
SPLIT SYSTEM AIR CONDITIONING
Install and commission split system air-
conditioning

level:	3
credit:	20
planned review date:	February 2010
sub-field:	Mechanical Engineering
purpose:	<p>This unit standard is for use in the training of installers of split system air conditioning, and covers installation and commissioning.</p> <p>People credited with this unit standard are able to: prepare for installation and commissioning; install the system components; perform pre-start and start-up commissioning procedures; and provide information to operators and complete documentation.</p>
entry information:	Recommended: Unit 22441, <i>Demonstrate knowledge of split system air conditioning principles and applications</i> , or demonstrate equivalent knowledge and skills.
accreditation option:	Evaluation of documentation and visit by NZQA.
moderation option:	A national moderation system of regional panels and assessor networks has been established by Competenz.
special notes:	<p>1 References Building Act 2004; Hazardous Substances and New Organisms Act 1996; Health and Safety in Employment Act 1992; Ozone Layer Protection Act 1996; Electricity Regulations 1997; Ozone Layer Protection Regulations 1996. <i>Code of Practice for the reduction of emissions of fluorocarbon refrigerants in refrigeration and air conditioning applications</i>. Institute of Refrigeration, Heating and Air Conditioning Engineers of New Zealand (IRHACE New Zealand), 2001. Available from IRHACE, 28 E Lambie Drive, Manukau City.</p>

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- 2 Definitions
- Specifications* typically includes drawings, performance specification, parts list, installation instructions, commissioning tests and procedures, and operating instructions.
- Split system air conditioning* refers to pre-assembled, pre-charged air conditioning units (excluding ducted systems) for use in domestic or light commercial applications. This includes high-wall, under-ceiling, cassette, floor console, and fascia types.
- Worksite procedures* refer to documents that include: worksite rules, codes, and practices; equipment operating instructions; production specifications; documented quality management systems; and health and safety requirements.
- 3 Range
- Evidence of installation and commissioning of at least five systems in different circumstances is required.

Elements and Performance Criteria

element 1

Prepare for installation and commissioning.

performance criteria

- 1.1 Specifications are checked against site conditions, and confirmed or modified to suit site conditions in accordance with worksite procedures.
- 1.2 An acceptable timeframe for installation and commissioning is established and agreed with stakeholders.
- Range: stakeholders may include but are not limited to – manager, supervisor, contract manager, contractor, building owner, internal staff.
- 1.3 Materials are assembled and verified against schedule of materials.

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- 1.4 Ancillary service connections are verified and timetabled in accordance with installation time schedule.
- Range: may include but is not limited to – electricity, condensate drain.
- 1.5 The ability to meet building code requirements for the installation is confirmed and, where required, permits and/or consents are identified and confirmed as to their suitability.

element 2

Install the system components.

performance criteria

- 2.1 Stand-alone system sections are positioned and installed in accordance with specifications.
- Range: stand-alone system sections may include but are not limited to – indoor unit, outdoor unit, packaged unit; placement considerations may include but are not limited to – sufficient support, vibration elimination, seismic restraint, retaining building's structural integrity, water-tightness.
- 2.2 Supports and bracketing to secure pipework are positioned and fixed in accordance with specifications.
- 2.3 Piping, tubing, and capping are run in accordance with specifications.
- Range: installation considerations – nitrogen purging, internal cleanliness.
- 2.4 Thermal insulation is secured in accordance with specifications.
- 2.5 Ancillary components are installed in accordance with specifications.
- Range: ancillary components may include but are not limited to – valves, controls, filters, driers.
- 2.6 The work of associated trades personnel is identified and scheduled.
- 2.7 Installation is completed in accordance with agreed timeframe.

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element 3

Perform pre-start commissioning procedures.

performance criteria

- 3.1 System equipment and components are verified as safe to be exposed to elevated operating pressures.
- 3.2 Compliance with electrical requirements is confirmed with the electrician.
- 3.3 Integrity of the installation is confirmed by appropriate visual and tactile checks.
- Range: may include but is not limited to – terminations, building penetrations, connections, drains.
- 3.4 Operation of fan motors and condensate pumps is checked against specifications.
- 3.5 System and component integrity is confirmed by the use of appropriate leak detection methods and equipment.
- 3.6 System is evacuated to pull down to 500 microns or less to ensure that moisture, oxygen, and non-condensables are removed.
- Range: evacuation tools include but are not limited to – Schraeder core removal tool, vacuum analyser, vacuum pump, short large-bore vacuum hose, solenoid valve, isolating valves.
- 3.7 Vacuum is broken with appropriate refrigerant after evacuation.

element 4

Perform start-up commissioning procedures.

performance criteria

- 4.1 System charge is checked and adjusted in accordance with manufacturer's specifications.

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- 4.2 Operational electronic controllers are set and proved to meet specified requirements.
- 4.3 System performance is checked and measurements recorded in accordance with specifications.
- Range: temperatures, pressures, current draw.
- 4.4 Commissioning is completed in accordance with agreed timeframe.

element 5

Provide information to operators and complete documentation.

performance criteria

- 5.1 Operators are familiarised with handbooks and operating instructions.
- 5.2 Documentation is produced in accordance with worksite procedures outlining labour and materials used, commissioning verification, and, where required, warranty.

Comments on this unit standard

Please contact Competenz_qualifications@competenz.org.nz if you wish to suggest changes to the content of this unit standard.

Please Note

Providers must be accredited by the Qualifications Authority or a delegated inter-institutional body before they can register credits from assessment against unit standards or deliver courses of study leading to that assessment.

Industry Training Organisations must be accredited by the Qualifications Authority before they can register credits from assessment against unit standards.

Accredited providers and Industry Training Organisations assessing against unit standards must engage with the moderation system that applies to those standards.

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Accreditation requirements and an outline of the moderation system that applies to this standard are outlined in the Accreditation and Moderation Action Plan (AMAP). The AMAP also includes useful information about special requirements for providers wishing to develop education and training programmes, such as minimum qualifications for tutors and assessors, and special resource requirements.

This unit standard is covered by AMAP 0013 which can be accessed at <http://www.nzqa.govt.nz/site/framework/search.html>.