

SORAA

Electrical compatibility – AR111 & PAR36 6W 12V lamps – North America

Table of contents

- General compatibility guidelines.....Page 2
- Transformer compatibility.....Page 3-5
- Dimming compatibility.....Page 6-8
 - 120V Dimmer compatibility (Electronic).....Page 6
 - 277V and 0-10V Dimmer compatibility (Electronic).....Page 7

Scope

This document provides the basic guidelines regards electrical compatibility of SORAA 12V AR111 & PAR36 6W lamps and compatibility tables for transformers and dimmers.

Transformer Compatibility

SORAA 12V AR111 & PAR36 lamps are made to work with 12V AC magnetic (MLV) and electronic (ELV) transformers and 12V DC transformers. Transformer compatibility tables are on pages 3-5. If multiple lamps are installed on one transformer, they need to be connected in parallel. They cannot be installed in series.

- 12V AC Magnetic transformers and 12V DC transformers are in general compatible.
- 12V AC Electronic transformers generally have a minimum load, and SORAA recommends using only transformers that have been tested and found compatible. In general we recommend to use transformers with very little or no minimum load (0W). If your transformer is not in the compatibility tables below, it does not mean it is incompatible, but it means that we have not tested it to date, please contact techsupport@soraa.com for guidance.

For transformer-lamp compatibility, Soraa only tests up to 5 transformers per circuit. Consult Soraa, controls provider and transformer manufacturer for latest compatibility when installing 5 or more fixtures per circuit. Lamp performance may vary based on field conditions, including but not limited to THD, shared neutral wires, power-quality. Whenever possible, test lamps in-situ to verify satisfactory performance.

Dimmer Compatibility

SORAA 12V AR111 & PAR36 lamps are made to work with trailing edge (reverse phase) and leading edge (forward phase) phase cut dimmers.

Electronic dimmable transformers need trailing edge dimmers, while Magnetic transformers need leading edge dimmers. On the dimmer compatibility tables, the percentages for each transformer/dimmer combination are the percentage of measured light output that we were able to dim down to without seeing any problems like flicker/shimmer. Anything 30% or above is considered not compatible and you will see a “NC” in a grey cell. There might be a minimum wattage load on the transformer/dimmer. If this minimum load is not met, there might be compatibility issues.

Maximum number of lamps on a dimmer/transformer

The following need to be considered when determining the amount of lamps on a dimmer/transformer.

1. SORAA tests have been carried out with 1 lamp unless stated otherwise.
2. There is a repetitive, very brief current spike the LED lamp will see twice per cycle. This current spike has to be provided by the transformer and/or dimmer, and will affect the recommended lamp load on each transformer or dimmer.
3. Ultimately the transformer/dimmer manufacturer is the only one with authority to rate their product, but SORAA can give an Engineering estimate.
4. For transformers, we recommend to use a 1.4 de-rating factor:
For example for a 50W transformer it would mean $50/1.4=35W$ of LED, so an estimated maximum of 5 lamps 6W.
5. For dimmers, we recommend to use a 2.0 de-rating factor for leading edge dimmers with magnetic transformers; and a 4.0 de-rating factor for trailing edge dimmers driving Low Voltage lamps on electronic transformers.

For example for a 500W leading edge dimmer it would mean $500/2=250W$ of LED, so an estimated maximum of 41 lamps 6W.

For example for a 400W trailing edge dimmer it would mean $400/4=100W$ of LED, so an estimated maximum of 16 lamps 6W.

Distance between transformer and lamp(s)

- 12V AC Magnetic transformers and 12V DC transformers do not have a limitation regards the maximum length of the wires between transformer and lamp. Only the voltage drop has to be taken into account (losses because of the inner resistance of the conductors).
- 12V AC Electronic transformers have a limitation in the length of the wires between transformer and lamp(s). This length is usually stated by the transformer manufacturer on its specs or on the transformer itself, and generally it is limited to 2 meters (6 feet).

Disclaimer

Compatibility tests are conducted by Soraa only as guidance for the user. All tests are conducted under bench conditions; results may differ from test results depending on conditions at the application site. Results may vary due to variability in component choices and manufacturing processes by the transformer and dimmer manufacturers. For more information on the dimmers/transformers, please find specs on the manufacturer's website.

SORAA AR111 12V 6W - TRANSFORMER COMPATIBILITY - North America

PASS - The transformer supports one or more lamps up to the maximum wattage;

NC - SORAA does not recommend this transformer for use with its lamps;

Brand	Model	Wattage	Voltage (Vac)	Transformer Type	Use Condition for 1 Lamp	
					Free Air or Open Fixture	Enclosed Fixture
North America						
B+L	CV90001 (CV-10/75-12)	10-75	120	Electronic	Pass	Pass
B+L	FX95100	0-75	120	Electronic	Pass	Pass
B+L	MS90119	35-75	120	Electronic	Pass	Pass
B+L	LS94117	75	120	Electronic	NC	NC
Hatch	RS12-60M	60	120	Electronic	Pass	NC
Hatch	RS12-60M-LED	60	120	Electronic	Pass	Pass
Hatch	RL12-60M-LED (*)	60	120	Electronic	Pass	Pass
Hatch	RS12-60M-LED-277	60	277	Electronic	Pass	Pass
Hatch	RS12-80M	80	120	Electronic	NC	NC
Hatch, Juno	Hatch VS12-60W (any suffix)	60	120	Electronic	NC	NC
Hatch, Juno	Hatch VS12-75W (any suffix)	75	120	Electronic	Pass	NC
Lightech	LET-60, LET 60 BF	75	120	Electronic	NC	NC
Lightech, Cooper RSA	Lightech LET-75, (RSA RT-75L)	75	120	Electronic	Pass	NC
Lightech, Cooper RSA	Lightech LET-105W, (RSA RT-105)	105	120	Electronic	Pass	Pass
LTF	TA60WA12LED-0000	60	120	Electronic	Pass	Pass
PONY	PET-120-12-75	75	120	Electronic	Pass	Pass
TOPSTAR	SL-728	150	120	Electronic	NC	NC
Basler Electric	MI-5481E	50	120	Magnetic	Pass	Pass
Cooper	TF149911-TP120XFMR	50	120	Magnetic	Pass	Pass
Cooper	TF-149911	50	120	Magnetic	Pass	Pass
Hammond Manufacturing	166Q12	75	120	Magnetic	Pass	Pass

SORAA AR111 12V 6W - TRANSFORMER COMPATIBILITY - North America

PASS - The transformer supports one or more lamps up to the maximum wattage;

NC - SORAA does not recommend this transformer for use with its lamps;

Brand	Model	Wattage	Voltage (Vac)	Transformer Type	Use Condition for 1 Lamp	
					Free Air or Open Fixture	Enclosed Fixture
North America						
Hatch	1250(E, EN, ENT)	50	120	magnetic	Pass	Pass
Hatch	1275(E, EN, ENT)	75	120	magnetic	Pass	Pass
Iris	TFA-311T	50	120	Magnetic	Pass	Pass
Iris	TFA-212	75	120	Magnetic	Pass	Pass
Iris	TFA-3TR	50	120	Magnetic	Pass	Pass
Iris	TFA-400	75	120	Magnetic	Pass	Pass
Iris	TFA-51T	75	120	Magnetic	Pass	Pass
Juno	310-1333	300	120	Magnetic	Pass	Pass
LINEA	701970	300	120	Magnetic	Pass	Pass
Orientronic	DLR1250BN	50	120	Magnetic	Pass	Pass
Philips	Removed from Fixture	50	120	Magnetic	Pass	Pass
Q-TRAN	QT-50-75CK-PT-RC	50-75	120	Magnetic	Pass	Pass
Q-TRAN	QT50SV-120/12-RC	50	120	Magnetic	Pass	Pass
Q-TRAN	QT20-120/12-TP-RC	20	120	Magnetic	Pass	Pass
Q-TRAN	QT10-120/12-TP-RC	10	120	Magnetic	Pass	Pass
Q-TRAN	Q6S-DC-120-12 (Rectified)	60	120	Magnetic	Pass	Pass
Q-TRAN	QTM60-DC+CAP (Rectifier + Filtered)	60	120	Magnetic	Pass	Pass
Q-TRAN	QT50-75CK-PT-277-RC	75	277	Magnetic	Pass	Pass

SORAA AR111 & PAR36 12V 6W - TRANSFORMER COMPATIBILITY - North America

Transformer compatibility Notes:

- Compatibility tests are conducted by Soraa only as guidance for the user
- All tests are conducted under bench conditions; results may differ from test results depending on conditions at the application site
- Results may vary due to variability in component choices and manufacturing processes by the transformer manufacturer
- Soraa recommends to keep the number of ELV transformers on the same circuit as low as possible, and also the cable length from line breaker to each transformer as short as possible in order to avoid problems with THD coming from some ELV transformers. For more details, please contact the transformer manufacturers.
- If the transformer's minimum wattage is not met, the lamp may only operate under nominal conditions (nominal line voltage and thermal conditions where the lamp is at full power).
- If the fixture/transformer is not listed as tested, please consult with Soraa first before making any recommendations to end customer.
- Above table is for applications where no dimmer is used. If a dimmer is used, the user should consult the Dimmer/Transformer table, or contact Soraa if their desired combination is not listed.
- Transformer maximum load should not be exceeded. Please follow transformer/dimmer manufacturer's guidelines regarding maximum load with LED lamps. To calculate the estimated maximum number of lamps, please download our calculator from the following link:
<https://res.cloudinary.com/soraa/raw/upload/v1452276139/content/max-lamp-load-calculator.xlsx>
Or following the guidelines stated on page 2 of this document.
- (*) This transformer added to the compatibility list as of this Revision

SORAA AR111 12V 6W - DIMMER/TRANSFORMER (ELECTRONIC) COMPATIBILITY - North America

Transformer	Dimmer -->		Crestron DIN-1DIMU4	Lutron Caseta PD-5NE-XX	Lutron Diva DVELV-300P	Lutron Grafik Eye QS QSGR+PHPM	Lutron SPSELV-600	Lutron Maestro MAELV- 600	Lutron Nova T NTELV-300	Lutron Skyark SELV-300P	Lutron LP-RPM-4A-120	Lutron Radio RA2 RRD- 6NA-WH.600W	Lutron CTELV-303P	Lutron FAELV-500M	Lutron VTELV-600M-B	Marlin Stellar RMS 4
B+L	FX95100	Electronic					17%	17%	18%	12%			10%	17%		
Hatch	RS12-60M	Electronic			11%		30%	NC	18%	13%		NC			28%	
Hatch	RL12-60M-LED (*)	Electronic	5%	13%	7%	4%				7%	7%	6%				9%
Hatch	RS12-60M-LED	Electronic					13%	13%	14%	6%			5%	13%		
Hatch	RS12-105	Electronic					14%	14%	13%	11%			13%	14%		
Hatch	VS12-75WD	Electronic					15%	15%	15%	9%			7%	15%		
Lightech	LET 75	Electronic			10%		16%	16%	16%	11%		NC			26%	
Lightech	LET 105	Electronic					11%	11%	12%	6%			6%	11%		
Lightech	LET 151 R	Electronic					15%	13%	14%	7%			8%	11%		
LTF	TA60WA12LED-0000	Electronic					13%	13%	14%	8%			6%	13%		
WAC	EN-12100-R-AR	Electronic						NC		7%			NC			

SORAA AR111 & PAR36 12V 6W – 277V ELV and 0-10V DIMMER/TRANSFORMER COMPATIBILITY - North America

Dimmer (277V) → Transformer (277V) ↓			Leviton Rencor II AWSMT-EA (TE)
North America			
Hatch	RS12-60M-LED-277	Electronic	9%

Transformer manufacturer		Transformer type	Number of Lamps per transformer	Dimmer →	Diva DVTV 0-10V
				Dimming Mode →	0-10V
Fulham (*)	T1M1UNV0 12V-20L	DC - PWM	1		7%
Fulham (*)	T1M1UNV0 12V-60L	DC - PWM	1		7%

SORAA AR111 & PAR36 12V 6W - DIMMER/TRANSFORMER COMPATIBILITY - North America

Dimming compatibility Notes:

- Compatibility tests are conducted by Soraa (unless stated otherwise) under bench conditions as guidance for the user; results at the application site may differ due to variability in usage conditions or in dimmer or transformer components/manufacturing.
- Regards compatibility tests conducted by dimmer manufacturer, please contact the manufacturer for more details and/or reports.
- If the transformer's minimum wattage is not met, the lamp may only operate under nominal conditions (nominal line voltage and thermal conditions where the lamp is at full power).
- The lamp load (or number of lamps) should meet minimum load requirement of respective dimmer.
- If the dimmer and transformer is not listed, please consult with Soraa before making recommendations to the end customer.
- Transformer/dimmer maximum load should not be exceeded. Please follow transformer/dimmer manufacturer's guidelines regarding maximum load with LED lamps. To calculate the estimated maximum number of lamps, please download our calculator from the following link:
<https://res.cloudinary.com/soraa/raw/upload/v1452276139/content/max-lamp-load-calculator.xlsx>
Or following the guidelines stated on page 2 of this document.
- (*) One or more test results with this transformer added to the compatibility list as of this Revision