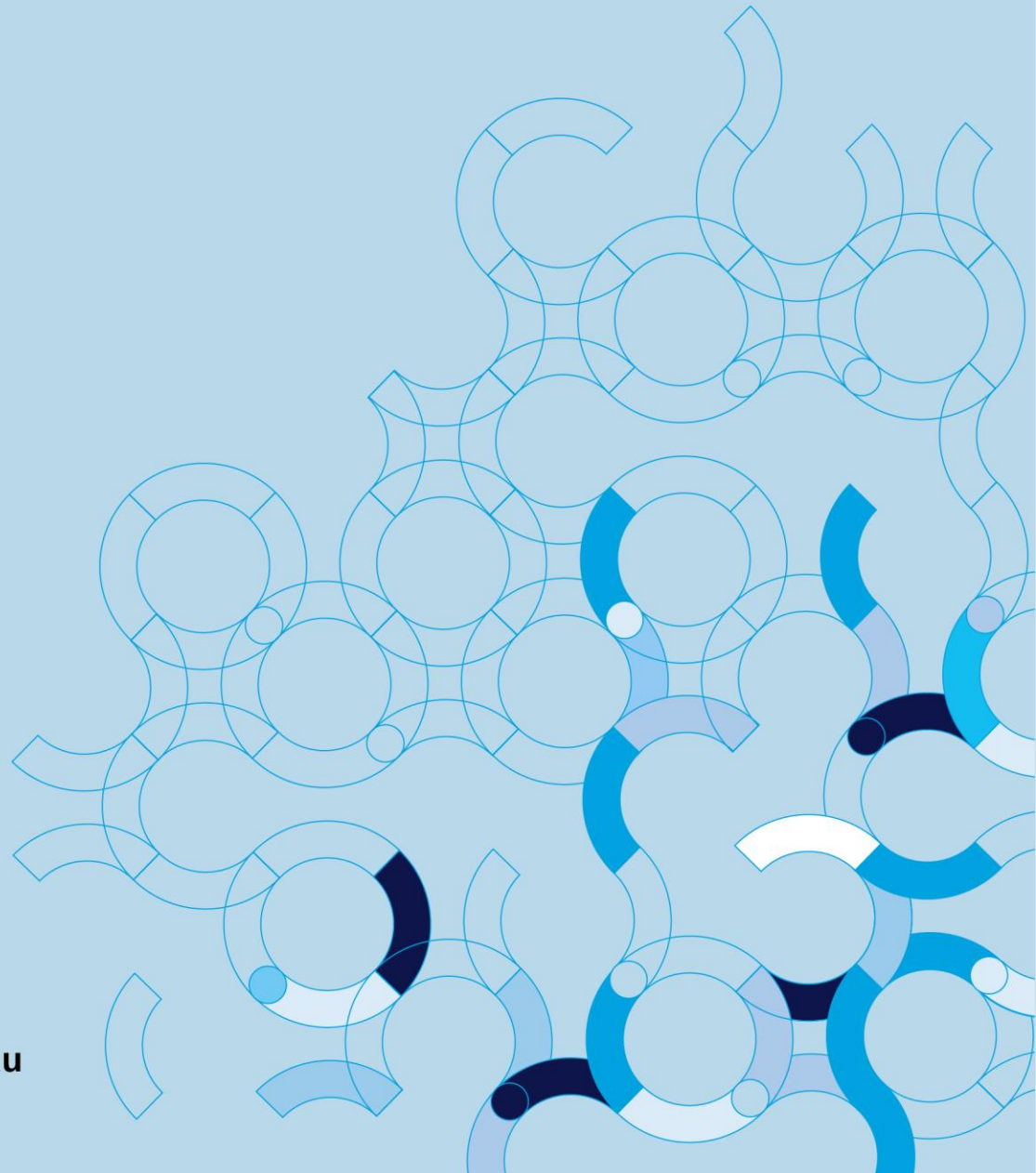
STD-SPE-M-003

Technical Specification

HYDRAULICALLY OPERATED AUTOMATIC WATER CONTROL (GLOBE) VALVES

August 2025



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Document management

Document authorisation table

Issue	Date	Author	Reviewer	Approver
1	11/08/17	J. Thirkell	S. Hill (Challenger Valves & Actuators Pty Ltd)	K. Danenbergsons
2	27/08/25	Updated by S. Asadollahi	P. Deb Roy	S. Asadollahi

Version control table

Issue	Date	Reason for issue
1	11/08/17	Original work by J. Thirkell (2013 and 2016) re-formatted and re-published as STD-SPE-M-003 as part of Icon Water's upgrade of engineering design standards.
2	27/08/25	Update to comply with ACT Professional Engineers Registration scheme and update to template specification.

Document applicability table

Asset area	Applicable (Yes/No)	Asset area	Applicable (Yes/No)
Dams (DAM)	**Yes**	Water Network (WAT)	**Yes**
Bulk Water Supply (BWS)	**Yes**	Sewerage Network (SEW)	**No**
Water Treatment Plants (WTP)	**Yes**	Sewage Pump Stations (SPS)	**No**
Water Pump Stations (WPS)	**Yes**	Sewage Treatment Plants (STP)	**No***
Reservoirs (RES)	**Yes**	Recycled Water Systems (REC)	**No***

* This specification is primarily intended for application within the water supply system. However, the requirements of this specification may be adopted for individual water, raw water or recycled water systems found within sewerage facilities as applicable.

Contents

Abbreviations

Acronym	Full form
ACT	Australian Capital Territory
ALT	Altitude Valve
AS; AS/NZS	Australian Standard; Joint Australian and New Zealand Standard
BAV	Backup Altitude Valve
BSP	British Standard Pipe
CRD	Cla-Val model code for direct acting pressure regulating/reducing valves
DN	Nominal Diameter
FAV	Flow Rate Altitude Combination Valve
FBE	Fusion Bonded Epoxy
FRCV	Flow Rate Control Valve
kPa	Kilo-Pascal(s)
mA	Milli-Amphere(s)
mm	Millimetres
NC	Normally Closed
NO	Normally Open
OCV	Outlet Control Valve
PCV	Pump Control Valve
PRV	Pressure Reducing Valve
PSV	Pressure Sustaining Valve
VDC	Volts Direct Current

Definitions

Keyword	Definition
Hold point	A milestone when acceptance is required from Icon Water, prior to commencing the subsequent construction activity. Acceptance from Icon Water must be obtained by providing all necessary documentation as required by Icon Water specification. Hold Points shall apply prior to commencement of designated work lots or work items. Hold points have been identified in Icon Water Standard specifications as a **guide** and shall be established within the boundaries of the contractor scope and context.
Icon Water Representative	The nominated person or organisation that has written authority to act on Icon Water's behalf. This may be an Icon Water employee (or employees) such as an Icon Water Inspector or Icon Water Site Surveillance Officer, or a third party engaged to act on Icon Water's behalf.
Registered Engineer	According to the Professional Engineers Act 2023, a professional engineer is an individual registered under the Act to carry out professional engineering services in one or more areas of engineering including civil, electrical, fire safety, mechanical, and structural. Registered engineers in the ACT are registered with the Professional Engineers Registrar, which is part of the ACT government. This Registrar manages the registration process, including assessing applications, maintaining the register of professional engineers, and ensuring compliance with the Act.
Witness point	Witness Point means an identified point in a process where the Contractor is required to give Icon Water prior notice with the option to observe an activity based on the contract requirements. Witness points have been identified in Icon Water Standard specifications as a **guide** and shall be established within the boundaries of the contractor scope and context.

1 Introduction

1.1 Background

There are more than one hundred and fifty (150) hydraulically operated automatic (globe) control valves operating within the water supply system of the ACT. Typical installations and applications include: water treatment plants, remote (localised) water supply systems, town service reservoirs, pump stations as well as within the water distribution network.

Hydraulically operated automatic water control valves can provide a range of functions such as but not limited to pressure reduction, pressure relief, flow rate control and reservoir altitude control. These functions are dependent upon the "build specifications" of the individual valve assembly with the common item being a main (globe) valve. During automatic control, the globe valve's "disc" (or "plug") moves either towards or away from a stationary "seat". This movement is based on a pressure differential across the valve and this pressure differential can be influenced by the connection of additional valves to the main valve via pressure tubing (which are known as "pilot lines"). An additional valve assembled on a main valve is typically known as a "pilot valve". Regardless of the configuration of the main valve and ancillary items, the pressure differential which is used to operate the valve is created by the flow of water through the main valve as well as the pilot lines.

As detailed in Icon Water document *STD-SPE-G-006 Approved Products List*, Icon Water has currently standardised on hydraulically operated automatic water control valves manufactured by Cla-Val. Cla-Val automatic water control valves are sold in Australia by Challenger Valves and Actuators Pty Ltd as part of a sole-agency agreement with the parent manufacturer. The reasons for Icon Water's standardisation are as follows:

- Efficient spare parts stock holding.
- Increased familiarity amongst the Icon Water operations and maintenance teams given that automatic water control valves are a complicated valve type.
- Standardisation of training leading to increased efficiency of troubleshooting and repair.
- Quality and responsiveness of the technical support provided by the manufacturer and local agent.
- Previous operating history with Cla-Val valves as well as inferior operating history with some other competing brands.

1.2 Scope

Table 1.2.1 details the types of hydraulically operated automatic water control valves for which this specification applies.

Table 1.2.1 Valve types

Abb.	Type/Function	Description
ALT	Altitude Valve	Used to control water flow into a reservoir or storage tank to within a set level (i.e. height) range. The valve opens when the level in the reservoir or tank drops below the low-level set-point and closes when the level in the tank or reservoir reaches the high-level set-point. The valve can be set-up to allow one-way or two-way flow (i.e. flow into or out of the tank or reservoir).
BAV	Backup Altitude Valve	Used for the same purposes as that of an Altitude Valve but provides a back-up function in the event that the primary valve fails or power failure occurs to an alternative level control loop.
FAV	Flow Rate Altitude Combination Valve	Controls the flow into or out of a tank or reservoir to a set-point flow rate whilst maintaining the set-point level within the tank or reservoir.
FRCV	Flow Rate Control Valve	Used to maintain a flow rate set-point regardless of upstream or downstream variations in pressure.
OCV	Outlet Control Valve	Used to reduce high pressure at the valve inlet to a lower set-point pressure at the valve outlet regardless of any variations of pressure or variations of flow through the valve.
PCV	Pump Control Valve	Used to prevent pressure transients (aka “water hammer”) when pumps (typically booster pumps) are started in a system.
PRV	Pressure Reducing Valve	Used to maintain a set-point downstream pressure irrespective of fluctuations in upstream pressure.
PSV	Pressure Sustaining Valve	Used to maintain a set-point upstream pressure irrespective of fluctuations to downstream pressure or flow through the valve.

Specifically excluded from the scope of this document are:

- Efficient spare parts stock holding
- Specific installation requirements (as these are detailed in Icon Water’s suite of standard drawings and will vary dependent upon the application type and location).
- Valve sizing (which should be done in-conjunction with advice from the valve supplier and Icon Water). Note: Icon Water Technical Authority approval shall be sought prior to finalising valve and pipework sizing.

1.3 Purpose

This specification details the “build” requirements for hydraulically operated automatic water control valves located within the asset areas described in the Applicability Table (located prior to the table of contents).

1.4 Referenced documents

All works carried out shall be in accordance with the requirements of:

- This specification, including all documents referenced by each section of the specification:
- The documents listed in Table 1.4.1 Referenced documents.
- The relevant Icon Water Work Instructions (which will be provided where applicable on a project-by-project basis).
- The relevant WorkSafe ACT, WorkCover NSW and SafeWork Australia codes of practice.

The work shall also comply with the requirements of all relevant legislation, bodies and codes. The order of precedence for this specification, from highest to lowest are:

- Legislative requirements
- Icon Water Specifications
- WSAA standards
- Australian Standards

The Designer or Contractor (as applicable) shall notify the Icon Water Representative of any ambiguity or discrepancy discovered. In the event of an ambiguity or discrepancy, the Icon Water Representative shall direct the Designer or Contractor as to the interpretation to be followed in carrying out the work.

Where there is no suitable Australian Standard available, an agreed international standard and/or industry current best practice shall be adopted. If an international standard is proposed in lieu of an Australian Standard, the Contractor shall submit to the Icon Water Representative for approval a detailed assessment to show that the proposed standard is equivalent or superior to the relevant Australian standard.

Drawings are not to be scaled. Where any discrepancy exists between figured and scaled dimensions the figured dimensions shall prevail.

The documents listed in Table 1.4.1 Referenced documents are either referenced by within this specification or shall be read in-conjunction with this specification and be complied with.

Table 1.4.1 Referenced documents

Item	Document Number	Title
Australian Standards		
1	AS 5081	Hydraulically operated automatic control valves for waterworks purposes
2	AS/NZS 4020	Testing for products for use in contact with drinking water
3	AS/NZS 4087	Metallic flanges for waterworks purposes
WSAA Codes and Publications		
4	WSA PS-268	Automatic Control Valves for Pressure Applications – Water Supply
5	WSA 201	Manual for Selection and Application of Protective Coatings
Icon Water Standards		
6	STD-SPE-G-005	Supplement to WSA 201 Manual for Selection and Application of Protective Coatings
7	STD-SPE-G-006	Approved Products List
8	Various	SD Series Drawings

Note: The documents shall be the latest publication at the time of award of contract for execution of the works unless noted otherwise in the project specific documentation.

1.5 Designer qualifications and experience

According to the Professional Engineers Act 2023, a professional engineer is an individual registered under the Act to carry out professional engineering services in one or more areas of engineering including civil, electrical, fire safety, mechanical, and structural. Registered engineers in the ACT are registered with the Professional Engineers Registrar, which is part of the ACT government. This Registrar manages the registration process, including assessing applications, maintaining the register of professional engineers, and ensuring compliance with the Act.

The Designer, or the engineer directly supervising the Designer, must be a professional Engineer registered under the **ACT Professional Engineers Registration Scheme** in the relevant area of Engineering (known herein as a **Registered Engineer**) and hold chartered status with Engineers Australia. The engineer holding such status must be able to demonstrate that they are suitably experienced, and they shall certify in writing that the design complies with the relevant codes, standards, legislative requirements and the requirements of this specification.

2 Build Requirements

Section 2.1 details general build requirements that are common to all hydraulically operated water control valves in all installations and applications, unless varied by the specific requirements detailed in Sections 2.2 to 2.10 inclusive. Where there is a conflict, the specific requirements shall take precedence unless a manufacturer (Cla-Val) or supplier (Challenger) produced drawing (i.e. a schematic) shows otherwise.

All proposed build requirements shall be referred to the Icon Water Technical Authority for endorsement/approval prior to issuing drawings and/or specifications for tender or construction as applicable.

2.1 Build requirements common to all valve functions

The following requirements are applicable and common to all hydraulically operated water control valves in all applications and installations unless noted otherwise in Sections 2.2 to 2.10 inclusive:

a) A full-port globe body shall be used. Any water main size reduction shall be achieved via pipeline taper fittings adjacent to the globe valve.

b) The main globe valve body shall be constructed of ductile iron and shall be fully coated both internally and externally with FBE in accordance with the requirements of WSA 201 as amended by Icon Water specification STD-SPE-G-005.

c) Stainless steel grade 316 shall be used for the seat, cover bolts, studs and nuts. All external threads shall be coated with an approved Nickel-based anti-seize compound to avoid galling of stainless nuts and bolts during assembly. Alternatively, Molybdenum coated nuts and bolts shall be used.

d) All pilot system isolation valves shall be directly fitted to the main valve body. Fitting via pipe nipples is acceptable. No elbow shall be allowed between the port and the pilot isolation valve.

e) A Reflux pilot line:

- Shall be provided on all globe valves.
- Shall be separated from the control pilot line and located on the opposite side of the valve to the control pilot line.
- Shall be provided with three ball valves. Two ball valves shall be fitted directly into the body of the valve with the third valve fitted between the reflux valve and bonnet valve on a tee line that discharges to atmosphere. The atmospheric outlet of the third ball valve shall be plugged to prevent accidental discharge from the bonnet.
- Shall be fitted with a strainer, swing check valve (mounted in the horizontal) and a barrel union (for piping DN20 and larger for dismantling purposes). Note: Refer to Figure 3.2.1 Schematic of a pressure reducing valve for details.
- Shall be the same size as the nominal threaded outlet on the main valve body.

f) Cover bleeding shall be achieved via the reflux pilot line discharging to the atmospheric outlet on the (third) ball valve.

g) Flared fittings shall be used on all pilot lines.

h) A Control pilot line:
   - Shall be provided with a Y-strainer with details as follows:
     - A simple Y strainer (Cla-Val model X43) shall be used (not combination strainers such as X42 and X44; and not X46).
     - The strainer shall be mounted in the horizontal alignment with the sieve on the lower side to trap debris at the end of the strainer by gravity.
     - A ball valve shall be provided on the Y-strainer to allow for flushing of the strainer.
   - Shall be supplied with opening and closing speed controllers on the pilot. The speed controllers shall be located either side of the tee located at the top of the riser (off the valve bonnet).
   - Shall have separable pipe pieces on the “control side” to allow for flushing of the pilot system in a piece-by-piece manner as well as to allow air bleeding.
   - Shall be constructed of DN10 (3/8”) Type B copper tubing (except in the case of pressure reducing valves where the manufacturer or supplier shall recommend the size and material of construction).

i) A sight glass with a valve position indicator (Cla-Val model X101) shall be provided unless limit switches are specified (Cla-Val model X105L2W or X117E).

j) An air bleed shall be provided at the highest point of the valve cover (if not provided for by the installation of a sight glass).

k) The pressure rating of all components (e.g. valves, fittings, ancillaries etc.) shall be a minimum of PN16 unless a higher rating is nominated by Icon Water for a specific application.

l) For new installations, all flanges shall be in accordance with AS/NZS 4087, otherwise they shall match the existing mating flanges (e.g. AS 2129 Table E, ASME CL150 etc.)

m) Solenoid valves shall:
   - Be manufactured by Bürkert (model “Type 330”) with the following details:
     - Part No. 041103 (NC) or Part No. 056984 (NO)
     - Brass Body with DN6 (¼”) ports
     - Cable plug type 2508
     - 24 VDC
     - 3/2 way solenoid with either NC or NO as per detailed specification
     - PN16 rated with 2mm orifice

n) All control systems shall be 24 VDC.

o) Anti-cavitation trim shall be provided when the valve manufacturer or supplier recommends its installation (Cla-Val order code “KO”). Other fitting and ancillaries shall be fitted as required based on the recommendation of the manufacturer and/or supplier.

The items detailed below are not provided by the manufacturer and shall be supplied and installed by the constructor:

p) Insulation shall be installed on all main and pilot lines of size DN50 and smaller except when the valve installation is within a thermally insulated building. Insulation shall be Thermotec "Quickseal" or Armaflex "Solar" and shall have a minimum wall thickness of 15mm.

q) Pressure gauges (in accordance with Icon Water's Approved Products List) shall be provided upstream and downstream of the main valve and shall have 100 mm dia. indicators, DN10 (3/8") threaded BSP connections and be liquid filled. The operating range and units (e.g. metres of water column or kPa) shall be confirmed by the Icon Water Technical Authority.

2.2 Pressure reducing valves – specific build requirements

Pressure reducing valves (PRVs) shall have the build requirements detailed in Section 2.1 of this specification as well as the following additional build requirements:

a) The Cla-Val model shall be 90-01.

b) A valve position transmitter (Cla-Val model X117E) shall be fitted as the default build and the programmable output relays shall be set to (i) ≥ 90% open, and (ii) 0% open. If Icon Water advise that a valve position transmitter is not required, limit switches (Cla-Val model X105L2W) shall be fitted for both the (i) ≥ 90% open, and (ii) 0% open conditions. The switch termination boxes shall be sealed with a removable plug in preparation for future connection to monitoring equipment.

c) An electronic actuated pressure reducing pilot (Cla-Val model CRD-33) and pilot control lines shall be fitted. The pilot (aka "CRD") valve spring size shall be factory set to suit the specific application requirements. Icon Water shall advise the specific spring range and pressure set-point. The Icon Water preferred spring ranges are:

- 1.4 – 21 metres of water column (2 – 30 psi)
- 10.5 – 52.7 metres of water column (15 – 75 psi)
- 21.1 – 211 metres of water column (30 – 300 psi)

d) A flow restrictor (Cla-Val model X58C) shall be fitted to the pilot line as the default build unless advised otherwise by Icon Water.

2.3 Flow rate control – specific build requirements

Flow rate control valves (FRCVs) shall have the build requirements detailed in Section 2.1 of this specification as well as the following additional build requirements:

a) The Cla-Val model shall be 131-22 with manual bypass valves 3A and 3B removed (as this function is already catered for by Burkert solenoid valves).

b) The control pilot line shall have (i) a solenoid valve (NO) installed between the main valve's inlet port and bonnet, and (ii) a solenoid valve (NC) installed between the main valve's bonnet and outlet port.

c) A valve position transmitter (Cla-Val model X117E) shall be fitted as the default build and the programmable output relays shall be set to (i) ≥ 90% open, and (ii) 0% open.

d) A flow restrictor (Cla-Val model X58C) shall be fitted to the pilot line as the default build unless advised otherwise by Icon Water.

e) Other fittings and ancillaries as recommended by the manufacturer or supplier subject to approval by the Icon Water Technical Authority.

2.4 Flow rate altitude combination valves – specific build requirements

Flow rate altitude combination valves (FAVs) are used for flow and altitude control in to service reservoirs and shall have all of the build requirements detailed in Section 2.1 and Section 2.3 (FRCVs) of this specification.

2.5 Combination PRV and backup altitude valves – specific build requirements

PRV and BAV combination builds are used for pressure conditioning prior to controlling flow at a service reservoir with power-fail shut-off.

A combination pressure reducing valve (PRV) and backup altitude valve shall have the build requirements detailed in Section 2.1 of this specification as well as the following additional build requirements:

a) The Cla-Val model shall be 93-01.

b) Limit switches (Cla-Val model X105L2W) shall be fitted for both the (i) ≥ 90% open, and (ii) 0% open conditions. The switch termination boxes shall be sealed with a removable plug in preparation for future connection to monitoring equipment.

2.6 Combination FAV and PRV – specific build requirements

A combination valve type that can function in either FAV or PRV mode depending upon the position of a manually actuated 3/2 ball valve or 3/2 solenoid valve. In the case of a solenoid controlled (rather than manually actuated) valve, the valve function would default to PRV mode on loss of power to the solenoid.

A combination flow rate altitude combination valve (FAV) and pressure reducing valve (PRV) combination shall have the build requirements detailed in Section 2.1 of this specification as well as the following additional build requirements:

a) The Cla-Val model shall be 131-18.

b) The pilot and associated pilot lines shall be as per Section 2.2 and 2.4 with the additional requirement being the installation of a 3/2 valve immediately downstream of the bonnet which is either (i) a manual ball valve that is mounted on a bracket(1) held to the main valve cover bolts, or (ii) a solenoid(2) valve.

Notes:

1. The bracket shall have sufficient rigidity to support the ball valve and the weight of a valve key (for installation in valve chambers). The rotating axis of the ball valve shall be vertical and the ball valve shall be positioned/located such that there is no obstruction to accessing the handle from above. The bracket shall be constructed of a material (including fasteners) which does not cause mix-metals interaction leading to corrosion damage to the valve, bracket or associated fittings and fasteners.
2. The solenoid valve shall be specified as “normally open”. In the event of a power failure, the solenoid shall change to closed thereby enabling the PRV function. This option is employed when remote control is required

2.7 Combination FRCV and PRV – specific build requirements

A combination valve type that can function in either FRCV or PRV mode depending upon the position of a manually actuated 3/2 ball valve or 3/2 solenoid valve. In the case of a solenoid controlled (rather than manually actuated) valve, the valve function would default to PRV mode on loss of power to the solenoid.

A combination flow rate control valve (FRCV) and pressure reducing valve (PRV) combination shall have the build requirements detailed in Section 2.1 and 2.6 of this specification.

2.8 Backup altitude (solenoid shut-off) valves – specific build requirements

Backup altitude valves (BAVs) shall have the build requirements detailed in Section 2.1 of this specification as well as the following additional build requirements:

a) The Cla-Val model shall be 136-01 without the PRV function.

b) A control pilot line shall have a solenoid valve installed between the valve bonnet and downstream port. Upon de-energising the solenoid, the globe valve shall close (i.e. “fail closed”).

c) A flow restrictor (Cla-Val model X58C) shall be installed in the pilot line to allow the closure speed of the valve to be adjusted so that excessive pressure transients are avoided in the main line when the valve closes.

2.9 Pressure sustaining valves – specific build requirements

Pressure sustaining valves (PSVs) used with Icon Water’s network typically maintain a minimum pressure in the reticulation network at the inlet to the pump station and shall have the build requirements detailed in Sections 2.1 and 2.6 of this specification as well as the following additional build requirements:

a) The Cla-Val model shall be 50-90.

b) A valve position transmitter (Cla-Val model X117E) shall be fitted as the default build for pumping station applications and the programmable output relays shall be set to (i) ≥ 90% open, and (ii) 0% open. Otherwise, limit switches (Cla-Val model X105L2W) shall be fitted for both the (i) ≥ 90% open, and (ii) 0% open conditions. The switch termination boxes shall be sealed with a removable plug in preparation for future connection to monitoring equipment.

2.10 Pump control valves – specific build requirements

A valve type that allows pumped flow to recirculate during pump startup and then closes in a controlled manner to prevent recirculation. The valve is located on the pump(s) recirculation line.

Pump control valves (PCVs) shall have the build requirements detailed in Section 2.1 of this specification as well as the following additional build requirements:

a) The Cla-Val model shall be 58-01 and shall be fitted with a solenoid valve for shut-off purposes.

b) A valve position transmitter (Cla-Val model X117E) shall be fitted as the default build for pumping station applications and the programmable output relays shall be set to (i) ≥ 90% open, and (ii) 0% open.

3 Valve Purchasing and Schematic

3.1 Valve purchasing example

Table 3.1.1 depicts a typical example of how to specify build requirements when purchasing valves.

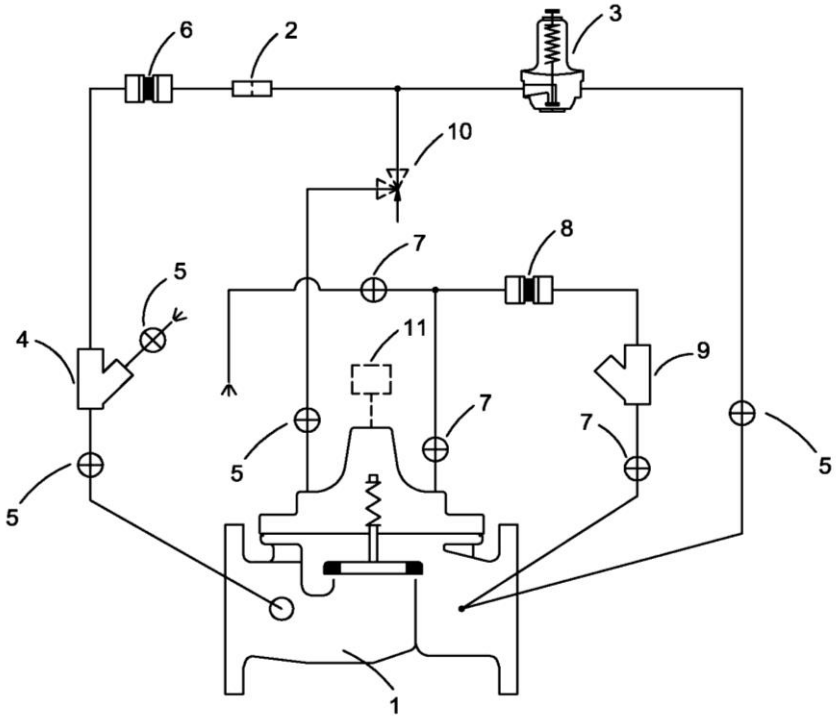
Table 3.1.1 Valve purchasing example

Cla-Val – Globe valve requirements Details: Mode and Asset number for valve	PRV/BAV WR056-20ME	Order code
Size	DN300	DNnnn
Model	93-01	Model number
Ductile Iron body		DI
Anti-cavitation		KO
Stainless steel seat: cover bolts, studs, nuts. (Note: Approved Nickel-based anti-seize compound to be applied to all external threads)		SS
FBE coating inside and out on main valve body		KC
Control pilot 3/8” • Ball valves and Y strainer (X43) on control pilot system • Y strainer to have flushing valve • X58C flow restrictor		BY X
Reflux valve pilot system • 3 x ball valves (includes bleed off)	DN25 pipe & fittings	D
X101 Sight glass	N/A	
X105L2W Limit switches	Y	X
X117E 4-20mA loop	N/A	
CV Opening and closing	2 off	X
Burkert solenoid model • 0330C 041103 (NC) • 0330D 056984 (NO)	 1 Nil	X
Manual 3/2 way ball valve. 3/8”	N/A	
Main valve pressure rating 1725 kPa		150#
Flange to AS 4087 PN16		CD

Cla-Val – Globe valve requirements Details: Mode and Asset number for valve	PRV/BAV WR056-20ME	Order code
CRD pilot spring range	30-300	nn-nnn
Set value for CRD (Desired HGL in mAHD) Final setting to be determined after AHD of installation in known.	663	Nn mWG

3.2 Schematics

Figure 3.2.1 details a typical schematic for a pressure reducing valve (PRV). Refer directly to manufacturer/supplier data sheets for other specific valve build schematics.



Schematic Diagram

Item	Description
1	Hytrol (Main Valve)
2	X58 Restriction Fitting
3	CRD Pressure Reducing Pilot
4	Y Strainer
5	⅜" Ball Valve
6	⅜" Swing Check Valve

Plumbed To Reverse Side Of Valve

7	Ball Valve (Size = Main Valve Port Tapping)
8	Swing Check Valve (Size = Main Valve Port Tapping)
9	Y Strainer (Size = Main Valve Port Tapping)

Optional Features

Item	Description
10	CV Flow Control (Opening)
11	X105L2W

PRV Ordering Code: Size(***) 90-01 DI SS KC BY D XXXX Drilled CD 30-300psi Set(***)

Where:

90-01 = Full Port Pressure Reducing Valve
DI = Ductile Iron Body
SS = Stainless Steel Seat, Cover Bolts/Studs/Nuts
KC = FBE Coating Inside and Out on Main Body Valve
BY = Isolation Ball Valves and Y Strainer on Pilot System
X1 = Control Line Y Strainer Fitted with Flush Ball Valve
X2 = Complete Tapping Sized Check Valve Feature Assembly Including all Pipe Fittings etc. to Match Specific Body Size
X3 = Bonnet Blowdown Ball Valve Integrated into Check Feature Pipeline
X4 = X105L2W Limit Switch Assembly c/w Plugged Holes
CD = Flange Drilling (same as AS4087 Class 16)
30-300psi = CRD Pilot Spring Range. Other Ranges Available 2-30, 15-75, 20-105.
Set = User Defined Factory Pre-Set Pressure

Figure 3.2.1 Schematic of a pressure reducing valve

Appendix A – Technical Specification Update History

A.1 Update History

Issue 1 (11/08/17): *Original work by J. Thirkell (2013 and 2016) re-formatted and re-published as STD-SPE-M-003 as part of Icon Water's upgrade of engineering design standards.*

Issue 2 (27/08/25): *Updated and re-issued. Updates included trasnfer to new template and addition of ACT Engineering Registration Scheme requirements.*

A.2 Issue Updates

Section	Update	Description
Abbreviations & Definitions	Additions	Additional Abbreviations and Definitions added to both tables.
1.5	ACT Registered Engineer	Amendments made to comply with the ACT Engineers Registration Scheme including swapping references from Charted Engineer to ACT Registered Engineer.
Throughout	Numbering	Numbering of sections updated to suit updated template.
Throughout	Technical Authority	All reference to Icon Water Principal Engineer updated to Icon Water Technical Authority.

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