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CNAS L0095

2014002171A

No.: GJW2018-2215

TEST REPORT

NAME OF SAMPLE: VALVE REGULATED TUBULAR GEL BATTERY

CLIENT: SHENZHEN SENZER TECH.,CO.LTD

CLASSIFICATION OF TEST: Commission Test

Vkan Certification and Testing Co., Ltd.

TEST REPORT

Name of product: VALVE REGULATED TUBULAR GEL BATTERY	Trade mark: HAZAN
Type/Model: OPzV2-1200, 1200Ah(10hr), 2V OPzV2-3000, 3000Ah(10hr), 2V OPzV2-2500, 2500Ah(10hr), 2V OPzV2-2000, 2000Ah(10hr), 2V OPzV2-250, 250Ah(10hr), 2V	Sample identification: OPzV2-1200 1#~3# OPzV2-3000 4# OPzV2-2500 5# OPzV2-2000 6# OPzV2-250 7#
Commissioned by: SHENZHEN SENZER TECH.,CO.LTD	Manufacturer by: SHENZHEN SENZER TECH.,CO.LTD
Commissioner address: No,402th 4th floor,Tower 5th, Qiaochengfang Nanshan, Shenzhen, P. R. China	Manufacturer address: Huaqiang Industrial Zone,Qingcheng District Qingyuan,Guandong, P. R. China
Quantity of sample: 7pcs	Sampled by: —
Sample status: The samples' status is good.	Sampling at (place): —
Means of receiving: Submitted by manufacturer	Means of sampling: —
Classification of test: Commission Test	Sampling date: —
Receiving date: 2018-03-10	Completing date: 2018-08-22
Tested according to: IEC 60896-21:2004, IEC 60896-22:2004	Test item: 17 items

Test conclusion:

The VALVE REGULATED TUBULAR GEL BATTERIES submitted by SHENZHEN SENZER TECH,. CO. LTD are tested according to IEC 60896-21:2004 Stationary lead-acid batteries- valve regulated types-methods of test and IEC 60896-22:2004 Stationary lead-acid batteries-valve regulated types-requirements.

The test results of High current tolerance, Protection against internal ignition from external spark sources, Protection against ground short propensity, Content and durability of required markings, Material identification, Valve operation, Intercell connector performance, Discharge capacity, Recharge behaviour, Abusive over-discharge, Thermal runaway sensitivity and Stability against mechanical abuse of units during installation comply with IEC 60896-21:2004 and IEC 60896-22:2004.

The test values of the Gas emission, Short circuit current and d.c. internal resistance, Flammability rating of materials, Low temperature sensitivity and Dimensional stability at elevated internal pressure and temperature are stated in the report.

Seal of CVC

Date of issue: 2018-08-25

Approved by: Reviewed by: Tested by:

Description and illustration of the sample:

The samples' status is good.

Description of the sampling procedure:

/

Description of the deviation from the standard, if any:

/

Remarks:

Throughout this report a comma is used as the decimal separator.

Type	Items
OPzV2-1200	Gas emission, High current tolerance, Short circuit current and d.c. internal resistance, Protection against internal ignition from external spark sources, Protection against ground short propensity, Material identification, Valve operation, Content and durability of required markings, Flammability rating of materials, Intercell connector performance, Discharge capacity, Abusive over-discharge, Thermal runaway sensitivity, Low temperature sensitivity, Dimensional stability at elevated internal pressure and temperature and Stability against mechanical abuse of units during installation
OPzV2-3000	Discharge capacity
OPzV2-2500	Discharge capacity
OPzV2-2000	Discharge capacity
OPzV2-250	Discharge capacity

Photos and markings

OPzV2-1200, 1200Ah (10hr), 2V

Photos and markings
OPzV2-3000, 3000Ah (10hr), 2V

Photos and markings

OPzV2-2500, 2500Ah (10hr), 2V

Photos and markings
OPzV2-2000, 2000Ah (10hr), 2V

Photos and markings

OPzV2-250, 250Ah (10hr), 2V

IEC 60896-21:2004 IEC 60896-22:2004			
Cl.	Requirement – Test	Result	Verdict

6	Safe operation requirements						P
6.1	Gas emission						state data
	The test methods are according to clause 6.1.1 to 6.1.14 which are stated in the standard IEC 60896-21	No.	OPzV2-1200				
	Requirement and application: At the rated float charge voltage; state data for all applications: ml gas per cell, h and Ah at 20℃; Requirement and application: at 2,40Vpc overcharge voltage conditions; state data for all applications: ml gas per cell, h and Ah at 20℃;	Uflo(V)= 2,25 ml /(Ah h cell)	The 1st	The 2nd	The 3rd	The 4th	
			0,011	0,012	0,012	0,011	
		at 2,40Vpc overcharge ml /(Ah h cell)	0,042				
6.2	High current tolerance						P
	The test methods are according to clause 6.2.1 to 6.2.6 which are stated in the standard IEC 60896-21	OPzV2-1200:					
	Requirement and application: Measure unit voltage, inspect and document the status of the top-lead and terminals of each unit after 30s current flow; Pass for all applications: Show evidence of no incipient melting or of no loss of electrical continuity after 30s of high current flow (value to be stated). After the completion of the specified discharge duration, the test shall stand for 5minutes in open circuit and their voltage measured and reported.	No.	1#	2#	3#		
		Voltage after the test (V)	2,08	2,06	2,06		
6.3	Short circuit current and d.c. internal resistance						state data
	The test methods are according to clause 6.3.1 to 6.3.6 which are stated in the standard IEC 60896-21	OPzV2-1200:					
	Define prospective short-circuit value I_{sc} and internal resistance Ri of all units of a type range	No.	1#	2#	3#		
		Short-circuit: (A)	6200	5700	5900		
		Resistance: (mΩ)	0,26	0,28	0,27		
6.4	Protection against internal ignition from external spark sources						P
	The test methods are according to clause 6.4.1 to 6.4.6 which are stated in the standard IEC 60896-21	OPzV2-1200: 1#~3#					

IEC 60896-21:2004 IEC 60896-22:2004			
Cl.	Requirement – Test	Result	Verdict
	Requirement and application: induce sparks near representative valve/barrier assemblies during emission Pass for all application: no evidence of rapid combustion or explosion beyond valve/barrier assemblies	No evidence of rapid combustion, no explosion beyond valve/barrier assemblies.	P
6.5	Protection against ground short propensity		
	The test methods are according to clause6.5.1 to 6.5.9 which are stated in the standard IEC 60896-21	OPzV2-1200: No evidence of ground short, no leakage.	P
	Requirement and application: Operate units in different orientations and apply d.c. gradient; Pass for all applications: No evidence of ground short and leakage phenomena;		
6.6	Content and durability of required markings		
	The test shall consist of visual verification of a) the presence and b) the legibility of all the required markings before and after exposure to selected chemicals The test methods are according to clause 6.6.1 to 6.6.4 which are stated in the standard IEC 60896-21 including test with water and aliphatic solvent, test with neutralizing solutions and test with electrolyte	OPzV2-1200: The markings are readable after rubbed 15s with water, petroleum, solution of sodium carbonate, and 40% in weight of H_2SO_4 in water respectively. The requested information is present.	P
	Requirement and application: 1.Information shall remain readable after exposure to chemicals and remain in place 2. Requested information to be present		
6.7	Material identification		
	The test methods are according to clause 6.7.1 to 6.7.4 which are stated in the standard IEC 60896-21	OPzV2-1200: The cover and case is ABS Material.	P
	Requirement and application: Inspect case and/or cover for ISO 1043-1 materials symbols. Expose to chemicals. Pass for all applications: ISO symbols present on the outside of the cover or/and case. Symbols shall remain readable after exposure to chemicals and remain in place		

IEC 60896-21:2004 IEC 60896-22:2004			
Cl.	Requirement – Test	Result	Verdict
6.8	Valve operation		P
	The test methods are according to clause 6.8.1 to 6.8.3 which are stated in the standard IEC 60896-21	OPzV2-1200: Open/close valve presure (Kpa) is: open(10~30KPa); release(3~10KPa).	
	Requirement and application: Overcharge units and detect gas flow from the valve; Pass for all applications: Gas release detected before and after stress temperature impact test.		
6.9	Flammability rating of materials		State data
	The test methods are according to clause 6.9.1 to 6.9.4 which are stated in the standard IEC 60896-21	OPzV2-1200: Flammability rating level: UL 94-V0	
	Requirement and application Determine flammability rating of case and cover material; State data for all applications: State the flammability rating level for samples of thickness equivalent to that of case and cover.		
6.10	Intercell connector performance		P
	The test methods are according to clause 6.10.1 to 6.10.2 which are stated in the standard IEC 60896-21	OPzV2-1200: The maximum temperature: 45 ℃	
	Requirement and application: Measure and report maximum intercell connector temperature reached; State data for all applications: Stats maximum temperature reached.		
6.11	Discharge capacity		P
	The test methods are according to clause 6.11.1 to 6.11.12 which are stated in the standard IEC 60896-21	See appended table A	
	Requirement and application: Determine actual capacity C_a; C_a to be at least × % of C_{rt} with all units at all rates shown below ; 10h \ 8h \ 3h \ 1h \ 0,25\ 1,80Vpc\1,75Vpc\ 1,70Vpc\ 1,60\Vpc 1,60Vpc\ Ca≥95% C_{rt}		

IEC 60896-21:2004 IEC 60896-22:2004			
Cl.	Requirement – Test	Result	Verdict
6.12	Charge retention during storage		N/A
	The test methods are according to clause 6.12.1 to 6.12.7 which are stated in the standard IEC 60896-21	---	
	Requirement and application: Determine charge retention factor C_{rf} after 6 months of storage; Comply for all applications: C_{rf}≥70%		
6.13	Float service with daily discharges		N/A
	The test methods are according to clause 6.13.1 to 6.13.5 which are stated in the standard IEC 60896-21	---	
	Requirement and application: see table 9 and Table 17 in the standard IEC60896-22		
6.14	Recharge behavior		P
	The test methods are according to clause 6.14.1 to 6.14.12 which are stated in the standard IEC 60896-21	OPzV2-1200:	
	Requirement and application: Rbf24h 24h Recharge behavior factor ≥90% Rbf168h 168h Recharge behavior factor ≥98%	Rbf24h: 96%. Rbf168h: 99%.	
6.15	Service life at an operating temperature of 40 ℃		N/A
	The test methods are according to clause 6.15.1 to 6.15.5 which are stated in the standard IEC 60896-21	---	
	Requirement and application: Brief duration exposure time: ≥ 500days; Medium duration exposure time: ≥ 750days; Long duration exposure time: ≥ 1100days Very long duration exposure time: ≥ 1700days.		

IEC 60896-21:2004 IEC 60896-22:2004			
Cl.	Requirement – Test	Result	Verdict

6.16	Impact of a stress temperature of 55 ℃ or 60 ℃				N/A
	The test methods are according to clause 6.16.1 to 6.16.8 which are stated in the standard IEC 60896-21	---			
	Requirement and application: At 60 ℃ Capacity monitored with 3h rate discharge test: Brief duration exposure time ≥150days; Medium duration exposure time ≥ 175days; Long duration exposure time ≥250days; Very long duration exposure time ≥ 350days.				
6.17	Abusive over -discharge				P
	The test methods are according to clause 6.17.1 to 6.17.15 which are stated in the standard IEC 60896-21	OPzV2-1200: Cyclic over-discharge capacity C_{aoc}: 95%			
	Requirement and application: determine capacity ration C_{aod} ,unbalanced sting over-discharge C_{oad}, C_{oad}≥0,80(for the string)				
	Requirement and application: determine capacity ration C_{aoc} ,unbalanced sting over-discharge C_{oac}, C_{oac}≥0,90(for the string)				
6.18	Thermal runaway sensitivity				P
	The test methods are according to clause6.18.1 to 6.18.14 which are stated in the standard IEC 60896-21	OPzV2-1200:			
		At 2,45Vpc	At 2,60Vpc		
	Requirement and application: Comply for all applications: Achieve at least 1 week below 60 ℃ at 2,45Vpc and at least 24h below 60 ℃ at 2,60Vpc; Show ultimate time to 60 ℃ or ultimate temperature after 168h at 2,45Vpc and 2,60Vpc.	The Maximum temperature after 168h is 46 ℃ at 2,45V(below 60 ℃).	The Maximum temperature is 54 ℃ after 24h of charging at 2,60V;		
6.19	Low temperature sensitivity				State data
	The test methods are according to clause 6.19.1 to 6.19.13 which are stated in the standard IEC 60896-21	OPzV2-1200:			
	Requirement and application: show abusive low temperature service capacity (C_{als}) of all unit and report eventual freezing induced damages.	No.:	1#	2#	32#
		C_{als}:	99,0%	98,0%	98,0%
		No freezing induced damages.			

IEC 60896-21:2004 IEC 60896-22:2004			
Cl.	Requirement – Test	Result	Verdict

6.20	Dimensional stability at elevated internal pressure and temperature				State data
	The test methods are according to clause 6.20.1 to 6.20.6 which are stated in the standard IEC 60896-21	OPzV2-1200			
		Items	Length	Width	
	Requirement and application: Show dimensional change in percentage and in mm.	Chang in mm	0,57	0,82	
		Change in percentage	0,21%	0,39%	
6.21	Stability against mechanical abuse of units during installation				P
	The test methods are according to clause 6.21.1 to 6.21.6which are stated in the standard IEC 60896-21	OPzV2-1200: No leakage detectable after two times two drops.			
	Requirement and application: Show leakage inspection results; No leakage detectable after two times two drops.				

Table A: 6.11 Discharge capacity

Type	OPzV2-1200					OPzV2-3000	OPzV2-2500	OPzV2-2000	OPzV2-250
C / No	C_{10}(Ah)	C_8(Ah)	C_3(Ah)	C(Ah)	$C_{0.25}$(Ah)	4#	5#	6#	7#
Crt	1200	1136	925,5	758,4	540,0	3000	2500	2000	250
1#	1212,4	1152,6	945,0	777,2	550,8	C_{10}(Ah)			
2#	1209,1	1161,7	940,3	780,6	556,2	3055,5	2527,1	2010,6	261,3
3#	1218,7	1158,2	942,4	775,7	553,2	%of Crt			
---	%of Crt					103,6%	106,0%	101,7%	106,5%
1#	105,2%	101,5%	103,5%	106,0%	102,0%	---	---	---	---
2#	104,8%	105,4%	102,7%	100,5%	103,0%	---	---	---	---
3#	106,7%	100,7%	101,7%	104,8%	102,4%	---	---	---	---

Important

1. The test report is invalid without the official stamp of CVC and Paging seal of CVC.

2. Nobody is allowed to photocopy or partly photocopy this test report without written permission of CVC.

3. The test report is invalid without the signatures of Ratifier, Reviewer and Testing engineer.

4. The test report is invalid if altered.

5. Objections to the test report must be submitted to CVC within 15 days.

6. The test report is valid for the tested samples only.

7. As for the test result, “N/A” means “not applicable”, “P” means “pass”, “F” means “fail” and “-” means “no need for judgement”.

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