



Vacurex vacuum control valve

Instruction Manual / Installation Instructions / Parts List
(Translation of the original operating instructions)

7047-9001-023

09-2010

Contents

1	Preface	3
1.1	Information on the instructions	3
1.2	Manufacturer's address	4
1.3	Customer service	4
1.4	Declaration of Incorporation	5
1.5	Successful milking	5
2	Safety	6
2.1	Owner's obligation of care	6
2.2	Explanation of the safety symbols used	7
2.3	Basic safety instructions	7
2.4	Personnel qualification	7
3	Description	8
3.1	Correct applications	8
3.2	Changes to the product	8
3.3	Technical Data	8
4	Transport	9
4.1	Safety instructions for transport	9
4.2	Includes	9
4.3	Storage conditions	9
4.4	Information on disposing of packing material	9
5	Installation	10
5.1	Safety instructions for installation	10
5.2	Environmental requirements	10
5.3	Mounting the vacuum regulator	10
6	Initial Commissioning	13
6.1	Special personnel qualification required for initial commissioning	13
6.2	Safety instructions for initial commissioning	13
6.3	Vacuum settings	13
	Recommended vacuum height for milking cows	13
	Setting vacuum levels after changing a cluster or modifications to the installation	14
	Recommended vacuum height for milking goats and sheep	14
6.4	Checks after initial commissioning	16
7	Operating faults	16
8	Maintenance	17
8.1	Safety instructions for maintenance	17
8.2	Scheduled maintenance responsibilities	17
9	Decommissioning	19
10	Spare parts	20

1 Preface

1.1 Information on the instructions

These instructions are supplied with the product.

- They should be kept close at hand and remain with the equipment even if the equipment is sold.
- This manual is not subject to an amendment service. The most recent version at any time can be obtained through the technical dealer or directly from the manufacturer.

The manufacturer reserves the right to make changes due to technical developments in the data and images given in this manual.

Reproductions, translations and copies of any kind, even of extracts, require written authorization from the manufacturer.

Pictograms used



This pictogram indicates information that will help towards a better understanding of the working processes.



A correction bar in the margin indicates changes to the previous edition.



This pictogram refers to another document or chapter.


If a manual number is given, the middle 4 figures indicate the language, as follows:


	Language		Language		Language
-9000-	German	-9013-	Dutch	-9032-	Serbian
-9001-	English (Great Britain)	-9015-	English (America)	-9034-	Slovakian
-9002-	French (France)	-9016-	Polish	-9036-	Lithuanian
-9003-	Italian	-9021-	Danish	-9038-	Portuguese (Brazil)
-9004-	Romanian	-9022-	Hungarian	-9039-	French (Canada)
-9005-	Spanish	-9023-	Czech	-9040-	Latvian
-9007-	Swedish	-9024-	Finnish	-9041-	Estonian
-9008-	Norwegian	-9025-	Croatian	-9043-	Spanish (North America)
-9009-	Russian	-9027-	Bulgarian		
-9010-	Greek	-9029-	Slovene		

Possibly not all above-mentioned languages are available.

1.2 Manufacturer's address

GEA Farm Technologies GmbH
Siemensstraße 25-27
D-59199 Bönen (Germany)

 +49 (0) 2383 / 93-70

 +49 (0) 2383 / 93-80

 contact@gea-farmtechnologies.com

 www.gea-farmtechnologies.com

1.3 Customer service

Authorised Technical Dealer


If necessary, please contact your nearest authorised technical dealer.


There is a comprehensive dealer Internet search function on our website at the following address:

- www.gea-farmtechnologies.com

European Contact Information:

GEA Farm Technologies GmbH
Siemensstraße 25-27
D-59199 Bönen (Germany)

 +49 (0) 2383 / 93-70


 +49 (0) 2383 / 93-80


 contact@gea-farmtechnologies.com


 www.gea-farmtechnologies.com

US Contact Information:

GEA Farm Technologies, Inc.
1880 Country Farm Dr.
Naperville, IL 60563 (USA)

 +1 630 369 - 8100

 +1 630 369 - 9875

 contact_us@gea-farmtechnologies.com

 www.gea-farmtechnologies.com

1.4 Declaration of Incorporation

Installation declaration in accordance with the machinery directive:
2006/42/EC- Annex:II B

Manufacturer:	GEA Farm Technologies GmbH Siemensstraße 25-27 D-59199 Bönen (Germany)	
Product category:	Vacuum control valve with and without 2nd vacuum level	
Name / Model:	Vacurex	
The named product is in conformity with the requirements of the following European directives: 2006/42/EC Machinery Directive		
Conformity with the requirements of these directives is testified by complete adherence to the following standards:		
<ul style="list-style-type: none"> • Harmonized European standards <ul style="list-style-type: none"> EN 12100-1 (2009-10) Machine safety, basic terms, general design guidelines. Part 1: Basic terminology, methods EN 12100-2 (2009-10) Machine safety, basic terms, general design guidelines. Part 2: Technical guidelines and specifications EN ISO 14121-1 (2007-12) Safety of machinery - Risk assessment - Part 1: Principles EN ISO 2151 (2009) Acoustics - Noise test code for compressors and vacuum pumps - Engineering method (class 2) EN 60204-1 (2007-06) Safety of machinery. Electrical equipment of machines General requirements EN 61310-1 (2008-09) Safety of machinery Requirements for visual, acoustic and tactile signals 		
<p>Attention! We would point out that commissioning is not permitted until it has been established that the machine/system in which this product is installed meets the conditions of the directives on which they are based.</p>		
Person responsible for compiling the relevant technical documents:	Josef Schröer GEA Farm Technologies GmbH Siemensstraße 25-27 D-59199 Bönen (Germany) ☎ +49 (0) 2383 / 93-70	
Bönen, 10.12.2009		Reinhard Frenser (Head of Research and Development)
The undersigned is acting by virtue of power of attorney from the management of: GEA Farm Technologies GmbH, Siemensstraße 25-27, D-59199 Bönen (Germany)		
This declaration certifies compliance with the guidelines indicated, but does not establish any guarantee in the sense of paragraphs 443, 444 BGB.		

1.5 Successful milking

Prerequisites for successful milking:

- A properly designed and adjusted milking installation.
The milking vacuum and automatic cluster removal must be set correctly to suit the animals. Regular checks and adjustments to meet any herd changes will also ensure successful milking.
- Only use original parts when exchanging.

2 Safety

2.1 Owner's obligation of care

The product has been designed and constructed while taking account of a potential risk analysis and after careful selection of the harmonized standards and other technical specifications to be complied with. It therefore guarantees a maximum level of safety.

This safety can only be achieved in practice on the farm however when all of the necessary measures have been taken. It is part of the owner's obligation of care to plan these measures and check that they are carried out.

In particular, the owner must ensure that

- Everyone who works with or performs activities in connection with the product carefully reads the instructions (especially the safety instructions and warnings) and signs to confirm that they have understood them and will act in accordance with them!
- A full set of legible instructions is always kept by the product.
- Anyone who has to carry out work on the product can look at the instructions at any time.
- The instructions in the section entitled "Basic safety instructions" are observed.
- The legal requirements are observed.
- Operating instructions are produced for the farm. These must be especially adapted to the conditions of the business, once again, expressly taking account of safety aspects.
- The product
 - Is only used for its intended purpose.
 - Is only used if it is in perfect operating condition and, in particular, the safety equipment is regularly checked to make sure it is in perfect operating condition.
- The work to be carried out is performed by a sufficiently qualified person!



In this respect, please also read the section on "Personnel Qualification".

- These personnel are regularly instructed in all relevant matters of safety at work and protection of the environment and be familiar with the manual, particularly the safety instructions it contains.

2.2 Explanation of the safety symbols used

Safety symbols draw attention to the importance of the adjacent text.
The design of the warnings is based on ISO 3864-2 and ANSI535.6.

Safety symbols and signaling word



Attention!

The indication "Attention" signals important information on risks for the product or the environment.

2.3 Basic safety instructions



Note!

There are warnings about specific residual dangers in the corresponding chapters.

- There are risks involved in the operation and maintenance of equipment for dairy farms. For your own safety, read and follow the operating manual carefully (especially the section entitled "Safety information")!
- The chapter on "Technical data" gives the permissible working conditions (pressure ranges, temperature ranges, airflow quantities etc.) and these must be observed!
- Do not open or dismantle devices (risk of injury)!
- Do not remove any protective devices (risk of injury)!
- When working with products from other manufacturers always observe the warnings from the safety data sheets and operating instructions from the product manufacturer!
- Observe measures on protection against noise!

2.4 Personnel qualification

All personnel who perform work on or with the product must carefully read and understand the instructions and act in accordance with them!

- In principle, any work on hydraulic and pneumatic equipment may only be carried out by specialist personnel who have received the necessary training.

In addition, special qualifications are required for the following activities:

- Commissioning



Note!

If the work requires special qualifications, these are described in the corresponding chapters!

3 Description

3.1 Correct applications

The product described has been designed for use in agricultural (mainly milk producing) operations.

The vacuum control valve is intended solely for controlling the operating vacuum in milking installations.

Any applications that are not listed here are not part of the intended purpose and are therefore considered as improper use!

The manufacturer/supplier is not liable for any resulting damage. The user alone bears the risk.

Correct use also includes reading the instructions and observing the inspection and maintenance conditions.

- The manufacturer expressly points out that only original parts and original accessories have been adapted, tested and authorized for use with the product.
- The installation or use of products from other manufacturers may affect the specified properties of the original parts and lead to injury to people and animals.
- The manufacturer does not accept any liability for injury to people or animals, or damage to the product, caused by the use of products from other manufacturers.

3.2 Changes to the product

For safety reasons, do not carry out any unauthorized changes!

Any planned changes must be approved by the manufacturer in writing.

3.3 Technical Data

Type	max. air flow (l/min)			suitable for pump capacity (l/min at 50 kPa)	Sound pressure level dB(A) *
	35 kPa	50 kPa	60 kPa		
Vacurex	1200	1200	1000	0 - 1200	75
* Sound pressure level measured at a distance of one meter, with pipes connected and with max. air flow					

4 Transport

4.1 Safety instructions for transport

To prevent damage to property and/or life-threatening injury to personnel always observe the following:

- Parts which are stacked too high can collapse.
- There is a fire hazard due to the highly flammable packing material - open flames and smoking prohibited!

4.2 Includes

Check the goods supplied against the packing list enclosed for completeness and damage.

4.3 Storage conditions

When storing the goods supplied, the location must provide protection against:

- Moisture
- Frost
- External damage (jolts, knocks, rodents, insects, . . .)

4.4 Information on disposing of packing material

After unpacking, the packing material is to be handled properly and disposed of carefully in accordance with the valid local regulations on waste disposal and utilisation.

5 Installation

Installation may only be carried out by specially qualified personnel in accordance with the safety instructions.



Also see the section on "Personnel qualification".

If necessary, please contact your nearest authorised technical dealer.

5.1 Safety instructions for installation

To prevent damage to property and/or life-threatening injury to personnel always observe the following:

- Before installation, look for any damage caused during transport. Do not use damaged components!



Also read the chapter on "Safety".

Special hazards during installation:

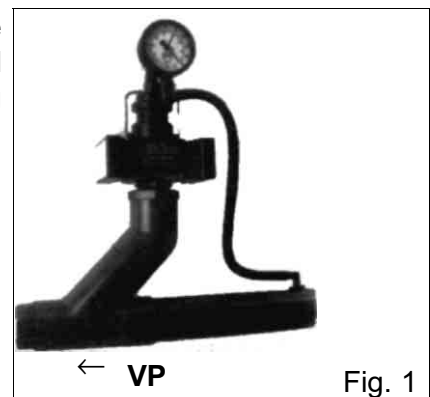
- Components which have not been removed correctly may fall off or twist.
- Components with sharp edges which are still open and accessible represent a source of injury.

5.2 Environmental requirements

The control valve should be installed in a well ventilated room to prevent the diaphragms from overheating. If the diaphragms overheat too much the operating vacuum will drop by an unacceptable amount during milking.

5.3 Mounting the vacuum regulator

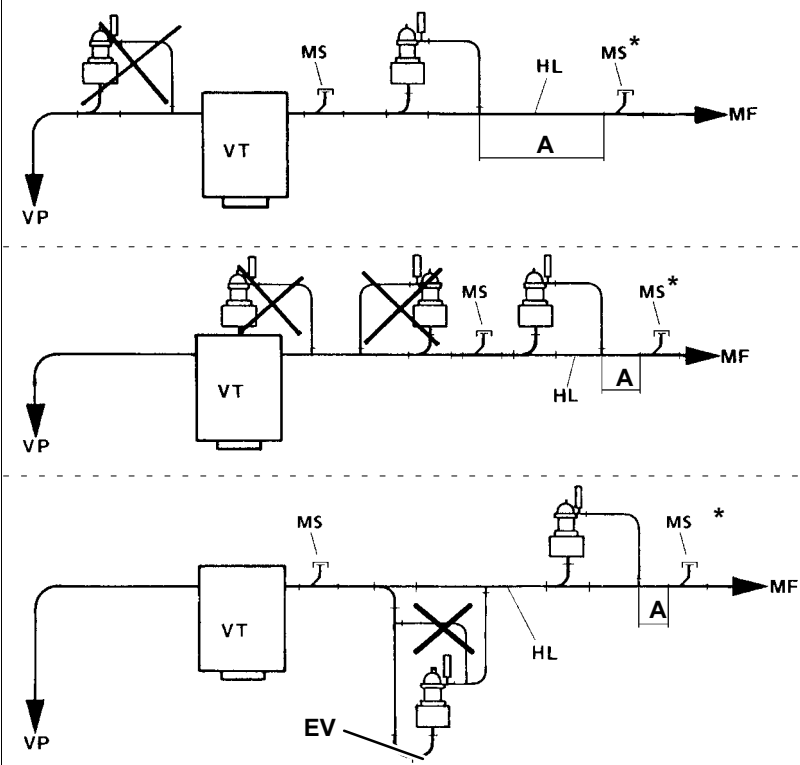
- The regulator must be mounted on the main line between the interceptor vessel and the milk sanitary trap (see "Mounting the vacuum regulator").



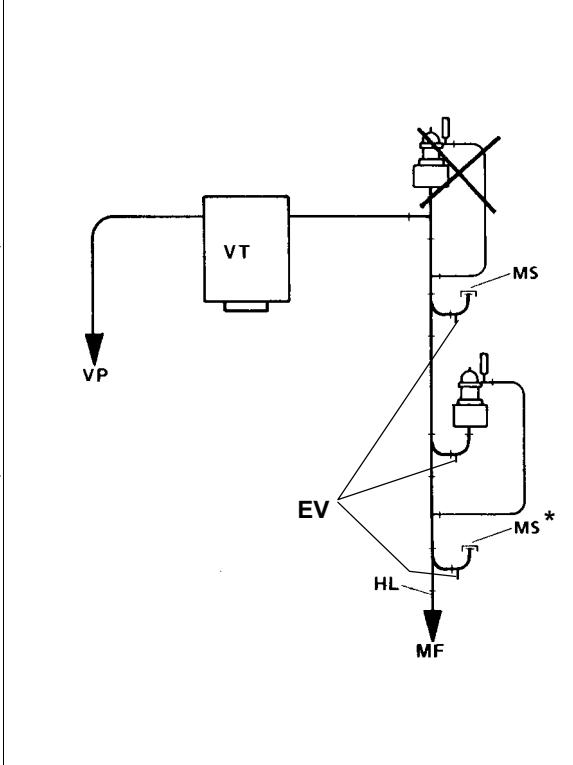
- When installing the regulator always make sure that no oil vapour from vacuum pump can be sucked in. Any oil vapour that is sucked in will be deposited in the control valve and cause operating faults.
- If the air taken in is as free of dust as possible this will also stop the regulator from clogging too soon.

Vacuum regulating valve assembly

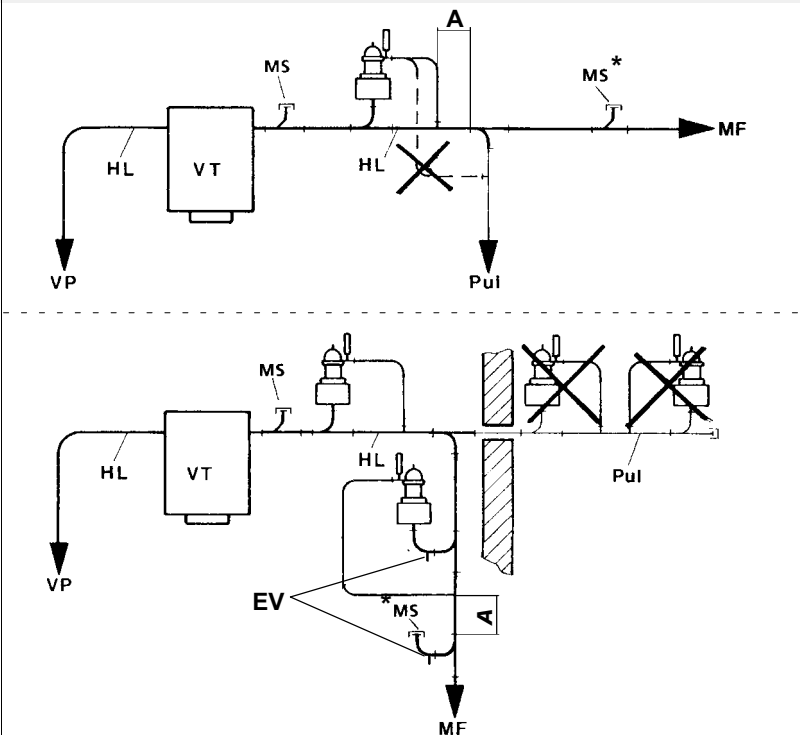
.... in a horizontal main vacuum line



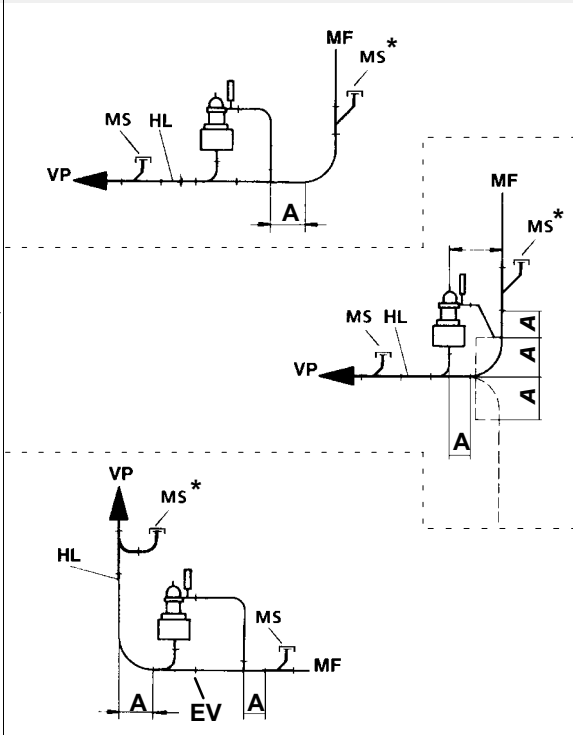
.... in vertical main vacuum line



close to the pulsation vacuum line



.... close to an elbow

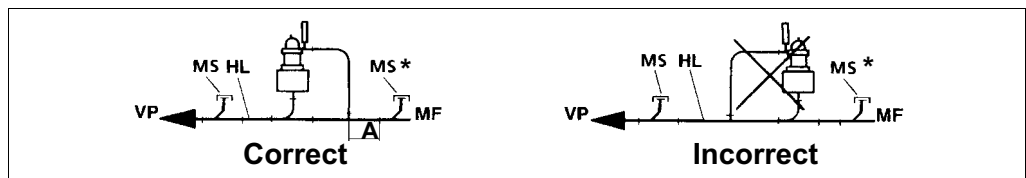
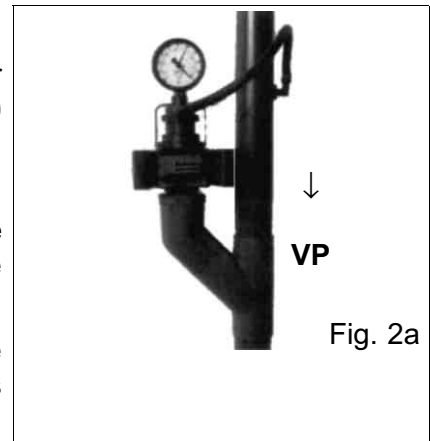


A	min. 5 x diameter of pipe	EV	Drain valve
MF	Milk transfer assy	HL	Main air line
MS	test tee	Pul	Pulsator vacuum line
*	In the case of bucket and churn milking installations, the test tee should be installed between the vacuum regulator and the vacuum connection (output side).	VP	Vacuum pump
		VT	Vacuum tank

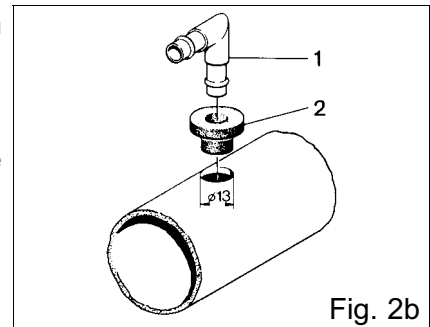
Fitting the control tube

Note!

- The control connection for the regulator should be installed a distance of 200-400 mm away from the connecting T-piece in the direction of the consumer.
- In order to avoid condensation water in the control hose, the horizontal line should be bored from above.
- The connecting pieces installed in the vertical line should be pointing upwards (Fig. 1 and 2a).



- ØBore a 13 mm dia. () hole in the vacuum line (steel or plastic).
- Insert packing 2 in the hole.
- Press connecting piece 1 in as far as the stop.



Before installing, press or screw the silencer that is included (item 28 or 24 in the spare parts list) into the bottom of the housing.

Accessories for two vacuum levels

In installations with a low milking vacuum (below 45 kPa), the regulators can be installed with an additional fitting for 2 vacuum heights. During the rinsing process the operating vacuum can be increased by approx. 10 kPa via the automatic rinsing units to make the cleaning fluid more turbulent.

Part No.	Description
7047-3200-010	Set of conversion parts "Second Vacuum Height Vacorex"

6 Initial Commissioning

6.1 Special personnel qualification required for initial commissioning

Initial commissioning may only be performed by specially qualified personnel in accordance with the safety instructions.

Any settings that have to be made (e.g. on control units) must always be made by personnel who have been suitably instructed/trained by the manufacturer.



Also see the section on "Personnel qualification".

6.2 Safety instructions for initial commissioning

- Check that all of the operating media are suitable, present and connected.



Also read the chapter on "Safety".

6.3 Vacuum settings

The final vacuum setting depends upon the milking capacity of the herd and the losses that occur when transferring the milk.



Note!

The final vacuum setting may deviate from the recommended vacuum level!

- minus 1-2 kPa for low yielding herds
- plus 1-2 kPa if there are particular losses

6.3.1 Recommended vacuum height for milking cows

Cluster	Milking installation					
	Milk line			Measuring reservoir		Bucket milking installations
	high	medium*	low	high	low	
200 and older, Eclipse	46 kPa	44 kPa	42 kPa	44 kPa	42 kPa	42 kPa
Classic 300, IQ	45 kPa	43 kPa	40 kPa	43 kPa	40 kPa	41 kPa
450 (CHAMPION)	45 kPa	43 kPa	38 kPa	42 kPa	40 kPa	40 kPa
BioMilker (green nozzle)	42 kPa	42 kPa	40 kPa	42 kPa	41 kPa	40 kPa
BioMilker (orange nozzle)	40 kPa	40 kPa	38 kPa	40 kPa	38 kPa	38 kPa
* up to 1.5 m above the surface the animals are standing on						
051						




Note!

If the recommended vacuum is above 40 kPa set the vacuum 1-2 kPa lower when using a ClassicPro type or IQPro type silicone teat liner.

6.3.2 Setting vacuum levels after changing a cluster or modifications to the installation

Setting vacuum level directly
The recommended vacuum level can be set directly if the difference between the existing operating vacuum and the recommended vacuum level is less than 3 kPa .

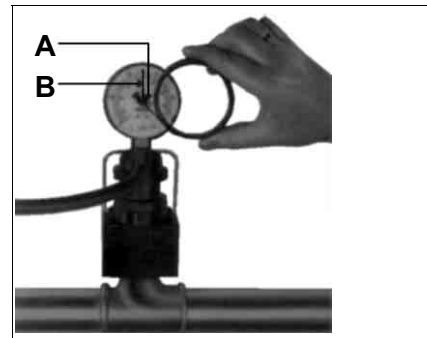
Adjusting vacuum level in stages
<p>The vacuum level must be adjusted in stages if</p> <ul style="list-style-type: none"> the difference in vacuum is more than 3 kPa. Set the vacuum 2 kPa above the recommended vacuum level. <p> Exception! If the old installation has very poor teat end vacuum conditions, the recommended vacuum level may be set straight away (note how long milking takes).</p> <ul style="list-style-type: none"> the difference in vacuum is more than 3 kPa and VacuStop is being fitted for the first time. When commissioning, set the vacuum level to 3 kPa above the recommended vacuum level. <p>Once the vacuum level has been set, then reduce the vacuum by 1 kPa every week until it reaches the recommended level or until the milking time takes longer.</p> <p>Then increase by 1 kPa if required (for shorter milking time)</p>

6.3.3 Recommended vacuum height for milking goats and sheep

Milking installation	Vacuum level (kPa)	
	Goats	Sheep
with low level milk line	36 - 38	33 - 36
with high level milk line	38 - 40	37 - 39
Bucket milking installations	36 - 38	34 - 37

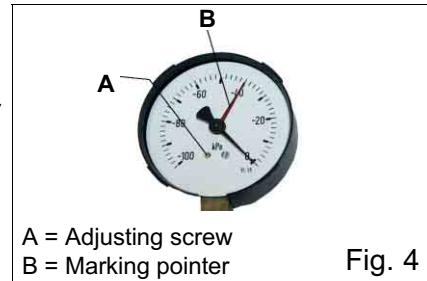
Vacuum meter

The push-on ring is connected to the housing with a bayonet catch. It is released by turning it to the left. Protective screen and push-on ring are glued together.



Reference pointer

The red marking indicator B should be set to the most suitable operating vacuum level for the herd. During operation both pointers then coincide, so that possible fluctuations in operating vacuum level are easily recognized.



A = Adjusting screw
B = Marking pointer

Fig. 4

Adjusting the vacuum gauge

Remove the protective screen. The vacuum meter can be calibrated to the operating vacuum by the adjusting screw situated on the dial and a second calibrated vacuum meter while the vacuum pump is running (fig. 5).

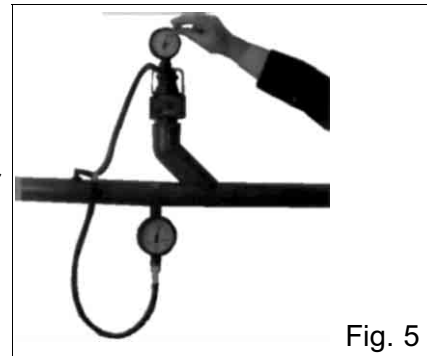
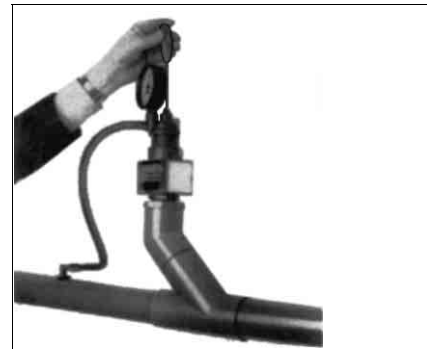


Fig. 5

Adjusting the operating vacuum

The black pointer (Fig. 3) and red marking indicator should be placed together on the scale interval required.



For further information on the subject, see the manual
7000-90 . . -000

6.4 Checks after initial commissioning



Attention!

Check the vacuum value on a daily basis.

If the vacuum increases	If the vacuum decreases
<ul style="list-style-type: none"> • If the valve cone (20) moves up 	<ul style="list-style-type: none"> • If the valve cone (20) moves down
<ul style="list-style-type: none"> • The system vacuum will decrease 	<ul style="list-style-type: none"> • The system vacuum will increase


7 Operating faults

If necessary, please contact your nearest authorised technical dealer.

Troubleshooting		
Malfunction	Cause	Remedy
Vacuum value is increasing	Vacuum hose (5) leaking	Replace vacuum hose
	Diaphragm (15) and/or (17) leaking	Replace defective diaphragm
	Air filter clogged	Replace air filter
Vacuum value is decreasing	Valve screw (4) clogged	Clean valve screw
	Spring (13) fatigued	Adjust desired vacuum value
Vacuum value very high	Vacuum hose not connected	Connect hose
	Diaphragm (15) and/or (17) leaking	Replace defective diaphragm

8 Maintenance

Maintenance work may only be performed by specially qualified personnel in accordance with the safety instructions.

 Also see the section on "Personnel qualification".

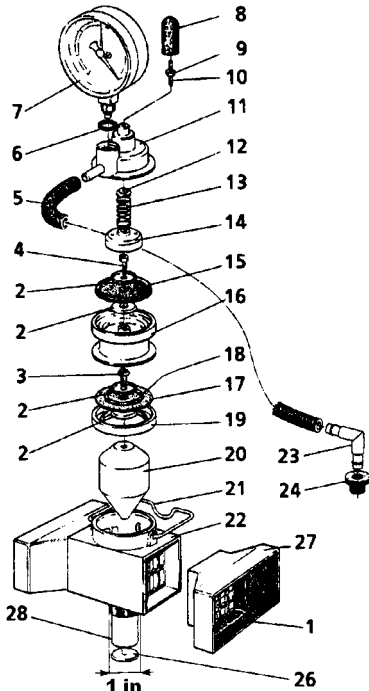
If necessary, please contact your nearest authorised technical dealer.

8.1 Safety instructions for maintenance

To prevent damage to property and/or life-threatening injury to personnel always observe the following:

- Only use original spare parts / original wearing parts / original accessories. In the case of products by other manufacturers it cannot be ensured that they have been designed and produced from the point of view of loads and safety.

8.2 Scheduled maintenance responsibilities

	1	7049-2799-000	Air filter	check / replace every week
	5	7047-2635-000	Vacuum hose	replace after 4500 hours of operation or 2 years
	6	0007-2502-750	Gasket	replace after 4500 hours of operation or every 2 years
	15	7047-1702-000	Diaphragm	replace after 1500 hours of operation once a year
	17	7047-1702-010	Diaphragm	replace after 1500 hours of operation or once a year
	24	7037-2284-010	Stopper	replace after 1500 hours of operation or once a year

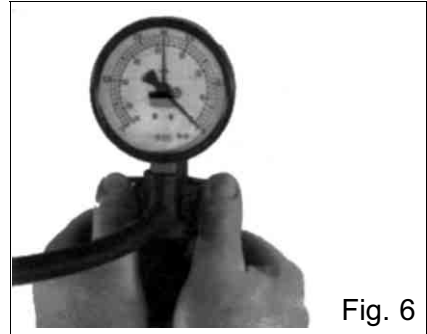
As far as animal health and milking results are concerned, it is extremely important for the milking installation to be inspected and settings checked on a regular basis.

- Vacuum level:
Is the vacuum level set correctly and is the operating vacuum being displayed correctly by the vacuum gauge? Would it be possible to set the operating vacuum at a lower level (gentler milking)?

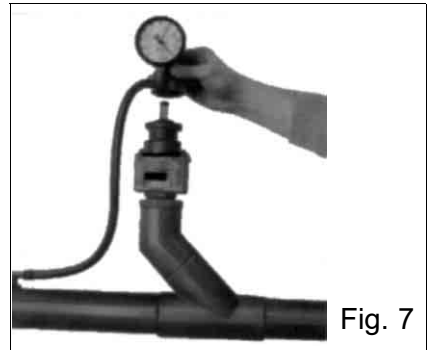
Vacuum control valve

Both valves should be dismantled and cleaned once a month.

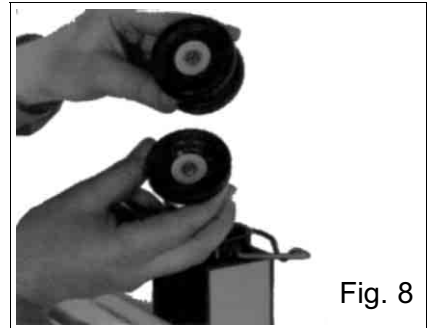
- Press back and hold the clamp on valves V1 and V2 in turn(fig. 6).



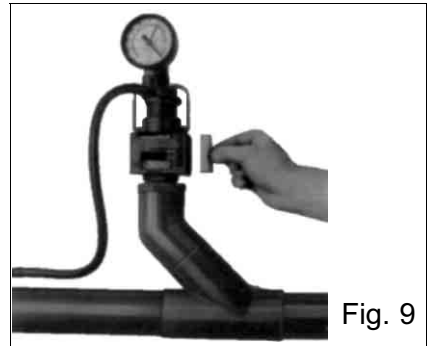
- Because the valve spring is pre-tensioned, the valve cover should be held tight and removed vertically (Fig. 6-8).



- Clean dirty parts with a cloth.
- If necessary, the holes in the valve screw, in the nozzle and the side ventilation hole in the intermediate flange beneath the upper diaphragm can be cleaned with a thin needle.



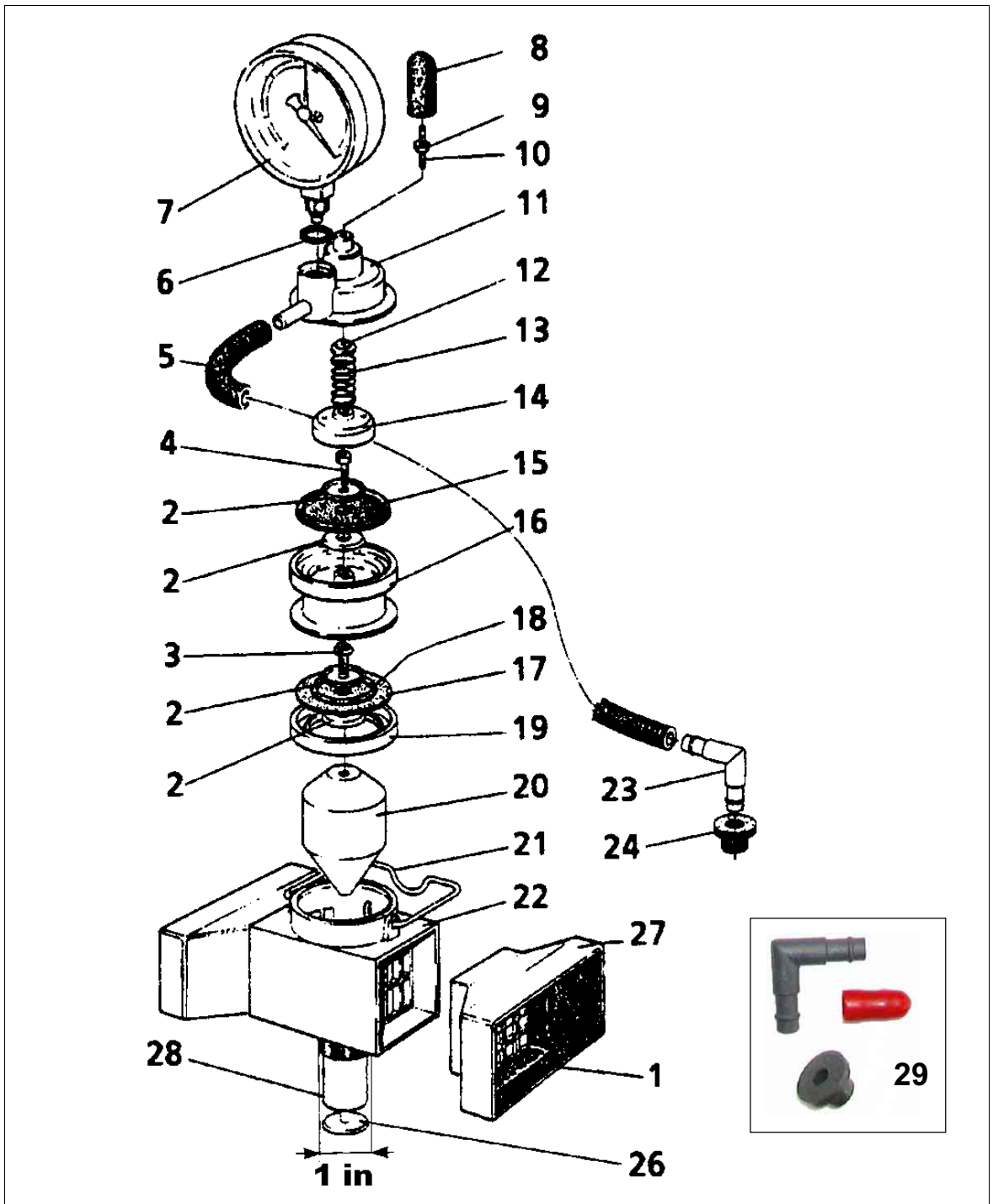
- Dirty filters should be washed with soapy water and dried well before they are replaced (fig. 9).



9 Decommissioning

After final decommissioning, handle all components properly and dispose of them in accordance with valid local regulations on waste disposal and utilization.

10 Spare parts



Pos.	Part No.		Description	
-	7047-1730-250		Vacuum control valve, compl.	Vacurex
1	7049-2799-000	X	Air filter	115x56
2	7041-2745-000		Locking screw	
3	0019-6812-300		Oval-head screw	M 5 x 12
4	7047-1647-000		Valve screw	M 5 x 15
5	7047-2635-000	X	Vacuum hose	6,5/13 x 500
6	0007-2502-750	x	Gasket	12 x 3
7	0001-1562-700		Vacuum meter	R1/4in
8	7047-1090-040		Cap	
9	0013-0275-300		Hexagon head nut	M 5
10	0019-5038-300		Threaded pin	M 5 x 30 DIN 553
11	7047-1159-020		Valve cover	
12	7047-1607-000		Spring cap	
13	0006-3851-300		Cylindrical pressure spring	14,5/1,5x24
14	7047-1648-000		Valve cap	
15	7047-1702-000	X	Diaphragm	
16	7047-1458-000		Intermediate flange	Vacurex
17	7047-1702-010		Diaphragm	Vacurex
18	7047-2696-000		Nozzle plate	
19	7047-1469-000		Intermediate ring	Vacurex
20	7047-1306-030		Valve cone	
21	7047-1859-000		Clamp	
22	7047-1738-030		Casing (bottom section)	Vacurex
23	0018-4944-820		Angle connector	9
24	7038-2284-010	x	Stopper	
26	7047-2711-020		Vibration damper	
27	7047-2875-000		Filter casing	
28	7047-1234-010		Length of pipe (sound-damper)	Vacurex
29	7045-1060-010		Elbow, complete	
30	7047-9902-000		Set of replacement parts (item 1(10x), 5, 6, 15, 17, 18, 24)	
x - Wear parts, interval of maintenance in chapter Maintenance”.				

GEA Farm Technologies

The right choice.



GEA Farm Technologies

GEA Farm Technologies GmbH

Siemensstraße 25-27, D-59199 Bönen (Germany)

Tel. +49 (0) 2383 / 93-70, Fax. +49 (0) 2383 / 93-80

www.gea-farmtechnologies.com