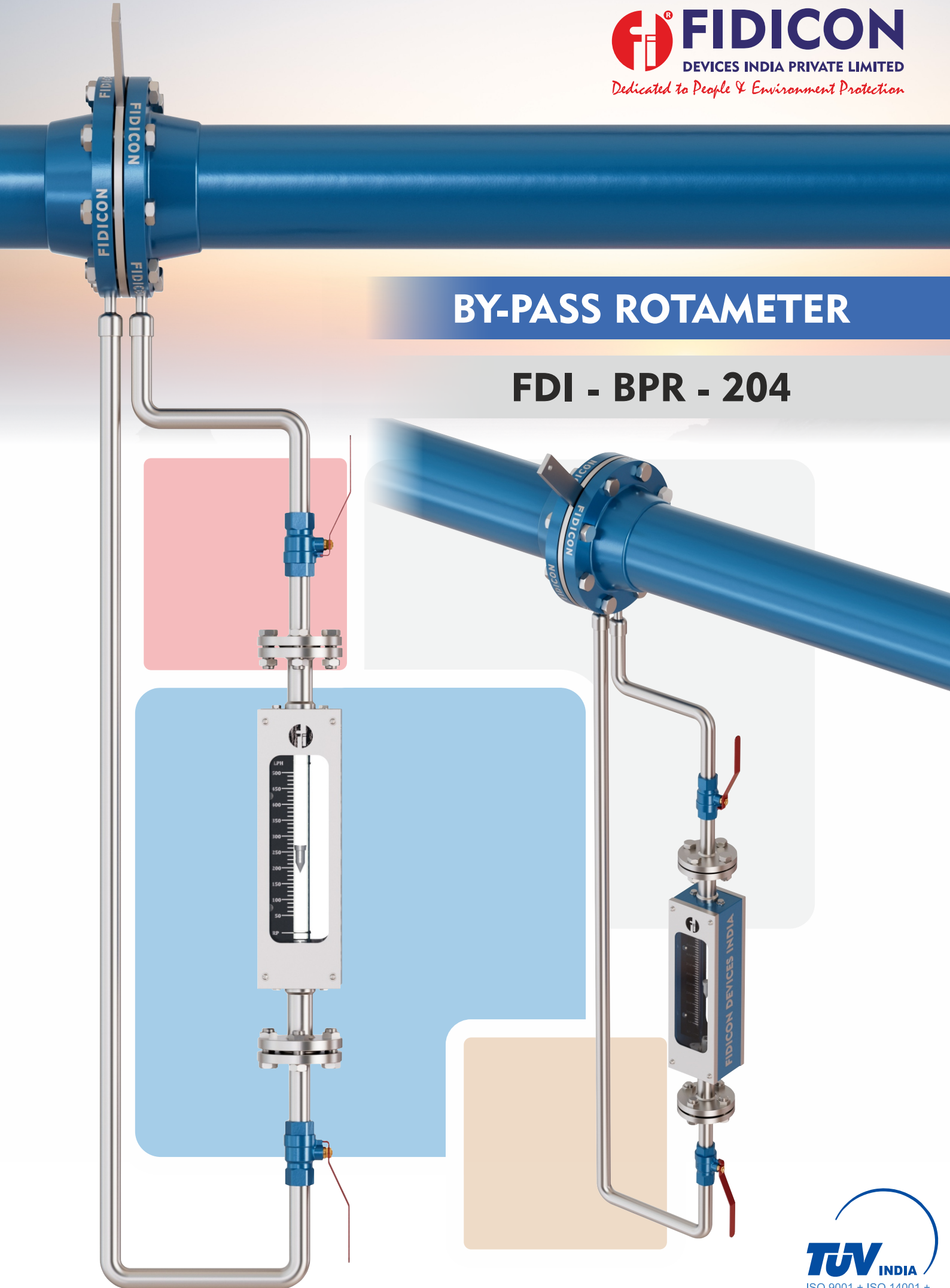


# BY-PASS ROTAMETER

## FDI - BPR - 204



# INTRODUCTION

By-pass rotameters are used for measurement of higher flow rates where using inline flow-meter is not commercially or functionally not possible. It works on the principle of measuring differential pressure created across restriction. The manufacture includes an orifice plate installed between either carrier ring or orifice flanges. The Hi/Low pressure taps of carrier ring/orifice flange are connected to indicating Rotameter with a help of impulse tube arrangement. The Indicating Rotameter can be of Glass or Metal tube Type. FIDICON make By-pass Rotameters can be used for liquids or Gases and is available from ½" to 6" sizes and other as per request.

FIDICON is a pioneer in the field of manufacturing Rotameter in India since 2002 years of designing, manufacturing, installation and service of the same. Bypass Rotameter manufactured by FIDICON are user friendly and easy to install. It comes in many ranges and can be tailor made as per the requirements of customers.

## BY-PASS METERING COMPONENTS

### ■ MAIN LINE ORIFICE PLATE

An Orifice Plate is installed in the main pipe line whose flow rate is to be measured. The Plate can either be installed in between the flanges or a carrier ring assembly. This orifice plate creates a pressure differential due the restriction created to the main line flow. The pressure differential varies with the fluid flow in the main line. Based on the pressure differential, the flow through a pipe can be established using a mathematical equation.

### ■ ORIFICE FLANGES / CARRIER RING

Orifice flanges / carrier rings serve two functions. Like, they hold the mainline orifice plate in the proper position within the pipeline and they channel a portion of the flow out of the high-pressure side of the orifice and return it again to the low-pressure side. This function may be accomplished with other than flange taps. The Bypass piping may be connected directly to the pipeline in the form of pipe taps, radius taps OR vena contract taps.

### ■ INDICATING ROTAMETER

This is a Glass/Metal Tube inline rotameter which is installed in a bypass arrangement. A small range orifice is fixed at the inlet of this rotameter. The range orifice is designed to create the same differential pressure which is created by a main line orifice plate. With this arrangement the rotameter works as a manometer or a differential measuring device.

### ■ BY-PASS PIPING

By pass arrangement is used to divert a small portion flow from the main line through an indicating rotameter. The flow at the upstream side of a main line orifice plate is connected at the inlet of the rotameter & outlet of the rotameter is connected to a downstream side of an orifice plate. The isolation valves are also provided in the bypass piping system for easy maintenance.

# INTRODUCTION

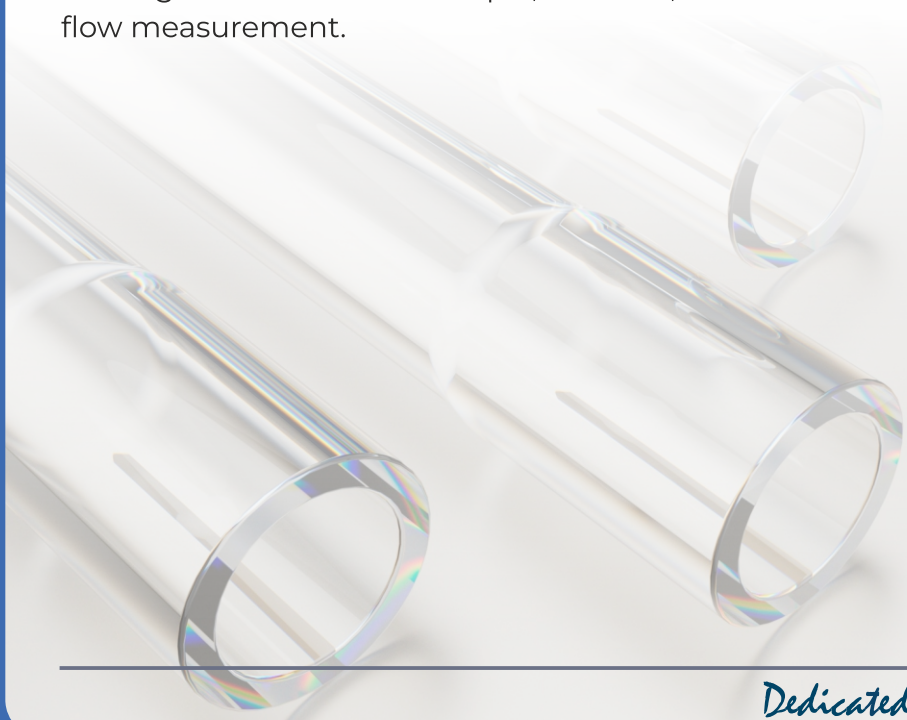
By-Pass Rotameter is an inference type Rotameter & fixed Orifice in a pipeline. Differential pressure is created in the main pipe line by providing an Orifice Plate in the main Pipe line. Because of this differential pressure a branch of flow moves through by- pass line provided across the orifice plate from upstream side to down -stream side of Orifice Plate.

An additional range orifice plate is provided in the by-pass line which is designed such that flow through range orifice plate flows in proportion with the flow through main pipe line (Main Orifice Plate). Hence by measuring the flow from By-pass Line we can estimate the flow through Main pipe Line.

Glass Tube Rota-meter is a Variable Area Flow Meter. A Rota-meter consists of a tapered tube, typically made of glass, with a 'float' made of SS or PTFE. The differential pressure across the annulus area is constant. The float moves through the tapered tube up and down with respect to fluid flow. The vertical position of the float as indicated by scale is the measure of the instantaneous flow rate.

A glass tube rotameter is a type of flow meter used to measure the flow rate of liquids or gases in a pipeline. It consists of a glass tube with a float inside that is free to move up and down with the flow. The float is typically shaped like a cylinder or a ball, and is designed to have a higher density than the fluid being measured.

The flow rate can be determined by observing the position of the float inside the tube and referring to a calibration chart. The glass tube allows the operator to visually observe the float and the flow, making the Rotameter a simple, low-cost, and reliable method of flow measurement.



# PRINCIPLE OF GLASS TUBE ROTAMETER

The principle of operation of a glass tube rotameter is based on the relationship between the flow rate and the pressure drop across an orifice. The float inside the glass tube is positioned in such a way that it creates an obstruction, or orifice, in the flow stream. As the flow rate increases, the pressure drop across the orifice increases, causing the float to rise. Conversely, as the flow rate decreases, the pressure drop decreases, causing the float to fall.

The position of the float is proportional to the flow rate, and this relationship is calibrated on a chart. The chart is usually marked on the outside of the glass tube and displays the corresponding flow rate for a given float position. The rotameter is designed so that the pressure drop across the orifice and the consequent rise or fall of the float are proportional to the square root of the flow rate.

In summary, the glass tube rotameter works by measuring the pressure drop across an orifice created by the float and using this pressure drop to determine the flow rate. The position of the float inside the glass tube indicates the flow rate, and the operator can read this flow rate from the calibrated chart.



## OPERATING PRINCIPLE & STANDARD FEATURES

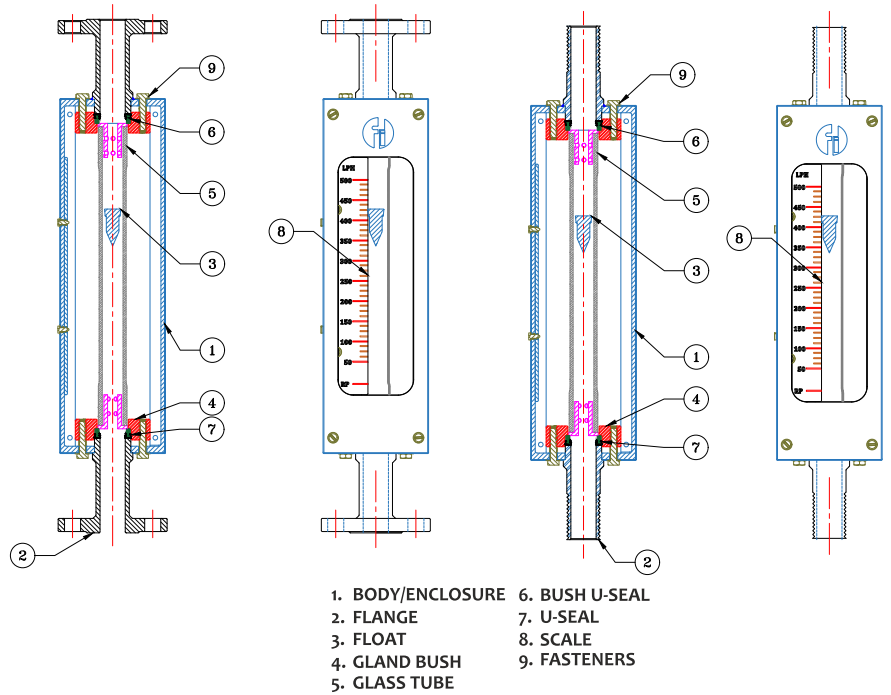
The flow rate is measured as a function of the annulus area, and the differential pressure across the annulus region is constant. this location is shown as being in the position of a "Float."

Glass Tube Rotameter Designed on variable area basis using tapered borosilicate glass tube pressure rating at 10kg/cm<sup>2</sup> temp at 150°C. We are leading manufacturer & supplier of Glass Tube Rotameter in Gujarat, India.

Material of wetted part: CS/SS 304/ SS316/PP/PVC/Teflon  
Line Size: 15NB to 100NB  
Flow range: 10 to 20,000 LPH of water  
Accuracy: ±1.5 % full scale reading  
Glass Tube Rotameter Accessories: Screwed /Flanged  
House -connection

# KEY APPLICATION

- Oil and gas pumping and refining processes
- Fuel cell research
- Chemical manufacturing
- Analytical instrumentation
- Water treatment and distribution systems
- Industrial processes
- Pharmaceutical production



Sr.	Part Name	Option
A	Body / Enclosure	MS-Powder Coated, SS-Powder Coated, SS-Buffed
B	Flanged(NB)	15, 20, 40, 50, 80
C	Flange Specifications	ASA-150, BS10-T-E, BS10 T-F, DIN-10
D	MOC Wetted	CS, SS 304, SS 316, CS-PTFE, CS-PP
E	Float - MOC	SS 316, PTFE, PVC, Aluminium
F	Glass Tube	Borosilicate
G	Flange - MOC	CS, SS 304, SS 316
H	PTFE Enve. Gland Packing	Nitrite, Silicon, Viton
I	Measuring Range in LPH of H2O @ T :- Ambt / Pr:-ATM	

◆ Materials are customized as per customer's specifications.

Glass Size	With PTFE Float LPH	With SS 316 Float LPH	Max. Pressure Drop in MMWC	Test Pressure
PN 1	2-20	3-30	140	15
PN 2	3-30	6-60		
PN 3	4-40	10-100		
PN 4	6-60	20-200	350	15
PN 5	8-80	30-300		
PN 6	12-120	40-400		
PN 7	18-180	60-600		
PN 8	20-200	80-800	600	12
PN 9	40-400	100-1000		
PN 10	50-500	150-1500		
PN 11	80-800	250-2500		
PN 12	90-900	300-3500	900	9
PN 13	100-1000	350-3500		
PN 14	150-1500	400-4000		
PN 15	200-2000	600-6000	900	7
PN 16	250-2500	700-7000		
PN 17	400-4000	1000-10000		
PN 18	500-5000	1500-15000	900	5
PN 19	600-6000	2000-20000		
PN 20	800-8000	2500-25000		

# RECOMMENDED DISPOSAL

- Give it back to us & we will take care of recycling & possible disposal.
- User can dis-assemble the product in multiple stage
- The above may be handed over (state pollution board), authorized re-cycler item-wise.



## ENQUIRY SPECIFICATIONS:

- [1] Service Media Details.
- [2] Size/Connection
- [3] System Operating and Design Pressure.
- [4] System Operating and Design Temperature.
- [5] Material Specifications ( Body, Internal )

## RECOMMENDED SPARES

- [1] Glass Tube
- [2] Float
- [3] Bush U-Seal
- [4] Orifice Flange assembly

## OTHER RANGE OF PRODUCTS

- [1] Flame Arrester
- [2] Breather Valve
- [3] Level Indicators
- [4] Rotameters
- [5] Emergency Relief Valve
- [6] Gauge Hatch
- [7] Strainers
- [8] Pressure Reducing Valve
- [9] Safety Relief Valve
- [10] Flowmeters
- [11] Level Switches
- [12] Pressure Reducing Station
- [13] Level Gauge, etc.



### Any Query?

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