NZS 4607:1989

NEW ZEALAND STANDARD

INSTALLATION OF THERMAL STORAGE ELECTRIC WATER HEATERS : VALVE VENTED SYSTEMS

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STANDARDS NEW ZEALAND

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COMMITTEE REPRESENTATION

This Standard was prepared under the supervision of the Energy and Resources Advisory Committee (50/E) and the Building and Civil Engineering Divisional Committee (30/-) for the Standards Council established under the Standards Act 1988.

The Valve Vented Water Heaters Committee (46/4) was responsible for the preparation of the Standard and comprised representatives of the following organizations:

Electrical Development Association
Ministry of Energy
New Zealand Local Government Association
New Zealand Manufacturing Engineers Federation
New Zealand Society of Master Plumbers
Works and Development Services Corporation (NZ) Ltd

ACKNOWLEDGEMENT

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	AMENDMENTS
Date of issue	*Description*

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Figure

RELATED DOCUMENTS

Reference is made in this Standard to the following:

NEW ZEALAND STANDARDS

NZS 918:1965	Immersion heaters for thermal storage electric water heaters
NZS 3501:1976	Copper tubes for water, gas, and sanitation
NZS 4222:1985	Materials for the thermal insulation of buildings
NZS 4602:1988	Low pressure copper thermal storage electric water heaters
NZS 4606:- - - -	Storage water heaters
Part 1:1989	General requirements
Part 2:1989	Specific requirements for water heaters with single shells
Part 3:1989	Specific requirements for water heaters with composite shells
NZS 4608:0000	Control valves for use in hot water systems (in preparation)
NZS 4617:1989	Tempering (3-port mixing) valves
NZS 6214:1988	Thermostats and thermal cutouts for domestic thermal storage electric water heaters (a.c. only)

AUSTRALIAN STANDARDS

AS 1530:- - - -	Methods for fire tests on building materials, components and structures
Part 3:1982	Test for early fire hazard properties of materials

BRITISH STANDARDS

BS 874:1973*	Methods for determining thermal insulating properties, with definitions of thermal insulating terms
BS 1845:1984	Specification for filler metals for brazing

NEW ZEALAND LEGISLATION

Drainage and Plumbing Regulations 1978
Electrical Wiring Regulations 1976

*Endorsed as suitable for use in New Zealand.

The users of this Standard should ensure that their copies of the above-mentioned New Zealand Standards or of overseas Standards endorsed as suitable for use in New Zealand are the latest revisions or include the latest amendments. Such amendments are listed in the annual SANZ Catalogue which is supplemented by lists contained in the monthly magazine Standards issued free of charge to committee and subscribing members of SANZ.

FOREWORD

This Standard is one of a group of four related Standards prepared for use in the design and installation of electrically heated valve vented hot water systems in domestic and light commercial establishments.

The other Standards are:

NZS 4602 Low pressure copper thermal storage electric water heaters
NZS 4606 Storage water heaters
NZS 4608 Control valves for use in hot water systems

NZS 4607 covers the two valve vented hot water systems commonly used and specified in New Zealand:

(a) Systems using heaters to NZS 4602 or NZS 4606 and pressure relief valves for obtaining working pressures of 12.0 metres head (120 kPa) and less. (Commonly known as low pressure valve vented systems).

(b) Systems using heaters to NZS 4606 for working pressures of greater than 12.0 metres head (120 kPa). (Commonly known as mains pressure systems).

The committee has decided to retain the term 'valve vented' in relation to these systems rather than the term 'un-vented' which is used in some other countries. The reason for this is that 'un-vented' when used in conjunction with 'open-vented' is misleading as the system is in fact vented to atmosphere via a pressure control valve.

REVIEW OF STANDARDS

Suggestions for improvement of this Standard will be welcomed. They should be sent to the Director, Standards Association of New Zealand, Private Bag, Wellington.

NEW ZEALAND STANDARD

INSTALLATION OF THERMAL STORAGE ELECTRIC WATER HEATERS : VALVE VENTED SYSTEMS

Section 1
GENERAL

101
SCOPE

101.1
This New Zealand Standard applies to the installation in the vertical position of thermal storage electric water heaters complying with NZS 4602 and NZS 4606. It is restricted to valve vented systems for domestic and light commercial use.

102
UNITS

102.1
Units of pressure are shown in both kilopascals (kPa) and metres head of water (mH_20) as follows:

(a) For pressures less than 15 mH_20 or 147 kPa the principal unit shall be mH_20 with kPa shown in parenthesis; for example 7.6 mH_20 (75 kPa).

(b) For pressures of 15 mH_20 or 147 kPa and greater the principal unit shall be kPa with mH_20 shown in parenthesis; for example 850 kPa (88 mH_20).

103
DEFINITIONS

103.1

In this Standard the following definitions apply:

APPROVED. Approved by the Engineer.

BALL VALVE. A form of isolating valve having a spherical movable component which can be turned to move its port or ports, relative to the body seating ports.

ENGINEER. The local authority's Engineer appointed under the Local Government Act.

EXPANSION CONTROL VALVE. A pressure actuated valve which opens automatically at a specified set pressure to discharge fluid through the valve from the inlet connection or the cold side of the water heater and which self-reseats.

GATE VALVE. A valve which provides a straight-through passage for the flow of fluid. The body ends are in line, and a shaped gate is moved between the body seats by a stem whose axis is at right angles to the line between the body ends.

HEATING ELEMENT. The electrical conducting medium which is heated by an electric current together with its insulation and supports and immediate closure (if any) plus any gasket.

MAINS PRESSURE WATER HEATER. A water heater designed to work at pressures in excess of 12 mH_20, and which complies with NZS 4606.

LOW PRESSURE WATER HEATER. A water heater designed to work at a pressure not exceeding 12 mH_20 (120 kPa) and complying with NZS 4602.

MAXIMUM WORKING PRESSURE. The maximum working pressure to which a water heater may be subjected as measured at the lowest point of the water heater.

PRESSURE LIMITING VALVE. A valve which limits the maximum pressure of water at its outlet to a predetermined set pressure.

PRESSURE REDUCING VALVE. A valve which reduces the pressure of water at its outlet to a predetermined set pressure.

PRESSURE RELIEF VALVE. A pressure actuated valve which automatically discharges fluid at a specified set pressure and self-reseats. It is fitted to heaters to prevent the pressure in the container from exceeding the maximum working pressure.

TEMPERATURE RELIEF VALVE. A temperature actuated valve which automatically discharges fluid at a specified set temperature and which self re-seats. It is combined with a pressure relief valve.

THERMAL STORAGE ELECTRIC WATER HEATER. An electric water heater in which the heated water is stored or may remain in a vessel. It includes the vessel, insulation, and outer casing, but does not include the hot water reticulation, pressure control, cold water supply piping, thermostat, or heating elements. WATER HEATER shall have the same connotation.

VACUUM RELIEF VALVE. A pressure actuated valve which automatically opens to relieve vacuum conditions, and which self re-seats. It may be combined with a pressure relief valve.

VALVE VENTED WATER HEATER. A water heater in which the venting to atmosphere is controlled by a valve. The valve may be on the inlet side, in which case it is called an expansion control valve, or on the outlet side in which case it is referred to as a pressure relief valve.

103.2
For the purposes of this Standard, the word "shall" refers to requirements which are mandatory for compliance with this Standard. The word "should" refers to requirements which are recommended or advised.

104
WORKMANSHIP

104.1
It shall be the installer's responsibility to ensure that the entire installation is carried out in accordance with this Standard, the requirements of the local authority, the requirements of the electric supply authority, and the manufacturers' instructions.

NOTE - Attention is drawn to the need for all electrical wiring work including the replacement of elements and thermostats to be carried out in accordance with the Electrical Wiring Regulations 1976 and all plumbing work to comply with the Drainage and Plumbing Regulations 1978.

Section 2
INSTALLATION OF WATER HEATERS

201
LOCATION OF WATER HEATERS

201.1
To provide adequate hot water supply, to facilitate servicing, and to minimize heat losses from the water heater and the hot water supply piping, the following conditions shall apply:

(a) Every water heater shall be installed in the vertical position and be so located that the element, thermostat, control valves, and all other accessories, as well as all connections to pipeworks, are readily accessible and replaceable, and so that the details of marking specified in NZS 4602, NZS 4606 or NZS 4608 can readily be seen.

(b) The water heater shall be located in a position free from draughts. This is best achieved, by locating it in a cupboard.

(c) Where the water heater is enclosed in a cupboard it shall be possible to remove and replace the complete water heater or any part without the necessity of completely dismantling the enclosure.

(d) The hot water system shall be arranged with the water heater located so as to achieve the shortest convenient length of pipe run to the outlet most frequently used.

(e) In a dwelling, in order to keep pipe heat loss to a minimum, the water heater shall be positioned such that the pipe run from the water heater to the kitchen sink does not exceed the following distance:

Pipe diameter mm N.B.	*Distance* m
10	12
15	10
20	5

To meet this requirement a separate water heater for the kitchen may be necessary.

(f) Where the pipe supplying the sink is composed of sections of different diameters, the total permissible run shall be calculated by proportion of water volume contained in the pipes.

(g) A safe tray shall be installed to prevent damage that could arise from water leakage from the water heater. It shall be fitted with an overflow pipe not less than 40 mm diameter discharging clear of the building at a point within the boundary of the premises where the discharge is readily visible but does not cause damage or nuisance. The overflow pipe shall fall continuously from the safe tray outlet to the discharge point.

202
SEISMIC SUPPORT

202.1
Water heaters shall be secured against seismic forces.

202.2
Means of securing shall be sufficient to prevent movement of the water heater if subjected to a maximum horizontal seismic force of 1 g.

202.3
Suitable methods of securing to comply with this requirement are shown in figures 1(a) and 1(b). The minimum size of fastenings is shown in table 1. Other means approved by the Engineer may be substituted.

202.4
Where fittings attached to the water heater pass through the supporting platform or floor the hole shall provide at least 25 mm clearance all round. Means of preventing rodent entry shall be provided when the water heater is installed above floor level.

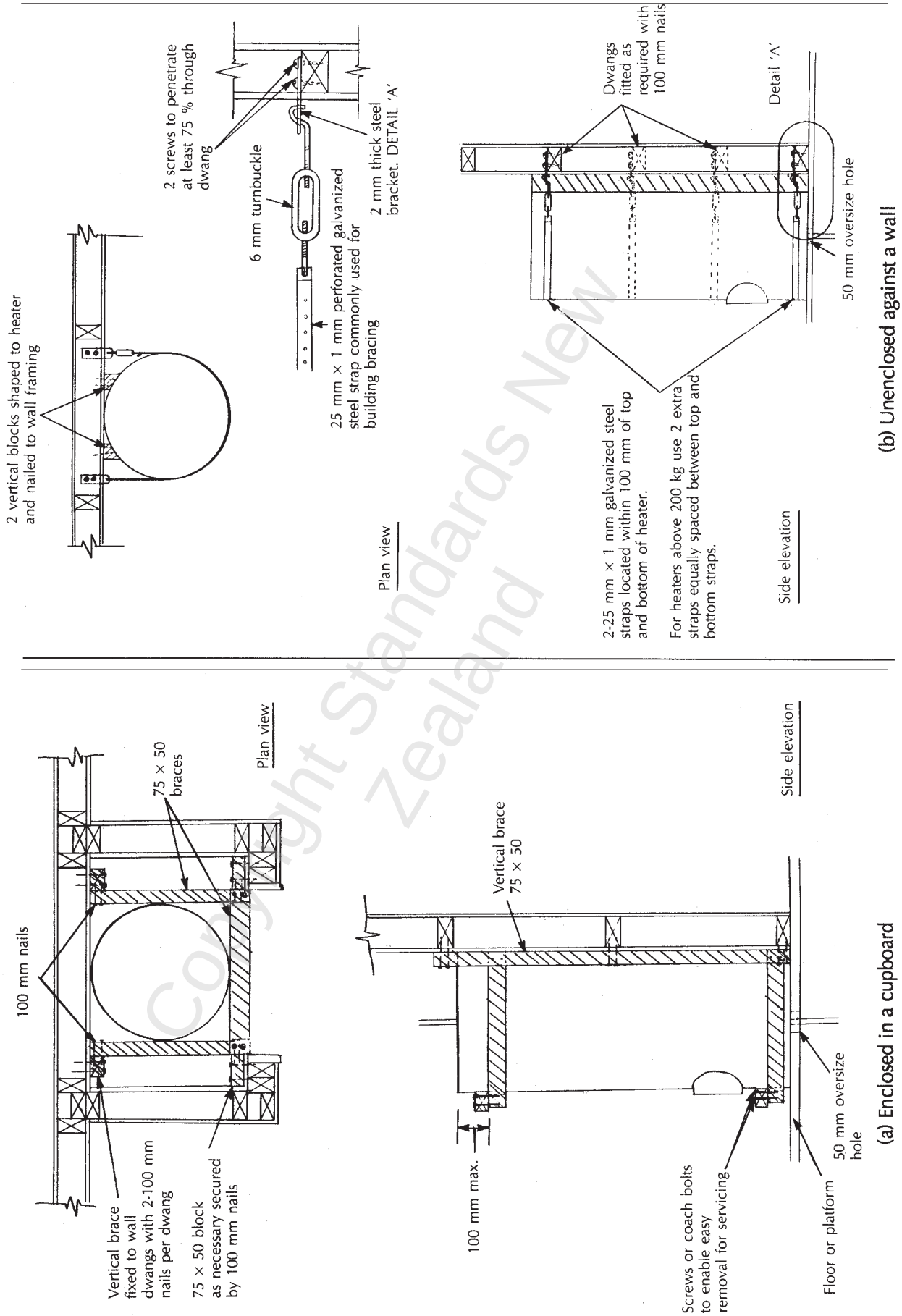

Fig. 1
METHOD OF SECURING WATER HEATERS AGAINST SEISMIC FORCES

Table 1
MINIMUM SIZE OF FASTENINGS REQUIRED TO SECURE WATER HATERS

Equipment weight	*Minimum fastener size*			
	Screw in 25 mm thick timber	*Screw in 50 mm thick timber*	*Bolt with washer through timber*	*Bolt through steel*
kg				
Below 50	10 g	10 g	M6	M6
50 to 100	24 g	24 g	M6	M6
100 to 150	Not recommended	24 g	M6	M6
150 to 200	Not recommended	24 g	M10	M6
200 to 250	Not recommended	12 mm dia.	M12	M6
250 to 350	Not recommended	12 mm dia.	M12	M10
Over 350	Special design required			

Section 3
COLD WATER SUPPLY

301
GENERAL

301.1
The water heater shall be connected to the cold water supply such that its maximum working pressure is not exceeded and the heated water is available at a pressure suitable to the installation and the user's requirements.

301.2
All pipe work and fittings shall be of material compatible with the valves, and pipe work between units shall not be smaller than the outlet size of the valve to which it is attached.

301.3
All expansion control valves, pressure limiting valves, pressure reducing valves, non-return valves and filter equipment shall comply with the relevant requirements of NZS 4608.

302
MAINS PRESSURE SYSTEMS

302.1
A ball or gate valve, filter and non-return valve, or any combination of these, shall be installed in the cold water supply to the water heater. Should a unit combine more than one device then the various devices shall occur in the sequence as stated above and shown in fig.2(a).

302.2
For safety and economy in domestic situations, where the inlet water pressure exceeds 500 kPa a pressure limiting valve shall be installed to prevent excessively high system working pressures.

302.3
To allow convenient isolation of control valves a second ball or gate valve should be fitted on the water heater side of the above valves.

302.4
On side entry water heaters a thermo-syphon trap shall be installed to protect the valving in the cold water supply when specified by the valve manufacturer.

302.5
A typical connection diagram is shown in fig. 2(a).

303
LOW PRESSURE SYSTEMS

303.1
A ball or gate valve, filter, pressure reducing valve and non-return valve, or any combination of these, shall be installed in the cold water supply to the water heater. Should a unit combine more than one device then the various devices shall occur in the sequence as stated above and as shown in fig. 2(b).

303.2
To allow convenient isolation of control valves a second ball or gate valve should be fitted on the water heater side of the above valves.

303.3
On side entry water heaters a thermo-syphon trap shall be installed to protect the valving in the cold water supply when specified by the valve manufacturer.

303.4
A typical connection diagram is shown in fig. 2(b).

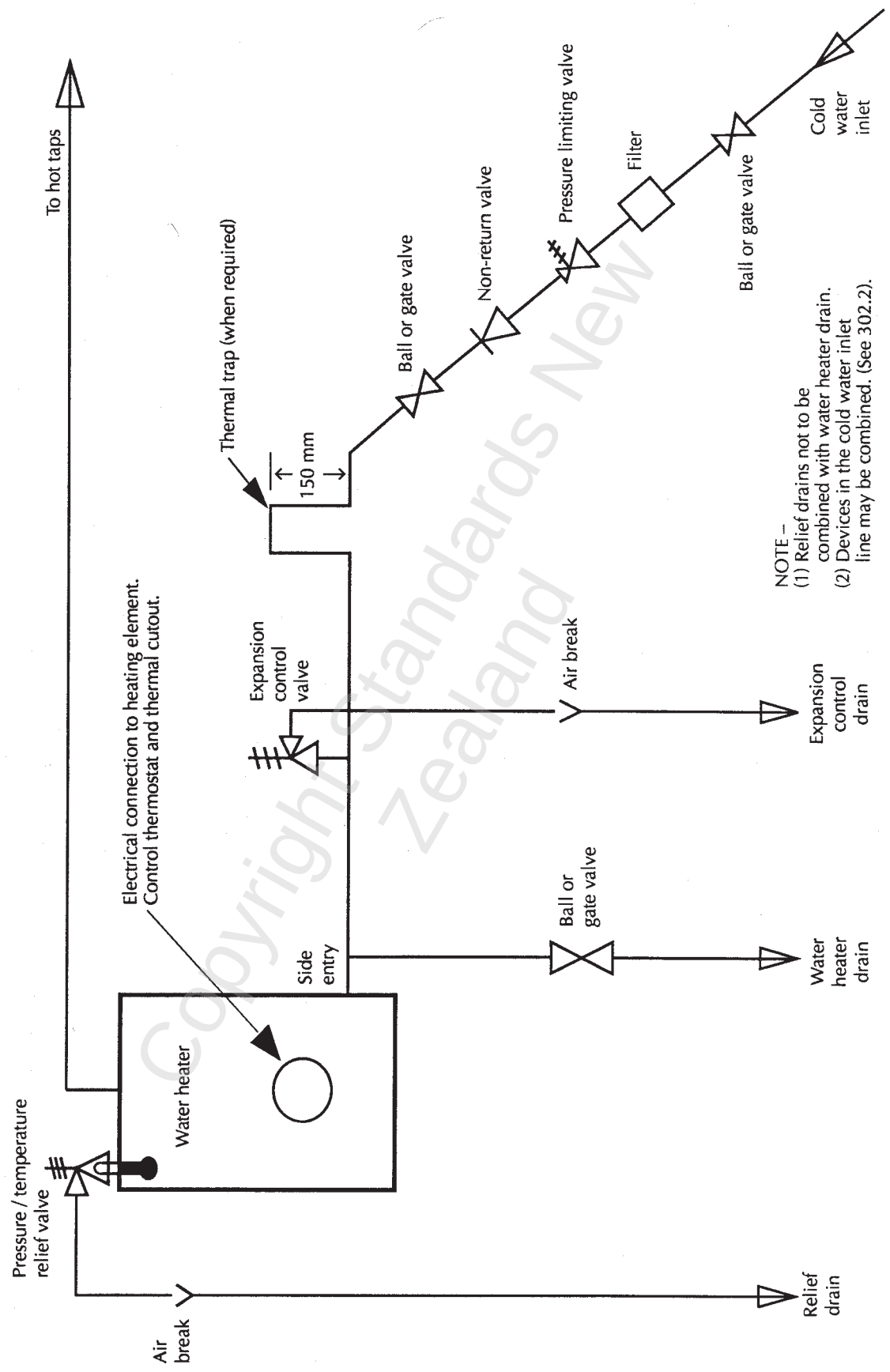

Fig. 2(a)
TYPICAL PIPING LAYOUT FOR MAINS PRESSURE VALVE VENTED SYSTEM

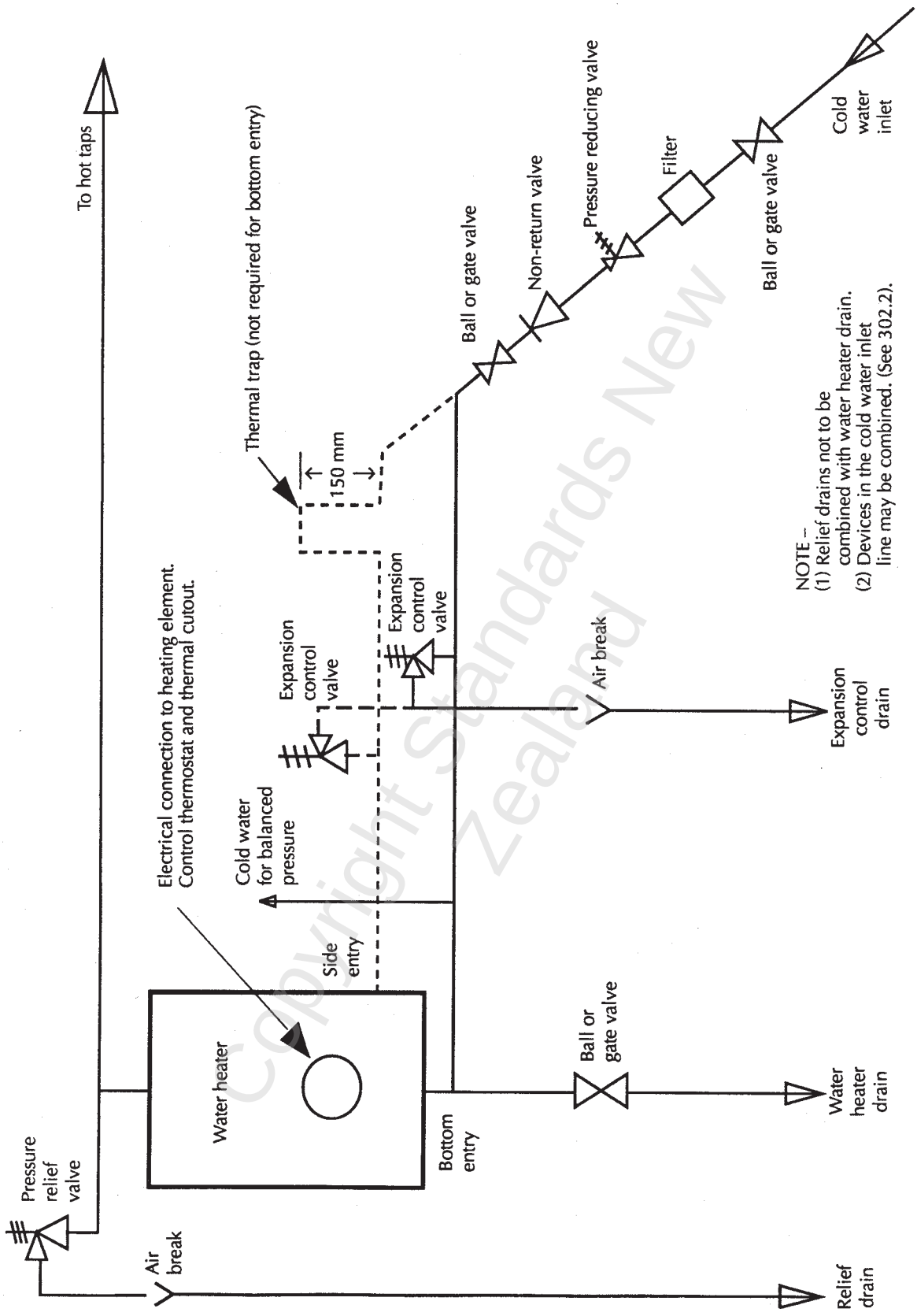

Fig. 2(b)
TYPICAL PIPING LAYOUT FOR LOW PRESSURE VALVE VENTED SYSTEM

Section 4
OPERATION AND SAFETY

401
GENERAL

401.1
Every storage water heater when installed as a valve-vented system shall be fitted with the operation devices and the safety devices specified in table 2. Typical valving layouts are shown in figures 2(a) and 2(b).

401.2
A combined temperature/pressure relief valve shall replace the pressure relief valve in all installations in which the working pressure exceeds 120 kPa (12 mH_2O) and may replace it in other installations.

402
PRESSURE

402.1
Operation
Every water heater shall be fitted with an expansion control valve complying with the requirements of NZS 4608.

NOTE - As a result of normal use there will be approximately 1-2 % of the heater's capacity discharged daily due to the thermal expansion of water during the heating process. This discharge is essential for the safe operation of the water heater system.

402.2
Safety
Every water heater shall be fitted with a pressure relief valve to relieve any excess pressure during abnormal conditions due to failure of any other control device in the system. The pressure relief valve shall comply with NZS 4608 and have a kW rating not less than the kW of the heating element(s).

402.3
The expansion control valve and pressure relief valve shall have set pressures related to the inlet water pressure of the water heater but not greater than its maximum working pressure.

403
TEMPERATURE

403.1
Operation
Every water heater shall be fitted with a thermostat complying with the requirements of NZS 6214 to limit the water temperature under normal conditions of operation, and all heating elements shall comply with NZS 918 or an approved equivalent.

NOTE - Attention is drawn to the need to comply with the appropriate requirements of the Electric Wiring Regulations.

403.2
Safety

403.2.1
Every water heater shall be fitted with a non-self-resetting thermal cutout complying with the requirements of NZS 6214 that will disconnect the electric supply in the event of water temperature exceeding 90 °C.

403.2.2
The thermal cutout and its fixing provisions shall be of a type approved by the water heater manufacturer as suitable for use with that particular make and model of water heater.

404
VACUUM

404.1
Where required by the water heater manufacturer a vacuum relief valve, complying with NZS 4608 shall be fitted to relieve vacuum within the cylinder and to prevent an implosion. This may be a separate relief valve or combined with any other relief valve.

404.2
Where hot water outlets are below the base of the water heater a separate vacuum relief valve shall be installed on the lines serving those fittings.

Table 2
MINIMUM OPERATION AND SAFETY REQUIREMENTS

	Requirement	
Condition	*Operation*	*Safety*
Pressure	Expansion control valve	Pressure relief valve
Temperature	Thermostat	Thermal cutout
Vacuum	Vacuum relief valve	

405
INSTALLATION OF EXPANSION CONTROL AND RELIEF VALVES

405.1
Each expansion control and relief valve shall be fitted with a drain pipe complying with 406 and installed to permit ready replacement and access to any easing gear.

405.2
The expansion control valve shall be the last control valve before the water heater on the cold water supply pipework. (See figures 2(a) and 2(b)).

405.3
The pressure relief valve, if not inbuilt, shall be installed onto the hot water piping adjacent to the water heater.

405.4
The temperature probe of any temperature relief valve, shall be installed in the top 150 mm of the vessel and within the top 20 % of the water capacity.

405.5
There shall be no valve or other restriction installed between the pressure relief valve, or combined temperature/pressure relief valve, and the water heater.

406
EXPANSION CONTROL AND RELIEF VALVE DRAIN PIPES

406.1
Drain pipes from expansion control and relief valves shall:

(a) Be of copper or other approved material

(b) Be of a size recommended by the valve manufacturer but not less than specified in table 3, and after a tundish be at least one size larger

(c) Have no valve or other restriction installed in the line and no connection or bend shall offer a passage less than the connecting pipework

(d) Fall continuously from the valve outlet with not more than three right angle bends

(e) Be insulated from the valve to the discharge point where there is a danger of freezing

(f) Have vacuum relief incorporated either within the valve or by a suitable tundish within 500 mm of the valve outlet

(g) Be combined with any other expansion control or relief valve drain only by discharging separately into a suitable tundish

(h) Discharge outside the building within the boundary of the premises without causing risk, injury or nuisance and be able to be readily observed

(j) Discharge not less than 300 mm above ground level except through a visible air-break and tundish into a common drain or down-pipe.

406.2
The water heater drain and safe tray drain shall not be combined with the relief valve drain.

Table 3
SIZE OF RELIEF VALVE DRAIN PIPE

Nominal (thread) size of valve outlet connection	*Nominal size of drain pipe*
	mm
1/2	15
3/4	20

Section 5
INSTALLATION OF HOT WATER RETICULATION SYSTEMS

501
PIPES, FITTINGS, AND PIPE LAYOUTS

501.1
Copper pipes complying with NZS 3501 and copper or copper alloy fittings, or other materials of a quality acceptable to the Engineer, shall be used throughout for all hot water runs, the inlet pipe and for any other pipe connected to the water heater. Adequate provision shall be made for thermal expansion, and precautions taken against damage due to seismic effects.

NOTE - Materials other than copper should have equivalent suitability and durability. Documentary evidence of suitability and durability in service should accompany any request to the Engineer for use of substitute materials.

501.2
All brazing materials used shall conform to the requirements of table 2 or table 3 of BS 1845.

501.3
The sizes of inlet and outlet pipes to and from the water heater shall be not less than the sizes of fittings on the water heater.

501.4
Subject to the provisions of 406.1, all hot water piping shall be of a diameter consistent with the supply required in relation to the pressure available. (See Appendix A.) Pipe runs shall be set out by the shortest possible route with an even gradient, avoiding all places where an airlock is likely to occur. Large radius bends shall be used throughout the installation. All tees should be swept in the direction of flow.

501.5
No hot water pipe shall rise to a height greater than two thirds of the water heater inlet pressure in metres.

501.6
Where a shower is fitted with a mixing valve, the valve should be matched to the balanced, or unbalanced, hot and cold water pressures available to ensure satisfactory temperature control.

501.7
The piping layout of a typical valve vented thermal storage electric water heater is shown in figures 2(a) and 2(b).

501.8
Pipe runs shall be adequately secured by such means as will not damage or deform the pipe. Materials used shall not corrode or cause corrosion or adversely affect the pipe.

501.9
The distances between fixing points shall not exceed those required by the local authority or the manufacturer.

501.10
Hot water pipes should not be buried in concrete. Where this is unavoidable the pipe should be provided with a duct to permit thermal expansion and contraction.

NOTE - As a guide to allow for thermal expansion, there should be 10 mm free space between the perpendicular copper pipe and the duct at each entry or exit from the concrete plus 2 mm for each metre of buried pipe or part thereof.

502
CONNECTIONS

502.1
All copper pipe connections to the water heater shall be made with copper alloy unions. No white or red lead or other hard setting material shall be used in making any joints in the installation.

502.2
Pipes of materials other than copper shall be connected to the water heater using unions or other readily detachable fittings of material recommended by the piping system manufacturer.

502.3
Heating elements shall be fitted into the cylinder bosses with watertight joints using jointing material which will remain watertight for the life of the element and allow for easy removal.

503
WATER HEATER DRAIN

503.1
Where not provided as part of the water heater every water heater of more than 30 L capacity shall have provision made for draining from the lowest point with the heater in position.

503.2
The water heater drainpipe shall be copper or other approved material, have an accessible valve in it, and shall terminate in a cap or plug in an accessible position. The drainpipe shall be not less than 15 mm diameter and discharge at some convenient point external to the building.

503.3
In hard water areas the drainpipe shall be not less than 20 mm diameter.

NOTE - Combining the water heater drain with any relief valve drain is prohibited by 406.2.

Section 6
ENERGY CONSERVATION, USER SAFETY AND OPERATION

601
PIPE INSULATION

601.1
Insulation material

601.1.1
Insulation shall have a heat loss not exceeding 17 watts per linear metre across 60 °C temperature differential, with a hot-face temperature of 80 °C when determined in accordance with BS 874.

601.1.2
Insulation shall be installed and secured in accordance with the manufacturer's instructions. Pipe runs outside buildings shall be fitted with a waterproof covering over the insulation.

601.1.3
Insulation shall have a low spread of flame index (preferably not more than 2) when tested in accordance with AS 1530:Part 3.

601.2
Hot water pipes

601.2.1
Hot water pipes to kitchen sinks shall be insulated from water heater to sink using material complying with 601.1 but pipe may be left uninsulated for a maximum length of 500 mm immediately before the kitchen tap if the insulation is exposed and liable to damage.

601.2.2
All other hot water pipes should be continuously insulated along their full length with helically wrapped, laminated aluminium foil complying with NZS 4222 or with self adhesive aluminium foil. Laminated foil, where fitted, shall be retained either with aluminium wire of not less than 0.7 mm diameter, tightly wrapped and at not more than 150 mm pitch, or in accordance with manufacturer's instructions. Other materials with an emissivity similar to aluminium may be used.

NOTE - Only polished metals have an emissivity similar to aluminium foil.

601.3
Frost protection
All pipes liable to freezing should be insulated to reduce the risk, using material complying with 601.1. In extreme climates other precautions will be necessary to prevent freezing.

602
SAFETY FROM SCALDING

602.1
It should be the concern of the installer of a domestic water heating system to ensure that excessive hot water temperatures are not possible, particularly at bathroom taps, where children or the aged are in danger from direct hot water scalds.

602.2
This can be achieved in a number of ways:

(a) The water heater control thermostat can be set at 55 °C; this however may not be practical for some installations with undersized water heaters

(b) Thermostatically controlled mixer valves at bath and shower can be installed, with set limits to hot water temperatures: or

(c) Install a tempering valve complying with NZS 4617 to mix hot water from the water heater with cold, to distribute water at a set 55 °C. This allows the water heater to operate at normal thermostat settings of 60 - 70 °C while providing safety and economy without restricting the quantity of hot water available.

603
SELECTION OF WATER HEATER AND VALVES

603.1
Where the water heater is connected to an off-peak electricity supply the specific hours of supply for the district concerned must be considered when selecting the size of water heater and the heating element necessary for the service conditions. Advice should be sought from the supplier of the water heater and the electricity supplier.

603.2
Correct matching of the pressure relief valve with the input water pressure, or the pressure control valve where installed, is essential to ensure effective operation and to prevent unnecessary relief valve overflow.

APPENDIX A
RECOMMENDED FLOW RATES

A1
It is recommended that the installation should be designed to provide the following hot water flow rates:

Type of outlet	*Flow rate (L/min)*
Kitchen sink	9
Bath	13
Wash hand basin	5
Shower	5
Laundry tub	9

A2
The diameter of pipe needed to meet these flow rates may be determined by use of table A1.

Table A1
FRICTION LOSS IN COPPER PIPES OF 10 TO 32 mm NOMINAL BORE

Friction loss per linear metre	*Flow rate in relation to nominal bore of pipe*				
	10 mm N.B.	*15 mm N.B.*	*20 mm N.B.*	*25 mm N.B.*	*32 mm N.B.*
mH_20	L/min	L/min	L/min	L/min	L/min
0.01	1.23	2.73	5.42	13.1	25.2
0.02	2.00	4.20	9.15	19.4	39.2
0.03	2.64	5.42	11.6	24.2	49.2
0.04	3.14	6.41	13.7	27.9	56.5
0.05	3.59	7.33	15.5	31.5	63.2
0.06	4.00	8.10	17.1	34.7	69.2
0.07	4.50	8.80	18.7	37.9	75.0
0.08	4.73	9.55	20.0	40.5	81.0
0.09	5.19	10.3	21.2	42.9	85.6
0.10	5.42	10.9	22.4	45.5	91.0
0.11	5.73	11.4	23.7	47.7	95.5
0.12	6.00	11.9	24.7	50.0	99.0
0.13	6.28	12.5	25.9	52.4	104.0
0.14	6.60	12.9	26.9	54.2	108.0
0.15	6.78	13.6	27.8	56.5	112.0
0.16	7.10	14.0	28.8	58.8	115.0
0.17	7.27	14.5	29.7	60.5	118.0
0.18	7.60	15.0	30.6	62.9	122.0
0.19	7.82	15.3	31.4	64.1	126.0
0.20	8.00	15.8	32.4	65.0	129.0
0.25	9.10	17.8	36.4	73.9	145.0

OTHER NEW ZEALAND STANDARDS FOR WATER HEATING SYSTEMS

NZS 4602:1988	Low pressure copper thermal storage electric water heaters
NZS 4603:1985	Installation of low pressure thermal storage electric water heaters with copper cylinders (open-vented systems)
NZS 4604:1978	Dairy-type thermal storage electric water heaters with copper cylinders
NZS 4605:1978	Code of practice for the installation of dairy-type thermal storage electric water heaters
NZS 4606:1989	Storage water heaters
NZS 4608:0000	Control valves for use in hot water systems (in preparation)
NZS 4613:1986	Domestic solar water heaters
NZS 4614:1986	Installation of domestic solar water heating systems
NZS 4617:1989	Tempering (3-port mixing) valves
NZS 6214:1988	Thermostats and thermal cutouts for domestic thermal storage electric water heaters (a.c. only)

THE NEW ZEALAND STANDARD CERTIFICATION MARK SCHEME

The 'S' Mark appearing on a product, container or label is an assurance that the goods are manufactured under a system of supervision, control, and testing (including periodical inspection at the manufacturer's works by SANZ Certification Officers) designed to ensure compliance of the commodity, process, or practice with the relevant New Zealand Standard. The New Zealand Standard Certification Mark, registered as a certification trade mark under the Trade Marks Act 1953, may be used only in terms of a licence issued by SANZ, and must be accompanied by the licence number and the NZS number.

Used correctly in conjunction with advertising the 'S' Mark can provide a strong assurance of product quality for a manufacturer when selling his goods and thus becomes a powerful marketing tool.

Manufacturers may obtain particulars of the conditions of licensing from the Director, Standards Association of New Zealand, Private Bag, Wellington.

Declared on 8 December 1989 by the Standards Council to be a standard specification pursuant to the provisions of section 10 of the Standards Act 1988.

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