

UHP Valves, Fittings & System Integration

**KITZ SCT**

# TDF4 Series

High-Speed High-Cycle Life Valves



The TDF4 series are high-purity gas-compatible diaphragm valves that combine high-speed opening/closing durability, and Cv stability required for atomic layer deposition (ALD) and atomic layer etch (ALE) processes.

## ■ Features

### High-speed opening/closing, and high response stability

Realizes valve total response time 14ms and response stability  $\pm 2$ ms after 40 million cycles.

\* Performance values according to our testing methods

### Stable Cv value

Cv values are 100% factory-adjusted prior to shipment. With little variation in Cv values during use, stable flow rates can be obtained.

\* Amount of variation with actuations within  $\pm 5\%$

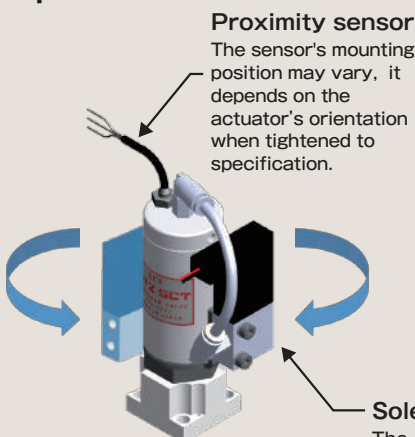
### High cycle life

Durability test performance value of 60 million cycles or more achieved as a result of our unique technology.

\* Our test performance (test conditions): fluid N<sub>2</sub>, charged pressure 0.25MPa(G), wetted area temperature 120° C



## Options



**Proximity sensor**  
The sensor's mounting position may vary, it depends on the actuator's orientation when tightened to specification.

### Solenoid valve

Fixed with a dedicated bracket, enabling high-speed motion. Shortens valve opening/closing time.

Solenoid products manufactured by MAC Valves, Inc., are recommended.

Type	Wiring length	Wiring
34C-ABA-GDFC-1GF	914 mm	Duplex

### Solenoid valve

The orientation can be freely changed without removing the mounting screw.

### Proximity sensor

Transmits the valve's actuator open state as an electrical signal. Shipped after adjusting to optimum performance during factory assembly.

Products manufactured by OMRON Corporation are recommended.

Sensor PN	Operation mode	Output form
E2E-S05S12-WC-B1 2M	NO	PNP
E2E-S05S12-WC-B2 2M	NC	PNP
E2E-S05S12-WC-C1 2M	NO	NPN
E2E-S05S12-WC-C2 2M	NC	NPN

\* In addition, special face-to-face dimensions and valve shapes, manifolds, mounting holes for cartridge heaters, corrosion-resistant material bodies, etc., are available.

Contact our sales representative.

## Specifications

Size	1/4"	
Cv *1	0.21(120°C)	
Maximum Operating Pressure	101psig (0.7 MPa(G))	
Wetted Area Volume	0.051in <sup>3</sup> (0.84 cm <sup>3</sup> ) (C-seal, 2-port) 0.057in <sup>3</sup> (0.94 cm <sup>3</sup> ) (C-seal, 3-port)	
Fluid Temperature *2	Room temperature ~120°C	
Atmospheric Temperature *2	20~120°C	
Response Speed *3	14±2 ms	
Leak Rates	Across the Seat	≤1×10 <sup>-9</sup> sccs (≤1×10 <sup>-10</sup> Pa·m <sup>3</sup> /s)(at room temp)
	He Leak Rates	≤1×10 <sup>-6</sup> sccs (≤1×10 <sup>-7</sup> Pa·m <sup>3</sup> /s)(at max. temp)
	Inboard He Leak Rates	≤1×10 <sup>-9</sup> sccs (≤1×10 <sup>-10</sup> Pa·m <sup>3</sup> /s)
Actuation pressure	NC : 65~87psig (0.45~0.6 MPa(G))	
	NO : 73~87psig (0.5~0.6 MPa(G))	

Grade	STD	EP	SEP
Body Material	SUS316L		SUS316LE (Double melt material)
Surface Roughness	≤ Rz 3.2 μm	≤ Rz 0.7 μm	
	≤ Ra 0.5 μm/20 μin	≤ Ra 0.13 μm / 5 μin	
Polish	Mechanical polished	Electro polished	
Cleaning	Degreasing + Precision cleaning		
Packaging	Single bagged package	Double bagged package	
Seat	PFA		
Diaphragm	Cobalt alloy		

\*1 The Cv value is calculated based on SEMASPEC-90120394B-STD and is min. value from the tested valves heated at 120 °C.

\*2 For proximity sensor and solenoid valve(Optional) installation, the fluid temperature and environment should not allow the solenoid valve to exceed 70°C.

\*3 Response speed: Motion time for the valve to open from a closed state after a signal is sent to the solenoid valve.

NC: Time between the instant when the solenoid valve signal is turned ON and the instant when the valve is fully opened

NO: Time between the instant when the solenoid valve signal is turned ON and the instant when the valve is fully closed

(Operating pressure: 0.48MPa, tube: length between the solenoid valve and the valve 76.2mm, inside diameter 2mm)

### Precautions

1)The valves are designed to be used under atmospheric pressure. If the valve's actuator is within a vacuum environment then the performance is not guaranteed.

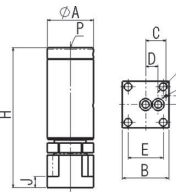
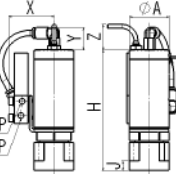
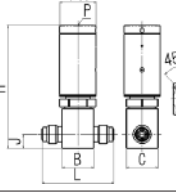
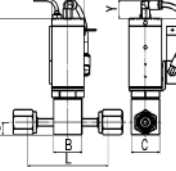
2) For high temperature applications, please select appropriate material for the actuator's air-fittings and tubes to assure proper performance.

## Type

Model	Size	Operation	Valve Shape	Connection	Seat Material	Open/Close Sensor	Option	Grade
TDF	4	C	S	G	A	S	****	EP-316L
TDF: TDF-type Diaphragm valve (High-speed high-durability spec)	4 : 1/4"	C: Normally closed O: Normally open	S: Straight B: Branch	G: C-seal Surface Mount V: CVC male VF: CVC female	A : PFA	Not shown: Without sensor S: With open/close sensor	Serial no.: Sensor spec with solenoid valve Other special spec	STD-316L: Mechanical polished + SUS316L EP-316L: Electro polished + SUS316L SEP-316LE: Electro polished + Double melt material

## Dimensions

Unit: inch (mm)

Model	Type	Connection	L	H	J	A	B	C	D	E	F	M	N	P	X	Y	Z
	TDF4CS-GA	C-1.125 Surface Mount	-	3.37 (85.7)	0.26 (6.6)	-	1.13 (28.6)	0.50 (12.7)	0.31 (7.75)	0.86 (21.74)	0.19 (4.75)	0.20 (5.2)	0.06 (1.55)	-	-	-	-
	TDF4CB-GA-S-****	C-1.125 Surface Mount	-	-	-	1.12 (28.5)	-	-	-	-	-	-	-	M5	1.28 (32.5)	0.63 (16)	0.71 (18)
	TDF4CS-VA	CVC 1/4" male	2.24 (57)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TDS4CS-VFA-S-****	CVC 1/4" female	2.78 (70.6)	3.83 (97.2)	0.43 (11)	-	0.98 (25)	0.98 (25)	-	-	-	1.00 (25.4)	2-M5 DEPTH 0.20(5.0)	-	-	0.63 (16)	0.71 (18)

\* The position of the solenoid valve can be turned in the desired direction.

\* The sensor's mounting position will depend on the actuator's orientation when tightened to specification.

\* For N.O dimensions, contact our sales representative.

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**Caution**

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