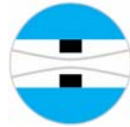


**Installation and Operating Instructions**  
**Differential-Pressure Flow Meter**  
**DDM**



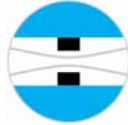
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**Table of Contents**

1. Foreword.....	3
2. Safety.....	3
2.1. Symbol and meaning.....	3
2.2. General safety directions and exemption from liability.....	3
2.3. Intended use .....	3
2.4. Operator and operating personnel .....	3
2.5. Regulations and guidelines .....	4
2.6. Notice as required by the hazardous materials directive .....	4
3. Transport and storage.....	4
4. Installation .....	5
4.1. DDM with screw connections .....	5
4.2. DDM mounted between flanges.....	6
4.3. DDM with internal thread.....	7
5. Start-up.....	8
6. Service .....	8
7. Disposal.....	8
8. Technical data .....	9
8.1. Connection.....	9
8.2. Materials .....	9
8.2.1. DDM-DN .....	9
8.2.2. DDM-Rp, Gi, Ga.....	9
8.3. Differential pressure and pressure resistance DDM .....	9
8.4. Dimensions for DDM with screw connections (Rp).....	10
8.5. Dimensions for DDM with screw connections (Gi).....	10
8.6. Dimensions for DDM with screw connections (Ga).....	11
8.7. Dimensions for DDM mounted between flanges .....	11
8.8. Flow rates for water.....	12
8.8.1. Connection with screw connections (DDM-Rp/-Gi/-Ga).....	12
8.8.2. Connection for mounting between flanges (DDM-DN).....	12
8.9. Flow rates for air .....	13
8.9.1. Connection with screw connections (DDM-Rp/-Gi/-Ga).....	13
8.9.2. Connection for mounting between flanges (DDM-DN).....	13





## 1. Foreword

These Installation and Operating Instructions are applicable to Series DDM devices. Please follow all instructions and information given for installation, operation, inspection and maintenance. The Instructions form a component part of the device, and should be kept in an appropriate place accessible to personnel in the vicinity of the location. Where various plant components are operated together, the operating instructions pertaining to the other devices should also be observed.

## 2. Safety

### 2.1. Symbol and meaning



Safety notice

This symbol is placed against all directions/information relating to occupational health and safety in these Installation and Operating Instructions, and draws attention to danger to life and limb. Such notices should be strictly observed.

### 2.2. General safety directions and exemption from liability

This document contains basic instructions for the installation, operation, inspection and maintenance of the differential-pressure flow meter. Failure to comply with these instructions can lead to hazardous situations for Man and Beast and also to damage to property, for which Kirchner und Tochter disclaims all liability.

The Operator is required to rule out potentially hazardous situations through voltage and released media energy.

### 2.3. Intended use

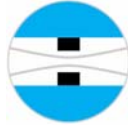
The DDM differential-pressure flow meters are designed for measuring and monitoring the flow of liquids and gases with an appropriate indicator. They may be installed in the pipeline only between flanges or using threaded pipe connections. Straight, unimpeded lengths of pipe runs must be a minimum of 6 times the nominal diameter upstream of the location and a minimum of 4 times the nominal diameter downstream of the location. The required version of the DDM device should be selected on the basis of the nominal diameter and nominal pressure at the location as well as the type of medium.

### 2.4. Operator and operating personnel

Authorized installation, operating, inspection and maintenance personnel should be suitably qualified for the jobs assigned to them, and should receive appropriate training and instruction.



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## 2.5. Regulations and guidelines

In addition to the directions given in these Installation and Operating Instructions, observe the regulations, guidelines and standards, such as DIN EN, and, for specific applications, the codes of practice issued by DVGW (gas and water) and VdS (underwriters), or the equivalent national codes, and applicable national accident prevention regulations.

## 2.6. Notice as required by the hazardous materials directive

In accordance with the law concerning handling of waste (critical waste) and the hazardous materials directive (general duty to protect), we would point out that all flow meters returned to Kirchner und Tochter for repair are required to be free from any and all hazardous substances (alkaline solutions, acids, solvents, etc.).



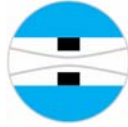
Make sure that devices are thoroughly rinsed out to neutralize hazardous substances.

## 3. Transport and storage

Always use the original packing for transport, handling and storage. Protect the device against rough handling, impact, jolts, etc.



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## 4. Installation

### 4.1. DDM with screw connections

The measuring device is screwed into the pipeline between two inserts that are supplied with the device. The straight, unimpeded inlet and outlet runs should be a minimum of 6 x DN upstream and a minimum of 4 x DN downstream of the location. Between the inserts, leave a gap of  $L1 + 4\text{mm}$  for the gaskets. The dimensions for L1 are given on page 10.

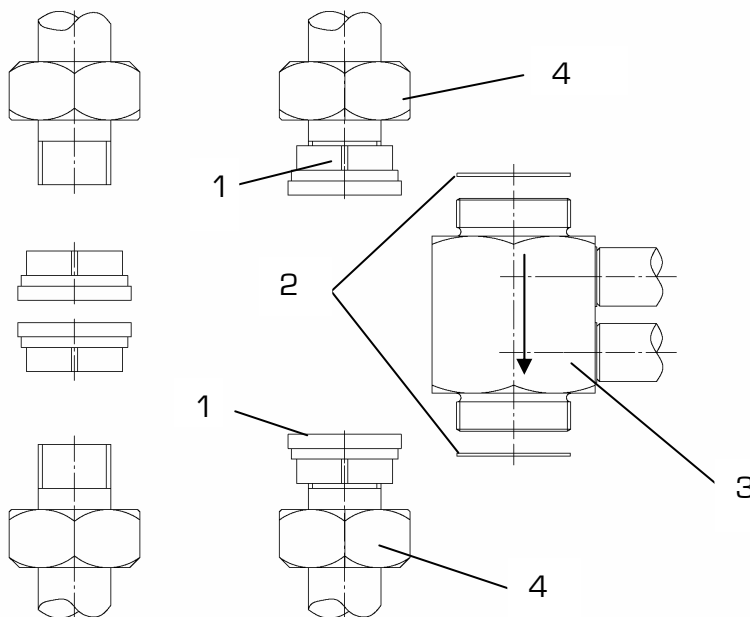
Cut appropriate threads on the pipe ends (in accordance with the order). Make sure that the ends of the pipe are in alignment.

Unscrew the union nuts from the DDM-DS11 and slide these on to the pipe ends, with the thread facing towards the device.

Screw the insert to the pipe ends using suitable packing material.

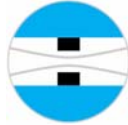
**Incorrect measurements are possible when device is installed in incorrect mounting position. When installing, be aware of the flow direction (see arrow on device (3)).**

Slide the DDM together with the two gaskets (2) between the pipe ends and tighten down the union nuts.



1. Insert
2. Gaskets
3. DDM
4. Union nut





## 4.2. DDM mounted between flanges

The flow meter is mounted between flanges to DIN EN 1092-1 (Type 11 or Type 13). The straight, unimpeded pipe run should be a minimum of 6 x DN upstream and a minimum of 4 x DN downstream of the location. The distance between the flanges should be 55 mm for the ring plus twice the thickness of the gaskets to be used. Make sure that the flanges are in alignment and the sealing faces are parallel to each other. Check that the flanges at the location agree with the details given in the order (standard and pressure rating).

The distance between the flanges should be 55mm + 2 x t (thickness of gaskets used).

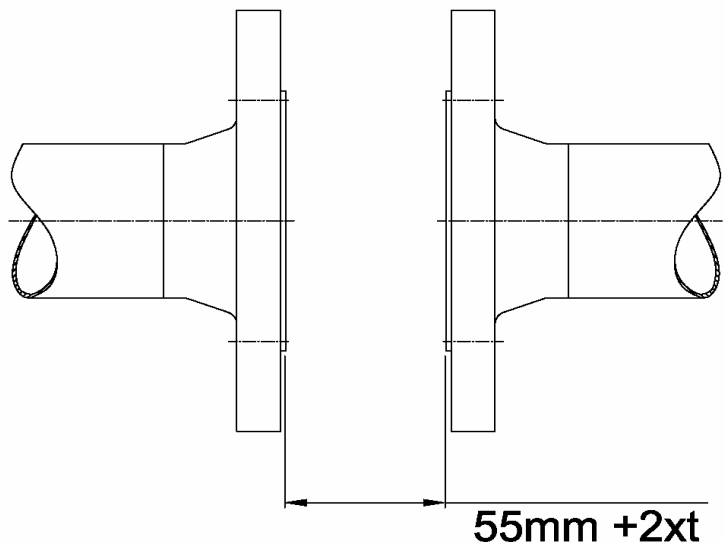
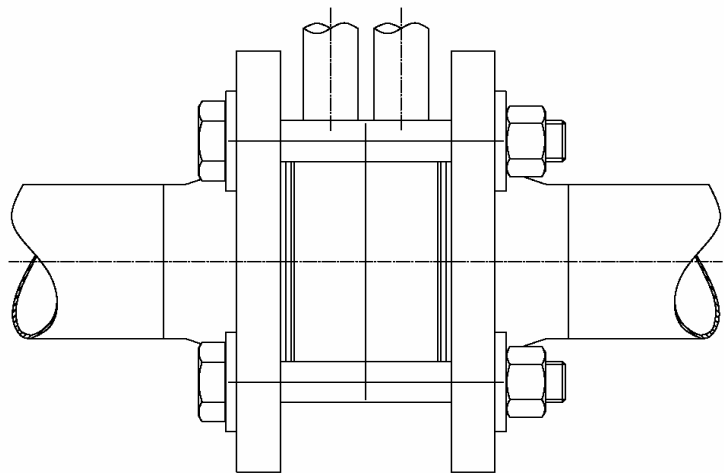
Fit half of the screw connections to the interflange connection,

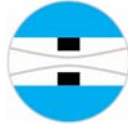
Mount the orifice, together with the gaskets fitted on both sides, between the two prepared flanges.

Assemble the remaining screw connections.

When tightening the screws, make sure that orifice and gaskets are concentric and in alignment with the pipeline.

Fasten all screw connections uniformly in diagonally opposed sequence.





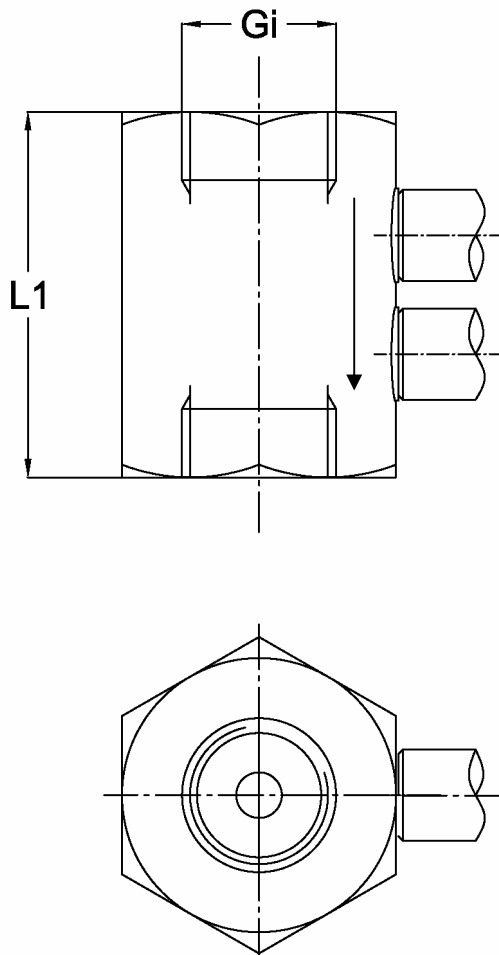
### 4.3. DDM with internal thread

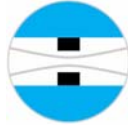
As a screw-in pipe fitting, the device is screwed into the pipeline. The straight, unimpeded length of pipe run needs to be a minimum of  $6 \times DN$  (= nominal diameter) upstream of the installation location and a minimum of  $4 \times DN$  downstream of the location. Provide a gap of  $L1$  between the pipe ends. The dimension for  $L1$  is given on page 3.

Provide the pipe ends with suitable threads (in accordance with the order).  
Make sure that the pipe ends are in alignment.

Screw the flow indicator to the pipe ends using suitable packing material.

Be aware of the flow direction (see arrow on device).





## 5. Start-up

The flow meter must have been properly installed before it is started up.

An electrical or mechanical differential-pressure meter/monitor or a transmitter must be connected to the measuring lines before start-up.

If no measuring devices are to be connected up, fit blanking plugs to the measuring connections.

After start-up, check the leak-tightness of the orifice.

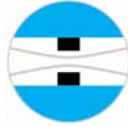
## 6. Service

All devices with defects or deficiencies should be sent direct to our repair department. To enable our customer service facility to deal with complaints and repairs as quickly as possible, you are kindly requested to coordinate the return of devices with our sales department, Tel. +49 2065-96090.

## 7. Disposal

Please help to protect our environment, and dispose of workpieces in conformity with current regulations or use them for some other purpose.





## 8. Technical data

### 8.1. Connection

DDM-DN	between flanges PN10 or between flanges PN16 to DIN EN 1092-1
DDM-Rp	for screw connection consisting of nut and insert to EN 10226-1 (ISO 7-1)
DDM-Ga	Cylindrical external fastening thread to DIN ISO 228 T1
DDM-Gi	Cylindrical internal fastening thread to DIN ISO 228.

### 8.2. Materials

#### 8.2.1. DDM-DN

Ring	S355J2G3, optionally 1.4301
Orifice plate	1.4571

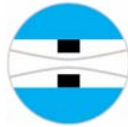
#### 8.2.2. DDM-Rp, Gi, Ga

Screw connection	malleable cast iron, galvanized (Rp only)
Orifice plate	brass, optionally aluminium, hard-coated

### 8.3. Differential pressure and pressure resistance DDM

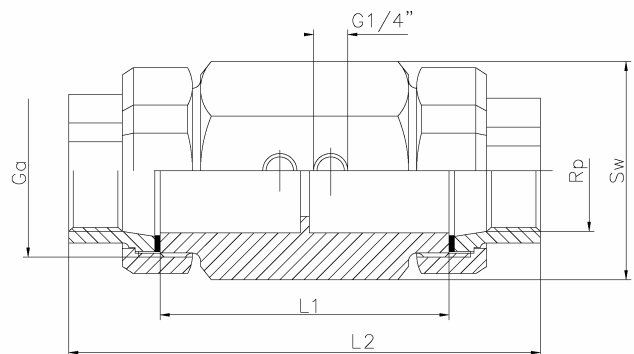
Differential pressure for liquids	100 - 1000 mbar for H <sub>2</sub> O
Differential pressure for gases	10 - 100 mbar for air
Pressure loss for liquids	approx. 40% of the differential pressure
Pressure loss for gases	approx. 40% of the differential pressure
Pressure resistance	PN16 (but max. pressure resistance of the indicator)





**8.4. Dimensions for DDM with screw connections (Rp)**

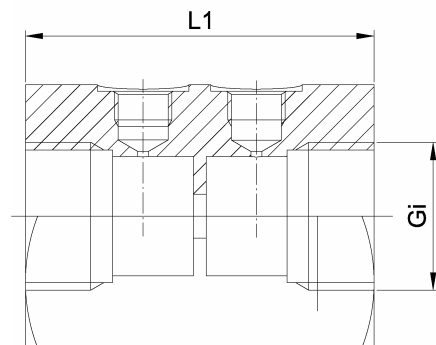
Rp *)	L1	L2	SW
1/4	80	124	41
3/8	80	128	46
1/2	80	128	46
3/4	80	128	50
1	80	136	60
1 1/4	80	146	70
1 1/2	80	149	70
2	90	164	85



\*) Inside diameter made after details provided of pipe inside diameter.

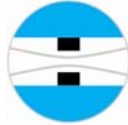
**8.5. Dimensions for DDM with screw connections (Gi)**

Gi*)	L1	SW
1/4	80	41
3/8	80	46
1/2	80	46
3/4	80	50
1	80	60
1 1/4	80	70
1 1/2	80	70
2	90	85



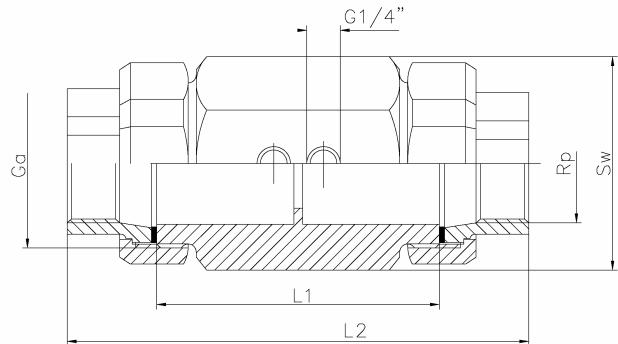
\*) Inside diameter made after details provided of pipe inside diameter.





8.6. Dimensions for DDM with screw connections (Ga)

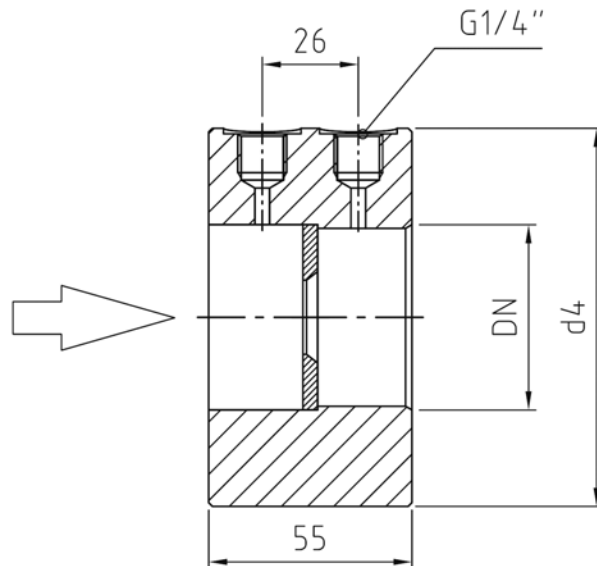
Ga <sup>*)</sup>	L1	SW
3/4	80	41
3/4	80	46
1 1/8	80	46
1 1/4	80	50
1 1/2	80	60
2	80	70
2 1/4	80	70
2 3/4	90	85



\*) Inside diameter made after details provided of pipe inside diameter.

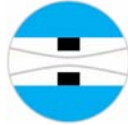
8.7. Dimensions for DDM mounted between flanges

DN <sup>*)</sup>	d4
50	102
65	122
80	138
100	158
125	188
150	212
200	268



\*) Inside diameter made after details provided of pipe inside diameter.





## 8.8. Flow rates for water

### 8.8.1. Connection with screw connections (DDM-Rp/-Gi/-Ga)

Rp	Min. measuring range [m <sup>3</sup> /h] H <sub>2</sub> O			Max. measuring range [m <sup>3</sup> /h] H <sub>2</sub> O		
1/4"	0,05	-	0,3	0,2	-	1,2
3/8"	0,05	-	0,4	0,4	-	2,3
1/2"	0,1	-	0,7	0,75	-	4,5
3/4"	0,2	-	1,3	1,4	-	8,5
1"	0,35	-	2	2,25	-	13,5
1 1/4"	0,6	-	3,5	4	-	24
1 1/2"	0,85	-	5	5,35	-	32
2"	1,25	-	7,5	8,65	-	52

Other measuring ranges on request

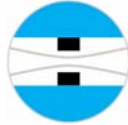
### 8.8.2. Connection for mounting between flanges (DDM-DN)

DN	Min. measuring range [m <sup>3</sup> /h] H <sub>2</sub> O			Max. measuring range [m <sup>3</sup> /h] H <sub>2</sub> O		
50	1,2	-	7	8,7	-	52
65	2	-	12	13	-	78
80	3	-	18	19,7	-	118
100	4,7	-	28	30,7	-	184
125	7,3	-	44	48	-	288
150	10,7	-	64	68,8	-	413
200	18,8	-	113	122,5	-	735

Other measuring ranges on request.



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## 8.9. Flow rates for air

### 8.9.1. Connection with screw connections (DDM-Rp/-Gi/-Ga)

Rp	Min. measuring range [m <sup>3</sup> /h] air <sup>1)</sup>	Max. measuring range [m <sup>3</sup> /h] air <sup>1)</sup>
1/4	0,5 - 3	1,3 - 8
3/8	0,8 - 5	2,3 - 14
1/2	1,0 - 6	3,5 - 21
3/4	1,3 - 8	7,5 - 45
1	2,0 - 12	9,0 - 54
1 1/4	4,0 - 24	18,0 - 108
1 1/2	5,8 - 35	25,0 - 150
2	8,3 - 50	45,0 - 270

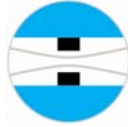
<sup>1)</sup> at STP (0°C and 1013 mbar)  
In-between ranges possible

### 8.9.2. Connection for mounting between flanges (DDM-DN)

DN	Min. measuring range [m <sup>3</sup> /h] air <sup>1)</sup>	Max. measuring range [m <sup>3</sup> /h] air <sup>1)</sup>
50	9 - 54	45 - 270
65	13,5 - 81	83 - 500
80	20 - 120	125 - 750
100	35 - 210	142 - 850
125	60 - 360	292 - 1750
150	75 - 450	433 - 2600
200	125 - 750	667 - 4000

<sup>1)</sup> at STP (0°C and 1013 mbar)  
In-between ranges possible





The equipment from Kirchner und Tochter GmbH has been tested in compliance with the applicable CE-regulations of the European Community. The respective declaration of conformity is available on request.

The Kirchner und Tochter GmbH QM-System will be certified in accordance with DIN-EN-ISO 9001:2000. The quality is systematically adapted to the increasing demands.



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