

# LIGHTSAVE SPECIFICATIONS

## STATIC FLUORESCENT DIMMER

**equipment  
description**

**Lightsave 2000B, Static Fluorescent Dimmer System**

Supply and install Energy Conservation Systems LightSave LSA 2000B equipment for control of lighting as detailed on the drawings. Each separate LightSave LSA 2000B unit shall provide a 15% maximum reduction in luminaire light output and reduce power consumed (kw) in the lighting sub-circuit by 30 %. LightSave LSA 2000B equipment shall operate connected luminaire at full power for an initial start up period of 5 minutes to facilitate striking of the lamp and stabilisation of light levels.

LightSave LSA 2000B equipment shall be Fail Save in operation and shall not generate harmonic distortion. The unit shall have no detrimental effect on fluorescent lamp efficiency and must be capable of automatically increasing the power factor of a controlled fluorescent load to 0.97 lagging when standard ballasts and capacitors luminaire auxiliaries are used.

The unit shall not at any time produce a leading power factor to the controlled fluorescent load. LightSave LSA 2000B equipment shall be installed in the switched line of the controlled load. LightSave LSA 2000B equipment shall be designed and manufactured to ISO 9001 or AS 3901 standard. LightSave equipment shall have C-tick label.

**selection  
schedule**

maximum number  
of fluorescent lamps  
for connection

Lamp	Ballast Type	Power Factor	Capacitance (micro-Farad)	Line Running Current (mA)	VA	LSA2000 Max. No. of Lamps	FLC (Amps)	LSA3000 Max. No. of Lamps	FLC (Amps)
18/20	<b>CODE</b> EC 18/20	0.31 (0.33)	-	370	89	27	9.99	34	12.58
		0.8	3.4	166	40	41	6.81	59	9.79
		0.9	3.8	147	35	37	5.44	53	7.79
18/20	<b>LOW LOSS</b> LLEC 18/20	0.26	-	370	89	27	9.99	34	12.58
		0.8	3.7	128	31	38	4.86	54	6.91
		0.9	4.1	114	27	34	3.88	49	5.59
18/20	<b>SUPER LOW LOSS</b> OMC 18/20	0.27 (0.26)	-	370	89	27	9.99	34	12.58
		0.8	3.8	134	32	37	4.96	53	7.10
		0.9	4.1	119	29	34	4.05	49	5.83
36/40	<b>CODE</b> EC 36/40	0.45 (0.49)	-	415	100	24	9.96	30	12.45
		0.8	3.0	261	63	38	9.92	48	12.53
		0.9	3.5	232	56	40	9.28	54	12.53
36/40	<b>LOW LOSS</b> LLEC 36/40	0.42 (0.45)	-	410	98	24	9.84	30	12.30
		0.8	3.2	216	52	44	9.50	58	12.53
		0.9	3.8	192	46	37	7.10	53	10.18
36/40	<b>SUPER LOW LOSS</b> OMC 36/40	0.38 (0.41)	-	430	103	23	9.89	29	12.47
		0.8	3.7	252	60	38	9.58	50	12.60
		0.9	4.3	222	53	33	7.33	47	10.43
58/65	<b>CODE</b> EC 58/65	0.44 (0.47)	-	660	158	15	9.90	19	12.54
		0.8	4.7	370	89	27	9.99	34	12.58
		0.9	5.9	329	79	24	7.90	34	11.19
58/65	<b>LOW LOSS</b> LLEC 58/65	0.41 (0.45)	-	660	158	15	9.90	19	12.54
		0.8	5.2	343	82	27	9.26	36	12.35
		0.9	6.2	306	73	23	7.04	32	9.79
58/65	<b>SUPER LOW LOSS</b> OMC 58/65	0.48 (0.43)	-	670	161	15	10.05	19	12.73
		0.8	5.5	400	96	25	10.00	31	12.40
		0.9	6.5	355	85	22	7.81	31	11.01

CAT #	Maximum Capacitance micro-Farad	Maximum Line Current Amps	VA Rating
LSA2000	140	10	2400
LSA3000	200	12.5	3000
LSA5000	350	20	5000

**DESIGN CONSIDERATIONS & LIMITATIONS**

- 240V 50Hz systems under consideration
- Ballast details sourced from ATCO lighting control equipment catalogue G5
- LightSave is not compatible with "Rapid Start" starters or down line switching.

Please check [www.ecsaustralia.com/productguide.php](http://www.ecsaustralia.com/productguide.php) to ensure this is the most recent issue

Q. Do we have a LightSave Unit larger than the LSA3000?

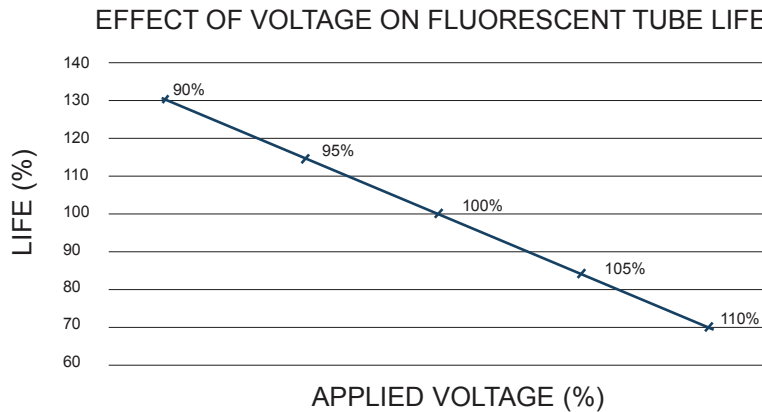
A. Yes. ECS have a LSA5000 (5 KVA) Unit. This is a special and is not generally stocked. A 6-8 week delivery time is required and minimum order quantity is 25 units.

Q. How have LightSave energy savings and LightSave reductions been proven?

A. Independent NATA Laboratory Tests have been done and are available. Hundreds of sites have been monitored to verify : "on-site" energy savings. These line up with NATA Laboratory Tests.

Q. How does LightSave effect lamp life?

A. Lamp life is extended. Please refer to graph produced by University of Oslo.



Please also note the following extracts of letters from lamp suppliers.

> Philips.

“...Most lamp problems at a lower voltage/power are ignition problems. The system you are considering has avoided these problems in a very nice way by igniting the lamps at nominal conditions...”

“...The light output of an inductive system will decrease by about 15%. This is visible by the human eye, which may lead to questions/remarks. We do not expect other problems. So, the expected lifetime will probably not change...”

> Sylvania.

“...Variable auto-transformer control systems: -Sine wave dimmers. Generally these systems will increase lamp life, as the system will reduce lamp current density as the lamp is dimmed...”.

Q. Can LightSave be used with ELV lamps?

A. Yes, but 30% tapping will result in 25% energy savings and 46% light reduction. Much longer lamp life will result though.

Q. Does LightSave have any effect on power factor?

A. Yes. The LightSave unit will increase the power factor of a lighting circuit. For example a circuit containing code ballasts and 0.8PF will increase the power factor of approx 0.95. For more in depth technical explanation refer to Head Office.

Q. Does the LightSave effect the harmonics?

A. Yes. A 30% tapping the voltage drops from 240V to 206V and the harmonics from 25.9% to 31.6%. But the input current is reduced substantially and because of this the actual harmonic current is reduced.

Q. Can 2 off LSA2000 units be wired in parallel to control a higher load than one unit could handle?

A. No.

# HID Dimmer Energy Controller **SPECIFICATIONS**

## ECS6000

### introduction

#### ***HID Dimmer Lighting Control System***

##### **General**

Manufacture, deliver and install all lighting control equipment including wiring and miscellaneous equipment to achieve a complete lighting control system installation as specified. The lighting control system shall be supplied by Energy Conservation Systems Pty Ltd (ECS); and shall strictly comply with the requirements as specified.

The lighting control system equipment supplier shall assist the Electrical Contractor in the on-site positioning, set-up, programming, testing and commissioning of the complete lighting control system.

The Electrical Contractor shall prepare detailed as-built drawings showing the location of all luminaires, all lighting control equipment and all lighting sub-circuit and switch wiring. As-built drawings shall be submitted for approval of the Superintendent prior to the commencement of work on-site.

The lighting control system shall be suitable for the automatic control of essential and non-essential lighting as detailed on the Tender drawings.

Emergency and Exit Lighting shall not be affected by the lighting control system.

24 Hour Security lighting shall not be affected by the lighting control system.

### operational area

#### ***Lighting Control System for Operational Area***

The lighting control system shall be an Energy Conservation Systems Pty Ltd 6000 Series lighting control system suitable for the control of 400 watt metal halide luminaires. The lighting control system shall strictly comply with the requirements as specified.

### system facilities

#### ***Lighting Control System Facilities***

The lighting control system shall incorporate the following facilities:-

- > Time based energy management control of lighting
- > Easily programmable energy management time controller using PC and Windows™ software. The system shall have the capability to interface with a BMS system to enable program alteration
- > Automatic ON/OFF fixed tap control of 400 watt metal halide lighting in response to daylight level changes within each separate building sub-zone.
- > Manual override ON control of 400 watt metal halide lighting associated with each separate building sub-zone via separate key operated switches.
- > Manual 50% (ON/OFF) control of 400 metal halide lighting sub-circuits associated with each separate building sub-zone via separate key operated switches .
- > Manual 100% (ON/OFF) control of 400 metal halide lighting sub-circuits associated with each separate building sub-zone via separate key operated switches .

**Lighting Control System Equipment**

> Each ECS M1008 Energy Management Time Controller shall be a dedicated central control supervisor with its own 8031 microprocessor and memory complete with 8 digital inputs, 8 analogue inputs and 8 digital outputs; and shall provide a 365 day programming schedule, fully automatic daylight savings adjustment and battery backup for all programs and date / time. Each ECS M1008 Energy Management Time Controller shall be provided with a history log function which may be used for future fault analysis or for sophisticated energy use monitoring. The energy management time controller shall have an RS 232 link for computer interface and shall be located as detailed on the Tender drawings.

> The DC Power Supply Unit associated with each energy management time controller shall be an ECS 240 Volt AC/24 Volt D.C; 10 Amp power supply unit. Each DC Power Unit shall be located adjacent to its associated energy management time controller.

> Solar level detectors associated with each separate sub-building zone shall be ECS 9002 Solar Level Detectors located at high level above the 400 watt metal halide luminaires to ECS on-site instruction. Solar level detectors shall be wired to their associated sub-building zone; energy management time controller.

> Two (2) ECS Lighting Control N/O contactor enclosures shall be provided for each separate sub-building zone. One (1) N/O contactor enclosure is required for Manual/ Automatic control ON/OFF of Essential Lighting subcircuits (50% lighting). One (1) N/O contactor enclosure is required for Manual/ Automatic control ON/OFF of Non-Essential Lighting sub-circuits (100% lighting). The N/O contactor enclosure associated with Essential Lighting sub-circuits shall be supplied via it's associated separate subbuilding zone Essential Distribution Board. The N/O contactor enclosure associated with Non-Essential Lighting sub-circuits shall be supplied via it's associated separate sub-building zone Non-Essential Distribution Board. Each ECS Lighting Control N/O contactor enclosures shall comprise a series of ECS type OK1W10/240V N/O 25 Amp rated N/O contactors; din rail mounted in suitable IP55 rated PVC enclosures. All control wiring to N/O contactor enclosures shall be terminated via suitably labelled din rail mounted terminal strips. Control wiring between each terminal strip and N/O contactor coils shall be provided by ECS. N/O contactors located within each Manual/Automatic Control N/O contactor re-enclosure shall be used for Manual ON and OFF control of 400 watt metal halide luminaires via local 50% (Essential Lighting sub-circuits); and 100% (Non-Essential Lighting sub-circuits) key operated switches interfaced to the energy management time controller. The same N/O contactors shall be used for 100% (ON) and 0% (OFF) Automatic control of 400 watt metal halide luminaires via the associated energy management time controller. Each sub-building zone ECS Lighting Control N/O contactor enclosure shall be located above its associated distribution board/ energy management time controller; to Superintendents approval.

> Each ECS 6000 Energy Controller is a fixed tapped switching device for control of 400 watt metal halide luminaires; in response to the presence of daylight. Continuous dimming systems shall not be acceptable. Each separate ECS 6000 Energy Controller shall control up to six (6) 400 watt metal halide luminaires connected to its associated lighting sub-circuit; and control the metal halide luminaires to provide 100% (ON); 75%; 55% and 0% (OFF) light output. Each ECS 6000 Energy Controller shall be used to control all six (6) 400 Watt metal halide luminaires associated with its particular lighting sub-circuit. Automatic 100% (ON); 0% (OFF) control of 400 watt metal halide luminaires shall be via the building sub-zone energy management time controller. On initial start-up, the system shall provide 100% power for a minimum period of 15 minutes to facilitate striking and stabilisation of the lamp. Initial start-up 100% (ON) may be Manually initiated (via remote key operated local switches); or Automatically initiated via time based signals from the energy management time controller. Final shut-down 0% (OFF) may be Manually initiated (via remote key operated local switches); or Automatically initiated via time based signals from the energy management time controller.

Manual 50 % (ON/OFF) and 100% (ON/OFF) control of 400 watt metal halide luminaire lighting sub-circuit shall be via separate remote 50%; 100% key operated switches associated with each separate building sub-zone. The 50% (ON/OFF); and 100% (ON/OFF) key operated switches shall be interfaced with their associated ECS Energy Management Time Controller; and separately labeled to all other Manual control switches.

## **Lighting Control System Equipment and Installation Requirements**

Provide and install the following lighting control system equipment:

> ECS M1008 Energy Management Time Controllers. Provide a separate dedicated 10 Amp 2 core & earth 240 Volt supply from the nearest adjacent Distribution Board to each separate ECS M1008 Energy Management Time Controller.

Provide separate 50% lighting level; and 100% lighting level remote key operated switches for each building sub-zone for manual override ON/OFF of 400 watt metal halide luminaires. Provide 2 core 1.5mm<sup>2</sup> double insulated wiring between each key operated switch and its associated building subzone energy management time controller. Provide a dedicated 3 core (1 time channel (ON/OFF); neutral and earthed) 1.5mm<sup>2</sup> 240 Volt rated PVC/PVC control bus cable from each energy management time controller to its associated building sub-zone separate N/O contactor coils (via terminal strips provided by ECS) located in N/O contactor enclosures.

Provide a separate dedicated 3 core 240 Volt rated PCV/PCV control bus (75% light level; 55% light level; and common ) from each energy management controller to its associated building sub-zone ECS 6000 Energy Controllers.

> ECS D.C Power Supply Units.

Provide a separate dedicated 10 Amp 2 core & earth 240 Volt supply from the nearest adjacent Distribution Board to each separate ECS D.C Power Supply Unit.

Provide a separate 2 core 1.5mm<sup>2</sup> 240 Volt rated PVC/PVC control cable (positive and negative) from each 240 Volt A.C/ 24 Volt D.C Power Supply unit and its associated ECS M1008 Energy Management Time Controller.

> ECS 9002 Solar Level Detectors.

Provide 2 core 1.5mm<sup>2</sup> 240 Volt rated PCV/PCV interface wiring between each building sub-zone Solar Level Detector and its associated ECS M1008 Energy Management Time Controller.

> ECS N/O Contactor Enclosures

Provide separate lighting sub-circuit wiring ( active, neutral, and earth ) between the appropriate building Distribution Board and its associated subzone N/O contactor enclosure.

> ECS 6000 Energy Controllers.

Provide separate sub-circuit wiring ( active, neutral, and earth ) between each building sub-zone N/O contactor enclosure and its associated sub-zone ECS 6000 Energy Controllers.

### **On-site testing and commissioning of the lighting control system**

The lighting control system equipment supplier shall carry out all on-site programming of each ECS M1008 Energy Management Time Controller to information provided by the Electrical Services Sub-Contractor. The lighting control system equipment supplier shall assist the Electrical Services Sub- Contractor in the on-site positioning, set-up, testing and commissioning of the complete lighting control system now specified.