

DST

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 m³/h to 300 - 1800 m³/h for H₂O, and from 0.15 m³/h - 1.5 to 1200 - 6000 m³/h for air at STP.

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.



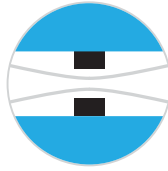
- wide choice of materials
- high volume rates of flow possible
- orifice plate can be installed in any position
- no power requirement for indication
- easy to install
- measuring accuracy +/- 2 % FS
- limit switch optionally available
- scale specific to the process fluid
- CE 0085BN0053



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Bypass flow meter



DST

Models

Device	Description
DST-PVC	instrument in PVC
DST-PP	instrument in PP
DST-PVDF	instrument in PVDF
DST-1/2	instrument in steel
DST-V4A	instrument in stainless steel

Dimensions

DST				
DN	d ₄	A	B	C ¹⁾
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

¹⁾ optionally: special overall lengths possible

²⁾ DST-PVC 500 mm, DST-PP 528 mm, DST-PVDF 555 mm,
DST-1/2 + DST-V4A 543 mm

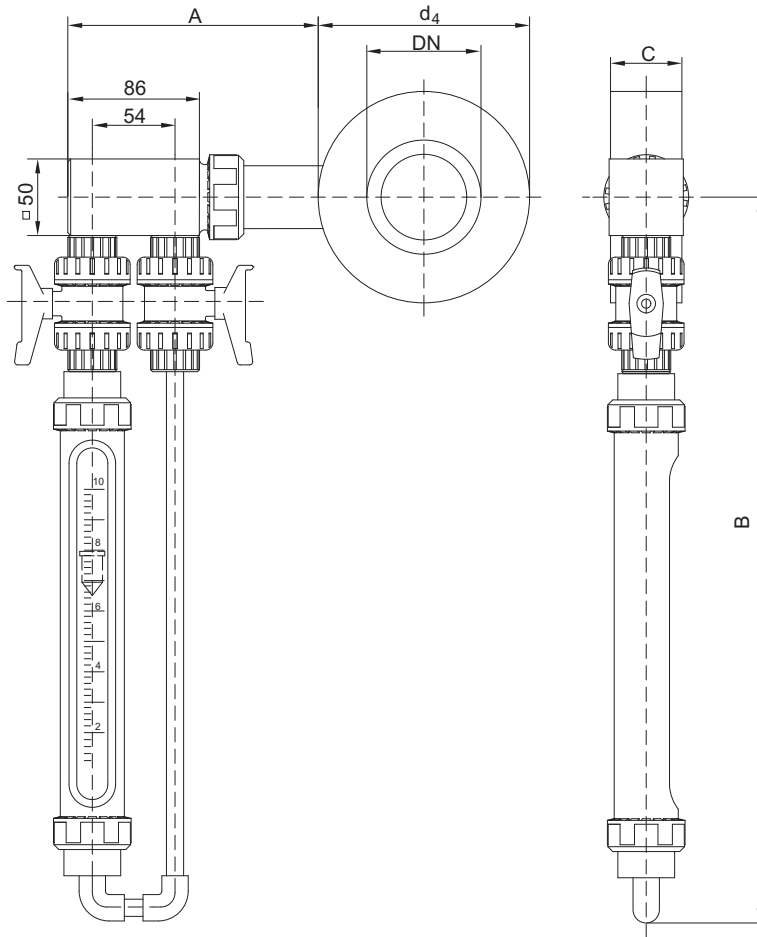
³⁾ All dimensions in mm

Technical Data/Materials

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 ¹⁾	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: 1.4571 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

¹⁾ see Data Sheet for the indicating devices

DST



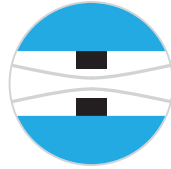
Measuring ranges

DN	Measuring range ¹⁾ H ₂ O [m ³ /h]	Max. pressure loss [hPa]	Measuring range ¹⁾ air [m ³ /h] at STP*	Max. pressure loss [hPa]
32	0.02 – 0.16	150	0.15 – 1.5	68
	3.5 – 25	300	35 – 200	38
40	0.02 – 0.16	150	0.15 – 1.5	68
	4 – 30	350	35 – 200	38
50	0.02 – 0.16	150	0.15 – 1.5	68
	4.5 – 40	550	49 – 300	38
65	1.2 – 2.7	36	12.5 – 30	6
	7 – 60	550	78 – 535	55
80	1.2 – 3.3	51	14 – 30	6
	13 – 100	350	150 – 1010	50
100	3 – 7	58	30 – 70	6
	25 – 200	430	280 – 1750	60
125	8 – 15	30	95 – 200	6
	40 – 300	350	470 – 2850	60
150	14 – 30	42	185 – 400	7
	55 – 380	500	640 – 3850	53
200	30 – 75	60	380 – 790	6
	90 – 650	500	1125 – 6000	69
250	43 – 140	90	390 – 800	7
	150 – 830	354	1200 – 6000	70
300	75 – 250	84	390 – 800	7
	185 – 1100	378	1200 – 6000	70
400	130 – 500	150	–	–
	300 – 1800	280	–	–

¹⁾ Minimum and maximum measuring ranges are stated in each case.
Measuring ranges for other process fluids and operating conditions will be supplied on request.

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

²⁾ Inside diameter made after details are provided of inside pipe diameter.



DST

Limit switches MSK 1/MSK 12/MSKW

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

Low-Voltage-Directive

Above 50 V AC/75 V DC, contacts are subject to the EU Low-Voltage Directive.

The user is required to verify their use accordingly.

Technical data of the limit switches

Design	MSK1	MSK12
Switching voltage	50 V AC/75V DC	50 V AC/75V DC
Switched current	0,5 A	0,5 A
Switching capacity	10 W/VA	10 W/VA
Dielectric strength	230V AC/400V AC	230V/AC/400V AC
Temperature range ¹⁾	- 20 to + 90 °C	- 20 to + 90 °C
Switching function	Normally closed contact	Normally open contact



Design	MSKW
Switching Voltage	50V AC/75V DC
Switched current	0,5 A
Switching capacity	5 W/VA
Dielectric strength	110V AC/200V DC
Temperature range ¹⁾	-20 bis +90°C
Switching funktion	change-over contact



¹⁾ the temperature resistance of the flow meter is decisive

Installation

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

The DST flow meter is easy to install between pipe flanges. A region of steady flow 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.

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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