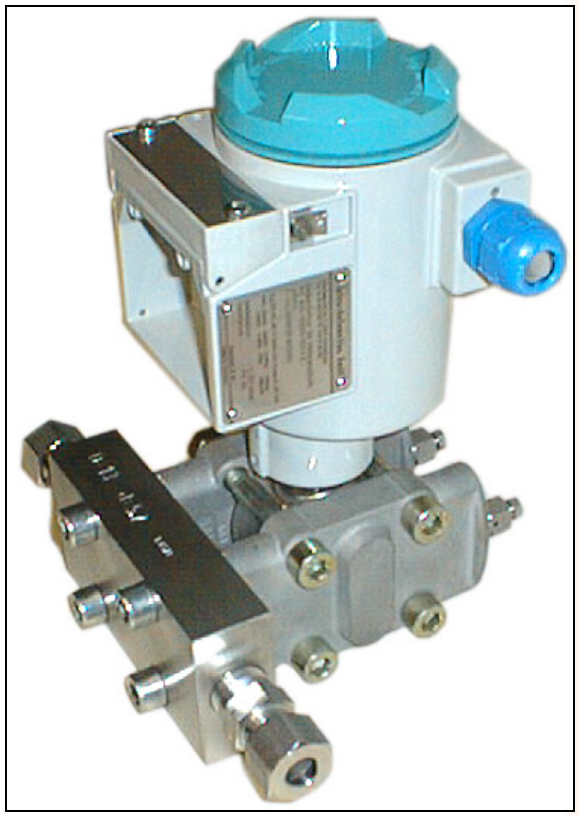
INTRA-AUTOMATION GmbH

Instrumentation and control technology

Electronic measurement and control devices

Integral Orifice Assembly

Measuring Section for Small Flow Measurement



Technical Information

11/2016

FLOW

THE EXPERT IN LEVEL AND FLOW

Intra-Automation
Technical Information
11/2016

Technical data subject to be changed.

For Comments regardingKommentare oder Anregungen bezüglich dieser Broschüre wenden Sie sich bitte an::
info@intra-automation.de

Intregral Orifice Assembly

Measuring Section for Small Flow Measurement

List of Contents:

1. Features

The integral orifice assembly is designed to be mounted to the differential pressure transmitter directly (see fig. 1).

The integral orifice assembly is a pipe segment for measurement of small flows. It is suitable for liquids and gases.

The integral orifice is the differential pressure sensor and is mounted inside the assembly. While the medium to be measured passes through the orifice, a pressure drop occurs. This value is proportional to the flow. A differential pressure transmitter transforms the pressure loss into a standardized signal, like a current output (4…20 mA).

The equation for the volume flow q_v is as follows:

$$q_v = c * \sqrt{\Delta p}$$

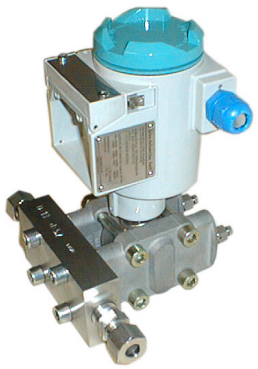


fig. 1: integral orifice assembly with transmitter

2. Description of Orifice Calculation

The integral orifice assembly is available with 6 different orifice sizes (size 1 to 6). To determine the differential pressure and the size of the orifice the mass flow under operation has to be converted to the equivalent volume flow of water or air. Using the Nomograms, it is possible to chose the size of orifice and to find a first approach of the span of the differential pressure.
The exact value of the differential pressure has to be calculated by using the equations of the calculation sheet (see following pages).
Once have changed to a different orifice size the calculation has to be redone.

3. Technical Data

Media : Liquids, Gases

Measuring ranges:

- Liquids : 0.396 to 1109.52 GPH
  : 1,50 to 4200 l/h
- Gases 1.766 to 4238 ft³/h
  0,05 to 120 m³/h

Inside diameter of the integrated orifice :

Size	d_i [inch]	d_i [mm]
1	0,197	0,500
2	0,394	1,000
3	0,591	1,500
4	0,787	2,000
5	0,984	2,500
6	1,181	3,000
7	1,378	3,500
8	1,575	4,000
9	1,772	4,500
10	1,969	5,000
11	2,165	5,500
12	2,362	6,000
13	2,559	6,500
14	2,756	7,000
15	2,953	7,500
16	3,150	8,000
17	3,346	8,500
18	3,543	9,000
19	3,740	9,500

Nominal pressure (max.) : ANSI 2500 # (PN 420)
Medium temperature : -40…+248°F
-40…+120°C
Process connection : ½“ NPT-F
Material, wetted parts : 316Ti (1.4571) (other material on request)
Weight : approx. 4.41 lbs (2 kg)

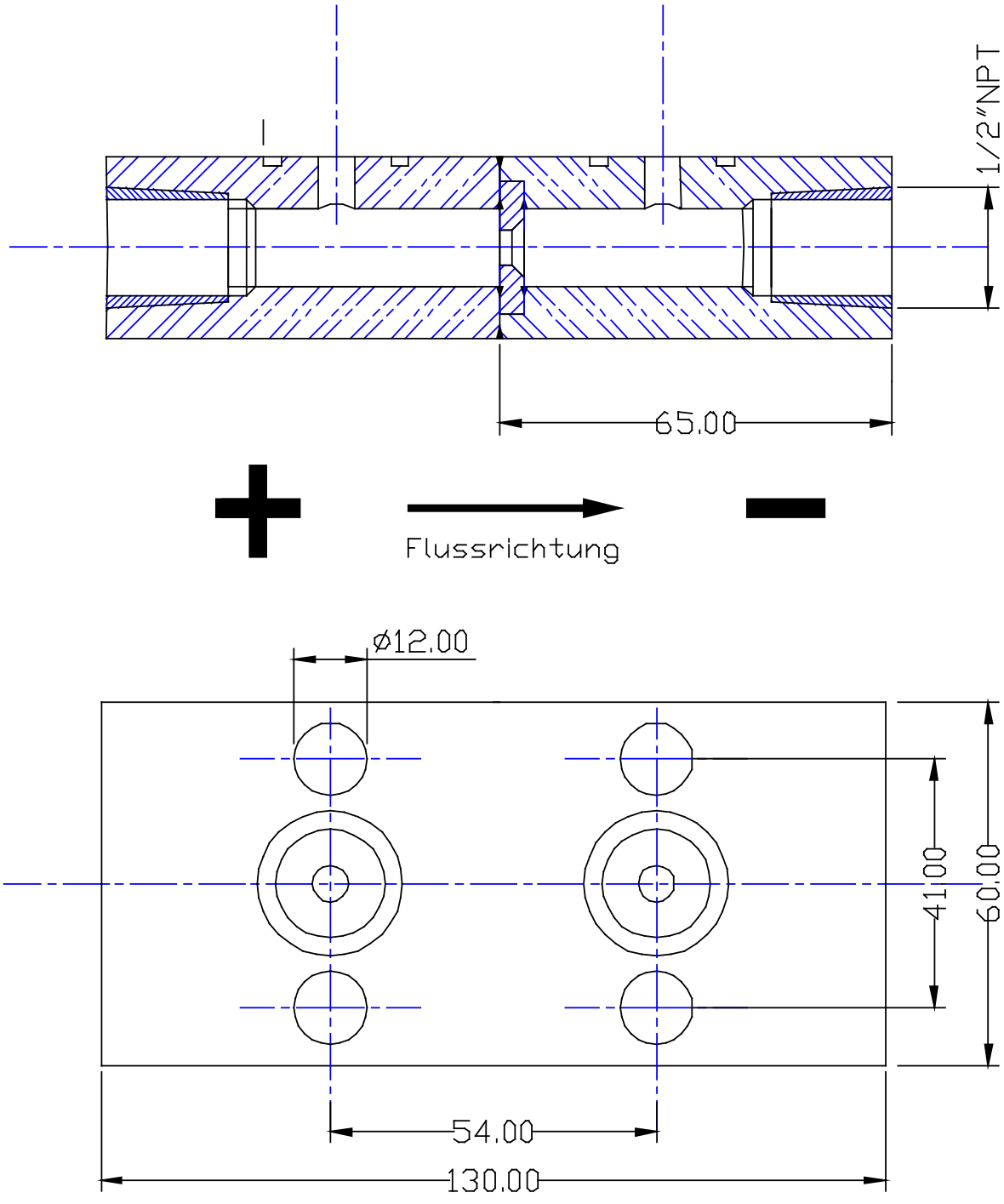
4. Flow Calculation

Flow Calculation with Conval®-Software and subsequent water calibration.

5. Order Code

Code	Description						
BB-102	Integral Orifice Plate ½" NPT-F						
	Material Orifice Plate						
	1	316Ti					
	2	1.4539					
	3	Hastelloy C4					
	4	Monel					
	Y1	other					
		Material Body					
		6	316Ti				
		7	1.4539				
		8	Hastelloy C4				
		9	Monel				
		Y2	other				
			Screw-joint connection for Ø12 mm tube				
				Connection	**Material**		
			A	without	-		
			B	½" NPT	carbon steel		
			C	½" NPT	316Ti		
			Y3	other	other		
				TAG plate (SS) with marking			
				0	without		
				40	TAG plate with marking		
					Documentation		
					Z	Drawing	
					D	Pressure test	
					B	EN 10204-31 material certificate	
						Certificate	
						C	Free of oil & grease
						D	Water calibration
						Y4	other
BB-102							

6. Dimensions



All dimensions in mm.

Besides the products covered by this brochure, Intra-Automation GmbH also manufactures other high-quality and high precision instruments for industrial measurement tasks. For more information, please contact us (contact details on the backside of this brochure).

Flow measurement

Itabar®-Flow Sensor

IntraSonic IS210 Ultrasonic Flow Meter

Level measurement

ITA-mag. Level Gauge

MAGLINK Level Indicator

Other Measurement Tasks:

DigiFlow Flow and Level Computers

IntraCon Digital Controllers

IntraDigit Digital Indicators / Meters

INTRA-AUTOMATION

MESS- UND REGELINSTRUMENTE / MEASUREMENT AND CONTROL

International Headquarters:
Intra-Automation GmbH
Otto-Hahn-Str. 20
41515 Grevenbroich
GERMANY

☎ +49 – (0) 21 81 / 7 56 65-0
🖷 +49 – (0) 21 81 / 6 44 92

🖱 info@intra-automation.de

Sales Office for the BENELUX:
B.V. Intra-Automation HTP
PO Box 10
4730 AA Oudenbosch
THE NETHERLANDS

☎ +31 – (0)165 – 32 22 01
🖷 +31 – (0)165 – 32 29 70

🖱 info@intra-automation.nl

💻 www.intra-automation.com