivolaru	DNV GL Netherlands B.V., Arnhem, the Netherlands
<b>Test programme</b>	The tests programme can be found in Appendix A.	
<b>Summary and conclusion</b>	The results obtained relate only to the work ordered and the material tested.	

This Summary of Tests shall not be considered as a final assessment of performance of the test object. The final test reports are issued with report numbers 1754-18 and 1761-18.

## Appendix A Test programme

no.	test / measurement	test standard	clause	Level	Port	Result
1	Product safety requirements					
1.1	Impulse voltage	IEC 60255-27	10.6.4.2	5 kV 1 kV	A, B, C D, E, F	Pass
1.2	Dielectric voltage	IEC 60255-27	10.6.4.3	2 kV 0,5 kV	A, B, C D, E, F	Pass
1.3	Insulation resistance	IEC 60255-27	10.6.4.4	500 V <sub>DC</sub>	A, B, C D, E, F	Pass

2	Electromagnetic compatibility (EMC) tests					
2.1	Emission					
2.1.1	Radiated emission	IEC 60255-26 CISPR11 CISPR22	table 1 table 6 table 7	class A class A	H H	Pass
2.1.2	Conducted emission	IEC 60255-26 CISPR22	table 2 table 2/4	class A	A, D, E	Pass
2.2	Immunity					
2.2.1	Slow damped oscillatory wave (1 MHz)	IEC 60255-26 (IEC 61000-4-18)	7.2.6	2,5 kV CM 1,0 kV DM 1 kV CM 0 kV DM	A, B, C, F A, B, C, F D, E D, E	Pass
2.2.2	Electrostatic discharges	IEC 60255-26 (IEC 61000-4-2)	7.2.3	6 kV cont. 8 kV air	H	Pass
2.2.3	Radiated radio frequency magnetic field	IEC 60255-26 (IEC 61000-4-3)	7.2.4	80 - 1000 MHz 10 V/m 1,4 – 2,7 GHz 10 V/m 80, 160, 380, 450, 900, 1850, 2150 MHz 10 V/m	H  H  H	Pass
2.2.4	Fast transient/burst	IEC 60255-26 (IEC 61000-4-4)	7.2.5	<input checked="" type="checkbox"/> Zone A 4 kV CM 2 kV CM <input type="checkbox"/> Zone B 2 kV CM 1 kV CM	A, B, C, F, G D, E A, B, C, F, G D, E	Pass
2.2.5	Surge	IEC 60255-26 (IEC 61000-4-5)	7.2.7	<input checked="" type="checkbox"/> Zone A to 4 kV LE to 2 kV LL <input type="checkbox"/> Zone B to 2 kV LE to 1 kV LL	A, B, C, D, E, F A, B, C, F A, B, C, D, E, F A, B, C, F	Pass

2.2.6	Conducted disturbance induced by RF fields	IEC 60255-26 (IEC 61000-4-6)	7.2.8	0,15 - 80 MHz 10 V 27, 68 MHz 10 V	A, B, C, D, E , F, G A, B, C, D, E , F, G	Pass
2.2.7	Power frequency voltage (50 Hz)	IEC 60255-26 (IEC 61000-4-16)	7.2.9	<input checked="" type="checkbox"/> Zone A 150 V DM 300 V CM <input type="checkbox"/> Zone B 100 V DM 300 V CM	C (inputs only)  C (inputs only)	Pass
2.2.8	Power frequency H-field (50 Hz)	IEC 60255-26 (IEC 61000-4-8)	7.2.10	30 A/m cont. 300 A/m 1-3 s	H H	Pass
2.2.9	D.C. voltage dips	IEC 60255-26 (IEC 61000-4-29)	7.2.11	100%; 10 – 1000 ms 60%; 200 ms 30%; 500 ms	A  A A	Pass
2.2.10	A.C. voltage dips	IEC 60255-26 (IEC 61000-4-11)	7.2.11	100%; 0,5 – 25 c. 60%; 10/12 c. 30%; 25/30 c.	A  A A	Pass
2.2.11	D.C. voltage interruptions	IEC 60255-26 (IEC 61000-4-29)	7.2.11	100%; 5 s	A	Pass
2.2.12	A.C. voltage interruptions	IEC 60255-26 (IEC 61000-4-11)	7.2.11	100%; 250/300 c	A	Pass
2.2.13	D.C. ripple	IEC 60255-26 (IEC 61000-4-17)	7.2.12	15% Ur_dc 100/120 Hz	A	Pass
2.2.14	D.C. gradual shut-down / start-up	IEC 60255-26	7.2.13	Shut d. ramp 60 s 5 min off St up ramp 60s	A	Pass
2.2.15	Damped oscillatory magnetic field (100 kHz and 1 MHz)	Customer's instructions (IEC 61000-4-10)		100 A/m (peak)	G	Pass
2.2.16	Pulse magnetic field	Customer's instructions (IEC 61000-4-9)		1000 A/m	G	Pass

3 Climatic environmental conditions						
3.1	Dry heat operational	IEC 60255-1 (IEC 60068-2-2, test Bd)	6.12.3.1	+70°C; 72 h	H	Pass
3.2	Cold operational	IEC 60255-1 (IEC 60068-2-1, test Ad)	6.12.3.2	-40°C; 72 h	H	Pass
3.3	Dry heat storage	IEC 60255-1 (IEC 60068-2-2, test Bb)	6.12.3.3	+80°C; 72 h	H	Pass

3.4	Cold storage	IEC 60255-1 (IEC 60068-2-1, test Ab)	6.12.3.4	-40°C; 72 h	H	Pass
3.5	Change of temperature	IEC 60255-1 (IEC 60068-2-14, test Nb)	6.12.3.5	-40°C; +70°C 3 hours; 5 cycles	H	Pass
3.6	Damp heat, steady state	IEC 60255-1 (IEC 60068-2-78, test Cab)	6.12.3.6	+40°C; 93% 10 days	H	Pass
3.7	Damp heat, cyclic	IEC 60255-1 (IEC 60068-2-30, test Db)	6.12.3.7	+25°C; 40°C 97%; 93% 6 cycles	H	Pass

4 Mechanical environmental conditions						
4.1	Vibration response	IEC 60255-1 (IEC 60255-21-1)	6.13.1	class 1	H	Pass
4.2	Vibration endurance	IEC 60255-1 (IEC 60255-21-1)	6.13.1	class 1	H	Pass
4.3	Shock response	IEC 60255-1 (IEC 60255-21-2)	6.13.2	class 1	H	Pass
4.4	Shock withstand	IEC 60255-1 (IEC 60255-21-2)	6.13.2	class 1	H	Pass
4.5	Bump	IEC 60255-1 (IEC 60255-21-2)	6.13.2	class 1	H	Pass
4.6	Seismic (single axis sweep)	IEC 60255-1 (IEC 60255-21-3)	6.13.3	class 1	H	Pass

### Ports

A	Auxiliary power supply input/output
B	Analogue input / output ports (e.g. CT, VT inputs)
C	Digital input / output ports (e.g. opto coupler inputs, relay contacts)
D	Process bus communication ports (e.g. pilot communication, IEC 61850-9-2LE)
E	Station bus communication ports (e.g. IEC 60870-5 protocols)
F	Time synchronization, if applicable (e.g. IRIGB, 1PPS)
G	Ground / earth
H	Housing