



# Owner's Manual

**NOTE TO INSTALLER : PLEASE GIVE THIS MANUAL TO THE CUSTOMER AFTER INSTALLATION.**

## EcoPower® Concealed Flush Valves

**Models**

**■ AUTOMATIC TOILET FLUSH VALVE**

TET2GN31,32,33#SS  
TET2LN31,32,33#SS

TET3GN31,32,33#SS  
TET3LN31,32,33#SS



**■ AUTOMATIC URINAL FLUSH VALVE**

TEU2GN11,21#SS  
TEU2LN11,21#SS  
TEU2UN11#SS

TEU3GN11,21#SS  
TEU3LN11,21#SS  
TEU3UN11#SS



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# Important Safeguards

(For your safety, please follow the instructions below.)

**Read these Important Safeguards thoroughly before using your Automatic Flush Valve and follow the precautions carefully.**




After you read this Owner's Manual, keep it where it can be easily referred to again. Symbols are shown for safe and proper use of your Automatic Flush Valve and in order to alert personal injury and damage to your property. The symbols and their meaning are as follows.



## Warning


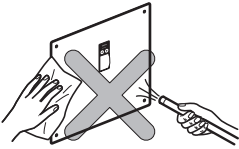
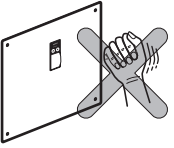
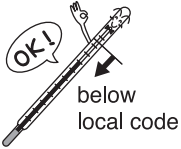

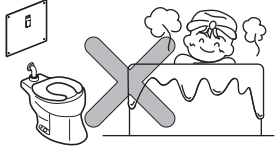

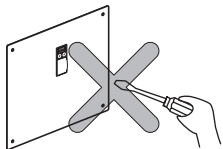
Ignoring these symbols may cause personal injury or property damage.

The items of observation are classified and described.

	<b>Absolutely "DO not".</b>		<b>Do not install the product in high humidity area such as a shower area or sauna.</b>
	<b>Do not disassemble.</b>		



## Warning

 <b>Do not</b>	<b>Never splash water on the controller.</b> The Automatic Flush Valve is an electrical appliance, this may cause product malfunction.	
	<b>Do not strike or kick to the Automatic Flush Valve.</b> This may cause product malfunction or water leakage.	
	<b>Do not use the Automatic Flush Valve at temperatures exceeding what local codes allow.</b> This may cause product malfunction.	
 <b>Do not use in humid areas</b>	<b>Do not place an item with this symbol displayed in a room with high humidity such as shower area or sauna.</b> This may cause product malfunction.	
 <b>Do not disassemble</b>	<b>Never attempt to disassemble, reassemble, repair or modify the Automatic Flush Valve, unless you are an electrician.</b> This may cause product malfunction and electric shock.	

# Model Number and Specifications

		Toilet		Urinal	
Model Number	Concealed Large cover	TET2LN32#SS TET2LN33#SS TET2LN31#SS	TET2GN32#SS TET2GN33#SS TET2GN31#SS	TEU2LN11#SS TEU2LN21#SS TEU2UN11#SS	TEU2GN11#SS TEU2GN21#SS
	Concealed Small cover	TET3LN32#SS TET3LN33#SS TET3LN31#SS	TET3GN32#SS TET3GN33#SS TET3GN31#SS	TEU3LN11#SS TEU3LN21#SS TEU3UN11#SS	TEU3GN11#SS TEU3GN21#SS
Dimensions of cover	Concealed Large cover	12-5/8"(H) x 14-3/16"(W) (320mm(H) x 360mm(W))			
	Concealed Small cover	4-23/32"(H) x 4-23/32"(W) (120mm(H) x 120mm(W))			
Detection time		6 seconds or more			
Ambient temperature		32-104°F(0-40°C)			
Water temperature		34-104°F(1-40°C)			
Connection of the water		1"NPT / 3/4"NPT			
The flush valve inlet		1-1/4"NPSM			
The flush valve outlet		1-1/2"NPSM			
Supply water pressure	Minimum (Flowing)	35 PSI (241kPa)	15 PSI (103kPa)		
	Maximum	125 PSI (862kPa)			
Shutoff pressure		7 PSI (48kPa)			
Discharge quantity per flush at 28 PSI (196kPa)		Approx 1.28 gallon (4.8L) Required Min Flow rate: 23 gpm (87Lpm)	Approx 1.6 gallon (6L)	Approx 0.5 gallon (1.9L)	Approx 0.5~1.0 gallon (1.9~3.8L) Recommended Max Flow rate: 10 gpm (38Lpm)
				Approx 1/8 gallon (0.47L)	
Toilet/Urinal Type		Flushometer type bowl		Wash down flush	
Trap seal protection		Automatic flushing every 24 hours, if not used		Automatic flushes once after twelve (12) hours of non-use	Automatic flushing every 24 hours, if not used

**Note** The minimum pressure required to the valve is determined by the type of fixture selected. Consult fixture manufacturer for pressure requirement.

# Green Feature

## 1. Hydropowered generator (See “Bits of Knowledge About TOTO’s EcoPower® Flush Valve”)

The EcoPower® Flush Valve detects the user on the toilet/urinal through an infrared sensor and automatically flushes the toilet/urinal. This flushing activates the hydro-power generator, which charges the automatic flush valve.

## 2. Fully Automatic

The EcoPower® Flush Valve detects the user on the toilet/urinal through an infrared sensor and automatically flushes the toilet/urinal. It does not require any manual operation for flushing.

## 3. Keeps the Toilet Hygienic.

The EcoPower® Flush Valve operates automatically, flushing the toilet/urinal each time it is used, there by keeping the toilet hygienic.

## 4. System Protection Timer.

When the toilet/urinal is not used for a 24 HR. PERIOD (12 HR PERIOD FOR TEU\*LN and TEU\*UN ) the protection timer commands the system to flush, maintaining a trap seal.

## 5. Anti Consecutive Flushing after Manual Operated Flushing

The EcoPower® Flush Valve offers water saving consecutive flush prevention. The valve will not automatically flush again for 10 seconds after it has been flushed (for urinals) or for 30 seconds (for toilets).

## 6. Manual Function

For maintenance and emergency use, the flush valve is equipped with a manual flushing button.

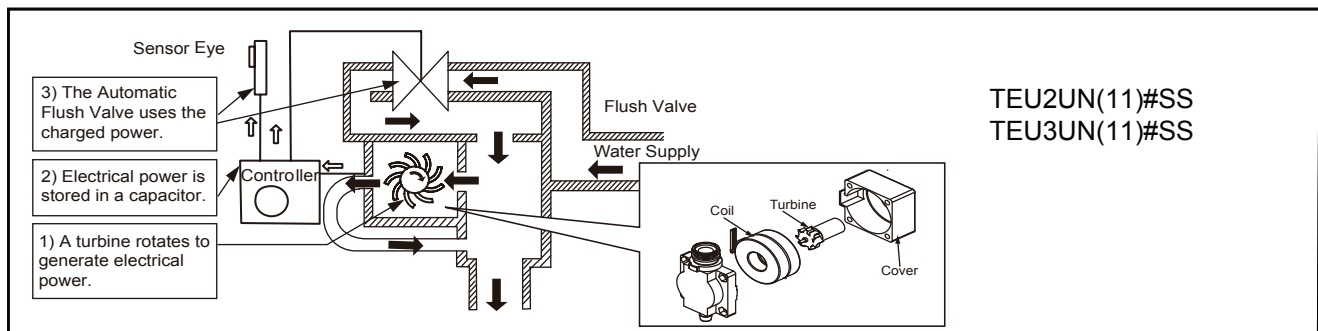
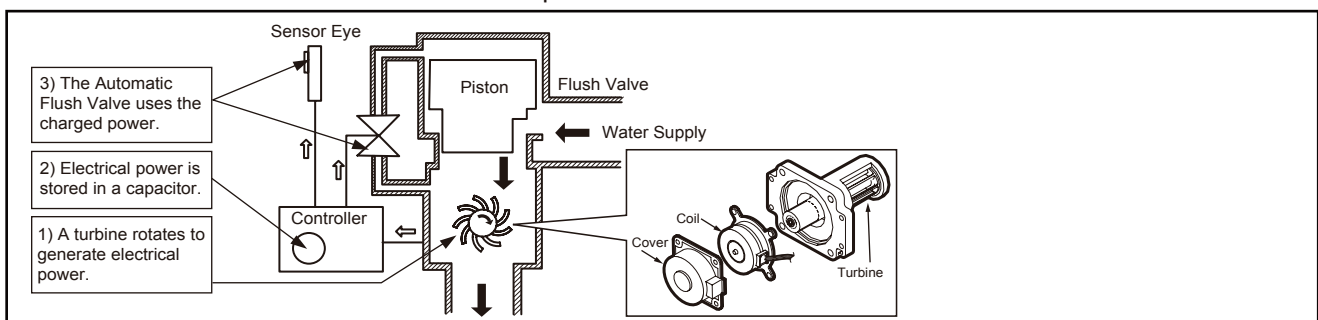
## 7. Conserves Water by Fuzzy Logic Control. (See “Bits of Knowledge About Fuzzy Logic Control”)

The flush valve has a fuzzy logic control function, for urinal flush valve only, that enables it to detect through the infrared sensor how often and long the urinal has been used and deliver the needed quantity of flush water each time the urinal is used.

### Bits of Knowledge About TOTO’s EcoPower® Flush Valves

#### • Mechanism for Hydro-Powered Generator

The flow of water causes the turbine in the power generator to rotate. The generator generates electrical power, and enables the Automatic Flush Valve to operate.



Flushing 12 times (30 times for TEU\*LN(11,21)#SS ;45 times for TEU\*UN(11)#SS) per day will keep the EcoPower® Flush Valve fully charged for 10 years. It may vary according to the discharge quantity and the flow rate.

## Bits of Knowledge About Fuzzy Logic Control

- FLC used only in TEU2GN and TEU3GN Urinal Valves.
- The fuzzy logic control function automatically adjusts the discharge quantity according to the frequency of usage. (See ① and ②.)

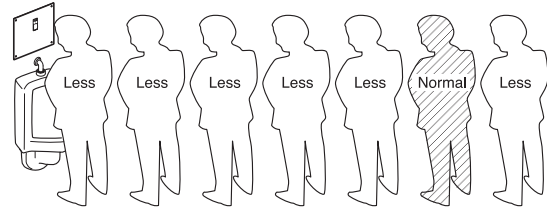
The fuzzy logic control system judges the frequency of usage by the idle time of the urinal and causes the flush valve to discharge water in an optimal flushing pattern based on the usage.

If the idle time is short, the system assumes frequent use of the urinal, causing the flush valve to discharge less water. If the idle time is long, the system assumes infrequent use, causing the flush valve deliver a normal quantity of water for thorough flushing.

- The fuzzy logic control function automatically adjusts the discharge quantity according to the volume of urine. (See ③ and ④.)

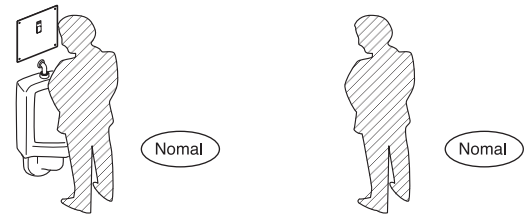
The fuzzy logic control system assumes the volume of urine based on how long the urinal has been used and causes the flush valve to discharge an optimal quantity of flush water according to the assumed volume. If the duration of urination is short, the system assumes the volume of urine is small, causing the flush valve to discharge less flush water. If the duration of urination is long, it assumes the volume of urine is large, causing the flush valve to deliver a normal quantity of flush water.

- ① When the frequency of usage is high. (at the time of a lunch break, an intermission in a movie theatre, etc.)

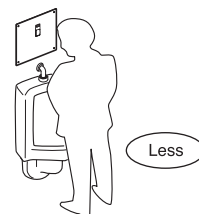


- ※ If less water is discharged five times in succession, a normal quantity of water is discharged in the above flushing pattern.

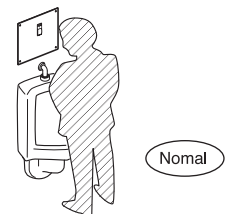
- ② When the frequency of usage is low. (in an office in the early morning or at night, a park with few visitors, etc.)



- ③ When the duration of urination is short.

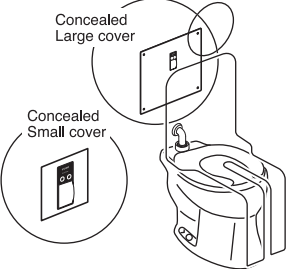
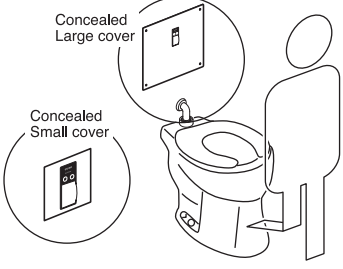
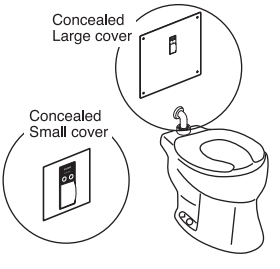


- ④ When the duration of urination is long.

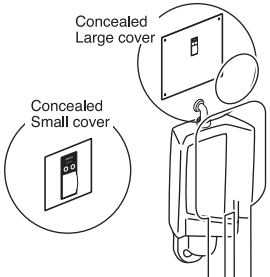
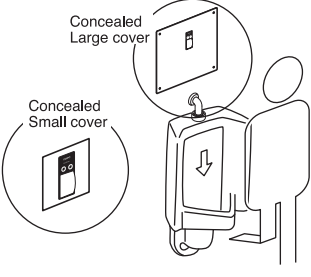
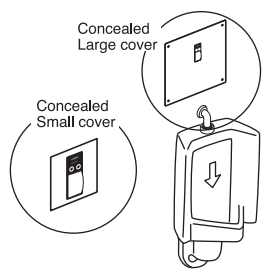


# Operation Procedure

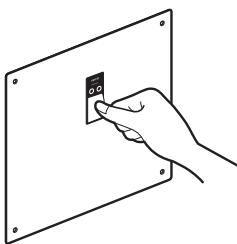
## ■ For The Toilet Flush Valve

① Infrared Sensor	② Flushing	③ Flushing Every 24 hours
 <p>The infrared sensor detects a user sitting on the toilet seat, or standing.</p>	 <p>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.</p>	 <p>If toilet is not used, the system automatically flushes every 24 hours as a maintenance and hygienic precaution.</p>

## ■ For The Urinal Flush Valve

① Infrared Sensor	② Flushing	③ Flushing Every 12/24 hours
 <p>The infrared sensor detects a user standing in front of the urinal within 2 ft(600mm).</p>	 <p>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.</p>	 <p>If urinal is not used, the system automatically flushes every 24 hours as a maintenance and hygienic precaution. For TEU2GN and TEU3GN Urinal Valves. Automatic flushes every 12 hours of non-use for TEU*LN and TEU*UN Urinal Valves.</p>

## ■ Common

Manual Flushing Switch
 <p>Use the manual flush Switch maintenance and/or emergencies.</p>

# Day-to-Day Care

In order to enjoy your new product, please follow the guidelines below on a day-to-day basis.

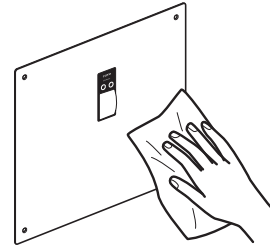
## Care with a Cloth

### ● For Light Cleaning

Please wring out a cloth that has been soaked in water and wipe away any debris adhering to the Automatic Flush Valve.

### ● For Heavy-Duty Cleaning

After wiping away debris with a cloth containing a suitable amount of a neutral, dishwashing detergent, wipe clean with a damp cloth.

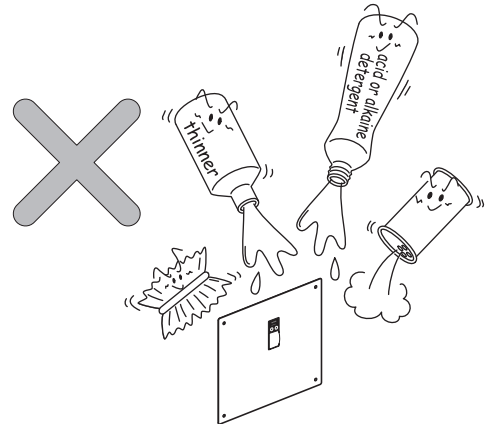


## Caution

### ● Please avoid using cleansers that might scratch the surface of the Automatic Flush Valve.

#### These include:

- Detergents containing acid, chlorine bleach or alkali.
- Solvents like paint thinner or benzene.
- Detergents with coarse granules, polishing powder or cleanser. Nylon scrubbers, pot scrubbers, brushes, etc.



# Periodical Checking

Please check your Automatic Flush Valve at least once a month according to the following instructions.

## Leakage

### Check the piping to see whether there are any leaks.

Ignoring this may cause property damage.



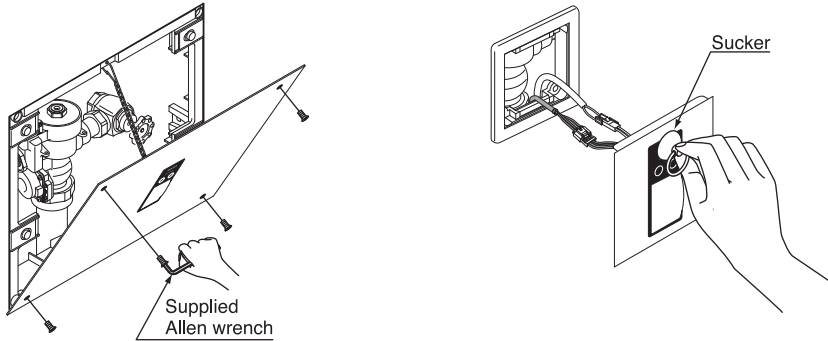
# Troubleshooting

	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.	-
	The connector is not connected.	Connect the wire.	-
	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 from the sensor.	10
	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 strainer.	9
	Hydropower generator clogged.	Service Hydropower Generator.	10
Water does not stop flowing.	The small hole in the piston is clogged.	Clean the small hole in the piston.	8
	The sealing area of the piston is dirty.	Clean the sealing area of the piston.	8
	The sealing area of the solenoid diaphragm is dirty.	Clean the sealing area of the diaphragm and strainer.	9
	Piston U-packing damaged.	Inspect & replace if necessary.	8
The discharge quantity is too small.	The screw of the control stop or the screw of the piston valve are not adjusted properly.	Adjust the discharge quantity by the screw of the control stop and the screw of the piston valve.	9
The discharge quantity is too much.			
The flow rate is too low.	Water supply pressure is too low. (below 15 PSI(103kPa))(Flowing) (below 35 PSI(241kPa) for TET* LN units) For TET*LN#: Water flow rate is lower than 23 gpm (87Lpm)	Consult with a plumbing contractor.	-
	The control stop is not open enough.	Adjust the control stop properly.	9
The flow rate is too high.	The control stop is not adjusted properly.	Adjust the control stop properly.	9
A red light in the sensor window blinks.	The battery is weak.	Replace with battery provided by TOTO®.	10

**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® Tech 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 following cautions below:

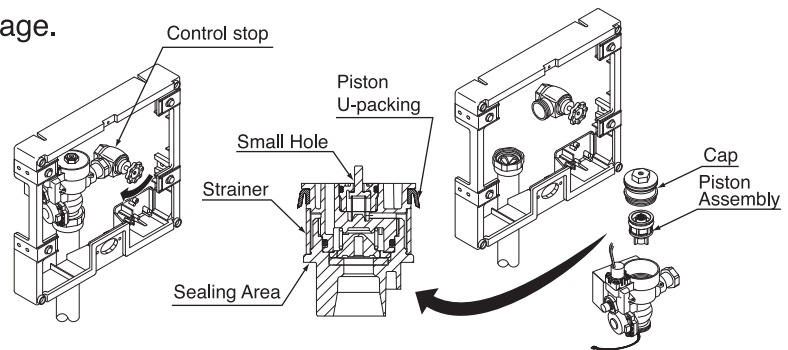
1. Be careful not to lose or tear the friction washer at the outlet connection to the vacuum breaker tube nut. To maintain a proper seal, replace the washer if necessary.
2. Be careful when re-installing the valve to the water supply to avoid pinching the O-ring.

## ■ CLEANING PISTON ASSEMBLY

1. Turn the screw of the control stop clockwise to turn off the water.
2. Take out the piston assembly.
3. Check the small hole in the piston to see if it is clogged with debris, insert a small wire to unclog hole. (Concealed Type)
4. Check the strainer to see if it is clogged with debris and gently brush it to 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.

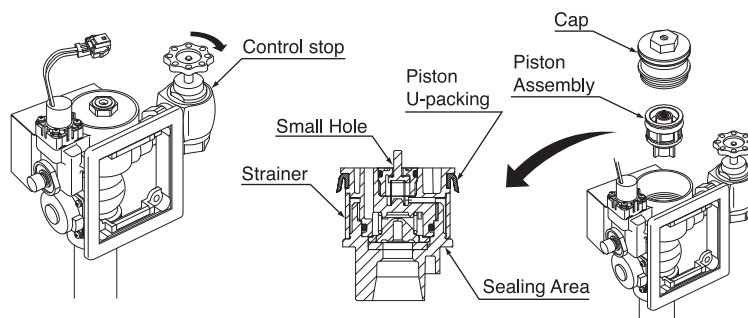
### Concealed Type (Large cover)

TET2GN31,32,33#SS  
 TET2LN31,32,33#SS  
 TEU2GN11,21#SS  
 TEU2LN11,21#SS



### Concealed Type (Small cover)

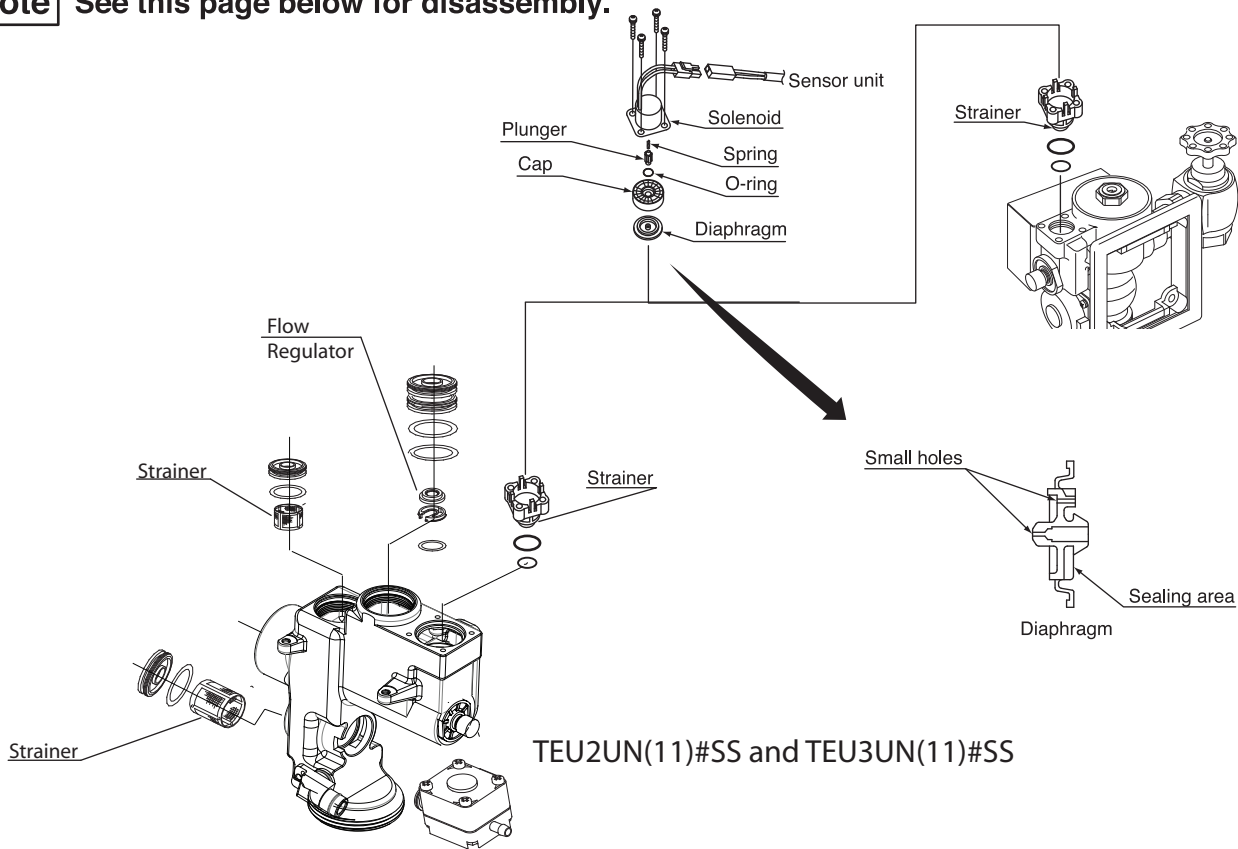
TET3GN31,32,33#SS  
 TET3LN31,32,33#SS  
 TEU3GN11,21#SS  
 TEU3LN11,21#SS



## ■ CLEANING DIAPHRAGM AND STRAINER

1. Turn the screw of the control stop clockwise to turn off the water.  
(See step 1 of page 8 "CLEANING PISTON ASSEMBLY")
2. Disconnect the solenoid.
3. Remove the solenoid and take out the diaphragm. Then check the small holes and sealing.

**Note** See this page 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.

Solenoid can be checked for proper function by two methods after assuring that the batteries are properly placed and wires are connected.

Method 1: With water supply turned off, place your hand in front of the sensor for 6 seconds, remove and listen for a "click" sound. This indicates the solenoid plunger has been activated.

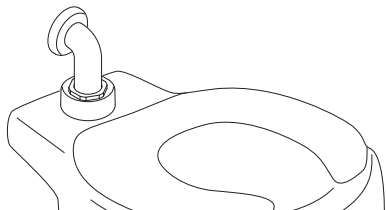
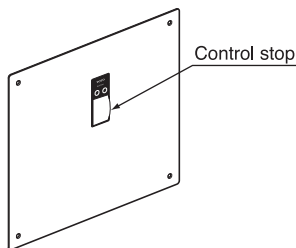
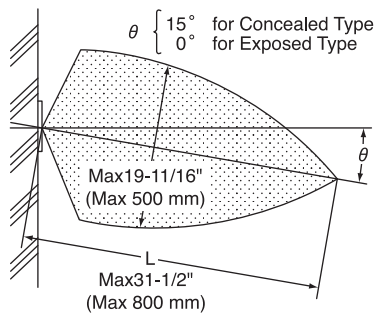
Method 2: Remove the 4 screws from solenoid assembly and remove diaphragm portion to expose solenoid, spring and plunger assembly only. Next, activate by covering the sensor for 6 seconds. After removing hands, the plunger will retract. This indicates proper function.

## ■ 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.

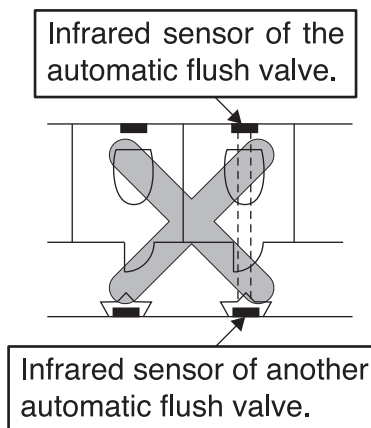
## ■ THE DETECTION RANGE

The detection range of the infrared sensor does not need to be adjusted because it has been previously set at the factory. The detection zone may differ according to color of user's clothes. When a user wears black clothes, the detection zone may become smaller and the valve may not flush.



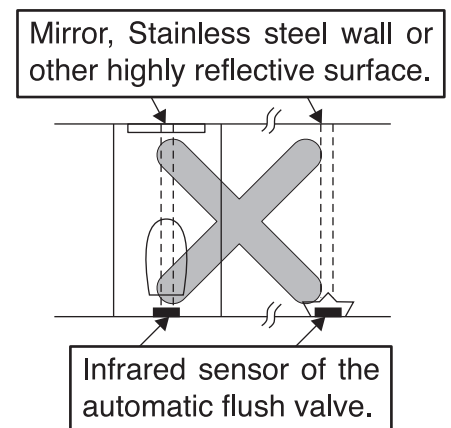
### "AVOID"

**DO NOT** place the Infrared sensor of one urinal so that it is in line with the sensor of another automatic flush valve sensor.



### "AVOID"

**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/width of the open front commercial seat. Please lower the seat or arrange to change the height of the valve ( Consult with TOTO® or plumbing contractor )

Thoroughly read the Installation Instruction on detailed rough-in information so that issues on false detection or obstruction of sensor can be avoided.

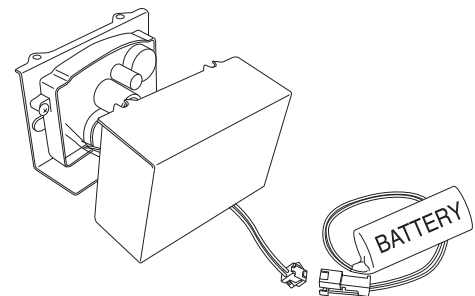
## ■ BACK UP BATTERY REPLACEMENT

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. Open the controller box.
2. Remove the old battery in the box.
3. Set the new battery at the proper position.
4. Close the box.



# Warranty

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1. TOTO® warrants its products to be free from manufacturing defects under normal use and service for a period of three (3) years from the date of purchase. This warranty is extended only to the ORIGINAL PURCHASER.
2. TOTO's® obligations under this warranty are limited to repair or replacement, at TOTO's® option, of products or parts found to be defective, provided that such products were properly installed and used in accordance with OWNER'S MANUAL. TOTO® reserves the right to make such inspections as may be necessary in order to determine the cause of the defect. TOTO® will not charge for labor or parts in connection with warranty repairs or replacements. TOTO® is not responsible for the cost of removal, return and/or reinstallation of products.
3. This warranty does not apply to the following items:
  - a) Damage or loss sustained in a natural calamity such as fire, earthquake, flood, thunder, electrical storm, etc.
  - b) Damage or loss resulting from any unreasonable use, misuse, abuse, negligence, or improper maintenance of the product.
  - c) Damage or loss resulting from removal, improper repair, or modification of the product.
  - d) Damage or loss resulting from sediments or foreign matter contained in a water system.
  - e) Damage or loss resulting from improper installation or from installation of a unit in a harsh and/or hazardous environment.
  - f) Damage or loss resulting from acts of animals such as mice and insects.
  - g) Damage or loss resulting from a use of abnormal power supply.
  - h) Damage or loss resulting from abrasion of consumable supplies.
  - i) Damage or loss resulting from frost.
4. This warranty gives you specific legal rights. You may have other rights which vary from State to State.
5. To obtain warranty repair service under this warranty, you must take the product or deliver it prepaid to a TOTO® service facility together with a letter stating the problem, or contact a TOTO® distributor or products service contractor, or write directly to TOTO® U.S.A., INC., 1155 Southern road, Morrow, Georgia 30260, (888) 295-8134. If, because of the size of the product or nature of the defect, the product cannot be returned to TOTO®, receipt by TOTO® of written notice of the defect shall constitute delivery. In such case, TOTO® may choose to repair the product at the purchaser's location or pay to transport the product to a service facility.

THIS WRITTEN WARRANTY IS THE ONLY WARRANTY MADE BY TOTO®. REPAIR OR REPLACEMENT AS PROVIDED UNDER THIS WARRANTY SHALL BE THE EXCLUSIVE REMEDY AVAILABLE TO THE PURCHASER. TOTO® SHALL NOT BE RESPONSIBLE FOR LOSS OF USE OF THE PRODUCT OR FOR OTHER INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES OR EXPENSES INCURRED BY PURCHASER, OR FOR LABOR OR OTHER COSTS DUE TO INSTALLATION OR REMOVAL, OR COSTS OF REPAIRS BY OTHERS, OR FOR ANY OTHER EXPENSE NOT SPECIFICALLY STATED ABOVE. EXCEPT TO THE EXTENT PROHIBITED BY APPLICABLE LAW, ANY IMPLIED WARRANTIES, INCLUDING THAT OF MERCHANTABILITY OR FITNESS FOR USE, ARE EXPRESSLY LIMITED TO THE DURATION OF THIS WARRANTY. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS. OR THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION AND EXCLUSION MAY NOT APPLY TO YOU.