GASTON

GTS-L rang Stationary VRLA Battery

Installation Manual

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1 Installation precautions

1.1 Safety precautions

1.1.1 Sulfuric acid

The battery contains sulfuric acid that could cause burns and other injury. When battery is damaged, the sulfuric acid will flow out from it. Therefore, wearing rubber apron , glove, protective glasses or other eye protection are suggested. In case of contact with sulfuric acid , flush immediately and thoroughly with water and go to hospital for a treatment.

1.1.2 Gas

Explosive gas may be generated in the battery, so combustibles such as spark, flame and fumy materials etc. should be prohibited in the battery room, and 1211 fire extinguisher should be equipped, all the installation tools should be wrapped with the insulative electrical tape. In order to reduce the possibility of short circuit while installing battery. It is prohibited that leaving tools, sundries and other conductive things on the battery.

1.1.3 Electrical impact

The system that includes many cells might create high voltage, so should avoid the danger of electrical impact while installing battery.

1.2 Installation conditions

1.2.1 Place

The battery installation place should be far away from heat source and the place where it is easy to sparkle. The distance where the battery is away from the electrics and electrical switches etc.should be over 0.5m. it should avoid the direct irradiation of the sun, ensure there is no organic solvent and caustic gas and avoid the direct effect on the cell temperature by air-conditioner and outside intake, for the sake of prevent causing the asymmetry of battery voltage.

1.2.2 Space

Enough space is needed to install the battery. The distance between battery sides (or battery backsides) and wall is no less than 200mm. The distance between two battery groups (backside by backside) is no less than 200mm. A 1200mm wide alleyway before every battery group should exist in advance, in order to maintain and watch battery group expediently.

1.2.3 Floor load ability

While installing battery, the request of floor load ability should be satisfied. About the detailed information please refer to the calculation methods of floor load ability.

1.2.4 Connective cable

Connective cable should be selected according to the following formula:

$S = 0.3 \times I_m$

S …… Sectional acreage

I_m …… Max. current of equipment running

Connective cable should be as short as possible. This will make the system get the best performance.. When parallel connection, all the circuit lengths between the parallel connection terminals and the loads should be equal, thus it makes each parallel connection circuit have the same floating charge voltage.

1.2.5 Temperature

The running performance of the battery is the best at 25℃. The environment temperature of battery system should be set between 15℃ an 35℃. Air-conditioner is suggested to install, in order to ensure the battery could run safely and reliably.

1.2.6 Tools

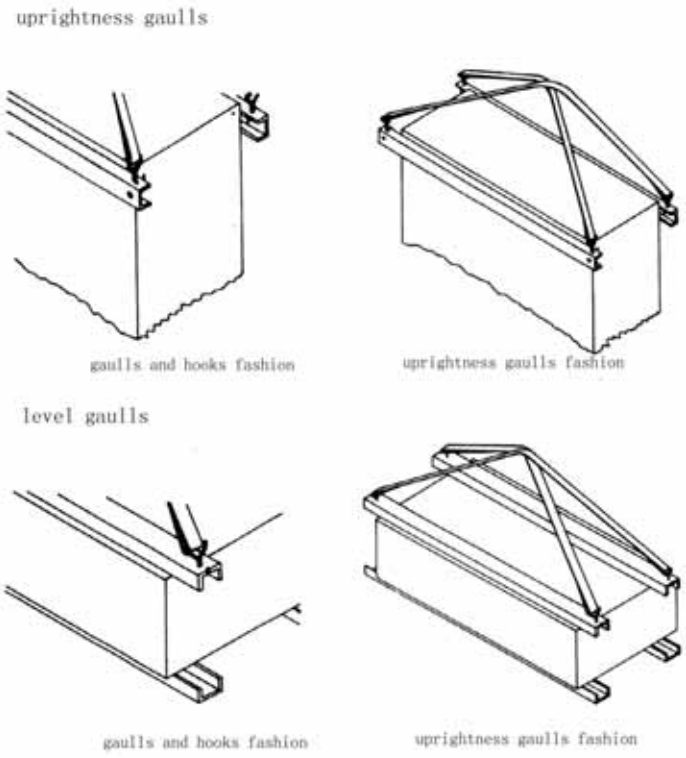
The tools such as impact electric drill, spanner (M6, M8, M10, M12) will be used.

1.3 Carrying

Because battery group is very heavy, please select the proper tools to carry, ensure that these tools can carry battery components safely.

- ✓ Rolling or throwing battery is forbidden.
- ✓ Don't touch the battery terminals and safety valve when carrying battery group.
- ✓ Prevent battery from short circuit and contacting with outside electric conduction when suspending and installing the battery.
- ✓ Use gallus and hooks correctly and don't suspending the battery by suing one gallus only.
- ✓ Only carry one group of battery by galluses.

The following is the sketch map about suspending and installing battery.



1.4 Declaration

battery won't hurt man and pollute the environment on the normal condition. But some dangerous things would happen such as releasing hydrogen and acid fog, leaking electrolyte, battery exploding etc., because of deviant operating, defacement, misapplication and misuse. This manual supplies the knowledge that should be known about installing battery. Therefore,WE suggests that this manual should be read detailedly and the battery ought to be installed according to this manual strictly.

2 Installation steps

2.1 Fixing battery slot steel

In order to make battery have the best stability and improve the ability of battery against earthquake, please install slot steel. Fix the slot steel on the floor with ground screws or expansible screws (equipped by customer, M10—M12). The requirement of distance between screws is following:

Position dimensions of battery slot steel

Battery type	A	B	C	D
GTS12-100L	387	222.6	60	50
GTS12-200L	615			
GTS12-300L	843			
GTS6-400L	573			
GTS6-500L	687			
GTS6-600L	801			
GTS12-500L	907	406.4		
GTS12-600L	1021			
GTS6-800L	751			
GTS6-1000L	865			
GTS4-1500L	743	318	71	
GTS6-1500L	1097			

2.2 Fixing rock-bottom batteries

Please fix the rock- bottom batteries on the slot steel with the bolts (M10×30) and nuts referring to figure 1.

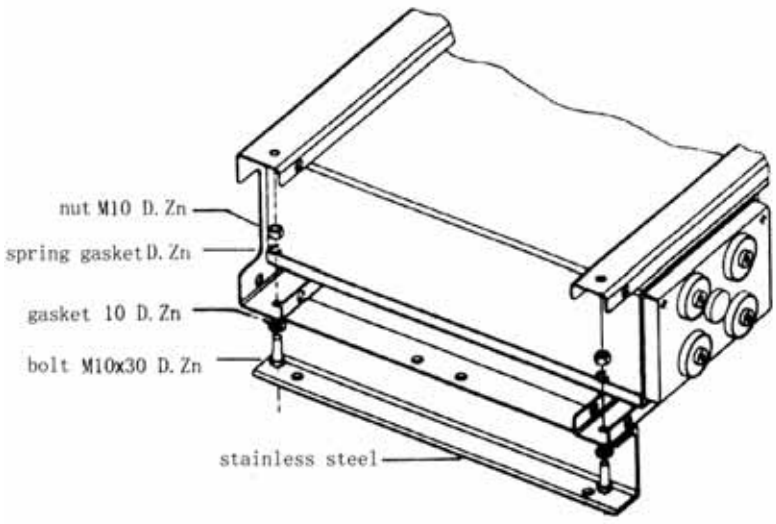


Fig 1

2.3 Fixing various layer of battery

Fix other batteries layer by layer and row by row with galvanized bolts(M10×30), nuts(M10) and gaskets referring to figure 2. Please ensure that the position arrange of battery positive and negative must be accordant with the system drawing, while installing each battery component. In the end, install the pressing lath on the batteries and attach the serials label to the pressing lath.

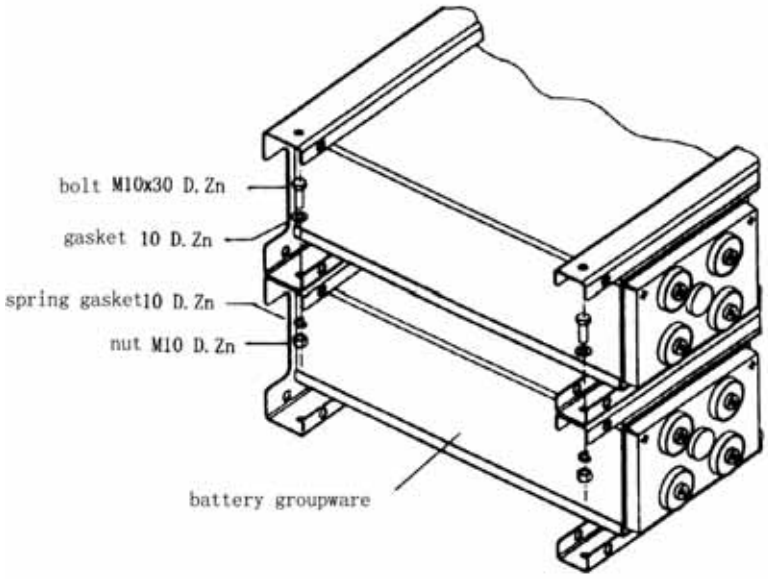


Fig2

2.4 Installing positive and negative insulative bracket

- ✓ Place the insulative bracket between the slot steel of battery component referring to figure 3.
- ✓ Fix the insulative bracket on the slot steel with galvanized bolts(M6×20), gaskets and screw them.

2.5 Installing terminal plate and angle shelves (Fig 4)

2.5.1First, connect the terminal plate with angle shelves by using stainless steel bolts(M8×35) and gaskets.

2.5.2 Then,fix the above- mentioned combined components on the insulative bracket with stainless steel bolts(M8×35), nuts(M8) and gaskets.

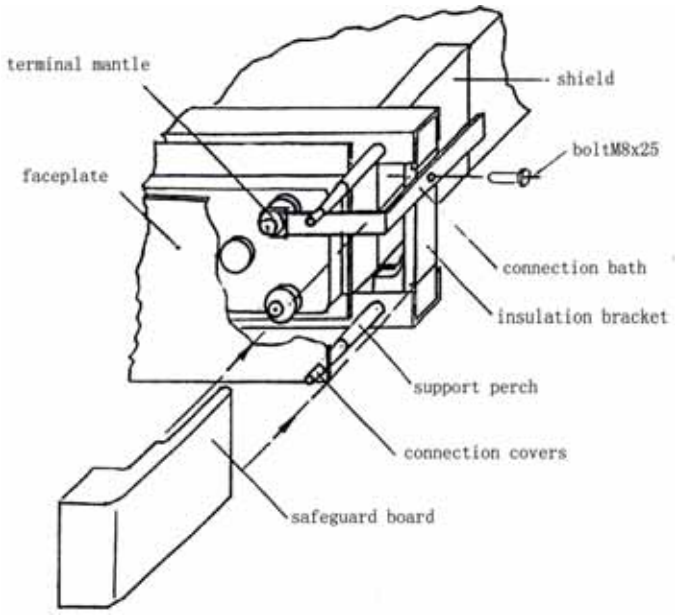


Fig 4

2.6 Circuit connection

Make series-parallel connection of battery circuit and install cupper jointing plate(when needed) referring to the system drawing of battery.

- ✓ Should clean the battery terminals and make sure there is no dirt such as dust, rust etc. before
- ✓ connecting.
- ✓ Select the available bolts to connect battery circuit referring to the following table:

Battery type	Slot specifications		
	Connection between terminals	Connection between terminal and angle shelves	Connection between terminal and forniciform connective plate
GTS12-100L	M6X20	M6X20	/
GTS-1500L	M10X30	M8X25	M10X30
Other types	M8X25	M8X20	M8X25

- ✓ Make sure that the bolts in the connective lath and cupper jointing plate must be screwed tightly, and the corresponding moment are indicated in the following firm:

The connection of battery components	the corresponding moment（N.M）
M6 stainless bolts	8
M8 stainless bolts	15
M10 stainless bolts	20
M12 stainless bolts	22
M6 stainless bolts	30
The connective bolts between battery components	30
Ground bolts	30

Note: make sure that the connection of battery circuit must be accordant with the system drawing.

2.7 Installing battery safeguard board and shield (Fig 5)

Install battery shield and insert battery safeguard board into the insulative bracket.

Spring gasker

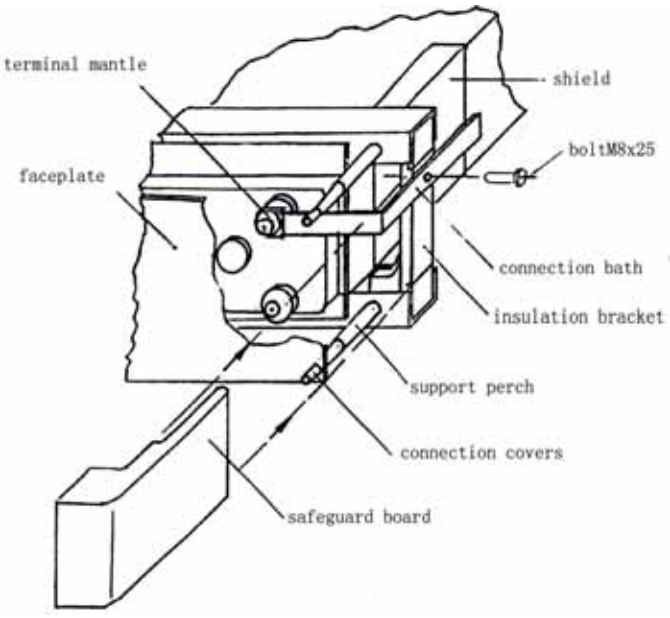


Fig 5

2.8 Installing battery front panel(Fig 6)

- ✓ Fix knight heads in the four-limbed hole of battery component with bolts(M6×20) and rubber gaskets.
- ✓ Insert the connective covers in the four-limbed hole of the panel obverse and insert the knight heads into the connective covers in the panel back.

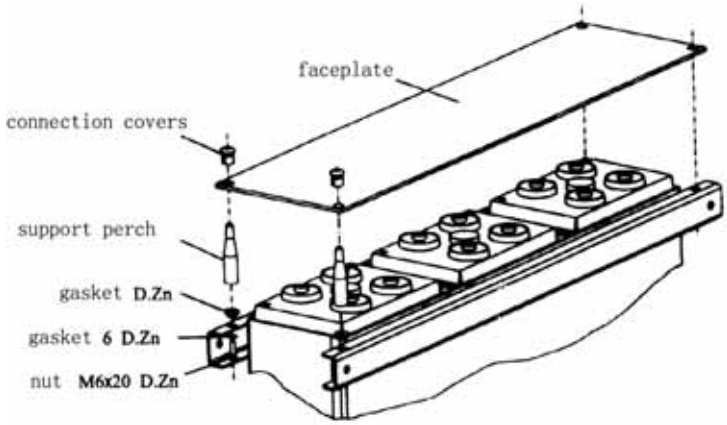


Fig 6

2.9 Installing cables (provided by customer)

Note: The specification of bolts is M12×35, which are provided by ***GASTON*** company and used to connect batteries with the cables.

3 Checking after installation

- ✓ Check all the conductive bolts one by one before conducting to see if they are screwed tightly in order to avoid causing bad accident.
- ✓ Inspect the total voltage of the battery system to see if it is normal. If it is abnormal , please check if the connections between battery positive and negative and the circuit connections are accordant with the system drawing.

Excursus 1 Installation mode and occupied space

24V system

Battery type	Installation mode		Total weight (Kg)	Occupied space L×W×H(mm)	Drawing No.	Page
	floor	column				
GTS12-100L	2	1	144	437×318×536	8	16
GTS12-200L	2	1	229	665×318×536	8	16
GTS12-300L	2	1	325	893×318×536	8	16
GTS6-400L	2	2	439	1246×318×318	10	17
	4	1	439	623×318×972	11	18
GTS12-500L	1	2	491	1914×503×318	7	16
	2	1	491	957×503×536	8	16
GTS12-600L	1	2	570	2142×503×318	7	16
	2	1	570	1071×503×536	8	16
GTS6-800L	1	4	827	3204×503×318	9	17
	2	2	827	1503×503×536	10	17
	4	1	827	801×503×972	11	18
GTS6-1000L	1	4	951	3660×503×318	9	17
	2	2	951	1830×503×536	10	17
	4	1	951	951×503×972	11	18
GTS-1500L	2	3	1318	2379×460×679	12	18
	3	2	1318	1586×460×956	13	19
	6	1	1318	793×460×1787	14	19
GTS6-1500L	1	4	1310	4588×460×402	9	17
	2	2	1310	2294×460×679	10	17
	4	1	1310	1147×460×1233	11	18

48V system

Battery type	Installation mode		Total weitht（Kg）	Occupied space L×W×H(mm)	Drawing no.	Page
	floor	column				
GTS12-100L	4	1	278	437×318×972	17	21
GTS12-200L	1	4	447	2660×318×318	15	20
	2	2	447	1330×318×536	16	20
	4	1	447	665×318×972	17	21
GTS12-300L	1	4	638	3572×318×318	15	20
	2	2	638	1786×318×536	16	20
	4	1	638	893×318×972	17	21
GTS6-400L	2	4	867	2492×1032×536	18	21
	4	2	867	1246×318×972	19	22
GTS12-500L	1	4	969	3828×503×318	15	20
	2	2	969	1914×503×536	16	20
	4	1	969	957×503×972	17	21
GTS12-600L	1	4	1126	3828×503×318	15	20
	2	2	1126	2142×503×536	16	20
	4	1	1126	1071×503×972	17	21
GTS6-800L	2	4	1641	3204×503×536	18	21
	4	2	1641	1503×503×972	19	22
	8	1	1641	801×503×1844	20	22
GTS6-1000L	2	4	1889	3660×503×536	18	21
	4	2	1889	1830×503×972	19	22
	8	1	1889	915×503×1844	20	22
GTS4-1500L	6	2	2631	1586×460×1787	21	23
GTS6-1500L	2	4	2604	4588×460×679	18	21
	4	2	2604	2294×460×1233	19	22
Parallel connection GTS6-2000L	4	4	3790	3660×503×972	22	23
	8	2	3780	1830×503×1844	23	24
Parallel connection GTS6-3000L	4	3	5690	2745×1206×972	24	24
	6	4	5680	3660×503×1408	25	25

Excursus 2: battery layout and connecting type

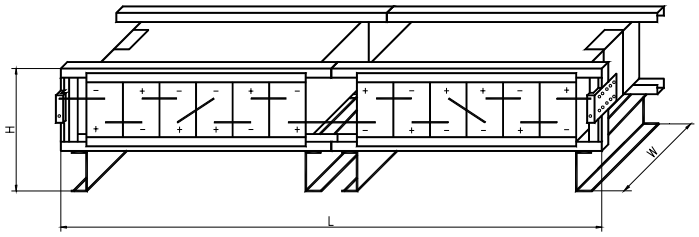


Fig 7　24V（one floor and two columns）

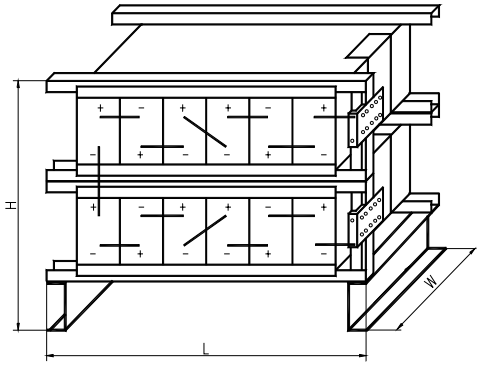


Fig 8　24V（two floors and one column）

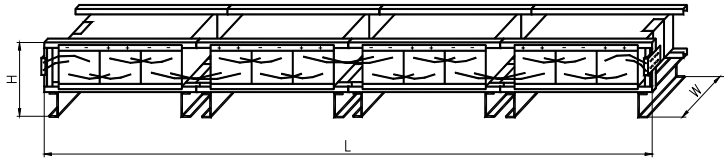


Fig 9　24V（one floor and four columns）

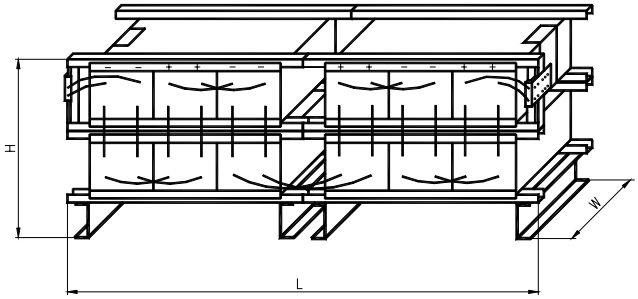


Fig 10　24V（two floors and two columns）

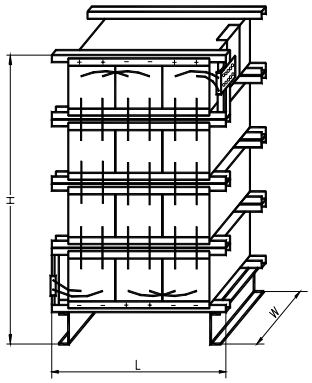


Fig 11　24V（fours floors and one column）

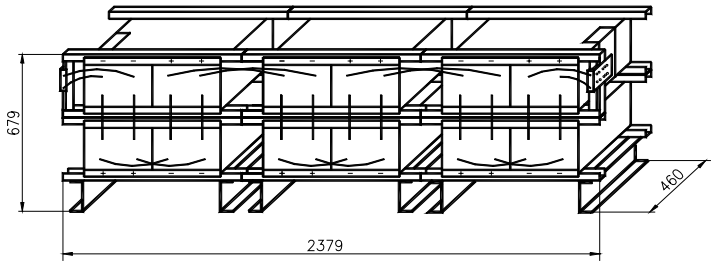


Fig 12　24V（two floors and three columns）

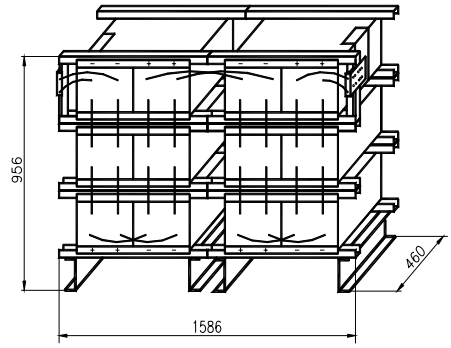


Fig 13　　24V（three floors and two columns）

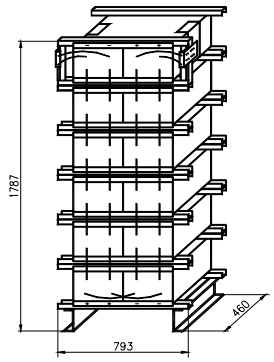


Fig 14　　24V （sex floors and one column）

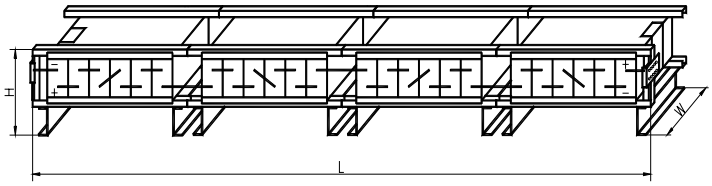


Fig 15　　48V（one floor and four columns）

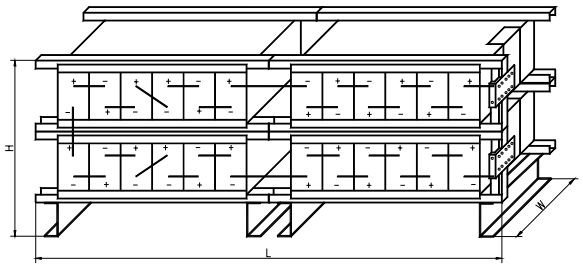


Fig 16　48V（two　floors and two columns）

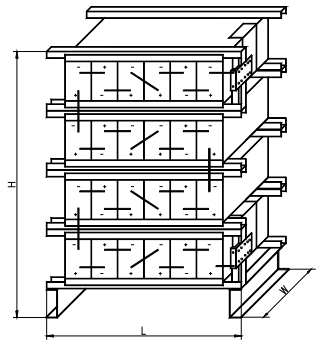


Fig 17　48V（four　floors and one column）

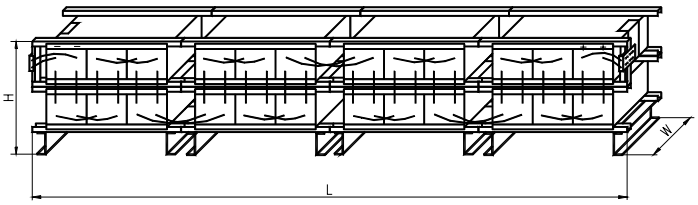


Fig 18　48V（two　floors and four columns）

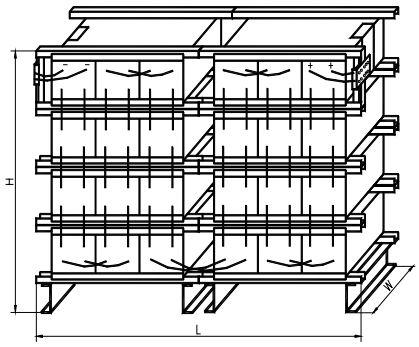


Fig 19　48V（four floors and two columns ）

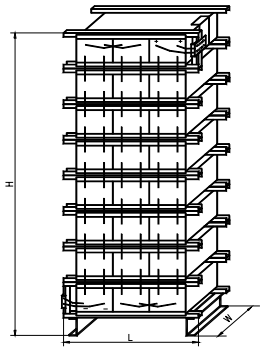


Fig 20　48V（eight　floors and one　column）

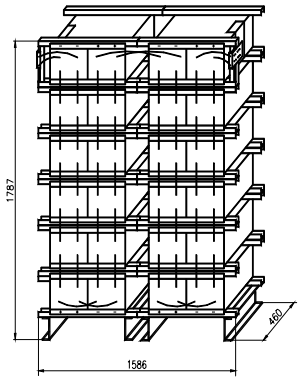


Fig 21　48V（six floors and two columns）

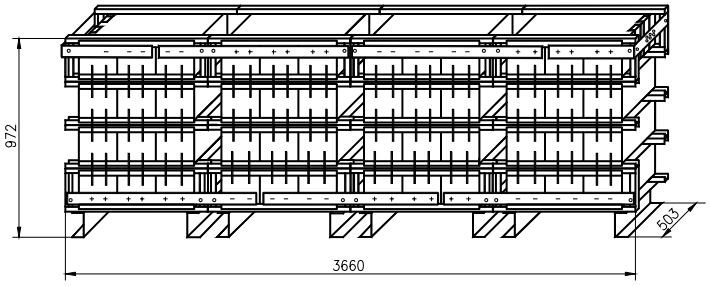


Fig 22　48V（two parallel connections/four floors and four columns）

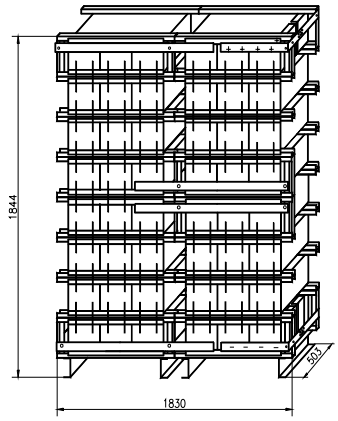


Fig23　48V（two parallel connections/eight floors and four columns）

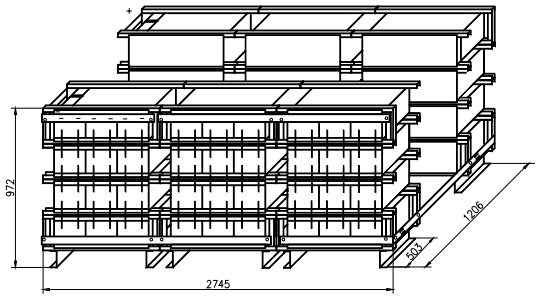


Fig24　48V（three parallel connections/four floors and three columns）

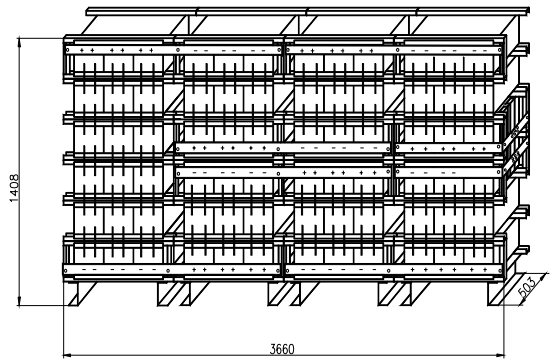


Fig 25　48V（three parallel connections/six floors and four columns）