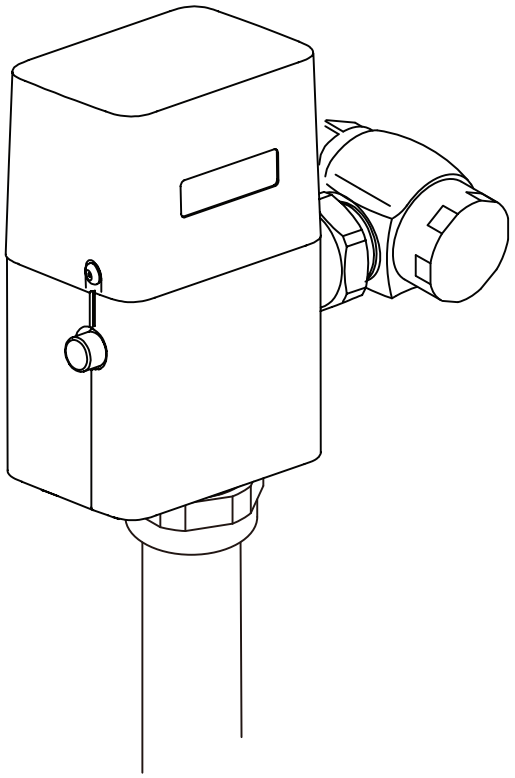
Installation and Owner's Manual
Manual de Instrucciones y del Propietario
Manuel d'Installation et d'Utilisation
Manual de Instalação e do Proprietário

TOTO

EcoPower Flush Valve
Fluxómetro EcoPower
Valve de Chasse EcoPower
Fluxómetro Self Power



Warranty Registration and Inquiry
For product warranty registration, TOTO U.S.A. Inc. recommends online warranty registration. Please visit our web site http://www.totousa.com.If you have questions regarding warranty policy or coverage, please contact TOTO U.S.A. Inc., Customer Service Department, 1155 Southern Road,Morrow, GA 30260 (888) 295-8134 or (678) 466-1300 when calling from outside of U.S.A.

ENGLISH

TABLE OF CONTENTS

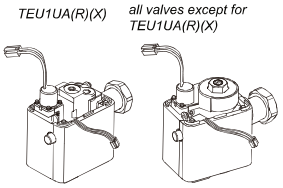
Thanks for Choosing TOTO!....2
Included Parts....2
Common Tools Needed....3
Initializing the Ecopower product....3
Features....3
Specifications....4
Technical Information....5
Warnings....6
Before Installation....6
Installation Procedure....7
Test Run....10
Note to the Installer....10
Periodic Maintenance....10
Care & Cleaning....10
Using the Flush Valve....11
Troubleshooting....12
Warranty....16
Rough-In Dimensions....62
Reclaimed Water Specifications....64

THANKS FOR CHOOSING TOTO!

The mission of TOTO is to provide the world with healthy, hygienic and more comfortable lifestyles. We design every product with the balance of form and function as a guiding principle. Congratulations on your choice.

INCLUDED PARTS

Check to make sure you have all these parts from the package*:

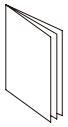


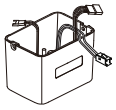
Valve body assembly


Back-up Battery Pack


Screws

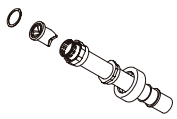

Hex wrench


Installation and Owner's Manual

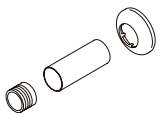

Top cover assembly


Flush valve Notice label

For TEU1UA(X)12, TEU1LA(X)(12,22),TEU1GA(12,22), TET1UA(X)32, TET1LA(X)32,TET6LA(X)32, TET1GA32, TET6GA32, TET6UA(X)32

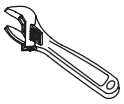

Vacuum breaker tube (with spud joint)


Control stop

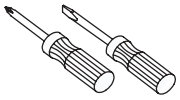

Sweat solder kit (Escutcheon, covering tube, Adapter)

*Appearance of some components may vary depending on the model.

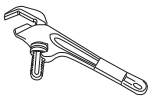
COMMON TOOLS NEEDED



Adjustable wrench



Screwdrivers (Phillips and Slotted)



Offset pipe wrench

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INITIALIZING THE ECOPOWER PRODUCT

Thank you for choosing the latest innovation in low power consumption EcoPower products. Please note below the duration of time required to initialize the electronics.

It will take approximately 5 minutes after connecting the battery for the electronics to initialize. This delay is a normal part of startup.
After approximately 30 seconds, the sensor LED will start flashing in 4 second intervals until the initialization is complete.

FEATURES

Fully Automatic and Hygienic

The EcoPower Flush Valve uses an infrared sensor to detect the user using and departing the fixture, to provide an automatic flush of the fixture after a short delay. No manual operation is required, improving the experience of use and hygiene of the fixture.

System Protection Timer

When the fixture is not used for 24 hours (12 hours for TEU1LA(R)(X) and TEU1UA(R)(X)) the protection timer commands the system to flush in order to maintain the trap seal.

Manual Functionality

For maintenance and emergency use, the EcoPower Flush Valve is equipped with a manual flushing button.

Green Features

Conserves Power

The flushing of the fixture activates a hydropower generator which generates electric power for the next flush. (See About TOTO's Hydropower Generator, page 5)

Conserves Water

Two functions help the EcoPower Flush Valve conserve water:

Fuzzy Logic Control

The EcoPower Flush Valve can sense how often and how long the fixture has been used to deliver the correct amount of water. (See About Fuzzy Logic Control, page 5)

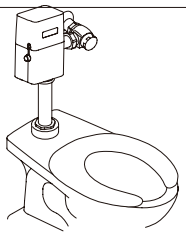
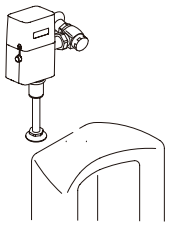
Anti Consecutive Flushing

The EcoPower Flush Valve offers water saving consecutive flush prevention. After a flush, the valve will not automatically flush again for 10 seconds for urinals and 30 seconds for toilets.

TOTO EcoPower Flush Valve are designed to work for 10 years, under normal conditions, with no minimum usage required.

ENGLISH

SPECIFICATIONS

		Toilet			Urinal		
Figure							
Model Number		TET1GAR TET6GAR	TET1LAR TET1LAX TET6LAR TET6LAX	TET1UAR TET1UAX TET6UAR TET6UAX	TEU1GAR	TEU1LAR TEU1LAX	TEU1UAR TEU1UAX
Rated Flush Volume		1.6 G (6 L)	1.28 G (4.8 L)	1 G (3.8 L)	fuzzy logic adj. flush vol. 0.5 G (1.9L) typical flush vol. 1.0 G (3.8 L)	0.5 G (1.9 L)	0.125 G (0.47 L)
Toilet/Urinal type		Flush Valve type bowl			Wash down flush		
Control stop inlet		1"NPT			3/4"NPT		
Flush Valve inlet		1-1/4"NPSM					
Flush Valve outlet		1-1/2"NPSM					
Supply water pressure	Min (Flowing)	15 psi (103 kPa)	35 psi (241 kPa)		15 psi (103 kPa)		
	Max* (Static)	125 psi (862 kPa)	125 psi (862 kPa)		125 psi (862 kPa)		
Shutoff pressure		7 psi (48 kPa)					
Dimension of cover		7" (H) x 4-9/16"(W) x 3-3/16"(D) (178 mm (H) x 115 mm (W) x 81 mm (D))					
Detection range from the front		Within 33-1/2" (850 mm)					
Detection time		6 seconds					
Trap seal protection		Automatic flush every 24 hours of non-use			Automatic flush every 12 hours of non-use		
Ambient temperature		32-104˚F (0-40˚C)					
Water temperature		34-104˚F (1-40˚C)					

NOTE: The type of fixture determines the minimum pressure required for the valve. Consult fixture manufacturer for the pressure requirement. TET6LA(R)(X), TET6GAR, and TET6UA(R)(X) require 24" OR LONGER vacuum breakers. The valve will not have the proper detection range if you use a shorter vacuum breaker.

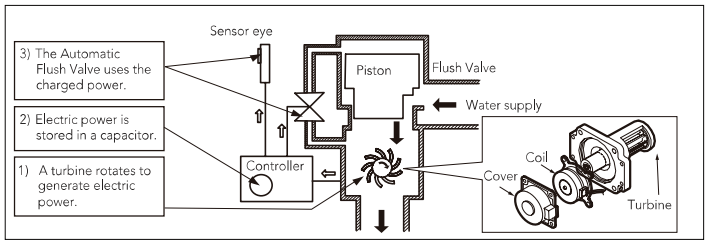
* Water pressures over 80 psi are not recommended for most plumbing fixtures.

TECHNICAL INFORMATION

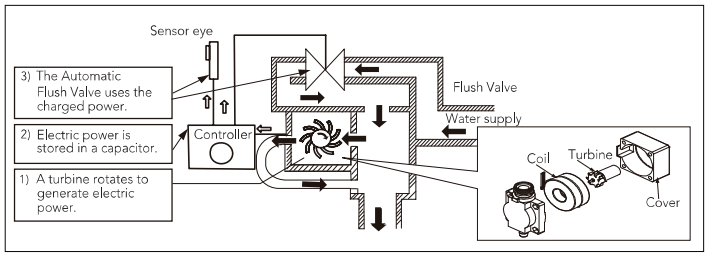
About TOTO's Hydropowered Generator

The flow of water causes the turbine in the power generator to rotate. This process generates electric power and enables the automatic Flush Valve to operate. See ill. 1 below.

TET1GAR
TET6GAR
TEU1GAR
TET1LA(R)(X)
TET6LA(R)(X)
TEU1LA(R)(X)
TET6UA(R)(X)
TET1UA(R)(X)



TEU1UA(R)(X)



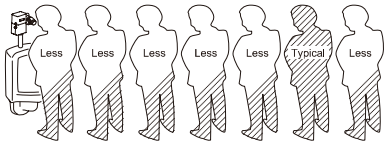
ill. 1 Hydropowered Generator

About Fuzzy Logic Control (TEU1GAR only)

The Fuzzy Logic Control function automatically adjusts the discharge of water according to the frequency and duration of usage (see ill. 2 and ill. 3).

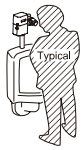
The Fuzzy Logic Control system judges the frequency of usage by the idle time of the fixture and causes the Flush Valve to discharge water in an optimal flushing pattern.

High Frequency of Usage



If the idle time is short, the system assumes frequent use and the Flush Valve discharges less water.
Examples of high frequency use would be during a lunch break or an intermission in a movie theatre.

Low Frequency of Usage

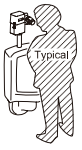


If the idle time is long, the system assumes infrequent use, causing the Flush Valve deliver a typical quantity of water for thorough flushing.
Examples of low frequency use would be during after hours at the office or a slow day at the park.

ill. 2 Frequency of Usage

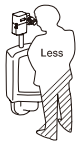
The Fuzzy Logic Control system predicts the quantity of flush water needed based on the user's duration of use.

Long duration of usage



A long duration of use indicates there may be more to flush, requiring the Flush Valve to deliver a typical quantity of flush water for thorough flushing.

Short Duration of Usage



A short duration of use indicates there may be less to flush, requiring the Flush Valve to discharge less flush water.

ill. 3 Duration of Usage

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WARNINGS

Please read and adhere to these notes. Failure to do so could result in personal injury and/or property damage.

- Never splash water on the controller. The EcoPower Flush Valve is an electric appliance. Risk of product malfunction.
- Do not strike or kick the EcoPower Flush Valve. Risk of product malfunction or water leakage.
- Do not use the EcoPower Flush Valve at temperatures exceeding what local codes or product specification allow. Risk of product malfunction.
- Do not place an item in a room with high humidity such as shower area or sauna. Risk of product malfunction.
- Never attempt to disassemble, reassemble, repair or modify the EcoPower Flush Valve unless you are a professional. Risk of product malfunction and electric shock.
- Do not use standard vacuum breaker or control stop with reclaimed water flush valve.
- Do not use petroleum based products or pipe sealants, doing so could damage product and cause water damage.

BEFORE INSTALLATION

IMPORTANT: Plumbing installation must be in accordance with applicable codes and regulations. Water supply lines must be sized to provide an adequate volume of water for each fixture. Flush all waterlines prior to operation.

- Toilet and urinal Flush Valves are not interchangeable, check the model number on the label to make sure you have the correct type. Toilet Flush Valve model numbers begin with 'TET' and Urinal Flush Valve model numbers begin with 'TEU'.
- Prior to installing your Flush Valve, install the items listed below:
  - Bowl fixture/Urinal fixture
  - Drain line
  - Water supply line

  The supply piping to these devices must be securely anchored to the building structure to prevent the installed device moving during use. Prevent marring to the exposed surface during installation. **IMPORTANT:** Purge all air from the supply lines before connecting flush valve to the bowl. Trapped air in supply lines may crack the china.

  Except for TET6GAR, TET6UA(R)(X) and TET6LA(R)(X), install the Flush Valve so the control stop is no less than 11-1/8" (282mm) above the top of the bowl/urinal. For TET6GAR, TET6UA(R)(X) and TET6LA(R)(X), install the Flush Valve such the control stop is 27" (685.8mm) above the bowl/urinal. see local codes for special requirements.
- Avoid damaging the surface of the infrared sensor while unpacking.
- For Toilet Flush Valve:
  The toilet Flush Valve may not function if toilet seat or lid cover are left upright and block the sensor.
- For Urinal Flush Valve:
  The urinal Flush Valve is designed for optimal performance with a washout urinal, but a siphon jet urinal may be substituted. Blowout urinals are not recommended.
- For Reclaimed Water Flush Valve:
  Only use reclaimed water angle stop and vacuum breaker.
- The detection range of the infrared sensor is shown on p.15.
- To prevent valve malfunction, do not install a handrail or any other object within the detection range of the sensor. Do not install the Flush Valve where sensor faces a mirror, stainless steel wall, other highly reflective surfaces or another infrared sensor.

INSTALLATION PROCEDURE

NOTE: For retrofit installation, remove the old Flush Valve after shutting off the control stop.

NOTE: For reclaimed water, do not use standard vacuum breaker or control stop.

NOTE: Do not use petroleum based products or pipe sealants.

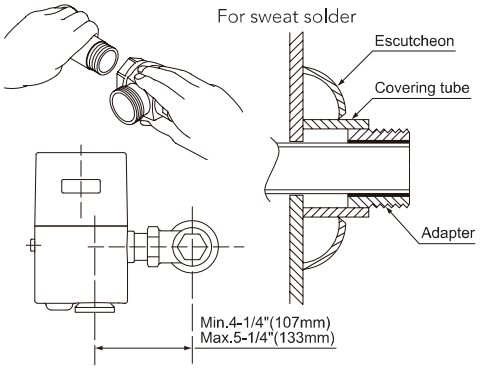


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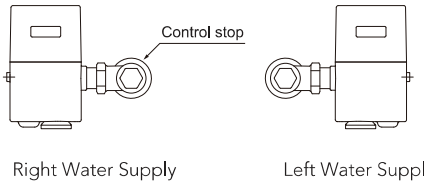
1. Install the control stop using an appropriate size escutcheon and a sweat solder adapter kit, if applicable.

   Thread sealing compounds should be used on male NPT threads only.

   The distance from center of the control stop to center of the Flush Valve should fall within 4-1/4" to 5-1/4"(107mm to 133mm).

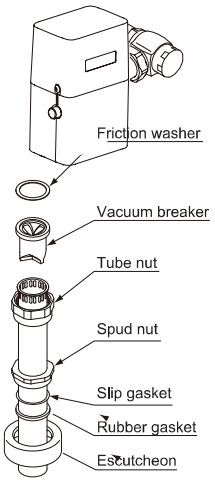


For use with a left water supply, attach the sensor top cover in the opposite direction so that the sensor will be at the front.



2. Determine the length of vacuum breaker tube to join the Flush Valve and fixture spud. If required, cut the vacuum breaker tube to the proper length.

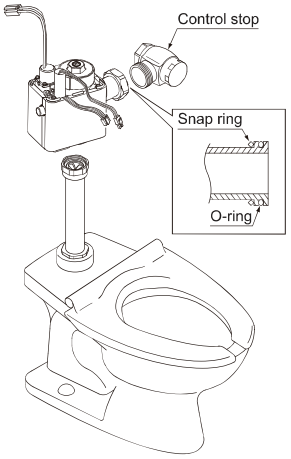
3. Assemble the spud nut assembly to the fixture spud. Hand tighten spud nut to fixture.



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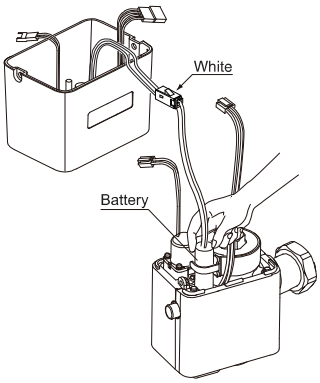
INSTALLATION PROCEDURE

4. Prior to inserting the Flush Valve tailpiece into the control stop, make sure that the o-ring is in the groove at the end of the tailpiece, the locking nut and the snap ring are located as shown.
5. Connect the Flush Valve with the control stop and the vacuum breaker tube. Exercise care not to damage the o-ring when inserting the tailpiece into the control stop. If lubrication is needed, wetting the o-ring with water is sufficient.
6. Align the Flush Valve and securely tighten fixture spud nut, vacuum breaker tube nut and locking nut with a wrench.

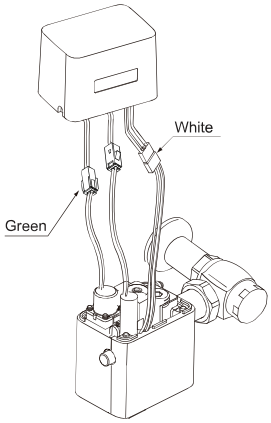


7. Connect the battery cable with that of the controller and set the battery at the proper position.

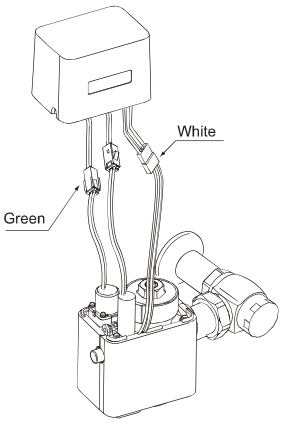
NOTE: It will take 5 minutes after connecting the battery for the electronics to initialize. After approximately 30 seconds, the sensor LED will flash in 4 second intervals until the initialization completes.



8. Connect the cables of the solenoid valve and generator with those of controller.



TEU1UA(R)(X)



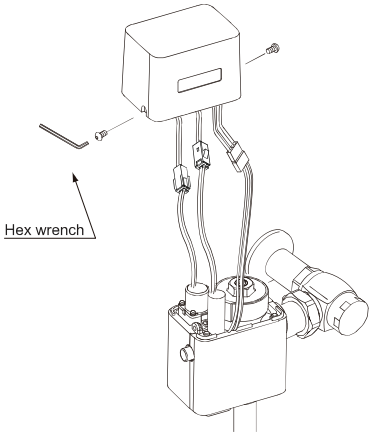
all valves except for TEU1UA(R)(X)

INSTALLATION PROCEDURE

9. Fasten the sensor top cover to body assembly with the supplied screws and hex wrench.

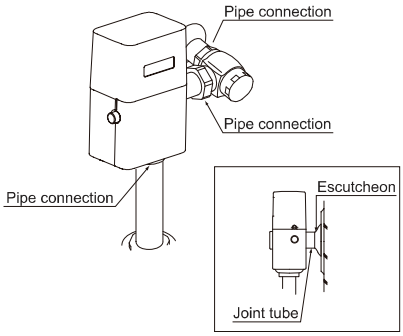


Protect the wire connections inside the top cover.



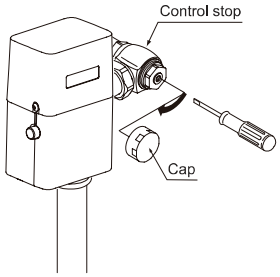
10. Before the supply water is turned on, be sure all water leaks are eliminated by tightening all the pipe connections.

NOTE: If for any reason it becomes necessary to remove the control stop, make sure the water is shut off at the main supply valve.



The Flush Valves are preset for fixture volume as marked on the valve carton. The valve does not require adjustment for variation in water pressure within its operating range.

11. To set the Flush Valve for proper operation, open the control stop completely by using the adjusting screw.
12. Activate the Flush Valve several times.
13. In the case of excessive flow rate, gradually adjust the control stop towards the closed position using the adjusting screw, until there is suitable water flow into the fixture.
14. The cap for the control stop should be placed after final adjustments have been made.
15. Tighten the cap firmly with a wrench.



WARNING: Do not open the control stop to the point where the flow from the Flush Valve exceeds the flow capability of the fixture. In case of a valve failure, the water must not overflow from the fixture.

ENGLISH

TEST RUN

After connecting the battery, the initialization process takes 5 minutes. After approximately 30 seconds, the sensor LED will start flashing in 4 second intervals until the initialization is complete. Please wait before starting the Test Run.

1. **For Toilet:** Sit on the toilet seat.
   For Urinal: Stand within two feet from the front of the Flush Valve.
2. Stay there for 6 seconds or more and then leave the toilet seat or the urinal. The valve should automatically flush, immediately for urinals and after 3 seconds for toilets.
3. Press the manual flushing button for 2 seconds and make sure the valve flushes properly and the sensor red light of the sensor is on. To correct overflow from a urinal Flush Valve, adjust the control stop clockwise.
4. Recheck all the pipe connections for water leaks. If the Flush Valve is not operating properly following the test run consult the Troubleshooting section on p.12.

NOTE TO THE INSTALLER

After the Flush Valve unit has been installed correctly, please explain to your customer how to use it and tell them to observe the following instructions:

1. Do not put any object in front of the sensor window which could obstruct the sensor, causing it to malfunction.
2. In case of any trouble, consult the troubleshooting section on p.12. If you lack the necessary skills required or have difficulty following the directions for installation, maintenance, repairs, troubleshooting or adjustments of the product, do not proceed without help from a qualified person to assist you.

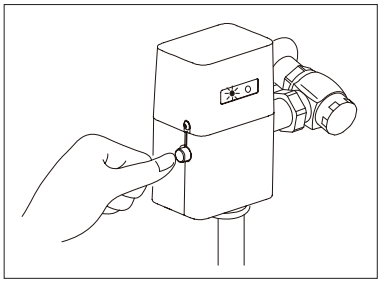
PERIODIC MAINTENANCE

Please check your EcoPower Flush Valve at least once a month according to the following instructions to avoid risk of property damage.

Check the piping to see whether there is any leakage.

Press the manual flushing button and make sure the sensor red light is on for 2 seconds to see if the generator performs properly or not.

If the red light is not on, check the generator to see if any debris is clogged up at the turbine.



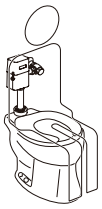
CARE & CLEANING

IMPORTANT! Do not scratch the sensor or faceplate when cleaning.

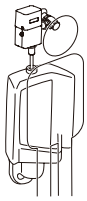
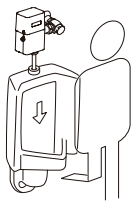
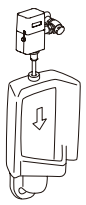
- Avoid using any cleaning materials that may scratch the surface.
- Never use polishing powder, detergent that includes coarse particles, thinners, benzene, acids, alkaline detergents, or nylon scrub brushes.
- To safely clean the surface, wipe it using a dampened soft cloth with diluted dishwashing detergent and dry it with another soft cloth. If this does not adequately clean the surface, wipe the area with a neutral detergent and wet cloth.

USING THE FLUSH VALVE

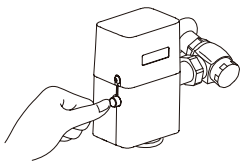
■ Using the Toilet Flush Valve

Infrared Sensor	Flushing	Flushing Every 24 hours
		
The infrared sensor detects a user of the toilet.	When the user stays in place longer than 6 seconds then moves away, the controller sends a signal to the operating unit to automatically trip the Flush Valve after 3 seconds delay.	If toilet is not used for 24 hrs, the system automatically flushes as a maintenance and hygienic precaution.

■ Using the Urinal Flush Valve

Infrared Sensor	Flushing	Flushing Every 12 hours
		
The infrared sensor detects a user standing within 2 ft (600 mm) of the front of the urinal.	When the user stays in place longer than 6 seconds then moves away, the controller sends a signal to the operating unit to automatically trip the flush. (No delay)	If urinal is not used for 12 hrs the system automatically flushes as a maintenance and hygienic precaution.

■ Common

Manual Flushing Button

Use the manual flush button for maintenance and/or emergencies.

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TROUBLESHOOTING

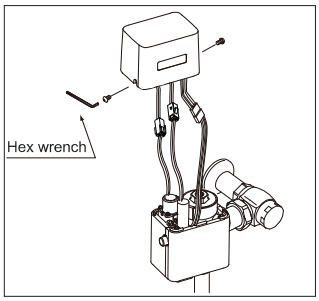
Problem	Possible Cause	Suggested Action	Ref.Page
No water comes from the Flush Valve	The main valve in water supply line or the control stop is shut off	Open the main valve or the control stop	-
	One or more cables not connected	Check all cable connections	-
	The surface of the glass in front of the infrared sensor is dirty	Clean the surface of the glass	-
	The glass is broken	Contact distributor for replacement	-
	There is a reflective surface in front of the sensor	Remove the reflective surface in front of sensor	15
	The infrared sensor or the solenoid is out of order	Contact distributor for replacement	-
	The small holes in the solenoid diaphragm are clogged	Clean the small hole in the diaphragm and filter	14
	Hydropower generator is clogged	Service hydropower generator	-
Water does not stop flowing	The small hole in the piston is clogged (not for TEU1UA(R)(X))	Clean the small hole in the piston	13
	The sealing area of the piston is dirty (not for TEU1UA(R)(X))	Clean the sealing area of the piston	13
	The sealing area of the solenoid diaphragm is dirty	Clean the sealing area of the diaphragm and filter	14
	Piston u-packing is damaged (not for TEU1UA(R)(X))	Inspect & replace if necessary	13
The discharge volume is too small	The screw of the control stop is not adjusted properly	Adjust the discharge quantity by the screw of the control stop	14
The discharge volume is too much			
The flow rate is too low	Water supply pressure is too low (below rated minimum pressure)	Consult with a plumbing contractor	-
	The control stop is not open enough	Adjust the control stop properly	14
The flow rate is too high	The control stop is not adjusted properly	Adjust the control stop properly	14
A red light in the sensor window blinks	The battery is weak	Check voltage with multimeter, if below 2.6 V, contact TOTO for replacement battery.	14

NOTE: Do not dismantle parts of the Flush Valve which are not specified in the troubleshooting guide.
If you need further assistance, please call TOTO Technical Support at (888) 295-8134.

■ DISASSEMBLY

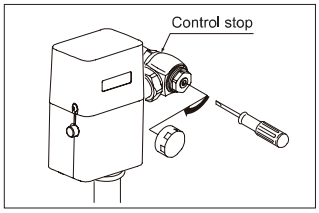
If the whole valve needs to be removed from the water supply for servicing, please be aware of the cautions below:

1. Be careful not to lose or tear the friction washer at the outlet connection to the vacuum breaker tube nut. To maintain a proper seal, replace the washer if necessary.
2. When re-installing the valve to the water supply, avoid pinching the o-ring.

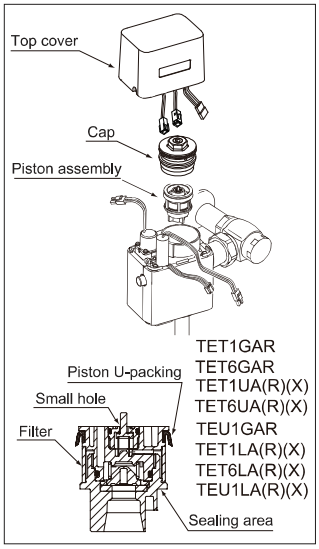


■ CLEANING PISTON ASSEMBLY AND FILTER

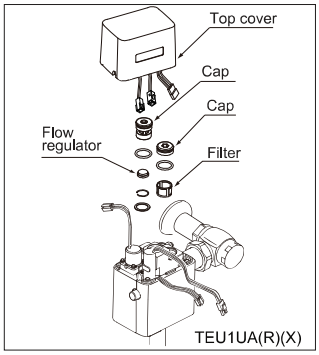
1. Turn the screw of the control stop clockwise to turn off the water.



2. Take out the piston assembly (except for TEU1UA(R)(X)) or take out the filter for TEU1UA(R)(X).



3. Check the small hole in the piston to see if it is clogged with debris. Insert a small wire to unclog hole if needed.
4. Check the filter to see if it is clogged with debris and gently brush it clean.
5. Check the sealing area of the piston and clean it if it is dirty.
6. Check the U-packing for cracks or damage.



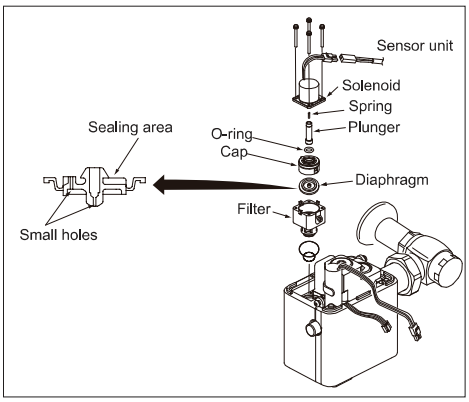
ENGLISH

■ CLEANING DIAPHRAGM AND FILTER

1. Turn the screw on the control stop clockwise to turn off the water.
2. Disconnect the solenoid.
3. Remove the solenoid and take out the diaphragm. Then check the small holes and sealing area.

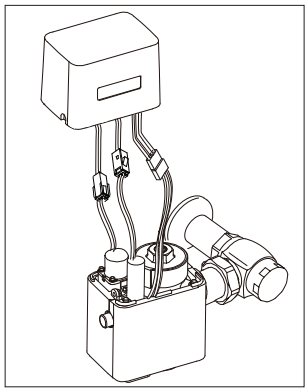
NOTE: See below for disassembly.

NOTE: Do not stretch or alter the shape of the spring in the solenoid valve in any way. It will void the warranty.



■ CHECKING THE SOLENOID

1. Make sure the batteries are properly placed and cables are connected.
2. With water supply turned off, place your hand in front of the sensor for 6 seconds.
3. Remove and listen for a "click" sound after 3 seconds. This indicates the solenoid plunger has been activated.



■ BATTERY REPLACEMENT

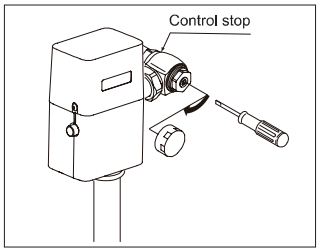
A special lithium back-up battery is used. Replace only with the battery provided by TOTO.

If a red light in the sensor window blinks with the cycle of 4 seconds, it is time to replace the battery.

1. Remove the old battery.
2. Set the new battery at the proper position.

■ ADJUSTMENT OF THE FLOW RATE

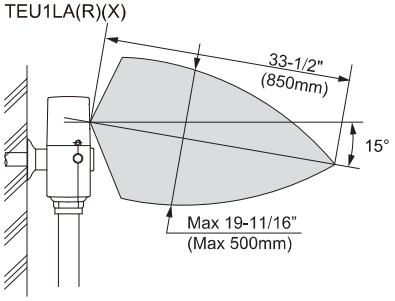
1. Adjust the flow rate by the turning screw on the control stop.
2. Turn the screw to the right to decrease the flow rate and turn to the left to increase.



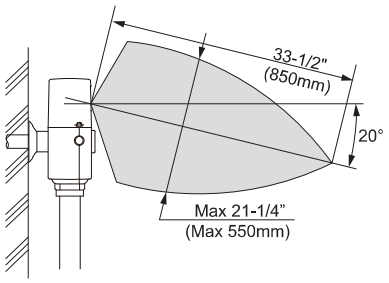
■ DETECTION RANGE

The detection range of the infrared sensor is set at the factory and does not need further adjustment.

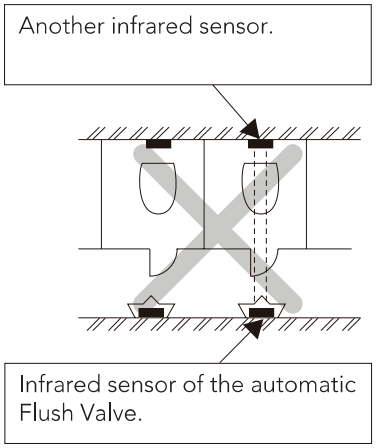
TET1GAR, TET1LA(R)(X), TET1UA(R)(X)
TEU1GAR, TEU1UA(R)(X)
TEU1LA(R)(X)



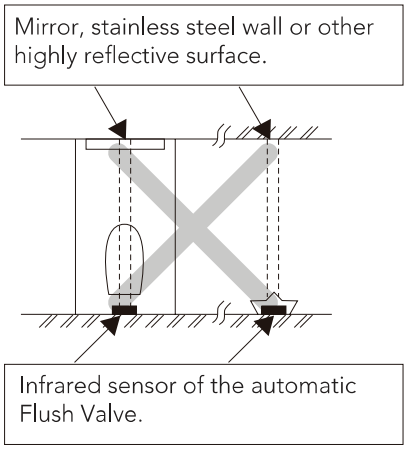
TET6LA(R)(X), TET6UA(R)(X)
TET6GAR



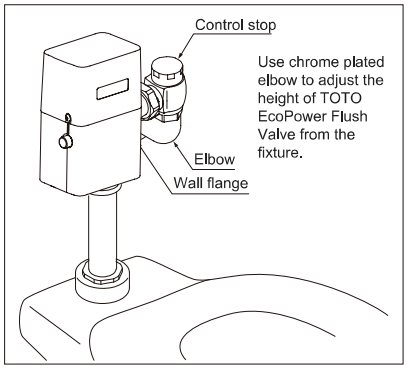
PRECAUTION
DO NOT place the infrared sensor of one Flush Valve so that it is in line with the sensor of another Flush Valve sensor.



PRECAUTION
DO NOT place the infrared sensor in front of a mirror, stainless steel wall, or other highly reflective surface.



NOTE: In some cases, the valve may not detect a user if the toilet seat is left in an upright position. This can be due to the rough-in dimension or gap of the open front commercial seat. Please lower the seat or arrange with a TOTO or other plumbing contractor to change the height of the valve.
The sensor can have trouble detecting users wearing black clothes in some conditions.



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