

GreenSmart Diverter Valves Installation & Operation Guide

For
2" thru 12" Valves



Important: This manual is to remain with the building throughout the life of the Diverter. Plumbing service workers doing any service to the building's wastewater or sewage system should be notified of the presence of wastewater diverters.

This device is to be installed in accordance with all applicable building and plumbing codes.

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INSTALLATION NOTES

Review this guide and all supplied materials completely prior to installation. The following will pertain to ALL Greensmart diverter sizes.

- Diverters may be installed in any position and will not affect flow.
- All diverters must have access for maintenance and inspection. UPC Code
- Read the label on the exterior of the actuator cover for supply voltage.
- All actuators are 24vac/dc powered and must be Class 2 compliant. UL 5085 see pg 13 for a power supply option.
- Depending on the system design, all units should be powered and cabled independently. Daisy chaining is not recommended as it could have a conflicting and faulty signal situation.
- Cabling for the actuated diverters: 16-20 gauge, 3 wire cable for the power and signal inputs. 16-20 gauge, 6 wire cable for the position output signals.
- Actuator Factory Video <https://www.youtube.com/watch?v=wqfhWI5yISM>
- More technical information can be found later in this manual and Greensmart website, www.Greensmartsc.com
- For horizontal installations where the flow through the wye's branch will be for overflow or bypass to storm drain or sewer, the bypass wye arm should be elevated at 1.5" - 2.0" above horizontal for system efficiency.
- Another option would be to install the bypass wye with the arm facing away from the normal flow towards the diverter, again 1.5" - 2.0" above horizontal.
- Installations subject to debris buildup shall include a debris collection device, catchment, or filter located upstream of the valve and accessible for inspection and maintenance. UPC Code Chapters 15 & 16
- Inspection and maintenance of the diverter system and debris filters should be done at least every 4 months to ensure optimum performance.
- Inspection and testing of the Battery Backup Failsafe system should be done at least every 4 months to insure proper Failsafe function. See pg 9.

This manual must be kept in a dry place and available for use.

This device is to be installed in accordance with all applicable building and plumbing codes and manufacturer's guidelines.

ALL DIVERTER SYSTEMS TO BE INSTALLED IN ACCORDANCE WITH ALL APPLICABLE BUILDING AND PLUMBING CODES INCLUDING CHAPTER 16 OF THE UNIFORM PLUMBING CODE.

This manual is to remain with the building through out the life of the Diverter. Plumbing service workers doing any service to the building's wastewater/ greywater sewage system should be notified of the presence of the wastewater / greywater diverters.

Read all installation instructions and manufacturers data sheets enclosed before installation of the actuator and diversion system.

IMPORTANT INFORMATION FOR ALL MODELS

- PVC & CPVC Ball Valve Material:
- ASTM 1784 NSF14/61
- Joining to be done by Solvent Cement Welding by using the appropriate primers and solvent cements per ASTM D285 or manufacturers recommendations.
- The unit can be installed in either a vertical or horizontal position with proper supports.
- The Diversion System must be accessible for service and inspection.
- The Diversion System should never be installed below-grade or below the level of the sewage waste line.
- Flow Direction should be clearly indicated.
- Installations must maintain the proper angle of slope for gravity drain drainage.
- Diversion Actuator has a manual Fail-safe feature in case of power outage.
- Always refer to the Ipex Valve Maintenance And Installation Instructions, supplied with the unit for detailed technical data or check manufacturers websites.

EXTERNAL HANDWHEEL OPERATION

On Electric Actuators With Plastic Cases

Operate the manual operation by putting pressure on the top of the handwheel and by making a small rotation to engage the handwheel. After engaging the manual operation, you can make the desired position by keeping pressure and turning the handwheel. Use the Open/Close dial for reference.

NOTE** The turning direction might be opposite of the position dial on top of the actuator.

WARNING: The handwheel for the manual override can be used only without supplied power. All power to the actuator must be disconnected or nonfunctional. Do not use tools to action the handwheel.

WARNING: Do not operate the manual override when the actuator is turning.

WARNING: For ball valves, if the actuator exceeds the stroke range by the manual Override. To reset, it is necessary to power up the actuator until it returns to the limit switch position.



EXTERNAL HANDWHEEL OPERATION

On Electric Actuators With Metal Cases

The VB110M / VB190M / VB270M / VB350M models are supplied with an external handwheel "H" (Fig.10), to manually perform the opening and closing operation. These models have also an AUTO/MAN selector switch "S" (Fig. 11) which allows to select the function-ing mode.

WARNING: the handwheel is supplied disassembled. The assembly is responsibility of the end user/customer. The manual override must be used only after turning the power off, by moving the selector "S" to "MAN" position. The direction of the handwheel is counterclockwise for opening and clockwise for closing.

WARNING: when switching to "AUTO" before power the actuator, perform a short rotation of the handwheel to make sure the pin is released. The manual override must be used only after turning off the power.

WARNING: do not operate the manual override while the actuator rotating.

To restore the automatic operation of the actuator it is necessary to turn off the power, and move the selector "S" to the AUTO position.





Fig.11 Particular of the "S" selector in "MAN" position.



Fig.10 Handwheel for manual override models VB110M / VB190M / VB270M / VB350M

The versions with battery of Valbia electric actuator use battery packs with series of cells in NiMh technology and nominal voltage on terminals at 24Vdc.

For the actuators with battery back-up, VALBIA can set up the actuator to automatically carry out one of the following actions in the event of power outage:

- **Opening:** the in-progress/current operation is interrupted.
- **Closing:** the in-progress/current operation is interrupted.
- **Completes the in-progress operation:** the motor continues the in progress action until it touches the travel stops/limit switches.

Battery operation is enabled after a delay of about 1 sec, it is instantaneous only if the emergency operation is consistent with the operation in progress (for example, when the actuator is closing, the supply voltage is lost and the battery set to NC intervenes).

The action in progress with the battery power supply is interrupted by a possible mains voltage recovery.

A yellow light (LED) mounted on the power supply board indicates that the board is charging the battery in TRICKLE mode.

When the battery is fully charged the LED light turn off.

The LED signal is reliable if the battery back-up has not been damaged.

The battery is a component that guarantees a limited number of charge / discharge cycles (over 500), therefore its life is inversely proportional to the number of interventions.

WARNING: to guarantee the emergency battery intervention, it is necessary that the actuator remains powered for more than 3 hours.

WARNING: for the version with battery it is recommended to power the actuator within 3 months from the purchase date.

The actuator can also be used in "solenoid" mode (wiring with two wires). To use this mode it is mandatory to follow the warnings above.

9.0 Maintenance

The electric actuator does not need any kind of maintenance. The internal lubrication of the gears is sufficient for the device life. For enclosure cleaning, use a light non-aggressive detergent. In case of damages or operation issues, we suggest sending the actuators back to Valbia for inspection.

Valbia s.r.l. declines responsibility and warranty on our actuators re-paired from any third party.



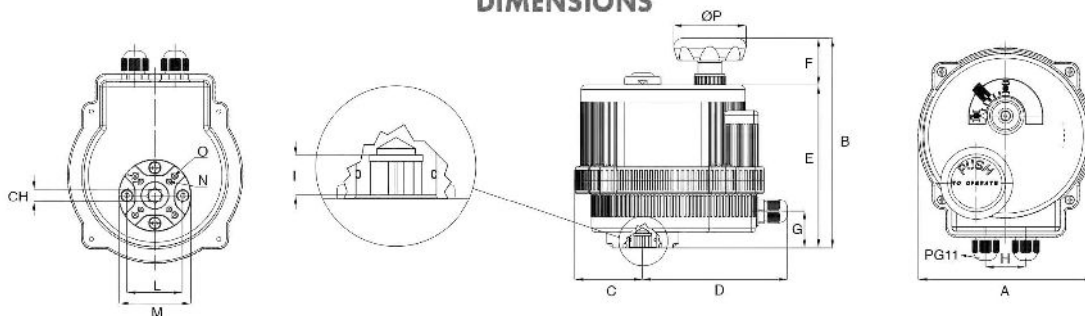
SERIES VB030 - VB350

VALBIA PLASTIC ELECTRIC ACTUATOR

FEATURES

- IP67 NEMA Type 4X Housing
- 12V/24V AC/DC and 100-240V AC Models Available
- ISO 5211 with female drive
- VB030 - VB350 - 12/24V DC and 100-240V AC - 75% Duty Cycle
- High-Strength, Impact Resistant IP67 Technopolymer Housing
- Temperature Range -4°F to 131°F
- Available with On/Off (-00*), On/Off w/ Battery Backup (01*), Positioner (-02*), Potentiometer (-03*), Battery Backup w/ Positioner (-04*), and Middle Positioner (-06*)
- PG11 Electrical Connection/Optional
- 1/2" Conduit

DIMENSIONS



Model	ISO 5211	CH	A	B	C	D	E	F	G	H	I	L	M	N	O	ØP
VB030	F03-F05	11	6.18	7.40	2.39	5.10	5.75	1.65	1.30	1.42	0.47	1.42	1.97	10-24 UNC 2Bx0.47	1/4-20 UNC 2Bx0.51	2.56
VB060	F05-F07	14	7.28	8.46	2.66	5.77	6.81	1.65	2.01	1.42	0.63	1.97	2.76	1/4-20 UNC 2Bx0.59	5/16-18 UNC 2Bx0.63	2.56
VB110	F07-F10	17	8.31	9.14	3.31	6.02	7.01	2.13	2.13	1.58	0.75	2.76	4.02	5/16-18 UNC 2Bx0.75	3/8-16 UNC 2Bx0.75	4.33
VB190	F07-F10	17	8.31	9.14	3.31	6.02	7.01	2.13	2.13	1.58	0.75	2.76	4.02	5/16-18 UNC 2Bx0.75	3/8-16 UNC 2Bx0.75	4.33
VB270	F07-F10	22	8.74	9.19	3.03	6.69	7.17	2.03	2.13	1.58	0.95	2.76	4.02	5/16-18 UNC 2Bx0.75	3/8-16 UNC 2Bx0.75	4.33
VB350	F07-F10	22	8.74	9.19	3.03	6.69	7.17	2.03	2.13	1.58	0.95	2.76	4.02	5/16-18 UNC 2Bx0.79	3/8-16 UNC 2Bx0.75	4.33

TECHNICAL DATA SERIES 85

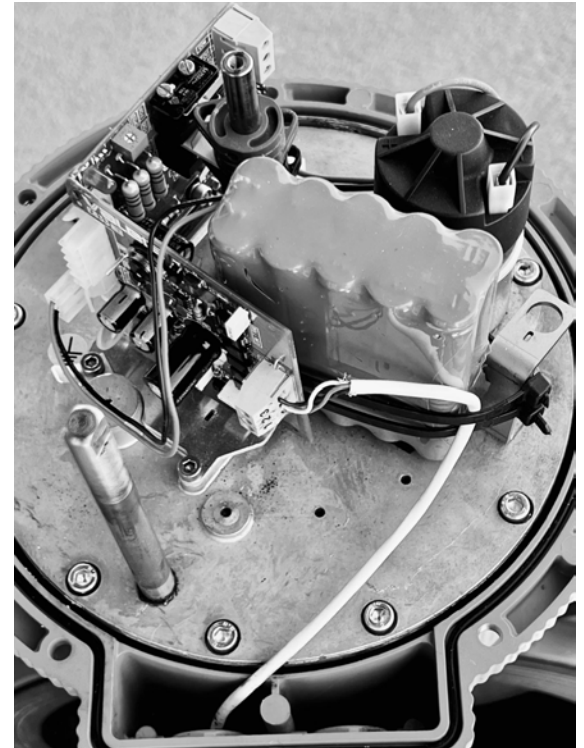
Model	VB030		VB060		VB110		VB190		VB270		VB350	
Max Working Torque	266		530		975		1680		2390		3100	
Nominal Tension (V)	12V AC/DC		12V AC/DC		12V AC/DC		12V AC/DC		12V AC/DC		12V AC/DC	
	24V AC/DC		24V AC/DC		24V AC/DC		24V AC/DC		24V AC/DC		24V AC/DC	
	100-240V AC		100-240V AC		100-240V AC		100-240V AC		100-240V AC		100-240V AC	
Working Time	8		9		27		27		50		50	
Torque Limiter	Standard		Standard		Standard		Standard		Standard		Standard	
Duty Rating	12V AC/24V AC	50%	12V AC/24V AC	50%	12V AC/24V AC	50%	12V AC/24V AC	50%	12V AC/24V AC	50%	12V AC/24V AC	50%
	12V DC/24V DC	75%	12V DC/24V DC	75%	12V DC/24V DC	75%	12V DC/24V DC	75%	12V DC/24V DC	75%	12V DC/24V DC	75%
	100-240V AC		100-240V AC		100-240V AC		100-240V AC		100-240V AC		100-240V AC	
Protection	IP67/Type 4x		IP67/Type 4x		IP67/Type 4x		IP67/Type 4x		IP67/Type 4x		IP67/Type 4x	
Enclosure	Technopolymer		Technopolymer		Technopolymer		Technopolymer		Technopolymer		Technopolymer	
Rotation	90°		90°		90°		90°		90°		90°	
Special Rotation	180° or 270°		180° or 270°		180° or 270°		180° or 270°		180° or 270°		180° or 270°	
Manual Override	Standard		Standard		Standard		Standard		Standard		Standard	
Position Indicator	Standard		Standard		Standard		Standard		Standard		Standard	
Working Temp. (°F)	-4°F - 131°F		-4°F - 131°F		-4°F - 131°F		-4°F - 131°F		-4°F - 131°F		-4°F - 131°F	
Heater	Standard		Standard		Standard		Standard		Standard		Standard	
Aux. Limit Switches	n°2 STD (type SPDT)		n°2 STD (type SPDT)		n°2 STD (type SPDT)		n°2 STD (type SPDT)		n°2 STD (type SPDT)		n°2 STD (type SPDT)	
ISO 5211	F03-F05		F05-F07		F07-F10		F07-F10		F07-F10		F07-F10	
Square Drive (mm)	11		14		17		17		22		22	
Special Square Drive (mm)	9-14		11-17		14-22		14-22		17		17	
Fail Safe (Batt. Backup)	Upon Request		Upon Request		Upon Request		Upon Request		Upon Request		Upon Request	
	Not Available for Mod 12V											
Std. Mode Positioner	Upon Request		Upon Request		Upon Request		Upon Request		Upon Request		Upon Request	
Middle Position	Upon Request		Upon Request		Upon Request		Upon Request		Upon Request		Upon Request	
Potentiometer	Upon Request		Upon Request		Upon Request		Upon Request		Upon Request		Upon Request	
Electrical Connections	PG11		PG11		PG11		PG11		PG11		PG11	
Weight (lbs.)	5.05		7.28		10.80		10.80		13.23		13.23	

Power Consumption													
Model		VB030		VB060		VB110		VB190		VB270		VB350	
Version H	Nominal Voltage	100-240V AC											
	Absorbed Current	0.4-0.2A		0.6-0.3A		0.4-0.2A		0.6-0.3A		0.6-0.3A		0.75-0.4A	
	Absorbed Power	40-48 VA		60-72 VA		40-48 VA		60-72 VA		60-72 VA		75-96 VA	
Version L	Nominal Voltage	12V AC/DC	24VAC/DC	12V AC/DC	24VAC/DC	12V AC/DC	24VAC/DC	12V AC/DC	24VAC/DC	12V AC/DC	24VAC/DC	12V AC/DC	24VAC/DC
	Absorbed Current	2.2-1.8A	1-0.7A	3.8-2.85A	1.8-1.2A	2.2-1.8A	1-07A	3.8-2.85A	1.81-1.2A	3.8-2.85A	1.8-1.2A	4.75-3.65A	1.95-1.65A
	Absorbed Power	26.5-22 VA	24-17 VA	46-34 VA	43-29 VA	26.5-22 VA	24-17VA	46-34VA	43-29 VA	46-34 VA	43-29VA	57-44VA	47-40VA
Frequency		50/60 HZ											

VALBIA/BONOMI ELECTRONIC ACTUATORS VB030-VB350 24V AC/DC WITH BATTERY BACKUP

Main Features

- 24V 1000mAh i-Mh battery positioned in the actuator casing 0,43kg (VB060-350)
- Automatic battery recharge system trickle charge 1 chg =15mA-37.5mA
 - No extra electric wiring
- Complete recharge time of flat battery 46hrs(VB030), 27hrs(VB060-350)
- Single operation recharge time of flat battery: 6min. (VB030), 5min. (VB060), 15min. (VB110-190), 25min. (VB270-350)
- Power consumption for battery recharge: 0.52W (VB030-190), 1.3W(VB270-350)
- Battery operation after 5 seconds power failure
- 2 modes selectable (factory setup):
 - Fail to open
 - Fail to close



For inspection and testing purposes: Checking the Failsafe for operation

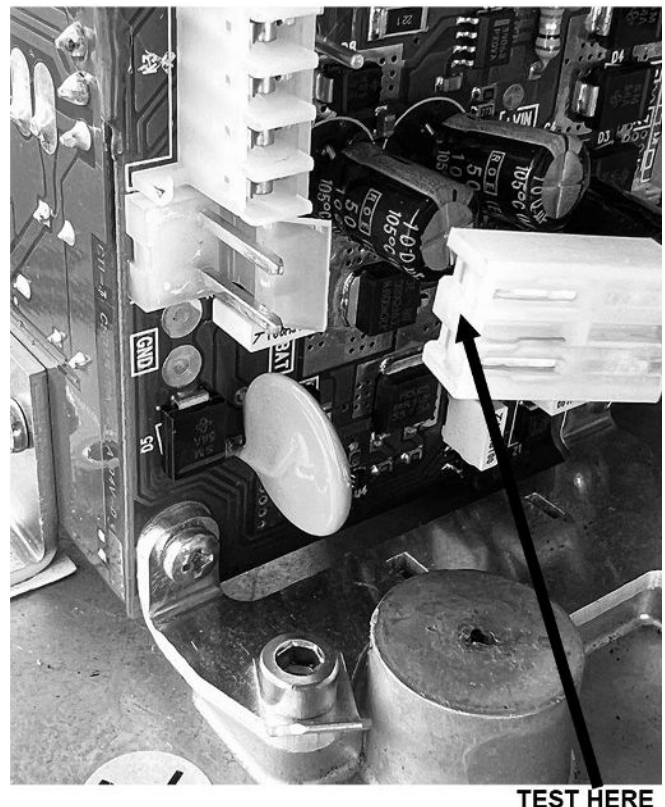
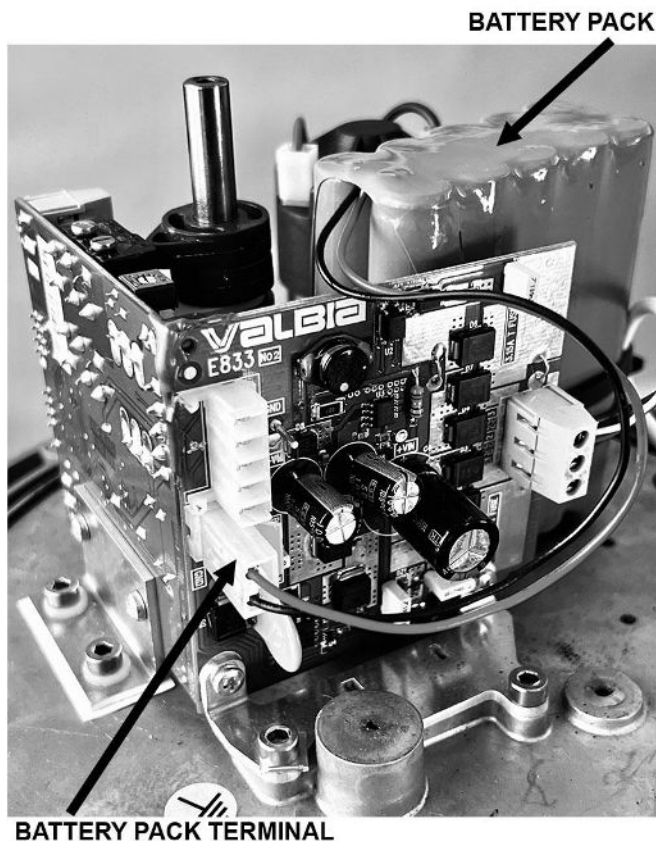
1. Observe the valve position on the indicator
2. Remove the actuator cover.
3. Remove the Common, # 2 wire from the F terminal block, or unplug the entire F block from the socket. This will disconnect power to the actuator.

If the valve was in the Open position the Failsafe should kick in and actuate the valve to the closed position.

Checking the battery pack

1. Disconnect the battery pack wires from the logic board and test on volt meter for 24 VDC. If the stored battery voltage reads less than 20vdc replacement would be necessary. If the actuator has continuous power the battery packs should last many (5-6) years.

See the photos.



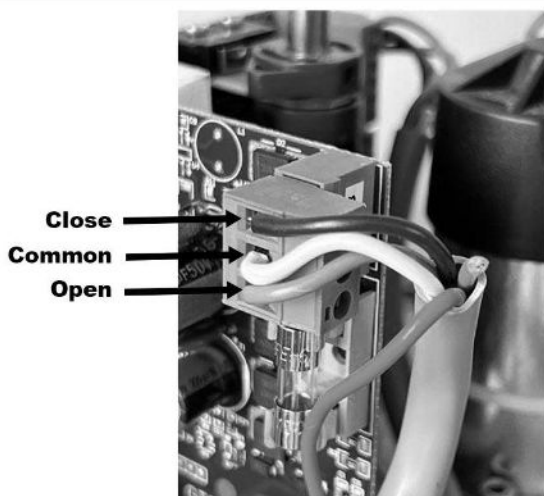
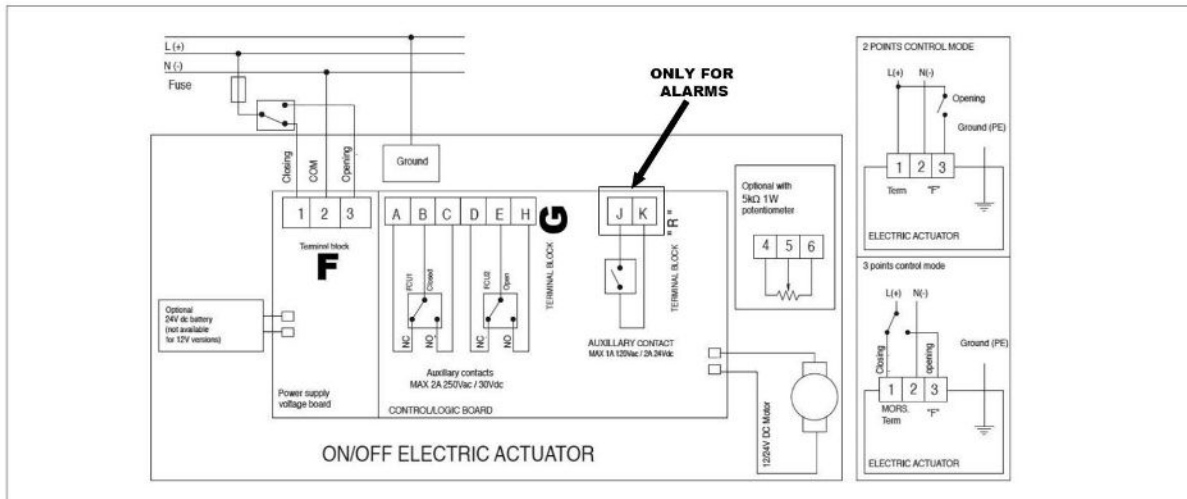
Note: since the valve has constant power the battery pack will be constantly trickle charged.

FAIL-SAFE OPERATION

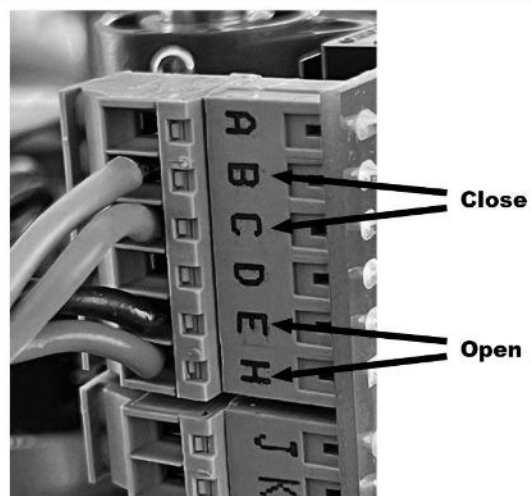
For All Greensmart Valve Actuators

- The battery-backup fail-safe model actuators provide dependable control for applications requiring automatic valve positioning during a particular event, namely, loss of power. The most common applications are diverter, main water supply, main machine/plant supply, solar switching, etc. that all require an immediate need in the event of power loss. All valve actuators are 24V AC/DC.
- These units automatically charge the battery pack completely during normal operation, and with 20, 1.2V, Nickel Metal Hydride batteries (24 VDC), easily maneuver the valve. The battery pack has a life expectancy of over 400 charge/discharge cycles; but, when properly used, will never completely discharge. The frequency of discharge (valve operation) depends on the load (the valve torque requirements). Since the actuator must have power restored to re-establish the valve position (open or closed), there is always a charge cycle for the battery packs.
- The unit has a 5 second delay prior to the failure movement to prevent unnecessary valve positioning with sporadic power supplies; therefore, it is necessary to consider valve closing times when developing the application control.
- The battery will finish the movement during a power loss, and will regain the normal position only after power has been restored. This movement will not be interrupted until it has reached the limit of the configuration, even if power is restored during the move.
- The batteries are Nickel Metal Hydride (NiMH). They have 30% greater life expectancy than Nickel Cadmium (NiCAD), better temperature compensation, and, unlike NiCAD, are eco-friendly and non-toxic.
- Since there is no status indication nor failure feedback, it is recommended to fully charge the batteries for 24 hours prior to service. A cycle test is also recommended once per month for true fail-safe applications.
- The expected lifetime of these batteries is 5-6 years. Replacement battery packs are available in case of damage or improper connections.
- Reliability, cost-effective design, performance, and cost easily make the unit an ideal choice for most emergency situations and many control applications.

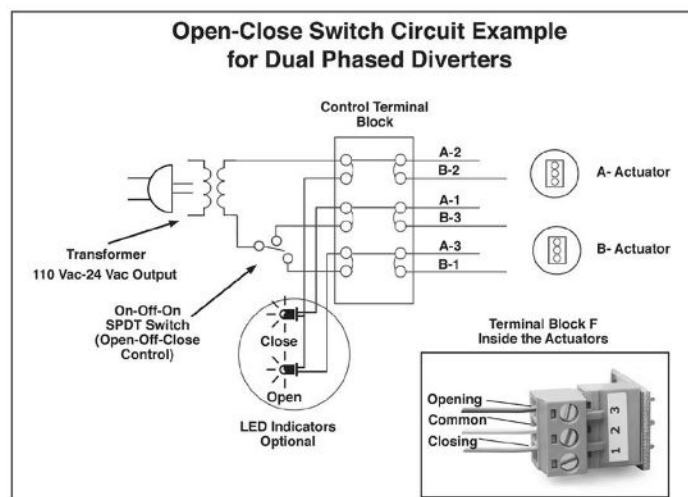
ON/OFF & POSITION FEEDBACK WIRING DIAGRAMS VB030 - VB350 24VDC



TERMINAL BLOCK F



TERMINAL BLOCK G



OPTIONAL RECOMMENDED POWER SUPPLY

Honeywell

AT120A-E; AT140A-E; AT150A,B,D-F; AT160B; AT175A-D,F Transformers

PRODUCT DATA



FEATURES

- AT120 is rated at 20 VA.
- AT140 is rated at 40 VA.
- AT150 is rated at 50 VA.
- AT160 is rated at 60 VA.
- AT175 is rated at 75 VA.
- All models meet National Electrical Code Class 2 not wet, Class 3 wet transformer requirements.
- All models conform to Underwriters Laboratories Inc. Standard UL 1585.
- Color-coded leadwires for primary connections and screw terminals for secondary connections, fixed 1/4 inch (6 mm) male quick-connects or color-coded leadwires for both primary and secondary, are standard.
- Models available with stripped leadwires, leadwires with variety of terminals, or special terminations as required on both primary and secondary.
- Mounting options include clamp mounting on outlet box knockout, plate mounting, foot mounting, panel mounting, conduit/panel and a combination.
- Models available for 120V, 240V, 277V, 480V, 120/240V, 208/240V, 277/480V, 120/208/240V, 208/240/480V, or 208/277/480V supply at 60 Hz.
- "F" models include a button for manually resetting the circuit breaker.

APPLICATION

These general purpose transformers provide power to 24 Vac circuits. They are typically used in heating/cooling control systems, but can be used in any application that doesn't exceed the load ratings.

Example Installation



Installation Flow Labeling

DIRECTION OF FLOW LABELING IS REQUIRED ON
ALL WASTEWATER DIVERTER VALVE SYSTEMS.

It has been recognized that not all greywater/rainwater diverter valve installations are the same. Design and installation considerations such as: greywater, rainwater, source and tank location and elevation, overflow elevation, available space and valve location result in wide variations. As a result, not all installations might have the wye connected directly to the valve. For these reasons, it is not possible to properly install all the labeling at the factory.

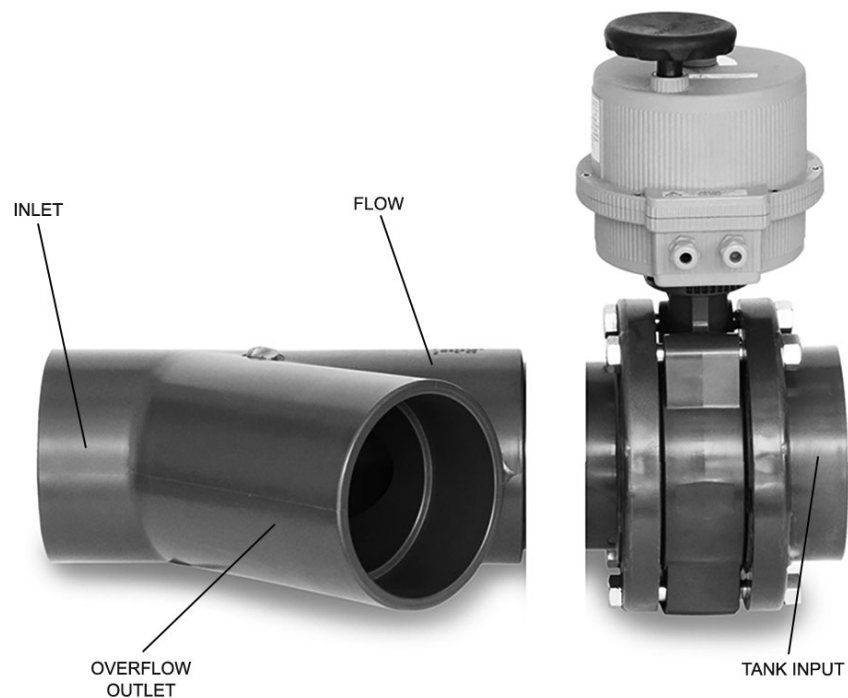
The diverter package comes with a packet of labels that must be applied to the appropriate locations, as per the usage and design of the system, at the completion of the installation depending on the type of system installed BEFORE FINAL INSPECTION.

The valve body will come with the GreenSmart/UPC Label installed, DO NOT REMOVE.

Label Packet Contents

1. FLOW – Direction of flow
2. INLET
3. SEWER OUTLET
4. TANK INPUT
5. OVERFLOW OUTLET

This is a guide only to assist in labeling locations



All outlets are interchangeable depending on customer's project

Testing and Operating



The purpose of system testing is to assess the quality of all joints and fittings to ensure that they will withstand the design working pressure, plus a safety margin, without loss of pressure or fluid. Typically, the system will be tested and assessed in sub-sections as this allows for improved isolation and remediation of potential problems. With this in mind, the testing of a specific installed valve is achieved while carrying out a test of the overall system.

An onsite pressure test procedure is outlined in the IPEX Industrial Technical Manual Series, *"Volume 1: Vinyl Process Piping Systems"* under the section entitled, *"Testing"*. The use of this procedure should be sufficient to assess the quality of a valve installation. **In any test or operating condition, it is important to never exceed the pressure rating of the lowest rated appurtenance in the system.**

Important points:

- Never test thermoplastic piping systems with compressed air or other gases including air-over-water boosters.
- When testing, do not exceed the rated maximum operating pressure of the valve.
- Avoid the rapid closure of valves to eliminate the possibility of water hammer which may cause damage to the pipeline or the valve.



GREENSMART VALVE MAINTENANCE OVERVIEW

IPEX FX and FE thermoplastic valves require routine inspection, periodic operation, proper cleaning, and material-compatible lubrication to ensure long-term reliability and contamination control. Maintenance practices should always follow manufacturer guidelines and safety requirements, particularly regarding pressure testing and lubricant selection.

General Maintenance

- Operate periodically: Cycle valves from fully open to fully closed at least once a month to maintain smooth operation and prevent sticking, even in low-use applications.
- Visual inspection: Regularly inspect for leaks, wear, corrosion, or abnormal operation.
- Clean regularly: Remove dirt and debris from valve exteriors and components using water or mild, material-compatible cleaning agents.
- Inspection frequency: Perform inspections at least twice per year, with increased frequency for high-use or critical applications.
- Follow manufacturer instructions: Always refer to the valve-specific manual for size- and model-dependent procedures.

Lubrication Guidelines

- Use only lubricants compatible with the valve material (PVC, CPVC, PP, or PVDF).
- IPEX FX valves require silicone-free lubricants to preserve their contamination-controlled design.
- Do not mix lubricants, as this may cause binding or valve lock-up.
- Lubricate moving parts only as needed.

EWS Valve–Specific Considerations

- Cleanroom integrity: Valves are factory-assembled and cleaned in a cleanroom environment. Maintenance practices should preserve this contamination-free condition.
- Silicone-free requirement: All maintenance products, including lubricants and packaging materials, must be silicone-free.
- Post-maintenance handling: After maintenance or repair, valves should be double-bagged in dual-skin, silicone-free packaging to prevent contamination during transport or storage.

6"-12" Valve–Specific Considerations

- Some FE series butterfly valves are designed to be maintenance-free, but monthly cycling is still recommended.

Disassembly and Part Replacement (When Required)

- Relieve system pressure completely before beginning any work.
- Disassemble carefully following manufacturer procedures for the specific valve size.
- Clean components thoroughly, removing chips, shavings, or particles that could interfere with operation.
- Inspect and replace worn parts such as o-rings, bushings, or seats as needed.
- Reassemble properly, ensuring correct alignment and secure fastening of all components.

Safety Warnings

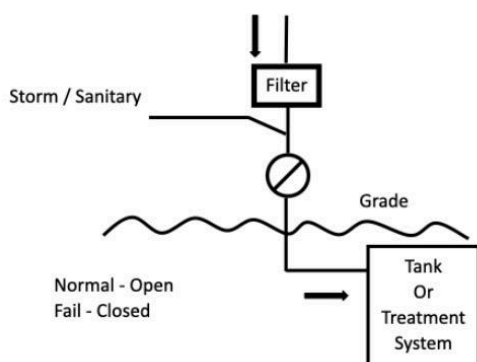
- Never use compressed air or gas for testing thermoplastic valves (PVC, CPVC, PP, PVDF). Doing so can cause explosive failure and severe injury.

Installation Examples

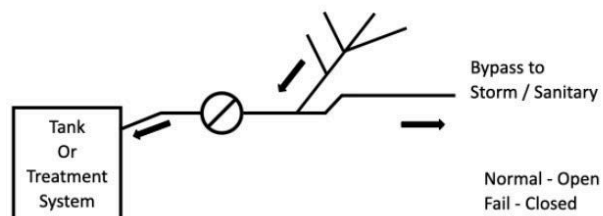
Examples below illustrate various ways in which GreenSmart diverters have been implemented for various wastewater uses.

Not to scale, for instructional purposes only.

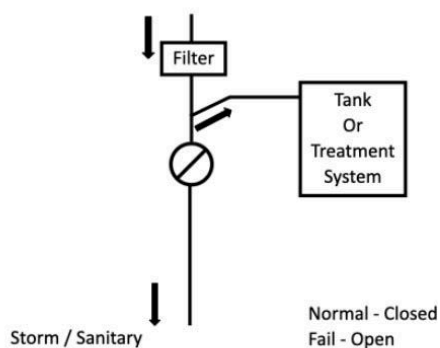
BYPASS BELOW GRADE TANK & TREATMENT W/O PUMP



MULTIPLE INLET BRANCHES W/ BYPASS



SIMPLE WASTEWATER DIVERSION / BYPASS



CONTAMINATION CONTROL

