Vacumaster

Series 23.0xx



Description

The Vacumaster is for milking installations with an unregulated vacuum pump to keep the milking vacuum constant within narrow limits (± 1 kPa).
It is also suitable for a fine adjustment in milking installations with regulated vacuum pumps.

The Vacumaster allows only as much ambient air as the system requires, to keep the vacuum at the desired level. This is achieved using the low inertia pressure difference principle, which provides fast and accurate control without the need for an electrical supply.

The reference vacuum is detected inside the control valve to eliminate the need for an external reading point.

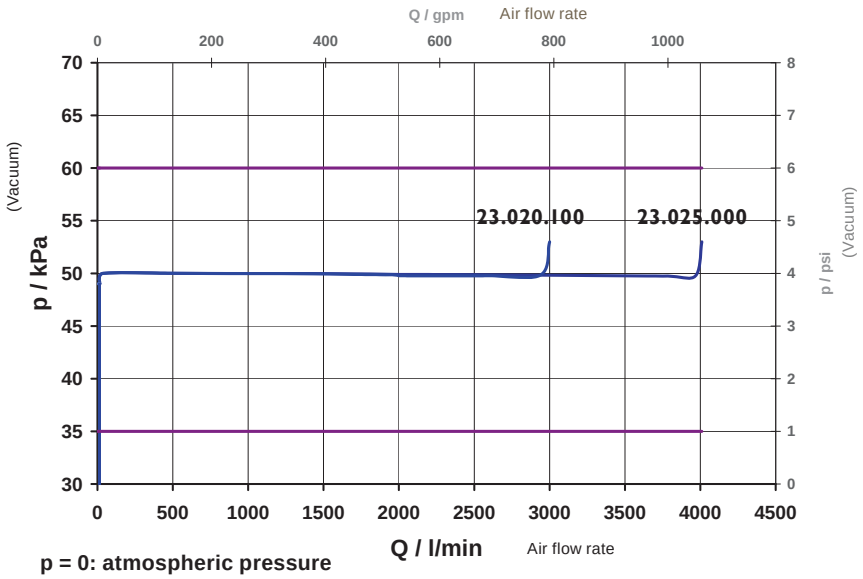
Dirt is removed from the ambient air by the PU foam filter.

Should the internal membrane become damaged, the system is force ventilated to prevent a vacuum build up.

Applications

- Milking installations with unregulated vacuum pumps
- Fine adjustment with regulated vacuum pumps

Typical performance curve



p = 0: atmospheric pressure

A. u. K. Müller

Solenoid valves
Control valves
Special valves and systems

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Characteristics

- Maintains accurate vacuum (± 1kPa)
- Any Fitting Orientation
- Low leakage of air
- Low Noise due to streamlined air intake design
- Adjustable milking vacuum in the range of 35 - 60 kPa
- Ventilates the system in the event of internal membrane damage

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Series 23.0xx

Overview of variants



23.020.100 - G 1



23.020.100 - G 1 1/4



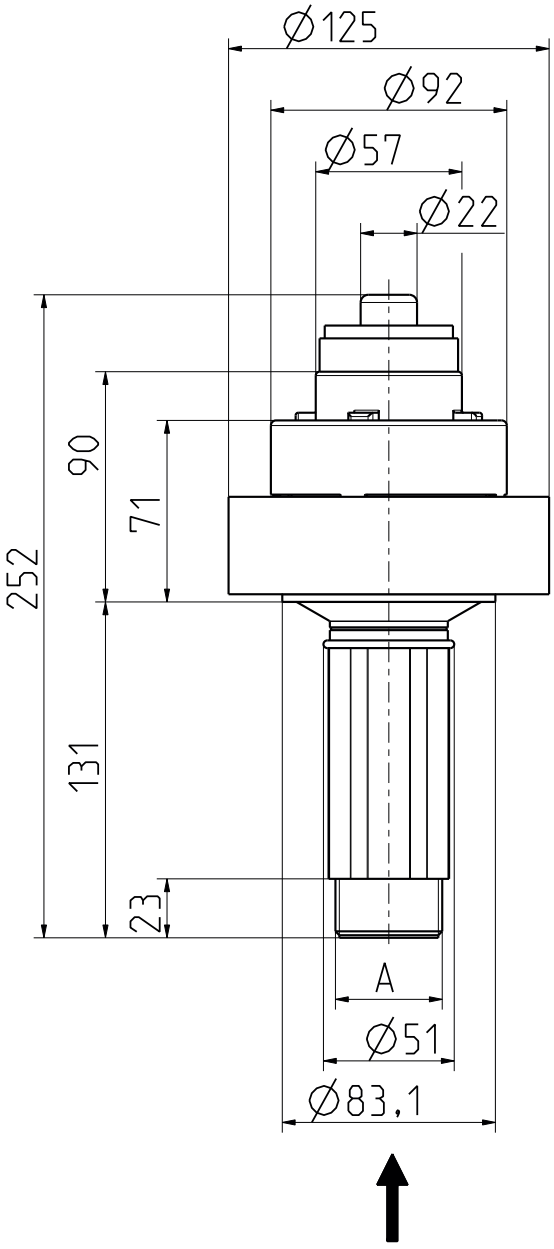
23.025.000 - G 1 1/4

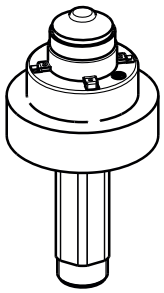
Materials

Valve body	PPE
Distance pipe	ASA
Spring and pressure sample bend	stainless steel
Membrane and seals	EPDM
Control air filter	PU

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Series 23.0xx





Technical Data

	23.020.100		23.025.000
Nominal vacuum (default setting)	50 kPa		50 kPa
Vacuum control range	35 - 60 kPa		35 - 60 kPa
Air flow rate range	450 - 2800 l/min		700 - 4000 l/min
Max. air flow rate	2800 l/min		4000 l/min
Air leakage	< 35 l/min		< 35 l/min
Central connection (A)	G 1 1/4	G 1	G 1 1/4
ID	540012	540016	540017

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Series 23.0xx

Mounting orientation
The function of the valves is independent of the mounting orientation, but they should be installed in a way that no condensate or rinse water can penetrate the valve.
To avoid the risk of flooding, vertical or horizontal mounting is preferable.

Mounting location
The Vacumaster is located between the vacuum pump and the milk separator or the first point of use. Placing at the end of the vacuum line should be avoided. To avoid congestion, the air should be allowed to flow freely into the pipe system. The control valve can be mounted directly to the pipe by a “T” piece. Avoid angled fittings and subsequent restrictions such as tapering or bends in the pipework. It is also important to ensure proper airflow if the control valve is mounted at or on the vacuum tank. Built in deflector plates or other restrictions to airflow should be removed. Air at the point of use should not effect the control valve to avoid distortion of the control function.

For larger systems multiple Vacumaster control valves can be used in the pipework or in the vacuum tank, but only mounted in series. The regulator valves should not effect each other, so should be installed in a way which ensures a free flow of air towards the points of use. “T” pieces, arch “T” pieces or 45Deg junctions are permissible but cross pieces should not be used. The distance between each valve should be 4 to 5 times the pipe diameter.

The valves should be installed in a dust free environment and not near to oily vacuum pump exhausts!

Adjustment range
The Vacumaster control valve is factory set to 50kPa vacuum. To re-adjust the setting, first remove the protective cap (2). Then loosen the top lock nut (4). Regulation setting is adjusted by moving the upper screw (3). The setting is secured by hand tightening the top lock nut (4) and the protective cap (2) is replaced.

Security of regulation
In case of failure, the Vacumaster control valve opens fully and the vacuum drops. This avoids an uncontrolled vacuum increase. It is recommended to install a vacuum valve close to the control valve, so that vacuum can be set temporarily to ensure the milking process can be finished.

Setting of vacuum level
To adjust the vacuum level, the performance of the vacuum pump should be reduced by, for example, opening an adjacent bypass.

Typical values are:
Typ 23.020 ca. 1800 l/min
Typ 23.025 ca. 2500 l/min

Example: **two control valves in series**.
When two control valves are in series, first close the valve nearest to the vacuum pump. Adjust the control valve nearest to the point of use. Then, adjust the previously closed control valve.

Measuring the vacuum level
The vacuum level should be measured near the control valve towards the point of use. The further the measuring point is located from the control valve the more accuracy is effected by line losses

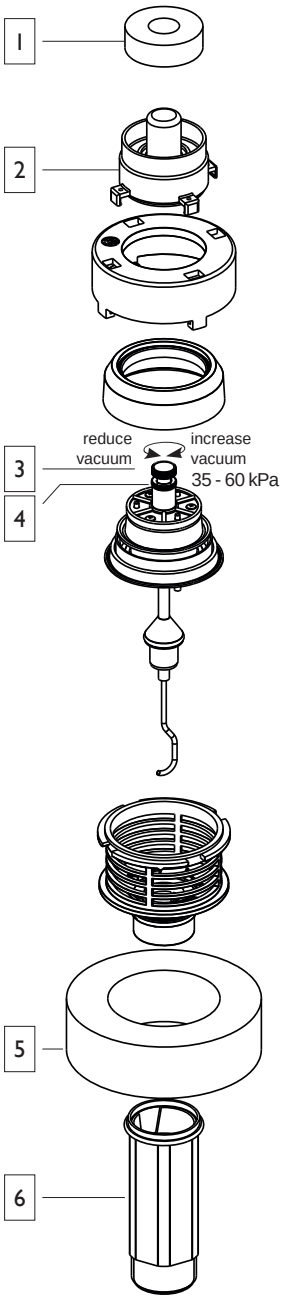
General
During operation, it may be noticed that two Vacumaster control valves do not respond simultaneously and one responded more than the other. This is caused by the response to rapid fluctuations in the vacuum, where fractions of a kPa will decide which valve opens or closes.

Maintenance
To ensure the valve works correctly, it is important to keep the filters (1) & (5) clean. These should be cleaned at least every three months depending on the environment. If the main filter (5) becomes clogged either by heavy soiling or freezing on condensate water, then the valve will fully open allowing the vacuum to drop.

Change of main filter
To clean or change the bottom filter (5) do not divide the control valve into parts but unscrew it completely with spacer tube (6) of the pipe work and pull the filter down the spacer tube.

Cleaning
Use only clean tap water with low detergent additives. Never use solvent based cleaners.

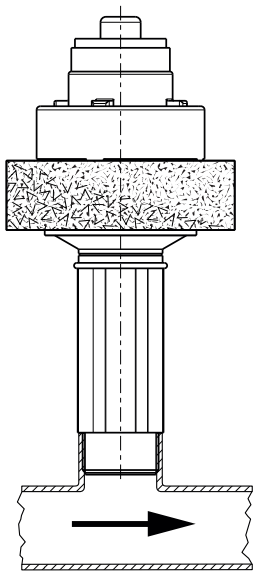
The valve is designed to be disassembled without tools.



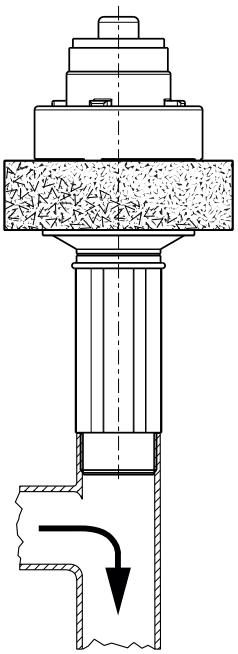
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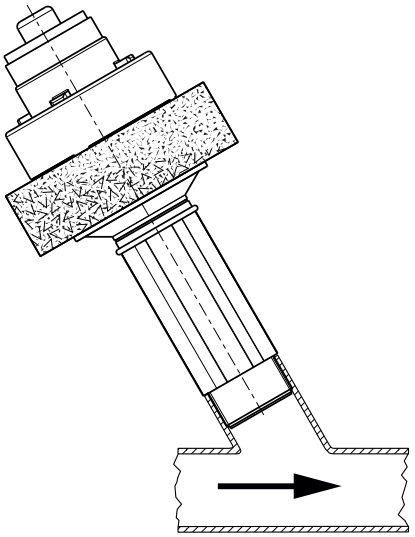
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Recommended Installations for Pipework ✓

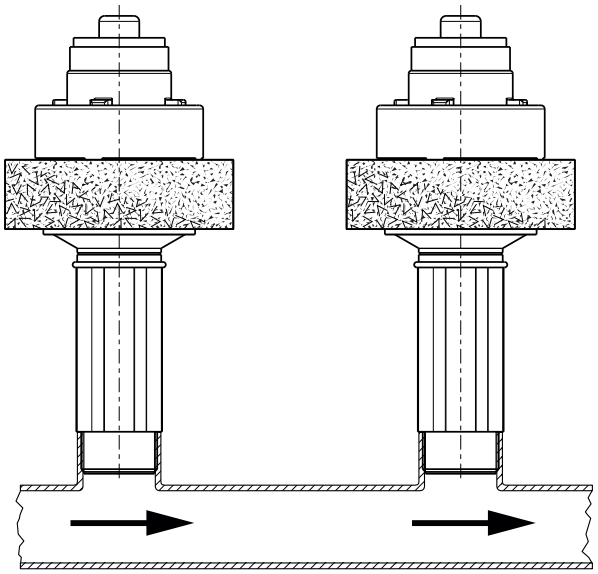


Favourable Installation without reductions or tapering in T-piece.





Other possible types of installation.

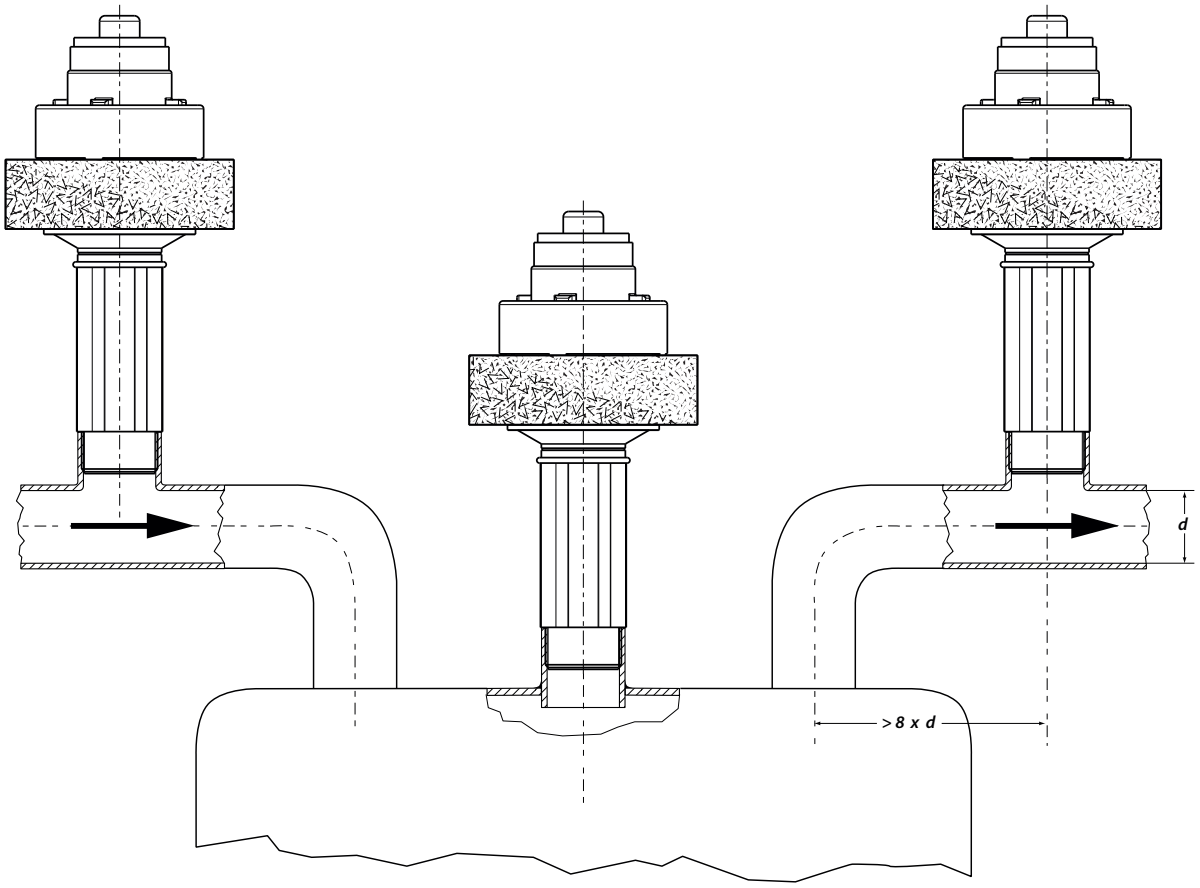


Installation of two valves in the vacuum line.
If the air capacity is exceeded choose a bigger valve size with a higher air throughput if possible.

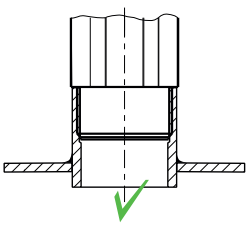
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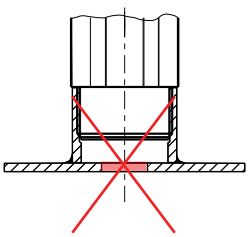
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Recommended Installations for Vacuum Tanks ✓

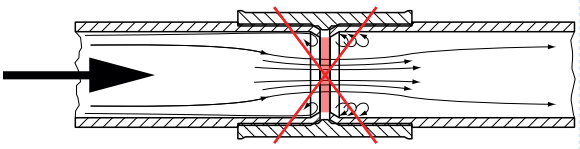


Installation example on a vacuum tank.
Do not install deflector plates in the vacuum tank.





Ensure for free air flow.
Constrictions cause a strong deviation.

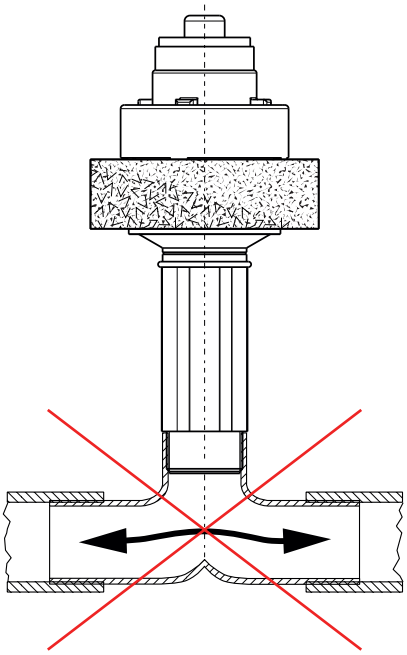


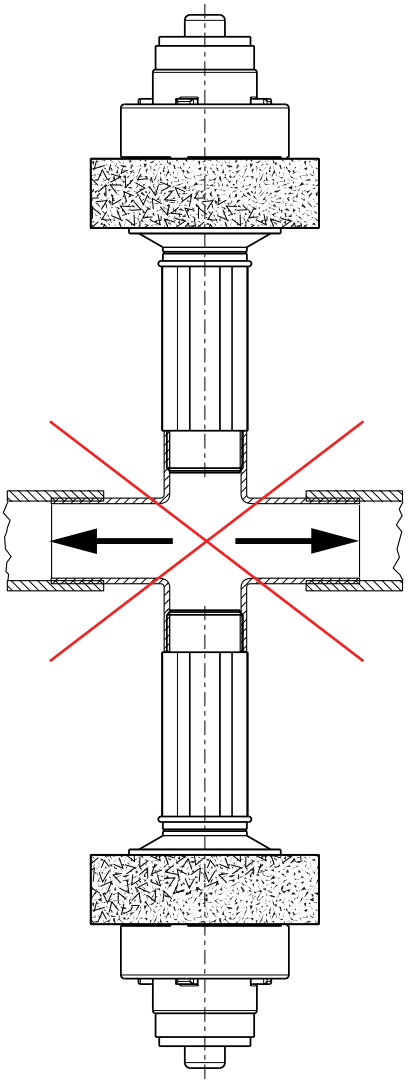
Flow resistances in the pipework are to be avoided.
The maximum pressure drop should
not exceed 0.025 bar.

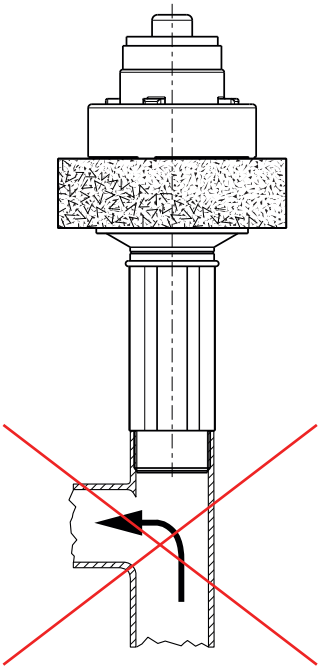
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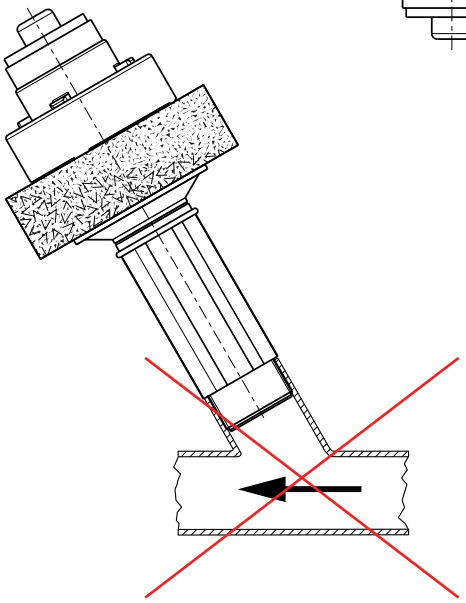
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Installations to be Avoided ✘









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International vacuum/pressure conversion table

Unit	bar	N/cm²	kPa	atm., kp/cm², m H2O	Torr, mm Hg	psi
bar	1	10	100	1,0197	750,06	14,5
N/cm²	0,1	1	10	0,1019	75,006	1,45
kPa	0,01	0,1	1	0,0102	7,5006	0,145
atm., kp/cm²; m H2O	0,9807	9,807	98,07	1	735,56	14,22
Torr, mm Hg	0,00133	0,0133	0,1333	0,00136	1	0,0193
psi(a)	0,0689	0,6896	6,896	0,0703	51,68	1

International vacuum/ pressure conversion table comparing absolute and relative values

Relative vacuum	Residual pressure absolute		Relative pressure					
%	kPa	bar	bar	N/cm²	kPa	atm., kp/cm², m H2O	Torr, mm Hg	psi
10	90	0,9	-0,101	-1,01	-10,1	-0,1	-76	-1,47
20	80	0,8	-0,203	-2,03	-20,3	-0,2	-152	-2,94
30	70	0,7	-0,304	-3,04	-30,4	-0,3	-228	-4,41
40	60	0,6	-0,405	-4,05	-40,5	-0,4	-304	-5,88
50	50	0,5	-0,507	-5,07	-50,7	-0,5	-380	-7,35
60	40	0,4	-0,608	-6,08	-60,8	-0,6	-456	-8,82
70	30	0,3	-0,709	-7,09	-70,9	-0,7	-532	-10,28
80	20	0,2	-0,811	-8,11	-81,1	-0,8	-608	-11,75
90	10	0,1	-0,912	-9,12	-91,2	-0,9	-684	-13,22

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