meister®

MASTERPIECES
MADE IN GERMANY

Flowmeter

2100, 2150, 2300, 2340

OVERVIEW

Operation

– Float measuring principle

Application

– Control panels
– Pilot plants
– Water treatment
– Pharmaceutical industry
– Chemical processes
– Heat treatment

Features

– Easy installation
– Small size
– No damping zone necessary
– Horizontal inlet and outlet
– Low pressure drop

Options:

– Adjustable limit switches
– Controller RCA and RCD (constant flow regulation with differential pressure)

Installation information

– The operating instructions for flowmeter series 2100, 2150, 2300 and 2340 must be observed!
– **Download: www.meister-flow.com**

2100, 2150, 2300, 2340 1 0007 12-15 E M

OPERATING DATA

Operating pressure, max.	15 bar
Pressure drop	refer to tables on pages 6 and 7
Media temperature	-20 °C - 80 °C
Ambient temperature	-20 °C - 80 °C
Measuring accuracy [1]	
2100	3,5 % (q_G = 50 %)
2150	3,0 % (q_G = 50 %)
2300	1,6 % (q_G = 50 %)
2340	1,6 % (q_G = 50 %)

[1] In accordance with VDI / VDE 3513

Changed operating data apply to the devices in explosion-proof design according to ATEX directive!

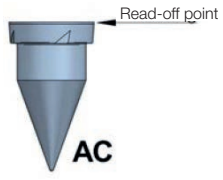
The operating instructions for flowmeter series 2100, 2150, 2300 and 2340 and the associated Declarations of Conformity must be strictly observed!

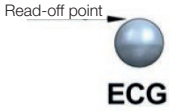
Download: www.meister-flow.com

MATERIALS

Refer to table on page 3

FLOAT TYPES





MEASURING RANGES

Water	0,05 l/h - 1000 l/h
	refer to tables on pages 6 and 7

The specified measuring / switching ranges are valid for water having a density of 1.00 kg/dm³, vertical installation of the device and flow direction from bottom to top.
Other installation positions or deviation from the operating densities, will increase the measurement error specified in the data sheet.
Operating density for water at 20 °C and 1.013 bar abs: 1.00 kg/dm³.

Air	1 Nl/h - 30000 Nl/h
	refer to tables on pages 5 and 6

The specified measuring / switching ranges are valid for air having a density of 1.205 kg/m³, vertical installation of the device and flow direction from bottom to top.
Other installation positions or deviation from the operating densities, will increase the measurement error specified in the data sheet.
Operating density for air at 20 °C and 1.013 bar abs: 1.205 kg/m³
Standard density for air (at 0 °C and 1.013 bar abs): 1.293 kg/m³

Upon request, special scales for deviating media and different operating conditions, are available.

Units:	l/h, l/min, % and others
Scale range:	10 : 1
Measuring tube length:	
2100	100 mm
2150	150 mm
2300	300 mm
2340	300 mm

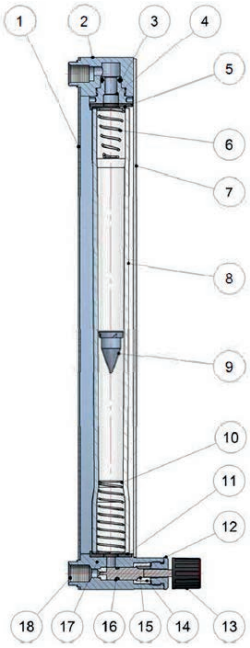
OPTIONS

See pages 8 to 12

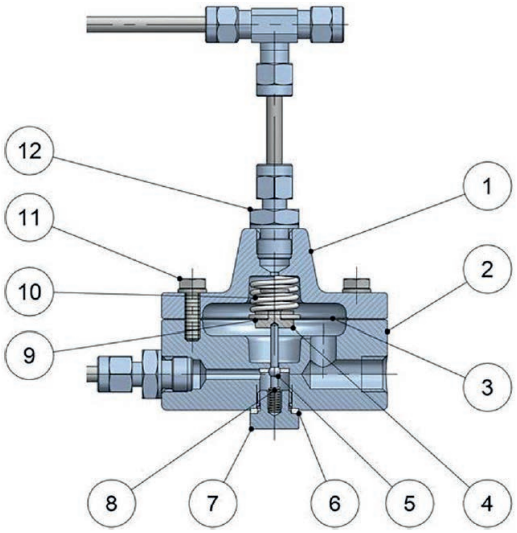
20-AMR	Reed contact (for series 2100 and 2150)
23-AMR	Reed contact (for series 2300)
24-AMR	Reed contact (for series 2340)
20-AMD	Microswitch
RCA	Regulator (constant flow at variable inlet pressure)
RCD	Regulator (constant flow at variable outlet pressure)

ASSEMBLY DRAWING

Flowmeter



Flow regulator



MATERIALS / PARTS DESCRIPTION

Flowmeter

Item	Description	Material
01	Frame:	1.4404
02	Upper connector:	1.4404
03	Piston gasket:	NBR / FKM / EPDM
04	Piston:	1.4404
05	Upper tube gasket:	NBR / FKM / EPDM
06	Upper float stop:	1.4319
07	Protection:	Polycarbonate [2]
08	Flow tube:	Borosilicate glass
09	Float:	1.4404 Glass Aluminum
10	Lower float stop:	1.4319
11	Lower tube gasket:	NBR / FKM / EPDM
12	Lower valve connector:	1.4404
13	Valve knob:	Plastic
14	Valve guide:	PTFE
15	Valve shaft:	1.4404
16	Valve gasket:	NBR / FKM / EPDM
17	Valve seat:	PTFE
18	Lower connector:	1.4404

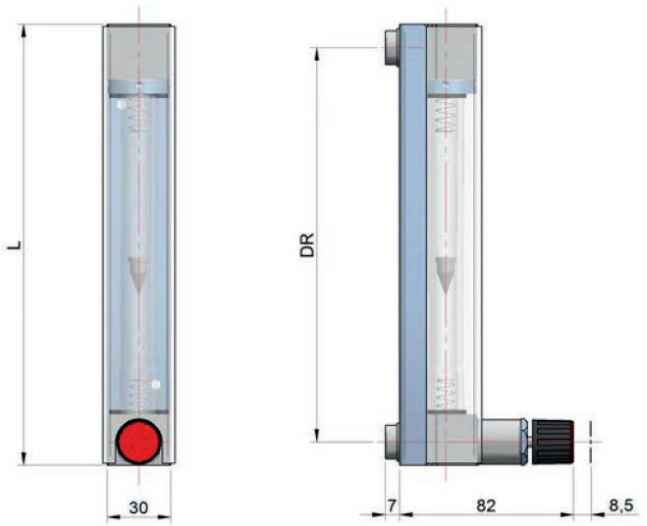
Regulator RCA / RCD

Item	Description	Material
01	Membrane body:	1.4404
02	Valve body:	1.4404
03	Membrane:	NBR / FKM / PTFE
04	Valve guide:	1.4404
05	Regulating valve:	1.4404
06	Gasket:	NBR / PTFE
07	Spring support:	1.4404
08	Valve spring:	1.4319
09	Membrane disk:	1.4404
10	Membrane spring:	1.4319
11	Screws:	1.4401
12	Connector union:	1.4401

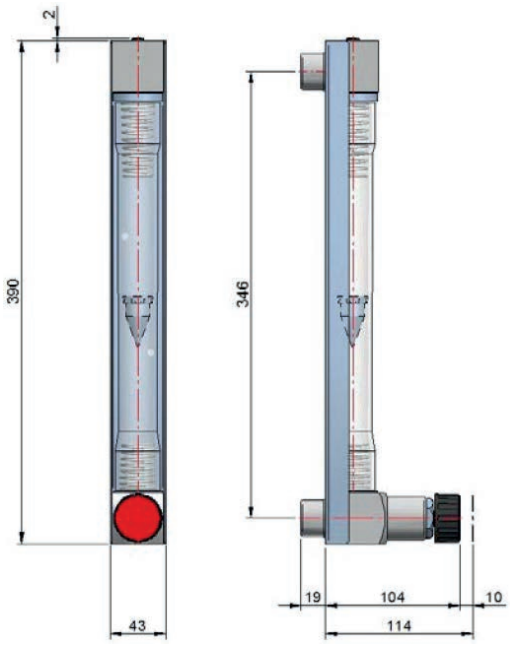
[2] Model 2340, without protection

TECHNICAL DRAWING

2100, 2150 and 2300



2340

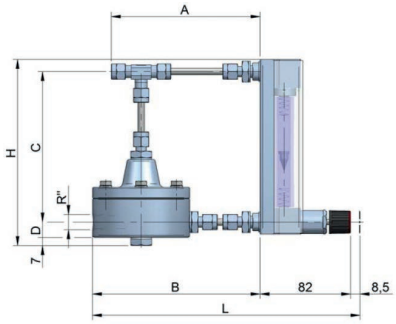


SUMMARY OF TYPES

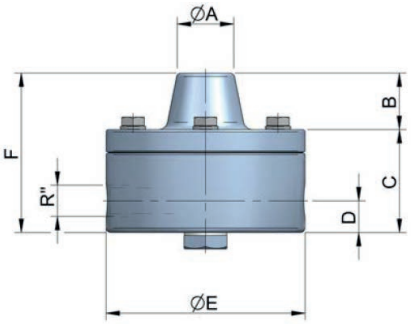
Type	Overall dimensions (mm)				Weight	
	Connection (internal thread)				Flowmeter	Flow regulator
	G	Type	L	DR	approx. [g]	approx. [g]
2100	1/4"	BSP/NPT	158	136	700	2500
2150	1/4"	BSP/NPT	208	186	850	2500
2300	1/4"	BSP/NPT	358	336	850	2500
2340	1/2"	BSP/NPT	390	346	1800	3000

TECHNICAL DRAWING

Flowmeter with constant flow regulator



Flow regulator



SUMMARY OF TYPES

Flowmeter with constant flow regulator

Type	Overall dimensions (mm)						
	G		A	B	C	H	L
2100	1/4"	BSP/NPT	150	170	136	172	266
2150	1/4"	BSP/NPT	150	170	186	222	266
2300	1/4"	BSP/NPT	150	170	336	372	266
2340	1/2"	BSP/NPT	180	200	346	397	320

Flow regulator

Model	Overall dimensions (mm)							
	G		ØA	B	C	D	ØE	F
RCA / RCD	1/4"	BSP/NPT	35	11	52	13	88	63
RCA / RCD	1/2" [3]	BSP/NPT	40	16	65	18	100	81

[3] For model 2340

COMBINATIONS

with flow regulator (optional)

Type	Flow ranges for Water	Flow ranges for Air
2100	≤ 10 - 100 l/h	≤ 300 - 3500 Nl/h
2150	≤ 10 - 100 l/h	≤ 300 - 3600 Nl/h
2300	≤ 25 - 250 l/h	≤ 770 - 7700 Nl/h
2340	≤ 60 - 630 l/h	≤ 1900 - 19000 Nl/h

FLOW RANGES

Type	Tube length	Flow ranges H_2O at 20 °C		Flow ranges Air at 1,013 bar abs. and 20 °C		Δp
		1.4404 [4]	Glass [4]	1.4404 [4]	Glass [4]	
	mm	l/h	l/h	Nl/h	Nl/h	mbar
Model 2100						
C110/0001	100	0,1 – 1	0,05 – 0,5	4 – 40	1 – 15	5
C110/0002	100	0,2 – 2,5	0,1 – 1	8 – 80	4 – 40	10
C111/0005	100	0,5 – 5	0,2 – 2	15 – 160	7 – 70	15
C111/0010	100	1 – 10	0,4 – 4	30 – 350	10 – 210	20
C111/0016	100	1,6 – 16	0,6 – 6	40 – 490	20 – 250	35
C112/0025	100	2,5 – 25	1 – 10	80 – 840	40 – 420	40
C113/0040	100	4 – 40	1,6 – 16	120 – 1200	70 – 700	45
C114/0060	100	6 – 60	2 – 20	200 – 2200	100 – 1200	50
C115/0100	100	10 – 100 [5]	4 – 40	300 – 3500	150 – 1800	55
Model 2150						
C210/0001	150	0,1 – 1	0,05 – 0,5	3 – 30	1 – 12	5
C210/0002	150	0,2 – 2,5	0,1 – 1	10 – 110	4 – 40	10
C211/0005	150	0,5 – 5	0,2 – 2	15 – 180	8 – 80	15
C211/0010	150	1 – 10	0,4 – 4	30 – 350	15 – 180	20
C211/0016	150	1,6 – 16	0,6 – 6	50 – 510	25 – 260	35
C212/0025	150	2,5 – 25	1 – 10	80 – 830	40 – 440	40
C213/0040	150	4 – 40	1,6 – 16	130 – 1300	70 – 700	45
C214/0060	150	6 – 60	2 – 20	150 – 2100	100 – 1100	50
C215/0100	150	10 – 100 [5]	4 – 40	300 – 3600	150 – 1900	55

[4] Float type ECG

[5] Also available with type AC float

FLOW RANGES

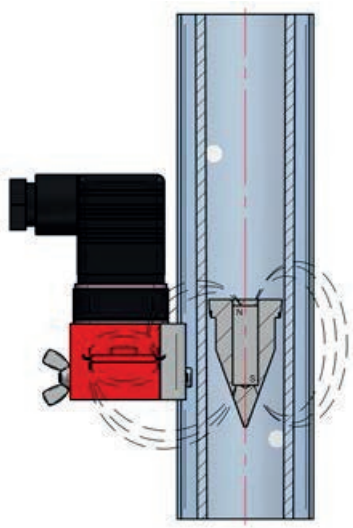
Type	Tube length	Flow ranges H_2O at 20 °C		Flow ranges Air at 1,013 bar abs. and 20 °C		Δp
	mm	1.4404 [6]	Glass [7]	1.4404 [6]	Aluminum [6]	
		l/h	l/h	Nl/h	Nl/h	mbar
Model 2300						
C311/0025	300	2,5 – 25	1 – 10	120 – 860	60 – 490	55
C311/0040	300	4 – 40	1,6 – 16	150 – 1300	80 – 800	80
C311/0060	300	6 – 60	2 – 20	150 – 2000	100 – 1100	110
C312/0100	300	10 – 100		300 – 3000	180 – 1800	130
C312/0160	300	16 – 160		490 – 4900	300 – 2900	160
C312/0250	300	25 – 250		770 – 7700	460 – 4600	180
Model 2340						
C313/0400	300	40 – 400		1200 – 12000	740 – 7300	90
C313/0630	300	60 – 630		1900 – 19000	1100 – 11000	200
C313/1000	300	100 – 1000		3000 – 30000	1800 – 18000	300

[6] Float type AC

[7] Float type ECG

OPTIONS, LIMIT SWITCH CONTACTS

20-AMR / 23-AMR / 24-AMR



FUNCTIONAL PRINCIPLE

The magnet inside the float activates a bi-stable Reed contact inside the PVC switch housing. Please specify Normally Open (NOC) or Change Over (COC) when ordering.

Available only with flowmeters without protective shield

Infinitely variable switch point adjustment by operator

ELECTRICAL CONNECTION

Connector in compliance with EN 175301-803, Form A
(DIN 43650, Form A)

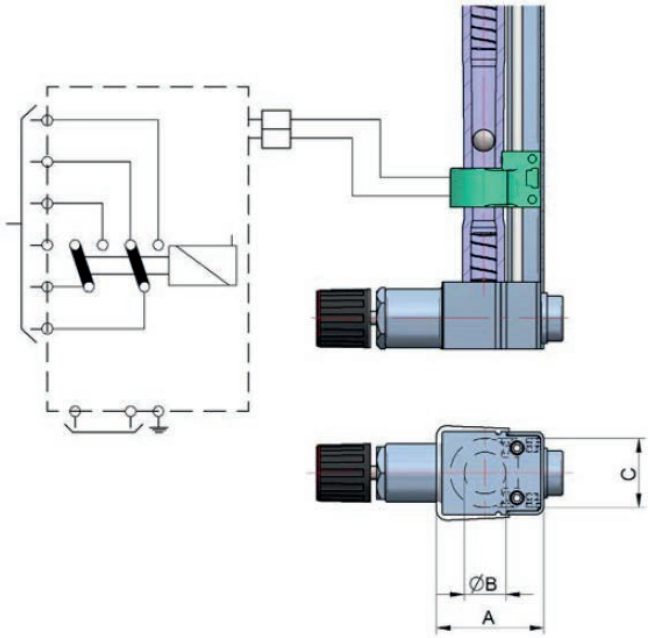
Ingress Protection	IP65
Ambient temperature	-25 °C - 80 °C
Output rating	250V AC· 0,5A · 12VA
Hysteresis	±5 % of full scale value
Models:	
20-AMR1	1 adjustable limit switch
20-AMR2	2 adjustable limit switches for models 2100 and 2150
23-AMR1	1 adjustable limit switch
23-AMR2	2 adjustable limit switches for model 2300
24-AMR1	1 adjustable limit switch
24-AMR2	2 adjustable limit switches for model 2340

MEASURING RANGES

Media	
Water:	from 10 - 100 l/h [8]
Air:	from 300 - 3000 Nl/h [8]

[8] Stainless steel float, type AC

20-AMD



FUNCTIONAL PRINCIPLE

The magnet inside the float activates a bi-stable inductive contact inside an aluminum housing.

Infinitely variable switch point adjustment by operator

ELECTRICAL CONNECTION

Slot initiator, 3.5 mm (activated by vane in the housing) NAMUR (EN 60947-5-6)	
ATEX certificate Ex ia IIC T4...T6 Ga / Ex ia IIIC T85°C Da	
Power supply	8V DC across control relay
Ambient temperature	-25 °C - 70 °C
Models:	
20-AMD1	1 adjustable limit switch
20-AMD2	2 adjustable limit switches for models 2100 and 2150
Control relay (on request)	
NAMUR (EN 60947-5-6) for 1 or 2 inductive detectors	
Power supply	24...253 V AC 50-60 Hz 24...300 V DC
Input	Namur Ex ia IIC
Output	1 or 2 relay contacts
Output rating	250V AC· 2A · 100VA 24V DC· 1A
Ambient temperature	-25 °C - 70 °C

MEASURING RANGES

Media	
Water:	to 6 - 60 l/h [9]
Air:	to 200 - 2200 Nl/h [9]

[9] Stainless steel float, type ECG

REGULATOR RCA

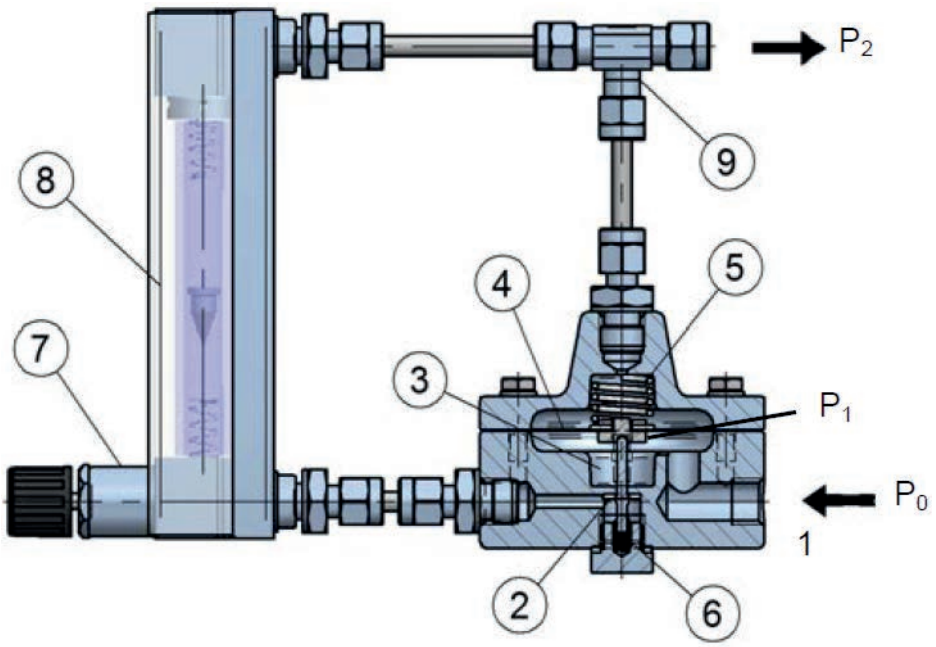
The design of the series 2000 flowmeters enable the use of RCA or RCD type controllers, which maintain a constant flow, even at fluctuating pressure.

Type RCA is used for gases and liquids with variable inlet pressure and constant outlet pressure.

FUNCTIONAL PRINCIPLE

The media flows, with variable input pressure P_0, through the connector (1), past the regulating valve (2) into the regulator chamber (3), where light pressure is exerted on the diaphragm (4). The regulating valve, which is connected to the diaphragm (4), is held open by force of the spring (5). When the media passes through the regulating valve (7) into the measuring tube (8) and flows through the outlet (9), the constant counter-pressure (P_2) there acts on the diaphragm (4).
The springs (5 and 6) are designed to open the valve, when inlet pressure P_0 decreases, and close the valve when P_0 increases. This maintains a constant flow rate at the regulating valve (7).
For proper operation of the regulator, and to ensure correct function of the springs (5 and 6), the differential pressure between P_0 and P_2 must always be higher than 350 - 450 mbar (depending on flowmeter model).

TECHNICAL DRAWING



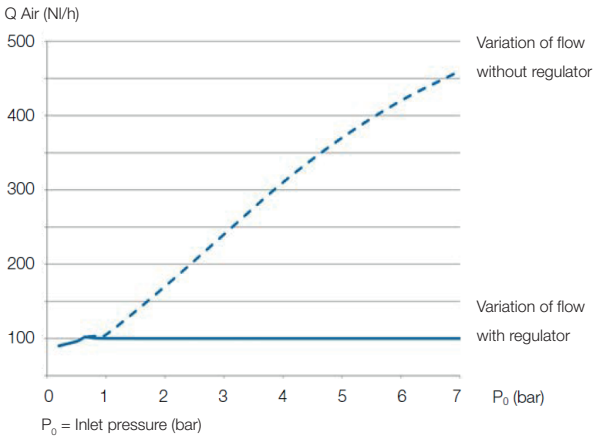
REGULATOR RCA

FLOW CURVES

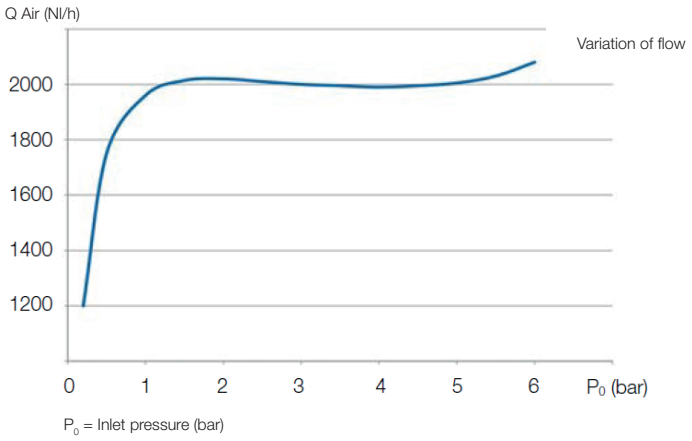
The flow curves show the relationship between the inlet pressure P_0 and the counter pressure P_2 in the RCA regulator.
The different flow rates are adjusted by means of the regulating valve (7) of the flowmeter. The counter pressure P_2, in this cases, corresponds to the atmospheric pressure.

DIAGRAMS

Regulator RCA at low flow



Regulator RCA at high flow



REGULATOR RCD

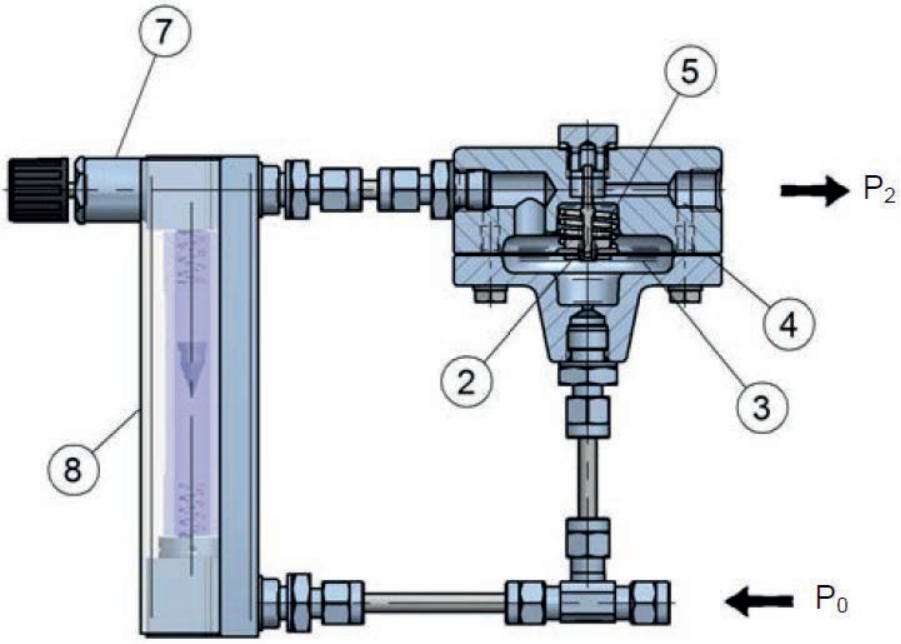
The design of the series 2000 flowmeter allows the use of RCA or RCD type regulators, which maintain a constant flow, even when pressure fluctuations occur.

RCD type regulators are used in applications for gases, where the inlet pressure is constant and outlet pressure is variable.

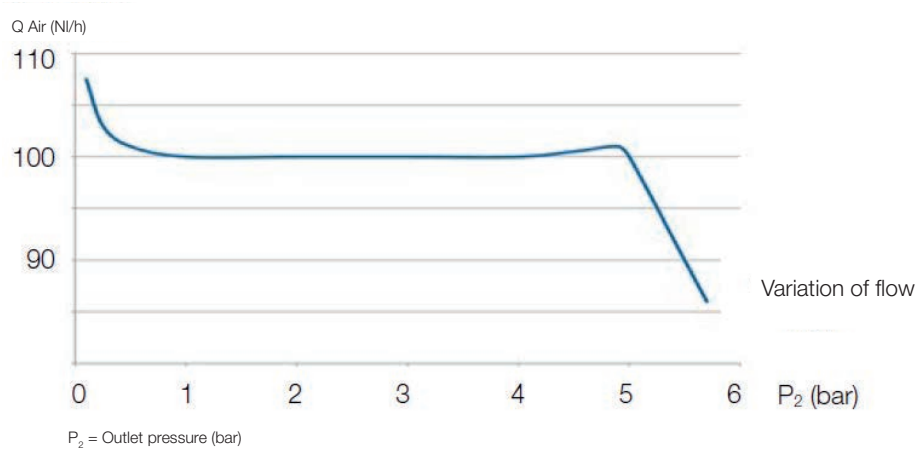
FUNCTIONAL PRINCIPLE

RCD type regulators operate reversely from RCA type regulators. The change in position of the valve (2) depends on the outlet pressure and the set value on the control valve (7).

TECHNICAL DRAWING



DIAGRAMS



P_2 = Outlet pressure (bar)

2100, 2150, 2300, 2340 12 0001 12-15 E M

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