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REPORT

on

LIGHT-EMITTING-DIODE SURFACE-MOUNTED LUMINAIRES

ANTEC LIGHTING
ONTARIO, CA

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DESCRIPTION

PRODUCT COVERED:

USL, CNL - Light-Emitting-Diode Surface-Mounted Luminaires, Models AOK-60WoH-NV-X-XX-XXXX-BN, AOK-60WoH-HV-X-XX-XXXX-BN, AOK-100WoH-NV-X-XX-XXXX-BN, AOK-100WoH-HV-X-XX-XXXX-BN, AOK-150WoH-NV-X-XX-XXXX-BN, AOK-150WoH-HV-X-XX-XXXX-BN, AOK-200WoH-NV-X-XX-XXXX-BN, AOK-200WoH-HV-X-XX-XXXX-BN, AOK-240WoH-NV-X-XX-XXXX-BN, AOK-240WoH-HV-X-XX-XXXX-BN, AOK-162WiH-NV-X-XX-XXXX-BN. Where "X" represents different brands of LED and can be "X3" or "X5"; "XX" represents sensor function and can be "00" (without sensor) or "SN" (with sensor); "XXXX" represents temperature color and can be any letters or digits ; "BN" represents the beam angle and can be any letters.

Note: USL - United States Standard, Listed.

CNL - Canadian Standard, Listed.

ELECTRICAL RATINGS:

Model	Input Ratings				Environment Use Location	Mounting
	V	Hz	A	W		
AOK-60WoH-NV-X-00-XXXX-BN	100-277	50/60	0.66	60	Damp	Pendant/ Wall/ Ceiling Mounted
AOK-60WoH-NV-X-SN-XXXX-BN	120-277					
AOK-60WoH-HV-X-00-XXXX-BN	200-480	50/60	0.33	100		
AOK-100WoH-NV-X-00-XXXX-BN	100-277	50/60	1.1			
AOK-100WoH-NV-X-SN-XXXX-BN	120-277					
AOK-100WoH-HV-X-00-XXXX-BN	200-480	50/60	0.55			

ELECTRICAL RATINGS: (Cont'd)

Model	Input Ratings				Environment Use Location	Mounting
	V	Hz	A	W		
AOK-150WoH-NV-X-00-XXXX-BN	100-277	50/60	1.65	150	Damp	Pendant/ Wall/ Ceiling Mounted
AOK-150WoH-NV-X-SN-XXXX-BN	120-277					
AOK-150WoH-HV-X-00-XXXX-BN	200-480	50/60	0.83			
AOK-200WoH-NV-X-00-XXXX-BN	100-277	50/60	2.2	200		
AOK-200WoH-NV-X-SN-XXXX-BN	120-277	50/60				
AOK-200WoH-HV-X-00-XXXX-BN	200-480	50/60	1.1			
AOK-240WoH-NV-X-00-XXXX-BN	100-277	50/60	2.64	240		
AOK-240WoH-NV-X-SN-XXXX-BN	120-277	50/60				
AOK-240WoH-HV-X-00-XXXX-BN	200-480	50/60	1.32			
AOK-162WiH-NV-X3-00-XXXX-BN	100-277	50/60	1.79	162	Damp	Ceiling Mounted
AOK-162WiH-NV-X3-SN-XXXX-BN	120-277					

GENERAL CONSTRUCTION:

These products comply with the applicable Standards for USL and/or CNL luminaires as noted under the "Technical Considerations" section noted below, the Section General, and the Description on the following pages.

All components of products bearing the C-UL mark shall be Listed or Recognized for Canada or CSA Certified, in addition to being UL Listed or Recognized.

TECHNICAL CONSIDERATIONS (NOT FOR FIELD REPRESENTATIVE'S USE):

USL indicates products comply with the Standard for Luminaires, UL 1598 and the Standard for Light Emitting Diode (LED) Equipment for Use in Lighting Products, UL 8750.

CNL indicates products comply with the Canadian National Standard for Luminaires, CSA C22.2 No. 250.0, and Light Emitting Diode (LED) Equipment for Lighting Application, CSA C22.2 No. 250.13.

MARKINGS:

Provided in accordance with the Standard and Section General. In addition, the following markings are required in accordance with the Standard.

- a) Listee's Name or UL File Number;
- b) Model number;
- c) Electrical Rating (V, Hz, A, W);
- d) Manufacturing date, consisting of MM-YY, where "MM" represents month; "YY" represents year;
- e) "THIS PRODUCT MUST BE INSTALLED IN ACCORDANCE WITH THE APPLICABLE INSTALLATION CODE BY A PERSON FAMILIAR WITH THE CONSTRUCTION AND OPERATION OF THE PRODUCT AND THE HAZARDS INVOLVED";
- f) Optional - "SUITABLE FOR DAMP LOCATIONS" in S24-L2;
- g) "SUITABLE FOR OPERATION IN AMBIENT NOT EXCEEDING 40°C" in Form S24-L2;
- h) "CAUTION - RISK OF FIRE" in Form S24-L1;
- i) "CONSULT A QUALIFIED ELECTRICIAN TO ENSURE CORRECT BRANCH CIRCUIT CONDUCTOR" in Form S24-L4.

ILLUSTRATION INDEX:

ILL. No	Description	Applicable Models
1	Mounting Ring	All except model AOK-162WiH-NV-X-SN-XXXX-BN
1a	Mounting bracket	
2	Heat Sink	AOK-100WoH-HV-X-XX-XXXX-BN
3		AOK-150WoH-HV-X-XX-XXXX-BN
4		AOK-240WoH-NV-X-XX-XXXX-BN
5	Diffuser	AOK-100WoH-HV-X3-XX-XXXX-BN
6		AOK-100WoH-HV-X5-XX-XXXX-BN
7		AOK-150WoH-HV-X3-XX-XXXX-BN
8		AOK-150WoH-HV-X5-XX-XXXX-BN
9		AOK-240WoH-HV-X3-XX-XXXX-BN
10		AOK-240WoH-HV-X5-XX-XXXX-BN
11	Bushing	All except model AOK-162WiH-NV-X3-SN-XXXX-BN
12	Diffuser Ring	AOK-100WoH-HV-X-XX-XXXX-BN
13		AOK-150WoH-HV-X-XX-XXXX-BN
14		AOK-240WoH-NV-X-XX-XXXX-BN
15	Wiring box	AOK-150WoH-HV-X-XX-XXXX-BN AOK-240WoH-HV-X-XX-XXXX-BN
16	PWB layout	AOK-100WoH-HV-X3-XX-XXXX-BN
17		AOK-150WoH-HV-X3-XX-XXXX-BN
18		AOK-240WoH-HV-X3-XX-XXXX-BN
22		AOK-150WoH-HV-X3-XX-XXXX-BN AOK-240WoH-HV-X3-XX-XXXX-BN
19		AOK-100WoH-HV-X5-XX-XXXX-BN
20		AOK-150WoH-HV-X5-XX-XXXX-BN
21		AOK-240WoH-HV-X5-XX-XXXX-BN
23		AOK-150WoH-HV-X5-XX-XXXX-BN AOK-240WoH-HV-X5-XX-XXXX-BN
24	Back Diffuser	AOK-150WoH-HV-X5-XX-XXXX-BN AOK-240WoH-HV-X5-XX-XXXX-BN

ILL. No	Description	Applicable Models
25	User manual	All except model AOK-162WiH-NV-X3-SN-XXXX-BN
26		
27		
28	Mounting Means	AOK-162WiH-NV-X3-SN-XXXX-BN
29	Heat Sink	
30	Driver Housing	
31	End Cap	
32	Driver Housing Cover	
33	Diffuser	
34	PWB layout	
35	User manual	

MODEL AOK-240WoH-NV-X3-SN-XXXX-BN - FIGS. 1 THRU 4

General - Figs. 1 thru 4 show overall and disassembled views of Model AOK-240WoH-NV-X3-SN-XXXX-BN. Also, represents Models AOK-60WoH-NV-X-XX-XXXX-BN, AOK-60WoH-HV-X-XX-XXXX-BN, AOK-100WoH-NV-X-XX-XXXX-BN, AOK-100WoH-HV-X-XX-XXXX-BN, AOK-150WoH-NV-X-XX-XXXX-BN, AOK-150WoH-HV-X-XX-XXXX-BN, AOK-200WoH-NV-X-XX-XXXX-BN, AOK-200WoH-HV-X-XX-XXXX-BN, AOK-240WoH-NV-X-XX-XXXX-BN, AOK-240WoH-HV-X-XX-XXXX-BN except noted below.

1. Mounting Ring - Painted Die-cast Iron, min. 2.5 mm thick, Secured to LED Driver Housing by self-threading. See I-1 for detailed dimensions.

Alternate Mounting bracket - Painted Die-cast steel, 2.5 mm thick, consist of three parts, secured together by screws. Secured to LED Driver by screw. See I-1A for detailed dimensions.

2. Heat Sink - Die-cast Aluminum, min. 2.5 mm thick. See below table for detailed dimensions.

Model	ILL. No.
AOK-60WoH-NV-X-XX-XXXX-BN, AOK-60WoH-HV-X-XX-XXXX-BN, AOK-100WoH-NV-X-XX-XXXX-BN, AOK-100WoH-HV-X-XX-XXXX-BN	2
AOK-150WoH-NV-X-XX-XXXX-BN, AOK-150WoH-HV-X-XX-XXXX-BN	3
AOK-200WoH-NV-X-XX-XXXX-BN, AOK-200WoH-HV-X-XX-XXXX-BN, AOK-240WoH-NV-X-XX-XXXX-BN, AOK-240WoH-HV-X-XX-XXXX-BN	4

3. Diffuser - R/C (QMFZ2), IDEMITSU KOSAN CO LTD (E48268), Model EA 537, rated 5VA, 120°C, min. 2.0 mm thick. Secured to Heat Sink via Diffuser Bracket by screws. See illustrations in below table for detailed dimensions.

Model	ILL. No.
AOK-60WoH-NV-X3-XX-XXXX-BN, AOK-100WoH-NV-X3-XX-XXXX-BN, AOK-60WoH-HV-X3-XX-XXXX-BN, AOK-100WoH-HV-X3-XX-XXXX-BN	5
AOK-60WoH-NV-X5-XX-XXXX-BN, AOK-100WoH-NV-X5-XX-XXXX-BN, AOK-60WoH-HV-X5-XX-XXXX-BN, AOK-100WoH-HV-X5-XX-XXXX-BN	6
AOK-150WoH-NV-X3-XX-XXXX-BN, AOK-150WoH-HV-X3-XX-XXXX-BN	7
AOK-150WoH-NV-X5-XX-XXXX-BN, AOK-150WoH-HV-X5-XX-XXXX-BN	8
AOK-200WoH-NV-X3-XX-XXXX-BN, AOK-240WoH-NV-X3-XX-XXXX-BN, AOK-200WoH-HV-X3-XX-XXXX-BN, AOK-240WoH-HV-X3-XX-XXXX-BN	9
AOK-200WoH-NV-X5-XX-XXXX-BN, AOK-240WoH-NV-X5-XX-XXXX-BN, AOK-200WoH-HV-X5-XX-XXXX-BN, AOK-240WoH-HV-X5-XX-XXXX-BN	10

4. Gasket - Silicone rubber, min. 1.2 mm thick. Located between Diffuser and Heat Sink.

5. Bushings - Steel. Provided with a silicone rubber ring inside the bushing. Secured to Heat Sink by threads and nuts. See ILL. 11 for detailed dimension.
6. Diffuser Bracket - Die-cast Aluminum, min. 0.2 mm thick. Secured to Heat Sink by screws. See illustrations in below table for detailed dimensions.

Model	ILL. No.
AOK-60WoH-NV-X-XX-XXXX-BN, AOK-60WoH-HV-X-XX-XXXX-BN, AOK-100WoH-NV-X-XX-XXXX-BN, AOK-100WoH-HV-X-XX-XXXX-BN	12
AOK-150WoH-NV-X-XX-XXXX-BN, AOK-150WoH-HV-X-XX-XXXX-BN	13
AOK-200WoH-NV-X-XX-XXXX-BN, AOK-200WoH-HV-X-XX-XXXX-BN, AOK-240WoH-NV-X-XX-XXXX-BN, AOK-240WoH-HV-X-XX-XXXX-BN	14

7. Motion sensor - For Models with suffix "XX" = "SN". Listed (XACN/7), SHENZHEN MERRYTEK TECHNOLOGY CO LTD (E489677), Type MC054V RC A, rated 120/277V, 50/60Hz, 4/3A. Provided with integral 18 AWG, Type SJTW cord. Secured to Heat Sink by screws.
8. Wiring Box - Constructed as follows.
 - a. Enclosure - R/C (QMFZ2), MITSUBISHI ENGINEERING-PLASTICS CORP (E41179), Type G2F 23 (a8)(f1), minimum 3.0 mm thick, rated 5VA, 130°C. 2-piece construction, secured together by screws, see ILL. 15 for details. Secured to Heat Sink by screws.
 - b. Power Supply Cord - Listed (ZJCZ), CN, Type SJTW, 18 AWG X 3C, rated 80°C, 600V.
 - c. Wire connector - Listed (ZMVV/7), WAGO KONTAKTTECHNIK GMBH & CO. KG (E69654), Model 222-412 or 222-413, rated 600 V, 30 A, min 90°C. Secured to enclosure by screws.
 - d. Strain Relief Bushings - 4 provided. Each, Steel, also provided with a silicone rubber ring inside the bushing. See ILL. 11 for detailed dimension. Secured to enclosure by thread and nut.
9. Bottom LED Module - Constructed as follows. Secured inside of Heat Sink by screws.
 - a. Printed Wiring Board - R/C (ZPMV2), metal-based, rated min. V-1, min. 105°C, min. 1 mm thick, suitable for direct support live parts. Lead wire soldering connections covered by epoxy or silicone rubber. See illustrations in below table for PWB Trace Layouts.

- b. LEDs - Each max. 7.1 V, 240 mA. See below table for details.

Model	No. of LEDs	PWB Dimensions	ILL. No.
AOK-60WoH-NV-X3-XX-XXXX-BN, AOK-60WoH-HV-X3-XX-XXXX-BN, AOK-100WoH-NV-X3-XX-XXXX-BN, AOK-100WoH-HV-X3-XX-XXXX-BN,	154	160 mm Diameter	16
AOK-150WoH-NV-X3-XX-XXXX-BN, AOK-150WoH-HV-X3-XX-XXXX-BN,	252	226 mm Diameter	17
AOK-200WoH-NV-X3-XX-XXXX-BN, AOK-200WoH-HV-X3-XX-XXXX-BN, AOK-240WoH-NV-X3-XX-XXXX-BN, AOK-240WoH-HV-X3-XX-XXXX-BN	385	293 mm Diameter	18

Alternate - Each rated max. 6.6 V, max 800 mA. See below table for details.

Model	No. of LEDs	PWB Dimensions	ILL. No.
AOK-60WoH-NV-X5-XX-XXXX-BN, AOK-60WoH-HV-X5-XX-XXXX-BN, AOK-100WoH-NV-X5-XX-XXXX-BN, AOK-100WoH-HV-X5-XX-XXXX-BN,	84	160 mm Diameter	19
AOK-150WoH-NV-X5-XX-XXXX-BN, AOK-150WoH-HV-X5-XX-XXXX-BN,	126	226 mm Diameter	20
AOK-200WoH-NV-X5-XX-XXXX-BN, AOK-200WoH-HV-X5-XX-XXXX-BN, AOK-240WoH-NV-X5-XX-XXXX-BN, AOK-240WoH-HV-X5-XX-XXXX-BN	196	293 mm Diameter	21

10. Top LED Modules - Only for Models AOK-150WoH-NV-X-XX-XXXX-BN, AOK-150WoH-HV-X-XX-XXXX-BN, AOK-200WoH-NV-X-XX-XXXX-BN, AOK-200WoH-HV-X-XX-XXXX-BN, AOK-240WoH-NV-X-XX-XXXX-BN, AOK-240WoH-HV-X-XX-XXXX-BN. Four provided, each secured to Heat Sink by screws. See illustrations in below table for PWB Trace Layouts. Constructed as follows:

- a. Printed Wiring Board - R/C (ZPMV2), metal-based, rated min. V-1, min. 105°C, min. 1 mm thick, suitable for direct support of live parts. Lead wire soldering connections covered by epoxy or silicone rubber. See illustrations in below table for PWB Trace Layouts.

b. LEDs - Each max 7.1 V, 240 mA. See below table for details.

Model No.	No. of LEDs for each PWB	PWB Dimensions	ILL. No.
AOK-150WoH-NV-X3-XX-XXXX-BN, AOK-150WoH-HV-X3-XX-XXXX-BN, AOK-200WoH-NV-X3-XX-XXXX-BN, AOK-200WoH-HV-X3-XX-XXXX-BN, AOK-240WoH-NV-X3-XX-XXXX-BN, AOK-240WoH-HV-X3-XX-XXXX-BN	7	45 by 10 mm	I-22

Alternate - Each rated 5.8-6.6 V, max 800 mA. See below table for details.

Model No.	No. of LED for each PWB	PWB Dimensions	ILL. No.
AOK-150WoH-NV-X5-XX-XXXX-BN, AOK-150WoH-HV-X5-XX-XXXX-BN, AOK-200WoH-NV-X5-XX-XXXX-BN, AOK-200WoH-HV-X5-XX-XXXX-BN, AOK-240WoH-NV-X5-XX-XXXX-BN, AOK-240WoH-HV-X5-XX-XXXX-BN	2	45 by 10 mm	I-23

c. Diffuser - R/C (QMFZ2), IDEMITSU KOSAN CO LTD(E48268), Model EA 537, min. 2.3 mm thick, rated 5VA, 120°C, secured to Heat Sink by screws. See ILL. 24 for detailed dimensions.

11. LED Driver - R/C (FKSZ2/8), suitable for damp location. See below table for model list and ratings. Integrally provided with, Type SJTW, 18 AWG for Input and output cords, and terminated to outlet box. May also provided with dimming leads wired to motion sensor. Secured to Heat Sink by screws.

Lamp Model	manufacturer	Driver Model	Ratings
AOK-60W _o H-NV-X3-XX-XXXX-BN, AOK-60W _o H-NV-X5-XX-XXXX-BN, AOK-100W _o H-NV-X3-XX-XXXX-BN, AOK-100W _o H-NV-X5-XX-XXXX-BN	MEAN WELL ENTERPRIS ES CO LTD (E334687)	HBG-100-48AB	Input: 100-240/277V, 50/60Hz, 1.1/0.45A. Output: Max. 49Vdc, 2A. LVLE.
AOK-150W _o H-NV-X3-XX-XXXX-BN, AOK-150W _o H-NV-X5-XX-XXXX-BN		HBG-160-48AB	Input: 100-240/277V, 50/60Hz, 1.7/0.7A. Output: 48Vdc, 3.3A.
AOK-200W _o H-NV-X3-XX-XXXX-BN, AOK-200W _o H-NV-X5-XX-XXXX-BN,		HBG-200-48AB	Input: 100-240/277V, 50/60Hz, 2.2/0.9A. Output: 68/52Vdc, 3.3/4.1A.
AOK-240W _o H-NV-X3-XX-XXXX-BN, AOK-240W _o H-NV-X5-XX-XXXX-BN.		HBG-240-48AB	Input: 100-240/277V, 50/60Hz, 2.5/1.2A. Output: Max. 49Vdc, 5A.
AOK-60W _o H-HV-X3-XX-XXXX-BN, AOK-60W _o H-HV-X5-XX-XXXX-BN,	SHENZHEN SOSEN ELECTRONICS CO LTD (E360758)	SS-100S-58B	Input: 200-480V, 50/60Hz, 0.8A. Output: 32-58Vdc, 1.3-2.4A. Class 2.
AOK-100W _o H-HV-X3-XX-XXXX-BN, AOK-100W _o H-HV-X5-XX-XXXX-BN		SS-150S-58B	Input: 200-480V, 50/60Hz, 1.2A. Output: 32-58Vdc, 2-3.6A.
AOK-150W _o H-HV-X3-XX-XXXX-BN, AOK-150W _o H-HV-X5-XX-XXXX-BN		SS-240S-58B	Input: 200-480V, 50/60Hz, 1.8A. Output: 32-58Vdc, 3.1-5.7A.
AOK-200W _o H-HV-X3-XX-XXXX-BN, AOK-200W _o H-HV-X5-XX-XXXX-BN,			
AOK-240W _o H-HV-X3-XX-XXXX-BN, AOK-240W _o H-HV-X5-XX-XXXX-BN.			

MODELS AOK-162WiH-NV-X3-SN-XXXX-BN - FIGS. 5 THRU 8

General - Figs. 5 thru 8 show overall and disassembled views of Model AOK-162WiH-NV-X3-SN-XXXX-BN. Also, represents Models AOK-162WiH-NV-X3-XX-XXXX-BN except noted below.

1. Mounting Means - Consisted of the following items.
 - a. Buckle/Wire - Buckles, 4 provided, steel. Wires, 4 provided, each galvanized or nickel high tensile steel wire, 2 mm OD, a 10 mm long aluminum sleeve crimped at one end to form a loop. See ILL. 28 for detailed dimensions.
 - b. End Stops - 2 provided. Steel, 1.3 mm min thick, see ILL. 28 for details.
 - c. Toggles - 4 provided, Steel, 2 mm min thick, see ILL. 28A for details. Secured to heat sink by screws.
2. Heat Sinks - Two provided. Aluminum, min. 1.3 mm thick. Secured to End Cap by screws. See ILL. 29 for detailed dimensions.
3. Enclosure - Painted steel, min. 1.0 mm thick. Secured to End Cap by screws. See ILL. 30 for detailed dimensions.

Alternate - For Models with suffix "XX" = "00". Same as above except ILL. 30A for detailed dimensions.
4. Enclosure Cover - Painted steel, min. 1.3 mm thick. See ILL. 31 for detailed dimensions. Secured to Enclosure by screws. Provided with three knockouts for 1/2 in trade size of conduit.
5. Diffusers - 4 provided. R/C (QMFZ2), SOLVAY ENGINEERING PLASTICS GBU (E44716), Model J 60X1 V50, rated 5VA, 120°C, min. 1.1 mm thick. Slid into the slots of heat sink. See ILL. 32 for detailed dimensions.
6. End Caps - Two provided. Die-cast aluminum, min. 1.2 mm thick. See ILL. 33 for detailed dimensions.
7. Connectors - Listed (ZMVV/7), rated min 300 V, min 80°C.
8. Sensor - For models with suffix "SN". Listed (ATNZ/7), EUCONTROLS CORP (E479515), Model S618-P-DR, rated 120/277Vac, 50/60Hz, 800W/1200VA. Secured to Enclosure by integral threaded and nut.
9. Power Supply cord - Listed (ZJCZ), CN, Type SJTW, 18 AWG X 3C, rated 80°C, 600V, min. 152 mm in length. Grounding lead terminated to Enclosure by a screw.

10. LED Modules - Four provided. Consists of Printed Wiring Board, LED Packages and Lead Wires. Secured inside of Heat Sink by screws.

a. Printed Wiring Board - R/C (ZPMV2), metal-based, rated min. V-1, min. 90°C, min. 1 mm thick, suitable for direct support of live parts. Lead wire soldering connections covered by epoxy or silicone rubber. See illustrations in below table for PWB Trace Layouts.

b. LEDs - Each max 7.1V, 240 mA. See below table for details.

Model No.	No. of LEDs for each PWB	PWB Dimensions	ILL. No. for PWB layout
AOK-162WiH-NV-X3-XX-XXXX-BN	476	556mm*22mm	34

c. Lead Wires - R/C (AVLV2/8), min. 24 AWG, solid conductors, rated min. 300 V, min. 90°C.

11. LED Driver - R/C (FKSZ2/8), MEAN WELL ENTERPRISES CO LTD (E334687), Model HLG-185H-48AB, rated input 100-240/277 V, 50/60 Hz, 2.1/0.8 A, output 48 Vdc, 3.9 A, suitable for damp location. Integrally provided with, Type SJTW, 18AWG for Input and output cords. May provide with dimming leads wired to motion sensor. Bonding lead of driver secured to Enclosure by a screw.