KEOFITT®

WORLD LEADERS IN STERILE SAMPLING™

SIMPLEX™ SAMPLING VALVE

User Manual

DOCUMENT VERSION LOG

The table below lists previous versions of this User Manual and states the major changes between versions.
This version list is introduced in November 2015.

Version #	Version date	Major changes from previous versions
1	April 2016	Latest version without version log

INTRODUCTION:

MANUFACTURER: Keofitt A/S
Kullinggade 31
5700 Svendborg, Denmark

TYPE: SIMPLEX™ SAMPLING VALVE
YEAR OF INTRODUCTION: 2007
YEAR OF REVISED DESIGN: 2014
MANUAL LAST UPDATED: Apr. 2016

CONTENTS

1. PRESENTATION

The Keofitt Simplex sampling valve is a valve, which can be readily sanitized and which meets both hygienic and process design requirements. This means that an effective cleaning of the sampling valve can be carried out between production batches. The Keofitt Simplex valve is EHEDG Type EL authorised. The EHEDG Type EL certification is a European standard and it includes additional tests of bacterial ingress on components that are in direct contact with the sample after the CIP process.
The valve is used in a wide range of processing industries, such as breweries, dairies, and the pharmaceutical and biotechnological industries.

1.1 Definition of terms

In order to ease the reading of this manual and to avoid any misunderstanding, please refer to the definition of terms in the table below:

TERM	DEFINITION
3-A Sanitary Standard	3-A SSI is an independent, not-for-profit US corporation dedicated to advancing hygienic equipment design for the food, beverage and pharmaceutical industries.
Acids	An acid is a chemical substance whose aqueous solutions are characterized by a sour taste and the ability to react with bases and certain metals (like calcium) to form salts. Aqueous solutions of acids have a pH of less than 7. A lower pH means a higher acidity, and thus a higher concentration of positive hydrogen ions in the solution. Removes limestone and most mineral deposits.
Alkali	Alkalis are all bases, which form hydroxide ions (OH-) when dissolved in water. The terms “base” and “alkali” are often used interchangeably. Alkalis have a pH value above 7. Alkalis dissolves fat and oil, destroys protein and attacks light metal.
Aseptic sampling	The process of withdrawing a sample from the production equipment through a closed circuit, which has been sterilised and kept sterile with no exposure to the ambient during the sampling process.
Bioload	See Microbial load.
Bioburden	See Microbial load.
Chemical Sterilant	A few disinfectants will kill spores with prolonged exposure times (3–12 hours); these are called chemical sterilants.
Chlorine	Chlorine is a chemical element with symbol Cl and atomic number 17. It belongs to the halogen group together with for instance iodine. It is a strong oxidizing agent and reacts with many substances. These properties make chlorine compounds efficient disinfectants.
CIP	Abbreviation of Clean-In-Place. The process of cleaning a process component (like a sampling valve) without removing it from the production line.
Cleaning	Removal, usually with detergent and water or enzyme cleaner and water, of adherent visible soil on a surface.
Complexing agent	A substance capable of forming a complex compound with another material in solution. Improves the cleaning properties of a detergent.
Contact time	The time span during which the item is in contact with the detergent or the disinfectant.

Enzymes	Molecules, which are added to cleaning agents to ease the removal of specific organic material. Assures same cleaning effect at a lower temperature.
Disinfectant	Usually a chemical agent that destroys harmful microorganisms but might not kill bacterial spores.
Disinfection	Thermal or chemical destruction of microorganisms. Disinfection is less lethal than sterilisation, because it destroys most recognised microorganisms but not necessarily all microbial forms (e.g. bacterial spores).
Detergent	A cleaning agent that has no antimicrobial effect, but in diluted solutions good cleaning properties.
EHEDG	Abbreviation for the European Hygiene Engineering and Design Group. EHEDG is a consortium of equipment manufacturers, food industries, research institutes as well as public health authorities promoting safe food by improving hygienic engineering and design in all aspects of food manufacture.
Electro polishing	Electro polishing is an electrochemical process by which the high points within the microscopic surface texture are removed and the corners rounded. This results in Reduced Product Adhesion, Ease of Cleaning and Improved Corrosion Resistance.
Exposure time	Period in a sterilisation/disinfection process during which the item is exposed to the sterilant/disinfectant at the specific sterilisation/disinfection parameters.
Flow path	The path the sample flows from the tank or process equipment to the sample recipient.
Germicidal	The property of an agent to destroy microorganisms.
Microbial load	The number and types of viable microorganisms with which an item is contaminated; also called bioload or bioburden.
Microorganisms	Animals or plants of microscopic size. As used in food and pharmaceutical industries, generally refers to bacteria, fungi, viruses and bacterial spores.
Peracetic acid	A commonly used disinfectant, which is efficient at low temperature and short contact time. Relatively harmless as it decomposes into carbon dioxide (CO2) and water (H2O).
Process media	The product in the process equipment and the product from which a sample is taken.
Representative sample	A sample which when it reaches the laboratory is still identical to the process media. A sample which is in no way contaminated or altered during neither the sampling process nor the transport to the laboratory.
Sanitization	The application of a chemical agent that reduces the number of bacterial contaminants to a safe level as judged by the public health authorities. The official sanitizer protocol indicates that 99.999% of the specific test bacteria be killed in 30 seconds under the conditions of the test.
SIP	Abbreviation for Sterilise-In-Place. The process of rendering a process component (like a sampling valve) sterile without removing it from the production line.
Spores	Relatively water-poor resting cells surrounded by an impervious cell wall, which makes them relatively resistant to disinfectants and sterilants. They are dangerous as they can survive in adverse conditions and re-emerge as live bacteria at a later stage.

Sporicidal	The property of an agent that kills spores.
Steaming	The process of using saturated steam under pressure as the sterilising agent.
Sterile	State of being free from all living microorganisms. In practice, usually described as a probability function, e.g., as the probability of any microorganism surviving sterilisation being one in one million.
Sterilant	A few disinfectants will kill spores with prolonged exposure times (3–12 hours); these are called chemical sterilants.
Sterilisation	Validated process used to render an item free of all forms of viable microorganisms. In a sterilisation process, the presence of microorganisms is expressed in terms of probability. Although this probability can be reduced to a very low number, it can never be reduced to zero.
Sterility Assurance Level	The probability of a viable microorganism being present on an item after sterilisation. Usually expressed as 10–n; a SAL of 10-6 means <1/1 million chance that a single viable microorganism is present on a sterilised item.
Tensides	A tenside is a surfactant that reduces the surface tension of water and assures a faster and better contact between the detergent and the soil.

1.2 Quick start

The table below gives you an overview of the relevant chapters to read depending on the operations you want to perform to obtain the required hygienic level.

Required hygienic level	4.1 Pre-production treatment	4.2 Chemical cleaning CIP	4.3 Chemical disinfection	4.4 Steaming	5.1 Chemical CIP	5.2 Chemical disinfection	5.3 Steam sterilisation	5.4 Sampling
Cleaning	✔	✔			✔			✔
Disinfection	✔		✔			✔		✔
Sterilisation	✔			✔			✔	✔

2. CLEANING – DISINFECTION – STERILISATION

2.1 Clean-In-Place (CIP)

Thorough cleaning of the valve is a prerequisite for proper disinfection or sterilisation. Cleaning of the valve is the removal of any visible residual product, it be organic or inorganic. It may be done using either steam (continuous steam will eventually lead to sterility; SIP = Sterilise-In-Place) or a suitable liquid detergent.
Cleaning is the removal of adhering soil from the environment and from the previous sample (to the extent it has not been removed by the recommended post-sample cleaning). Cleaning is usually performed by flushing with water followed by a thorough washing with an appropriate detergent and finished off with a thorough rinsing with water.
Depending on the actual process media the proper detergent must be determined in cooperation with your usual supplier of detergents. The company Novadan ApS, Kolding, Denmark - www.novadan.dk, has supplied the generic table below for your convenience.

What to clean for	Generic cleaning agents	Comments
Fat	Alkali and Tensides	Heat will facilitate the cleaning process as the fat melts
Protein	Alkali, Acids, Tensides and Chlorine	Coagulation and burning when heated, which makes the product hard to remove.
Sugar, Salt	Water is usually sufficient as the product is water soluble	Sugar caramelises when heated, turning into a hard sticky substance, which is difficult to remove
Minerals	Acids, Complexing agent	Often seen as lime scale
Biofilm	Alkali and Chlorine, Peracetic acid, possibly Enzymes	Biofilm is an accumulated mass of microorganisms that is tightly adhered to a surface and cannot be easily removed.
Starch	Alkali and Chlorine	

2.2 Disinfection

Although CIP removes all visible residues of the process media the valve surfaces will still be contaminated on a microscopic level. Depending on your actual process media it will be necessary to carry out a disinfection operation in order to a) reduce the microbial load to an acceptable level (also referred to as Sanitization) or b) destroy critical microorganisms, but not necessarily all microbial forms (e.g. bacterial spores).
The disinfection process may be carried out in one of two ways and to different levels of disinfection depending on a) the initial microbial load distribution, b) the required hygienic level and c) the type, exposure time and concentration of the chemicals used (if using a chemical disinfectant):

- By steaming (in a continued process after steam cleaning)
- By applying one or more suitable liquid chemical disinfectants

There are a number of chemical disinfectants. It is important to choose the right one, the right concentration and contact time and the right method for your current application. Your usual supplier of chemical disinfectants can support you in choosing the right disinfectant for your process media and the specific group of microorganisms you are aiming at.
The company Novadan ApS, Kolding, Denmark has supplied the table below, as a preliminary indication of which type of disinfectant to use:

Disinfectant / Microbes to inactivate	**Halogenes** (Clorine)	**Peroxides** (hydrogenperoxid & peracetic acid)	**Alcohol** (70%)
Gram-neg **bacteria** Salmonella Campylobacter E. Coli and others...			
Gram-pos **bacteria** Listeria Bacillus cereus Clostridium and others...			
Bacteria **spores** Bacillus cereus and others...			
Bacteriophage			
Yeast			
Fungi			
Virus			

Legend:	Efficient	Limited effect	Little/No effect

NOTE! The final choice of detergent, disinfectant and method lies with the user, supported by the supplier of the CIP fluids and disinfectants, as it is very much dependant on individual concerns and circumstances.

3. VALVE FUNCTION

The valve is designed to regularly take representative non-sterile random samples in the production process. The valve is therefore designed such that effective cleaning and sampling can be carried out. For sterile sampling, please refer to other Keofitt sampling valves such as Keofitt W9 or Keofitt Reflex. Cleaning is carried out by simply opening the valve during the CIP process allowing the cleaning agents to flow through the valve and its outlet, which should be connected to a by-pass loop or other closed circuit to prevent the operator from being exposed to the CIP liquid.

NOTE! The membrane functions both as a dynamic packing in the valve seat and as a hygienic, static packing against the valve body.

WARNING

- The valve is designed for use in working conditions of up to 6 bar(g) pressure and temperatures of up to 121 C. It is therefore important to be aware that the rubber plug (designed for max. 3 bar(g)) or the steel plug (designed for max. 10 bar(g)) may be forced out at high speed, if not seated properly
- Always remember to use safety goggles when CIPping, taking samples and all other operations of the sampling valve

IMPORTANT

- If vacuum occurs during the process it is preferable to use PTFE membranes as rubber membranes risk to be sucked hard into the seat. Never open sampling under vacuum conditions due to the high risk of contaminating the process.
- The membrane is available in 3 different qualities: Silicone, EPDM and PTFE
- The Silicone membrane has the advantage that it in general can withstand high temperatures, but it cannot tolerate moisture condensation resulting from steam sterilisation
- The EPDM membrane is better able to cope with the condensation in the steam and at the same time it can be used with a majority of CIP fluids and disinfectants in normal concentrations
- The PTFE membrane resists all CIP fluids and disinfectants except highly oxidising acids in high concentrations

4. EVERYDAY USE OF THE VALVE

This chapter gives an introduction to how the sampling valve works in different operating conditions. For specific operator instructions please refer to the chapter “VALVE OPERATIONS”.

4.1 Pre-production treatment

Before every new production batch the sampling valve is cleaned (and possibly disinfected) together with the tank or vessel or the entire production line.
Make sure the valve is in its open position during the initial line CIP to allow cleaning of the valve seat and the membrane contact surface.
Connect a return hose to the valve outlet port to lead the CIP fluid back into the CIP circuit.
Remember to close the valve after the final rinse and prior to starting up the next production batch.

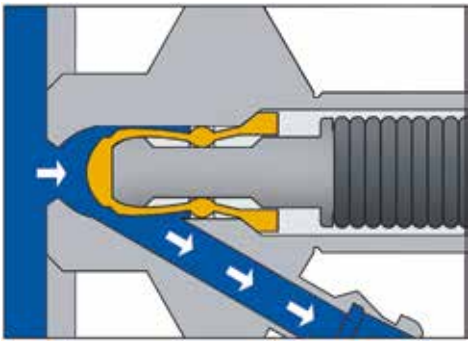
4.2 Chemical cleaning (CIP) and disinfection

The valve chamber and the valve port must be cleaned both immediately after and before each sampling.
Cleaning after the sampling is to remove any product residues before they stick to the valve interior.
Cleaning before sampling is to reduce the risk of contaminating the sample (and possibly the production batch) by removing any airborne or other contaminants that might have settled on the valve since the last sample was taken.
Cleaning is carried out by squirting a jet of cleaning agent into the valve port.
Similarly disinfection is carried out squirting a disinfectant into the valve port.
Rinsing is done in the same way using clean water or similar.

Just prior to sampling the valve port is cleaned

4.3 Sampling

Once the cleaning is accomplished taking a sample is done by opening the valve and closing it again when the riquired sample volume is obtained.



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5. VALVE

5.1 Material

Valve body:	AISI 316L (1.4404)
Valve head:	AISI 316L (1.4404)
Membrane:	Silicone (grey)
	EPDM (black)
	PTFE (white)

5.2 Certificate

Valve body:	3.1	
Membrane:	Silicone	acc. to FDA & BGA
	EPDM	acc. to FDA & BGA
	PTFE	acc. to FDA & BGA

* A 6-digit code is marked on the valve body. This code refers to a 3.1 certificate which accompanies every consignment of valve bodies. The 3.1 certificate is available at the Keofitt Online Service Center on www.keofitt.dk. Click Certificates and then 3.1.

5.3 Pressure (max.)

Working pressure:	6 bar(g) / 87 psi(g)
Rubber plug	3 bar(g) / 44 psi(g)
Steel plug	15 bar(g) / 218 psi(g)

5.4 Surface finish

Internal:	Electropolished
	Ra<=0.5µm / 20µinch
	Ra(mean) = 0.2µm / 8µinch
	Ra(std.deviation) = 0.08µm / 3µinch
	Valves with internal electropolishing are identified by an E preceding the serial number e.g. E12345678
External:	Electropolished
	The surface roughness is measured for each valve at 4 critical places.
	A serial number identifies each valve body. A specific surface roughness certificate is supplied with every valve. A general surface finish certificate copy is available on www.keofitt.dk

5.5 Viscosity:

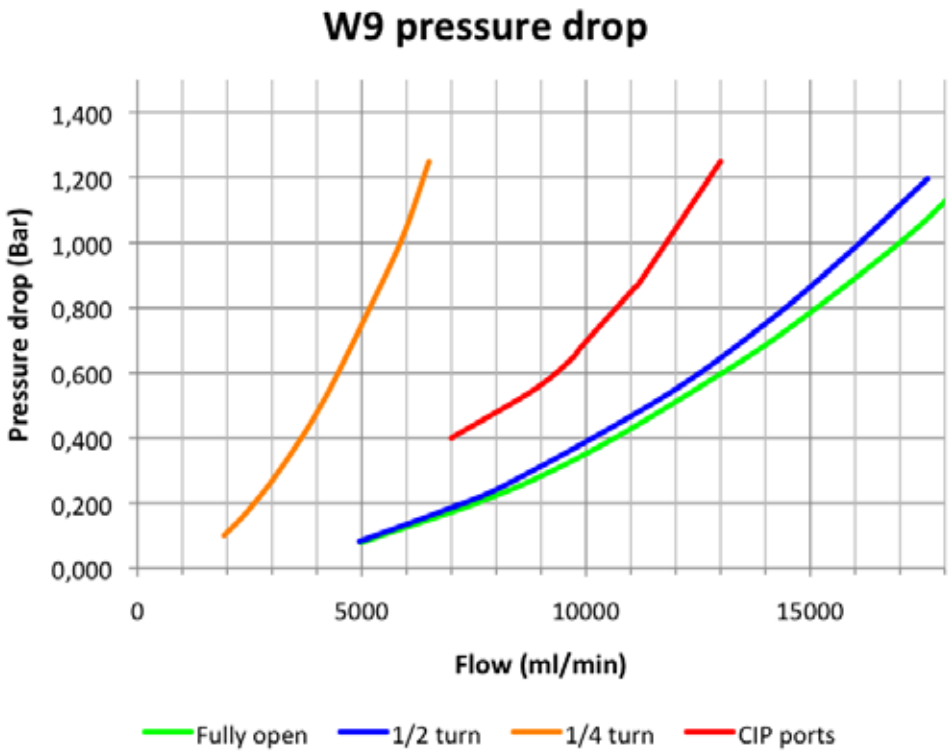
Viscosity range:	0-1000cP, with particles up to 3mm in diameter.
	Higher viscosity liquids may be sampled, only will the sampling take longer.

5.6 Flow

The graphs below illustrate (for water at 20°C/68°F) the following:

- Pressure drop across valve as a function of the flow for different positions of the turn knob

Based on the tank pressure and the requested sample flow the graphs may be used to get an indication of to which degree the valve must be opened.



The generally accepted sampling time is around 10 sec. for small samples and around 30 sec. for larger samples. As usual sample sizes are between 100 ml and 1000 ml the needed flow lies from 600 to 2000 ml/min.
As the pressure on the sample side usually is 0 bar(g) the pressure drop across the valve equals the process pressure (tank pressure or line pressure).

The volume flow through a valve is given by:

$$k_v = Q\sqrt{\frac{\rho}{1000 \times \Delta p}}$$

Symbol	Unit	Description
k_v	m^3/h	Flow in m^3/h through a valve at a pressure drop of 1 bar as defined in VDE/ VDI norm 2173.
Q	m^3/h	Volume flow through the valve
ρ	kg/dm^3	Density of the fluid. For Water it is 1.
Δp	bar	Pressure drop across valve. As the gauge pressure at the valve outlet usually is 0 bar(g) the pressure drop is often equal to the gauge pressure at the input (the process side)

WARNING

- The valve is designed for use in working conditions of up to 6 bar(g) pressure and temperatures of up to 121 C. It is therefore important to be aware that the rubber plug (designed for max. 3 bar(g)) or the steel plug (designed for 10 bar(g)) may be forced out at high speed, if not seated properly
- For valve heads allowed under ATEX for Group IIGD, Category 2 (zone 1) both handle and top of valve heads N and Q must be cleaned before use
- Always remember to wear safety goggles when steaming, CIPping, taking samples or any other operations of the sampling valve

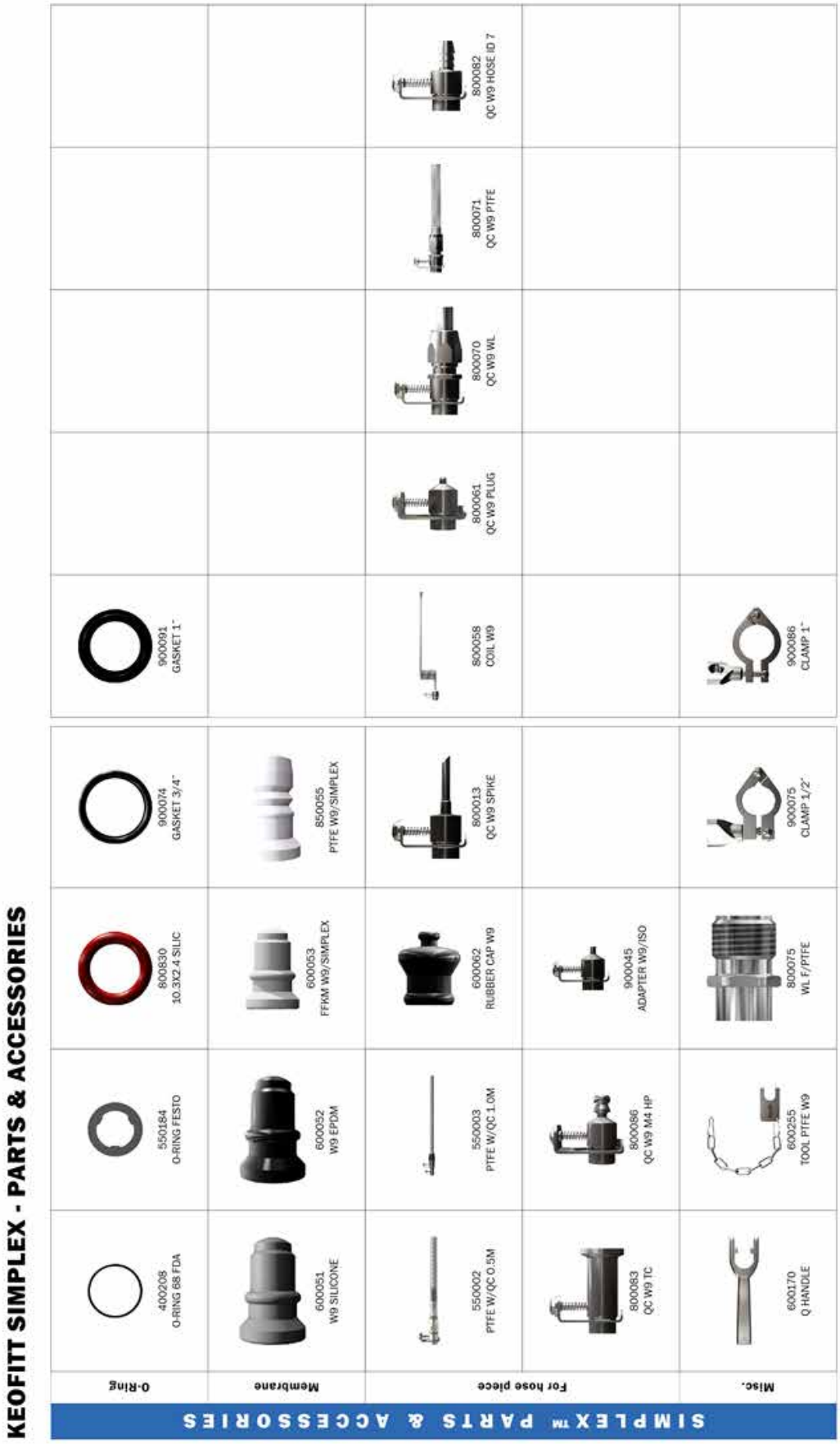
IMPORTANT

- CIP fluids are hazardous

6. VALVES

For further product information - material, dimensions etc. - please refer to the specific datasheet at www.keofitt.dk

7. PARTS & ACCESSORIES

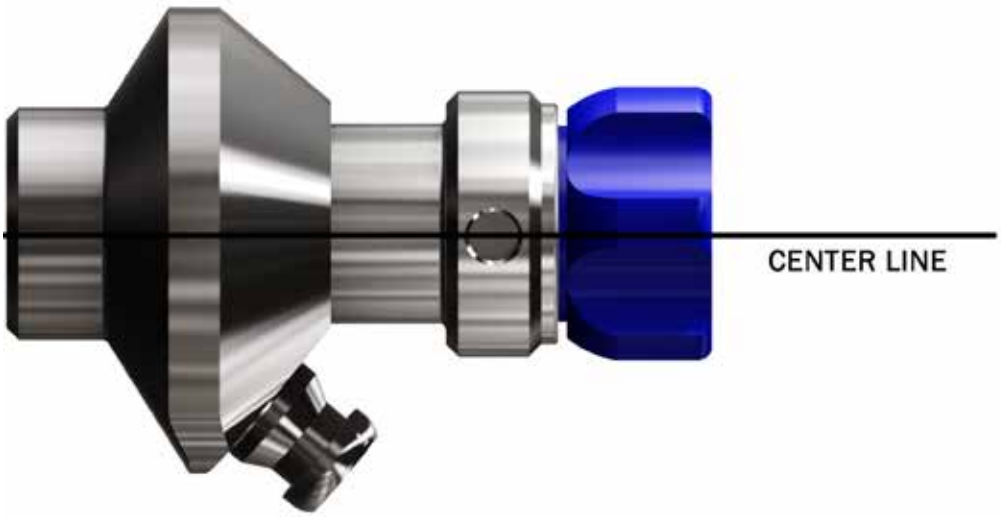


For further product information - material, dimensions etc. - please refer to the specific datasheet at www.keofitt.dk

8.MOUNTING INSTRUCTIONS

8.1 Location

The valve should always be located with its centre line in a horizontal position and with the hose piece in a vertical position pointing downwards as shown on the figure. Only with this orientation the valve will be self draining.



8.2 Before welding

Remember to disassemble the valve body and head. The valve body and head must be separated during welding. Rubber plugs, chain and membrane must be removed from the valve body, as otherwise heat from the welding process will damage them.

9. WELDING INSTRUCTIONS

Valves for welding are available in two types: T (tank) and P (pipe).

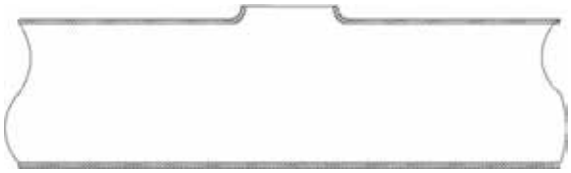
1. For type T (tank) it is necessary to drill a hole ø28 mm into the tank wall, and then fit the valve into this hole flush with the inside of the tank. Welding should be carried out as a penetration welding.
   Material thickness less than 4 mm: Weld from inside. Material thickness greater than 4 mm: Weld from both outside and inside.
   Since type T has a solid end piece, the valve will not be damaged by penetration welding. However, the use of purge gas in the form of either Argon or Formier gas is recommended in order to give the best result.
2. For type P (pipe) penetration welding must be carried out from outside. The valve is machined with a recess-like shoulder on the outside of the end piece which gives approximately the same material thickness (1.5mm material thickness) as in the pipe wall. This machined shoulder can be modified according to the customer's wishes.

IMPORTANT!

- When grinding/polishing the internal weld, the valve seat must not be touched.

9.1 Welding method

The welding result will be best if the following method is used:
A collar is made on the pipe section so that the valve has a flat contact face. This flaring must look like a T-piece, as shown in the example below.



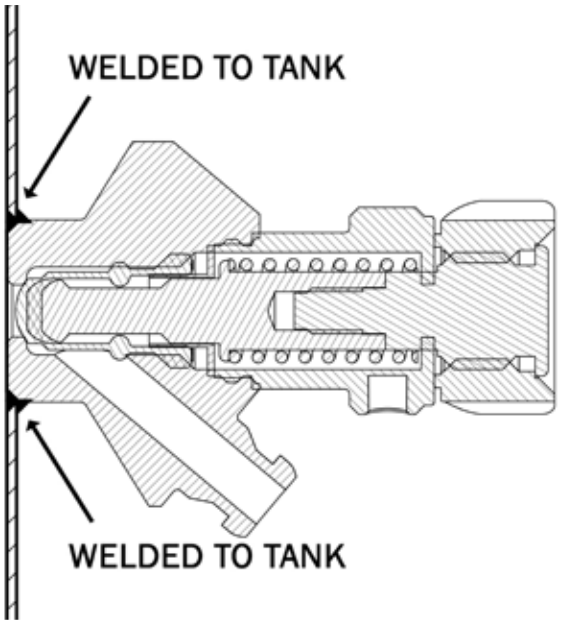
- The pipe section and the valve's hose pieces are sealed with sponge rubber or similar.
- Purge gas such as Argon or Formier gas is fed through the valve body into the pipe section and the system is now filled with 6 times the estimated volume of the pipe section. All O_2 is thus expelled from the system and welding can commence.
- Welding must take place only with the purge gas continually flowing in the system.
- The gas remains in the system until the item is lukewarm, after which the set-up can be dismantled.

9.2 Guideline welding values

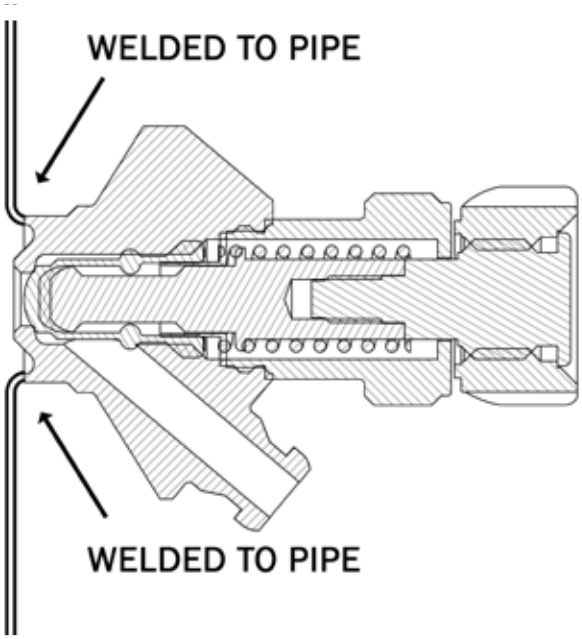
Simplex™ sampling valve welded onto a 2 mm 3" dairy pipe: 50-60 Amp.
It should be noted that Keofitt can supply all P type valves welded onto a pipe section according to customer specifications. Flaring is thus avoided and only a girth weld is required.

10. BLOCK DIAGRAMS

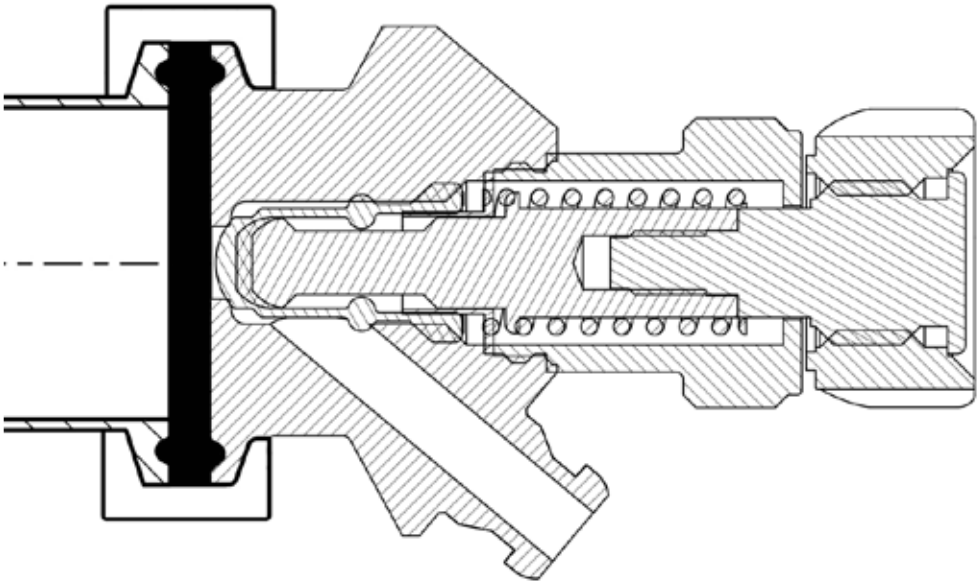
10.1 Keofitt valve type T (tank)



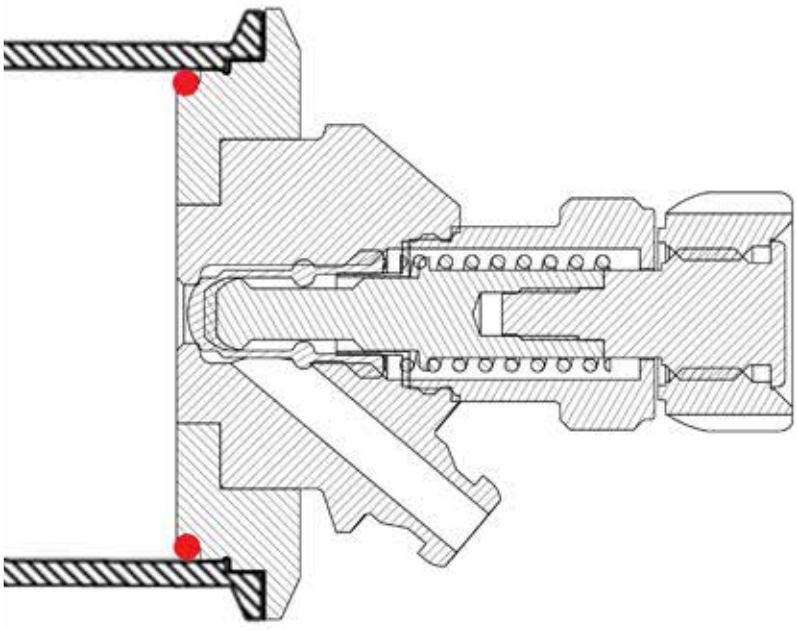
10.2 Keofitt valve type P (pipe)



10.3 Keofitt valve type clamp connection

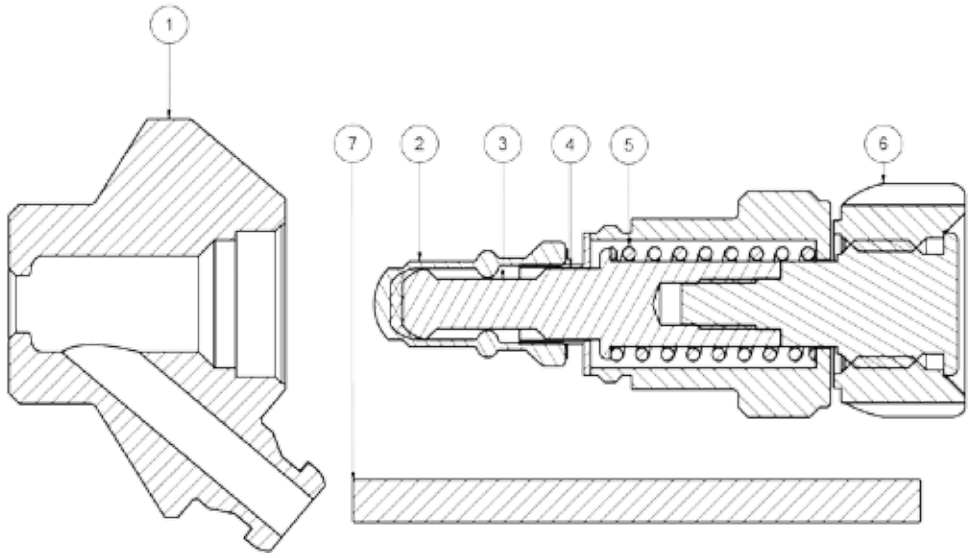


10.4 Keofitt valve type Varivent®



11. MAINTENANCE

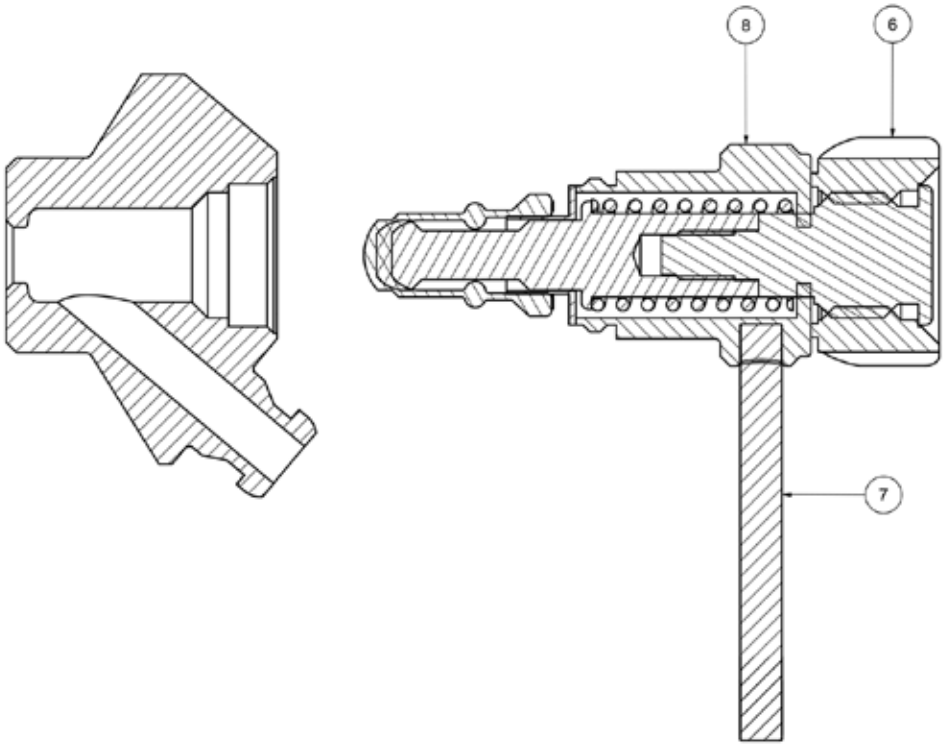
The rubber membrane should be replaced every other month. PTFE membranes should be replaced every 12 months. In the event of intensive sterilisation and cleaning it may be necessary to replace it more frequently. The appropriate replacement frequency should be determined by the user by starting with short intervals and continuously extend the time in use intil one reaches the limit of the membrane's durability. Based on the desired safety margin the user then decides on the replacement interval to adapt.
For disassembly of valve body and valve head, see instructions.



11.1 Spare parts list

1. Valve body
2. Membrane Silicone (grey) Membrane EPDM (black) Membrane PTFE (White)
3. Lower stem (slightly different shape for PTFE membrane)
4. Steel bushing
5. Spring
6. Turn knob
7. Tommy bar

11.2 Assembly of valve body and head



In order to dissassemble and assemble the valve body and valve head please perform the following operations:

1. Set the valve head at the OPEN position. For types H and K this is done by turning pos. 6 clockwise.
2. Remove the valve head pos. 8. DON'T use a wrench. A tommy bar pos. 7 should be used for disassembly and assembly. This is carried out by turning pos. 8 anti-clockwise until loose and then pulling the valve head off.
3. Refit the valve head (in the OPEN position) once the necessary parts have been replaced. Care should be taken not to damage the threads. Use suitable lubricant.

WARNING!

- When replacing the membrane, set the valve head in the OPEN position before it is unscrewed and pulled out of the valve body. Omitting to do so may result in twisting and cutting of the membrane.
- Don't clean the valve head in an ultrasonic bath or by immersing it in a degreasing liquid, as it will impede the proper functioning of the screw action. When in doubt, contact your local Keofitt dealer

11.3 Disassembly of valve head

Over time the turn knob may become harder to turn, which may be remedies by regreasing the threaded part of the turn knob. Perform the following steps to take the valve head apart after having separated it for the valve body as explained in chapter 11.2:

- Set the valve head in closed position
- Pull off the membrane
- Remove the bushing
- Fix the lower stem in a vice using soft jaws
- Unscrew the valve head top using the tommy bar (hold it back when it gets loose, as the spring will push it out)
- Pull by the knob to separate it from the union nut
- Unscrew the upper stem from the turn knob
- Lubricate the upper stem's threaded part in contact with the turn knob

Assembly is the same in reverse order, but please note:

- Discard the membrane and replace with a new one
- Push the membrane and the bushing together so that the membrane is situated against the shoulder of the bushing

12. INSTRUCTIONS ON REPLACING PTFE MEMBRANE

To remove an old membrane from the valve head:

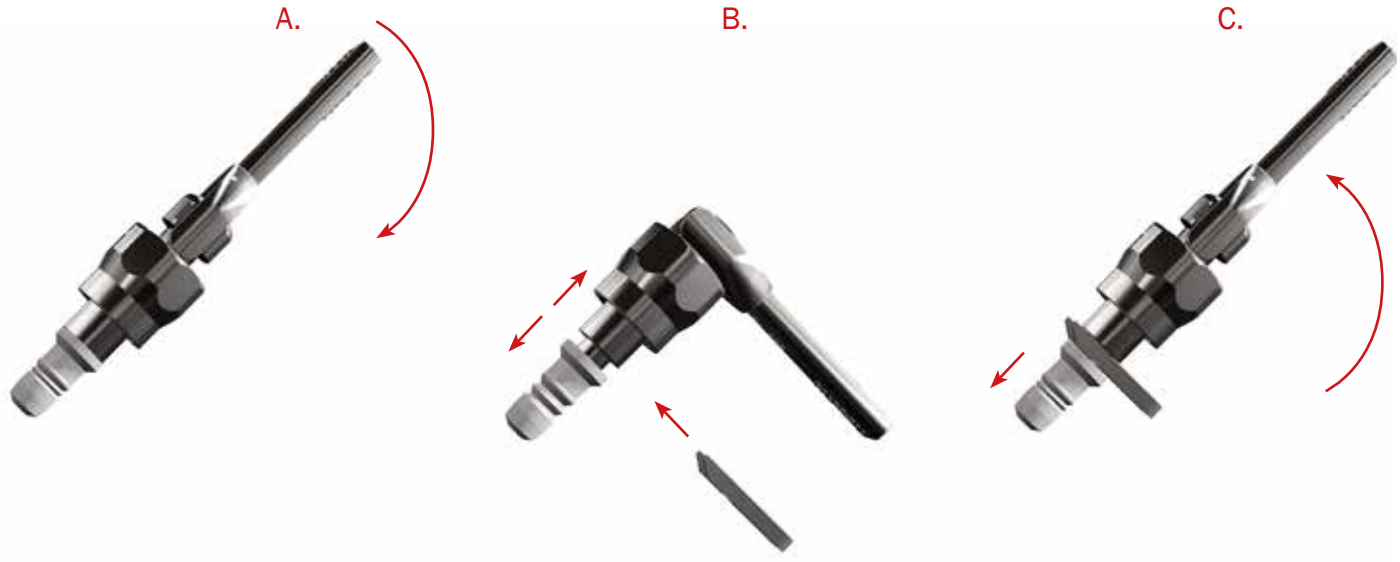
1. OPEN the valve (lever position as in illustration A).
2. Unscrew the valve head from the valve body as described in chapter 13.2.
3. CLOSE valve head (illustration A).
4. Push the membrane and bushing apart (illustration B) until the tool for membrane fits under it.
5. Insert tool for membrane, between the membrane and the bushing (illustration B).
6. OPEN valve head (illustration C).
7. Now the membrane is loosened from the valve head and can be replaced.

To attach a new membrane to the valve head:

8. Set the valve head to CLOSED position (lever position as in illustration B).
9. Place the new membrane on valve head.
10. Mount the membrane bushing with the new Teflon membrane by pressing the membrane with your hand until it clicks.
11. Set the valve head in OPEN position.
12. Insert the valve head into the valve body.
13. CLOSE valve head.

IMPORTANT

- Once the membrane has been removed from the valve head the click system in the membrane might be damaged. Therefore the membrane might be unsafe for further use and it is recommended not to use the membrane again.
- Do not use hammer or other tool that might scratch the surface of the membrane.



13. UPGRADE FROM SILICONE/EPDM TO PTFE MEMBRANE

13.1 For manually operated valve heads type H, K and Q

1. Close valve.
2. Pull off the silicone / EPDM membrane.
3. Take the bushing off. (page 30, pos. 5)
4. Put the valve head in vice.
5. Turn the hex-nut counter clockwice until the membrane seat and spring are loose. Put the new lower stem for PTFE membrane in the vice.
6. Fit the new spring on the new lower stem.
7. Insert the rest of the valve head in the pin and press firmly.
8. Turn the hex-nut clockwise until the lower stem is firmly in place. Care should be taken not to damage the threads.
9. Put the bushing over the spring, then place PTFE membrane on the lower stem and press firmly until it clicks in place.
10. Put the valve head in open position.
11. Put valve head in valve body and tighten.

IMPORTANT

- This is a delicate procedure to be performed by skilled personnel only.
- Use vice with aluminium grips, to avoid scratching and damaging the valve head.
- Use the spring supplied with the PTFE kit. PTFE membranes require a different type of spring than EPDM and silicone membranes.
- Do not use hammer or other tool that might scratch the surface of the membrane.

Upgrade kit 854155 consisting of:

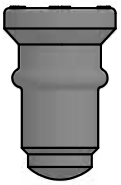
	Ident no.	Part name	Material
	600340	Lower stem for PTFE	AISI 316L (1.4404)
	850055	Membrane for W9™ & Simplex™	PTFE
	600411	Spring H-Q-K 12 bar(g)	St.St.

14. MEMBRANES

14.1 Silicone membrane - art. no. 600051

10 PC MEMBRANE W9/SIMPLEX SILICONE, GREY

ART. NO. 600051



GENERAL

KEOFITT has the widest selection of spare parts and accessories to complete your sampling system

Compatible with all KEOFITT W9 & Simplex valve heads for silicone, EPDM & FFKM membrane

The patented membrane design is an essential part of the hygienic design of the KEOFITT sampling valves

It allows for optimal exposure to CIP and SIP media while also integrating the capacity to remove the membrane from the valve body without the use of tools

FEATURES

Compatible with all KEOFITT W9 & Simplex valve heads for silicone, EPDM & FFKM membrane

CERTIFICATION*

FDA · USP · EU 1935/2004

TECHNICAL DATA

Type:	Silicone (QBF-65 - grey)
Hardness (°Sha):	70 ±3
Tensile strength (MPa):	Min. 8,5
Elongation at break (%):	550 ±80
Density (g/cm3):	1,19 ±0,01
Range of temperature in dry atmospheric air (°C/°F):	-60° - +200°C / -140° - +392°
Compression set, DIN 53517, 24h/175°C (%):	Max. 25
Wear resistance:	Less suitable
Tear resistance:	Very good
Resistance to Weather and Ozone:	Excellent
Resistance to Hydrolysis (water and steam):	Good
Resistance to Chemicals (acids/bases):	Suitable
Resistance to mineral oil and gas:	Less suitable
Air and gas density:	Not suitable

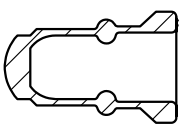
SERVICE LIFE

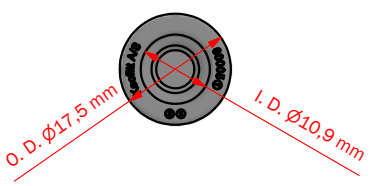
Average service life of a Silicone membrane is 2-3 months - actual life expectancy must be experimentally determined by the user.

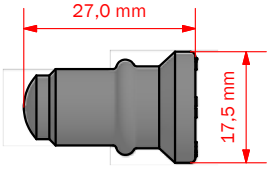
Temp. max.:	121°C / 250°F
Steam pressure:	0 - 2 bar (g) / 0 - 29 psi (g)
Process pressure:	0 - 6 bar (g) / 0 - 87 psi (g)
CIP:	NaOH or similar
Samples:	1-5 a day

Net Weight

· Kg/lbs	0,030 kg /0,07 lbs







*For further information please visit keofitt.dk

Last updated 22-01-2015

14.2 EPDM membrane - art. no. 600052

10 PC MEMBRANE W9/SIMPLEX EPDM BLACK

ART. NO. 600052

GENERAL

KEOFITT has the widest selection of spare parts and accessories to complete your sampling system

Compatible with all KEOFITT W9 & Simplex valve heads for silicone, EPDM & FFKM membrane

The patented membrane design is an essential part of the hygienic design of the KEOFITT sampling valves

It allows for optimal exposure to CIP and SIP media while also integrating the capacity to remove the membrane from the valve body without the use of tools

FEATURES

Compatible with all KEOFITT W9 & Simplex valve heads for silicone, EPDM & FFKM membrane

CERTIFICATION*

FDA · USP · EU 1935/2004

TECHNICAL DATA

Type:	EPDM (EPL-60 - black)
Hardness (°Sha):	61 ±3
Tensile strength (MPa):	Min. 16
Elongation at break (%):	400 ±50
Density (g/cm3):	1,12 ±0,01
Range of temperature in dry atmospheric air (°C/°F):	-40° - +140°C / -40° - +284° F
Compression set, DIN 53517, 24h/175°C (%):	Max. 16
Wear resistance:	Very good
Tear resistance:	Very good
Resistance to Weather and Ozone:	Excellent
Resistance to Hydrolysis (water and steam):	Excellent
Resistance to Chemicals (acids/bases):	Very good
Resistance to mineral oil and gas:	Not suitable
Air and gas density:	Less suitable

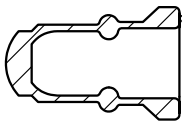
SERVICE LIFE

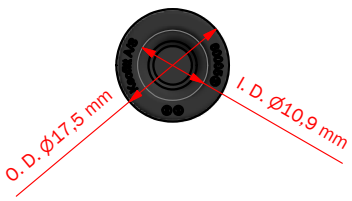
Average service life of an EPDM membrane is 2-3 months - actual life expectancy must be experimentally determined by the user.

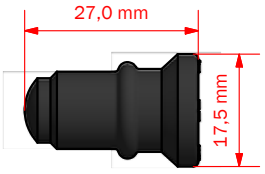
Temp. max.:	121°C / 250°F
Steam pressure:	0 - 2 bar (g) / 0 - 29 psi (g)
Process pressure:	0 - 6 bar (g) / 0 - 87 psi (g)
CIP:	NaOH or similar
Samples:	1-5 a day

Net Weight

· Kg/lbs	0,040 kg /0,09 lbs







*For further information please visit keofitt.dk

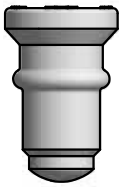
Last updated 22-01-2015

14.3 FFKM membrane - art. no. 600053

MEMBRANE W9 & SIMPLEX FFKM, WHITE

ART. NO. 600053

GENERAL



KEOFITT has the widest selection of spare parts and accessories to complete your sampling system

Compatible with all KEOFITT W9 & Simplex valve heads for silicone, EPDM & FFKM membrane

The patented membrane design is an essential part of the hygienic design of the KEOFITT sampling valves

It allows for optimal exposure to CIP and SIP media while also integrating the capacity to remove the membrane from the valve body without the use of tools

FEATURES

Compatible with all KEOFITT W9 & Simplex valve heads for silicone, EPDM & FFKM membrane

CERTIFICATION*

FDA · USP · EU 1935/2004

TECHNICAL DATA

Type:	FFKM (Perfluorelstomer)
Hardness (°Sha):	70 ±5
Tensile strength (MPa):	13
Elongation at break (%):	130
Density (g/cm3):	2,41
Range of temperature in dry atmospheric air (°C/°F):	1° - +270°C / 34° - 518°F
Compression set, D395 70h/200°C (%):	24
Wear resistance:	Excellent
Tear resistance:	Excellent
Resistance to Weather and Ozone:	Excellent
Resistance to Hydrolysis (water and steam):	Excellent
Resistance to Chemicals (acids/bases):	Excellent
Resistance to mineral oil and gas:	Excellent
Air and gas density:	Excellent

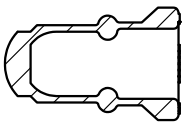
SERVICE LIFE

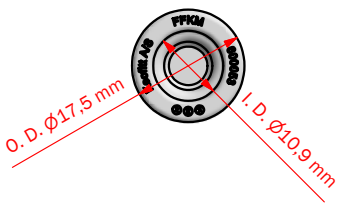
Average service life of a FFKM membrane is 12 months (or more) - actual life expectancy must be experimentally determined by the user.

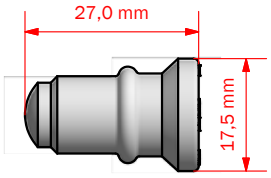
Temp. max.:	250° C / 482° F
Steam pressure:	0 - 2 bar (g) / 0 - 29 psi (g)
Process pressure:	0 - 6 bar (g) / 0 - 87 psi (g)
CIP:	NaOH or similar
Samples:	1-5 a day

Net Weight

· Kg/lbs	0,004 kg /0,009 lbs







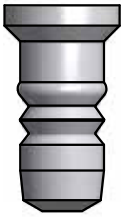
*For further information please visit keofitt.dk

Last updated 01-07-2015

14.4 PTFE membrane - art. no. 850055

MEMBRANE W9/SIMPLEX PTFE

ART. NO. 850055



GENERAL

KEOFITT has the widest selection of spare parts and accessories to complete your sampling system

Compatible with all KEOFITT W9 & Simplex valve heads for PTFE membrane

The patented membrane design is an essential part of the hygienic design of the KEOFITT sampling valves

It allows for optimal exposure to CIP and SIP media while also integrating the capacity to remove the membrane from the valve body without the use of tools

FEATURES

Compatible with all KEOFITT W9 & Simplex valve heads for PTFE membrane

CERTIFICATION*

FDA · USP · EU 1935/2004

TECHNICAL DATA

Material:	PTFE (TFM 1600 - white)
Range of temperature in dry atmospheric air:	-200° - +200°C / -328° - +392°
Ball hardness (N/mm2):	29
Tensile strength (DIN53455 - N/mm2):	35
Elongation at break (DIN53455 - %):	350
Density (DIN 53479 - g/cm3):	2,17
Shore D (DIN 53505):	57
Thermal conductivity (W/m.k DIN 52612):	0,22
Expansion coefficient (DIN 53752 [K^-1]):	12-17x10^-5
Flammability:	Inflammable UL 94
Chemical resistance:	Is not attacked by common chemicals with the exception of strongly oxidising acids

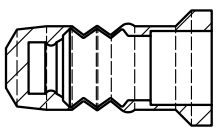
SERVICE LIFE

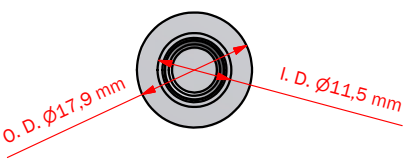
Average service life of a PTFE membrane is 12 months - actual life expectancy must be experimentally determined by the user.

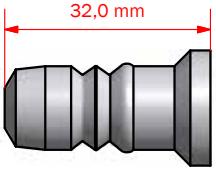
Temp. max.:	1 - 150°C / 34 - 302° F
Steam pressure:	0 - 2 bar (g) / 0 - 29 psi (g)
Process pressure:	0 - 6 bar (g) / 0 - 87 psi (g)
CIP:	NaOH or similar

Net Weight

· Kg/lbs	0,004 kg /0,01 lbs







*For further information please visit keofitt.dk

Last updated 19-12-2014

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For complete set of updated data sheets and manuals for Keofitt products please refer to our web page www.keofitt.dk

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