

KITZ SCT

TDF Series

High-Speed High-Cycle Life Valves



The TDF series are high-purity gas-compatible diaphragm valves that combine high-speed opening/closing operation, high durability, heat resistance, 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 18ms* and response stability $\pm 2\text{ms}^*$ after durability cycles.

* Performance values according to our testing methods

Compatible with high-temperature fluids

Adoption of a structure that reduces heat transfer to the actuator enables usage with high-temperature fluids up to 220°C*.

* Body Temperature up to 200°C with solenoid valve and sensor installed.

Stable Cv value

Adoption of a structure and seat material in consideration of thermal influence ensures Cv 0.5* at 220°C. Cv values are 100% factory-adjusted. With little variation in Cv value during use, stable gas flow rates can be obtained.

* Initial Cv value error and variation during use within $\pm 5\%$

High cycle life

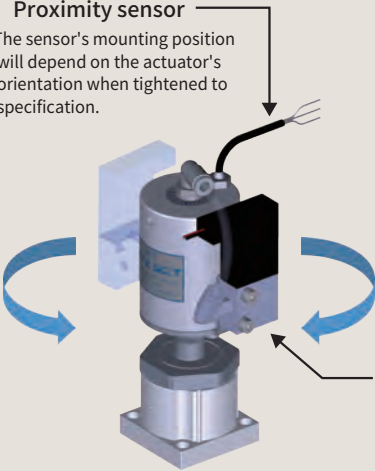
With a 220°C high-temperature body temperature rating, and durability test performance value of **one hundred million cycles or more*** achieved as a result our unique technology.

*Our test performance (test conditions): fluid N2, charged pressure 0.25MPa(G), wetted area temperature 220°C

Options

Proximity sensor

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



Solenoid valve

Enables high-speed motion, and shortens valve opening/closing time. Fixed with a dedicated bracket.

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

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

Proximity sensor

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

Products manufactured by OMRON Corporation are recommended.

Type	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

Solenoid valve

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

* 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	1/2"	
Cv at 220°C *1	0.5	
Maximum Operating Pressure	101.5psig (0.7 MPa(G))	
Wetted Area Volume	0.1172in³ (1.92 cm³ (C-seal, 2-port))	
	0.1532in³ (2.51 cm³ (C-seal, 3-port))	
Fluid Temperature	80°C~220°C *2	
Atmospheric Temperature	20°C~130°C	
	20~70°C (with sensor and solenoid valve installed)	
Response Speed *3	18±2 ms	
Leak Rates (Room temperature when shipped)	Across the Seat He Leak Rates	≤ 1 × 10 ⁻⁹ sccs (≤ 1 × 10 ⁻¹⁰ Pa·m³/sec)
	Inboard He Leak Rates	≤ 1 × 10 ⁻⁹ sccs (≤ 1 × 10 ⁻¹⁰ Pa·m³/sec)
Actuation pressure	65.3~87.0psig (0.45~0.6 MPa(G))	

Grade	STD	EP	SEP
Body Material	SUS316L		SUS316LE (Double melt material)
Surface Roughness	≤ Rz 3.2 μ m	≤ Rz 0.7 μ m	
Polish	Mechanical polished	Electro polished	
Cleaning	Degreasing + Precision cleaning		
Packaging	Single bagged package	Double bagged package	
Seat	PFA		
Diaphragm	Cobalt alloy		

*1 The minimum value is stated by Cv value measurement (220°C) based on SEMASPEC-90120394B-STD.

*2 Room temperature - 220°C if not used continuously, and up to 200°C with sensor and solenoid valve installed.

*3 Motion of the valve from a closed state to opening; Time between the instant when the solenoid valve signal is turned ON and the instant when the valve is fully opened under the following conditions:
(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. Usage such as under vacuum vessels are not guaranteed.
- 2) For high temperature applications, please select appropriate material for air-fittings and tubes to assure proper performance.

Type

Model	Size	Operation	Valve Shape	Connection	Fitting Size	Seat Material	Open/Close Sensor	Option	Grade
TDF	8	C	S	G		A	S	****	EP-316L

TDF : TDF-type
Diaphragm valve
(High-speed
high-durability spec)

8 : 1.5" HF C :
Pneumatic valve
Normally closed

S : Straight
B : Branch

G : C-seal
Surface Mount
V : CVC male
VF : CVC female

Not shown: 1/2"
4 : 1/4"
(CVC only)

A: PFA

Not shown:
Without sensor
S:
With open/
close sensor

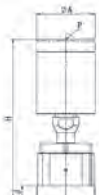
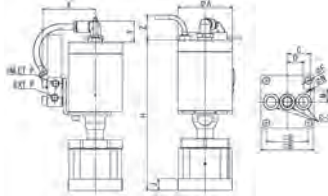
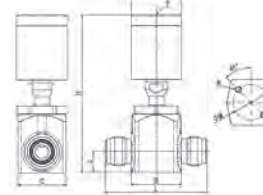
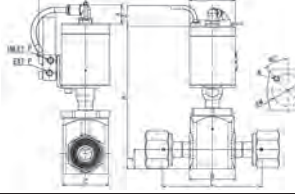
Serial no.:
Sensor spec with
solenoid valve
Other special spec

STD-316L :
Mechanical polished + SUS316L
EP-316L :
Electro polished + SUS316L
SEP-316LE:
Electro polished + Double melt material

* For normally open type, contact our sales representative.

Dimensions

Unit: inch(mm)

Model	Type	Connection	L	H	J	A	B	C	D	E	F	M	N	P	X	Y	Z
	TDF8CS-GA	C-1.5" HF Surface Mount		4.13 (105)	0.315 (8)		1.490 (37.85)	0.645 (16.38)	0.455 (11.56)	1.188 (30.18)	0.203 (5.16)	0.330 (8.38)	0.079 (2)	Rc 1/8			
	TDF8CB-GA- S-****	C-1.5" HF Surface Mount												M5	1.457 (37)	0.551 (14)	0.669 (17)
	TDF8CS-VA	CVC 1/2" male	3.03 (77)			1.496 (38)								Rc 1/8			
	TDF8CS- VFA- S-****	CVC 1/2" female	3.27 (83)	4.69 (119)	0.630 (16)		1.496 (38)	1.417 (36)				1.102 (28)	M5	M5			

* 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.



Caution

Product specifications and performance values described in this catalog are based on our design calculations, in-house testing, product usage performance and public standards and specifications, and are posted as a user's guide under general usage conditions of the product. If the product is used outside of the described usage conditions or under special usage conditions, you should receive our technical advice in advance or it will be necessary to first conduct research and evaluation for performance verification at the users' own responsibility. Even if physical or personal damage occurs without use of the procedure, we shall assume no responsibility. Although this catalog has been edited with the utmost care possible, contact us if there are any unclear points if you come across any questionable matter. In addition, information described in this catalog will be revised without notice due to reasons that include correction of errors, supplement/improvement of insufficient content, improvement in product performance design change, and discontinuation of production of products, etc., when deemed necessary. This invalidates the product catalog of the previous version. The issue code is described in the back of your catalog. For product selection, contact us to confirm whether your catalog is the latest version. In addition, when exporting our products, exporters should obtain an export permit from the Ministry of Economy, Trade and Industry based on the provisions of the Export Trade Control Order of the "Foreign Exchange and Foreign Trade Act." Contact us regarding any unclear points.

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