

### Design and application

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 PVDF is suitable for the flow measurement of aggressive media, e.g. in water treatment, while the DST-1/2 is mainly used for flow measurement of air and gases.

The measuring range extends from 0.02 - 0.16 m<sup>3</sup>/h to 300 - 1800 m<sup>3</sup>/h for H<sub>2</sub>O, and from 0.15 m<sup>3</sup>/h - 1.5 to 1200 - 6000 m<sup>3</sup>/h for air at NTP.

The DST bypass flow meter operates on the differential-pressure method. A ring with an orifice plate is installed in the pipeline. The orifice plate causes constriction of the flow and effects a drop in pressure. This pressure drop is proportional to the square of the flow rate.

If the pressure tap upstream of the orifice plate is connected by a pipe to that downstream of the orifice plate, a partial flow will flow through that pipe. This partial flow is proportional to the flow rate in the main pipeline.

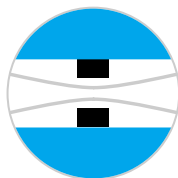
The partial flow can be turned on and off, as required, by installing two ball valves in the bypass line.



- 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
- limit switch optionally available
- scale specific to the process fluid
- C€ 0085BN0053



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## Installation

To install, use appropriate flat gaskets for the connection flanges.

The DST flow meter is easy to install between pipe flanges. Straight inlet/outlet runs of 4 - 6 x D upstream and downstream of the ring need to be included in the planning of the DST bypass flow meter.

The flow for the indicating device in the bypass - a variable-area flow meter - needs to be from bottom to top. If the measuring device is used for water, the indicating device is installed in suspended arrangement and for air in standing arrangement to avoid accumulation of air and condensation of water. Alternatively, the manufacturer will provide vent valves.

For separate installation of the indicator and the orifice plate, dimension B (see dimensional drawing) can on request be extended.

## Dimensions

DST				
DN	d <sub>4</sub>	A	B	C <sup>1)</sup>
32	78	160	2)	50
40	88	160	2)	50
50	102	160	2)	50
65	122	160	2)	50
80	138	160	2)	50
100	158	160	2)	50
125	188	160	2)	50
150	212	160	2)	50
200	268	160	2)	50
250	320	160	2)	50
300	370	160	2)	50
400	482	160	2)	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-1/2 + DST-V4A 543 mm

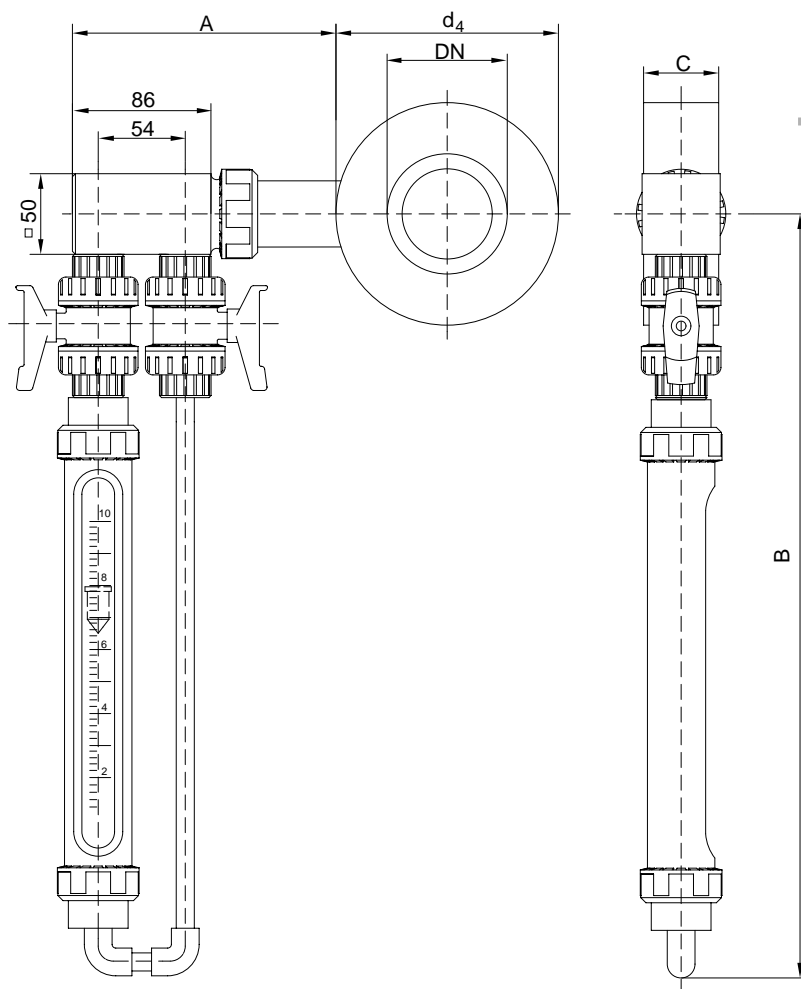
<sup>3)</sup> All dimensions in mm

## Models

Model	DST-PVC	DST-PP	DST-PVDF	DST-1/2	DST-V4A
Ring	PVC	PP	PVDF	steel, St. 37	1.4571
Orifice plate	PVC	PP	PVDF	1.4301	1.4571
Valves	PVC	PP	polysulphone / PVDF can be supplied without valves	brass, nickel-plated	1.4571
Bypass line	PVC	PP	PVDF	steel, galvanized	1.4571
Indicator <sup>1)</sup>	RA 77 / PSU	RA 77 / PSU	PSU / RA 87	RA 65	RA 87
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: 1.4305 air: anodized aluminium	water: 1.4571 air: Teflon
Gaskets	EPDM, optionally Viton	EPDM, optionally Viton	Viton, optionally EPDM	NBR	Viton
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

DST

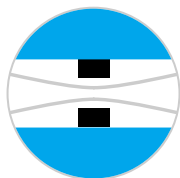


## Measuring ranges and pressure losses

DN	Measuring range <sup>1)</sup> H <sub>2</sub> O m <sup>3</sup> /h	Max. pressure loss in hPa	Measuring range <sup>1)</sup> air m <sup>3</sup> /h at NTP*	Max. pressure loss in hPa
32	0.02 – 0.16 3.5 – 25	150 300	0.15 – 1.5 35 – 200	68 38
40	0.02 – 0.16 4 – 30	150 350	0.15 – 1.5 35 – 200	68 38
50	0.02 – 0.16 4.5 – 40	150 550	0.15 – 1.5 49 – 300	68 38
65	1.2 – 2.7 7 – 60	36 550	12.5 – 30 78 – 535	6 55
80	1.2 – 3.3 13 – 100	51 350	14 – 30 150 – 1010	6 50
100	3 – 7 25 – 200	58 430	30 – 70 280 – 1750	6 60
125	8 – 15 40 – 300	30 350	95 – 200 470 – 2850	6 60
150	14 – 30 55 – 380	42 500	185 – 400 640 – 3850	7 53
200	30 – 75 90 – 650	42 500	380 – 790 1125 – 6000	6 69
250	43 – 140 150 – 680	90 270	390 – 800 1200 – 6000	7 70
300	75 – 250 170 – 665	84 360	390 – 800 1200 – 6000	7 70
400	130 – 500 300 – 1800	140 280	– –	– –

<sup>1)</sup> Minimum and maximum measuring ranges stated in each case.  
Measuring ranges for other process fluids and operating conditions supplied on request.

\*at NTP: at normal temperature and pressure (0°C and 1.013 bar abs.)



### Limit switches MSK 1/MSK 12

In order to realize a local display with a monitoring function the flow meter can be equipped with limit switches. The limit switch consists of a bistable reed contact which is actuated by the magnet integrated in the float.

The switch is laterally guided and can be adjusted throughout the entire measuring range.

In case of inductive or capacitive load applications, e.g. caused by contractors or solenoid valves, uncontrolled current or 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 contact.

### Technical data of the limit switches

Design	MSK 1	MSK 12
Switching voltage	230 V AC/DC	230 V AC/DC
Switched current	0,5 A	0,5 A
Switching capacity	10 W/VA	10 W/VA
Dielectric strength	400 V	400 V
Temperature range	– 40 to + 50 °C the temperature resistance of the flow meter is decisive	
Switching function	Normally closed contact 1—○—○—2	Normally open contact 1—○—○—2

### Safety notice

For safety reasons we recommend to use the VA flow meters with glass measuring tubes only in combination with a protective shield in front of the measuring tube.

Avoid extreme pressure shocks.

The equipment from KIRCHNER has been tested in compliance with applicable CE-regulations of the European Community.

The respective declaration of conformity is available on request.

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



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