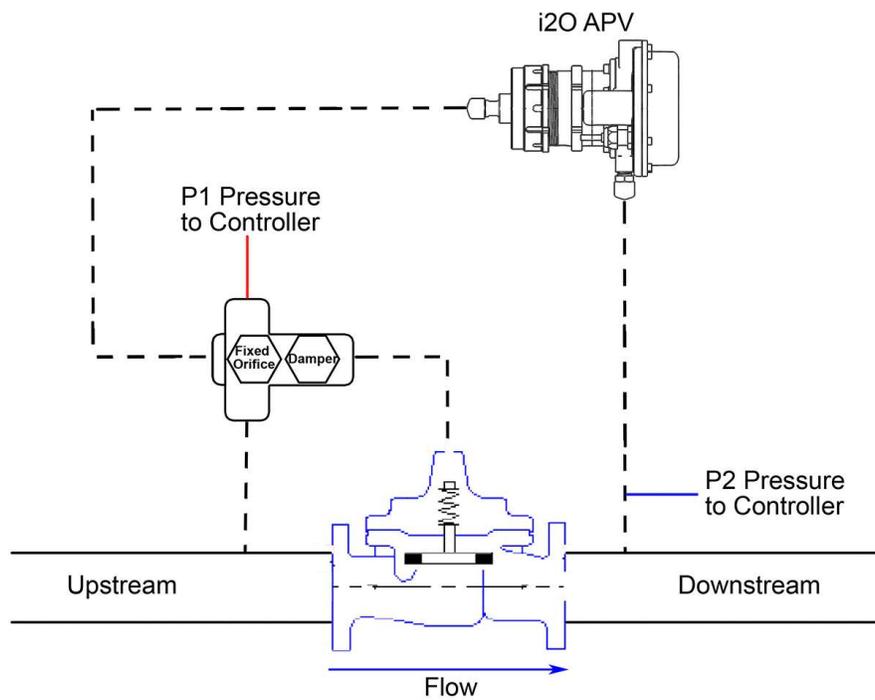


PRV Control System

Installation and Commissioning Manual



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Introduction

The i2O PRV Pressure Management solution enables water utilities to achieve the optimal network pressure automatically, with minimal operational support. It provides accurate data collection from the PRV, where the Control Logger captures upstream and downstream pressures along with flow. A separate Logger records critical point (or control point) pressure for modelling of flow-related head loss and automatic optimisation. The Control Logger and Advanced Pilot Valve (APV) are easy to install and all the required hardware for installation is included in i2O kits.

The installation requires upstream, downstream and control space tapplings at the PRV, with shut-off valves fitted to each tapping prior to installation.

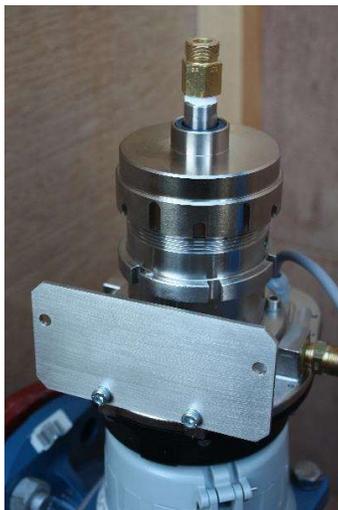
After installation, calibration and commissioning, the PRV control is adjusted remotely using the i2O Web platform (oNet). The required profiles can be configured in oNet prior to commissioning, and these settings will be applied when the controller first dials-up and connects to the platform. The APV provides accurate, smooth and frequent adjustment of the outlet pressures to ensure the PRV delivers the required scheduled pressures, with smooth transitions and no hydraulic disturbance to the network.

Further information about the Configurator and dNet are available in the i2O Help Center at support.i2owater.com. For support and assistance, please contact support@i2owater.com

i. Hardware installation procedure



- Install Control Logger and APV mounting brackets



- Install APV mounting plate



- Mount Control Logger and APV to brackets in the orientation shown.

Note: APV should be located just above PRV to allow self-bleeding (air)

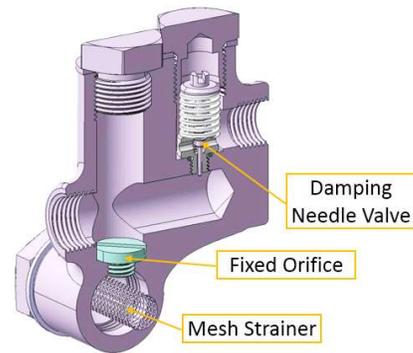


- Assemble hose connection hardware to the PRV, fitting the T-piece downstream and Restriction Block upstream

PRV Size: 80mm to 200mm				
PRV Seat Dia. (mm)	Fixed Orifice Diameter (mm)		Internal Damper Settings (Turns from closed)	
	1.8	2.0	Stable	Unstable
80	x		8	4
100	x		8	4
150		x	8	4
200		x	8	4

PRV Size: 250mm to 400mm				
PRV Seat Dia. (mm)	Fixed Orifice Diameter (mm)		External Damper Settings (Turns from closed)	
	2.0	2.8	Stable	Unstable
250	x		2.5	*To be determined
300	x		3.0	
400		x	4.0	

- Select and fit the appropriate size of fixed orifice to the Restriction Block, based on the size of the PRV



1. Mark hose as shown



2. Insert hose up to mark



- Prepare quick release connectors on 6mm hoses.

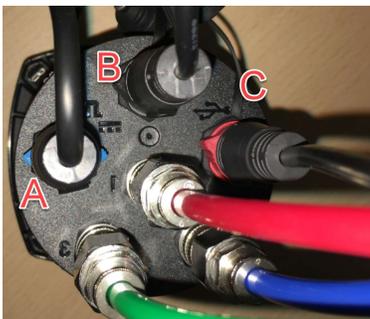


- Connect 6mm hoses and cables to Control Logger as shown:

RED: Upstream pressure (P1)

GREEN: Control Space
Pressure(Optional) (P3)

BLUE: Downstream pressure (P2)



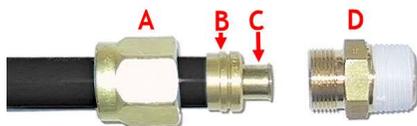
A: Flow

B: APV (PILOT)

C: USB port to connect the Laptop



- If required, splice flow meter cable in accordance with supplied instructions



- Assemble Serto couplings onto 12mm hoses

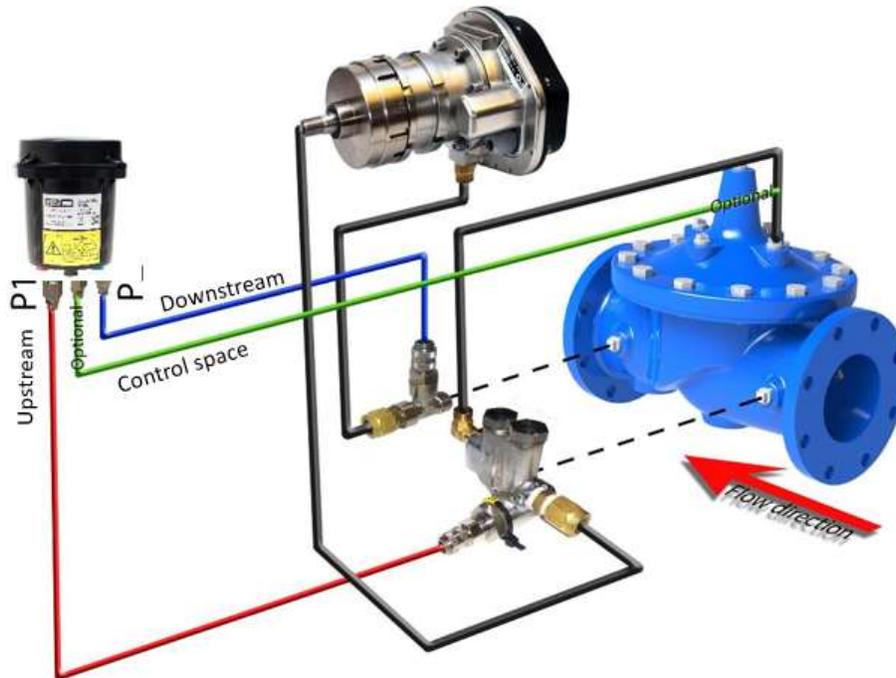
A: Compression nut

B: Sleeve

C: Stainless steel insert

D: Male adapter

- Connect 12mm hoses to APV and PRV as shown below:



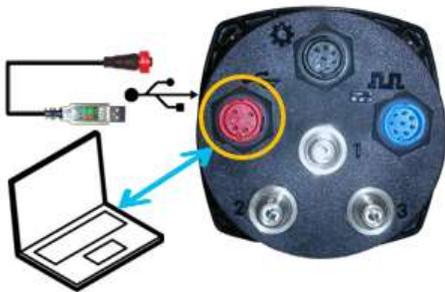
- 12mm black hoses should:
 - Be as short as possible
 - Have a long smooth radius
 - Have no kinks
 - Be routed appropriately to reduce strain

Important: Note that the APV shaft moves in and out approximately 10mm in normal operation. Ensure no rubbing or restriction to the black hose and do not clamp tubing

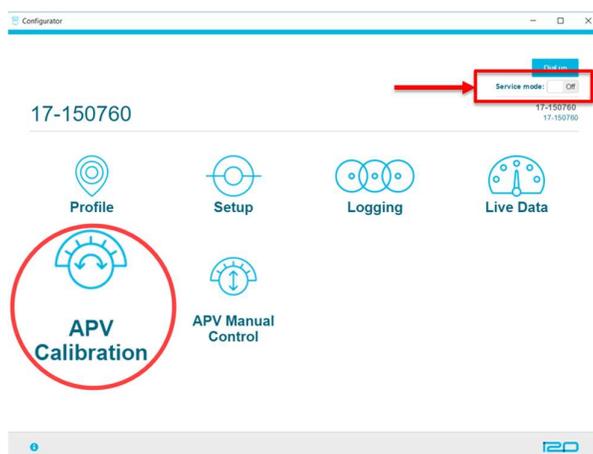
ii. Calibration procedure

Before activating the i2O PRV Control System, the following prerequisites must be met:

- Verify correct installation of equipment
- Control Logger set up
- Flow cable connected
- Control Logger pre-assigned to a location / associated to a DMA, using the device serial number in i2O Portal Platform
- Start Configurator; Download Configurator from your i2O Platform. For more information on downloading and using Configurator, visit support.i2owater.com.
- Deploy device through Configurator
- This updates location/DMA details in the device and imports configuration settings
- Check the flow calibration and adjust as required
- Ensure PRV is not under i2O control



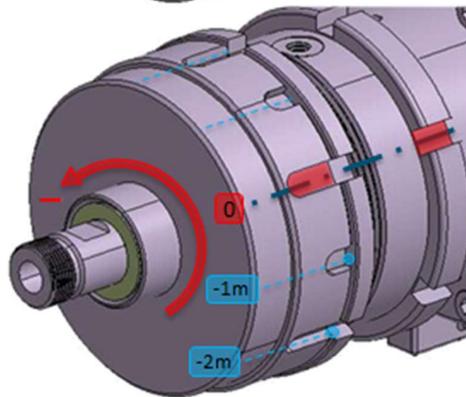
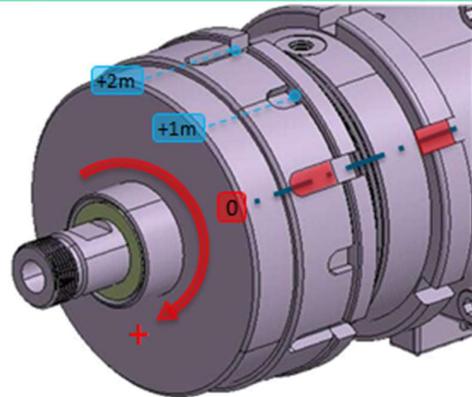
Connect the Control Logger to the Laptop and open Configurator. After a few seconds, the main screen of Configurator will appear showing the different options.



You must be in service mode in order to calibrate the APV.

Once in service mode, select the option “APV Calibration”

To consider before start the Calibration Process:

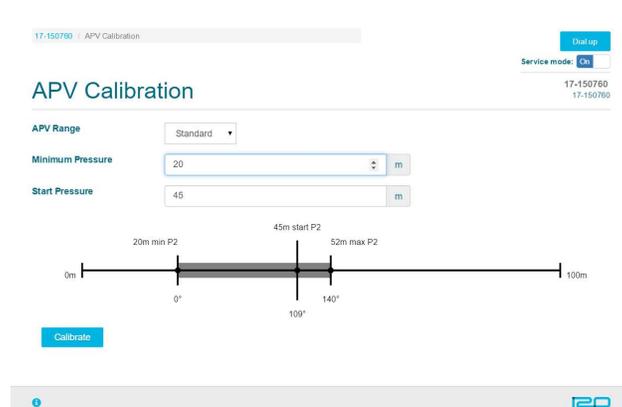


- All APVs are factory set to provide approx. 18m minimum downstream pressure.
- Rotating the APV end cap by “1-slot” is equivalent to 1m water pressure in both directions. Use a C-spanner to adjust the APV where required.
- Always ensure the APV is depressurized (hoses disconnected) when performing calibrations.
- When end cap contact is made with the internal spring, the equivalent pressure is approximately 10m

Before proceeding you must make sure that, the APV is isolated from PRV and cannot affect the operational pressures currently set by the PRV.

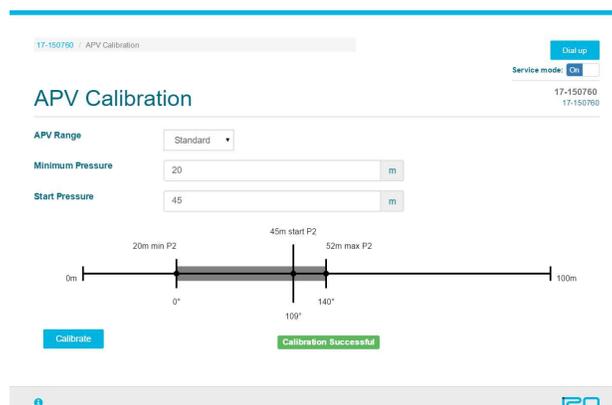
Once in **Configurator**, Open “APV Calibration”.

Select the minimum pressure and downstream start pressure entering values according to what we expect.



You need to ensure that the pilot has been mechanically set to its minimum spring pressure and the starting pressure has been entered before clicking the “Calibrate” button. If not, you have to mechanically set the pilot to the minimum spring pressure and enter the starting pressure before continuing.

Click the button “Calibrate” and consecutive messages will appear on the main screen. **Please read carefully all of them before click ok!**



When the calibration is completed, a green message will appear showing “**Calibration Successful**” and the system is ready to be commissioned.

Important note to consider:

When in Service Mode, the controller does not make any automatic adjustment of the APV, regardless of any configuration it has received from oNet. As soon as you exit Service Mode, the APV starts to control automatically from the starting point configured in the calibration process.

For this reason, it is absolutely vital that the controller is left in service mode when the shut-off valves on the PRV are opened, to ensure that the APV is still at the same starting point when it starts to hydraulically control the pressure.

It is only after the pressure has stabilised and the PRV is controlled hydraulically by the APV that the user should exit Service Mode and allow automatic control to start moving the APV

iii. Commissioning procedure

1. Ensure the APV is connected to the PRV but with the control space tap either shut.
2. Open the upstream and downstream taps, this will pressurise the i2O APV and pipe work. Check for leaks on both the hoses and the fittings at this point, rectifying or repairing as necessary.
3. When you see pressures recorded on the i2O Configurator (“Live Data” Screen) that are within acceptable limits for the location, slowly open the control space tap.
4. The pilot will now take control of the valve and it is likely that some change in the downstream pressure could be registered at this point.
Note: Different sized valves can react to changes in their control pressures at different speeds, small valves can react almost instantly and can be very variable whereas larger valves tend to move more slowly but be more stable.
5. Allow the pressures to stabilise before making any adjustments. Given the variability of installation, it is possible for set pressures to be +/- 2meters from the target pressure required. If this occurs, then adjust the end cap, using the C spanner in the method described earlier, either in a clockwise or anti clockwise rotation to achieve the target start pressure.
Do not change any other settings at this point; only adjust the APV end cap if necessary.
6. At this stage, the pilot will work as a conventional hydraulic pilot and will attempt to maintain the set fixed outlet pressure.
7. In order for the system to begin controlling, this must be correctly configured in oNet, the oNet settings will take effect the next time the device dials up. *It is recommended that the installer forces a dial-up to check the behaviour before leaving site, as control settings could immediately change pressure.*
8. When active control is implemented and the user is satisfied with the correct operation of the i2O system, then it is important that service mode is deactivated before disconnection of the device from the Configurator.

Installation of the PRV Control System is now complete. If you experience any difficulty or require assistance at any stage please email photographs of the installation to support@i2owater.com, stating the name and location of the site and device serial number.

Installation Checklist

APV Serial No.		Fixed Orifice Size	
Control Logger Serial No.			

No.	Test Name	Tick	Comments	
1	Installation hardware present	()		
	Shut off valves installed	()		
	Control space point available	()		
2	Mount APV rail and Control Logger bracket	()		
	Mount APV to rail using fittings supplied	()		
	Fit T-piece to and Restriction block PRV	()		
3	Connect red/blue tubing and cables	()		
	Connect Flowmeter	()		
	Connect APV 12mm hoses	()		
	Record current downstream pressure	()		Pressure:(mH/psi/bar)
4	Adjust APV endcap to set minimum pressure (if required)	()		
	Connect to Configurator and carry out APV calibration	()		
	Record Current downstream pressure	()		Pressure: (mH/bar/psi)
	Re-adjust endcap if necessary	()		
	Force Dial up from Configurator, check pressures and PRV operation	()		
		()		
5	Take photographs of:		If you experience any difficulty or require assistance at any stage. Email photographs to support@i2owater.com , stating the name and location of the site.	
	• APV to Restriction Block	()		
	• PRV connections	()		

Notes and observations		
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