

## SoftTouch 2 Series Ball Valves

SUPERSEDES: New

EFFECTIVE: September 30, 2016

Plant ID No. 001-4275

### Applications

The ST2 Series Ball Valves are designed to regulate the flow of hot, chilled water in response to the demand of a controller in Heating, Ventilating, and Air Conditioning (HVAC) systems.

**IMPORTANT:** Use the ST2 Series Valves as an operating control. Where failure or malfunction of the ST2 Series Valve could lead to personal injury or property damage to the controlled equipment or other property, additional precautions must be designed into the system. Incorporate and maintain other devices, such as supervisory or alarm systems or safety or limit controls, intended to warn of or protect against failure or malfunction of the ST2 Series Valve.

**IMPORTANT:** Take care to prevent foreign material such as weld slag, thread burrs, metal chips, and scale from entering the piping system. This debris can damage or severely impede the operation of the valve by embedding itself in the seats, scoring the valve, and ultimately resulting in seat leakage. If the debris becomes embedded in the seats, subsequent flushing and filtering of the piping system with the valve installed does not remedy the problem.

### Installation

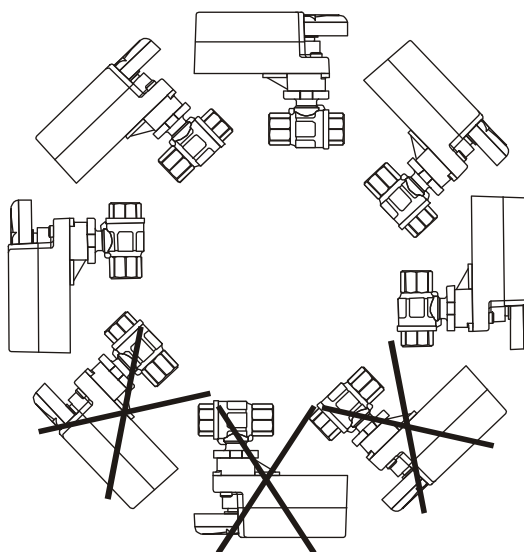
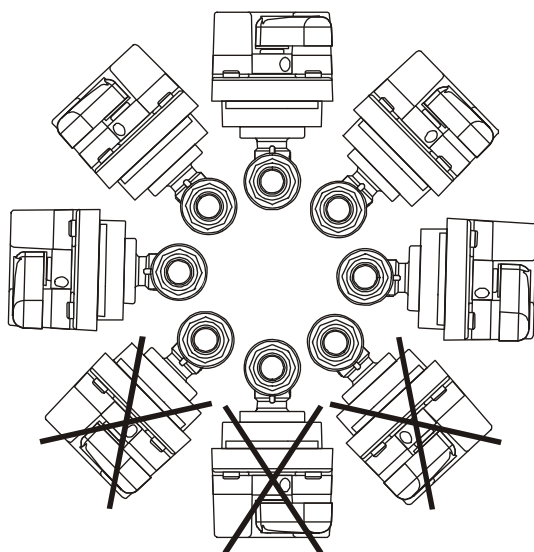
Install ST2 Series Ball Valves with the actuator at or above the centerline of the horizontal piping, as shown in Figure 1.

When mounting the actuator in the field (before installation), use an adjustable wrench to manually rotate the valve stem several times. This rotation breaks the torque that may have built up during long-term storage.

For the valve to move in the proper direction, wire the input lines to the electric actuator correctly.

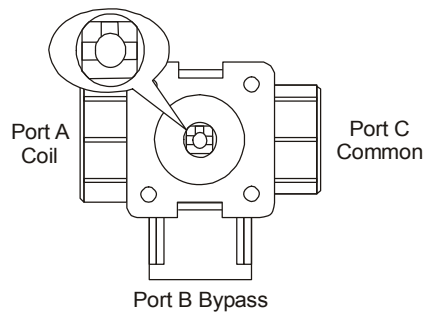
#### Note:

On models with the flow-characterizing disk, the disk is located in Port A. Port A must be the inlet. On three-way models, use Port A as the coil inlet and Port B as the bypass inlet.

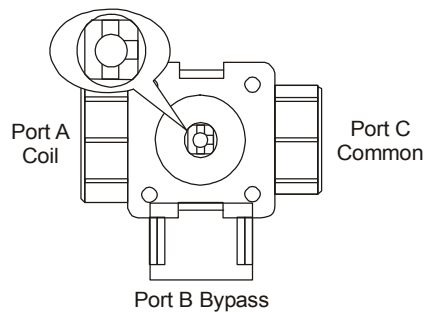


Contact your local Taco representative for compatibility concerns before using ST2 Series Ball Valves to control the flow of fluids other than those outlined in the Technical Specifications table in this document.

## Port Configuration



**ST2 Series Three-Way  
Ball Valve (Port A Connected to Port C)**



**ST2 Series Three-Way  
Ball Valve (Port B Connected to Port C)**

**IMPORTANT:** Protect the actuator from dripping water, condensation, and other moisture. Water or moisture could result in an electrical short, which may damage or affect the operation of the actuator.

**IMPORTANT:** Do not cover the actuator with thermal insulating material. High ambient temperatures may damage the actuator, and a hot water pipe, steam pipe, or other heat source may overheat it.

## Wiring

Be sure to wire the input lines to the electric actuator correctly for the valve to move in the proper direction.

**IMPORTANT:** Use copper conductors only. Make all wiring connections in accordance with local, national, and regional regulations. Do not exceed the actuator's electrical ratings.



**WARNING: Risk of Electric Shock.** Disconnect the power supply before making electrical connections. Contact with components carrying hazardous voltage can cause electric shock and may result in severe personal injury or death.

## Troubleshooting

### Servicing the Actuator or Piping System

When servicing the electric actuator or the piping system:

- disconnect the power supply to the actuator.
- relieve the pressure in the piping system.

**IMPORTANT:** Do not attempt to manually rotate the drive shaft while the actuator is installed without first releasing the actuator gears. Manually rotating the drive shaft without releasing the actuator gears may result in permanent damage to the actuator.



**CAUTION: Risk of Property Damage.** Do not apply power to the system before checking all wiring connections. Short circuited or improperly connected wires may result in permanent damage to the equipment.

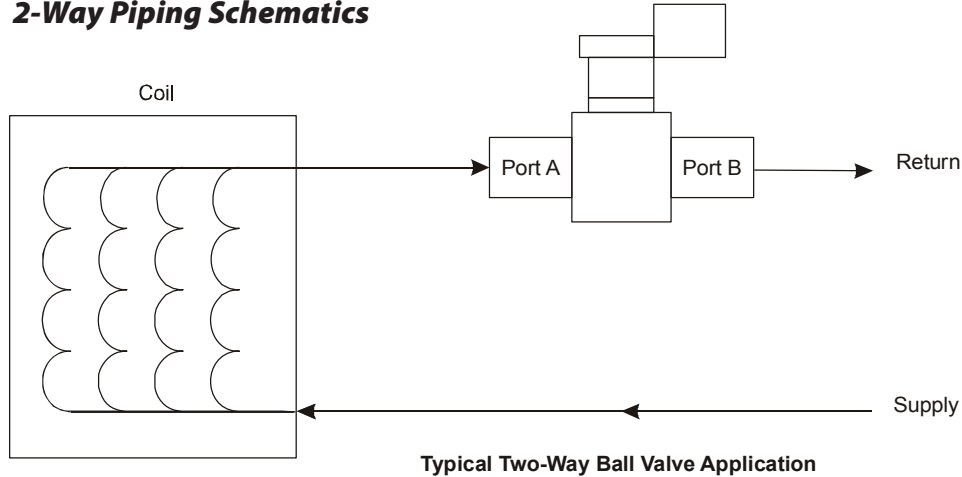
## Technical Specifications

Service		Hot Water, Chilled Water, 50/50 Glycol Solutions for HVAC Systems
Valve Body Pressure/ Temperature Rating	Cold Working Pressure (CWP) Water	580 PSI (PN 40) 23°F to 203°F (-5°C to 95°C)
Maximum Recommended Operating Pressure Drop		50 psi Maximum Differential Pressure for Valves with Characterized Flow Control Disk and 30 psi Maximum for Quiet Service Ball Valves
Flow Characteristics	Two-Way Three-Way	Equal Percentage Equal Percentage Port A, Linear Port B (Bypass)
Rangeability		Greater than 500:1
Minimum Ambient Operating		See Actuator Specifications
Leakage		.01% of Maximum Flow per ANSI/FCI 70-2, Class 4 1% of Maximum Flow for Three-Way Bypass Port
End Connections		NPT or BSP
Materials	Body	Forged Brass
	Ball	300 Series Stainless Steel
	Stem	300 Series Stainless Steel
	Seats	Graphite-Reinforced PTFE with EPDM O-ring backing
	Stem Seals	EPDM Double O-rings
	Characterizing Disk	Amodel®
Close-Off		200 PSI
Compliance CRN		OC16910.5

Disclaimer - The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult your Taco representative. Taco, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.

## ST2 Series Piping and Installation Tips

### 2-Way Piping Schematics



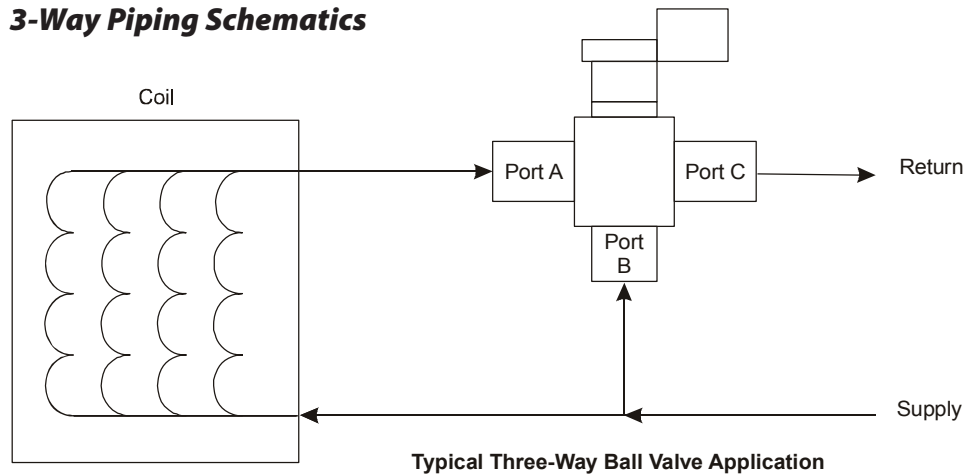
**Note:** Mount the valve downstream from the coil to minimize heat transfer to the actuator.

### 2-Way - Default Configuration for ST2 Ball Valves

Valve Position at Actuator Position	2-Way Non Spring Return	2-Way Spring Return N.O	2-Way Spring Return N.C.
Valve Position w/ Act CCW	Open	Open	Open
Valve position w/Act CW	Closed	Closed	Closed
Valve Position w power removed	Last Position	Open	Closed
Proportional actuator control signal Action (Direct Acting)*	CCW at 0; CW at Max	CCW at 0, CW at Max	CW at 0, CCW at Max

\*Proportional actuators include a switch to field convert from Direct Acting to Reverse Action

### 3-Way Piping Schematics



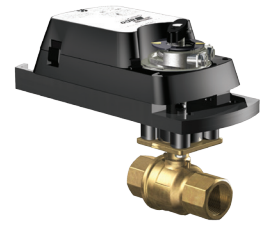
**Note:** Mount the valve downstream from the coil to minimize heat transfer to the actuator.

### 3-Way - Default Configuration for ST2 Ball Valves

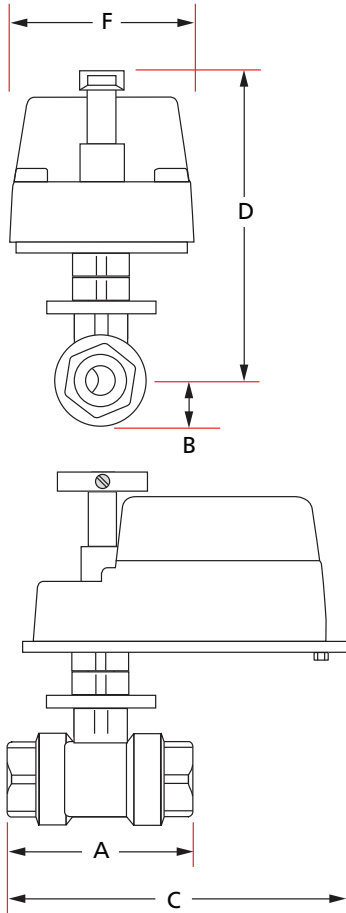
Valve Position at Actuator Position	3-Way Non Spring Return	3-Way Spring Return N.O	3-Way Spring Return N.C.
Valve Position w/ Act CCW	A open to C	A open to C	A open to C
Valve position w/Act CW	B open to C	B open to C	B open to C
Valve Position w power removed	Last Position	A open to C	B open to C
Proportional actuator control signal Action (Direct Acting)*	CCW at 0; CW at Max	CCW at 0, CW at Max	CW at 0, CCW at Max

\*Proportional actuators include a switch to field convert from Direct Acting to Reverse Action

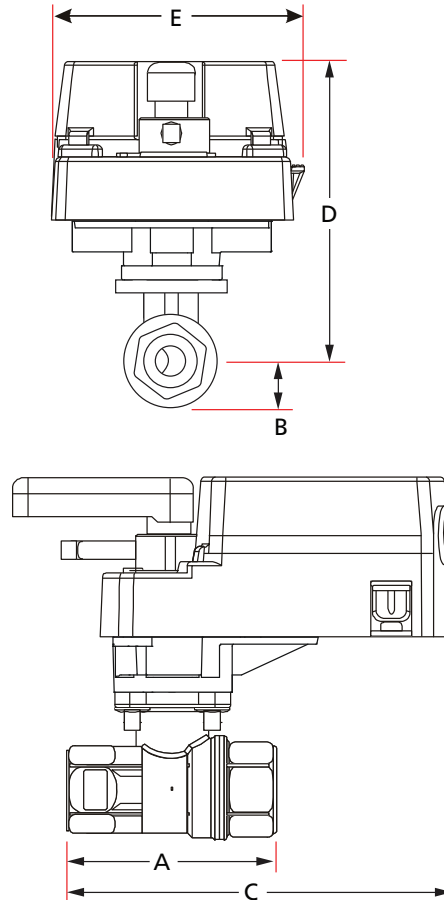
## SoftTouch 2 - 2-Way Dimensions



### Universal Mount D-Series



### Direct Mount VA-Series



### ST2 Dimensions - 2-Way

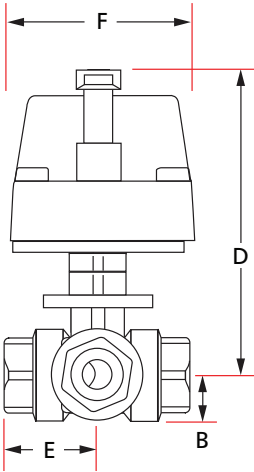
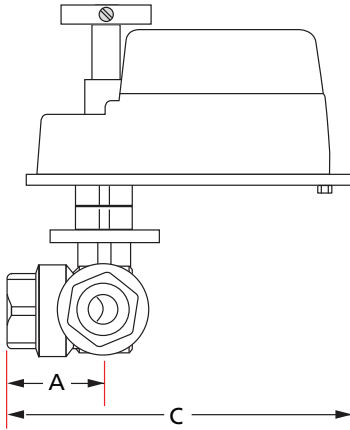
ST2 Dimensions -2-Way																
	ST2 VALVE MODEL # PREFIX ST2 Size-Way-Cv	Connection		Available Cv's	Please reference the illustration											
					A		B		C		D*		E		Weight	
		in.	mm		in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lb	kg
Direct Mount VAS 27 Series	ST2-05-2-...	1/2	15	1.2, 1.9, 2.9, 4.7, 11.7	2-33/64	64	21/32	17	6-23/32	171	4-1/4	108	3-1/4	82	3.0	1.4
	ST2-75-2-...	3/4	20	4.7, 7.4, 11.7	2-51/64	71	21/32	17	6-7/8	175	4-1/4	108	3-1/4	82	3.1	1.4
	ST2-1-2-...	1	25	7.4, 11.7, 18.7	3-13/32	87	3/4	19	7-7/64	181	4-9/32	109	3-1/4	82	3.4	1.5
Direct Mount VA 35 Series	ST2-05-2-...	1/2	15	1.2, 1.9, 2.9, 4.7, 11.7	2-33/64	64	21/32	17	5-7/64	129	3-7/8	98	2-13/16	71	3.0	1.4
	ST2-75-2-...	3/4	20	4.7, 7.4, 11.7	2-51/64	71	21/32	17	5-7/32	133	3-7/8	98	2-13/16	71	3.1	1.4
	ST2-1-2-...	1	25	7.4, 11.7, 18.7	3-13/32	87	3/4	19	5-9/16	141	3-11/16	100	2-13/16	71	3.4	1.5
Direct Mount VAS 70 Series	ST2-125-2-...	1-1/4	32	11.7, 18.7, 29.2	3-15/16	100	1-1/32	26	7-5/32	182	7-11/16	195	3-29/32	99	5.7	2.6
	ST2-150-2-...	1-1/2	40	18.7, 29.2, 46.8	4-5/16	110	1-9/64	29	7-3/8	187	7-7/8	200	3-29/32	99	6.4	2.9
	ST2-2-2-...	2	50	29.2, 46.8, 73.7	4-13/16	123	1-15/32	37	7-19/32	193	8-1/32	204	3-29/32	99	8.1	3.7
Universal Mount D 70 Series	ST2-125-2-...	1-1/4	32	11.7, 18.7, 29.2	3-15/16	100	1-1/32	26	7-7/8	175	6-7/16	164	4-1/4	108	5.7	2.6
	ST2-150-2-...	1-1/2	40	18.7, 29.2, 46.8	4-5/16	110	1-9/64	29	8-1/16	180	6-5/8	168	4-1/4	108	6.4	2.9
	ST2-2-2-...	2	50	29.2, 46.8, 73.7	4-13/16	123	1-15/32	37	8-5/16	186	6-3/4	171	4-1/4	108	8.1	3.7

Allow 3.5" clearance for actuator removal.

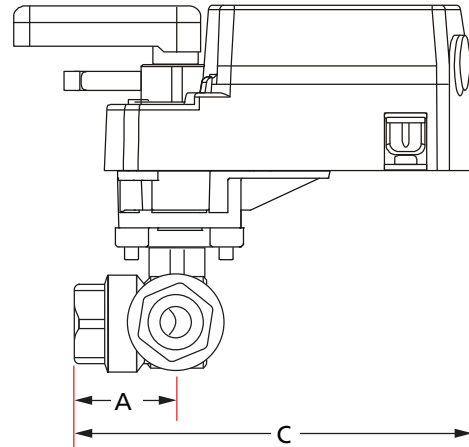
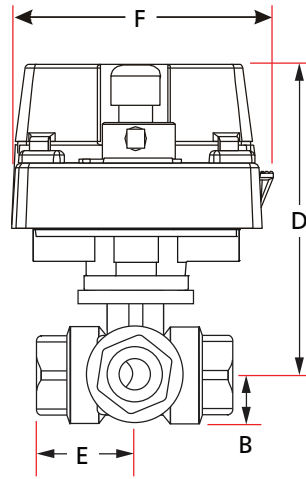
Weights shown are for valve/actuator assemblies

## SoftTouch 2 - 3-Way Dimensions

### Universal Mount D-Series



### Direct Mount VA-Series



### ST2 Dimensions - 3-Way

	ST2 VALVE MODEL # PREFIX ST2 Size-Way-Cv	Connection		Available Cv's	Please reference the illustration													
		in.	mm		A		B		C		D*		E		F		Weight	
					in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lb	kg
Direct Mount VAS 27 Series	ST2-05-3-...	1/2	15	1.2, 1.9, 2.9, 4.7, 11.7	1-1/4	32	21/32	17	6-23/32	171	4-1/4	108	2-33/64	64	3-1/4	82	3.0	1.4
	ST2-75-3-...	3/4	20	4.7, 7.4, 11.7	1-13/32	36	21/32	17	6-7/8	175	4-1/4	108	2-51/64	71	3-1/4	82	3.2	1.5
	ST2-1-3-...	1	25	7.4, 11.7, 18.7	1-45/64	43	3/4	19	7-7/64	181	4-9/32	109	3-13/32	87	3-1/4	82	3.3	1.5
Direct Mount VA 35 Series	ST2-05-3-...	1/2	15	1.2, 1.9, 2.9, 4.7, 11.7	1-1/4	32	21/32	17	5-7/64	129	3-7/8	98	2-33/64	64	2-13/16	71	3.0	1.4
	ST2-75-3-...	3/4	20	4.7, 7.4, 11.7	1-13/32	36	21/32	17	5-7/32	133	3-7/8	98	2-51/64	71	2-13/16	71	3.2	1.5
	ST2-1-3-...	1	25	7.4, 11.7, 18.7	1-45/64	43	3/4	19	5-9/16	141	3-11/16	100	3-13/32	87	2-13/16	71	3.3	1.5
Direct Mount VAS 70 Series	ST2-125-3-...	1-1/4	32	11.7, 18.7, 29.2	1-31/32	50	1-1/32	26	7-5/32	182	7-11/16	195	3-15/16	100	3-29/32	99	6.1	2.8
	ST2-150-3-...	1-1/2	40	18.7, 29.2, 46.8	2-11/64	55	1-9/64	29	7-3/8	187	7-7/8	200	4-21/64	110	3-29/32	99	6.9	3.1
	ST2-2-3-...	2	50	29.2, 46.8, 73.7	2-27/64	62	1-15/32	37	7-7/8	200	8-1/32	204	4-27/32	123	3-29/32	99	9.5	4.3
Universal Mount D 70 Series	ST2-125-3-...	1-1/4	32	11.7, 18.7, 29.2	1-31/32	50	1-1/32	26	7-7/8	175	6-7/16	164	3-15/16	100	4-1/4	108	6.1	2.8
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	ST2-2-3-...	2	50	29.2, 46.8, 73.7	2-27/64	62	1-15/32	37	8-5/16	186	6-3/4	171	4-27/32	123	4-1/4	108	9.5	4.3

Allow 3.5" clearance for actuator removal.

Weights shown are for valve/actuator assemblies

# LIMITED WARRANTY STATEMENT

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Taco, Inc. will repair or replace without charge (at the company's option) any product or part which is proven defective under normal use within five (5) years from the date of manufacture.

In order to obtain service under this warranty, it is the responsibility of the purchaser to promptly notify the local Taco stocking distributor or Taco in writing and promptly deliver the subject product or part, delivery prepaid, to the stocking distributor. For assistance on warranty returns, the purchaser may either contact the local Taco stocking distributor or Taco. If the subject product or part contains no defect as covered in this warranty, the purchaser will be billed for parts and labor charges in effect at time of factory examination and repair.

Any Taco product or part not installed or operated in conformity with Taco instructions or which has been subject to misuse, misapplication, the addition of petroleum-based fluids or certain chemical additives to the systems, or other abuse, will not be covered by this warranty.

If in doubt as to whether a particular substance is suitable for use with a Taco product or part, or for any application restrictions, consult the applicable Taco instruction sheets or contact Taco at [401-942-8000].

Taco reserves the right to provide replacement products and parts which are substantially similar in design and functionally

equivalent to the defective product or part. Taco reserves the right to make changes in details of design, construction, or arrangement of materials of its products without notification.

TACO OFFERS THIS WARRANTY IN LIEU OF ALL OTHER EXPRESS WARRANTIES. ANY WARRANTY IMPLIED BY LAW INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS IS IN EFFECT ONLY FOR THE DURATION OF THE EXPRESS WARRANTY SET FORTH IN THE FIRST PARAGRAPH ABOVE. THE ABOVE WARRANTIES ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR STATUTORY, OR ANY OTHER WARRANTY OBLIGATION ON THE PART OF TACO.

TACO WILL NOT BE LIABLE FOR ANY SPECIAL, INCIDENTAL, INDIRECT OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OF ITS PRODUCTS OR ANY INCIDENTAL COSTS OF REMOVING OR REPLACING DEFECTIVE PRODUCTS.

This warranty gives the purchaser specific rights, and the purchaser may have other rights which vary from state to state. Some states do not allow limitations on how long an implied warranty lasts or on the exclusion of incidental or consequential damages, so these limitations or exclusions may not apply to you.



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