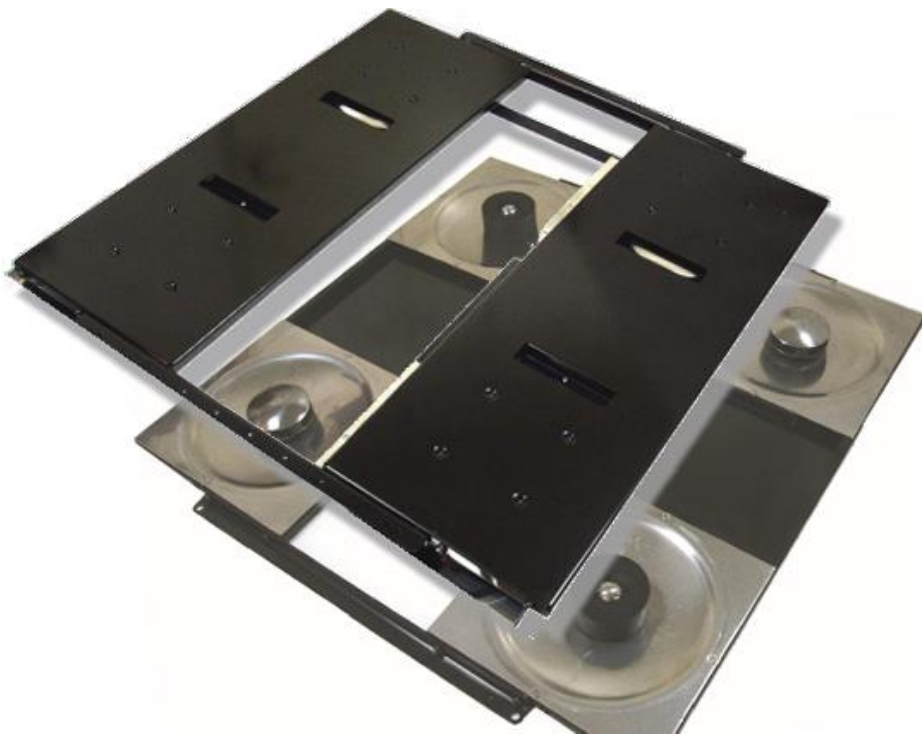


Specification and Installation

absolver®

Model F1



Version F1_1802-E1b updated Feb. 10, 2018

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- (1) The contents of this specification are subject to change without notice.
- (2) The absolver model F1 is a new model that has been changed from a conventional fixed inter-link model to the flexible sized model that can be scaled in width.
- (3) There is no change with the old model except the procedure to connect the connection bar.

Table of Contents

1. Packing of Absolver-F1	3
1-1 Packing for one unit of Absolver	3
1-2 Parts number	4
(1) Absolver Unit	4
(2) Connection Bar	4
(3) End Bar	4
(4) Rubber Mat (optional)	4
2. Specifications of Flexible type absolver: model F1	5
2-1 Absolver model F1 and Connection Bars	5
2-2 Rubber Mat	5
3. Installation	6
3-1 Field survey	6
3-2 Floor situation	6
3-3 Weight restriction and installation position of the object	6
3-4 Allowance for cable wiring	7
3-5 Fixing of objects (server rack etc.)	7
4. Assembly	8
(1) Bearing	8
(2) Remove all bolts (front and rear 6 pieces) from the main unit	11
(3) Connect the units.	11
(4) Remove the upper unit once.	12
(5) Then attach the square connection bar to the upper unit	12
(6) Insert and screw the connection bar ab-U500 or ab-U700	12
(7) When arranging two or more racks, connect three or more Absolver units.	12
Appendix:	13
A-1 Layout example of two racks and three unit	13
A-2 Table of possible value of space between absolver units	14
A-3 Screw hole positions of absolver unit and connection bar	15
A-4 How to decide the layout ?	16
A-5 Installation procedure	16
A-6 Layout Example of ten racks	17
A-7 Sectional view of the unit connection of absolver	17

1. Packing of Abserver-F1

The factory shipment of the Abserver-F1 is as shown in the figure below.

The seismic isolation unit which fixed the upper and lower plates with temporary fixing metal fittings, the connector bar which connects it, and other parts are packed.

Please check whether it is packed as shown in the figure below.

One packing consists of one unit Abserver. For one rack, use 2 units.

When two or more racks are consecutive, add one unit to connect them.

1-1 Packing for one unit of Abserver

1. Main Unit of Abserver

- Upper and Lower plate × 1 each
- Bearing × 2
- Hexagon socket head bolt M8: short × 8 (for L-shaped bar), long × 8 (for square bar)
- Temporary fixing bracket × 2

2. ab-F-344: Square outer bar to attach to the Main unit (2 for upper plate)

32×32×344mm t=1.6mm

3. Square inner bar to connect two units: 28×28×500mm (or 700mm) t=1.6mm

4. L-shaped outer bar to connect lower plates: 28×28×500mm (or 700mm) t=1.6mm

5. Wire band for rack fixing (541 mm × 2, tensile strength 100 kgf)

6. Hexagon bolt (M8 long × 8 pieces, washer × 8 pieces)

7. End-bar × 2: 28×28×150mm t=1.6mm

8. Installation manual

Note:

- (1) For items 3 and 4, select one of 500 mm or 700 mm bar.
- (2) The end-bar of item 8 comes with two bars for one block of connected units.
Specify the number of end-bars when ordering



The image may be different from the real set.
Rubber mat is optional.

1-2 Parts number

When placing an order, please indicate the parts number and quantity.

(1) Absorber Unit

One extra unit is required for the number of racks

- ab-F11 Depth=1100mm
- ab-F13 Depth=1300mm
- ab-F15 Depth=1500mm

(2) Connection Bar

The number of units plus 2 bars are standard accessories.

If the number of units is odd, only one more bar is added.

Indicate even number of each bar of 500 mm or 700 mm when ordering.

- ab-U500 500mm square bar for upper unit
- ab-U700 700mm square bar for upper unit
- ab-L500 500mm L-shaped bar for lower unit
- ab-L700 700mm L-shaped bar for upper unit

(3) End Bar

End bar is required at both ends of the connected block.

Four end-bars are required per block. Please specify the number of blocks when ordering.

- ab-E150 150mm square bar for both ends.

(4) Rubber Mat (optional)

- ab-KH8 300×300mm

Two mats of ab-KH8 are required for one absorber unit.

2. Specifications of Flexible type absorber: model F1

2-1 Absorber model F1 and Connection Bars

Parts number		ab-F11	ab-F13	ab-F15
Name		Absorber Model F1		
Unit Size	W	344 mm		
	D	1100	1300	1500
	H	63mm (*1)		
Unit Weight		35kg	40kg	45kg
Set Size for 500 mm bar		844 / 884 / 924 / 964 / 1004		
Set Size for 700mm bar		1044 / 1084 / 1124 / 1164 / 1204		
Maximum load weight		1000kg per unit (*2)		
Material		Main body and Connector: SS 400 or equivalent, Saucer: SUS 430, Marble (Oblate spheroid) bearing: Ductile Iron, Steel ball: Bearing steel, Pad: Special rubber, Surface treatment: Cation electrodeposition coating		
Accessories		<ul style="list-style-type: none"> • Instruction manual, Wire Bands, • Square Connection Bar set for upper unit: ab-U500 or ab-U700 (500mm or 700mm bars: two each) • L-shaped Connection Bar set for lower unit: ab-L500 or ab-L700 (500 or 700mm bars: two each) 		

(*1) Upon earthquake, it will raise up to 10 mm higher.

(*2) Depending on the deviation from the unit center of the weight center of gravity, the maximum loading weight will be 500 to 1000 kg.

2-2 Rubber Mat

- Parts Number : ab-KH8
- Size : 300×300×8 mm
- Warranty : about 10 years in indoor use
- Material : natural rubber or chloroprene rubber
- Quality standard: JIS K6386 Rubber materials for vibration isolators



3. Installation

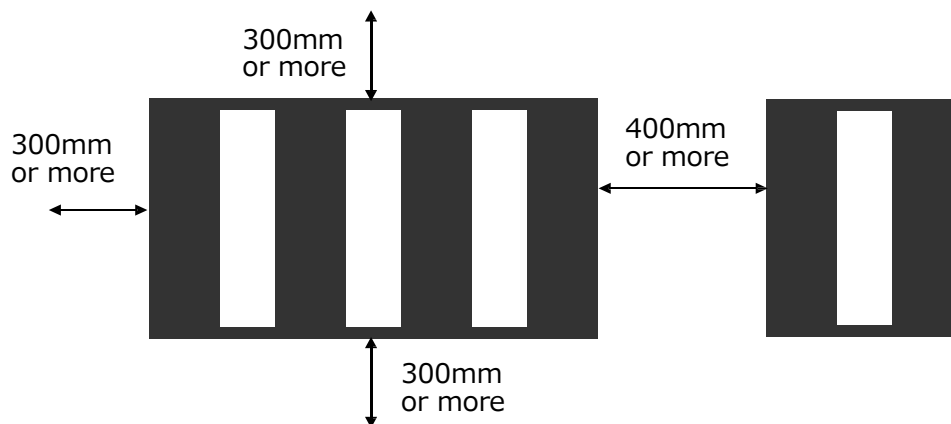
3-1 Field survey

Please investigate the installation site in advance.

- Prepare enough space to jack up or move existing racks.
- Check the wiring position at field investigation.
Be sure to take sufficient extra length of 30 cm or more in advance for the cable wiring of the rack.

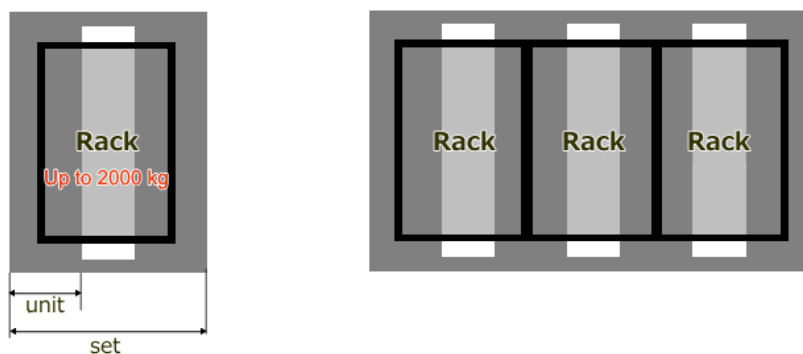
3-2 Floor situation

- Install observer on a level and smooth floor within an inclination of about 6/1000 mm.
- If there is a problem with the leveling of the installation floor, please adjust using a shim plate such as steel plate or an optional rubber mat so that Observer is installed horizontally.
- Observer moves about ± 200 mm at the time of an earthquake, so please take a space of 300 mm or more around it.
- It is also recommended to keep the space between observers 400 mm or more for safety.



3-3 Weight restriction and installation position of the object

- Weight of the load for one set of Observer (two units Observer per rack) should be within 2,000 kg maximum.

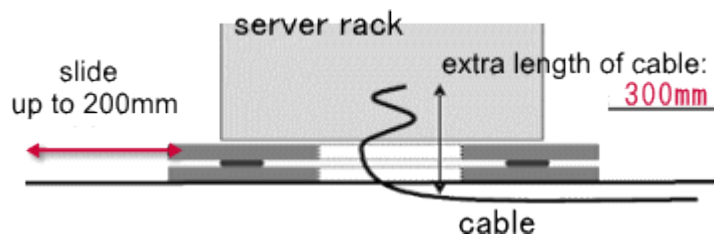


- When arranging multiple racks, please be sure to arrange them as evenly as possible for each unit.

3-4 Allowance for cable wiring

Abserver usually moves around 200mm horizontally.

If there is any wiring or cables connected to the load we recommend there be at least 300mm of slack.

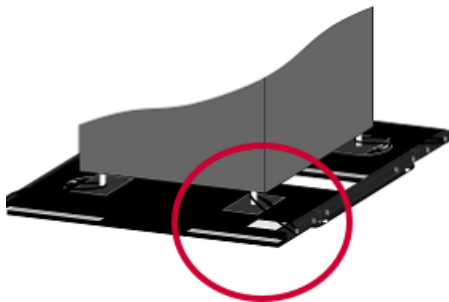


3-5 Fixing of objects (server rack etc.)

There is a possibility that the loaded object will be displaced from the Abserver when it is artificially pushed or an earthquake occurs.

It is recommended to fix Abserver and the load with standard fixing band.

If the caster or leveler is the load point, the load will be concentrated, so please lay it on the attached fixed plate (for load distribution).



Wire Band



temporary fixing bracket

4. Assembly

Observer should be assembled with 2 units or more.

(1) Bearing

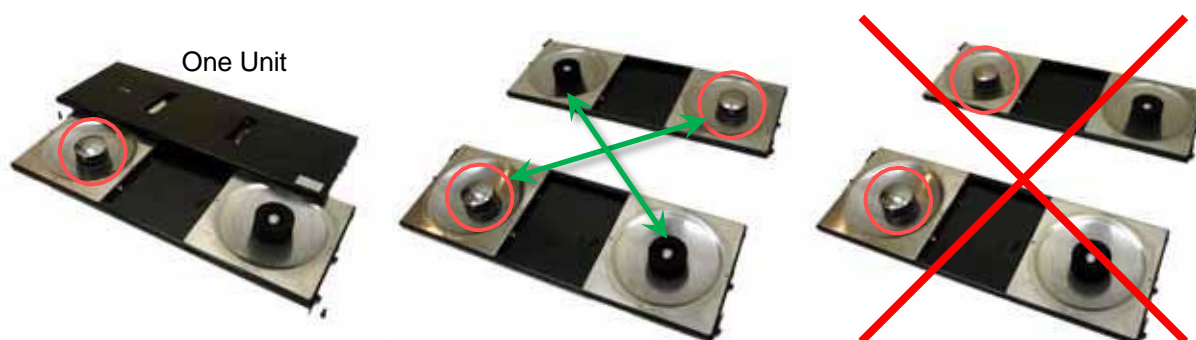
The main unit has a marble type bearing and/or a ball type bearing (with pad) inside.

There is a "marble" seal on the top of the unit on the marble type bearing side.

If two different type of bearings are used, please be sure to set the same type of bearing on the diagonal as shown below.

* Damping ratio of marble bearing and ball bearing is different.

When installing each in parallel, the size to slide at the occurrence of an earthquake will change in the front and back, left and right, there is a possibility of collapse, be sure to set it on the diagonal.



Be sure to set it on the diagonal when using two different type of bearings.



When the upper and lower plate of the Observer unit is already set, as shown in the figure, there is a "Marble" sticker on the side where the marble bearing is located.

(2) Remove all bolts (front and rear 6 pieces) from the main unit.

Put all bolts in a container etc. so that the bolt will not go away, please temporarily keep it.
Remove the temporary fixing bracket in the same way and keep it (temporary fixing bracket is necessary when fastening the rack and the device).



(3) Connect the units.

First, install the L-shaped connector bar ab-L500 or ab-L700 between the lower units. Please fix it to each unit with 2 bolts (short) removed. As for the fixing part, it is two inner parts as seen from the unit (Since it becomes free at the two ends of the lower unit, it is recommended to install the bolt directly to the unit.)



- (4) Remove the upper unit once.

Make sure that the position of the bearing is in the center of the isolation plate.

In case of misplacement, please correct the position. Also, when you exchange optional parts, please change at this time.



- (5) Then attach the square connection bar to the upper unit.

Tighten the bolt hole and temporarily fix it, the work will be smooth (There are positioning holes at the top, so please work together).

- (6) Insert and screw the connection bar ab-U500 or ab-U700

- (7) When arranging two or more racks, connect three or more Absolver units.

In this case, connect the end connectors only for both end sides.

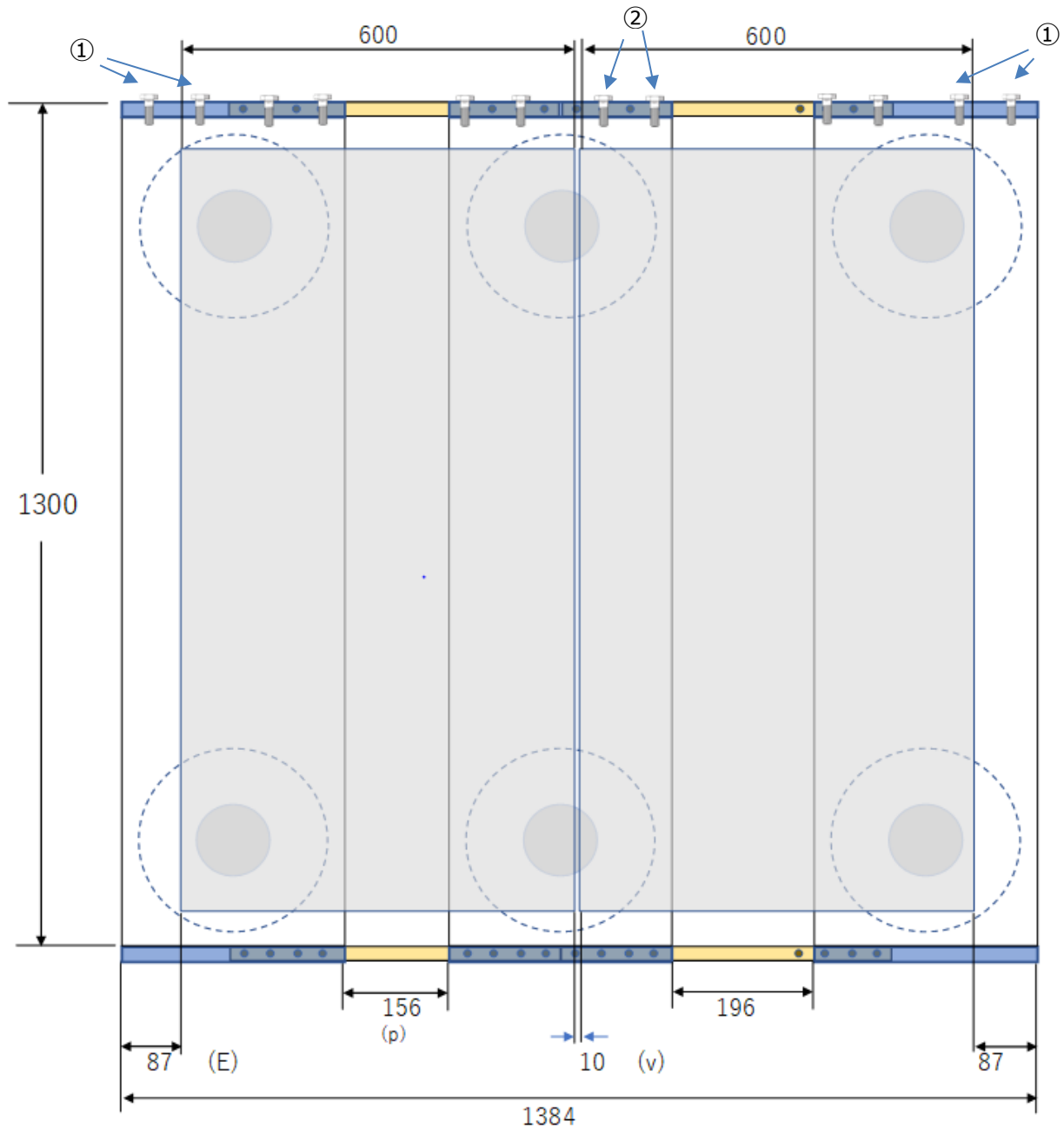
Use only the square connector bar for the middle part.



Appendix:

A-1 Layout example of two racks and three unit

Layout example of two 600 mm racks

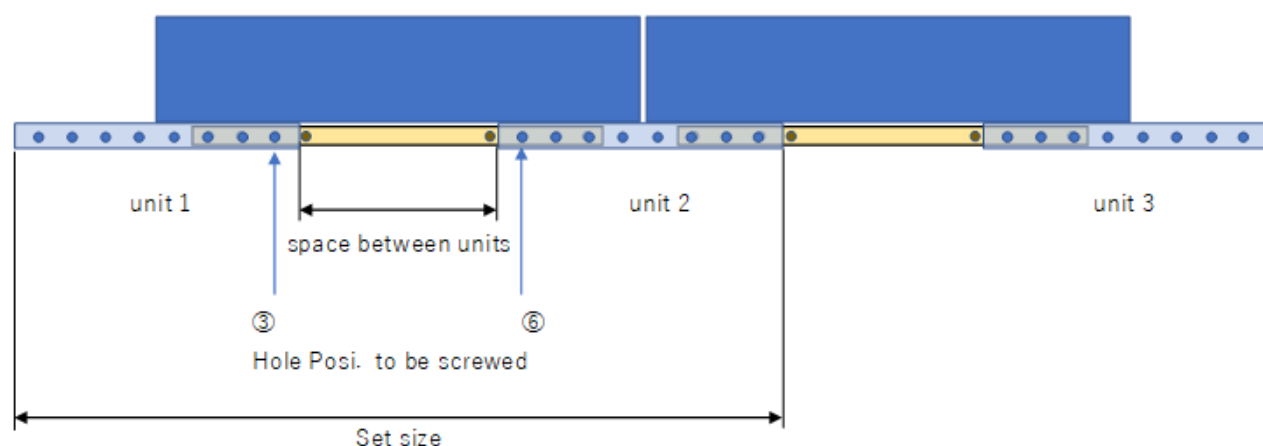


Note for Installation:

- ① Be sure to use the end-bar for reinforcement and two screws to tighten both ends.
- ② Be sure to tighten the connection bar with two or more screws.

A-2 Table of possible value of space between abserver units

Hole position where the abserver unit and connecting bar are screwed



Possible value of space between abserver units for 500mm Bar

Hole Posi. to be screwed	unit 2				Mini..Set size	
	⑤	⑥	⑦	⑧	Max. Set size	
unit 1	①				Recommended Rack Size	
	②	236	276	316	580	660
	③	196	236	276	540	620
	④	156	196	236	500	580

Possible value of space between abserver units for 700mm Bar

Hole Posi. To be screwed	unit 2				Mini..Set size	
	⑤	⑥	⑦	⑧	Max. Set size	
unit 1	①				Recommended Rack Size	
	②	436	476	516	780	860
	③	396	436	476	740	820
	④	356	396	436	700	780

Note: Since the combination of ① and ⑧ becomes a one-hole screw tightening, we recommend not to use it for reasons of safety.

A-3 Screw hole positions of abserver unit and connection bar

The connection bar has square and L shapes, each with a length of 500 mm and 700 mm.

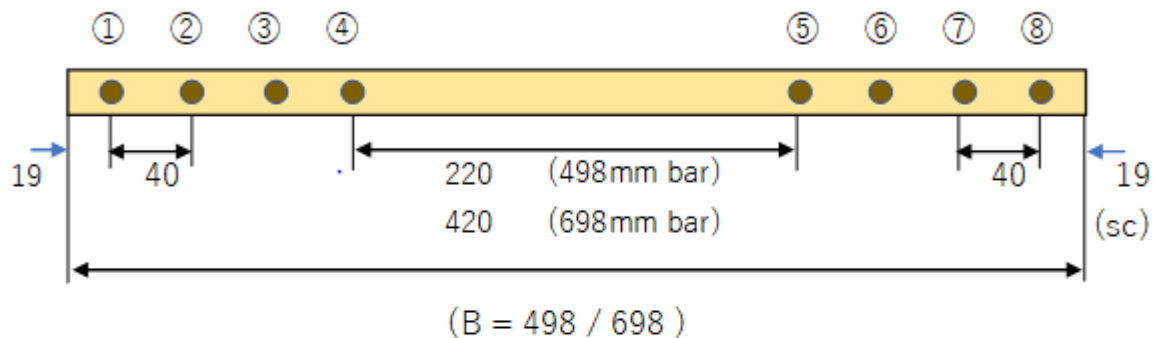
The square connecting bar is used to connect the upper unit.

The L-shaped connecting bar is used to connect the lower unit.

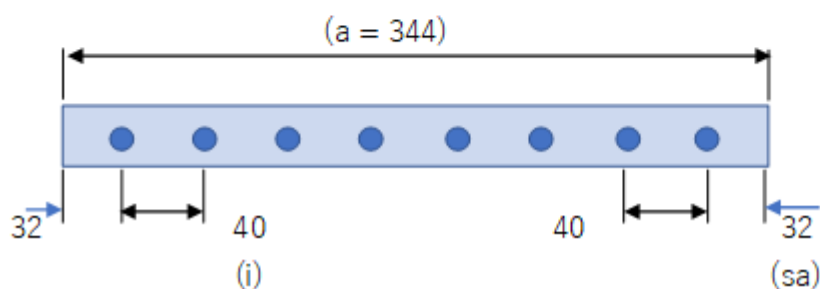
Notes on screwing the connection bar

- Avoid using hole ① and ⑧ alone.
- Screw with more than 2 places.
- Screw the L-shaped bar directly to the unit body to connect the lower units.

Screw hole position of Connection bar



Position of the screw hole of abserver unit



A-4 How to decide the layout ?

Calculation method to determine the layout :

set values to be $W+C = U+P$

- | | |
|--|---------------|
| 1. Calculate the total width of racks to be lined side by side | = W |
| 2. Number of racks | = r |
| 2. Number of racks + 1 = number of units of abserver | = n |
| 3. Total width of units = $n \times 344$ | = U |
| 5. Set the provisional value of clearance between racks | = v |
| 6. Set the provisional value of rack position from the left and right ends | = e |
| 7. Calculate the total provisional value = $v \times (r-1) + e \times 2$ | = C |
| 8. Set the optimum pitch for each rack width from the table | |
| 9. Calculate the total pitch between units | = P |
| 11. Reset the value of rack position from the left and right ends | |
| = $(U+P - (W+vx(r-1))) / 2$ | = E |
| 12. Total extension width | = $U+P = W+C$ |

Note:

- 1) In step 5 to 6, provisional values should be changed according to the results of steps 9 to 11.
- 2) Both value of rack position from the left and right ends should be the same, in order to hold the center of gravity balance to abserver as evenly as possible.

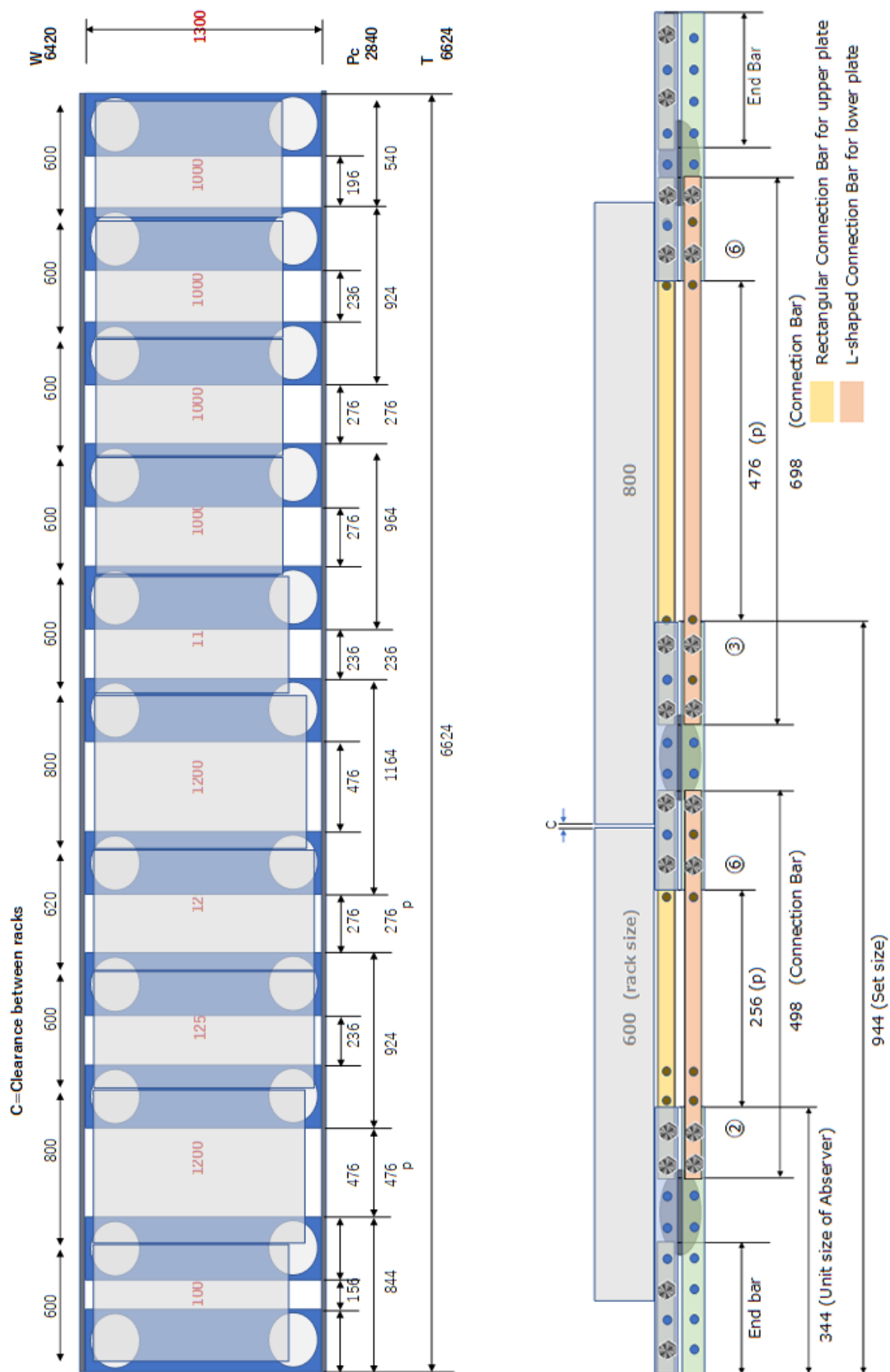
There are excel sheets that can almost automate these calculations.
Please request it when necessary.

A-5 Installation procedure

(Refer to the figure on the next page)

- (1) Connect two lower units with L-shaped connection bar ab-L500 or ab-L700.
- (2) Insert the inner bar ab-U500 or ab-L700 into the ab-F-344 Square outer bar and screw them to the upper unit.
- (3) Connect the third and subsequent units in the same procedure
- (4) Insert the end-bar at both ends of the connected unit and tighten with two screws

A-6 Layout Example of ten racks



A-7 Sectional view of the unit connection of abserver

