



## Design and applications

The wide choice of materials that can be used to manufacture our DST bypass flow meters allows flow measurement of the most varied fluids.

The low-cost device in PVC is frequently used in swimming-pool water technology. The device in PP and PVDF is suitable for the flow measurement of aggressive media, e.g. in water treatment. For other fields of application there is a steel and stainless steel variant (DST ½ and DST V4A).

The DST bypass flow meter operates on the differential-pressure-bypass method. A ring with an orifice plate is installed in the pipeline between flanges. The measuring orifice leads to a constriction and causes a differential pressure. As compensation a volume flow occurs in the bypass which is displayed by a variable area flow meter. This partial flow is proportional to the flow rate in the main pipeline.

The unimpeded, straight tube length has to be 6 DN before and 4 DN behind the mounting position.

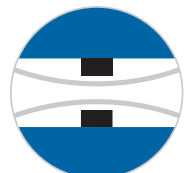
The partial flow can be turned on and off, as required, by installing two ball valves in the bypass line.

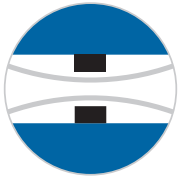
By installation of electrical limit value switches, which are adjustable throughout the entire measuring range, these devices can be used as detectors.

DST



- wide choice of materials
- high volume rates of flow possible
- orifice plate can be installed in any position
- no power requirement for indication
- easy to install
- measuring accuracy +/- 2 % FS
- scale specific to the process fluid
- optionally
  - limit value switches
  - extension of the bypass (see dimension B, p. 3)





# DST

## Bypass flow meters

### Type series

DST-PVC	device in PVC
DST-PP	device in PP
DST-PVDF	device in PVDF
DST-½	device in steel
DST-V4A	device in stainless steel
DST-...-MSK1	with limit value switch (normally open)
DST-...-MSK12	with limit value switch (normally closed)
DST-...-MSKW	with limit value switch (change over)

### Dimensions

DN	d <sub>4</sub>	A	B	C <sup>1)</sup>
32	78	160	<sup>2)</sup>	50
40	88	160	<sup>2)</sup>	50
50	102	160	<sup>2)</sup>	50
65	122	160	<sup>2)</sup>	50
80	138	160	<sup>2)</sup>	50
100	158	160	<sup>2)</sup>	50
125	188	160	<sup>2)</sup>	50
150	212	160	<sup>2)</sup>	50
200	268	160	<sup>2)</sup>	50
250	320	160	<sup>2)</sup>	50
300	370	160	<sup>2)</sup>	50
400	482	160	<sup>2)</sup>	50

<sup>1)</sup> optionally: special overall lengths possible

<sup>2)</sup> DST-PVC 500 mm, DST-PP 528 mm, DST-PVDF 555 mm, DST-½ + DST-V4A 543 mm

<sup>3)</sup> all dimensions in mm

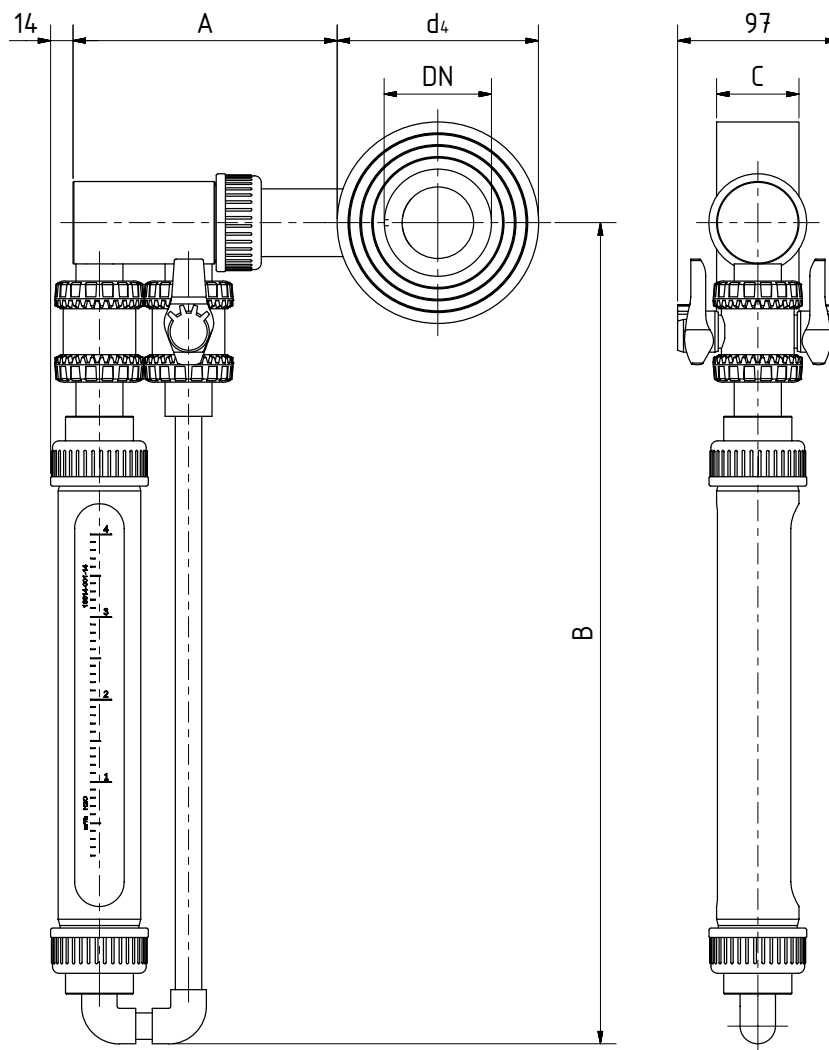
### Materials and technical data

Model	DST-PVC	DST-PP	DST-PVDF	DST-½	DST-V4A
Ring	PVC	PP	PVDF	S355 <sup>2)</sup>	1.4571
Orifice plate	PVC	PP	PVDF	1.4571	1.4571
Valves	PVC	PP	polysulphone / PVDF can be supplied without valves	brass, nickel-plated	1.4571
Bypass line	PVC	PP	PVDF	steel, zinc plated	1.4571
Indicator <sup>1)</sup>	RA77 / PSU	RA77 / PSU	RA87 / PSU	RA65	RA87
Glass measuring tube	borosilicate glass, optionally polysulphone	borosilicate glass, optionally polysulphone	borosilicate glass, optionally polysulphone	borosilicate glass	borosilicate glass
Float	PVC, optionally 1.4571, PTFE	PP, optionally 1.4571, PTFE	PVDF, optionally 1.4571, PTFE	water: 1.4571 air: anodized aluminium	water: 1.4571 air: PTFE
Gaskets	EPDM, optionally FKM	EPDM, optionally FKM	FKM, optionally EPDM	NBR	FKM
max. temperature / pressure (gauge)	20 °C at 10 bar 40 °C at 6 bar	20 °C at 10 bar 70 °C at 2,5 bar 80 °C at 1,5 bar	20 °C at 10 bar 80 °C at 5 bar 100 °C at 4 bar	20 °C at 10 bar special design: 80 °C at 5 bar	20 °C at 10 bar special design: 80 °C at 5 bar

<sup>1)</sup> see data sheet for the indicating devices

<sup>2)</sup> corrosion protection: epoxy paint, kiln-dried, traffic blue (RAL 5017), satin finished; corrosion class: C2

DST



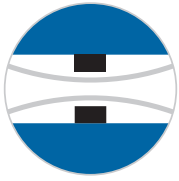
## Measuring range

DN <sup>2)</sup>	measuring range <sup>1)</sup> H <sub>2</sub> O				max. pressure loss in mbar	measuring range <sup>1)</sup> air at STP <sup>*</sup>				max. pressure loss in mbar
32	20	-	160	l/h	150	8	-	18	m <sup>3</sup> /h	68
	3,5	-	25	m <sup>3</sup> /h	300	35	-	200	m <sup>3</sup> /h	38
40	0,02	-	0,16	m <sup>3</sup> /h	150	8	-	18	m <sup>3</sup> /h	68
	4	-	30	m <sup>3</sup> /h	350	35	-	200	m <sup>3</sup> /h	38
50	0,02	-	0,16	m <sup>3</sup> /h	150	8	-	18	m <sup>3</sup> /h	68
	4,5	-	40	m <sup>3</sup> /h	550	49	-	300	m <sup>3</sup> /h	38
65	1,2	-	2,7	m <sup>3</sup> /h	36	12,5	-	30	m <sup>3</sup> /h	6
	7	-	60	m <sup>3</sup> /h	550	78	-	535	m <sup>3</sup> /h	55
80	1,2	-	3,3	m <sup>3</sup> /h	51	14	-	30	m <sup>3</sup> /h	6
	13	-	100	m <sup>3</sup> /h	350	150	-	1010	m <sup>3</sup> /h	50
100	3	-	7	m <sup>3</sup> /h	58	30	-	70	m <sup>3</sup> /h	6
	25	-	200	m <sup>3</sup> /h	430	280	-	1750	m <sup>3</sup> /h	60
125	8	-	15	m <sup>3</sup> /h	30	95	-	200	m <sup>3</sup> /h	6
	40	-	300	m <sup>3</sup> /h	350	470	-	2850	m <sup>3</sup> /h	60
150	14	-	30	m <sup>3</sup> /h	42	185	-	400	m <sup>3</sup> /h	7
	55	-	380	m <sup>3</sup> /h	500	640	-	3850	m <sup>3</sup> /h	53
200	30	-	75	m <sup>3</sup> /h	60	380	-	790	m <sup>3</sup> /h	6
	90	-	650	m <sup>3</sup> /h	500	1125	-	6000	m <sup>3</sup> /h	69
250	43	-	140	m <sup>3</sup> /h	90	390	-	800	m <sup>3</sup> /h	7
	150	-	830	m <sup>3</sup> /h	354	1200	-	6000	m <sup>3</sup> /h	70
300	75	-	250	m <sup>3</sup> /h	84	390	-	800	m <sup>3</sup> /h	7
	185	-	1100	m <sup>3</sup> /h	378	1200	-	6000	m <sup>3</sup> /h	70
400	130	-	500	m <sup>3</sup> /h	150	-	-	-	-	-
	300	-	1800	m <sup>3</sup> /h	280	-	-	-	-	-

<sup>1)</sup> The minimum and maximum measuring range is specified for each nominal diameter. measuring ranges for other process fluids and operating conditions will be supplied on request

<sup>2)</sup> The inner diameter is made as prescribed by the pipe inner diameter.

\* at STP: at normal temperature and pressure (0 °C and 1013 mbar abs.)



## Limit value switches MSK1/MSK12/MSKW

In order to realise a local display with a monitoring function the flowmeter can be equipped with limit value switches. The limit value switch consists of a connector housing and a bistable reed switch.

A magnet integrated in the float switches this reed switch. The limit value switch is guided in a guide slot on the back of the protective tube and can be adjusted throughout the entire measuring range. In case of inductive or capacitive load applications, e.g. caused by contactors or solenoid valves, uncontrolled current and voltage peaks may occur. In dependence on their geometry such peaks also occur in lines if they exceed a certain length. It is therefore recommended to use an additionally available arc suppression relay "MSR". This increases the switching capacity and avoids the appearance of inductive and capacitive peaks. It thereby ensures a long lifetime of the limit value switch.

## Technical data of the limit value switches

Design	MSK1	MSK12
Switching voltage	50 V AC/75 V DC	50 V AC/75 V DC
Switching current	0,5 A	0,5 A
Switching capacity	10 WVA	10 WVA
Dielectric strength	230 V AC/400 V DC	230 V AC/400 V DC
Temperature range <sup>1)</sup>	-20 ... +90 °C	-20 ... +90 °C
Switching function	normally closed	normally open
Connection		

Design	MSKW	
Switching voltage	50 V AC/75 V DC	
Switching current	0,5 A	
Switching capacity	5 WVA	
Dielectric strength	110 V AC/200 V DC	
Temperature range <sup>1)</sup>	-20 ... +90 °C	
Switching function	change over	
Connection		

<sup>1)</sup> The thermal endurance of the flow meter is crucial.

## Low Voltage Directive

Above 50 V AC/75 V DC, electrical components are subjected to the EU Low Voltage Directive (LVD). The user is required to verify their use accordingly.

## Proper use

The user is responsible for assessing the suitability of the flow meters for his case of application, for use as prescribed and for material compatibility regarding the fluid product used in his process. The manufacturer shall not be liable for any damage arising from incorrect or improper use of the devices. Pressure surges can cause glass breakage and should therefore generally be avoided. The limit values given in the data sheet should be observed. In all other respects we advise following the installation recommendations specified in Code VDI/VDE 3513, Sheet 3.

The equipment from **Kirchner und Tochter** has been tested in compliance with applicable CE-regulations of the European Community. The respective declaration of conformity is available on request. Subject to change without notice. The current valid version of our documents can be found at: [www.kt-flow.de](http://www.kt-flow.de)

The **Kirchner und Tochter** QM-System is certified in accordance with DIN-EN-ISO 9001:2008. The quality is systematically adapted to the continuously increasing demands.