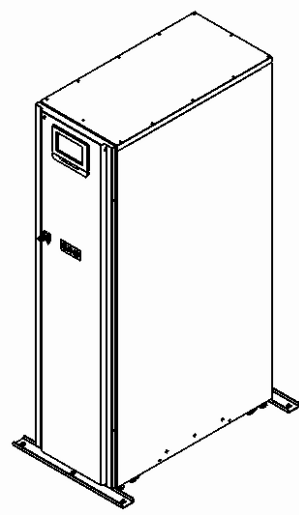
Eaton Corporation
Power Quality Division

Email : aupqsales@eaton.com
Web : www.powerquality.eaton.com

Application Note
AN0150
Issue A, January 2018

93PS20 Hold-down Installation

Last updated	17 January 2018
Applicable products	UPS 93PS20
Audience	Eaton UPS Customers ,Product Channel Partners and Integrators
Related documents	93PS20 Certificate of Design Compliance 7710 (Australia) 93PS20 Certificate of Design Compliance 7620 (New Zealand) Ramset Specifiers Anchoring Resource Book ANZ – EPCON C8 cracked concrete anchor studs Eaton 93PS20 - GA
For more information	Contact eeshelpdesk@eaton.com with details of the product.



Introduction

This application note details how to effect the hold – down installation of a 93PS20 UPS on a concrete floor to comply with seismic certificates 7710 and 7620 (refer appendices)

Assumptions

1. Centre of mass is located as indicated in the document "Eaton 93PS20 - GA" (refer appendix)
2. The proposed UPS units, or associated fixings, are not installed over a building movement Joint
3. The UPS units are installed in accordance with the clearance requirements outlined within the design report for *"Seismic and post disaster response building engineering services- BSEDRE-000-001* ':
4. Anchor fixings are located to avoid all reinforcement and post-tensioning ducts within the floor slab. Eaton recommend that the concrete floor slab is scanned with a ground penetrating radar, or similar, to set out the location of the required fixings. Strictly no reinforcement is to be cut without prior written approval by the main building structural engineer.
5. All fitments, nuts and bolts to be hot dip galvanised to AS 4680 or zinc plated
6. The UPS units are installed within a very low (Category A) atmospheric environment, in accordance with AS 2312.
7. The concrete floor slab has a minimum thickness of 150mm
8. The concrete slab and wall has a compressive strength of at least f'c=32MPa
9. Chemical anchors are installed in accordance with the manufacturer's specifications.
10. Chemical anchors are rated for seismic loading in cracked concrete.
11. The edge distance between the centre of any anchor and the nearest concrete edge is at least 200mm

If any of these criteria are not met on site, the capacity of the anchors may be compromised and the seismic restraint may not meet the design requirements. Please notify Eaton if any of the site conditions vary from the design assumptions.

Definitions

93PS20 :	Eaton UPS
EPCON C8	Ramset Hold-down Resin

References

	Name	Location
1	Chemical Anchoring - Specifiers Resource Book Ramset SARB ANZ – EPCON C8 Cracked Concrete Anchor Studs.pdf	http://www.ramset.co.nz/Document/Resources/361/Search
2	07710 Certificate of Compliance 93PS 20kW (Australia)	Appendix A
3	07620 Certificate of Compliance 93PS 20kW (New Zealand)	Appendix B
4	Eaton 93PS20 - GA	Appendix C

93PS20 Hold-Down installation

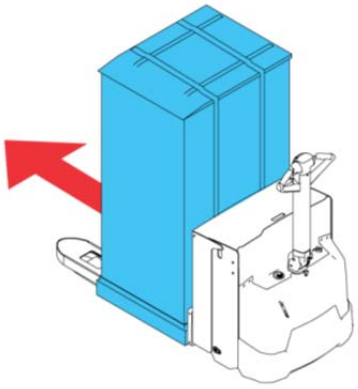
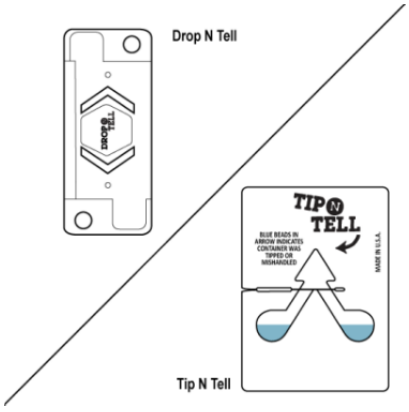
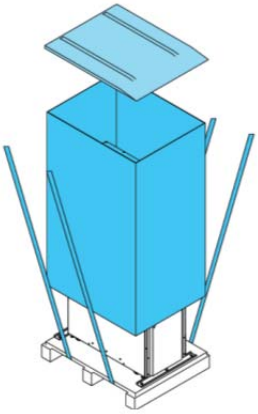
Unpacking and unloading the UPS

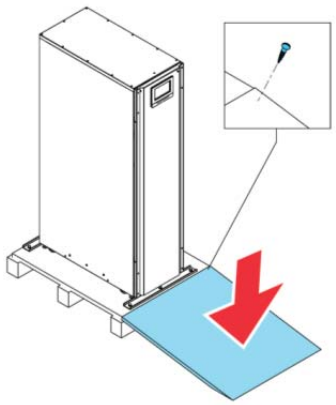
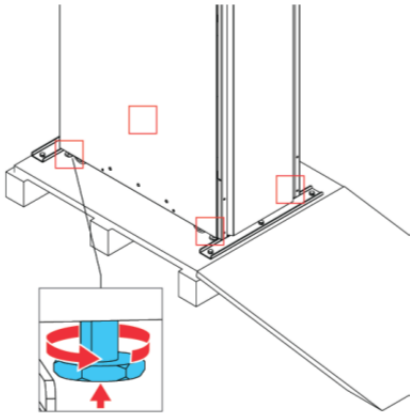
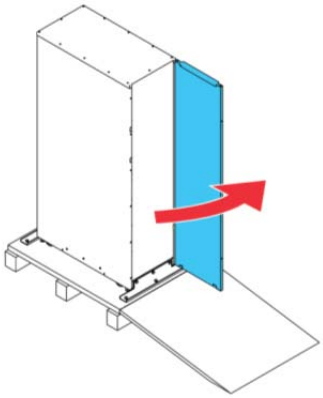
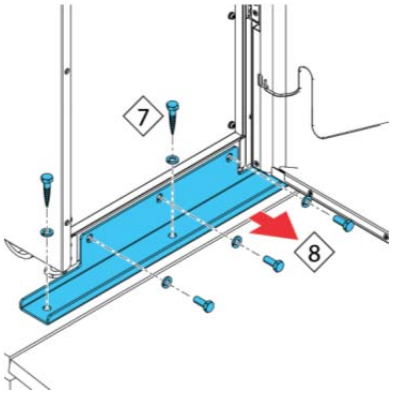
Before you start to unpack and unload the UPS, check the TipNTell / DropNTell indicator on the package surface (see step 2 below). If the equipment has been correctly transported in the upright position, the indicator should be intact. If the indicator arrow has turned all blue, contact the appropriate parties to report inappropriate transportation.

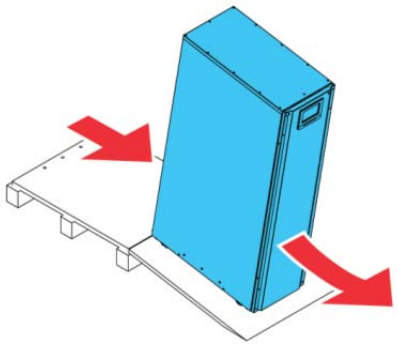
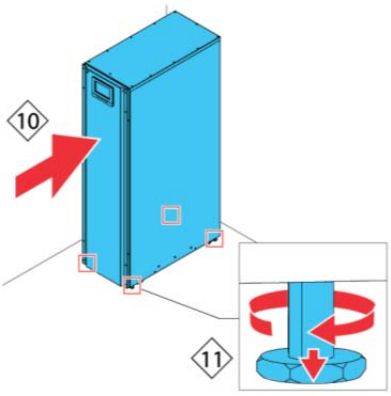
WARNING

The UPS cabinet is heavy. If the unpacking instructions are not closely followed, the cabinet may tip over and cause serious injury.
Do not tilt the UPS cabinet more than 10 degrees from the vertical or the cabinet may tip over.

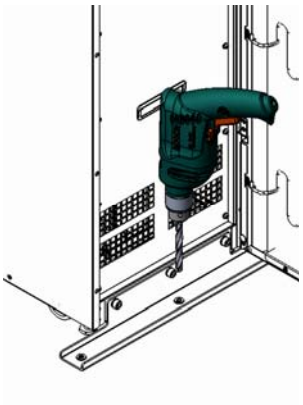
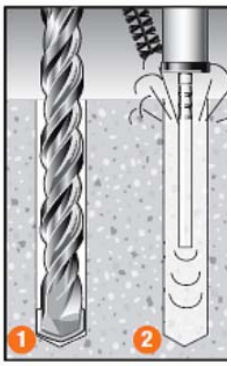
For transportation purposes, the UPS cabinet is bolted onto a wooden pallet. To remove the pallet, perform the following procedure:

1. Before you unload the cabinet from the pallet, use a forklift or other material handling equipment to move the cabinet to the installation area. Insert the forks of the forklift between the skids on the bottom the unit.	
2. Make a visual inspection and check that there are no signs of shipping damages. Check the indicators. See the instructions next to the indicators on the package.	
3. Open the UPS package. The roof of the package is used as a ramp for moving the UPS off the pallet.	

4. Place the ramp on the floor and attach it to the pallet with nails or screws so that it can be safely used for wheeling the UPS off the pallet.	
5. If the leveling feet are not fully retracted, turn them until they are retracted.	
6. Open the UPS front door.	
7. Remove the bolts that fasten the hold-down brackets to the UPS cabinet and to the pallet. 8. Remove the hold - down brackets.	

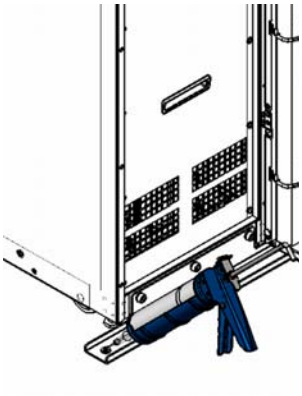
9. Slowly roll the cabinet toward the ramp edge. Be careful not to push the cabinet too much or too fast since it may cause the cabinet to tip over. Note that the cabinet is heavy. Make sure that you have enough manpower to handle and support the unit while rolling it off the pallet.	
10. Roll the cabinet to its final installation location. 11. To secure the UPS cabinet in position, lower the leveling feet until the cabinet is not resting on the casters and the cabinet is level. Reattach the Hold-down brackets to the UPS cabinet.	

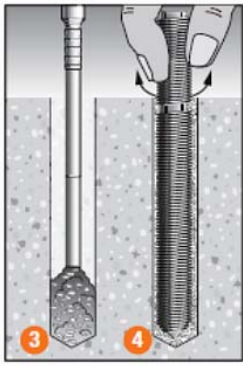
Bolting down the UPS
Once the cabinet is in the required position with the hold-down brackets touching the floor you are ready to bolt-down

12. Using the hold-down bracket holes as a guide drill into the concrete slab using a M12 drill to a min depth of 70mm As you drill remove concrete dust with a vacuum cleaner to prevent contamination of the UPS or surroundings Evacuate the hole with a stiff wire or nylon brush and a blower using the following sequence Blow x 4, Brush x 3, Blow x 4, Brush x 3, Blow x 4	 

13. Insert Ramset C8 Resin into the hole using Ramset applicator
Fill hole to 3/4 the hole depth ensuring no air pockets form

Insert M10 Ramset Chemset Anchor Stud turning the stud as it is inserted





14. Allow the EPCON C8 resin with stud inserted time to cure (set).
Curring/setting times are shown in the table

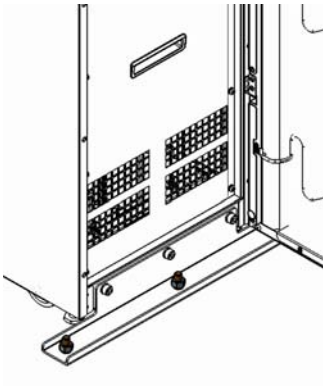
Setting Times EPCON™ C8

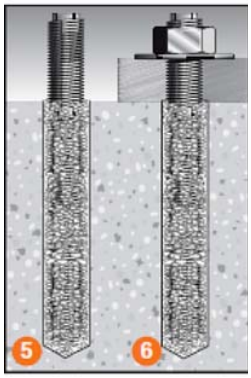
Temperature of base material	Gel Time	Curing time in dry concrete	Curing time in wet concrete
5°C - 9°C	20 min	30 h	60 h
10°C - 19°C	14 min	23 h	46 h
20°C - 24°C	11 min	16 h	32 h
25°C - 29°C	8 min	12 h	24 h
30°C - 39°C	5 min	8 h	16 h
40°C	5 min	6 h	12 h

15. When the EPCON C8 Resin has cured/set attach the washers and nuts.

Note: Nuts have a tightening torque of 20NM

Hold - down is complete when all six studs (3 Front and 3 Rear) have been installed





Appendix A: 07710 Certificate of Compliance 93PS 20kW (Australia)

LANCE HOPE
Consulting Engineer Ltd

23 Red Stag Lane
RD1 Richmond 7081
New Zealand
Phone (64) (3) 541 0438
Fax (64) (3) 541 0439
Mobile (027) 229 5092
Email lance.hope@clear.net.nz

CERTIFICATE of DESIGN COMPLIANCE 93PS20 UPS

Certificate No: 07710

Issued by : Lance Kennedy Hope

Issued to : Eaton Industries Company

In respect of : 93PS20 UPS

Drawing No: EATON 93PS20 – GA Rev 001

As an independent design professional covered by a current policy of Professional Indemnity Insurance to a minimum value of $300,000, I believe on reasonable grounds that :-

(i) Subject to all proprietary products meeting their performance specification requirements;
(ii) And when fabricated in accordance with the drawing specified above;
(iii) And when the supporting floor is designed to withstand forces imposed by the 93PS20 UPS;

That the Eaton 93PS20 UPS is designed to resist the loading requirements of *AS1170.4:2007 Structural Design Actions Part 4 - Earthquake Actions in Australia* for a maximum lateral force coefficient of C = **2.0** when used in conjunction with a properly installed seismic anchorage system with minimum tensile and shear ratings of:

Tension = 8.9 kN/anchor
Shear = 2.4 kN/anchor

An example of such a system would be the use of six Ramset Chemset Epcon C8 Anchors with M10 Chemset Anchor Stud Grade 5.8 Carbon Steel, drilled hole depth to be 70 mm.

At a lateral force coefficient of C = 2.0 the maximum Zone Factor (Z) is related to Importance Level (IL) and installation elevation by the following table:

	Ground Level	<12m above Ground Level
IL 1	2.05	0.67
IL 2	1.03	0.34
IL 3	0.79	0.26
IL 4	0.57	0.19

UPS installations higher than 12m above the structural base of the structure are not covered by this certificate and are subject to specific engineering design.

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Lance Hope Consulting Engineer
23 Red Stag Lane
RD1 Richmond
Nelson NZ

Date 11 September 2017
CPEng ID No 11914
MIPENZ

Appendix B: 07620 Certificate of Compliance 93PS 20kW (New Zealand)

LANCE HOPE
Consulting Engineer Ltd

23 Red Stag Lane
RD1 Richmond 7081
New Zealand
Phone (64) (3) 541 0438
Fax (64) (3) 541 0439
Mobile (027) 229 5092
Email lance.hope@clear.net.nz

CERTIFICATE of DESIGN COMPLIANCE 93PS20 UPS

Certificate No: 07620

Issued by : Lance Kennedy Hope

Issued to : Eaton Industries Company

In respect of : 93PS20 UPS

Drawing No: EATON 93PS20 – GA Rev 001

As an independent design professional covered by a current policy of Professional Indemnity Insurance to a minimum value of $300,000, I believe on reasonable grounds that :-

(i) Subject to all proprietary products meeting their performance specification requirements;
(ii) And when fabricated in accordance with the drawing specified above;
(iii) And when the supporting floor is designed to withstand forces imposed by the 93PS20 UPS;

That the Eaton 93PS20 UPS complies with the requirements of *NZS4219:2009 Seismic Performance of Engineering Systems in Buildings* for a maximum lateral force coefficient of **C = 2.0** when used in conjunction with a properly installed seismic anchorage system with minimum tensile and shear ratings of:

Tension = 8.9 kN
Shear = 2.4 kN

An example of such a system would be the use of six Ramset Chemset Epcon C8 Anchors with M10 Chemset Anchor Stud Grade 5.8 Carbon Steel, drilled hole depth to be 70 mm.

At a lateral force coefficient of C = 2.0 the maximum Zone Factor (Z) is related to Importance Level (IL) and installation elevation by the following table:

	Ground Level	Above Ground
IL 1	0.87	0.29
IL 2	0.87	0.29
IL 3	0.67	0.22
IL 4	0.48	0.16

Lance Hope Consulting Engineer
23 Red Stag Lane
RD1 Richmond
Nelson NZ

Date 12 September 2017
CPEng ID No 11914
MIPENZ

Appendix C: Eaton 93PS 20KW - GA