

# Dual Chamber Orifice Fitting

080.320.02.DC

## Overview

**CUBICON®** Orifice Plate Dual-Chamber fittings is a high-quality, high-precision orifice plates manufactured in a wide range of sizes and materials. With proven measurement principles and **site repairability**, the Dual-Chamber orifice bore provides a reliable and **cost-effective solution for your flow measurement needs**.

These units are manufactured to meet or exceed ASME and ANSI specifications and comply with the requirements of the latest versions of **AGA3 (API-14.3) & ISO5167:1-2**.

It is available in **Flanged, Flanged to Flanged, Flanged to Welding Neck** configurations.

No matter what the application is, your transaction will benefit from **CUBICON's** proven reliability and you can make a profit without sacrificing quality, service or performance.



Good Performance



*"The CUBICON® Dual-Chamber orifice plate allows for accurate flow measurements, orifice plate inspection changing without breaking or depressurizing the **flow on-line in process.**"*

*\_Ing. Cem Berberoğlu, INKOTEK\_*



**"You can install  
anywhere and still  
be in touch"**



## At a Glance

- LOW price total cost ( TCO )
- High Precision Accuracy  $\leq 0,5\%$
- High turndown Ratio 1:50
- No moving part
- No maintenance
- No longer calibration
- ISO 5167 : 1 and 2, ASME MFC-3M
- ISO - TR15377:2018
- 4 .. 20 mA HART® ( DPT/op. )
- IECEx or ATEX ( DPT/op. )
- ASTM A 316 L - S.S
- ASTM A 216 WCB, WCC or LCC ( low temp. )
- EC 2014/68/EU for PED



**Best Solution Ever**

**OPTIMUM® Isıtma Çözümleri A.Ş**

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## Safety First

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### • Notes for Your Consideration

This appliance has been produced in compliance with current standards; however, circumstances may arise during installation that could present a risk to you or others.

To prevent this, kindly review the following notes attentively.



Authorized personnel are permitted to intervene.



Consult the user manual.



Refrain from methods that may result in harm to yourself or others.



Ensure that you, your equipment, and the environment are secure during electrical connections.



Given that the products are utilized in flammable and explosive fluids due to their inherent properties, it is essential to avoid any factors that could present a risk of explosion.



Ensure that the product is prepared for use and/or properly maintained.

### • Important

This appliance has been produced in compliance with current standards; however, circumstances may arise during installation that could present a risk to you or others.

### • Warranty

Thank you for selecting a CUBICON® gas meter for your installations.

The manufacturer disclaims responsibility for damages arising from errors or malfunctions resulting from installation, user actions, or external conditions.

This device should be utilized solely for its designated purpose. Any alternative use is deemed inappropriate and consequently hazardous.

All of these are mandatory regulations and directives that must be adhered to for the proper functioning of our devices and are essential conditions of our warranty.

### General observations

Utilize the gas meter solely if it is in perfect working condition. This manual is a crucial component of the product and must be provided to the user. Keep the manual in close proximity to the meter. Ensure that anyone performing the following tasks reviews this manual;

- Operation
- assembly, installation, initiation
- maintenance/troubleshooting

The device is sealed and safeguarded against any interference.

Express permission from the manufacturer is required for the installation of instruments outside the locations permitted by the system requirements, provided that the instrument is applicable.

### • Safety for electrical devices

Risk of electric shock!

Electric shock can pose significant dangers!

Comply with hazardous area and safe area regulations. Adhere to IEC EN 60079 Ex-Proof ATEX, IECEX, and 2014/32/EU requirements.

Electrical installations must be performed by a qualified service engineer in compliance with current national and international standards.

Regularly inspect electrical equipment.

Defective or worn auxiliary equipment must be replaced without delay.

When operating electrical equipment, it is essential to disconnect the devices from the power supply. Ensure that no one can reconnect the device to the power supply during your work.

## Overview

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### Application

ODC series Orifice Plates are flow elements used for flow measurement of single phase aggressive and/ or non-aggressive gases, steam or as engineering units..

### Design

Orifice plate can be installed directly in the chamber. Depending on the process conditions, the plate type can be produced as;

- square-edged concentric
- quarter circle nozzle
- segmental
- conical inlet plate
- double cone

according to the relevant standards;

- ISO 5167:1-2
- ASME MFC-3M
- ISO/ TR 15377:2018 etc..
- EN 10204:3.1B

The plate type is chosen based on the specific process conditions. Orifice plates from a wear-resistant material like stainless steel.

The ODC flowmeter therefore features a minimum length of upstream and downstream pipe, reducing additional uncertainties of the installation to a minimum. It is suitable for process and allocation measurement of gases and liquids including viscous fluids, fluids with suspended solids or fluids with gas entrainment



Single-Phase version available

## Construction

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### Material and Parts

Our standard zinc-plated 4130 carbon steel internals offer **superior corrosion protection and resistance to sulfide or hydrogen** induced cracking, providing reliability and performance over service life. These parts conform to **NACE MR-0175 and ISO 15156-1-3:2020**.

**For extreme corrosive applications, such as wet H<sub>2</sub>S service**, ASTM A 316 L or ASTM A 240 S.S internals are available to protect against general and localized corrosion. CUBICON® has endeavored to ensure that our parts and accessories offering are interchangeable with the current industry standard orifice fitting brand new, marking us own's suitable for re-builds any other.



### Advantages

- low-price design (TCO)
- reasonable especially for large pipe diameters
- easy installation
- on-line process operation or maintenance

### Measuring Uncertainty

- Ranges from  $\leq 0,5\%$  to 1% of the discharge co-efficient **C**, depending on the application.

### Pressure Loss

- The pressure loss depends on the diameter ratio  $\beta$  ( $d/D$ ) and range differential pressure.

### Nominal Diameter ( OUR RANGE )

acc.to ISO 5167 : 1-2

- DN 50 to DN 600 / 2" to 24" - ANSI 900RF  
**if requested other sizes are possible.**



**Meter Run also available.**



## Plates

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### Plate Thickness "E"

- The plate thickness "E" as well as the dimensions of the tag handle depend on the nominal diameters and are based on ASME/API standards.

### Plate Sealing

#### Surface according to EN 1092-1, ISO 7005

- flat (form B1 and B2)
- groove (form D) tongue (form C)
- female (form E)

#### male (form E) according to ASME B16.5

- flat (RF and SF)
- groove (small/large)
- tongue (small/large)
- male/female (small/large)
- RTJ male or female
- or according to other flange standards specified.



Meter-Run has been constructed by CUBICON® for Petro-Bangla and TITAS Co., Bangladesh



Machining

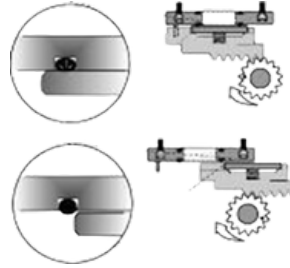
## Sealing & Inspections

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### NBR/ H, NBR, O-Ring Seal

The body and seal bar come standard with all **CUBICON®** Dual-Chamber. In this feature eliminates nuisance gasket. Maintenance and clampingbar screw breakage, while providing superior sealing capability.

The O-rings incorporated are standard shelf sizes and can be supplied in wide variety of compositions.

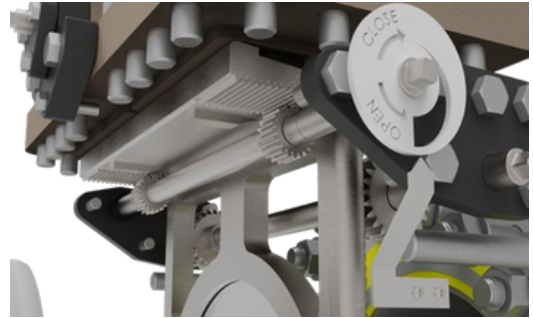


### Seat Valve Seal

The seat valve seal is available for all Dual-Chamber models. Particularly suited to low applications, this unique design enables a smash bubble-tight seal between upper and lower chambers without the for frequent lubrication.

The specially machined seal channel helps prevent O-ring dislocation and O-ring seals incorporated are available in wide variation of composition of material.

Eccentricity of the Orifice Plate carrier fully accessible and adjustable from exterior of the orifice fitting. Temper proof seal is the on request.



### Test Inspection Reports

Acc. to an AGA norm, Inspection Test Report Included with the purchase of **every-fit-things**.

Documents include test following below;

- Orifice Eccentricity
- Tap Connection
- I.D bore through tolerance
- Instrument diameter
- Plate seal test
- Bore inside diameter
- Bore roughness
- Surface roughness
- Overall straightness, flatness and circularity



\*Acc. to AGA and ISO calculation norms.

<b>Design</b>	ASME 16.34 and ASME 16.5 ASTM specifications, AGA3 (API 14.3) and ISO 5167.
<b>Body</b>	ASTM A216 WCB, WCC, LCC ( low temperature )
<b>Internal</b>	AISI 316 L SS, 4130 carbon steel, A351 CF8M SS
<b>Connections</b>	Flange and/or Weld Neck
<b>Size and Class Rate</b>	ANSI class RF/ RTJ 2" trough 12" ANSI150 to 2500 14" trough 16" ANSI150 to 1500 18" trough 30" ANSI150 to 600
<b>Sealing Compounds</b>	Seal bar - HNBR/ O-ring standard, gasket optional Shafts - Teflon packing standard Inner valve - Grease seal standard Orifice Plate - HNBR seal on a 316 SS retainer ring Dual ring - HNBR/ O-ring standard on a 316 SS retainer ring Teflon snap seal two-piece Teflon PTFE
<b>Line Bore ID tolera.</b>	In conformance AGA 3 and ISO 5167
<b>Eccentrically</b>	In conformance AGA 3 and ISO 5167
<b>Tap Connections</b>	Two ½" NPT thrd. Each side as standard
<b>Operating Temp.</b>	-20 .. + 60 oC
<b>Assembling</b>	Horizontal or Vertical
<b>Design Module</b>	CE mark and EC 2014/68/EU for PED

# Materials

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\*The following table shows a selection of typical materials utilized for orifice plates. When selecting the material, special consideration has to be taken for aggressive fluids. Other materials are also available on request.

Material	Description	DIN Material No.	ASTM/ UNS
<b>Plastic/ Polimer</b>	Polyvinylchloride Polyethylene PVDF (GRP 25%) Teflon (GRP 25%)	PVC PE PVDC PTFE	Polyvinylchloride Polyethylene PVDF PTFE
<b>Non-Alloy Steels</b>	S235 JR (St37-2) P 265 GH (HII) --	1.0038 1.0425 --	-- -- A516 Gr. 60
<b>Stainless-Steel</b>	X2CrNiMo 17-12-2 X6CrNiTi 1810 X6CrNiMoTi 17 12 2 X2CrNiMoCu 20-25	1.4404 1.4541 1.4571 1.4539	A240 Gr. 316L A240 Gr. 321 A240 Gr. 316Ti A240 Gr. 904L
<b>Seawater-Resistant Steels</b>	Duplex Superduplex	1.4462 1.4501	S 31803 S 32760
<b>Heat - Resistant S.S</b>	X10 CrAl 7 X15CrNiSi 20-12	1.4713 1.4828	Sicromal 8 S 30900
<b>High Corrosion Resistant Alloys</b>	Hastelloy B2 Hastelloy C276 Titan Monel 400 Alloy 625	2.4617 2.4819 3.7035 2.4360 2.4856	N10665 N 10276 R50250/ R 50400 N 04400 N 06625

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