

## Variable Area Flowmeter, Plastic

### Construction

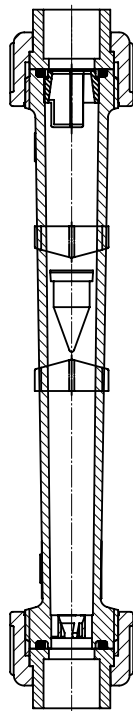
The flowmeter operates according to the variable area principle. Metering tubes are available in PA transparent or Polysulphone suitable for inert or corrosive\* media (PVC-U and PVDF tubes on request). Male threads moulded onto the ends of the metering tube allow for easy mounting of unions. O-ring seals at the faces of the tube ensure reliable sealing between metering tube and union and provide stress-free sealing. The floats are available in stainless steel 1.4571, PVC-U, PP or PVDF (depending on working medium and measuring range). The scale on the metering tube can be suited to the medium and is available e.g. in l/h, m<sup>3</sup>/h or %. Dovetail sections moulded onto the metering tube allow for easy mounting of adjustable visual flow indicators, limit switches and a continuous readout transmitter.

### Advantages

- Good level of accuracy, simple operation
- Corrosion resistant
- Over 500 standard scales and 13,000 special scales are available with further scales on request
- Clear and large size printed scale

\* see information on working medium on page 2

### Sectional drawing



**GEMÜ® 850**

851 / 855 / 857 / 861 / 865  
867 / 870 / 875 / 880 / 885

## Technical data

### Working medium

Corrosive and inert gaseous and liquid media which have no negative impact on the physical and chemical properties of the metering tube, float, seal and union materials.

### Operating pressure\*

Metering tubes with plastic unions	max. 10 bar
Metering tubes with metal unions	max. 15 bar

\*Operating pressure dependent on tube material and operating temperature

### Accuracy class

4 acc. to VDE/VDI 3513, sheet 2, i.e.  $\pm 1\%$  of end value and  $\pm 3\%$  of measured value.

### Version

Type	Working medium	Float material
851	Liquids and gases	PVC-U, red
861	Liquids and gases	PVC-U, red (with magnet)
855	Liquids and gases	PP, black
865	Liquids and gases	PP, black (with magnet)
857	Liquids	Stainless steel 1.4571
867	Liquids	Stainless steel 1.4571 with magnet
875	Gases	PP, black (only gases)
885	Gases	PP, black (with magnet) (only gases)
870	Liquids and gases	PVDF, white
880	Liquids and gases	PVDF, white (with magnet)

### Pressure / temperature correlation - Variable area flowmeter

Tube material	Union material	Code	Temperature in °C																
			-20	-10	±0	5	10	20	25	30	40	50	60	70	80	90	100	110	120
PA transparent code 21	PVC-U	1	-	-	-	10	10	10	10	8.0	6	3.5	1.5	-	-	-	-	-	-
	PP	5	-	-	-	10	10	10	10	8.5	7	5.5	4.0	-	-	-	-	-	-
	PVDF	20	10	10	10	10	10	10	10	9.0	8	7.1	6.3	-	-	-	-	-	-
	Malleable iron	6	15	15	15	15	15	15	15	13.5	12	10.7	9.5	-	-	-	-	-	-
	Stainless steel	7	15	15	15	15	15	15	15	13.5	12	10.7	9.5	-	-	-	-	-	-
Poly-sulphone code 22	Stainless steel/PP	1V	-	-	-	10	10	10	10	8.5	7	5.5	4.0	-	-	-	-	-	-
	PVC-U	1	-	-	-	10	10	10	10	8.0	6	3.5	1.5	-	-	-	-	-	-
	PP	5	-	-	-	10	10	10	10	8.5	7	5.5	4.0	2.7	1.5	0.8	-	-	-
	PVDF	20	-	-	-	10	10	10	10	9.0	8	7.1	6.3	5.4	4.7	3.6	2.5	-	-
	Malleable iron	6	-	-	-	15	15	15	15	14.0	13	12.0	11.0	9.7	8.5	7.7	6.0	-	-
PVC-U, transparent code 3	Stainless steel	7	-	-	-	15	15	15	15	14.0	13	12.0	11.0	9.7	8.5	7.7	6.0	-	-
	Stainless steel/PP	1V	-	-	-	10	10	10	10	8.5	7	5.5	4.0	2.7	1.5	0.8	-	-	-
	PVC-U	1	-	-	-	10	10	10	10	8.0	6	3.5	-	-	-	-	-	-	-
	Malleable iron	6	-	-	-	10	10	10	10	8.0	6	3.5	-	-	-	-	-	-	-
	Stainless steel	7	-	-	-	10	10	10	10	8.0	6	3.5	-	-	-	-	-	-	-
PVDF code 20	Stainless steel/PP	1V	-	-	-	10	10	10	10	8.0	6	3.5	-	-	-	-	-	-	-
	PVDF	20	10	10	10	10	10	10	10	9.0	8	7.1	6.3	5.4	4.7	3.6	2.5	1.7	1.2
	Stainless steel	7	10	10	10	10	10	10	10	9.0	8	7.1	6.3	5.4	4.7	3.6	2.5	1.7	1.2
	Stainless steel/PVDF	2V	10	10	10	10	10	10	10	9.0	8	7.1	6.3	5.4	4.7	3.6	2.5	1.7	1.2

\* with K-No. 1123 (Float stoppers PVDF)

### Pressure loss [mbar]

Type	Nominal size			
	10	15	20	25
851	-	6.0	8	10.0
855, 861, 865, 870, 880	5	6.0	8	10.0
857, 867	10	12.0	17	19.0
875	1	1.5	2	2.5
885	-	-	11	13.0

## Order data

Version	
Float material	Type
PVC-U, red	851
PVC-U, red (with magnet)	861
PP, black	855
PP, black (with magnet)	865
Stainless steel 1.4571 (only liquids)	857
Stainless steel 1.4571 with magnet (only liquids)	867
PP, black (only gases)	875
PP, black (with magnet) (only gases)	885
PVDF, white	870
PVDF, white (with magnet)	880

2 RoHS compliance	Code
RoHS compliant	R

3 Nominal size	Code
Type	DN
855, 857, 861, 865, 867, 870, 875, 880	10
851, 855, 857, 861, 865, 867, 870, 875, 880	15
851, 855, 857, 861, 865, 867, 870, 875, 880, 885	20
851, 855, 857, 861, 865, 867, 870, 875, 880, 885	25

4 Body configuration	Code
Straight through	D

5 Connection	Code
Union ends with DIN insert (socket)	7
Union ends with inch insert (socket)	33
Union ends with DIN insert (IR butt welding)	78
Union ends with insert (threaded socket Rp)	7R
Spigots DIN	0
Spigots DIN 11850, series 1	16
Spigots DIN 11850, series 2	17
Spigots DIN 11850, series 3	18
Spigots SMS 3008	37
Spigots ASME BPE	59
Spigots EN ISO 1127	60
Flanged connection on request	

6 Tube material		Code
PVC-U	on request	3
PVDF	on request	20
PA transparent	temperature range 0 to 60°C*	21
Polysulphone	temperature range 0 to 100°C*	22

\* Stated temperatures are valid for water

7 Seal material		Code
O-ring	FPM	4
O-ring	EPDM	14
O-ring	FEP encapsulated	55

8 Union material	Code
Insert PVC-U, union nut PP	1
Insert PP, union nut PP	5
Malleable iron	6
Insert 1.4404 (threaded socket Rp) union nut stainless steel	7
Insert PVDF, union nut PVDF	20
Insert 1.4435 (butt weld spigot) union nut stainless steel	41
Insert 1.4435 (butt weld spigot) or Insert 1.4404 (threaded socket Rp), union nut PP	1V
Insert 1.4435 (butt weld spigot) or Insert 1.4404 (threaded socket Rp), union nut PVDF	2V

\* Other materials on request

9 Tube size	Code
See tables on pages 4 and 5	

10 Measuring range	Code
See tables on pages 4 and 5	
Always state the maximum measuring range value when ordering.	

### Note:

The scale divisions given on pages 4 and 5 correspond to the actual flows.  
When ordering, the flow ranges should be stated as follows:  
Liquid media: l/h  
Gaseous media: Nm<sup>3</sup>/h

### Ordering information:

The following data are necessary:

1. Type of medium
2. Concentration of medium (%)
3. Required flow range (l/h, m<sup>3</sup>/h, kg/h)
4. Operating pressure, relative or absolute (bar)
5. Temperature of medium (°C)
6. Viscosity of medium
7. Medium density
8. Float with or without magnet

Order example	1	2	3	4	5	6	7	8	9	10
Code	855	R	10	D	7	21	14	1	13	60

**Selection of scales \*/\*\* (liquid media)**

Type	Nominal size	Water H <sub>2</sub> O	Hydrochloric acid HCl 30-33%	Sodium hydroxide NaOH 30%	Sodium hydroxide NaOH 45%	Sodium hydroxide NaOH 50%	Tube size	Weight	
		Tube						Union	
		PA transp./ Polysulphone	Poly-sulphone	PA transparent / Polysulphone				PVC-U	Malleable iron
	DN	l/h					Code	[kg]	
851 without magnet (DN 15-25) 861 with magnet Float material PVC-U  855 without magnet 865 with magnet Float material PP	10	2 - 25	1 - 20	0.25 - 3.75	0.05 - 0.85	0.025 - 0.60	11	0.07	0.18
		2 - 40	2 - 32	0.50 - 8.00	0.10 - 2.00	0.05 - 1.45	12		
		5 - 60	2 - 54	1.00 - 20.0	0.25 - 4.75	0.25 - 3.25	13		
		10 - 100	5 - 90	2.50 - 45.0	0.50 - 12.5	0.50 - 9.00	14		
		15 - 160	10 - 150	5.00 - 80.0	1.00 - 30.0	1.00 - 22.0	15		
	15	5 - 60	2.5 - 50	1.0 - 15.0	0.25 - 3.25	0.10 - 2.40	21	0.12	0.30
		10 - 100	5.0 - 80	2.0 - 34.0	0.50 - 8.00	0.25 - 5.50	22		
		15 - 160	10 - 130	2.5 - 67.5	1.00 - 8.00	0.50 - 13.5	23		
		20 - 250	20 - 220	5.0 - 130	2.50 - 45.0	2.00 - 32.0	24		
		30 - 320	20 - 260	10.0 - 170	2.50 - 65.0	2.50 - 47.5	25		
	20	10 - 160	10 - 135	2.5 - 62.5	1.0 - 15.0	0.5 - 11	31	0.21	0.48
		20 - 250	20 - 210	5.0 - 115.0	2.0 - 32.5	1.0 - 24	32		
		40 - 400	25 - 325	10 - 190.0	2.5 - 70.0	2.5 - 50	33		
		40 - 640	50 - 550	25 - 375.0	10.0 - 180	5.0 - 130	34		
		20 - 250	20 - 200	5 - 110	2.0 - 29	1.0 - 20	41		
25	40 - 400	30 - 340	10 - 200	2.5 - 70	2.5 - 50	42	0.29	0.61	
	60 - 640	50 - 550	20 - 380	10 - 150	5 - 120	43			
	100 - 1000	100 - 900	25 - 650	25 - 350	10 - 260	44			
870 without magnet 880 with magnet Float material PVDF	10	2 - 25	1 - 20	-	-	-	11	0.07	0.18
		2 - 40	2 - 32	-	-	-	12		
		5 - 60	2 - 54	-	-	-	13		
		10 - 100	5 - 90	-	-	-	14		
		15 - 160	10 - 150	-	-	-	15		
	15	5 - 60	2.5 - 50	-	-	-	21	0.12	0.30
		10 - 100	5.0 - 80	-	-	-	22		
		15 - 160	10 - 130	-	-	-	23		
		20 - 250	20 - 220	-	-	-	24		
		30 - 320	20 - 260	-	-	-	25		
	20	10 - 160	10 - 135	-	-	-	31	0.21	0.48
		20 - 250	20 - 210	-	-	-	32		
		40 - 400	25 - 325	-	-	-	33		
		40 - 640	50 - 550	-	-	-	34		
		20 - 250	20 - 200	-	-	-	41		
25	40 - 400	30 - 340	-	-	-	42	0.29	0.61	
	60 - 640	50 - 550	-	-	-	43			
	100 - 1000	100 - 900	-	-	-	44			
857 without magnet 867 with magnet Float material 1.4571	10	4 - 40	-	0.5 - 8.5	0.10 - 2.0	0.05 - 1.40	11	0.08	0.19
		5 - 60	-	1.0 - 19.0	0.25 - 4.5	0.25 - 3.25	12		
		10 - 100	-	2.5 - 40.0	0.50 - 11	0.5 - 8.00	13		
		15 - 160	-	5.0 - 85.0	1.00 - 28	1.0 - 21.0	14		
		20 - 250	-	10.0 - 150	2.50 - 60	2.5 - 47.5	15		
	15	10 - 100	-	2.5 - 37.5	0.5 - 9.0	0.25 - 6.5	21	0.13	0.31
		20 - 160	-	5.0 - 75.0	1.0 - 22	1.00 - 15	22		
		20 - 250	-	5.0 - 140	2.5 - 50	2.00 - 36	23		
		40 - 400	-	10.0 - 250	5.0 - 110	5.00 - 85	24		
		50 - 500	-	20.0 - 300	10 - 160	5.00 - 120	25		
	20	20 - 250	-	5 - 135	2.5 - 42.5	2.0 - 30	31	0.24	0.51
		30 - 400	-	10 - 230	5.0 - 90.0	2.5 - 65	32		
		60 - 600	-	25 - 350	10 - 180	5.0 - 135	33		
		100 - 1000	-	25 - 650	25 - 400	20 - 320	34		
	25	40 - 400	-	10 - 220	5.0 - 75	2.5 - 55	41	0.34	0.66
50 - 650		-	20 - 380	10 - 180	5 - 135	42			
100 - 1000		-	25 - 650	25 - 400	20 - 300	43			
150 - 1600		-	50 - 1100	50 - 750	25 - 650	44			

\* All scales in this data sheet are based on a medium temperature of 20 °C.

\*\* For smaller or larger flow ranges see data sheets GEMU 800, 840.

Other ranges available on request.

Tubes in PVC-U and PVDF on request

### Selection of scales (gaseous media)

Type	Nominal size	Medium air At 1 bar abs. and 20°C PA transparent / Polysulphone	Tube size	Weight	
				Union	
	DN	Nm <sup>3</sup> /h	Code	PVC-U	Malleable iron
				[kg]	
875 without magnet Float material PP	10	0.02 - 0.36	11	0.07	0.18
		0.05 - 0.55	12		
		0.10 - 0.90	13		
		0.15 - 1.50	14		
		0.20 - 2.40	15		
	15	0.10 - 0.90	21	0.11	0.29
		0.15 - 1.50	22		
		0.20 - 2.40	23		
		0.40 - 3.80	24		
		0.40 - 4.80	25		
	20	0.20 - 2.50	31	0.19	0.46
		0.25 - 3.75	32		
0.50 - 5.50		33			
1.00 - 10.0		34			
25	0.4 - 4.0	41	0.25	0.57	
	0.5 - 6.0	42			
	1.0 - 10.0	43			
	1.0 - 16.0	44			
885 with magnet Float material PP	20	0.75 - 6.5	31	0.19	0.46
		1.0 - 10.0	32		
		1.5 - 14.5	33		
		2.0 - 24.0	34		
	25	1.0 - 10.0	41	0.25	0.57
		2.0 - 16.0	42		
		3.0 - 24.0	43		
		5.0 - 37.5	44		

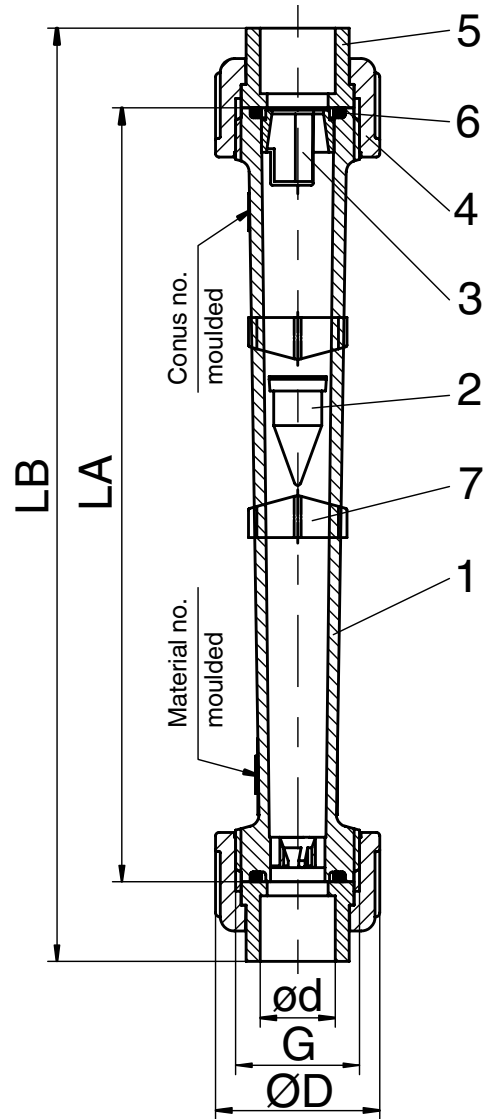
**To types 875/885:**

Caution! With gaseous media the scaling alters according to operating pressure. Please state when ordering.

**Special scales:**

For other media and operating requirements differing from those given for standard versions, special scales are available. Please note the ordering information (see page 3).

Dimensions [mm]



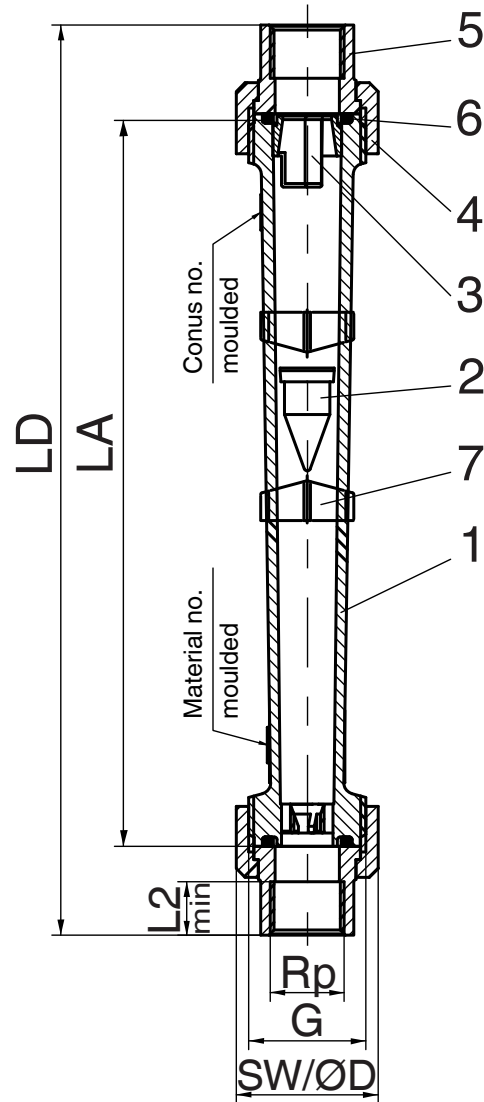
Item	Designation	Pieces
1	Tube	1
2	Float	1
3	Float stop	2
4	Union nut	2
5	Union	2
6	O-ring (see table)	2
7	Flow indicator	2

Plastic union

Connection code				øD	7			NPS	33		
DN	G	LA	O-ring		ød	LB			ød	LB	
Union material code						1	5	20		1	
10	G 3/4	165	15.5 x 2.6	35	16	199	199	199	3/8"	17.3	209
15	G 1	170	20.2 x 3.5	43	21	208	205	208	1/2"	21.4	208
20	G 1 1/4	185	28.0 x 3.5	53	25	229	223	227	3/4"	26.7	229
25	G 1 1/2	200	33.0 x 3.5	60	32	250	242	246	1"	33.6	250

Tube material PVDF = LA/LB -3 mm

Dimensions [mm]

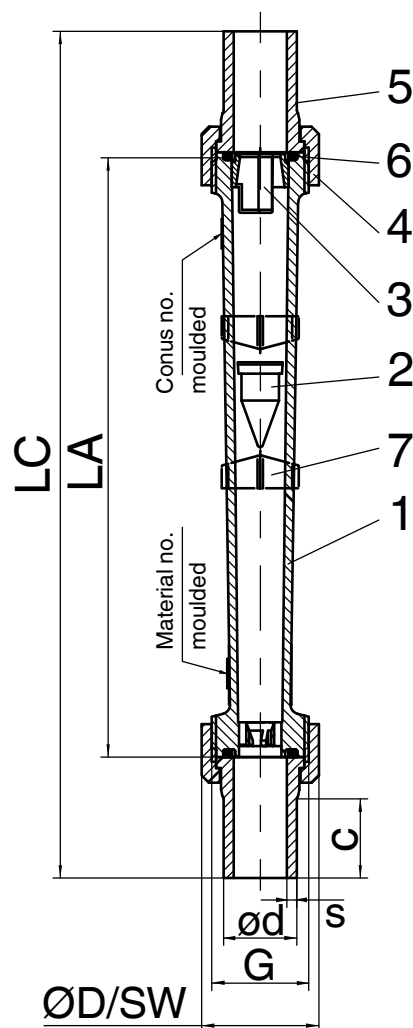


Item	Designation	Pieces
1	Tube	1
2	Float	1
3	Float stop	2
4	Union nut	2
5	Union	2
6	O-ring (see table)	2
7	Flow indicator	2

Metal and plastic union										
Connection code				7R						
DN	G	LA	O-ring	ød	SW	Rp	L2 min	LD		
Union material code				1, 1V, 2V	6, 7	1, 6, 7, 1V, 2V		1	6	7, 1V, 2V
10	G 3/4	165	15.5 x 2.6	35	32	RP 3/8	11.4	213	209	203
15	G 1	170	20.2 x 3.5	43	41	RP 1/2	15.0	222	214	212
20	G 1 1/4	185	28.0 x 3.5	53	50	RP 3/4	16.3	243	229	239
25	G 1 1/2	200	33.0 x 3.5	60	55	RP 1	19.1	264	252	256

Tube material PVDF = LA/LB -3 mm

## Dimensions [mm]



Item	Designation	Pieces
1	Tube	1
2	Float	1
3	Float stop	2
4	Union nut	2
5	Union	2
6	O-ring (see table)	2
7	Flow indicator	2

### Plastic union

Connection code				øD	78					
DN	G	LA	O-ring		ød	s		c		LC
Union material code						5	20	5	20	5
10	G 3/4	165	15.5 x 2.6	35	-	-	-	-	-	-
15	G 1	170	20.2 x 3.5	43	20	1.9	1.9	37	276	
20	G 1 1/4	185	28.0 x 3.5	53	25	2.3	1.9	39	297	
25	G 1 1/2	200	33.0 x 3.5	60	32	2.9	2.4	40	318	

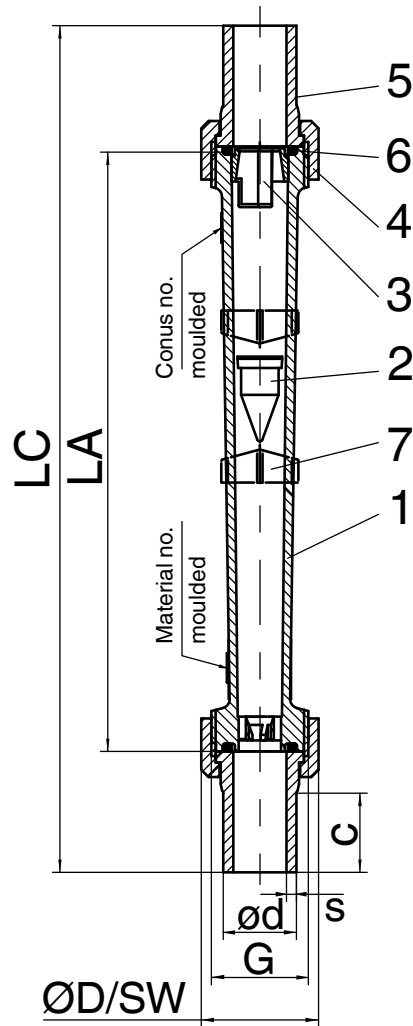
### Metal union

Connection code				SW	øD	LC	c	17		37		59		60	
DN	G	LA	O-ring					ød	s	ød	s	ød	s	ød	s
Union material code				41	1V, 2V	41, 1V, 2V									
10	G 3/4	165	15.5 x 2.6	32	35	240	34	13	1.5	-	-	9.53	0.89	17.2	1.6
15	G 1	170	20.2 x 3.5	41	43	246	34	19	1.5	-	-	12.70	1.65	21.3	1.6
20	G 1 1/4	185	28.0 x 3.5	50	53	261	34	23	1.5	-	-	19.05	1.65	26.9	1.6
25	G 1 1/2	200	33.0 x 3.5	55	60	279	34	29	1.5	25	1.2	25.40	1.65	33.7	1.6

Tube material PVDF = LA/LB -3 mm



Dimensions [mm]



Item	Designation	Pieces
1	Tube	1
2	Float	1
3	Float stop	2
4	Union nut	2
5	Union	2
6	O-ring (see table)	2
7	Flow indicator	2

Plastic union										
Connection code				øD	78					
DN	G	LA	O-ring		ød	s		c		LC
Union material code						5	20	5	20	5
10	G 3/4	165	15.5 x 2.6	35	-	-	-	-	-	-
15	G 1	170	20.2 x 3.5	43	20	1.9	1.9	37	276	
20	G 1 1/4	185	28.0 x 3.5	53	25	2.3	1.9	39	297	
25	G 1 1/2	200	33.0 x 3.5	60	32	2.9	2.4	40	318	

Metal union															
Connection code				SW	øD	LC	c	17		37		59		60	
DN	G	LA	O-ring					ød	s	ød	s	ød	s	ød	s
Union material code				41	1V, 2V	41, 1V, 2V									
10	G 3/4	165	15.5 x 2.6	32	35	240	34	13	1.5	-	-	9.53	0.89	17.2	1.6
15	G 1	170	20.2 x 3.5	41	43	246	34	19	1.5	-	-	12.70	1.65	21.3	1.6
20	G 1 1/4	185	28.0 x 3.5	50	53	261	34	23	1.5	-	-	19.05	1.65	26.9	1.6
25	G 1 1/2	200	33.0 x 3.5	55	60	279	34	29	1.5	25	1.2	25.40	1.65	33.7	1.6

Tube material PVDF = LA/LB -3 mm

## Overview GEMÜ 850

Union material	1			5		6	7, 1V, 2V	20		41, 1V, 2V			
Connection code	7	7R	33	7	78	7R	7R	7	78	17	37	59	60
DN 10	X	X	X	X	-	X	X	X	-	X	-	X	X
DN 15	X	X	X	X	X	X	X	X	X	X	-	X	X
DN 20	X	X	X	X	X	X	X	X	X	X	-	X	X
DN 25	X	X	X	X	X	X	X	X	X	X	X	X	X

## Accessories for variable area flowmeter series GEMÜ 850

To increase the versatility of the GEMÜ 850 flowmeter, numerous accessories have been developed which can be retrofitted onto the tube without modification.

The float, however, must be one containing a magnet, in order for these accessories to function.



### GEMÜ 1250 for DN 25

Change-over contact  
(Switching duty of magnetic switch 10 VA)

### GEMÜ 1256 for DN 10, 15, 20

Limit switch (max.)  
(Switching duty of magnetic switch 10 VA)

### GEMÜ 1251 for DN 25

Limit switch (max.)  
(Switching duty of magnetic switch 10 VA)

### GEMÜ 1257 for DN 10, 15, 20

Limit switch (min.)  
(Switching duty of magnetic switch 10 VA)

### GEMÜ 1252 for DN 25

Limit switch (min.)  
(Switching duty of magnetic switch 10 VA)



### GEMÜ 1276

Digital display unit Versions:  
With or without switch points.



### GEMÜ 1271

Instrument sensor for continuous  
flow readout (resistance 0 -10 kΩ).

### GEMÜ 1273

Instrument sensor for continuous  
flow readout via output signal  
4-20 mA from an integrated 2-wire  
measuring transducer

Separate data sheets are available for the above accessories on request.

### Other products from our product range:

- Plastic valves, pneumatically, electrically and manually operated.
- Metal valves, pneumatically, electrically and manually operated.

For further flowmeters, accessories and other products,  
please see our Product Range catalogue and Price List.  
Contact GEMÜ.

**GEMÜ**® VALVES, MEASUREMENT  
AND CONTROL SYSTEMS

