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Underwriters
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CHANGWON PLANT
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KOREA

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Issue

<u>Date</u>	<u>Vol</u>	<u>Sec</u>	<u>Pages</u>	<u>Revised Date</u>
	1		Revised Index Page(s) 1	2011/09/07
1988/11/23	1	1	Revised Description Page(s) 1,1B,3B,3C,3D,4A,5B,5C	2011/09/07

Inspections at your plant will be conducted under the supervision of SUNGMIN CHO, UL INSPECTION CENTER SEOUL, UL KOREA LTD, STAR TOWER, 33RD FL, KANGNAM-GU, 737 YEOKSAM-DONG, SEOUL, Korea, Republic of, 135-984., PHONE: 2-2009-9000, FAX: 2-2009-9485, EMAIL: sungmin.cho@kr.ul.com

Please file revised pages and illustrations in place of material of like identity. New material should be filed in its proper numerical order.

NOTE: Follow-Up Service Procedure revisions DO NOT include Cover Pages, Test Records and Conclusion Pages. Report revisions DO NOT include Authorization Pages, Indices, Section General Pages and Appendixes.

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NBK File

UL INSPECTION CENTER 747

PRODUCT COVERED:

Component - Sealed cell, lead acid batteries complying with the requirements of the sealed battery/cell pressure release test of UL 1989, the Standard for Standby Batteries.

*Battery Models ES28-12, ES30-12, ES30-12FR, ESH30-12, ESH30-12FR, ES34-12, ES34-12FR, ESH34-12, ESH34-12FR, ESL34-12, ESL34-12FR, ES40-12, ES40-12FR, ESH40-12, ESH40-12FR, ES42-12, ES42-12FR, ESH42-12, ESH42-12FR, ESL42-12, ESL42-12FR, ES65-12, ES65-12FR, ESH65-12, ESH65-12FR, ES70-12, ES70-12FR, ESH70-12, ESH70-12FR, ESL70-12, ESL70-12FR, ES100-12, ES100-12FR, ESH100-12, ESH100-12FR, ES120-12, ES120-12FR, ESH120-12, ESH120-12FR, ES130-12, ES130-12FR, ESH130-12, ESH130-12FR, ES150-12, ES150-12FR, ESH150-12, ESH150-12FR, ES200-12, ES200-12FR, ESH200-12, ESH200-12FR, ESS220-12, ESS220-12FR, **GEX (GSL) 100**, ESG (MSB) 100, **GEX (GSL) 120**, ESG (MSB) 120, GEX100FR, ESG (MSB) 100FR, ESG (MSB) 120FR, **GEX (GSL) 150**, ESG (MSB) 150, GEX150FR, ESG (MSB) 150FR, **GEX (GSL) 200**, ESG (MSB) 200, GEX200FR, ESG (MSB) 200FR, **GEX (GSL) 250**, ESG (MSB) 250, GEX250FR, ESG (MSB) 250FR, **GEX (GSL) 300**, ESG (MSB) 300, GEX300FR, ESG (MSB) 300FR, **GEX (GSL) 400**, ESG (MSB) 400, GEX400FR, ESG (MSB) 400FR, **GEX (GSL) 500**, ESG (MSB) 500, GEX500FR, ESG (MSB) 500FR, **GEX (GSL) 600**, ESG (MSB) 600, GEX600FR, ESG (MSB) 600FR, **GEX (GSL) 700**, ESG (MSB) 700, GEX700FR, ESG (MSB) 700FR, **GEX (GSL) 800**, ESG (MSB) 800, GEX800FR, ESG (MSB) 800FR, **GEX (GSL) 900**, ESG (MSB) 900, GEX900FR, ESG (MSB) 900FR, **GEX (GSL) 1000**, ESG (MSB) 1000, **GEX (GSL) 1200**, ESG (MSB) 1200, GEX1000FR, ESG (MSB) 1000FR, ESG (MSB) 1200FR, **GEX (GSL) 1400**, ESG (MSB) 1400, GEX1400FR, ESG (MSB) 1400FR, **GEX (GSL) 1600**, ESG (MSB) 1600, GEX1600FR, ESG (MSB) 1600FR, **GEX (GSL) 1800**, ESG (MSB) 1800, GEX1800FR, ESG (MSB) 1800FR, **GEX (GSL) 2000**, ESG (MSB) 2000, GEX2000FR and ESG (MSB) 2000FR.

Obsolete product: (Retained for Reference only)

Models: ES1.2-6, ES1.2-6FR, ES4-6, ES4-6FR, ES6-6, ES7-6, ES7-6FR, ES8-6, ES10-6, ES1.2-12, ES1.2-12FR, ES1.9-12, ES2.9-12, ES2.9-12FR, ES2-12FR, ES2-12, ES3.2-12, ES3.2-12FR, ES4-12, ES4-12FR, ES4-12D, ES4-12DFR, ESH5-12, ESH5-12FR, ES6.5-12, ES7-12, ES7-12FR, ES12-6FR, ES12-6, ES12-12, ES12-12FR, ES15-12, ES15-12FR, ES18-12, ES18-12FR, ES24-12, ES24-12FR,

GENERAL DESCRIPTION:

These rechargeable lead acid batteries have from one to six cells with one pressure release vent per cell, designed to prevent excessive accumulations of gas pressure and battery/cell rupture.

Material Modification - There shall be no changes in the formulation or composition of any of the materials used in the construction of the batteries or relief vents unless previously cleared through Underwriters Laboratories Inc.

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

Use - For use only where the acceptability of the combination is determined by Underwriters Laboratories Inc.

Following Models ESG(MSB) series are identical in construction, design, and ratings to Models GEX(UXL) series except for model designation.

*ESG(MSB) series	GEX(GSL) series
*ESG(MSB) 100	GEX(GSL) 100
*ESG(MSB) 120	GEX(GSL) 120
*ESG(MSB) 150	GEX(GSL) 150
*ESG(MSB) 200	GEX(GSL) 200
*ESG(MSB) 250	GEX(GSL) 250
*ESG(MSB) 300	GEX(GSL) 300
*ESG(MSB) 400	GEX(GSL) 400
*ESG(MSB) 500	GEX(GSL) 500
*ESG(MSB) 600	GEX(GSL) 600
*ESG(MSB) 700	GEX(GSL) 700
*ESG(MSB) 800	GEX(GSL) 800
*ESG(MSB) 900	GEX(GSL) 900
*ESG(MSB) 1000	GEX(GSL) 1000
*ESG(MSB) 1200	GEX(GSL) 1200
*ESG(MSB) 1400	GEX(GSL) 1400
*ESG(MSB) 1600	GEX(GSL) 1600
*ESG(MSB) 1800	GEX(GSL) 1800
*ESG(MSB) 2000	GEX(GSL) 2000

Following Models ESG(MSB) series are identical in construction, design, and ratings to Models GEX series except for model designation.

ESG(MSB) series	GEX FR series
ESG(MSB) 100FR	GEX100FR
ESG(MSB) 120FR	
ESG(MSB) 150FR	GEX150FR
ESG(MSB) 200FR	GEX200FR
ESG(MSB) 250FR	GEX250FR
ESG(MSB) 300FR	GEX300FR
ESG(MSB) 400FR	GEX400FR
ESG(MSB) 500FR	GEX500FR
ESG(MSB) 600FR	GEX600FR
ESG(MSB) 700FR	GEX700FR
ESG(MSB) 800FR	GEX800FR
ESG(MSB) 900FR	GEX900FR
ESG(MSB) 1000FR, ESG(MSB) 1200FR	GEX1000FR
ESG(MSB) 1400FR	GEX1400FR
ESG(MSB) 1600FR	GEX1600FR
ESG(MSB) 1800FR	GEX1800FR
ESG(MSB) 2000FR	GEX2000FR

<u>Battery No.</u>	<u>Number of Cells</u>	<u>Nominal Voltage</u>	<u>Nominal Capacity, Ah</u>
ES100-12	6	12	100.0 (2)
ES100-12FR	6	12	100.0 (2)
ESH100-12	6	12	100.0 (2)
ESH100-12FR	6	12	100.0 (2)
ES120-12	6	12	120.0 (2)
ES120-12FR	6	12	120.0 (2)
ESH120-12	6	12	120.0 (2)
ESH120-12FR	6	12	120.0 (2)
ES130-12	6	12	130.0 (2)
ES130-12FR	6	12	130.0 (2)
ESH130-12	6	12	130.0 (2)
ESH130-12FR	6	12	130.0 (2)
ES150-12	6	12	150.0 (2)
ES150-12FR	6	12	150.0 (2)
ESH150-12	6	12	150.0 (2)
ESH150-12FR	6	12	150.0 (2)
ES200-12	6	12	200.0 (2)
ES200-12FR	6	12	200.0 (2)
ESH200-12	6	12	200.0 (2)
ESH200-12FR	6	12	200.0 (2)
ESS220-12	6	12	220.0 (2)
ESS220-12FR	6	12	220.0 (2)
*GEX (GSL) 100,	1	2	100.0 (3)
GEX (GSL) 120			
ESG (MSB) 100,			
ESG (MSB) 120			
GEX100FR,	1	2	100.0 (3)
ESG (MSB) 100FR			
ESG (MSB) 120FR			
*GEX (GSL) 150,	1	2	150.0 (3)
ESG (MSB) 150			
GEX150FR,			
ESG (MSB) 150FR	1	2	150.0 (3)
*GEX (GSL) 200,	1	2	200.0 (3)
ESG (MSB) 200			
GEX200FR,	1	2	200.0 (3)
ESG (MSB) 200FR			

<u>Battery No.</u>	<u>Number of Cells</u>	<u>Nominal Voltage</u>	<u>Nominal Capacity, Ah</u>
*GEX (GSL) 250, ESG (MSB) 250	1	2	250.0 (3)
GEX250FR, ESG (MSB) 250FR	1	2	250.0 (3)
*GEX (GSL) 300, ESG (MSB) 300	1	2	300.0 (3)
GEX300FR, ESG (MSB) 300FR	1	2	300.0 (3)
*GEX (GSL) 400, ESG (MSB) 400	1	2	400.0 (3)
GEX400FR, ESG (MSB) 400FR	1	2	400.0 (3)
*GEX (GSL) 500, ESG (MSB) 500	1	2	500.0 (3)
GEX500FR, ESG (MSB) 500FR	1	2	500.0 (3)
*GEX (GSL) 600, ESG (MSB) 600	1	2	600.0 (3)
GEX600FR, ESG (MSB) 600FR	1	2	600.0 (3)
*GEX (GSL) 700, ESG (MSB) 700	2	2	700.0 (3)
GEX700FR, ESG (MSB) 700FR	2	2	700.0 (3)
*GEX (GSL) 800, ESG (MSB) 800	2	2	800.0 (3)
GEX800FR, ESG (MSB) 800FR	2	2	800.0 (3)
*GEX (GSL) 900, ESG (MSB) 900	2	2	900.0 (3)
GEX900FR, ESG (MSB) 900FR	2	2	900.0 (3)
*GEX (GSL) 1000, GEX (GSL) 1200	2	2	1000.0 (3)
ESG (MSB) 1000, ESG (MSB) 1200			1000.0 (3)
GEX1000FR, ESG (MSB) 1000FR,	2	2	
ESG (MSB) 1200FR			1400.0 (3)
*GEX (GSL) 1400, ESG (MSB) 1400	4	2	1400.0 (3)
GEX1400FR, ESG (MSB) 1400FR	4	2	1600.0 (3)
*GEX (GSL) 1600, ESG (MSB) 1600	4	2	1600.0 (3)
GEX1600FR, ESG (MSB) 1600FR	4	2	1800.0 (3)
*GEX (GSL) 1800, ESG (MSB) 1800	4	2	1800.0 (3)
GEX1800FR, ESG (MSB) 1800FR	4	2	

(Table Continued)

<u>Battery No.</u>	<u>Number of Cells</u>	<u>Nominal Voltage</u>	<u>Nominal Capacity, Ah</u>
*GEX (GSL) 2000, ESG (MSB) 2000	4	2	2000.0 (3)
GEX2000FR, ESG (MSB) 2000FR	4	2	2000.0 (3)

- (1) - Capacity determined at 20 h rate to 1.75 V per cell, unless otherwise noted.
- (2) - Capacity determined at 10 h rate to 1.75 V per cell.
- (3) - Capacity determined at 10 h rate to 1.80 V per cell.

TABLE B
DIMENSIONS OF BATTERY CASES AND COVERS

thickness Battery No.	Approximate Outside Dimension, mm (in.)			Cover Minimum Case Minimum Wall Thickness, mm (in.)			Wall mm (in.)
	Length	Width	Height	Bottom	Sides		
*GEX (GSL) 100, (0.18) GEX (GSL) 120, ESG (MSB) 100, ESG (MSB) 120, GEX100FR, ESG (MSB) 100FR, ESG (MSB) 120FR, *GEX (GSL) 150, ESG (MSB) 150, GEX150FR, ESG (MSB) 150FR	106 (4.17)	170 (6.69)	362 (14.25)	4.6 (0.18)	5.1 (0.20)	4.6	
*GEX (GSL) 200, ESG (MSB) 200, GEX200FR, ESG (MSB) 200FR, *GEX (GSL) 300, ESG (MSB) 300, GEX300FR, ESG (MSB) 300FR	106 (4.17)	170 (6.69)	362 (14.25)	4.6 (0.18)	5.1 (0.20)	4.6 (0.18)	
*GEX (GSL) 400, ESG (MSB) 400, GEX400FR, ESG (MSB) 400FR	195 (7.68)	170 (6.69)	362 (14.25)	4.6 (0.18)	5.1 (0.20)	4.6 (0.18)	
*GEX (GSL) 500, ESG (MSB) 500, GEX500FR, ESG (MSB) 500FR	195 (7.68)	170 (6.69)	362 (14.25)	4.6 (0.18)	5.1 (0.20)	4.6 (0.18)	
*GEX (GSL) 600, ESG (MSB) 600, GEX600FR, ESG (MSB) 600FR	285 (11.22)	170 (6.69)	362 (14.25)	4.6 (0.18)	5.1 (0.20)	4.6 (0.18)	
*GEX (GSL) 700, ESG (MSB) 700, GEX700FR, ESG (MSB) 700FR	285 (11.22)	170 (6.69)	362 (14.25)	4.6 (0.18)	5.1 (0.20)	4.6 (0.18)	
*GEX (GSL) 800, ESG (MSB) 800, GEX800FR, ESG (MSB) 800FR	382 (15.04)	171 (6.73)	362 (14.25)	4.6 (0.18)	5.35 (0.21)	4.6 (0.18)	
*GEX (GSL) 900, ESG (MSB) 900, GEX900FR, ESG (MSB) 900FR	382 (15.04)	171 (6.73)	362 (14.25)	4.6 (0.18)	5.35 (0.21)	4.6 (0.18)	
*GEX (GSL) 1000, ESG (MSB) 1000, ESG (MSB) 1200	471 (18.54)	171 (6.73)	362 (14.25)	4.6 (0.18)	5.35 (0.21)	4.6 (0.18)	
*GEX (GSL) 1200, ESG (MSB) 1000, ESG (MSB) 1200 GEX1000FR, ESG (MSB) 1000FR, ESG (MSB) 1200FR	471 (18.54)	171 (6.73)	362 (14.25)	4.6 (0.18)	5.35 (0.21)	4.6 (0.18)	
*GEX (GSL) 1400, ESG (MSB) 1400, GEX1400FR, ESG (MSB) 1400FR	472 (18.58)	333 (13.11)	372 (14.65)	4.6 (0.18)	5.1 (0.20)	4.6 (0.18)	
*GEX (GSL) 1600, ESG (MSB) 1600, GEX1600FR, ESG (MSB) 1600FR	472 (18.58)	333 (13.11)	372 (14.65)	4.6 (0.18)	5.1 (0.20)	4.6 (0.18)	
*GEX (GSL) 1800, ESG (MSB) 1800, GEX1800FR, ESG (MSB) 1800FR	472 (18.58)	333 (13.11)	372 (14.65)	4.6 (0.18)	5.1 (0.20)	4.6 (0.18)	
*GEX (GSL) 2000, ESG (MSB) 2000, GEX2000FR, ESG (MSB) 2000FR	472 (18.58)	333 (13.11)	372 (14.65)	4.6 (0.18)	5.1 (0.20)	4.6 (0.18)	

Table C Cont.
Dimensions

MODEL	A	B	C	D	E
ESS220-12	11.8	9	1	1.5	8
ESS220-12FR	11.8	9	1	1.5	8
*GEX (GSL) 100	12	9	1	1.5	8
GEX (GSL) 120					9.5
ESG (MSB) 100					
ESG (MSB) 120					
GEX100FR	12	9	1	1.5	9.5
ESG (MSB) 100FR					
ESG (MSB) 120FR					
*GEX (GSL) 150	12	9	1	1.5	9.5
ESG (MSB) 150					
GEX150FR	12	9	1	1.5	9.5
ESG (MSB) 150FR					
*GEX (GSL) 200	12	9	1	1.5	9.5
ESG (MSB) 200					
GEX200FR	12	9	1	1.5	9.5
ESG (MSB) 200FR					
*GEX (GSL) 250	12	9	1	1.5	9.5
ESG (MSB) 250					
GEX250FR	12	9	1	1.5	9.5
ESG (MSB) 250FR					
*GEX (GSL) 300	12	9	1	1.5	9.5
ESG (MSB) 300					
GEX300FR	12	9	1	1.5	9.5
ESG (MSB) 300FR					
*GEX (GSL) 400	12	9	1	1.5	9.5
ESG (MSB) 400					
GEX400FR	12	9	1	1.5	9.5
ESG (MSB) 400FR					
*GEX (GSL) 500	12	9	1	1.5	9.5
ESG (MSB) 500					
GEX500FR	12	9	1	1.5	9.5
ESG (MSB) 500FR					
*GEX (GSL) 600	12	9	1	1.5	9.5
ESG (MSB) 600					
GEX600FR	12	9	1	1.5	9.5
ESG (MSB) 600FR					
*GEX (GSL) 700	12	9	1	1.5	9.5
ESG (MSB) 700					
GEX700FR	12	9	1	1.5	9.5
ESG (MSB) 700FR					
*GEX (GSL) 800	12	9	1	1.5	9.5
ESG (MSB) 800					
GEX800FR	12	9	1	1.5	9.5
ESG (MSB) 800FR					
*GEX (GSL) 900	12	9	1	1.5	9.5
ESG (MSB) 900					
GEX900FR	12	9	1	1.5	9.5
ESG (MSB) 900FR					

(Table Continued)

MODEL	A	B	C	D	E
*GEX (GSL) 1000 GEX (GSL) 1200 ESG (MSB) 1000 ESG (MSB) 1200	12	9	1	1.5	9.5
GEX1000FR ESG (MSB) 1000FR ESG (MSB) 1200FR	12	9	1	1.5	9.5
*GEX (GSL) 1400 ESG (MSB) 1400	11.9	9	1	1.5	8
GEX1400FR ESG (MSB) 1400FR	11.9	9	1	1.5	8
*GEX (GSL) 1600 ESG (MSB) 1600	11.9	9	1	1.5	8
GEX1600FR ESG (MSB) 1600FR	11.9	9	1	1.5	8
*GEX (GSL) 1800 ESG (MSB) 1800	11.9	9	1	1.5	8
GEX1800FR ESG (MSB) 1800FR	11.9	9	1	1.5	8
*GEX (GSL) 2000 ESG (MSB) 2000	11.9	9	1	1.5	8
GEX2000FR ESG (MSB) 2000FR	11.9	9	1	1.5	8

Models	Section	Report Date
*ES1.2-6, ES1.2-6FR, ES4-6, ES4-6FR, ES6-6, ES7-6, ES7-6FR, ES8-6, ES10-6, ES1.2-12, ES1.2-12FR, ES1.9-12, ES2.9-12, ES2.9-12FR, ES2-12, ES2-12FR, ES3.2-12, ES3.2-12FR, ES4-12, ES4-12FR, ES4-12D, ES4-12DFR, ESH5-12, ESH5-12FR, ES6.5-12, ES7-12, ES7-12FR, ES12-6, ES12-6FR, ES12-12, ES12-12FR, ES15-12, ES15-12FR, ES18-12, ES18-12FR, ES24-12, ES24-12FR, ES28-12, ES30-12, ES30-12FR, ESH30-12, ESH30-12FR, ES34-12, ES34-12FR, ESH34-12, ESH34-12FR, ESL34-12, ESL34-12FR, ES40-12, ES40-12FR, ESH40-12, ESH40-12FR, ES42-12, ES42-12FR, ESH42-12, ESH42-12FR, ESL42-12, ESL42-12FR, ES65-12, ES65-12FR, ESH65-12, ESH65-12FR, ES70-12, ES70-12FR, ESH70-12, ESH70-12FR, ESL70-12, ESL70-12FR, ES100-12, ES100-12FR, ESH100-12, ESH100-12FR, ES120-12, ES120-12FR, ESH120-12, ESH120-12FR, ES130-12, ES130-12FR, ESH130-12, ESH130-12FR, ES150-12, ES150-12FR, ESH150-12, ESH150-12FR, ES200-12, ES200-12FR, ESH200-12, ESH200-12FR, ESS220-12, ESS220-12FR, GEX (GSL) 100 , GEX (GSL) 120 , ESG (MSB) 100, ESG (MSB) 120, GEX100FR, ESG (MSB) 100FR, ESG (MSB) 120FR, GEX (GSL) 150 , ESG (MSB) 150, GEX150FR, ESG (MSB) 150FR, GEX (GSL) 200 , ESG (MSB) 200, GEX200FR, ESG (MSB) 200FR, GEX (GSL) 250 , ESG (MSB) 250, GEX250FR, ESG (MSB) 250FR, GEX (GSL) 300 , ESG (MSB) 300, GEX300FR, ESG (MSB) 300FR, GEX (GSL) 400 , ESG (MSB) 400, GEX400FR, ESG (MSB) 400FR, GEX (GSL) 500 , ESG (MSB) 500, GEX500FR, ESG (MSB) 500FR, GEX (GSL) 600 , ESG (MSB) 600, GEX600FR, ESG (MSB) 600FR, GEX (GSL) 700 , ESG (MSB) 700, GEX700FR, ESG (MSB) 700FR, GEX (GSL) 800 , ESG (MSB) 800, GEX800FR, ESG (MSB) 800FR, GEX (GSL) 900 , ESG (MSB) 900, GEX900FR, ESG (MSB) 900FR, GEX (GSL) 1000 , GEX (GSL) 1200 , ESG (MSB) 1000, ESG (MSB) 1200, GEX1000FR, ESG (MSB) 1000FR, ESG (MSB) 1200FR, GEX (GSL) 1400 , ESG (MSB) 1400, GEX1400FR, ESG (MSB) 1400FR, GEX (GSL) 1600 , ESG (MSB) 1600, GEX1600FR, ESG (MSB) 1600FR, GEX (GSL) 1800 , ESG (MSB) 1800, GEX1800FR, ESG (MSB) 1800FR, GEX (GSL) 2000 , ESG (MSB) 2000, GEX2000FR and ESG (MSB) 2000FR.	1	1988-11-23
VGS160, VGS160FR, VGS200, VGS200FR, VGS250, VGS250FR, VGS300, VGS300FR, VGS350, VGS350FR, VGS400, VGS400FR, VGS490, VGS500, VGS500FR, VGS490FR, VGS600, VGS600FR, VGS800, VGS800FR, VGS1000, VGS1000FR, VGS1200, VGS1200FR, VGS1400, VGS1500, VGS1500FR, VGS1600, VGS1800, VGS2000, VGS2000FR, VGS2200, VGS2400, VGS2500, VGS2500FR, VGS2800, VGS3000 and VGS3000FR	2	2001-07-10