SORAA

Electrical compatibility – Warm Dim AR111 12V lamps – North America

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Scope

This document provides the basic guidelines regards electrical compatibility of SORAA 12V AR111 Warm Dim lamps and compatibility tables for transformers and dimmers.

Transformer Compatibility

SORAA 12V AR111 lamps are made to work with 12V AC magnetic (MLV) and electronic (ELV) transformers and 12V DC transformers. Transformer compatibility tables are on this document. 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@ecosenselighting.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 lamps are made to work with both reverse and forward phase dimmers.
Electronic dimmable transformers need ELV rated, reverse phase dimmers, while Magnetic transformers need MLV rated forward phase dimmers.
On the dimmer compatibility, 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 1 lamp 18.5W.
5. For dimmers, we recommend to use a 2.0 de-rating factor for MLV dimmers with magnetic transformers; and a 4.0 de-rating factor for ELV dimmers driving Low Voltage lamps on electronic transformers.
   For example for a 500W MLV dimmer it would mean 500/2=250W of LED, so an estimated maximum of 13 lamps 18.5W.
   For example for a 400W reverse phase dimmer it would mean 400/4=100W of LED, so an estimated maximum of 5 lamps 18.5W.

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 WARM DIM AR111 12V - TRANSFORMER COMPATIBILITY LIST - 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;
2 Lamp Min - The transformer supports two or more lamps upto the maximum lamp wattage limit;
3 Lamp Min - The transformer supports three or more lamps upto the maximum lamp wattage limit

Trnaformer Brand	Transformer Model	Wattage (W)	Input Voltage (Vac)	Transformer Type	Compatibility with 1pc 19W lamp	Maximum nr of lamps per transformer
Ambiance	9454-12	60	120	ELV	PASS	2
B+L	CV90010	10-105	120	ELV	PASS	4
B+L	CV90012	10-150	120	ELV	PASS	6
B+L	CV90021	10-200	120	ELV	PASS	8
B+L	FX95100	0-75	120	ELV	PASS	2
B+L	FX95100 / RFI	0-75	120	ELV	PASS	2
B+L	LS94117	75	120	ELV	2 lamp min	2
B+L	MS90119	35-75	120	ELV	PASS	2
ELG	250EL7512	75	120	ELV	PASS	3
Fulham	T1M1UNV012V-60L	60	120-277	DC	NC	NC
Hatch	RL12-75A-EPL	75	120	ELV	PASS	2
Hatch	RS1215BFLED	15	120	ELV	NC	NC
Hatch	RS12-150	150	120	ELV	PASS	6
Hatch	RS12-300	300	120	ELV	PASS	11
Hatch	RS12-60(AS)	60	120	ELV	PASS	2
Hatch	RS12-15M-LED	15	120	ELV	NC	NC
Hatch	RS12-30M-LED	30	120	ELV	PASS	1
Hatch	RS12-60M-LED	60	120	ELV	PASS	2
Hatch	RL12-60M-LED	60	120	ELV	PASS	2
Hatch	RS12-80(AS)	80	120	ELV	NC	NC
Hatch	VS12-60W	60	120	ELV	PASS	2
Hatch	VS12-105	105	120	ELV	PASS	4
LighTech	LET-60, LET-60 BF	60	120	ELV	PASS	2
LighTech	LET60-LW	60	120	ELV	PASS	2
LighTech	LET-75-120	75	120	ELV	PASS	3
LighTech	LET-105	105	120	ELV	PASS	4
LighTech	LET-151 R	150	120	ELV	PASS	5
LighTech	LET-303-12	300	120	ELV	PASS	11
LTF	TA15WA12LEDB15	15	120	ELV	NC	NC
LTF	TA60WA12LED	60	120	ELV	PASS	2
LTF	TA75WA12	75	120	ELV	PASS	3
LTF	TA105WA12LED	105	120	ELV	PASS	4
LTF	TA300WDS12LEDRE	300	120	DC	PASS	10
Meanwell	LPV-20-12	20	120	DC	NC	NC

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3 Lamp Min - The transformer supports three or more lamps upto the maximum lamp wattage limit

Trnaformer Brand	Transformer Model	Wattage (W)	Input Voltage (Vac)	Transformer Type	Compatibility with 1pc 19W lamp	Maximum nr of lamps per transformer
MDL Corp	316-0002	150	120	ELV	PASS	6
PONY	PET-120-12-75	75	120	ELV	PASS	3
PowerSelect Inc	Model PS20D75S	75	120	ELV	PASS	3
WAC	EN-12100-R-AR	100	120	ELV	PASS	3
WAC	EN-1260-R2	60	120	ELV	PASS	2
WAC	EN-1275-R-AR	75	120	ELV	3 lamp min	3
Basler electronic	MI-5481E	50	120	MLV	PASS	1
Cooper	T50W120VSL	50	120	MLV	PASS	1
Cooper	TF-149911	50	120	MLV	PASS	1
Cooper	TF149911-TP120	50	120	MLV	PASS	1
Cooper	TFA4120	50	120	MLV	PASS	1
Hammond Mfg	166Q12	75	120	MLV	PASS	2
Hatch	LT12-75-JIG-1	75	120	MLV	PASS	2
Hatch	RL12-50(E, EN, ENT)	50	120	MLV	PASS	1
Hatch	RL12-75(E, EN, ENT)	75	120	MLV	PASS	2
Iris	TFT-212	75	120	MLV	PASS	2
Iris	TFA-311T	50	120	MLV	PASS	1
Iris	TFA-3TR	50	120	MLV	PASS	1
Iris	TFA-400	75	120	MLV	PASS	2
Iris	TFA-51T	75	120	MLV	PASS	2
Juno	310-1333	300	120	MLV	PASS	11
MDL Corp	315-0071A-IRIS RPN3MR Fixt Dim Tab	50	120	MLV	PASS	1
MDL Corp	315-0071A-IRIS RPN3MR Fixt Norm Tab	50	120	MLV	PASS	1
MDL Corp	315-0126-12.3V	50	120	MLV	PASS	1
MDL Corp	315-0005-1	150	120	MLV	PASS	5
LINEA	701970	300	120	MLV	PASS	11
Orientronic	DLR1250BN	50	120	MLV	PASS	1
Orientronic	DLR1250BN	50	120 & 277	MLV	PASS	1
Q-Tran	QT50-75CK-PT-RC	50	120	MLV	PASS	1
Q-Tran	QT50SV-120/12-RC	50	120	MLV	PASS	1
Q-Tran	QTMS-300MV	300	120	MLV	PASS	11
Q-Tran	QSET-300-120/12	300	120	MLV	PASS	11

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Trnaformer Brand	Transformer Model	Wattage (W)	Input Voltage (Vac)	Transformer Type	Compatibility with 1pc 19W lamp	Maximum nr of lamps per transformer
Hatch	LT12-75-JIG-2	75	277	MLV	PASS	2
Hatch	RL12-75-ABF-277 (*1) (*2)	60	277	ELV	NC	NC
Hatch	RS12-105-277 (*1) (*2)	105	277	ELV	NC	NC
Hatch	RS12-80-277 (*1) (*2)	80	277	ELV	NC	NC
Hatch	RS12-60M-LED-277 (*1)	60	277	ELV	PASS	2
Lightech	LET75 277 R (*1)	75	277	ELV	PASS	2
Q-Tran	QT50-75CK-PT-277-RC	50	277	MLV	PASS	1

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
- 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.
- 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 WARM DIM AR111 12V - DIMMING COMPATIBILITY LIST - ELV - North America

Transformer manufacturer ↓	Transformer model ↓	Transf. type ↓	← Number of lamps per transformer	Dimmer →	Creston DIN-1DIMU4	Lutron Caseta PD-5NE	Lutron Diva DVELV-300	Lutron Grafik Eye QS + ELV Interface PHPM	Lutron Radio RA2 RRD-6NA	Lutron Remote Power Modules HW / LP-RPM-4A-120	Lutron Skylark SELV-300	Marlin Stellar RMS 4
				Dimming phase →	Reverse	Reverse	Reverse	Reverse	Reverse	Reverse	Reverse	Reverse
Hatch	RS12-60M-LED	ELV	1		10%	10%	6%	8%	8%	7%	6%	10%
Lightech	LET60, LET60-BF	ELV	1		4%	6%	4%	2%	8%	5%	4%	5%

SORAA WARM DIM AR111 12V - DIMMING COMPATIBILITY LIST - MLV - North America

Transformer manufacturer ↓	Transformer model ↓	Transf. type ↓	← Number of lamps per transformer	Dimmer →	Creston DIN-1DIMU4	Lutron Caseta PD-5NE	Lutron Grafik Eye QS QSGRJ-3P	Lutron Radio RA2 RRD-6NA	Lutron Remote Power Modules HW/LP-RPM-4A-120	Lutron Remote Power Modules HW/LP-RPM-4U-120	Marlin Stellar RMS 4
				Dimming phase →	Forward	Forward	Forward	Forward	Forward	Forward	Forward
Q-Tran	QT50SV-120/12-RC	MLV	1		10%	7%	NC	5%	NC	5%	10%

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 or Soraa 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