



VALVCHEQ - AS/NZS 3500.1 BACKFLOW PREVENTION

Summary of AS/NZS 3500.1, Section 4 - connection control and backflow prevention

CROSS CONNECTION HAZARD RATINGS

Any property that potable water enters is designated to be either a high, medium or low hazard area.

- High hazard -** Any condition, device or practice which in connection with the water supply system has the potential to cause death.
- Medium hazard -** Any condition, device or practice which in connection with the water supply system has the potential to endanger health.
- Low hazard -** Any condition, device or practice which in connection with the water supply system would constitute a nuisance but not endanger health or cause injury.

LEVELS OF PROTECTION

- Individual protection -** Backflow prevention protection provided at individual fixtures.
- Zone protection -** Backflow prevention protection provided at the connection to specific sections of a water supply system within a building or facility.
- Containment protection -** Backflow prevention protection provided at the property boundary to protect the authority's water supply from contamination.

NOTE: Any of the levels of protection can be either a high, medium or low hazard device.

VALVCHQ - AS/NZS 3500.1 BACKFLOW PREVENTION

INDIVIDUAL PROTECTION - PROTECTION PROVIDED AT INDIVIDUAL FIXTURES

INDUSTRIAL AND COMMERCIAL APPLICATIONS

Form of cross connection	Hazard rating	Backflow prevention device	Model required
Fogging and cleaning spray equipment with chemical injection or additives	High	RBT/RPZD	RP03
Pan washing apparatus	High	RBT/RPZD	RP03
Chemical dispensers (high toxicity)	High	RAG/RBT//RPZD	RP03
Potable or mobile tankers	High	RAG/RPZD	RP03
Mixing of chemicals	High	RAG/RPZD	RP03
Weed and pest spraying and water cartage tanks	High	RAG/RPZD	RP03
Chemical dispensers (low toxicity)	Medium	Testable devices	DC03
Coils and jackets in heat exchangers -unsealed and toxic environments	Medium	DCV only	DC03
Coils and jackets in heat exchangers -sealed and non-toxic environments	Low	Non-testable devices	DuCV03
Photographic processing machines (no developer mixing)	Low	Non-testable devices	DuCV03

HOSPITAL - MEDICAL, DENTAL AND VETERINARY APPLICATIONS

Form of cross connection	Hazard rating	Backflow prevention device	Model required
Equipment used for handling, mixing, measuring and processing chemical and microbiological substances	High	RAG/RPZD	RP03
Photographic developers			
(a) Developer mixing facilities	High	RAG/RPZD	RP03
(b) Water supplying rinse tanks	Low	Non-testable devices	DuCV03
Haemodialysis Machines			
(a) Australia	Low	Non-testable devices	DuCV03
(b) New Zealand	High	RAG/RPZD	RP03

NOTE: Veterinary equipment is rated as per hospital/medical.

FIXTURES AND APPLIANCES

Form of cross connection	Hazard rating	Backflow prevention device	Model required
Food preparation or food storage tanks, vats and vessels with clean-in-place systems	High	RAG/RPZD	RP03
Fixtures for food preparation, eg.,baths, bidets, basins, showers	Low	AG	AG
Fixtures for ablutions, eg.,sinks	Low	AG	AG
Laundry troughs	Low	AG	AG
Hair salon basins or troughs	Low	Non-testable devices	DuCV03
Carbonated drink dispensing machines	Low	Stainless steel dual CV(intermediate) vent	SS Du CV
Drink dispensing equipment, vending machines, coffee machines	Low	Non-testable devices	DuCV03
Food preparation or food storage tanks, vats and vessels	Low	AG/non-testable devices	DuCV03
Bidets	High	RBT/RPZD	RP03

VALVCEOQ - AS/NZS 3500.1 BACKFLOW PREVENTION

INDIVIDUAL PROTECTION - PROTECTION PROVIDED AT INDIVIDUAL FIXTURES

HOSE ATTACHMENT OUTLETS

Form of cross connection	Hazard rating	Backflow prevention device	Model required
External hose taps	Low	Non-testable devices	HCVB
Flexible connections over domestic fixtures	Low	Non-testable devices	DuCV03
Hose taps located within an area provided with zone protection, but not connected downstream of the zone protection device.			
(i) Flexible connections over commercial, Industrial or hospital fixtures	Low	Non-testable devices	DuCV03
(ii) Laboratory outlets	Low	Non-testable devices	DuCV03
Hose taps located within 18m of a Type 'C' irrigation system	Low	Non-testable devices	DuCV03

WATER SUPPLY APPLICATIONS PERMANENTLY ATTACHED

Form of cross connection	Hazard rating	Backflow prevention device	Model required
Cooling towers*	High	RAG/RPZD	RP03
Steam boilers	Low	BT	BT
Steam calorifier	Medium	Testable devices	DC03

NOTES: * Cooling tower air gap should be measured from the rim of the cooling tower basin

WATER TREATMENT APPLICATIONS

Form of cross connection	Hazard rating	Backflow prevention device	Model required
Dem mineralizing equipment using ion-exchange resins with acid and alkali regeneration	High	RBT/RPZD	RP03
Plants with auxiliary non-potable water supplies	High	RBT/RPZD	RP03
Chlorinators	Medium	Testable devices	DC03
Drinking water in reclaimed water plants	Low	Non-testable devices	DuCV03
In-line water softeners and filters	Low	Non-testable devices	DuCV03

AGRICULTURE AND HORTICULTURAL APPLICATIONS

Form of cross connection	Hazard rating	Backflow prevention device	Model required
Antibiotic injectors	High	RBT/RPZD	RP03
Fertilisers, herbicides, nematicides, insecticides and weedicides injected into an irrigator (see Section 7, Type D)	High	RBT/RPZD	RP03
Fogging and cleaning sprays with chemical injection	High	RBT/RPZD	RP03

LEGEND

AG	=	Air gap	RAG	=	Registered air gap
AVB	=	Atmospheric vacuum breaker	RBT	=	Registered break tank
BT	=	Break tank	RPZD	=	Reduced pressure zone device
DCV	=	Double check valve	SCVT	=	Single check valve testable
DCDA	=	Double check detector assembly	SCDAT	=	Single check detector assembly testable
DuCV	=	Dual check valve	SS Du CV	=	Dual check valve
HCVB	=	Hose connection vacuum breaker			

VALVCEQ - AS/NZS 3500.1 BACKFLOW PREVENTION

ZONE PROTECTION - PROTECTION WITHIN A BUILDING OR FACILITY

INDUSTRIAL AND COMMERCIAL APPLICATIONS

Form of cross connection	Hazard rating	Backflow prevention device	Model required
Electro-plating, degreasing, descaling, stripping, pickling, dipping, etc, tanks, vats and vessels	High	RBT/RPZD	RP03
Commercial laundries	High	RAG/RPZD	RP03
Cooling or heating systems with recirculating water	High	RAG/RPZD	RP03
Clean-in-place systems (i.e. internal chemical cleaning tanks place without disassembling equipment)	High	RAG/RPZD	RP03
Dockside facilities	High	RAG/RPZD	RP03
Industrial process water which has been recirculated	High	RAG/RPZD	RP03
Industrial and teaching laboratories recirculated	High	RAG/RPZD	RP03
Secondary school laboratories (including fume cupboards)	Medium	Testable devices	DC03
Water filtration equipment	Low	Non-testable	DuCV03
Photographic laboratories	Low	Non-testable	DuCV03

FIRE SERVICES

Form of cross connection	Hazard rating	Backflow prevention device	Model required
Direct connection to public water supply (Aust only). No tank, reservoir, connection to other water supply, antifreeze or other additives or auxiliary supply, e.g. pond or lake within 180m of fire brigade booster connection	Low	SCVT/SCDAT	SCV03/SCDA03
Fire hose reel located in areas of hazard have to have a backflow prevention device in line with the hazard ratings of the areas with in reach of the fire hose	High/medium	RP03/DC03	RP03/DC03
All other fire services be used for purposes other than fire fighting	Medium	DCV	DC03
Home fire sprinkler systems [see AS2118.5]	Low	DuCV03	DuCV03

HOSPITAL, MEDICAL, DENTAL, VETERINARY AND NURSING HOME APPLICATIONS

Form of cross connection	Hazard rating	Backflow prevention device	Model required
Dissection rooms in hospitals and medical buildings	High	RBT/RPZD	RP03
Mortuary equipment used in funeral parlours, mortuaries, autopsy areas	High	RBT/RPZD	RP03
Utility rooms, where other than hand basins are installed	High	RBT/RPZD	RP03
Operating theatres in hospitals and medical buildings	High	RBT/RPZD	RP03

FIXTURES AND APPLIANCES

Form of cross connection	Hazard rating	Backflow prevention device	Model required
Sanitary dump points	High	RAG/RPZD	RP03
Food storage tanks, vats and vessels with clean-in-place systems	High	RAG/RPZD	RP03
Food storage tanks, vats and vessels	Low	Non-testable devices	DuCV03
Hair salons, basins or troughs	Low	Non-testable devices	DuCV03

VALVCEQ - AS/NZS 3500.1 BACKFLOW PREVENTION

ZONE PROTECTION - WATER SUPPLY PROTECTION

AGRICULTURAL AND IRRIGATION SYSTEMS

Form of cross connection	Hazard rating	Backflow prevention device	Model required
Irrigation systems injected with fertilisers, herbicides, nematicides, insecticides and weedicides injected into herbicides, nematicides, irrigation systems	High	Registered break tank/RPZD	RP03
Drinking nipples and troughs	High	Registered break tank/RPZD	RP03
Irrigation systems for farms, animal shelters, sanctuaries	Medium	Testable devices	DC03
Irrigation systems - commercial residences	Medium	Testable devices	DC03
Irrigation systems - residential	Low	Non-testable devices	DuCV03
All properties using injection systems. Systems involving fertilisers, herbicides, nematicides, etc (Type D)	High	Registered break tank/RPZD	RP03
Domestic properties and residential units not using injection systems. Outlets and pipework more than 150mm above ground (permanently open, not subject to ponding) (Type A)	N/A	No backflow prevention required	-
Outlets and pipework less than 150mm above ground (Type B)	Low	Non-testable devices	DuCV03
All other properties - other than domestic properties and residential units not using injection systems. Outlets and pipework more than 150mm above ground (permanently open, not subject to ponding) (Type A)	N/A	No backflow prevention required	-
Outlets and pipework less than 150mm above ground (Type C)	Medium	Testable devices	DC03

LEGEND

AG = Air gap	HCVB = Hose connection vacuum breaker
AVB = Atmospheric vacuum breaker	RAG = Registered air gap
BT = Break tank	RBT = Registered break tank
DCV = Double check valve	RPZD = Reduced pressure zone device
DuCV = Dual check valve	

NOTE: If in doubt check with your Local Authority and or Australian/New Zealand Standard for current status.

VALVChEQ - AS/NZS 3500.1 BACKFLOW PREVENTION

CONTAINMENT PROTECTION - PROTECT THE AUTHORITY'S WATER SUPPLY FROM CONTAMINATION

TYPES OF PREMISES

Form of cross connection	Hazard rating	Backflow prevention device	Model required
Premises with an alternative water supply*	High	RBT/RPZD	RP03
Premises where inspection is restricted	High	RBT/RPZD	RP03
Hospitals, mortuaries, clinics and the like	High	RBT/RPZD	RP03
Piers, docks and other waterfront facilities	High	RBT/RPZD	RP03
Sewerage treatment plants and sewerage lift stations	High	RBT/RPZD	RP03
Chemical plants	High	RBT/RPZD	RP03
Metal finishing plants	High	RBT/RPZD	RP03
Petroleum processing or storage plants	High	RBT/RPZD	RP03
Radioactive material processing plants or nuclear reactors	High	RBT/RPZD	RP03
Car and plant washing facilities	High	RBT/RPZD	RP03
Abattoirs	High	RBT/RPZD	RP03
Factories using, processing or manufacturing toxic chemicals	High	RBT/RPZD	RP03
Chemical laboratories	High	RBT/RPZD	RP03
Pathology laboratories	High	RBT/RPZD	RP03
Sanitary depots	High	RBT/RPZD	RP03
Universities	High	RBT/RPZD	RP03
Food and beverage processing plants	Medium	Testable devices	DC03
Caravan parks	Medium	Testable devices	DC03
Marinas	Medium	Testable devices	DC03
Premises with grey water re-use systems	Medium	Testable devices	DC03
Public swimming pools	Medium	Testable devices	DC03
Premises with reticulated disinfected reclaimed water systems	Medium	Testable devices	DC03
Premises with rainwater tanks	Low	Non-testable devices	DuCV03

LEGEND

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AVB = Atmospheric vacuum breaker	RAG = Registered air gap
BT = Break tank	RBT = Registered break tank
DCV = Double check valve	RPZD = Reduced pressure zone device
DuCV = Dual check valve	

NOTES:

- * Properties with alternative water supply see AS3500.1 Clause 4.2.5.
Air gaps should not be used in toxic environments.

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