Hot Water Audit Checklist (version 3.1)

Auditors for the Solar Homes Program use this checklist when they conduct audit inspections of hot water installations and applicable supplementary services.



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Acknowledgements

Solar Victoria collaborated with Energy Safe Victoria, the Victorian Building Authority and TechSafe Australia to develop this audit checklist.

For more information about Solar Victoria’s commitment to safety and quality, including our audit program and requirements for participation in the in the Solar Homes Program, visit:

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We acknowledge and respect Victorian Traditional Owners as the original custodians of Victoria’s land and waters, their unique ability to care for Country and deep spiritual connection to it.

We honour Elders past and present whose knowledge and wisdom   
has ensured the continuation of culture and traditional practices.

DEECA is committed to genuinely partnering with Victorian Traditional Owners and Victoria’s Aboriginal community to progress their aspirations.

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# Understanding this audit checklist

Auditors for the Solar Homes Program use this checklist when they conduct audit inspections of hot water system installations.

This hot water system audit checklist:

* 1. is specific to the solar homes hot water rebate stream
  2. comprises the questions for the audit of rebated hot water system installations nominally performed within six months of the hot water system installation date – focusing on safety and standards
  3. is NOT and should not be regarded as an audit checklist for hot water systems (and applicable supplementary services) more broadly
  4. is NOT a checklist for installing a hot water system.

## What do auditors look at when they conduct inspections?

Auditors will assess the following components of an installed hot water system:

* 1. Hot Water System.
  2. Electrical Components.

## What do these ratings mean?

|  |  |
| --- | --- |
| Rating | Explanation |
| Unsafe | This means there is a safety hazard which poses an imminent risk of damage to property or persons and that the system will be shut down until rendered safe. |
| Needs Rectification | This means the system does not meet key safety and quality clauses in the standards/guidelines for installation. The installation does not pose an imminent safety risk but may be at risk of becoming unsafe in the future. The system requires priority rectification by the retailer and installer. |
| Improvements Identified (For Information) | This means the system does not pose a safety risk but was found to not comply with all standards and guidelines. |
| Adequate | This means no evidence of material non-compliance with standards or guidelines was identified and that the system was installed satisfactorily. |

## Changes to this audit checklist

Checklist items updated in version 3.1 are highlighted for information purposes only:

* Orange fill checklist items indicate new questions
* Grey fill checklist items indicate changes to ratings or wordings

Updates to version 3.1 of this checklist reflect the greater understanding of compliance in hot water system installations gained through the increase in audits conducted in 2024.

More detail has been added to the checklist with the addition of eight new items, and amendments to the wording of six items. Two items have been removed, with the safety aspects of these items covered by new or amended questions.

# Hot Water Audit Checklist Items

## Hot Water System

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| --- | --- | --- | --- |
| Checklist Item | Question | Applicable Rating | Relevant Standards/ References |
| **Cross Connection 1** | Are the cross-connection control and backflow protection provisions in accordance with the standards? | Unsafe / Needs Rectification | Clause 3.2 - AS/NZS 3500:4:2021 Cross connection control and backflow prevention devices shall be installed in accordance with AS/NZS 3500:1.2021. AS/NZS3500.1:2021 cl 4.4.7 Heated water systems: the requirements of this section for backflow prevention devices apply equally to heated water supply systems and cold-water supply services. The Backflow prevention device used in heated water supply systems shall be suitable for the specific heated water installation. |
| **Flow Rate 1** | Have the correct flow rates at outlets within a building been achieved? | Needs Rectification | AS/NZS 3500.4:2021 cl 1.10. and cl 10.3.2 |
| **General Installation Requirements 6**  *New Item* | Has the water tank been installed level and on an appropriate base of either: - bonded brick - pre-case concrete (slab or pad)? | Needs Rectification | AS/NZS 3500.4:2021 cl 5.5.3 |
| **General Installation Requirements 3** | Do any storage tanks connected have overflow and safe tray provisions that comply? | Needs Rectification | AS/NZS 3500.4:2021 cl 2.6.1, 2.6.2, 5.4.3, 5.4.4, 5.4.5, 6.4.4, |
| **General Installation Requirements 4** | Does below ground pipework have the correct depth of cover? | Unsafe / Needs Rectification / Improvements Identified | AS/NZS 3500.4:2021 cl 4.10 |
| **General Installation Requirements 5** | Have the manufacturer’s installation requirements been adhered to? | Needs Rectification / Improvements Identified | Plumbing regulations – part 3, 14. Manufacturer’s instructions are not mandatory, but must be considered. Includes gas installations.  AS/NZS 5601.1:2022 cl 6.2.2 |
| **Material and Products 1** | Are the materials used fit for their intended purpose and where required appropriately authorised? | Unsafe / Needs Rectification / Improvements Identified | AS/NZS 3500.4:2018 – Section 2 and PCA Watermark Requirements AS/NZS 3500.1:2021 – App B.2 Watermark Certification PCA reference to AS/NZS 4020. |
| **Pipework 1** | Does the installation have the minimum internal diameter pipe size? | Needs Rectification | AS/NZS 3500.4:2021 cl 1.7 to meet requirements of 1.8 and 1.9, cl 6.3.6 for solar water heaters, cl 10.6.1.1 for recirculation systems, and cl 7.2.1. for thermosiphon only. |
| **Pipework 2** | Does the installation have the correct pipework support? | Unsafe / Needs Rectification / Improvements Identified | AS/NZS 3500.4:2021 cl 4.5 |
| **Pipework 3** | Where penetrating concrete has the pipework been protected? | Needs Rectification | AS/NZS 3500.4:2021 cl 4.6.1.2, 4.6.1.3, 4.6.4 |
| **Pressure Requirements 1** | Has the static pressure at outlets within a building been maintained at or below the minimum 500kPa? | Unsafe / Needs Rectification | AS/NZS 3500.1:2021 cl 10.4.1 (note – this only applies to circulating systems) |
| **Protection against Freezing 1** | Has the pipe work been insulated and/or heat traps provided for heat retention as required? | Needs Rectification | AS/NZS 3500.4:2021 cl 4.11.5 (where applicable), 8.2.1 and section 8 |
| **Protection against Freezing 2** | Does the installation have frost protection as required? | Needs Rectification | AS/NZS 3500.4:2021 cl 6.5.2.2 and AS/NZS 2712. Also, cl 4.11 for freezing when applicable. |
| **Protection against Leakage 1** | Are there any leaks in the installation? | Needs Rectification | AS/NZS 3500.4:2021 cl 9.3 and 9.4 |
| **Proximity 1** | Does the installation comply with the proximity to other services? | Unsafe / Needs Rectification | AS/NZS 3500.4:2021 cl 4.3 |
| **Roof Mounting 1** | Is the roof deflection significant or are there any concerns about adequate roof strength? | Unsafe | AS/NZS 3500.4:2021 cl 6.3.3 |
| **Roof Mounting 2** | Have hot water storage tanks, compressor units and solar collectors been installed securely and in line with manufacturer's instructions? | Unsafe / Needs Rectification | AS/NZS 3500.4:2021 cl 6.3.13 |
| **Solar Collector 1** | Are the solar collectors likely to be shaded between 9am and 3pm? | Needs Rectification | AS/NZS 3500.4:2021 cl 6.3.2, 6.5.1.1 and Appendix H (informative) |
| **Solar Collector 2** | Do the solar collectors face between 30°E and 60°W of magnetic north? | Needs Rectification | Plumbing Regulations 2018 Schedule 2 - Division 7 Regulation 9 (1) (a). Question should read "between 30 degrees east and 60 degrees west of magnetic north". |
| **Solar Collector 3** | Is the collector inclination between 15° and 55° to the horizontal? | Needs Rectification | Plumbing Regulations 2018 Schedule 2 - Division 7 Regulation 9 (1) (b). Question should read "35 degrees plus or minus 20 degrees to horizontal." i.e., between 15 degree and 55 degree to the horizontal. |
| **System Specification 6**  *New Item* | What is the make of the installed hot water system? | Information Only | N/A |
| **System Specification 7**  *New Item* | What is the model of the installed hot water system? | Information Only | N/A |
| **System Specification 1** | Does the manufacturer of the HW system match the SV data as required? | Information Only | N/A |
| **System Specification 2** | Does the model number of the HW system match the SV data as provided? | Information Only | N/A |
| **System Specification 3** | Does the serial number of the HW tank match the SV data as provided? | Information Only | N/A |
| **System Specification 4** | Do the serial numbers of the HW collectors match the SV data as provided? | Information Only | N/A |
| **System Specification 5** | Was the homeowner given information about the suitability of the water heater relevant to their premises and hot water needs? | Improvements Identified (for information) | N/A |
| **Valves 2** | Do all the valves, cisterns, taps and temperature pressure relief valves perform? | Unsafe / Needs Rectification | AS/NZS 3500.4:2021 cl 9.3 and 9.4 |
| **Valves 3** | Does the temperature pressure relief (TPR) valve termination point comply? | Unsafe / Needs Rectification | AS/NZS 3500.4:2021 cl 5.11 |
| **Drainage Point 1**  *New Item* | Has TPR point of discharge from drain line been located so that the discharge of water is not directed at the operator? | Needs Rectification | AS/NZS 3500.4:2021 cl 5.11.3 (d) and (g) |
| **Drainage Point 2**  *New Item* | Does the TPR drain line terminate at an appropriate height as per AS/NZS 3500.4:2021 clause 5.11.3 (e)? | Needs Rectification | AS/NZS 3500.4:2021 cl 5.11.3 (e) |
| **Drainage Point 3**  *New Item* | Does the TPR point of discharge from each drain line been located so that the release of steam or hot water does not cause a nuisance (including not causing a slip hazard), is readily available and incurs no risk of damage to the building or injury to persons? | Needs Rectification | AS/NZS 3500.4:2021 cl 5.11.3 (d) |
| **Valves 4** | Does the installation have isolating valves where required? | Unsafe / Needs Rectification | AS/NZS 3500.4:2021 Table 5.9.1 (a), cl 5.9, 5.9.4 and 10.10 (recirculating systems) |
| **Water Temperature 2** | Does the maximum delivery temperature comply with the requirements? | Unsafe / Needs Rectification | AS 3498:2018 cl 7.1 and 7.2, PCA NCC volume 3 2022, part B2, B2D5 |
| **Decommissioning 1** | If the decommissioned product is left on site, is it disabled so it cannot be used again? | Improvements Identified | N/A |
| **Decommissioning 2**  *New Item* | Have any existing gas inlet/outlets related to the new hot water installation, been capped/sealed as required? | Needs Rectification | AS/NZS 5601.1:2022, Section 3.4.2 |
| **Other** | Other auditor concerns and/or comments relating to the installation. Full details to be provided in commentary. | Unsafe / Needs Rectification / Improvements Identified | N/A |

## Electrical System

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| Checklist Item | Question | Applicable Rating | Relevant Standards/ References |
| **Earthing 1** | Have all exposed conductive parts of the HW been provided with an appropriately sized bonding conductor that is connected to the electrical installations earthing system? | Needs Rectification | AS/NZS 3000:2018 5.4.1.1 |
| **Connections 1** | Is there evidence of loose connections in the HW cables and connections with signs of heat? | Unsafe | AS/NZS 3000:2018 3.7.2 |
| **Connections 2** | Is there evidence of loose connections in the HW cables and connections with no signs of heat | Needs Rectification | AS/NZS 3000:2018 3.7.2 |
| **Wiring 2** | Has all electrical equipment and wiring been installed according to all applicable standards and additional manufacturers requirements? | Needs Rectification | AS/NZS 3000 |
| **Elec 1** | Has the HW electrical components, wiring system and circuit protection been installed to manufacturer’s instructions? | Needs Rectification | AS/NZS 3000: 2018 Wiring Rules Clauses 2.1.2 (f), 3.1.2(g) and 4.1.2(e) |
| **Elec 2** | Has basic protection been provided from access to live parts of the HW installation? | Unsafe | Section 43(1) of the ESA 1998 (Defect code 112002) |
| **Elec 3** | If a new HW final sub-circuit has been installed, is it adequately mechanically protected and supported if it is likely to be disturbed? | Needs Rectification | AS/NZS 3000:2018 Wiring Rules Clause 3.9.3.3.2 |
| **Elec 4** | Has basic protection been provided from access to live parts of the switchboard? | Unsafe | AS/NZS 3000:2018 Wiring Rules Clause 2.10.3.1 (defect code 212186) |
| **Elec 5** | Has an over current protection device been installed at the origin of HW final sub-circuit to protect it from over current? | Needs Rectification | AS/NZS 3000:2018 Wiring Rules cl 2.5.1.3. |
| **Elec 6** | Is the HW final sub-circuit protected by a residual current device rated at no more than 30mA, and not of type AC, and has been installed so that it operates correctly? | Needs Rectification | AS/NZS 3000: 2018 Clause 2.6.3.2.2 and 2.6.2.2.2 |
| **Elec 7** | Do all switched poles of the residual current device protecting the HW final sub-circuit operate to disconnect the final sub-circuit? | Needs Rectification | AS/NZS 3000:2018 Wiring Rules Clause 8.3.10 |
| **Elec 8** | If a new HW final sub-circuit has been installed has the neutral conductor of the final sub-circuit been marked or arranged to identify its corresponding active conductor? | Improvements Identified (for information) | AS/NZS 3000:2018 Wiring Rules Clause 2.10.5.4 |
| **Elec 9** | If a new HW final sub-circuit has been installed has the neutral conductor of the final sub-circuit been provided with a separate terminal at the switchboard? | Needs Rectification | AS/NZS 3000:2018 Wiring Rules Clause 2.10.4.3 (d) (ii) |
| **Elec 10** | If a new hot water circuit has been installed, that causes the summation of overcurrent protection devices in the main switchboard to exceed the current carrying capacity of Consumer mains, then has appropriate overcurrent protection been installed to protect the consumer mains? | Needs Rectification | AS/NZS 3000: 2018 Wiring Rules Clause 2.5.1.2 (b) Note 5 and 2.5.3.1 |
| **Elec 11** | If a new HW final sub-circuit has been installed, has it been suitably installed where it enters the switchboard? | Needs Rectification | AS/NZS 3000:2018 Wiring Rules Clause 3.10.3.5 - 3.10.3.6 |
| **Elec 12** | If a new HW final sub-circuit has been installed has the switchboard been sealed to prevent the spread of fire (If required) where the final sub-circuit enters the switchboard? | Improvements Identified (for information) | AS/NZS 3000:2018 Wiring Rules Clause 2.10.7 |
| **Elec 13** | If a new HW final sub-circuit has been installed has double insulation of the final sub-circuit been maintained where it enters the switchboard, if not installed in a wiring enclosure? | Needs Rectification | AS/NZS 3000:2018 Wiring Rules Clause 3.10.1.2 |
| **Elec 14** | If a new hot water system circuit has been installed, is the HW protective device marked on or adjacent to the switchboard to identify the final sub-circuit it protects? | Needs Rectification | AS/NZS 3000:2018 Wiring Rules Clause 2.10.5.2 |
| **Elec 15** | Is the resistance of the HW final sub-circuit protective earthing conductor low enough to permit the passage of current necessary to operate the over current protective device in the required time? | Needs Rectification | AS/NZS 3000:2018 Wiring Rules Clause 8.3.5.1 Table 8.2 |
| **Elec 16** | Is the insulation resistance between all live conductors of the HW final subcircuit and the installation earthing system no less than 1 MEG OHM? | Needs Rectification | AS/NZS 3000:2018 Wiring Rules Clause 8.3.6.1 |
| **Elec 17** | Are all circuits connected to the corresponding terminals of the electrical equipment such that an immediate unsafe situation is present? Example transposed earth and active conductors | Unsafe | AS/NZS 3000:2018 Wiring Rules Clause 8.3.7.1 Defect code 212938 |
| **Elec 24**  *New Item* | Are all circuits connected to the corresponding terminals of the electrical equipment such that an immediate unsafe situation is not present, however safety issue could occur at some stage in the future? (for example - transposed active and neutral conductors, or transposed earth and neutral conductors) | Needs Rectification | AS/NZS 3000:2018 Wiring Rules cl 8.3.7.1 |
| **Elec 18** | Have all conductors been connected in a manner that provides reliability, electrical continuity, and appropriate level of insulation, mechanical strength and no undue mechanical stress on any connection? | Needs Rectification | ASNZS 3000:2018 Wiring rules Clause 3.7.1 |
| **Elec 19** | If required has a lockable isolating switch been installed adjacent to, but not on the HW itself? | Needs Rectification | AS/NZS 3000: 2018 AMDT 2 Clause 4.19 |
| **Elec 20** | Does all electrical equipment installed have the characteristics appropriate to the conditions to which it is installed? | Needs Rectification | AS/NZS 3000:2018 Wiring Rules Clause 4.1.3 |
| **Elec 21** | Confirm that the electrical installation for the HW as presented is consistent with the details in the Certificate of Electrical Safety (COES)? | Improvements Identified | Section 44(3) of the ESA 1998 Defect code 111009 |
| **Elec 22** | Does the installation match the information provided on the COES? | Improvements Identified | Section 44(3) of the ESA 1998 Defect code 111009 |
| **Elec 23** | Has the HW socket outlet been installed in a manner that is subject to undue mechanical stress or damage in normal service?  For plug in installation:  - Without the use of a power board or double adapter  - Without needing to be extended, altered or strain put on the connection.  - Not subject to mechanical damage | Needs Rectification | AS/NZS 3000:2018 Wiring Rules Clause 4.4.2.2 |

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