



Stormwater360

FoxValve FF600

Operation & Maintenance Guidelines

DRAFT (for site-specific guidelines email maintenance@stormwater360.co.nz)

**This manual is the property of the owner/operator.
This manual should be read by all personnel**

INTRODUCTION:

The FoxValve (Model FF600) system is a 'site specific' trade waste diversion unit that will capture the 'first flush' of rain falling on a site after a pollution generating activity has occurred. Pollutants such as grease and oils left on the slab can be dislodged by rain and carried into the stormwater network. The FF600 is designed to cleanse a site by capturing the runoff at the commencement of rain and diverting it to suitable treatment, as it is most likely that this initial runoff will carry with it any residual pollutants. This volume will be diverted to a holding tank for processing or discharged to a trade waste sewer.

The FF600 system meets local authority requirements by automatically diverting washdown water and an initial volume of rainfall to treatment while allowing remaining rain to go to stormwater.

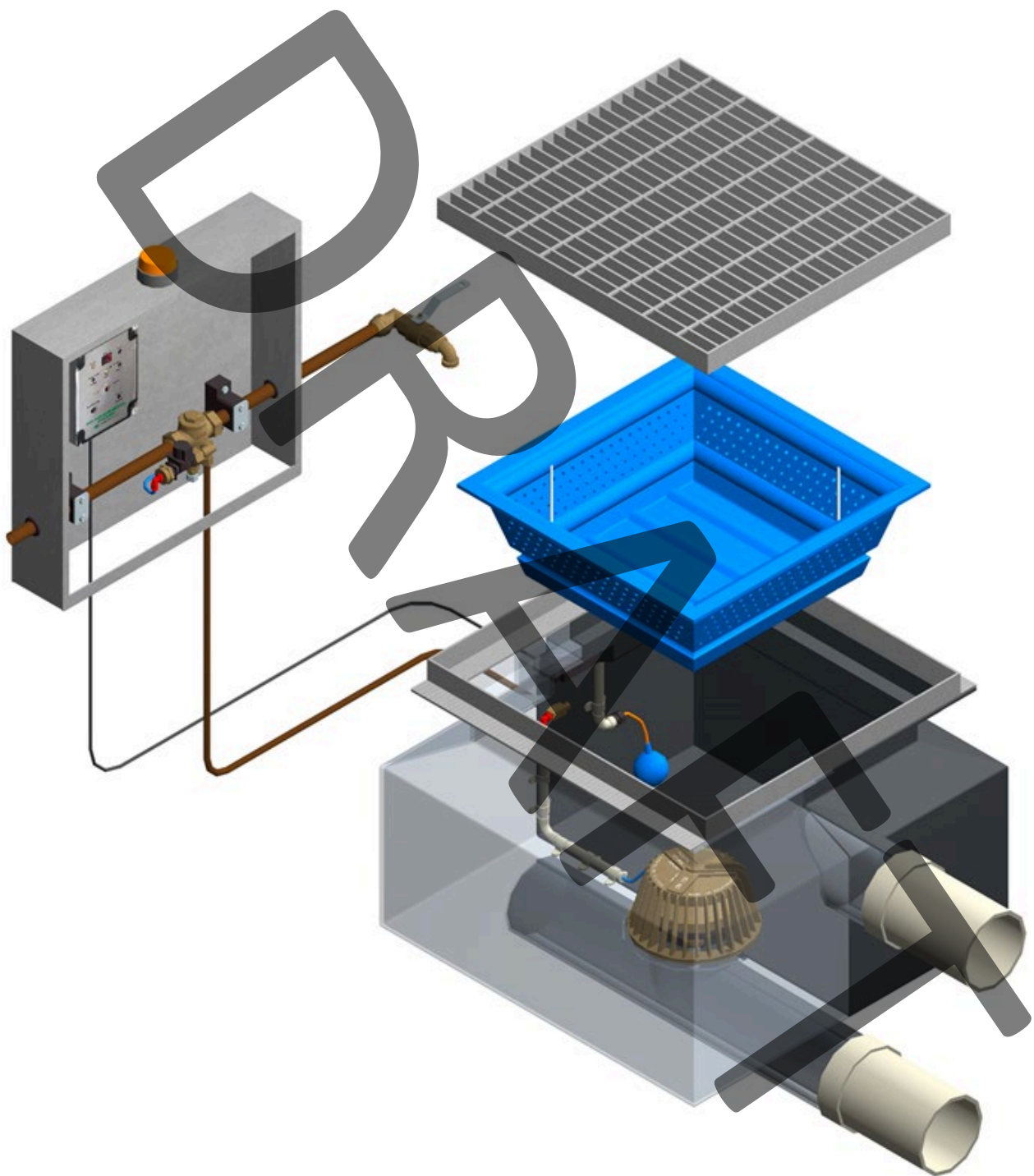
Distributor:

Stormwater360 NZ is the distributor of FoxValve in New Zealand under licence from Fox Environmental Systems. For maintenance and general enquiries please contact the office via:
Telephone: 0800 STORMWATER or Email: info@stormwater360.co.nz

Disclaimer:

Information in this document is subject to change without notice and does not represent a commitment on the part of Stormwater360 NZ. Stormwater360 NZ makes no representations or warranties, implied or otherwise, that amongst others, the information available from this document are free from errors or omissions.

Nothing in this document should be construed as an expressed warranty or an implied warranty of Merchantability or fitness for any particular purpose.



Process Description:

All runoff should be presented to the FF600PM Pit via the silt basket or other screening devices which will hold back silts and solids. All drains and silt traps must be checked periodically and kept clean of debris and silt. This is to protect the diversion valve and your waste treatment process as well as being a mandatory requirement of Council Trade Waste Regulations.

The Fox FF600PM will divert all trade waste from an open washdown area providing the washdown equipment is located downstream of the Control Panel. When the washdown tap is turned on the Demand Valve will send a hydraulic signal to the Diversion Valve in the pit. The valve will open and all washdown water will be directed to the holding tank for treatment. Hoses and taps other than those downstream of the Control Panel should not be used in the area.

When washdown ceases, the Diversion Valve will close preventing any rainwater from entering your trade waste treatment system. Allowing rainwater to go to treatment and the sewer system is a chargeable offence under Council Trade Waste Laws.

The system will divert a predetermined volume at the commencement of rain (the First Flush). This will cleanse the site of contaminants that may have been left on the slab.

The amount of First Flush volume is calculated by the formula:
Length x Width of Area x Depth of First Flush (the amount of rain needed to wash the contaminants into the catchment chamber e.g. 10mm).

An area 10x5 metres will have: $10 \times 5 \times 10\text{mm} = 500\text{L}$ First Flush Volume.

At the commencement of rain, the pit will fill to the level of the float. The Diversion Valve will open and the pit contents will be diverted to the trade waste holding tank. This is called a 'drop'. This process will repeat until the required First Flush volume has been taken. Once the First Flush has been diverted the remaining rainfall will exit to the stormwater network.

Note: (Float activation level should be located a minimum of 20mm below the stormwater outlet). The First Flush will not be retaken until a wash operation occurs or the (programmable) reset timer expires.

Equipment Specifications:

FoxValve FF600	
Pit/Chamber	Medium Density Polyethylene
Silt Screening	600mm sq MDPE
Grate	600mm sq Galvanised
Diversion Valve	
Model	DV150
Flow Rate	1200L/min at 0.5 mtr head
Min. Opening Pressure	100KPa
Body	Gunmetal
Shafts	Stainless Steel
Flange	Nylon
Diaphragm	Nitrile Rubber
Gasket	Nitrile Rubber
Demand Valve	
Model	DMV25
Solenoid	12V DC
Valve Body	Gunmetal
Seals	Nitrile Rubber/Polyurethane
Max. Inlet Pressure	1400 KPa
Control Station	
	PLC Programmable Logic Controller
Drive Line	
	½" Copper (not supplied)
Conduit	
	32mm PVC HD Electrical (not supplied)

Maintenance:

Good housekeeping practices of your washdown area and the diversion chamber will ensure correct operation of your system and protect your waste treatment process. Generally, the advice here is to use common sense and try to limit the amount of silts and solids from entering the system. Drainage systems are designed for liquids only.

Site maintenance is a mandatory requirement of Council Trade Waste Regulations. Inspection and cleaning should be carried out on a regular basis – scheduling will be dependent on the systems usage.

Do Not leave the Pit unattended with the grate off

The following housekeeping instructions are intended to ensure that this system continues to work properly, protecting your business and the environment.

- Remove obstructions from the grate, such as rags, scraps and plastic bags.
- Remove and empty silt traps into a collection bin or similar. Do not clean the silt basket on the wash slap or in the bunded area.
- While the silt trap and grate are off the pit, visually inspect the Diversion Valve to make sure it is not clogged with silt or obstructions.
- Check that the Diversion Valve is operational by turning on a hose beyond the Control Panel. The valve should open when the tap is turned on and close once the tap is turned off.
- Wash out the collection pit.
- Check the Diversion Valve seals. With the tap off, pour a bucket of water into the FFPM pit. If the water drains away, the Diversion Valve requires attention. Call Stormwater360 on 0800 STORMWATER.
- Check the float switch. Manually lift the float ball upwards, then release. The valve will open and then close. Note that water ejects freely from the delay jet in the Bleed Valve situated on the Float Plate (refer to Drawing A4-INST-1008/1). If this is a washdown site, the first flush can be programmed to reset after any washdown activity within 90 seconds. The reset light will display on the PLC and the count will zero.

Note: Silt will clog the Diversion Valve ONLY when the plumbing downstream of the valve builds up with silt. House cleaning should be done on a regular basis to keep silt from entering the holding tank and pipe work and eventually clogging the valve.

Alarm Activation:

An audible alarm is activated when the Diversion Valve cannot shut in a normal operational manner within 60 minutes. If the 'alarm' and 'valve open' lights are illuminated on the PLC, proceed with the following:-

- Remove the grate and silt basket from the Pit.
- Inspect the Diversion Valve for any foreign material which may be preventing it from closing. Turn on a washdown hose and wait for the valve to fully open before removing any obstruction so as not to damage the nitrile rubber seal.
- The closed light on the PLC must be illuminated before the alarm mode will cancel.
- If the Diversion Valve still does not close there may be a problem with the Demand Valve or driveline.

Trouble Shooting:

A regular service should be carried out by an authorised technician to prevent unnecessary failure/damage to the system and to maintain the warranty. Please read the following in conjunction with the drawings in Appendix C.

Note: Water should bleed from the delay jet in the chamber when the system is in use. (Caution: water expelled at pressure).

Possible Causes of Problems:

- Demand Valve needs adjustment/servicing.
- Driveline blocked
- Delay Jet blocked.
- Debris blocking the Diversion Valve.
- Ruptured diaphragm in the Diversion Valve. Service and replace.
- Proximity switch needs adjustment.

Diversion Valve Will Not Open:

Note: If the holding tank is full the Diversion Valve may be open, but the chamber contents will have nowhere to drain to. Check the level in the holding tank before continuing.

- Check for leaks downstream of the Demand Valve.
- Remove the Grate and Silt Basket from the chamber.
- Check for debris under the sealing lip of the Diversion Valve. If the Valve is blocked, turn on the hose connected to the wash tap and wait for the Diversion Valve to fully open before hosing around the valve to clear the chamber.

- Remove the Driveline from the Demand Valve. Turn the washdown tap to approx. $\frac{1}{4}$ " flow to activate the Demand Valve. If the water doesn't flow from the Driveline connection point, adjust the Demand Valve Stem. (Loosen lock nut on bottom of stem first). Ref to drawing A4-DM-5001: Demand Valve Adjustments.
- With the washdown tap on, water should be coming from the Delay Jet in the chamber. If not remove the driveline from the Bleed Valve and check. The driveline may be blocked.
- If the valve still does not close it is a mechanical fault in the Diversion Valve. A service will be required. Please call Stormwater360 on 0800 STORMWATER for assistance.

To Check the Demand Valve:

- Remove $\frac{1}{2}$ " Driveline from the Demand Valve.
- Slowly turn on the tap downstream of the Demand Valve.
- Water should eject from the Driveline connection when tap is at approximately $\frac{1}{4}$ flow. When tap is turned off no water should flow from the Driveline connection.
- To adjust the Demand Valve, refer to drawing A4-DM5001-Demand Valve Adjustments.

Installation Instructions for FF600:

These instructions are to be read in conjunction with drawings A4-INST-1007/6 & A4-INST-1007/7.

1. Provision for connections from the control panel should be in place when the concrete is poured.
 - ½" Copper Driveline or equivalent to the FF600 Chamber.
 - 32mm Conduit to the FF600 Chamber. Do Not use conduit smaller than 32mm. Do Not use small radius conduit elbows. Make sure all joins are clear and burr free. Run a draw wire through while laying the 32mm conduit.
2. Select the desired wastewater outlet on the bottom of the FF600 chamber and saw the capped end off.
3. Place the FF600 chamber in the excavation and level. Connect 150mm pipework to the Stormwater and Trade Waste outlets. Connect the 32mm conduit to the chamber. If the Diversion Valve is to be installed under the ORG level a reflux valve may need to be installed under the Diversion Valve.
4. Mount the Fox Control Panel to a wall or similar in a weather proof area. Before connecting mains water supply to the Control Panel, flush the main lines thoroughly. Connect using compression fittings after a line strainer and RPZ (supplied on request). Place a stopcock or similar at the outlet pipe of the Control Panel. All washdown equipment must be located beyond the Demand Valve. Hoses and taps other than those downstream of the Demand Valve should not be accessible in the area.
5. Connect ½" Copper Driveline to the Demand Valve using a compression fitting. Install with a 90° bend to enable disconnection at the valve.
6. Flush the ½" Driveline thoroughly before connecting to the Bleed Valve assembly. Connect only after the installer is sure it is clear of debris.
7. Gently draw the 6-core control cable through the 32mm conduit to the Control Panel. Do not allow the control cable to line in the bottom of the chamber during the rest of construction as concreting material and water will cause damage.
8. Backfill and concrete around the chamber. Before pouring concrete, the chamber must be braced internally to prevent distortion. When pouring concrete around the chamber, make sure the excessive concrete does not distort the chamber walls. Do not vibrate. Do not ram. Both these operations will distort the chamber walls.

Wiring Instructions:

1. Ensure the PLC is off before connecting the 6-core cable.
2. Open the Connection Box and insert the 6-core cable from the chamber through the gland at the bottom.
3. Pair back the outer grey sheath and expose the six coloured wires.
4. Expose approximately 10mm of copper on the black, blue, yellow and red wires (green and white wires are not required in a First Flush system and may be trimmed back).
5. Twist each copper wire tightly and place on bootlace ferrules supplied.
6. Using pliers squeeze the soft metal on the bootlace ferrule so the ferrule clamp flattens onto the wire. Ensure the wires are properly joined by pulling the wire. The wire and ferrule should remain connected.
7. Insert the correct coloured wire (with bootlace ferrule now attached) into the appropriate terminal matching the colour and name;

Black	to	Black	-	Ground
Red	to	Red	-	Valve Signal
Yellow	to	Yellow	-	Proximity 12 V
Blue	to	Blue	-	Float
8. Ensure that all terminal connections are tightened and secured correctly.
9. Replace connection box cover.

Plumbing Fittings:

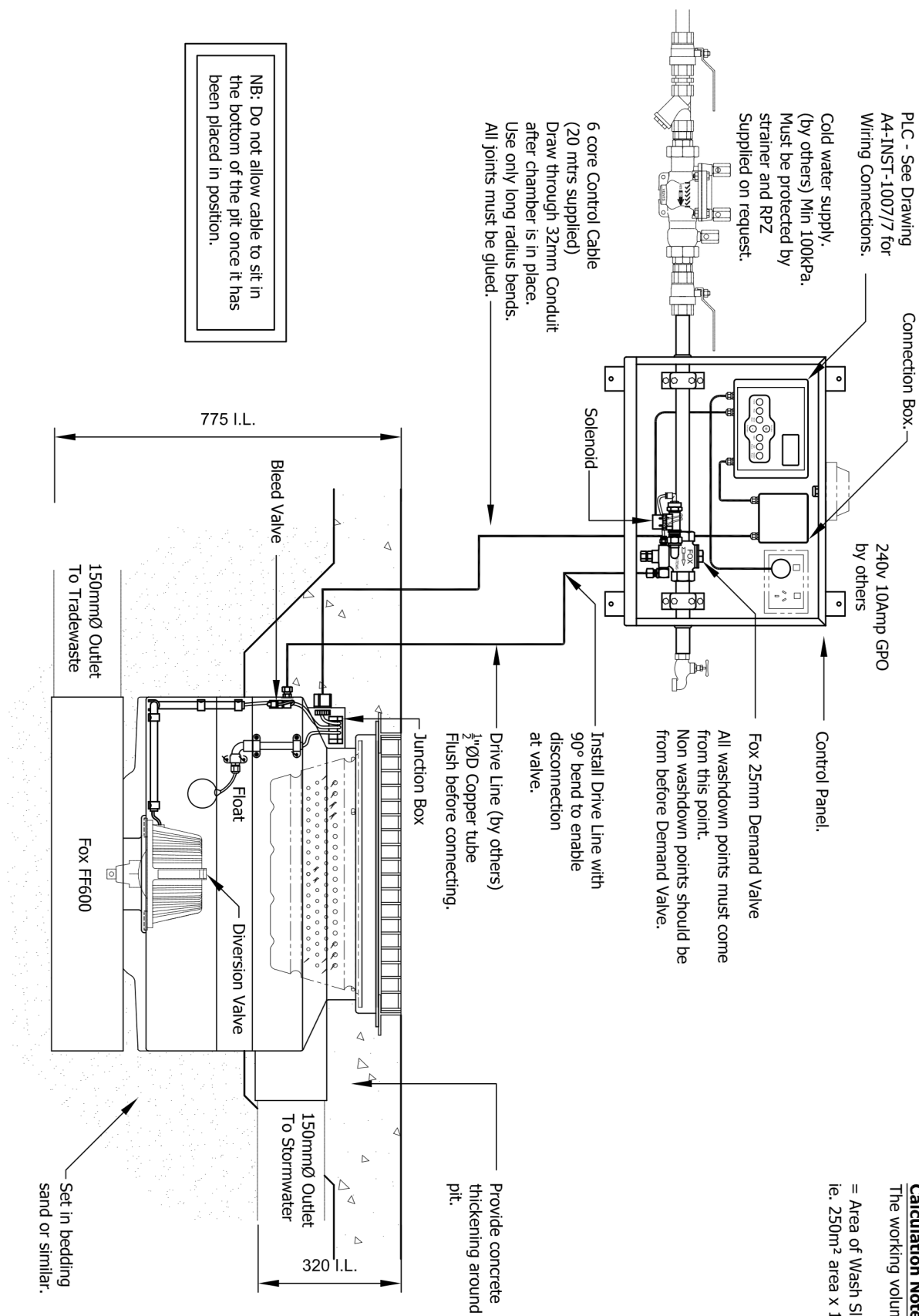
Valves and fittings shown are those generally required to operate the FF600 system. We do not warrant that this arrangement will be in accordance with all local by-laws. Waste will probably require pretreatment before discharge to sewer. It is the responsibility of the installer to ensure that the installation is inspected by and to the satisfaction of the relevant local authority.

Warranty:

Warranty will be void if

- (a) Fox FF600 System is not installed as per manufacturer's instructions and if an in-line strainer is not installed prior to the Fox Demand Valve.
- (b) Water press exceeds 1400KPa

Schematic Detail of FF600 Installation with RPZ Fitted



Calculation Note:
The working volume is the 'First Flush Capture Volume'.
= Area of Wash Slab (m²) x First Flush Depth (mm)
ie. 250m² area x 10mm depth = 2500 Litres.



CONDITIONS OF USE:
© STORMWATER360
2019 Any unauthorised reproduction of this drawing in part or in full is prohibited.

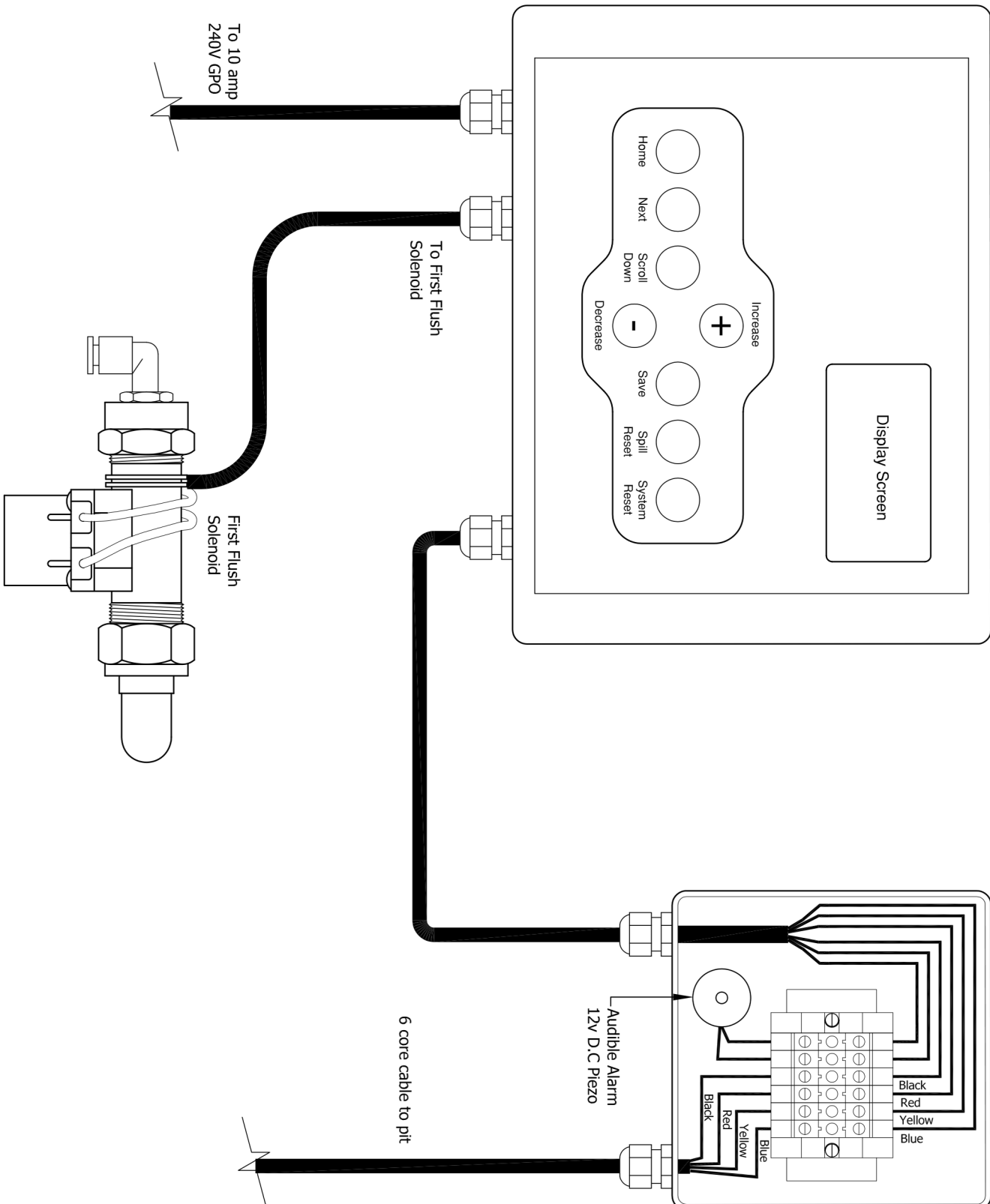
Project: Installation Instructions	
Drawing Title: FF600 System	
Drawn by:	J.F.S
Date:	30/05/2010
Scale:	NTS
Drawing No:	A4 - INST-1007/6

Fox First Flush PLC

PLC Wiring Connections

Connection Box

PLC Wiring Connections



Ground	-	Black
Valve Signal	-	Red
Proximity	-	Yellow
Float	-	Blue

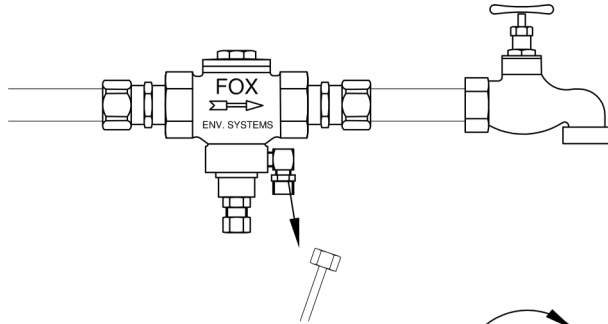


CONDITIONS OF USE:
© STORMWATER360
2019 Any unauthorised reproduction of this drawing in part or in full is prohibited.

Project: Installation Instructions	
Drawing Title: PLC Wiring Detail	
Drawn by:	J.F.S
Date:	30/05/2010
Scale:	NTS
Drawing No:	A4 - INST-1007/7

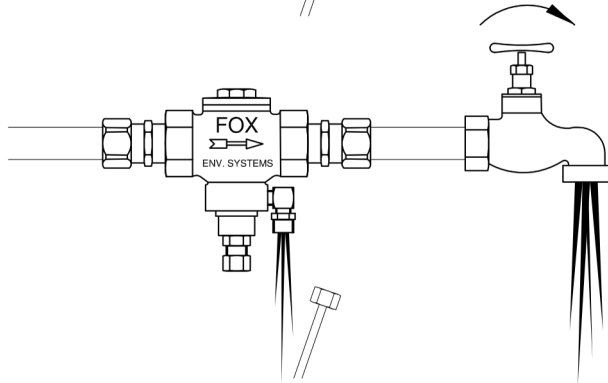
STEP 1

Remove Drive Line from
Demand Valve.



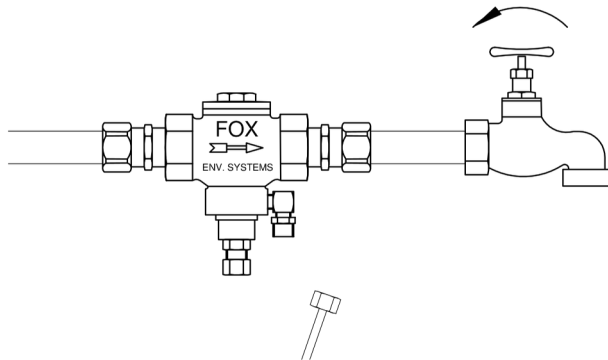
STEP 2

Turn on tap to activate Demand
Valve. Tap should be
approximately at $\frac{1}{4}$ flow.



STEP 3

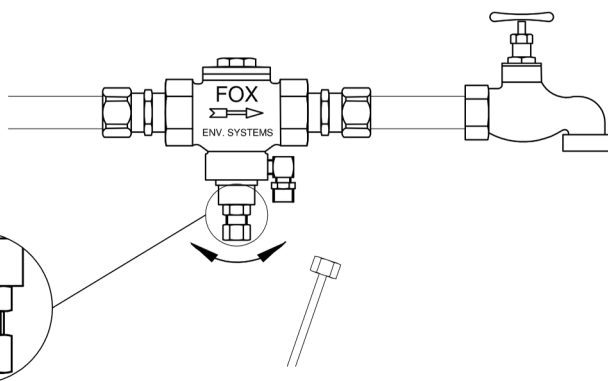
Turn tap off. Demand Valve flow
should cease.



STEP 4

If numbers 2 & 3 can not be achieved,
adjustment may be necessary. Using the
appropriate spanner ($\frac{3}{4}$ AF) slacken the
Valve Stem Lock Nut,
then adjust the Valve Stem
to achieve the correct flow.
NOTE: Screwing Adjuster Tube in makes
the Demand Valve less sensitive.

Check Demand Valve setting again after
locknut has been tightened.



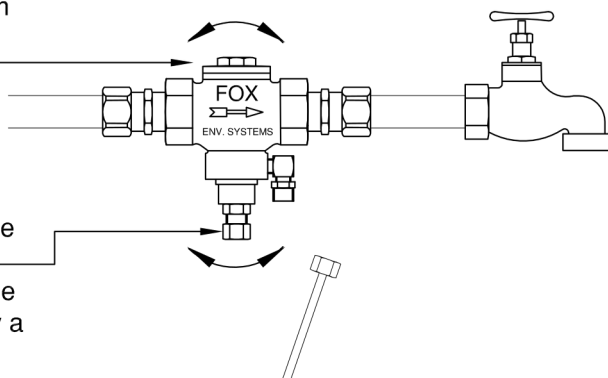
STEP 5

If flow from the Driveline doesn't stop when the Valve Stem
is fully screwed in, there will be a service issue with
the valve.

- Isolate the water supply prior the the RPZ.
- Remove the Top Cap, Piston and Spring
to ensure that no debris (such as thread tape) has
entered the valve.

If the valve is clear, remove the Valve Stem and inspect the
O-rings and sealing tip for damage.

(In areas where hard water is passing through the valve the
sealing tip can be eroded and may need to be replaced by a
Valve Stem with a stainless steel tip.



**CONDITIONS OF USE:**

© STORMWATER360
2019 Any unauthorised
reproduction of this
drawing in part or in full is
prohibited.

Project:

Field Service Instructions

Problem:

Diversion Valve not closing.

Drawing No:

A4 - DV-5002

Date:

13/08/2007

Drawn By: R.O'B.

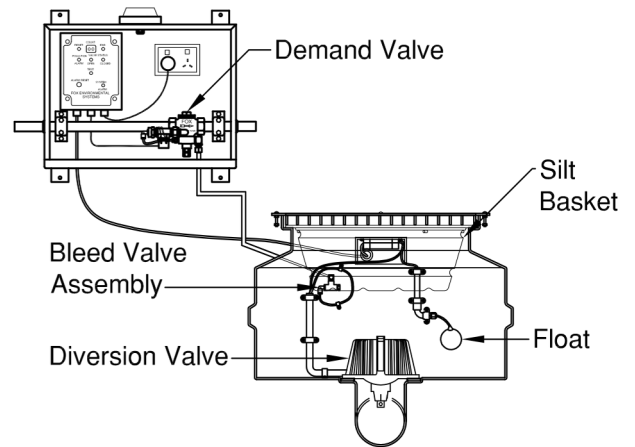
Revision:

STEP 1

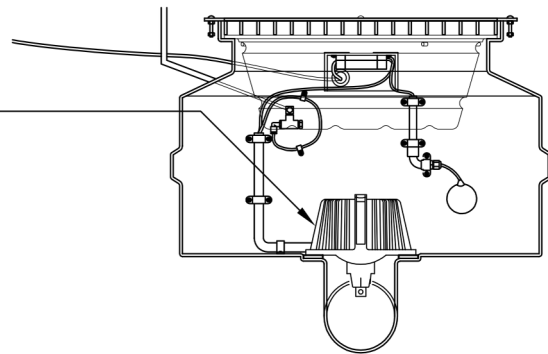
Remove the grate and silt basket.

Identify the various components in your system.

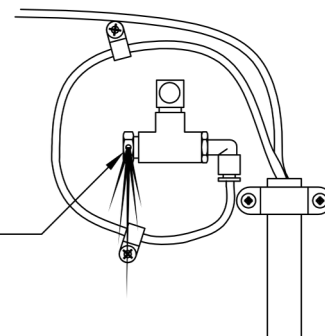
Note: In some systems (FF600, SCS600) the Demand Valve may be located in a control panel box.

**STEP 2**

Determine if the Diversion Valve has been blocked by debris. Connect a hose to the wash tap and hose around the Diversion Valve to clean the pit.

**STEP 3**

Determine if a water jet comes from the Bleed Valve when a wash tap is on. If no water is noticed, turn off the tap and manually bleed the pressure from the system by removing the Bleed Plug. If the pressure bleeds off and the valve closes then the bleed hole is blocked. Use a 1.5mm dia. drill or similar to clear the hole.

**STEP 4**

With no taps on in the area determine if water is ejecting from the Delay Jet in the Bleed Valve Assembly. If water is noticed ensure that no other taps are connected to the waterline after the Fox Demand Valve. If not refer to instructions for Demand Valve adjustment.

