Product Range

Variable Area Flow Meters Type 335, Type 350 Short Version Special Version

+GF+

GEORG FISCHER
PIPING SYSTEMS

Benefits

Variable area flow meters – a reliable, accurate and economical measuring principle.

Variable area flow meters from GF Piping Systems are radially installed dismountable meters for flow measuring in industrial piping applications. The measurement ranges, which are attuned to our customers' needs, and the range of materials available for the tubes and connection ends, mean that the flow meters can be used for a wide range of applications and a great variety of media.

G = A + K

Measuring principle - Three main forces act on the float

- The weight G
- The buoyancy A
- The flow force K

Main advantages

- The flowmeters require no auxiliary power
- Cost effective to measure the flow rate
- Break-proof and corrosion-resistant
- Accessories like sensor 4-20 mA and limit contacts
- Guiding rod from DN50 for stabilisation of float within volume flow
- Low pressure loss
- Can be used for liquids and gases
- Volume- and % scale as standard

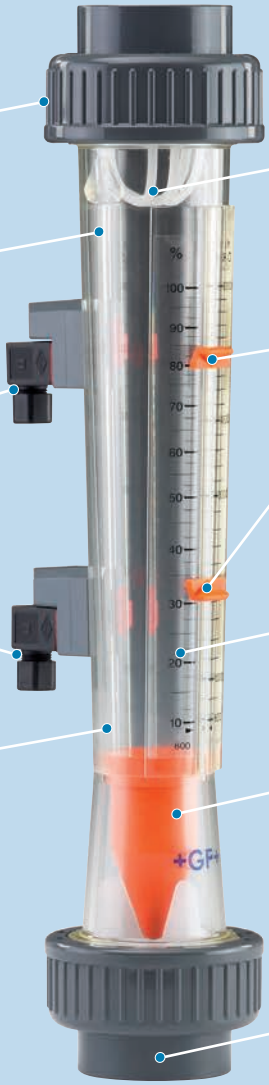
Segments

- Water Treatment
- Chemical Process Industry
- Microelectronics
- Food & Beverage
- Ship Building
- Building technology
- And many more

Features

Know your flow

All the flow meters are equipped with a double scale: a percentage scale as well as a scale for the flow volume in l/h for water (H_2O). Special scales are on offer for m^3/h, GPM, in addition to special graduations for HCL, NaOH, air and can be affixed on taper tubes without scales subsequently. Measuring accuracy falls in the accuracy class 4 according to VDE/VDI 3513 Part 2.



Install and remove radially with threaded joint

Wide dovetail guide for easy fastening of limit switches

One limit switch each for min./max. flow (optional)

Transparent taper tube in a variety of materials

Insert with damping feature for float in case of water hammer

Flow immediately visible with setpoint indicators

Imprinted double scale for water in percent (%) and flow volume (l/h)

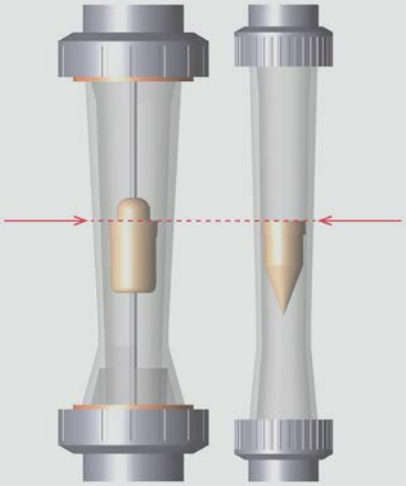
Orange-colored PVDF float makes it easy to read the flow

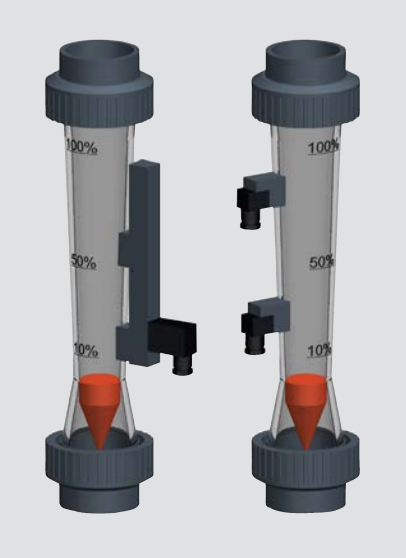
Fast connection with standardized cement socket

System details

The float measuring principle – accurate flow measurement of liquids and gases.

If a medium flows upwards at a sufficient rate of flow through the vertically mounted taper tube, the float is raised to the point at which a state of equilibrium sets in between the lifting force of the medium and the weight of the float. Since the mean rate of flow is proportional to the quantity flowing through per unit of time, this state of equilibrium corresponds to the measurement of the instantaneous flow rate.





Accurate reading

The top edge of the float indicates the flow volume. If special scales are applied subsequently, it must be ascertained that the scale marking ▶◀ is affixed congruently with the one on the taper tube.

Installation lenghts and materials

The variable area flow meters are now available in the installation lengths 335 mm, 350 mm, 200 mm, 185 mm and 165 mm. The taper tubes are available in Polyamid, Polysulfon and transparent PVC-U. The standard floats are in PVDF with or without magnet. The end stops are in PVDF. The threaded joint including insert is available in PVC-U, as well as in PP, PE or ABS on request. The O-rings are made of EPDM or FPM.
The nominal pressure is 10 bar at 20°C.

Before installing

1. The pincer-like transport lock must be removed. To do this, the upper union nut is unscrewed and the upper insert including seals is removed. Double-check the taper tube and if available the guiding rod on damages caused due to shipping.
2. Then the VAFM must be reassembled.
3. The piping system into which the VAFM is installed must be in a vertical position to ensure its functionality.
4. An inlet and outlet section must be provided for (inlet ca. 10 x DN, outlet ca. 5 x DN).

Accessories

Due to the integrated dovetail shaft it is possible to mount further accessories like 4-20 mA flow sensor GK15 or limit contacts GK10/11.

Technical Data

The most important data at a glance.

The VDE/VDI 3513 Part 2 guideline describes the procedure for converting the scales of variable area flow meters. It takes into account all material and flow parameters including pressure, temperature, density and viscosity. GF Piping Systems offer you tables to accommodate changed operating conditions. You can find the tables in the GF Piping Systems Planning Fundamentals.

Accuracy of measurement VDE/VDI 3513, accuracy class 4, ± 1% related to the full scale ± 3% related to the measured value

Flow rate in %	10	20	30	40	50	60	70	80	90	100
Total measurement error % of measured value	13,00	8,00	6,33	5,50	5,00	4,67	4,43	4,25	4,11	4,00
Total measurement error % of full scale value	1,3	1,6	1,9	2,2	2,5	2,9	3,1	3,4	3,7	4,0

Temperature range

Taper tube	Union	max. temperature at 1 bar
PVC-U	PVC-U	0 – 60°C
PA	PVC-U	0 – 60°C
PSU	PVC-U	0 – 60°C
PSU	PVDF	0 – 90°C
PVDF	PVDF	0 – 100°C

Pressure loss for type 335 / 350

Measuring range [l/h]	50 – 500	100 - 1000	150 – 1500	250 – 2500	200 – 2000	300 – 3000
Pressure loss [mbar]	22,84	22,84	22,84	22,84	24,99	24,99

Measuring range [l/h]	600 – 6000	1000 - 10000	1500 - 15000	2000 – 20000	3000 - 30000	8000 - 60000
Pressure loss [mbar]	24,99	24,99	28,23	45,67	45,67	47,24

Chemical resistance list

	Chemical			PVC-U	PA	PSU	PVDF	PEEK	SS
Acid	phosphoric acid	H3PO4	75%	X	O	X	X	X	-
	sulfuric acid	H2SO4	<90%	X	-	-	X	-	-
	nitric acid	HNO3	<55%	X	-	-	X	-	-
	nitric acid	HNO3	67%	-	-	-	X	-	-
	hydrofluoric acid	HF	<70%	X	-	-	X	-	-
	hydrochloric acid	HCl	36%	X	O	X	X	O	-
Base	ammonia	NH4OH	25%	X	X	X	-	X	X
	caustic potash	KOH	<50%	X	O	X	-	X	X
	caustic soda	NaOH	<50%	X	O	X	-	X	X
Anorganica	ferric chloride	FeCl3		X	X	X	X	X	-
	sodium hydrochloride	NaOCl	15%	X	X	X	-	X	O
	sodium bisulfite	NaHSO3	<40%	X	X	X	X	X	X
	hydrogen peroxide	H2O2	35%	X	-	X	O	X	X
	aqueaous inorganic sline solutions (not oxidizing)		til saturation	X	X	X	X	X	O
Organica	formic acid	HCOOH	85%	O	-	O	O	O	O
	acetic acid	CH3COOH	85%	O	-	O	O	O	X
	formaldehyde	H2CO	<40%	X	-	X	O	X	X
	glycol		<50%	O	-	X	X	X	X
	acetone	undiluted		-	O	-	O	X	X
	ethanol, methanol	undiluted		O	-	X	X	X	X
	aliphatic hydrocarbons	undiluted		O	X	X	X	X	X

Valid for 40°C and 2bar

X: recommended O: with limitations -: not recommended

For higher or lower concentrations than mentioned in the list or entry "O", please contact gss@georgfischer.com

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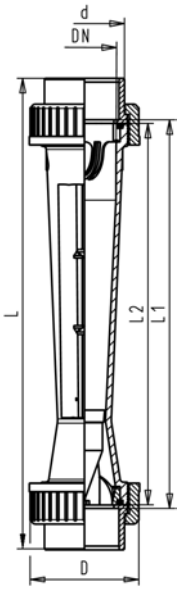
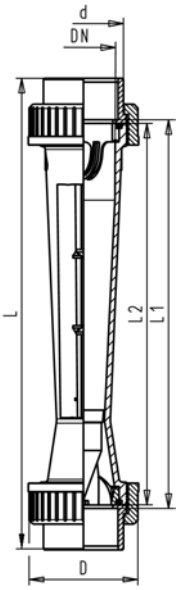


Variable area flow meter type 335
Float in PVDF without magnet
With solvent cement sockets PVC-U metric

Scale range [l/h]	d [mm]	DN [mm]	Taper tube in PVC-U transp. O-rings in EPDM Code	Taper tube in Polyamid O-rings in EPDM Code	Taper tube in Polysulfone O-rings in EPDM Code
50 - 500	32	25	**198 335 000**	**198 335 020**	**198 335 040**
100 - 1000	32	25	**198 335 001**	**198 335 021**	**198 335 041**
150 - 1500	40	32	**198 335 002**	**198 335 022**	**198 335 042**
250 - 2500	40	32	**198 335 003**	**198 335 023**	**198 335 043**
200 - 2000	50	40	**198 335 004**	**198 335 024**	**198 335 044**
300 - 3000	50	40	**198 335 005**	**198 335 025**	**198 335 045**
600 - 6000	50	40	**198 335 006**	**198 335 026**	**198 335 046**
600 - 6000	63	50	**198 335 007**	**198 335 027**	**198 335 047**
1000 - 10000	63	50	**198 335 008**	**198 335 028**	**198 335 048**
1500 - 15000	63	50	**198 335 009**	**198 335 029**	**198 335 049**
2000 - 20000	75	65	**198 335 010**	**198 335 030**	**198 335 050**
3000 - 30000	75	65	**198 335 011**	**198 335 031**	**198 335 051**
8000 - 60000	75	65	**198 335 012**	**198 335 032**	**198 335 052**

Scale range [l/h]	D [mm]	L [mm]	L1 [mm]	L2 [mm]	G [inch]
50 - 500	58	385	341	335	1 ½
100 - 1000	58	385	341	335	1 ½
150 - 1500	72	393	341	335	2
250 - 2500	72	393	341	335	2
200 - 2000	83	403	341	335	2 ¼
300 - 3000	83	403	341	335	2 ¼
600 - 6000	83	403	341	335	2 ¼
600 - 6000	101	417	341	335	2 ¾
1000 - 10000	101	417	341	335	2 ¾
1500 - 15000	101	417	341	335	2 ¾
2000 - 20000	135	429	341	335	3 ½
3000 - 30000	135	429	341	335	3 ½
8000 - 60000	135	429	341	335	3 ½



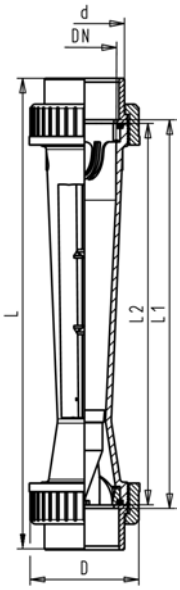
Variable area flow meter type 335
Float in PVDF with magnet
With solvent cement sockets PVC-U metric

Model:

- Suitable limit switches see accessories for variable area flow meters

Scale range [l/h]	**d** [mm]	**DN** [mm]	**Taper tube in PVC-U transp. O-Rings in EPDM Code**	**Taper tube in Polyamid O-rings in EPDM Code**	**Taper tube in Polysulfone O-rings in EPDM Code**
50 - 500	32	25	**198 335 100**	**198 335 120**	**198 335 140**
100 - 1000	32	25	**198 335 101**	**198 335 121**	**198 335 141**
150 - 1500	40	32	**198 335 102**	**198 335 122**	**198 335 142**
250 - 2500	40	32	**198 335 103**	**198 335 123**	**198 335 143**
200 - 2000	50	40	**198 335 104**	**198 335 124**	**198 335 144**
300 - 3000	50	40	**198 335 105**	**198 335 125**	**198 335 145**
600 - 6000	50	40	**198 335 106**	**198 335 126**	**198 335 146**
600 - 6000	63	50	**198 335 107**	**198 335 127**	**198 335 147**
1000 - 10000	63	50	**198 335 108**	**198 335 128**	**198 335 148**
1500 - 15000	63	50	**198 335 109**	**198 335 129**	**198 335 149**
2000 - 20000	75	65	**198 335 110**	**198 335 130**	**198 335 150**
3000 - 30000	75	65	**198 335 111**	**198 335 131**	**198 335 151**
8000 - 60000	75	65	**198 335 112**	**198 335 132**	**198 335 152**

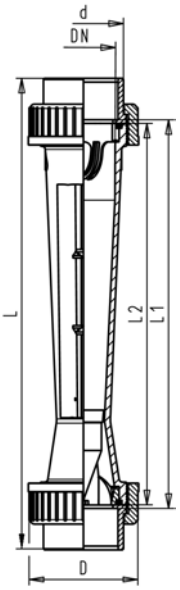
Scale range [l/h]	**D** [mm]	**L** [mm]	**L1** [mm]	**L2** [mm]	**G** [inch]
50 - 500	58	385	341	335	1 ½
100 - 1000	58	385	341	335	1 ½
150 - 1500	72	393	341	335	2
250 - 2500	72	393	341	335	2
200 - 2000	83	403	341	335	2 ¼
300 - 3000	83	403	341	335	2 ¼
600 - 6000	83	403	341	335	2 ¼
600 - 6000	101	417	341	335	2 ¾
1000 - 10000	101	417	341	335	2 ¾
1500 - 15000	101	417	341	335	2 ¾
2000 - 20000	135	429	341	335	3 ½
3000 - 30000	135	429	341	335	3 ½
8000 - 60000	135	429	341	335	3 ½



Variable area flow meter type 350
Float in PVDF without magnet
With solvent cement sockets PVC-U metric

Scale range [l/h]	d [mm]	DN [mm]	Taper tube in PVC-U transp. O-rings in EPDM Code	Taper tube in Polyamid O-rings in EPDM Code	Taper tube in Polysulfone O-rings in EPDM Code
50 - 500	32	25	**198 350 000**	**198 350 020**	**198 350 040**
100 - 1000	32	25	**198 350 001**	**198 350 021**	**198 350 041**
150 - 1500	40	32	**198 350 002**	**198 350 022**	**198 350 042**
250 - 2500	40	32	**198 350 003**	**198 350 023**	**198 350 043**
200 - 2000	50	40	**198 350 004**	**198 350 024**	**198 350 044**
300 - 3000	50	40	**198 350 005**	**198 350 025**	**198 350 045**
600 - 6000	50	40	**198 350 006**	**198 350 026**	**198 350 046**
600 - 6000	63	50	**198 350 007**	**198 350 027**	**198 350 047**
1000 - 10000	63	50	**198 350 008**	**198 350 028**	**198 350 048**
1500 - 15000	63	50	**198 350 009**	**198 350 029**	**198 350 049**
2000 - 20000	75	65	**198 350 010**	**198 350 030**	**198 350 050**
3000 - 30000	75	65	**198 350 011**	**198 350 031**	**198 350 051**
8000 - 60000	75	65	**198 350 012**	**198 350 032**	**198 350 052**

Scale range [l/h]	D [mm]	L [mm]	L1 [mm]	L2 [mm]	G [inch]
50 - 500	58	400	356	350	1 ½
100 - 1000	58	400	356	350	1 ½
150 - 1500	72	408	356	350	2
250 - 2500	72	408	356	350	2
200 - 2000	83	418	356	350	2 ¼
300 - 3000	83	418	356	350	2 ¼
600 - 6000	83	418	356	350	2 ¼
600 - 6000	101	432	356	350	2 ¾
1000 - 10000	101	432	356	350	2 ¾
1500 - 15000	101	432	356	350	2 ¾
2000 - 20000	135	444	356	350	3 ½
3000 - 30000	135	444	356	350	3 ½
8000 - 60000	135	444	356	350	3 ½



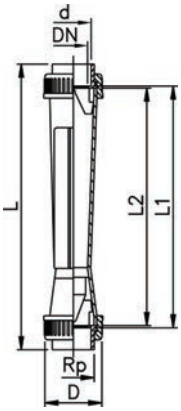
Variable area flow meter type 350
Float in PVDF with magnet
With solvent cement sockets PVC-U metric

Model:

- Suitable limit switches see accessories for variable area flow meters

Scale range [l/h]	d [mm]	DN [mm]	Taper tube in PVC-U transp. O-Rings in EPDM Code	Taper tube in Polyamid O-rings in EPDM Code	Taper tube in Polysulfone O-rings in EPDM Code
50 - 500	32	25	**198 350 100**	**198 350 120**	**198 350 140**
100 - 1000	32	25	**198 350 101**	**198 350 121**	**198 350 141**
150 - 1500	40	32	**198 350 102**	**198 350 122**	**198 350 142**
250 - 2500	40	32	**198 350 103**	**198 350 123**	**198 350 143**
200 - 2000	50	40	**198 350 104**	**198 350 124**	**198 350 144**
300 - 3000	50	40	**198 350 105**	**198 350 125**	**198 350 145**
600 - 6000	50	40	**198 350 106**	**198 350 126**	**198 350 146**
600 - 6000	63	50	**198 350 107**	**198 350 127**	**198 350 147**
1000 - 10000	63	50	**198 350 108**	**198 350 128**	**198 350 148**
1500 - 15000	63	50	**198 350 109**	**198 350 129**	**198 350 149**
2000 - 20000	75	65	**198 350 110**	**198 350 130**	**198 350 150**
3000 - 30000	75	65	**198 350 111**	**198 350 131**	**198 350 151**
8000 - 60000	75	65	**198 350 112**	**198 350 132**	**198 350 152**

Scale range [l/h]	D [mm]	L [mm]	L1 [mm]	L2 [mm]	G [inch]
50 - 500	58	400	356	350	1 ½
100 - 1000	58	400	356	350	1 ½
150 - 1500	72	408	356	350	2
250 - 2500	72	408	356	350	2
200 - 2000	83	418	356	350	2 ¼
300 - 3000	83	418	356	350	2 ¼
600 - 6000	83	418	356	350	2 ¼
600 - 6000	101	432	356	350	2 ¾
1000 - 10000	101	432	356	350	2 ¾
1500 - 15000	101	432	356	350	2 ¾
2000 - 20000	135	444	356	350	3 ½
3000 - 30000	135	444	356	350	3 ½
8000 - 60000	135	444	356	350	3 ½



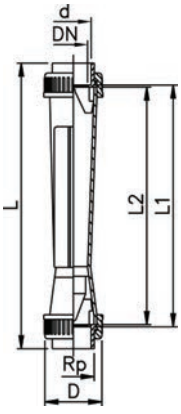
Short version
Float in PVDF without magnet
With solvent cement sockets PVC-U metric

Model:

- Union nuts and valve ends in other materials on request

Type	d [mm]	DN [mm]	Scale range [l/h]	Taper tube in Polysulfone O-rings in EPDM Code	Taper tube in PVC-U transp. O-rings in EPDM Code
SK 50	16	10	2.5 - 25	**198 801 880**	**198 803 310**
SK 51	16	10	5 - 50	**198 801 881**	**198 803 311**
SK 52	16	10	10 - 100	**198 801 882**	**198 803 312**
SK 60	20	15	8 - 80	**198 801 883**	**198 803 313**
SK 61	20	15	15 - 150	**198 801 884**	**198 803 314**
SK 62	20	15	20 - 200	**198 801 885**	**198 803 315**
SK 70	32	25	15 - 150	**198 801 886**	**198 803 316**
SK 71	32	25	30 - 300	**198 801 887**	**198 803 317**
SK 72	32	25	50 - 500	**198 801 888**	**198 803 318**
SK 73	32	25	100 - 1000	**198 801 889**	**198 803 319**

Type	D [mm]	L [mm]	L1 [mm]	L2 [mm]	Rp [inch]
SK 50	35	199	171	165	⅜
SK 51	35	199	171	165	⅜
SK 52	35	199	171	165	⅜
SK 60	43	223	191	185	½
SK 61	43	223	191	185	½
SK 62	43	223	191	185	½
SK 70	60	250	206	200	1
SK 71	60	250	206	200	1
SK 72	60	250	206	200	1
SK 73	60	250	206	200	1



Short version
Float in PVDF with magnet
With solvent cement sockets PVC-U metric

Model:

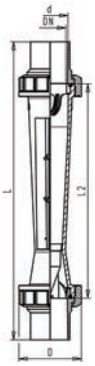
- Union nuts and valve ends in other materials on request
- Suitable limit switches see accessories for variable area flow meters

Type	d [mm]	DN [mm]	Scale range [l/h]	Taper tube in Polysulfone O-rings in EPDM Code	Taper tube in PVC-U transp. O-rings in EPDM Code
SK 500	16	10	2.5 - 25	**198 801 890**	**198 803 320**
SK 510	16	10	5 - 50	**198 801 891**	**198 803 321**
SK 520	16	10	10 - 100	**198 801 892**	**198 803 322**
SK 600	20	15	8 - 80	**198 801 893**	**198 803 323**
SK 610	20	15	15 - 150	**198 801 894**	**198 803 324**
SK 620	20	15	20 - 200	**198 801 895**	**198 803 325**
SK 700	32	25	15 - 150	**198 801 896**	**198 803 326**
SK 710	32	25	30 - 300	**198 801 897**	**198 803 327**
SK 720	32	25	50 - 500	**198 801 898**	**198 803 328**
SK 730	32	25	100 - 1000	**198 801 899**	**198 803 329**

Type	D [mm]	L [mm]	L1 [mm]	L2 [mm]	Rp [inch]
SK 500	35	199	171	165	⅜
SK 510	35	199	171	165	⅜
SK 520	35	199	171	165	⅜
SK 600	43	223	191	185	½
SK 610	43	223	191	185	½
SK 620	43	223	191	185	½
SK 700	60	250	206	200	1
SK 710	60	250	206	200	1
SK 720	60	250	206	200	1
SK 730	60	250	206	200	1

Special version PVDF-HP
Float in PTFE without magnet
With fusion spigots BCF/IR

Type	d [mm]	DN [mm]	Scale range [l/h]	Scale range [gal/min]	Taper tube in Polysulfone O-rings in FPM Code
SK 70	32	25	68 - 204	0.3-0.9	**198 807 209**
SK 71	32	25	90 - 295	0.4-1.3	**198 807 210**
SK 73	32	25	136 - 795	0.6-3.5	**198 807 202**
SK 20	50	40	568 - 2273	2.5-10.0	**198 807 203**
SK 21	50	40	909 - 4091	4.0-18.0	**198 807 204**
SK 30	63	50	1000 - 8142	4.4-36.0	**198 807 205**
SK 31	63	50	1000 - 9091	4.4-40.0	**198 807 206**
SK 40	75	65	1848 - 11364	8.0-50.0	**198 807 207**
SK 41	75	65	2273 - 16364	10.0-72.0	**198 807 208**

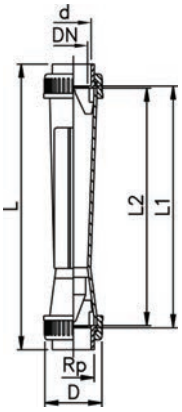


Type	D [mm]	L [mm]	L1 [mm]	L2 [mm]	Rp [inch]
SK 70	60	318		200	1
SK 71	60	318		200	1
SK 73	60	318		200	1
SK 20	83	466		335	1 ½
SK 21	83	466		335	1 ½
SK 30	103	472		335	2
SK 31	103	472		335	2
SK 40	122	495		335	2 ½
SK 41	122	495		335	2 ½

Special version PVDF
Float in PVDF (red) without magnet

Dimension L and L1 only valid for socket connection
Dimension L2 describes taper tube length

Type	d [mm]	DN [mm]	Scale range [l/h]	Taper tube in PVDF O-rings in FPM fusion socket Code	Taper tube in PVDF O-rings in FPM IR fusion spigot Code
SK 10	32	25	50 - 500	**198 806 466**	**198 803 905**
SK 11	32	25	100 - 1000	**198 806 467**	**198 803 906**
SK 20	50	40	200 - 2000	**198 806 468**	**198 803 907**
SK 21	50	40	300 - 3000	**198 806 469**	**198 803 908**
SK 30	63	50	600 - 6000	**198 806 470**	**198 803 909**
SK 31	63	50	1200 - 12000	**198 806 471**	**198 803 910**
SK 40	75	65	2000 - 20000	**-**	**198 803 911**
SK 41	75	65	3000 - 30000	**-**	**198 803 912**



Type	D [mm]	L [mm]	L (IR-SS) [mm]	L1 [mm]	L2 [mm]	Rp [inch]
SK 10	60	385	443	341	335	1
SK 11	60	385	443	341	335	1
SK 20	83	403	459	341	335	1 ½
SK 21	83	403	459	341	335	1 ½
SK 30	103	417	461	339	335	2
SK 31	103	417	461	339	335	2
SK 40	122	429	453	341	335	2 ½
SK 41	122	429	453	341	335	2 ½

Accessories

Limit contacts

Variable area flow meters from George Fischer are equipped with two dovetail shafts. For external electrical monitoring, these can be used for fitting magnetically actuated limit contacts.

Function of the limit contact (GK)

The limit contact serves to monitor externally the limited flow values and can be adjusted to any flow value on the corresponding scale. The magnet built into the float closes or opens a reed contact in the limit contact. This is a bistable switching function because the switching status remains when the float is taken from the contact.

Note: When subsequently mounting limit contacts, mind that you have to replace the standard float with a magnetic float.

The limit contacts GK10/ GK11 are only suitable for the VAFM type 335/ 350 as well as the short version of the existing range. The same contact type can not be used for monitoring both the min. and max. levels (GK 10min / GK11 max).

Assembly instructions contacts

1. Replace the float with a magnetic float.
2. Position the limit contact on the dovetail shaft of the VAFM.
3. Tighten fastening screw.

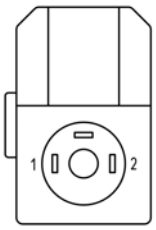
Mode of operation of contacts

Position of float in relation to limit contacts:

	Top	Bottom
max. contact (GK11)	closed	open
min. contact (GK10)	open	closed

The contacts remain in these positions, even if the float leaves the contact concerned. When the float moves back to the desired position, the corresponding contact is deactivated.

Technical data to contacts



Connection: Standard plug DIN 40050
Contact fitted: Reed contact
Mode of protection: IP 65
Max. voltage: 230 V
Max. continuous current: 0.2 A
Peak switch-on current: 0.5 A

For use with inductive loads, use a relay to protect the contacts

4-20 mA Sensor Type GK 15

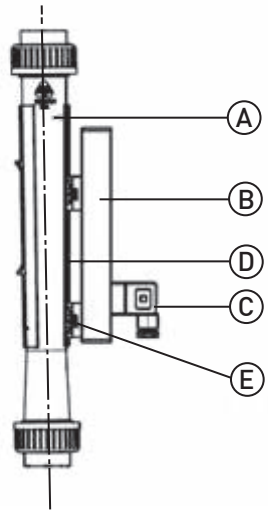
Description

The Sensor GK15 is developed from the measurement sensor GK05. Other than the old model, no reed-sensors are used for the production of the GK15, but a special and new developed electronic system with microprocessor and sensors. The sensor provides an output signal of 4 - 20 mA, according to the level setting of the magnetic float in the flow meter. This signal could be used by a SPS to control processes or to show the precise flow-rate on an external display.

Caution

Since the resolution of the scales differs in the settings, the sensor is programmed individually for each measurement range ex-works.
Therefore, you need to identify your required measurement range when you place the order.

Function elements GK 15

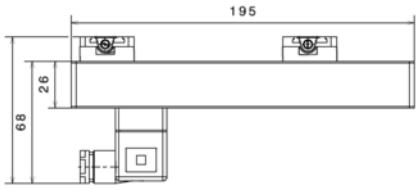


A: GF Flow meter M335 / M350 with magnet float
B: Sensor GK15
C: Cable plug
D: Dove tail
E: Clamping screws, for the sensor adjustment and the attachment

Assembly instructions GK 15

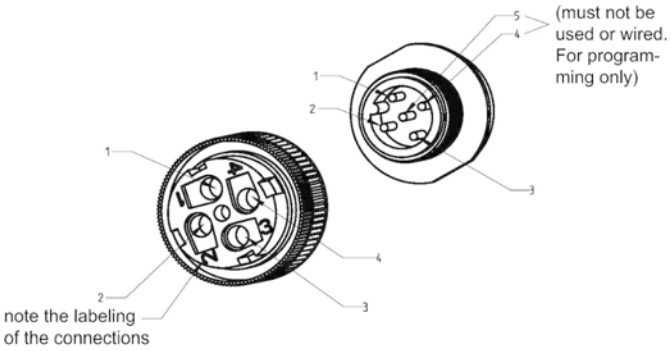
1. Position the sensor on the dove tail guide of the flow meter.
2. Adjust the notch on the sensor to the 50 % mark on the scale (see picture).
3. Tighten the clamping screws.
4. Take off the plug and wire it according description (see electrical connection).

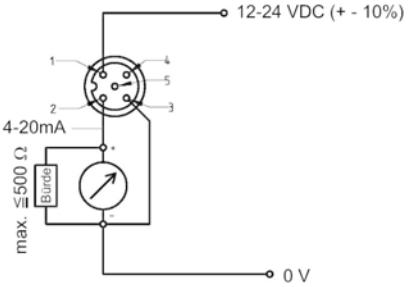
Dimensions



Technical data to sensor GK 15

Wiring diagram of the measurement sensor Z60



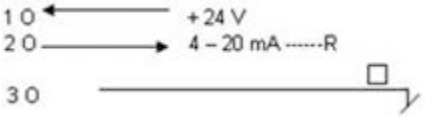


Technical data

Supply voltage:	12-24 VDC (+ - 10%)
Current consumption:	<50 mA
Load resistor:	Min. 0 max. 500 Ω
Current output:	4-20 mA (3 wire)
Safety class:	IP65
Ambient temperature:	0 °C to +50 °C
Connection:	Plug DIN 43650
Measurement accuracy:	<1%

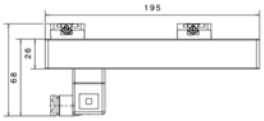
Electrical connection

Pin1: Supply voltage 12-24 V
Pin2: Output signal 4-20 mA
Pin3: 0 V



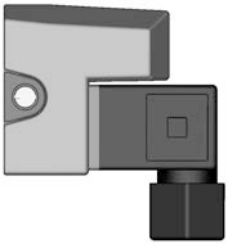
Pin4: must not be used or wired. For programming only.

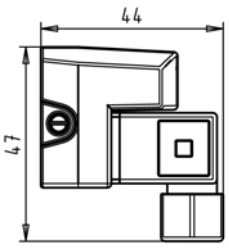
Pin5: must not be used or wired. For programming only.



4-20 mA sensor
For type 335 and type 350

Type	d [mm]	DN [mm]	Corresponds to water scale [l/h]	Code
GK 15	32	25	50-500	**198 335 962**
GK 15	32	25	100-1000	**198 335 963**
GK 15	40	32	150-1500	**198 335 964**
GK 15	40	32	250-2500	**198 335 965**
GK 15	50	40	200-2000	**198 335 966**
GK 15	50	40	300-3000	**198 335 967**
GK 15	50	40	600-6000	**198 335 968**
GK 15	63	50	600-6000	**198 335 969**
GK 15	63	50	1000-10000	**198 335 991**
GK 15	63	50	1500-15000	**198 335 992**
GK 15	75	65	2000-20000	**198 335 993**
GK 15	75	65	3000-30000	**198 335 994**
GK 15	75	65	8000-60000	**198 335 995**





Limit contacts GK10/GK11
For type 335/350 and short version

Type	Code
GK10 (min.)	**198 335 960**
GK11 (max.)	**198 335 961**

Special scale for type 335/350 l/h

d [mm]	DN [mm]	Scale range [l/h]	Code
32	25	50-500	**198 335 861**
32	25	100-1000	**198 335 862**
40	32	150-1500	**198 335 863**
40	32	250-2500	**198 335 864**
50	40	200-2000	**198 335 865**
50	40	300-3000	**198 335 866**
50	40	600-6000	**198 335 867**
63	50	600-6000	**198 335 868**
63	50	1000-10000	**198 335 869**
63	50	1500-15000	**198 335 870**
75	65	2000-20000	**198 335 871**
75	65	3000-30000	**198 335 872**
75	65	8000-60000	**198 335 873**

Special scale for type 335/350 % for H2O

d [mm]	DN [mm]	Scale range	Corresponds to water scale [l/h]	Code
32	25	10-100 %	50-500	**198 335 084**
32	25	10-100 %	100-1000	**198 335 083**
40	32	10-100 %	150-1500	**198 335 069**
40	32	10-100 %	250-2500	**198 335 068**
50	40	10-100 %	200-2000	**198 335 054**
50	40	10-100 %	300-3000	**198 335 053**
50	40	10-100 %	600-6000	**198 335 039**
63	50	10-100 %	600-6000	**198 335 038**
63	50	10-100 %	1000-10000	**198 335 037**
63	50	10-100 %	1500-15000	**198 335 036**
75	65	10-100 %	2000-20000	**198 335 035**
75	65	10-100 %	3000-30000	**198 335 034**
75	65	13.3-100 %	8000-60000	**198 335 033**

Special scale for type 335/350 m3/h

d [mm]	DN [mm]	Scale range [m³/h]	Corresponds to water scale [l/h]	Code
32	25	0.05 - 0.5	50 - 500	**198 335 655**
32	25	0.1 - 1	100 - 1000	**198 335 656**
40	32	0.15 - 1.5	150 - 1500	**198 335 657**
40	32	0.25 - 2.5	250 - 2500	**198 335 658**
50	40	0.2 - 2.0	200 - 2000	**198 335 659**
50	40	0.3 - 3	300 - 3000	**198 335 660**
50	40	0.6 - 6	600 - 6000	**198 335 661**
63	50	0.6 - 6	600 - 6000	**198 335 662**
63	50	1 - 10	1000 - 10000	**198 335 663**
63	50	1.5 - 15	1500 - 15000	**198 335 664**
75	65	2 - 20	2000 - 20000	**198 335 665**
75	65	3 - 30	3000 - 30000	**198 335 666**
75	65	8 - 60	8000 - 60000	**198 335 667**

Special scale for type 335/350 Imp. GPM

d [mm]	DN [mm]	Scale range [gal/min]	Corresponds to water scale [l/h]	Code
32	25	0,183 - 1,83	50-500	**198 335 670**
32	25	0,366 - 3,66	100-1000	**198 335 671**
40	32	0,55 - 5,5	150-1500	**198 335 672**
40	32	0,916 - 9,16	250-2500	**198 335 673**
50	40	0,733 - 7,33	200-2000	**198 335 674**
50	40	1,09 - 10,9	300-3000	**198 335 675**
50	40	2,19 - 21,9	600-6000	**198 335 676**
63	50	2,2 - 22	600-6000	**198 335 677**
63	50	3,66 - 36,6	1000-10000	**198 335 678**
63	50	5,49 - 54,9	1500-15000	**198 335 679**
75	65	7,32 - 73,2	2000-20000	**198 335 680**
75	65	10,98 - 109,8	3000-30000	**198 335 681**
75	65	29,28 - 219,6	8000-60000	**198 335 682**

Special scale for type 335/350 US GPM

d [mm]	DN [mm]	Scale range [gal/min]	Corresponds to water scale [l/h]	Code
32	25	0.22 - 2.2	50 - 500	**198 335 685**
32	25	0.44 - 4.4	100 - 1000	**198 335 686**
40	32	0.66 - 6.6	150 - 1500	**198 335 687**
40	32	1.1 - 11	250 - 2500	**198 335 688**
50	40	0.88 - 8.8	200 - 2000	**198 335 689**
50	40	1.32 - 13.2	300 - 3000	**198 335 690**
50	40	2.64 - 26.4	600 - 6000	**198 335 691**
63	50	2.64 - 26.4	600 - 6000	**198 335 692**
63	50	4.40 - 44.02	1000 - 10000	**198 335 693**
63	50	6.60 - 66.04	1500 - 15000	**198 335 694**
75	65	8.80 - 88	2000 - 20000	**198 335 695**
75	65	13.20 - 132	3000 - 30000	**198 335 696**
75	65	35.2 - 264	8000 - 60000	**198 335 697**

Special scale for type 335/350 Air/0bar/Nm3/h

d [mm]	DN [mm]	Scale range [m³/h]	Corresponds to water scale [l/h]	Code
32	25	1.5 - 14	50 - 500	**198 350 655**
32	25	2.5 - 29	100 - 1000	**198 350 656**
40	32	4 - 45	150 - 1500	**198 350 657**
40	32	7 - 79	250 - 2500	**198 350 658**
50	40	6 - 58	200 - 2000	**198 350 659**
50	40	9 - 108	300 - 3000	**198 350 660**
50	40	17 - 174	600 - 6000	**198 350 661**
63	50	17 - 175	600 - 6000	**198 350 662**
63	50	29 - 301	1000 - 10000	**198 350 663**
63	50	53 - 405	1500 - 15000	**198 350 664**
75	65	55 - 545	2000 - 20000	**198 350 665**
75	65	80 - 758	3000 - 30000	**198 350 666**
75	65	-	8000 - 60000	**198 350 667**

Special scale for type 335/350
HCl 30-33% l/h

d [mm]	DN [mm]	Scale range [l/h]	Corresponds to water scale [l/h]	Code
32	25	20 - 405	50-500	**198 350 670**
32	25	55 - 866	100-1000	**198 350 671**
40	32	90 - 1340	150-1500	**198 350 672**
40	32	165 - 2310	250-2500	**198 350 673**
50	40	115 - 1660	200-2000	**198 350 674**
50	40	190 - 3050	300-3000	**198 350 675**
50	40	420 - 4900	600-6000	**198 350 676**
63	50	430 - 5090	600-6000	**198 350 677**
63	50	750 - 9460	1000-10000	**198 350 678**
63	50	1415 - 11570	1500-15000	**198 350 679**
75	65	1500 - 17300	2000-20000	**198 350 680**
75	65	2175 - 24120	3000-30000	**198 350 681**
75	65	-	8000-60000	**198 350 682**

Special scale for type 335/350
NaOH 30% l/h

d [mm]	DN [mm]	Scale range [l/h]	Corresponds to water scale [l/h]	Code
32	25	4 - 226	50-500	**198 350 685**
32	25	15 - 600	100-1000	**198 350 686**
40	32	30 - 970	150-1500	**198 350 687**
40	32	70 - 1800	250-2500	**198 350 688**
50	40	35 - 1240	200-2000	**198 350 689**
50	40	75 - 2370	300-3000	**198 350 690**
50	40	230 - 4000	600-6000	**198 350 691**
63	50	240 - 4700	600-6000	**198 350 692**
63	50	475 - 7340	1000-10000	**198 350 693**
63	50	1030 - 10330	1500-15000	**198 350 694**
75	65	915 - 11720	2000-20000	**198 350 695**
75	65	1195 - 16040	3000-30000	**198 350 696**
75	65	-	8000-60000	**198 350 697**

Special scale for type 335/350
NaOH 50% l/h

d [mm]	DN [mm]	Scale range [l/h]	Corresponds to water scale [l/h]	Code
32	25	1 - 55	50-500	**198 350 755**
32	25	3 - 192	100-1000	**198 350 756**
40	32	6 - 365	150-1500	**198 350 757**
40	32	15 - 770	250-2500	**198 350 758**
50	40	8 - 520	200-2000	**198 350 759**
50	40	15 - 1170	300-3000	**198 350 760**
50	40	50 - 2270	600-6000	**198 350 761**
63	50	55 - 2300	600-6000	**198 350 762**
63	50	140 - 4340	1000-10000	**198 350 763**
63	50	420 - 5820	1500-15000	**198 350 764**
75	65	245 - 7590	2000-20000	**198 350 765**
75	65	400 - 11120	3000-30000	**198 350 766**
75	65	-	8000-60000	**198 350 767**

Special scale for short version
Water l/h

Type	Scale range [l/h]	Code
SK 50 / 500	2.5 - 25.0	**198 801 386**
SK 51 / 510	5.0 - 50.0	**198 801 387**
SK 52 / 520	10.0 - 100.0	**198 801 388**
SK 60 / 600	8.0 - 80.0	**198 801 389**
SK 61 / 610	15.0 - 150.0	**198 801 390**
SK 62 / 620	20.0 - 200.0	**198 801 391**
SK 70 / 700	15.0 - 150.0	**198 801 392**
SK 71 / 710	30.0 - 300.0	**198 801 393**
SK 72 / 720	50.0 - 500.0	**198 801 394**
SK 73 / 730	100.0 - 1000.0	**198 801 395**

Special scale for short version
US GPM

Type	Scale range [gal/min]	Code
SK 50 / 500	0,01 - 0,11	**198 801 961**
SK 51 / 510	0,02 - 0,22	**198 801 962**
SK 52 / 520	0,04 - 0,44	**198 801 963**
SK 60 / 600	0,03 - 0,35	**198 801 964**
SK 61 / 610	0,06 - 0,66	**198 801 965**
SK 62 / 620	0,08 - 0,88	**198 801 966**
SK 70 / 700	0,06 - 0,66	**198 801 967**
SK 71 / 710	0,13 - 1,32	**198 801 968**
SK 72 / 720	0,22 - 2,20	**198 801 969**
SK 73 / 730	0,44 - 4,40	**198 801 970**

Special scale for short version
Air/0bar/Nm3/h

Type	Scale range [m³/h]	Code
SK 50 / 500	0,5 - 0,95	**198 801 308**
SK 51 / 510	0,5 - 1,9	**198 801 309**
SK 52 / 520	0,8 - 3,0	**198 801 310**
SK 60 / 600	0,6 - 2,8	**198 801 311**
SK 61 / 610	1,4 - 5,6	**198 801 312**
SK 62 / 620	1,5 - 7,0	**198 801 313**
SK 70 / 700	1,0 - 6,5	**198 801 314**
SK 71 / 710	1,5 - 11,0	**198 801 315**
SK 72 / 720	3,0 - 18,0	**198 801 316**
SK 73 / 730	6,0 - 30,0	**198 801 317**

Special scale for short version
HCl 30 - 33% l/h

Type	Scale range [l/h]	Code
SK 50 / 500	2,5 - 20	**198 806 511**
SK 51 / 510	5 - 40	**198 806 512**
SK 52 / 520	10 - 85	**198 806 513**
SK 60 / 600	8 - 70	**198 806 514**
SK 61 / 610	15 - 125	**198 806 515**
SK 62 / 620	20 - 170	**198 806 516**
SK 70 / 700	5 - 125	**198 806 517**
SK 71 / 710	30 - 260	**198 806 518**
SK 72 / 720	50 - 425	**198 806 519**
SK 73 / 730	100 - 850	**198 806 520**

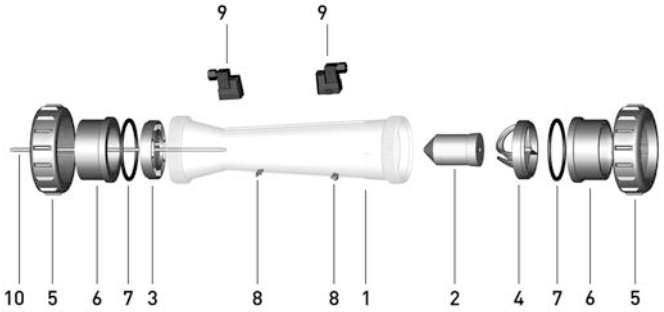
Special scale for short version NaOH 30% l/h

Type	Scale range [l/h]	Code
SK 50 / 500	0.2 - 5	**198 806 521**
SK 51 / 510	1 - 14	**198 806 522**
SK 52 / 520	3 - 35	**198 806 523**
SK 60 / 600	2 - 23	**198 806 524**
SK 61 / 610	3 - 55	**198 806 525**
SK 62 / 620	5 - 80	**198 806 526**
SK 70 / 700	3 - 55	**198 806 527**
SK 71 / 710	6 - 130	**198 806 528**
SK 72 / 720	10 - 250	**198 806 529**
SK 73 / 730	40 - 590	**198 806 530**

Special scale for short version NaOH 50% l/h

Type	Scale range [l/h]	Code
SK 60 / 600	0,2 - 3,5	**198 806 531**
SK 61 / 610	0,5 - 10	**198 806 532**
SK 62 / 620	0,5 - 16	**198 806 533**
SK 70 / 700	0,5 - 11	**198 806 534**
SK 71 / 710	1 - 33	**198 806 535**
SK 72 / 720	2 - 80	**198 806 536**
SK 73 / 730	10 - 220	**198 806 537**

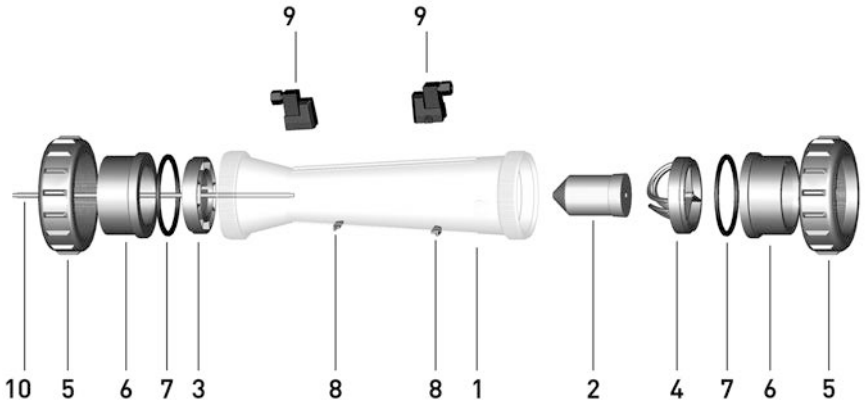
Spare Parts for Type 335/350



Pos.	Item	Quantity
1	Taper tube	1
2	Float	1
3	Bottom insert	1
4	Top insert	1
5	Union nut	2
6	Union end	2
7	O-Ring	2
8	Flow value indicator	2
9*	Limit contact	2
10**	Guiding rod	1

* optional
** only for DN50 (1500-15000 l/h) and DN65
(all metering ranges)

Variable area flow meter type 335



Taper tube with water scale (1)

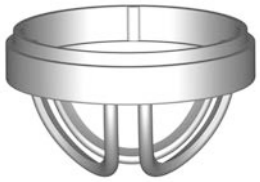
- PVC-U transparent

Scale range [l/h]	d [mm]	Inch	DN [mm]	PVC-U transparent Code	Polyamid Code	Polysulfon Code
50 - 500	32	1	25	**198 335 055**	**198 335 070**	**198 335 085**
100 - 1000	32	1	25	**198 335 056**	**198 335 071**	**198 335 086**
150 - 1500	40	1 ¼	32	**198 335 057**	**198 335 072**	**198 335 087**
250 - 2500	40	1 ¼	32	**198 335 058**	**198 335 073**	**198 335 088**
200 - 2000	50	1 ½	40	**198 335 059**	**198 335 074**	**198 335 089**
300 - 3000	50	1 ½	40	**198 335 060**	**198 335 075**	**198 335 090**
600 - 6000	50	1 ½	40	**198 335 061**	**198 335 076**	**198 335 091**
600 - 6000	63	2	50	**198335062***	**198 335 077**	**198 335 092**
1000 - 10000	63	2	50	**198335063***	**198 335 078**	**198 335 093**
1500 - 15000	63	2	50	**198335064***	**198 335 079**	**198 335 094**
2000 - 20000	75	2 ½	65	**198335065***	**198 335 080**	**198 335 095**
3000 - 30000	75	2 ½	65	**198335066***	**198 335 081**	**198 335 096**
8000 - 60000	75	2 ½	65	**198335067***	**198 335 082**	**198 335 097**

Taper tube without scale (1)

- PVC-U transparent

Scale range [l/h]	d [mm]	Inch	DN [mm]	PVC-U transparent Code	Polyamid Code	Polysulfon Code
50 - 500	32	1	25	**198 335 255**	**198 335 270**	**198 335 285**
100 - 1000	32	1	25	**198 335 256**	**198 335 271**	**198 335 286**
150 - 1500	40	1 ¼	32	**198 335 257**	**198 335 272**	**198 335 287**
250 - 2500	40	1 ¼	32	**198 335 258**	**198 335 273**	**198 335 288**
200 - 2000	50	1 ½	40	**198 335 259**	**198 335 274**	**198 335 289**
300 - 3000	50	1 ½	40	**198 335 260**	**198 335 275**	**198 335 290**
600 - 6000	50	1 ½	40	**198 335 261**	**198 335 276**	**198 335 291**
600 - 6000	63	2	50	**198335262***	**198 335 277**	**198 335 292**
1000 - 10000	63	2	50	**198335263***	**198 335 278**	**198 335 293**
1500 - 15000	63	2	50	**198335264***	**198 335 279**	**198 335 294**
2000 - 20000	75	2 ½	65	**198335265***	**198 335 280**	**198 335 295**
3000 - 30000	75	2 ½	65	**198335266***	**198 335 281**	**198 335 296**
8000 - 60000	75	2 ½	65	**198335267***	**198 335 282**	**198 335 297**



Insert PVDF (3,4)

Scale range [l/h]	d [mm]	Inch	DN [mm]	top (4) Code	bottom (3) Code	bottom (3) for PEEK guiding rod Code	
50 - 500	32	1	25	**198 335 970**	**198 335 977**		
100 - 1000	32	1	25	**198 335 970**	**198 335 977**		
150 - 1500	40	1 ¼	32	**198 335 971**	**198 335 978**		
250 - 2500	40	1 ¼	32	**198 335 971**	**198 335 978**		
200 - 2000	50	1 ½	40	**198 335 972**	**198 335 979**		
300 - 3000	50	1 ½	40	**198 335 972**	**198 335 979**		
600 - 6000	50	1 ½	40	**198 335 972**	**198 335 979**		
600 - 6000	63	2	50	**198 335 973**	**198 335 980**		
1000 - 10000	63	2	50	**198 335 973**	**198 335 980**		
1500 - 15000	63	2	50	**198 335 974**		**198 335 982**	
2000 - 20000	75	2 ½	65	**198 335 975**		**198 335 981**	
3000 - 30000	75	2 ½	65	**198 335 975**		**198 335 981**	
8000 - 60000	75	2 ½	65	**198 335 975**		**198 335 981**	

Scale range [l/h]	d [mm]	Inch	DN [mm]	bottom (3) for PVDF/SS guiding rod Code	
50 - 500	32	1	25		
100 - 1000	32	1	25		
150 - 1500	40	1 ¼	32		
250 - 2500	40	1 ¼	32		
200 - 2000	50	1 ½	40		
300 - 3000	50	1 ½	40		
600 - 6000	50	1 ½	40		
600 - 6000	63	2	50		
1000 - 10000	63	2	50		
1500 - 15000	63	2	50	**198 335 893**	
2000 - 20000	75	2 ½	65	**198 335 894**	
3000 - 30000	75	2 ½	65	**198 335 894**	
8000 - 60000	75	2 ½	65	**198 335 894**	

Float PVDF (2)

Scale range [l/h]	d [mm]	Inch	DN [mm]	Without magnet Code	With magnet (bistabil) Code	
50 - 500	32	1	25	**198 335 455**	**198 335 470**	
100 - 1000	32	1	25	**198 335 455**	**198 335 470**	
150 - 1500	40	1 ¼	32	**198 335 455**	**198 335 470**	
250 - 2500	40	1 ¼	32	**198 335 455**	**198 335 470**	
200 - 2000	50	1 ½	40	**198 335 456**	**198 335 471**	
300 - 3000	50	1 ½	40	**198 335 457**	**198 335 471**	
600 - 6000	50	1 ½	40	**198 335 457**	**198 335 471**	
600 - 6000	63	2	50	**198 335 457**	**198 335 471**	
1000 - 10000	63	2	50	**198 335 457**	**198 335 471**	
1500 - 15000	63	2	50	**198 335 458**	**198 335 472**	
2000 - 20000	75	2 ½	65	**198 335 459**	**198 335 473**	
3000 - 30000	75	2 ½	65	**198 335 459**	**198 335 473**	
8000 - 60000	75	2 ½	65	**198 335 460**	**198 335 474**	

Guiding rod (10)

Model:

- Only for DN50 (1'500 - 15'000 l/h) and DN65 (all metering ranges)

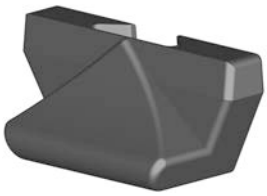
Scale range [l/h]	d [mm]	Inch	DN [mm]	Peek Code	Stainless steel Code	PVDF Code	
1500 - 15000	63	2	50	**198 335 985**	**198 335 098**	**198 335 984**	
2000 - 20000	75	2 ½	65	**198 335 985**	**198 335 098**	**198 335 984**	
3000 - 30000	75	2 ½	65	**198 335 985**	**198 335 098**	**198 335 984**	
8000 - 80000	75	2 ½	65	**198 335 985**	**198 335 098**	**198 335 984**	

Insert guiding rod PVDF (for 10)

Model:

- Only for DN50 (1'500 - 15'000 l/h) and DN65 (all metering ranges)

Scale range [l/h]	d [mm]	Inch	DN [mm]	for PEEK Code	for PVDF/SS Code
1500 - 15000	63	2	50	**198 335 986**	**198 335 953**
2000 - 20000	75	2 ½	65	**198 335 987**	**198 335 954**
3000 - 30000	75	2 ½	65	**198 335 987**	**198 335 954**
8000 - 60000	75	2 ½	65	**198 335 987**	**198 335 954**

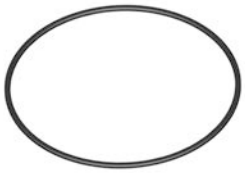


Flow value indicator PS (8)

Model:

- For all dimensions type 335/350

d [mm]	Inch	DN [mm]	Flow value indicator Code
32	1	25	**198 335 990**
40	1 ¼	32	**198 335 990**
50	1 ½	40	**198 335 990**
63	2	50	**198 335 990**
75	2 ½	65	**198 335 990**



O-rings (7)

d [mm]	Inch	DN [mm]	EPDM Code	FPM Code
32	1	25	**748 410 008**	**749 410 008**
40	1 ¼	32	**748 410 009**	**749 410 009**
50	1 ½	40	**748 410 010**	**749 410 010**
63	2	50	**748 410 011**	**749 410 011**
75	2 ½	65	**748 410 014**	**749 410 014**

Union nut (5)

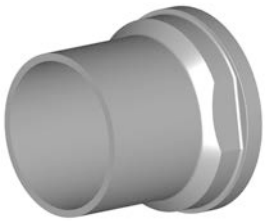
Union nut not useable for the special version with taper tube in PVDF

d [mm]	Inch	DN [mm]	PVC-U Code	PVC-C Code	ABS Code	PP-H Code	PVDF Code
32	1	25	**721 690 008**	**723 690 008**	**729 690 408**	**727 690 408**	**735 690 408**
40	1 ¼	32	**721 690 009**	**723 690 009**	**729 690 409**	**727 690 409**	**735 690 409**
50	1 ½	40	**721 690 010**	**723 690 010**	**729 690 410**	**727 690 410**	**735 690 410**
63	2	50	**721 690 011**	**723 690 011**	**729 690 411**	**727 690 411**	**735 690 411**
75	2 ½	65	**198 806 429**	**-**	**-**	**198 806 421**	**198 806 422**

Union end / Socket (6)

For DN65 PVDF only spigot

d [mm]	Inch	DN [mm]	PVC-U Code	PVC-C Code	ABS Code	PP-H Code	PVDF Code
32	1	25	**721 600 108**	**723 600 108**	**729 600 108**	**727 600 108**	**735 600 108**
40	1 ¼	32	**721 600 109**	**723 600 109**	**729 600 109**	**727 600 109**	**735 600 109**
50	1 ½	40	**721 600 110**	**723 600 110**	**729 600 110**	**727 600 110**	**735 600 110**
63	2	50	**721 600 111**	**723 600 111**	**729 600 111**	**727 600 111**	**735 600 111**
75	2 ½	65	**721 600 112**	**700 253 867**	**700 246 112**	**700 253 866**	**-**



Union end / Spigot (6)

d [mm]	Inch	DN [mm]	PP-H Code	PVDF Code
32	1	25	**727 608 508**	**735 608 608**
40	1 ¼	32	**727 608 509**	**735 608 609**
50	1 ½	40	**727 608 510**	**735 608 610**
63	2	50	**727 608 511**	**735 608 611**
75	2 ½	65	**700 256 401**	**175 483 013**

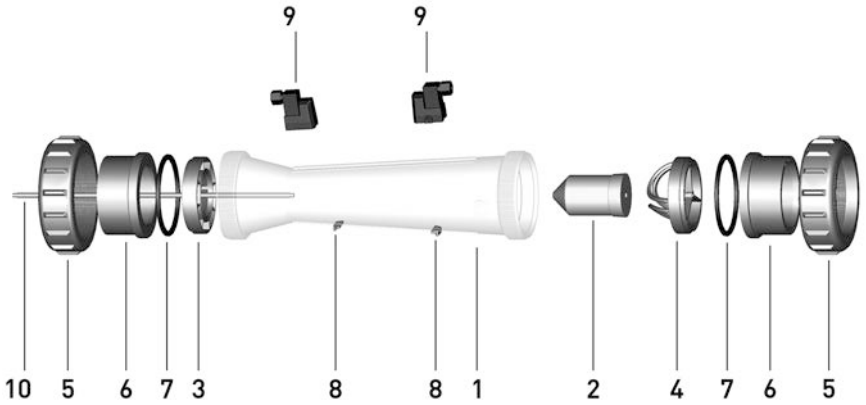
Exchange kit

Model:

- Exchange kit consisting of: guiding rod, insert guiding rod and insert bottom
- Only for DN50 (1'500 - 15'000 l/h) and DN65 (all metering ranges)

Scale range [l/h]	d [mm]	Inch	DN [mm]	Code
1500 - 15000	63	2	50	**198 335 895**
2000 - 20000	75	2 ½	65	**198 335 896**
3000 - 30000	75	2 ½	65	**198 335 896**
8000 - 80000	75	2 ½	65	**198 335 896**

Variable area flow meter type 350



Taper tube with water scale (1)

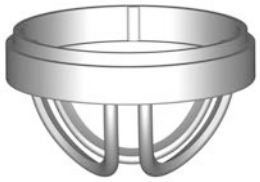
- PVC-U transparent

Scale range [l/h]	d [mm]	Inch	DN [mm]	PVC-U transparent Code	Polyamid Code	Polysulfon Code
50 - 500	32	1	25	**198 350 055**	**198 350 070**	**198 350 085**
100 - 1000	32	1	25	**198 350 056**	**198 350 071**	**198 350 086**
150 - 1500	40	1 ¼	32	**198 350 057**	**198 350 072**	**198 350 087**
250 - 2500	40	1 ¼	32	**198 350 058**	**198 350 073**	**198 350 088**
200 - 2000	50	1 ½	40	**198 350 059**	**198 350 074**	**198 350 089**
300 - 3000	50	1 ½	40	**198 350 060**	**198 350 075**	**198 350 090**
600 - 6000	50	1 ½	40	**198 350 061**	**198 350 076**	**198 350 091**
600 - 6000	63	2	50	**198350062***	**198 350 077**	**198 350 092**
1000 - 10000	63	2	50	**198350063***	**198 350 078**	**198 350 093**
1500 - 15000	63	2	50	**198350064***	**198 350 079**	**198 350 094**
2000 - 20000	75	2 ½	65	**198350065***	**198 350 080**	**198 350 095**
3000 - 30000	75	2 ½	65	**198350066***	**198 350 081**	**198 350 096**
8000 - 60000	75	2 ½	65	**198350067***	**198 350 082**	**198 350 097**

Taper tube without scale (1)

- PVC-U transparent

Scale range [l/h]	d [mm]	Inch	DN [mm]	PVC-U transparent Code	Polyamid Code	Polysulfon Code
50 - 500	32	1	25	**198 350 255**	**198 350 270**	**198 350 285**
100 - 1000	32	1	25	**198 350 256**	**198 350 271**	**198 350 286**
150 - 1500	40	1 ¼	32	**198 350 257**	**198 350 272**	**198 350 287**
250 - 2500	40	1 ¼	32	**198 350 258**	**198 350 273**	**198 350 288**
200 - 2000	50	1 ½	40	**198 350 259**	**198 350 274**	**198 350 289**
300 - 3000	50	1 ½	40	**198 350 260**	**198 350 275**	**198 350 290**
600 - 6000	50	1 ½	40	**198 350 261**	**198 350 276**	**198 350 291**
600 - 6000	63	2	50	**198350262***	**198 350 277**	**198 350 292**
1000 - 10000	63	2	50	**198350263***	**198 350 278**	**198 350 293**
1500 - 15000	63	2	50	**198350264***	**198 350 279**	**198 350 294**
2000 - 20000	75	2 ½	65	**198350265***	**198 350 280**	**198 350 295**
3000 - 30000	75	2 ½	65	**198350266***	**198 350 281**	**198 350 296**
8000 - 60000	75	2 ½	65	**198350267***	**198 350 282**	**198 350 297**



Insert PVDF (3,4)

Scale range [l/h]	d [mm]	Inch	DN [mm]	top (4) Code	bottom (3) Code	bottom (3) for PEEK guiding rod Code	
50 - 500	32	1	25	**198 335 970**	**198 335 977**		
100 - 1000	32	1	25	**198 335 970**	**198 335 977**		
150 - 1500	40	1 ¼	32	**198 335 971**	**198 335 978**		
250 - 2500	40	1 ¼	32	**198 335 971**	**198 335 978**		
200 - 2000	50	1 ½	40	**198 335 972**	**198 335 979**		
300 - 3000	50	1 ½	40	**198 335 972**	**198 335 979**		
600 - 6000	50	1 ½	40	**198 335 972**	**198 335 979**		
600 - 6000	63	2	50	**198 335 973**	**198 335 980**		
1000 - 10000	63	2	50	**198 335 973**	**198 335 980**		
1500 - 15000	63	2	50	**198 335 974**		**198 335 982**	
2000 - 20000	75	2 ½	65	**198 335 975**		**198 335 981**	
3000 - 30000	75	2 ½	65	**198 335 975**		**198 335 981**	
8000 - 60000	75	2 ½	65	**198 335 975**		**198 335 981**	

Scale range [l/h]	d [mm]	Inch	DN [mm]	bottom (3) for PVDF/SS guiding rod Code	
50 - 500	32	1	25		
100 - 1000	32	1	25		
150 - 1500	40	1 ¼	32		
250 - 2500	40	1 ¼	32		
200 - 2000	50	1 ½	40		
300 - 3000	50	1 ½	40		
600 - 6000	50	1 ½	40		
600 - 6000	63	2	50		
1000 - 10000	63	2	50		
1500 - 15000	63	2	50	**198 335 893**	
2000 - 20000	75	2 ½	65	**198 335 894**	
3000 - 30000	75	2 ½	65	**198 335 894**	
8000 - 60000	75	2 ½	65	**198 335 894**	

Float PVDF (2)

Scale range [l/h]	d [mm]	Inch	DN [mm]	Without magnet Code	With magnet Code	
50 - 500	32	1	25	**198 335 455**	**198 335 470**	
100 - 1000	32	1	25	**198 335 455**	**198 335 470**	
150 - 1500	40	1 ¼	32	**198 335 455**	**198 335 470**	
250 - 2500	40	1 ¼	32	**198 335 455**	**198 335 470**	
200 - 2000	50	1 ½	40	**198 335 456**	**198 335 471**	
300 - 3000	50	1 ½	40	**198 335 457**	**198 335 471**	
600 - 6000	50	1 ½	40	**198 335 457**	**198 335 471**	
600 - 6000	63	2	50	**198 335 457**	**198 335 471**	
1000 - 10000	63	2	50	**198 335 457**	**198 335 471**	
1500 - 15000	63	2	50	**198 335 458**	**198 335 472**	
2000 - 20000	75	2 ½	65	**198 335 459**	**198 335 473**	
3000 - 30000	75	2 ½	65	**198 335 459**	**198 335 473**	
8000 - 60000	75	2 ½	65	**198 335 460**	**198 335 474**	

Guiding rod (10)

Model:

- Only for DN50 (1'500 - 15'000 l/h) and DN65 (all metering ranges)

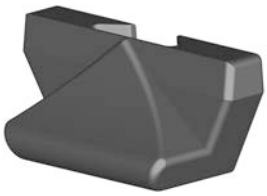
Scale range [l/h]	d [mm]	Inch	DN [mm]	Peek Code	Stainless steel Code	PVDF Code	
1500 - 15000	63	2	50	**198 350 980**	**198 350 098**	**198 350 981**	
2000 - 20000	75	2 ½	65	**198 350 980**	**198 350 098**	**198 350 981**	
3000 - 30000	75	2 ½	65	**198 350 980**	**198 350 098**	**198 350 981**	
8000 - 60000	75	2 ½	65	**198 350 980**	**198 350 098**	**198 350 981**	

Insert guiding rod PVDF (for 10)

Model:

- Only for DN50 (1'500 - 15'000 l/h) and DN65 (all metering ranges)

Scale range [l/h]	d [mm]	Inch	DN [mm]	for PEEK Code	for PVDF/SS Code
1500 - 15000	63	2	50	**198 335 986**	**198 335 953**
2000 - 20000	75	2 ½	65	**198 335 987**	**198 335 954**
3000 - 30000	75	2 ½	65	**198 335 987**	**198 335 955**
8000 - 60000	75	2 ½	65	**198 335 987**	**198 335 956**

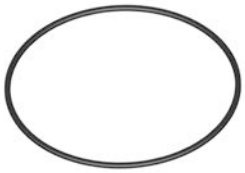


Flow value indicator PS (8)

Model:

- For all dimensions type 335/350

d [mm]	Inch	DN [mm]	Flow value indicator Code
32	1	25	**198 335 990**
40	1 ¼	32	**198 335 990**
50	1 ½	40	**198 335 990**
63	2	50	**198 335 990**
75	2 ½	65	**198 335 990**



O-rings (7)

d [mm]	Inch	DN [mm]	EPDM Code	FPM Code
32	1	25	**748 410 008**	**749 410 008**
40	1 ¼	32	**748 410 009**	**749 410 009**
50	1 ½	40	**748 410 010**	**749 410 010**
63	2	50	**748 410 011**	**749 410 011**
75	2 ½	65	**748 410 014**	**749 410 014**

Union nut (5)

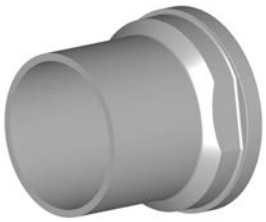
Union nut not useable for the special version with taper tube in PVDF

d [mm]	Inch	DN [mm]	PVC-U Code	PVC-C Code	ABS Code	PP-H Code	PVDF Code
32	1	25	**721 690 008**	**723 690 008**	**729 690 408**	**727 690 408**	**735 690 408**
40	1 ¼	32	**721 690 009**	**723 690 009**	**729 690 409**	**727 690 409**	**735 690 409**
50	1 ½	40	**721 690 010**	**723 690 010**	**729 690 410**	**727 690 410**	**735 690 410**
63	2	50	**721 690 011**	**723 690 011**	**729 690 411**	**727 690 411**	**735 690 411**
75	2 ½	65	**198 806 429**	**-**	**-**	**198 806 421**	**198 806 422**

Union end / Socket (6)

For DN65 PVDF only spigot

d [mm]	Inch	DN [mm]	PVC-U Code	PVC-C Code	ABS Code	PP-H Code	PVDF Code
32	1	25	**721 600 108**	**723 600 108**	**729 600 108**	**727 600 108**	**735 600 108**
40	1 ¼	32	**721 600 109**	**723 600 109**	**729 600 109**	**727 600 109**	**735 600 109**
50	1 ½	40	**721 600 110**	**723 600 110**	**729 600 110**	**727 600 110**	**735 600 110**
63	2	50	**721 600 111**	**723 600 111**	**729 600 111**	**727 600 111**	**735 600 111**
75	2 ½	65	**721 600 112**	**700 253 867**	**700 246 112**	**700 253 866**	**-**



Union end / Spigot (6)

d [mm]	Inch	DN [mm]	PP-H Code	PVDF Code
32	1	25	**727 608 508**	**735 608 608**
40	1 ¼	32	**727 608 509**	**735 608 609**
50	1 ½	40	**727 608 510**	**735 608 610**
63	2	50	**727 608 511**	**735 608 611**
75	2 ½	65	**700 256 401**	**175 483 013**

Exchange kit

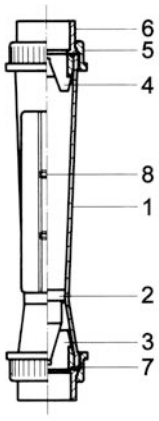
Model:

- Exchange kit consisting of: guiding rod, insert guiding rod and insert bottom
- Only for DN50 (1'500 - 15'000 l/h) and DN65 (all metering ranges)

Scale range [l/h]	d [mm]	Inch	DN [mm]	Code
1500 - 15000	63	2	50	**198 350 895**
2000 - 20000	75	2 ½	65	**198 350 896**
3000 - 30000	75	2 ½	65	**198 350 896**
8000 - 80000	75	2 ½	65	**198 350 896**

Technical information for type SK

Pos.	Item	Quantity
1	Taper tube	1
2	Float	1
3	Bottom insert	1
4	Top insert	1
5	Union nut	2
6	Union end	2
7	O-Ring	2
8	Flow value indicator	2



Pressure loss for type SK

Type	Loss (mm Wp)
SK 10/100	242
SK 11/110	242
SK 12/120	242
SK 18/180	255
SK 19/190	255
SK 20/200	255
SK 21/210	255
SK 29/290	254
SK 30/300	305
SK 31/310	305

Type	Loss (mm Wp)
SK 40/400	312
SK 41/410	312
SK 50/500	44
SK 51/510	44
SK 52/520	44

Type	Loss (mm Wp)
SK 60/600	83
SK 61/610	83
SK 62/620	83
SK 70/700	46
SK 71/710	46
SK 72/720	46
SK 73/730	46

Spare part for variable area flow meter SK50-SK73/SK500-SK730

Short version taper tube Polysulfone

Type	d [mm]	DN [mm]	Code
SK 50 / 500	16	10	**198 801 341**
SK 51 / 510	16	10	**198 801 342**
SK 52 / 520	16	10	**198 801 343**
SK 60 / 600	20	15	**198 801 449**
SK 61 / 610	20	15	**198 801 450**
SK 62 / 620	20	15	**198 801 451**
SK 70 / 700	32	25	**198 801 445**
SK 71 / 710	32	25	**198 801 338**
SK 72 / 720	32	25	**198 801 339**
SK 73 / 730	32	25	**198 801 340**

Short version taper tube PVC-U transparent

Type	d [mm]	DN [mm]	Code
SK 50 / 500	16	10	**198 803 790**
SK 51 / 510	16	10	**198 803 791**
SK 52 / 520	16	10	**198 803 792**
SK 60 / 600	20	15	**198 803 793**
SK 61 / 610	20	15	**198 803 794**
SK 62 / 620	20	15	**198 803 795**
SK 70 / 700	32	25	**198 803 796**
SK 71 / 710	32	25	**198 803 797**
SK 72 / 720	32	25	**198 803 798**
SK 73 / 730	32	25	**198 803 799**

Short version float PVDF Without magnet

Type	d [mm]	DN [mm]	Code
SK 50 / 51 / 52	16	10	**198 806 219**
SK 60 / 61 / 62	20	15	**198 806 220**
SK 70 / 71 / 72 / 73	32	25	**198 806 221**

Short version float PVDF With magnet bistable

Type	d [mm]	DN [mm]	Code
SK 500 / 510 / 520	16	10	**198 806 222**
SK 600 / 610 / 620	20	15	**198 806 223**
SK 700 / 710 / 720 / 730	32	25	**198 806 224**

Short version float PTFE Without magnet

Type	d [mm]	DN [mm]	Code
SK 73	32	25	**198 807 166**

Short version top insert PVDF

Type	d [mm]	DN [mm]	Code
SK 50 / 500; 51 / 510; 52 / 520	16	10	**198 807 188**
SK 60 / 600; 61 / 610; 62 / 620	20	15	**198 807 187**
SK 70 / 700; 71 / 710; 72 / 720; 73 / 730	32	25	**198 807 182**

Adjustment Factors

Temperature-adjustment table for gases

		Calibrating temperature (°C)								
		0	10	20	30	40	50	60	70	80
Operating temperature (°C)	0	1	1.018	1.035	1.052	1.07	1.088	1.103	1.12	1.135
	10	0.983	1	1.018	1.035	1.051	1.068	1.084	1.1	1.116
	20	0.965	0.983	1	1.015	1.032	1.05	1.065	1.08	1.096
	30	0.948	0.966	0.983	1	1.015	1.031	1.047	1.062	1.08
	40	0.933	0.95	0.967	0.984	1	1.015	1.031	1.046	1.061
	50	0.92	0.936	0.953	0.968	0.984	1	1.015	1.03	1.045
	60	0.905	0.922	0.938	0.953	0.968	0.985	1	1.015	1.03
	70	0.892	0.907	0.924	0.94	0.955	0.97	0.985	1	1.014
	80	0.88	0.895	0.912	0.927	0.943	0.965	0.971	0.987	1

Use this chart to adjust the displayed values for gaseous media of your flow meter, if the operating temperature differs from the underlying temperature (20°C) at calibrating time.

Example:
Calibrating temperature is 20°C and operating temperature is 70°C. Take the factor 0.924 from the calibrating temperature column for 20°C and the operating temperature line 70°C. The values shown by the flow meter have to be multiplied by this factor so the actual flow volume at an operating temperature of 70°C can be calculated. You get the factor with the following formula:

$$\sqrt{\frac{T_c + 237}{T_o + 237}} = \sqrt{\frac{20 + 237}{70 + 237}} = 0.924$$

T_c = calibrating temperature
T_o = operating temperature

Note:
Operating temperature >calibrating temperature:
Factor <1
Operating temperature <calibrating temperature:
Factor >1

Density-adjustment table for gases

		Gases for calibration					
operating gasses	P [kg/Nm³]	air	oxygen	nitrogen	ammonia	acetylene	chlorine
air	1.293	1.000	1.050	0.983	0.772	0.953	1.580
oxygen	1.429	0.953	1.000	0.935	0.735	0.906	1.500
nitrogen	1.251	1.017	1.069	1.000	0.786	0.968	1.604
ammonia	0.771	1.295	1.360	1.272	1.000	1.232	2.040
acetylene	1.171	1.050	1.105	1.033	0.812	1.000	1.660
chlorine	3.220	0.633	0.665	0.623	0.490	0.603	1.000
hydrogen	0.089	3.810	4.010	3.750	2.940	3.630	6.020
carbon dioxide	1.977	0.808	0.850	0.796	0.625	0.770	1.275
sulphur dioxide	2.926	0.668	0.698	0.654	0.514	0.633	1.050
coal gas	0.550	1.532	1.610	1.506	1.185	1.460	2.420
propane	2.020	0.800	0.841	0.786	0.618	0.762	1.262

		Gases for calibration				
operating gasses	P [kg/Nm³]	hydrogen	carbon dioxide	sulphur dioxide	coal gas	propane
air	1.293	0.262	1.238	1.495	0.652	1.250
oxygen	1.429	0.250	1.175	1.430	0.621	1.189
nitrogen	1.251	0.267	1.255	1.530	0.664	1.272
ammonia	0.771	0.340	1.600	1.946	0.845	1.620
acetylene	1.171	0.276	1.300	1.580	0.685	1.314
chlorine	3.220	0.166	0.785	0.953	0.413	0.792
hydrogen	0.089	1.000	4.715	5.725	2.480	4.760
carbon dioxide	1.977	0.212	1.000	1.216	0.528	1.010
sulphur dioxide	2.926	0.174	0.823	1.000	0.433	0.830
coal gas	0.550	0.403	1.895	2.306	1.000	1.915
propane	2.020	0.210	0.990	1.205	0.522	1.000

Use this chart to adjust the displayed values for gaseous media of your flow meter, if the specific media gravity differs from the underlying specific gravity (1.293 kg/Nm³ (air)) at calibrating time.

Example:
Specific gravity at calibrating time is 1.293 kg/Nm³ (air). The media hydrogen with its specific gravity of 0.089 kg/Nm³ should be measured. From the column hydrogen, in line seven for operating gas, you get the factor 3.81 . The values shown by the flow meter have to be multiplied by this factor so the actual flow volume at a specific gravity of 0.089 kg/Nm³can be calculated.

Note:
Operating gas density >calibrating gas density:
Factor <1
Operating gas density <calibrating gas density:
Factor >1

Density-adjustment table for liquids

		Calibrating solution (kg/l) float material PVDF							
		0.5	0.6	0.7	0.8	0.9	1	1.1	1.2
Density of operating liquid	0.5	1	1.105	1.2	1.29	1.38	1.464	1.545	1.63
	0.6	0.903	1	1.084	1.168	1.248	1.32	1.397	1.475
	0.7	0.834	0.923	1	1.078	1.15	1.22	1.29	1.36
	0.8	0.775	0.856	0.928	1	1.066	1.133	1.196	1.262
	0.9	0.724	0.802	0.87	0.937	1	1.06	1.12	1.18
	1.0	0.683	0.755	0.818	0.883	0.94	1	1.055	1.114
	1.1	0.645	0.715	0.771	0.836	0.892	0.946	1	1.055
	1.2	0.613	0.678	0.735	0.793	0.845	0.896	0.947	1
	1.3	0.585	0.648	0.7	0.755	0.807	0.857	0.903	0.955
	1.4	0.56	0.62	0.671	0.723	0.773	0.82	0.865	0.913
	1.5	0.537	0.595	0.645	0.695	0.743	0.787	0.832	0.877
	1.6	0.515	0.57	0.618	0.665	0.712	0.755	0.798	0.84
	1.7	0.496	0.548	0.595	0.641	0.685	0.726	0.767	0.81
	1.8	0.478	0.538	0.574	0.617	0.66	0.7	0.74	0.78
	1.9	0.462	0.511	0.555	0.597	0.638	0.676	0.715	0.755
	2.0	0.446	0.495	0.536	0.578	0.617	0.654	0.691	0.73

		Calibrating solution (kg/l) float material PVDF							
		1.3	1.4	1.5	1.6	1.7	1.8	1.9	2
Density of operating liquid	0.5	1.71	1.785	1.86	0.94	2.02	2.09	2.16	2.24
	0.6	1.545	1.615	1.68	0.754	1.82	1.89	1.95	2.02
	0.7	1.425	1.49	1.55	1.615	1.68	1.745	18	1.865
	0.8	1.325	1.38	1.43	1.5	1.56	1.62	1.67	1.73
	0.9	1.24	1.295	1.35	1.405	1.46	1.515	1.57	1.62
	1.0	1.17	1.22	1.27	1.325	1.375	1.43	1.48	1.53
	1.1	1.106	1.155	1.2	1.255	1.3	1.35	1.4	1.45
	1.2	1.05	1.095	1.14	1.19	1.235	1.28	1.33	1.37
	1.3	1	1.044	1.088	1.134	1.176	1.22	1.264	1.305
	1.4	0.958	1	1.042	1.085	1.13	1.17	1.21	1.25
	1.5	0.92	0.96	1	1.042	1.084	1.125	1.16	1.205
	1.6	0.882	0.92	0.958	1	1.04	1.08	1.11	1.15
	1.7	0.848	0.886	0.923	0.961	1	1.038	1.072	1.11
	1.8	0.817	0.853	0.888	0.926	0.962	1	1.032	1.07
	1.9	0.79	0.826	0.858	0.897	0.93	0.968	1	1.034
	2.0	0.798	0.798	0.83	0.867	0.9	0.935	0.965	1

Use this chart to adjust the displayed values for liquid media of your flow meter, if the specific media gravity (1.0 kg/l (water)) differs from the underlying specific gravity at calibrating time.

Example:
Specific gravity at calibration 1.0 kg/l.The liquid media with a specific gravity of 0.9 kg/l is to be measured. If you have a calibrating solution of 1.0 kg/l you take in line five the factor 1.06. The values shown by the flow meter have to be multiplied by this factor so the actual flow volume at a specific gravity of 0.9 can be calculated.

Note:
New density is higher: factor <1
New density is lower : factor >1