Dellmeco®

INSTRUCTION MANUAL

Air Operated Double Diaphragm Pumps
Hygienic Series (AISI 316L)

Ver. 5.28-A

Models:

DM 15/30 H.. and ATEX: DM 15/30 H..-X
DM 25/75 H.. and ATEX: DM 25/75 H..-X
DM 40/125 H.. and ATEX: DM 40/125 H..-X
DM 50/315 H.. and ATEX: DM 50/315 H..-X
DM 65/565 H.. and ATEX: DM 65/565 H..-X
DM 80/850 H.. and ATEX: DM 80/850 H..-X

Version with AISI 304 central housing (also for ATEX):

DM 25/75 HH.., HH..-X
DM 40/125 HH.., HH..-X
DM 50/315 HH.., HH..-X
DM 65/565 HH.., HH..-X

TÜVRheinland® CERTIFIED
Management System ISO 9001:2015
www.tuv.com ID 9105038609

Model: _____

Serial no.: _____

DECLARATION OF CONFORMITY

Directive 2006/42/EC, Annex 2A

Company: **DELLMECO Krzysztof Ziemann**

Address: **Swierkowa 2**
83-330 Glincz
POLAND

declares under our sole responsibility, that the product:

Product name: **Air Operated Double Diaphragm Pumps**

Models: **DM - series**

Referred to in this declaration conforms with the:

- Directive 2006/42/EC

Date: **July 1st 2014**

K. Ziemann
Managing Director

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1. Introduction

This pump is a positive-displacement pump that transfers fluids by means of diaphragms movement operated by compressed air. The casing in contact with the fluid is made of AISI 316L. Hygienic Series Pumps are available in standard (code: H..) and ATEX (H..-X) versions.

2. For safe operation

This document contains information indispensable for maintaining safe and efficient operation of this product. Read this document carefully before using the pump, particularly the "Warnings and cautions". Get familiar with all operating procedures. This document must be kept handy for future reference.

3. Warnings and cautions

The meanings of warning and caution symbols are given below. Be sure to remember their meanings.

⚠ **WARNING:** ignoring the warning and operating the product in an improper manner can result in danger of serious bodily injury or death.

⚠ **CAUTION:** ignoring the warning and operating the product in an improper manner can result in danger of personal injury or property damage.

Ø This symbol means a “DON’T”, and will be followed by an explanation on what you must not do.

! This symbol means a “DO”, and will be followed by an explanation on what you must do in a specified situation.

4. Operating caution

Before using this product:

⚠ WARNING

! To drive the pump you must use one of the following compressed gases (called in this document "compressed air"):

- Compressed air supplied from air compressor
- Nitrogen (N_2) gas

Use of compressed air other than the above may cause air pollution, damage to the pump, or even an explosion.

! The maximum permissible pressure for the compressed air, and the fluid pumped by one of its pumps is 7 bar g. Should the above applicable maximum permissible pressure be exceeded, the following results may follow: damage to the casing, or even a severe, possibly fatal accident.
In some Hygienic Series Pumps executions, specified by manufacturer, the maximum pressure can reach 14÷15 bar g.

! In case a diaphragm gets damaged, fluid will gush out together with air through the exhaust port. Provide protective measures in consideration of possible leakage of fluid.
When using the pump with suction/discharge hoses, make sure to use a model with appropriate corrosion resistance for the fluid to be pumped.

⚠ WARNING

! When installing this product, be sure to connect a ground wire from the specified position of this product. Otherwise friction between parts and abrasion caused by the flow of some fluids inside the casing may generate static electricity. Depending on the type of fluid being pumped and the installation environment (such as gases in the air and type of surrounding mixtures), static electricity could cause fire or electric shock.

! Some fluid may remain inside the pump and inside the connected piping after shutting down the pump, or if the pump is left unused for a prolonged period.
Therefore, be sure to purge the system of fluid and clean the pump before prolonged disuse.
The fluid remaining in the connected piping as well as the pump itself may expand because of freezing or heat which may cause damage to the pump or/and piping and lead to leakage of the fluid.

Ø Use only genuine Dellmeco parts when replacing component parts of this product.

! Torque of all tightening parts must be checked before running the pump. Designated torques are mentioned in maintenance manual. Valve ball stoppers in all Hygienic Series Pumps, except DM 80/850 model, are integrated with side housing (suction side) and outlet connection (discharge side). In DM 80/850 Hygienic Pumps ball valve stoppers [**26**] are replaceable elements.

! In case of pumping a hazardous fluid (hot, flammable, strong acid, etc.) with this pump, protective measures (install a pit, a protection box, sensors, etc.) must be provided in consideration of possible leakage of fluid. Warning signs must be displayed at necessary places. Leakage of fluid may cause fire or accident.

! Before using this pump, get fully familiar with the precautions regarding the fluid to be pumped, and verify the corrosion resistance of the parts that will come into contact with the fluid. NEVER use the pump with any fluid against which it does not have sufficient corrosion resistance or with a fluid that poses a risk of explosion. If you are unable to verify the corrosion resistance, contact your dealer. Using this product with any fluid against which the parts in contact with the fluid do not have sufficient corrosion resistance may result in damaging the product or leakage of fluid.

⚠ CAUTION

! The running pump may generate loud operating noise. Its level will vary depending upon the conditions of use (fluid pumped, supply air pressure and discharge pressure)

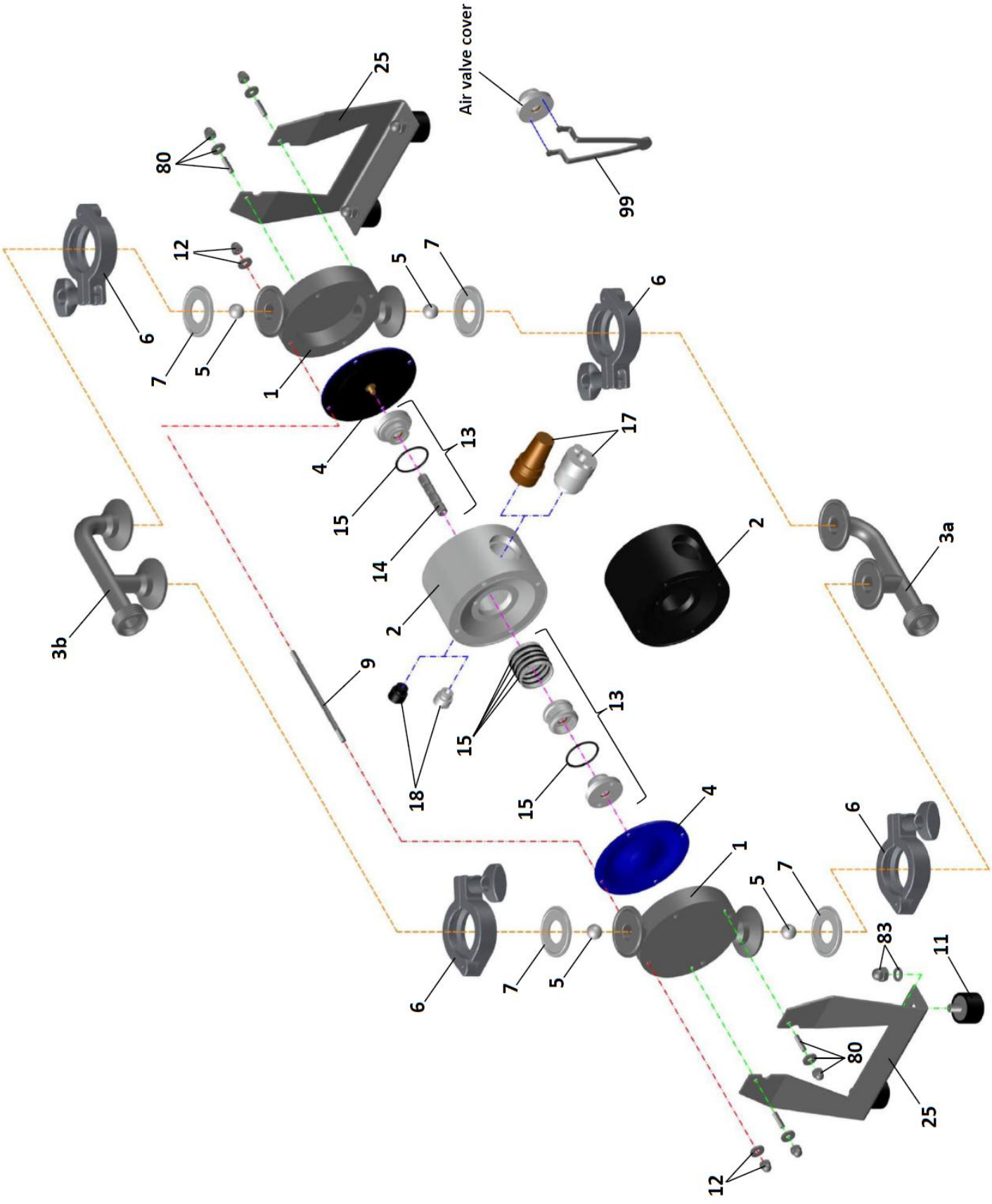
! To drive this product, supply air with minimum moisture content and without any oil and/or dirt.

! If a diaphragm of this pump is damaged, supply air may mix with the fluid or the fluid may flow into the central housing. DO NOT OPERATE THE PUMP if air supply is inadequate or contaminated.

Ø While operating this product, do NOT put your hand on the inlet port.

5. Names of parts and materials

5.1. DM 15/30 H.. and H..-X (for ATEX) – exploded view



Spare parts list for DM 15/30 H.. and H..-X (ATEX) Hygienic Series Pumps

				Pump size and material execution: H – AISI 316L, electro-polished	
Item	**Part name**	**Quantity**	**Material**	**DM 15/30 H..**	**DM 15/30 H..-X**
1.	Pump housing	2	AISI 316L	**4 15 01 53**	
2.**	Central housing	1	PE	**1 10 10 20**	
			PE conductive		**1 10 10 21**
3a.	Manifold inlet DIN	1	AISI 316L	**4 15 30 53**	
	Manifold inlet Tri-Clamp			**4 15 32 53**	
	Manifold inlet RJT			**4 15 37 53**	
3b.	Manifold outlet DIN	1	AISI 316L	**4 15 33 53**	
	Manifold outlet Tri-Clamp			**4 15 35 53**	
	Manifold outlet RJT			**4 15 137 53**	
4.	Diaphragm	2	EPDM	**1 10 50 08**	
			NBR	**1 10 50 10**	
			TFM(PTFE)	**1 10 50 05**	
			TFM(PTFE)-PFA	**1 10 50 00**	
5.	Ball valve	4	AISI 316	**1 15 60 52**	
			Ceramic	**1 15 60 90**	
			EPDM	**1 15 60 08**	
			NBR	**1 15 60 10**	
			Polyurethane	**1 15 60 07**	
			PTFE	**1 15 60 23**	
6.	Clamp	4	AISI 304	**4 25 36 50**	
7.*	In-/outlet sealing	4	EPDM	**4 25 70 08**	
			FKM	**4 25 70 09**	
			NBR	**4 25 70 10**	
			PTFE	**4 25 70 23**	
			Silicone	**4 25 70 11**	
9.	Housing bolt	4	AISI 304	**4 15 42 50**	
11.	Shock absorber	4	NR/A2	**1 15 69 52**	
12.	Nut with washer set	8	AISI 304	**4 15 45 50**	
13.**	Air valve, complete (thread mount)	1	PET-NBR	**1 08 020 31**	
			PET-FKM	**1 08 020 32**	
14.[1)]	Air valve/diaphragm shaft	1	AISI 304	**1 08 24 50**	
15.[1)]	Air valve O-ring, external	6	NBR	**1 08 080 10**	
			FKM	**1 08 080 09**	
17.**	Exhaust muffler, old version	1	PE porous	**1 08 99 35**	
			Bronze (sintered)	**1 08 99 86**	
	Exhaust muffler, actual version	1	PE porous	**1 08 499 35**	
			Bronze (sintered)	**1 08 499 86**[(2)]	
18.**	Air adapter	1	PP	**1 08 46 28**	
			PE conductive	**1 08 46 21**[(2)]	
25.	Pump stand	2	AISI 304	**4 15 96 50**	
35.	Central housing complete	1	Diverse (non-ATEX)	**1 10 11 20**	
			Diverse (ATEX)	**1 10 11 21**	
80.	Pump support mounting set	4	AISI 304	**4 15 138 50**	
83.	Shock absorber mounting set (cup nut + washer)	4	AISI 304	**4 15 345 50**	
99.***	Universal key	1	Structural steel	**1 10 58 00**	

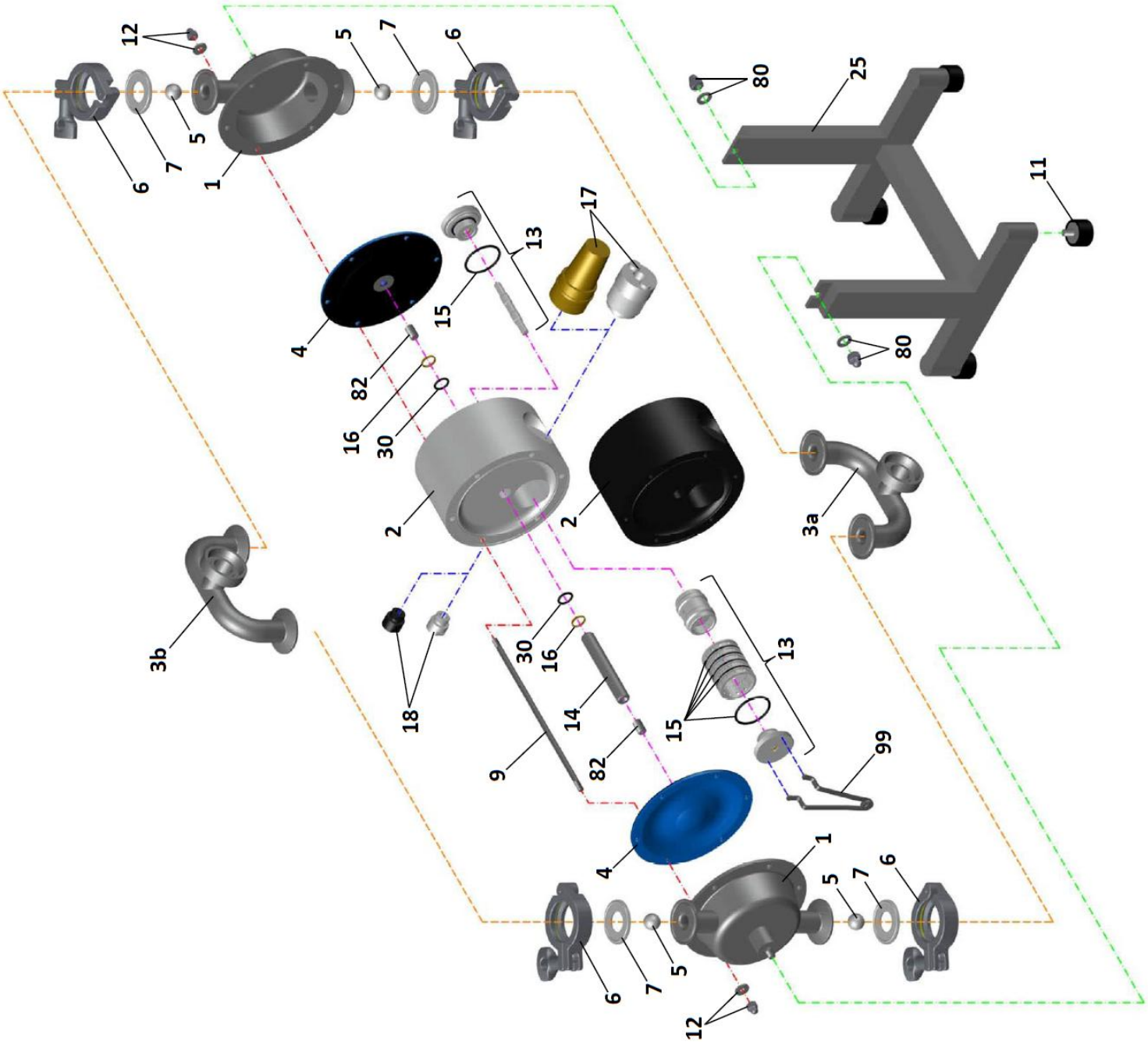
***** - Clamp seals material: EPDM for EPDM diaphragms, NBR for NBR diaphragms, PTFE for TFM(PTFE) and TFM(PTFE)-PFA diaphragms;
****** - parts included in Item 35 „Central housing complete";
******* - available on request (not delivered with the pump and/or with spare part kit sets);
1) - included in Item 13 „Air valve, complete", but also can be ordered separately;
2) - obligatory for "ATEX 0" (for detailed information, please refer to "**Chapter 16.20**", page **84**), but also can be ordered separately.

List of parts for spare part kits SET 1 and SET 2 in Hygienic Series Pumps DM 15/30 H.., H..-X

Spare part kit set type		Item	Quantity	Part description		Pump size							
						15/30							
						Material execution [A]							
						HEE HEE-X	HES HES-X	HNN HNN-X	HNS HNS-X	HTT HTT-X	HTS HTS-X	HFT HFT-X	HFS HFS-X
						Part number							
SET 2 (wet and dry side)	SET 1 wet side)	4.	2	Diaphragm		1 10 50 08		1 10 50 10		1 10 50 05		1 10 50 00	
		5.	4	Valve ball		1 15 60 08	1 15 60 52	1 15 60 10	1 15 60 52	1 15 60 23	1 15 60 52	1 15 60 23	1 15 60 52
		7.	4	In-/outlet sealing set		4 25 70 08		4 25 70 10		4 25 70 23			
		17.	1	Exhaust muffler	Actual (coarse thread) [B]	1 08 499 35 or 1 08 499 86 [C]							
					Old (fine thread)	1 08 99 35 or 1 08 99 86 [C]							
		13.	1	Air valve	Thread mount	1 08 020 31 or 1 08 020 32							
					Circlip mount [D]	1 08 20 31 or 1 08 20 32							

[A] - typical pump material executions (other material executions may require different spare parts);
[B] - actual exhaust muffler with coarse thread (implemented gradually from 2018), part number 1 08 499 35 (PE porous) or 1 08 499 86 (sintered bronze);
[C] - exhaust muffler from sintered bronze is available only on customer's request (standard execution is PE porous muffler);
[D] - circlip mounted air valve available for the pumps manufactured before August 2007 (pump's serial number verification required).

5.2. DM 25/75 H.., H..-X (ATEX) and DM 40/125 H.., H..-X (ATEX) – exploded view



Spare parts list for DM 25/75 H.., H..-X and DM 40/125 H.., H..-X Hygienic Series Pumps

				Pump size and material execution: H – AISI 316L, electro-polished			
Item	**Part name**	**Q-ty**	**Material**	**DM 25/75 H..**	**DM 25/75 H..-X**	**DM 40/125 H..**	**DM 40/125 H..-X**
1.	Pump housing	2	AISI 316	**4 25 01 53**		**4 40 01 53**	
2.**	Central housing	1	PE	**1 15 10 20**		**1 25 10 20**	
			PE conductive		**1 15 10 21**		**1 25 10 21**
3a.	Inlet manifold DIN 11851	1	AISI 316L	**4 25 30 53**		**4 40 30 53**	
	Inlet manifold SMS			**4 25 31 53**		**4 40 31 53**	
	Inlet manifold Tri-Clamp			**4 25 32 53**		**4 40 32 53**	
	Inlet manifold RJT			**4 25 37 53**		**4 40 37 53**	
3b.	Outlet manifold DIN 11851	1	AISI 316L	**4 25 33 53**		**4 40 33 53**	
	Outlet manifold SMS			**4 25 34 53**		**4 40 34 53**	
	Outlet manifold Tri-Clamp			**4 25 35 53**		**4 40 35 53**	
	Outlet manifold RJT			**4 25 137 53**		**4 40 137 53**	
4.	Diaphragm	2	EPDM	**1 15 50 08**		**1 25 50 08**	
			NBR	**1 15 50 10**		**1 25 50 10**	
			TFM(PTFE)	**1 15 50 05**		**1 25 50 05**	
			TFM(PTFE)-PFA	**1 15 50 00**		**1 25 50 00**	
5.	Ball valve	4	AISI 316	**1 15 60 52**		**1 25 60 52**	
			EPDM	**1 15 60 08**		**1 25 60 08**	
			Ceramic	**1 15 60 90**		**1 25 60 90**	
			NBR	**1 15 60 10**		**1 25 60 10**	
			PTFE	**1 15 60 23**		**1 25 60 23**	
			PU	**1 15 60 07**		**1 25 60 07**	
6.	Clamp	4	AISI 304	**4 25 36 50**			
7.*	Sealing	4	EPDM	**4 25 70 08**		**4 40 70 08**	
			FKM	**4 25 70 09**		**4 40 70 09**	
			NBR	**4 25 70 10**		**4 40 70 10**	
			PTFE	**4 25 70 23**		**4 40 70 23**	
			Silicone	**4 25 70 11**		**4 40 70 11**	
9.	Housing bolt	4	AISI 304	**4 25 42 50**		**4 40 42 50**	
11.	Shock absorber	4	NR/A2	**1 15 69 52**			
12.	Nut with washer set	8	AISI 304	**4 25 45 50**		**4 40 45 50**	
13.**	Air valve, complete (thread mount)	1	PET-NBR	**1 15 020 31**			
			PET-FKM	**1 15 020 32**			
14.	Diaphragm shaft	1	AISI 304	**1 15 440 50**		**1 25 440 50**	
15.[1)]	Air valve O-ring, external	6	NBR	**1 15 080 10**			
			FKM	**1 15 080 09**			
16.**	Central housing seal	2	PE	**1 15 85 22**		**1 25 85 22**	
17.**	Exhaust muffler, old version	1	PE porous	**1 15 99 35**			
			Bronze (sintered)	**1 15 99 86**			
	Exhaust muffler, actual version	1	PE porous	**1 15 499 35**			
			Bronze (sintered)	**1 15 499 86** [(2)]			
18.**	Air adapter	1	PP	**1 15 46 28**			
			PE conductive	**1 15 46 21** [(2)]			
25.	Pump stand	1	AISI 304	**4 25 96 50**		**4 40 96 50**	
30.**	Central housing O-ring	2/4[(a)]	NBR	**1 15 85 10**		**1 25 85 10**[(a)]	
35.	Central housing complete	1	Diverse (non-ATEX)	**1 15 11 20**		**1 25 11 20**	
			Diverse (ATEX)	**1 15 11 21**		**1 25 11 21**	
80.	Support nut with washer, set	2	AISI 304	**4 25 138 50**		**4 40 138 50**	
82.	Shaft allen pin screw	2	AISI 304	**1 15 540 50**		**1 25 540 50**	
99.***	Universal key	1	Structural steel	**1 10 58 00**			

***** - Clamp seals material: EPDM for EPDM diaphragms, NBR for NBR diaphragms, PTFE for TFM(PTFE) and TFM(PTFE)-PFA diaphragms;
****** - parts included in Item 35 „Central housing complete";
******* - available on request (not delivered with the pump nor with spare part kit sets);
1) - included in Item 13 „Air valve, complete", but also can be ordered separately;
2) - obligatory for "ATEX 0" (for detailed information, please refer to "**Chapter 16.20**", page **84**), but also can be ordered separately.

List of parts for spare part kits SET 1 and SET 2 in Hygienic Series Pumps DM 25/75 H.. and H..-X (ATEX)

Spare part kit set type		Item	Quantity	Part description		Pump size							
						25/75							
						Material execution [A]							
						HEE HEE-X	HES HES-X	HNN HNN-X	HNS HNS-X	HTT HTT-X	HTS HTS-X	HFT HFT-X	HFS HFS-X
						Part number							
SET 2 (wet and dry side)	SET 1 (wet side)	4.	2	Diaphragm		1 15 50 08		1 15 50 10		1 15 50 05		1 15 50 00	
		5.	4	Valve ball		1 15 60 08	1 15 60 52	1 15 60 10	1 15 60 52	1 15 60 23	1 15 60 52	1 15 60 23	1 15 60 52
		7.	4	In-/outlet sealing		4 25 70 08		4 25 70 10		4 25 70 23			
		17.	1	Exhaust muffler	Actual (coarse thread) [B]	1 15 499 35 or 1 15 499 86 [C]							
					Old (fine thread)	1 15 99 35 or 1 15 99 86 [C]							
		13.	1	Air valve		1 15 020 31 or 1 15 020 32							
				Air valve, circlip mount [D]		1 15 20 31 or 1 15 20 32							
		14.	1	Diaphragm shaft		1 15 440 50							
		16.	2	Central housing seal		1 15 85 22							
		30.	2	Central housing O-ring		1 15 85 10							
		82.	2	Shaft allen pin screw		1 15 540 50							

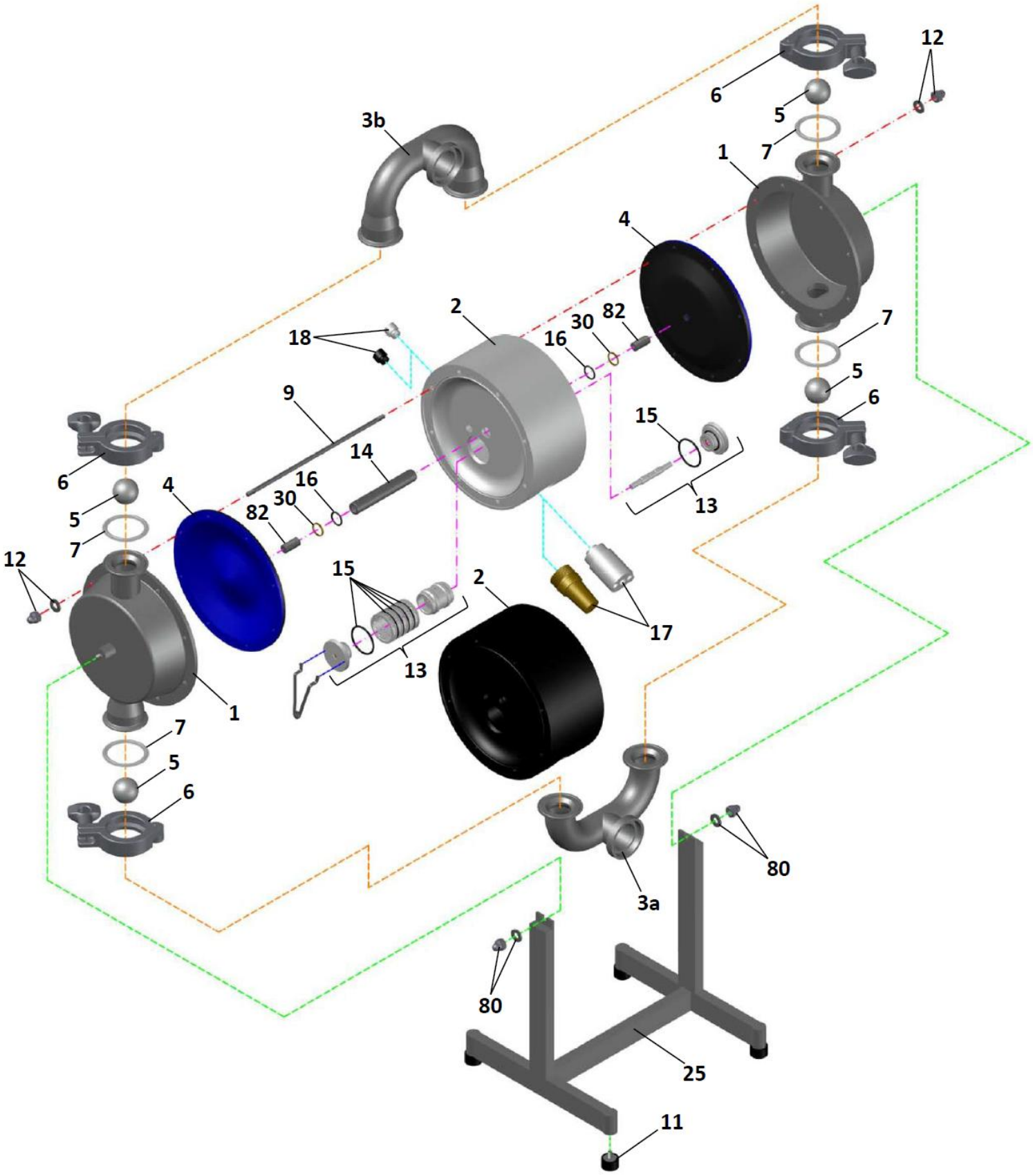
[A] - typical pump material executions (other material executions may require different spare parts);
[B] - actual exhaust muffler with coarse thread (implemented gradually from 2018), part number 1 15 499 35 (PE porous) or 1 15 499 86 (sintered bronze);
[C] - exhaust muffler from sintered bronze is available only for “ATEX 0” (standard “ATEX” execution is PE porous muffler), or on customer’s request;
[D] - circlip mounted air valve available for the pumps manufactured before August 2007 (pump’s serial number verification required).

List of parts for spare part kits SET 1 and SET 2 in Hygienic Series Pumps DM 40/125 H.. and H..-X (ATEX)

Spare part kit set type		Item	Quantity	Part description		Pump size							
						40/125							
						Material execution [A]							
						HEE HEE-X	HES HES-X	HNN HNN-X	HNS HNS-X	HTT HTT-X	HTS HTS-X	HFT HFT-X	HFS HFS-X
						Part number							
SET 2 (wet and dry side)	SET 1 (wet side)	4.	2	Diaphragm		1 25 50 08		1 25 50 10		1 25 50 05		1 25 50 00	
		5.	4	Valve ball		1 25 60 08	1 25 60 52	1 25 60 10	1 25 60 52	1 25 60 23	1 25 60 52	1 25 60 23	1 25 60 52
		7.	4	In-/outlet sealing		4 40 70 08		4 40 70 10		4 40 70 23			
		17.	1	Exhaust muffler	Actual (coarse thread) [B]	1 15 499 35 or 1 15 499 86 [C]							
					Old (fine thread)	1 15 99 35 or 1 15 99 86 [C]							
		13.	1	Air valve		1 15 020 31 or 1 15 020 32							
				Air valve, circlip mount [D]		1 15 20 31 or 1 15 20 32							
		14.	1	Diaphragm shaft		1 25 440 50							
		16.	2	Central housing seal		1 25 85 22							
		30.	4	Central housing O-ring		1 25 85 10							
		82.	2	Shaft allen pin screw		1 25 540 50							

[A] - typical pump material executions (other material executions may require different spare parts);
[B] - actual exhaust muffler with coarse thread (implemented gradually from 2018), part number 1 15 499 35 (PE porous) or 1 15 499 86 (sintered bronze);
[C] - exhaust muffler from sintered bronze is available only for “ATEX 0” (standard “ATEX” execution is PE porous muffler), or on customer’s request;
[D] - circlip mounted air valve available for the pumps manufactured before August 2007 (pump’s serial number verification required).

5.3. DM 50/315 H.., H..-X (ATEX) and DM 65/565 H.., H..-X (ATEX) – exploded view



Spare parts list for DM 50/315 H.., H..-X and DM 65/565 H.., H..-X Hygienic Series Pumps

				Pump size and material execution: H – AISI 316L, electro-polished			
Item	**Part name**	**Q-ty**	**Material**	**DM 50/315 H..**	**DM 50/315 H..-X**	**DM 65/565 H..**	**DM 65/565 H..-X**
1.	Pump housing	2	AISI 316	**4 50 01 53**		**4 65 01 53**	
2.**	Central housing	1	PE	**1 40 10 20**		**1 50 10 20**	
			PE conductive		**1 40 10 21**		**1 50 10 21**
3a.	Inlet manifold DIN 11851	1	AISI 316L	**4 50 30 53**		**4 65 30 53**	
	Inlet manifold SMS			**4 50 31 53**		**4 65 31 53**	
	Inlet manifold Tri-Clamp			**4 50 32 53**		**4 65 32 53**	
	Inlet manifold RJT			**4 50 37 53**		**4 65 37 53**	
3b.	Outlet manifold DIN 11851	1	AISI 316L	**4 50 33 53**		**4 65 33 53**	
	Outlet manifold SMS			**4 50 34 53**		**4 65 34 53**	
	Outlet manifold Tri-Clamp			**4 50 35 53**		**4 65 35 53**	
	Outlet manifold RJT			**4 50 137 53**		**4 65 137 53**	
4.	Diaphragm	2	EPDM	**1 40 50 08**		**1 50 50 08**	
			NBR	**1 40 50 10**		**1 50 50 10**	
			TFM(PTFE)	**1 40 50 05**		**1 50 50 05**	
			TFM(PTFE)-PFA	**1 40 50 00**			
5.	Ball valve	4	AISI 316	**1 40 60 52**		**1 50 60 52**	
			EPDM	**1 40 60 08**		**1 50 60 08**	
			Ceramic	**1 40 60 90**		**1 50 60 90**	
			NBR	**1 40 60 10**		**1 50 60 10**	
			PTFE	**1 40 60 23**		**1 50 60 23**	
			PU	**1 40 60 07**		**1 50 60 07**	
6.	Clamp	4	AISI 304	**4 50 36 50**		**4 65 36 50**	
7.*	Sealing	4	EPDM	**4 50 70 08**		**4 65 70 08**	
			FKM	**4 50 70 09**		**4 65 70 09**	
			NBR	**4 50 70 10**		**4 65 70 10**	
			PTFE	**4 50 70 23**		**4 65 70 23**	
			Silicone	**4 50 70 11**		**4 65 70 11**	
9.	Housing bolt	4	AISI 304	**4 50 42 50**		**4 65 42 50**	
11.	Shock absorber	4	NR/A2	**1 15 69 52**			
12.	Nut with washer set	8	AISI 304	**4 50 45 50**		**4 65 45 50**	
13.**	Air valve, complete (thread mount)	1	PET-NBR	**1 40 020 31**			
			PET-FKM	**1 40 020 32**			
14.	Diaphragm shaft	1	AISI 304	**1 40 440 50**		**1 50 440 50**	
15.[1)]	Air valve O-ring, external	6	NBR	**1 40 080 10**			
			FKM	**1 40 080 09**			
16.**	Central housing seal	2	PE	**1 40 85 22**		**1 50 85 22**	
17.**	Exhaust muffler, old version	1	PE porous	**1 40 99 35**		**1 50 99 35**	
			Bronze (sintered)	**1 40 99 86**		**1 50 99 86**	
	Exhaust muffler, actual version	1	PE porous	**1 40 499 35**		**1 50 499 35**	
			Bronze (sintered)	**1 40 499 86** [(2)]		**1 50 499 86** [(2)]	
18.**	Air adapter	1	PP	**1 40 46 28**			
			PE conductive	**1 40 46 21** [(2)]			
25.	Pump stand	1	AISI 304	**4 50 96 50**		**4 65 96 50**	
30.**	Central housing O-ring	2	NBR	**1 40 85 10**		**1 50 85 10**	
35.	Central housing complete	1	Diverse (non-ATEX)	**1 40 11 20**		**1 50 11 20**	
			Diverse (ATEX)	**1 40 11 21**		**1 50 11 21**	
80.	Support nut with washer, set	2	AISI 304	**4 50 138 50**		**4 65 138 50**	
82.	Shaft allen pin screw	2	AISI 304	**1 40 540 50**		**1 50 540 50**	
99.***	Universal key	1	Structural steel	**1 10 58 00**			

***** - Clamp seals material: EPDM for EPDM diaphragms, NBR for NBR diaphragms, PTFE for TFM(PTFE) and TFM(PTFE)-PFA diaphragms;
****** - parts included in Item 35 „Central housing complete";
******* - available on request (not delivered with the pump nor with spare part kit sets) ;
1) - included in Item 13 „Air valve, complete", but also can be ordered separately;
2) - obligatory for "ATEX 0" (for detailed information, please refer to "**Chapter 16.20**", page **84**), but also can be ordered separately.

List of parts for spare part kits SET 1 and SET 2 in Hygienic Series Pumps DM 50/315 H.. and H..-X (ATEX)

Spare part kit set type		Item	Quantity	Part description		Pump size							
						50/315							
						Material execution [A]							
						HEE HEE-X	HES HES-X	HNN HNN-X	HNS HNS-X	HTT HTT-X	HTS HTS-X	HFT HFT-X	HFS HFS-X
						Part number							
SET 2 (wet and dry side)	SET 1 (wet side)	4.	2	Diaphragm		1 40 50 08		1 40 50 10		1 40 50 05		1 40 50 00	
		5.	4	Valve ball		1 40 60 08	1 40 60 52	1 40 60 10	1 40 60 52	1 40 60 23	1 40 60 52	1 40 60 23	1 40 60 52
		7.	4	In-/outlet sealing		4 50 70 08		4 50 70 10		4 50 70 23			
		17.	1	Exhaust muffler	Actual (coarse thread) [B]	1 40 499 35 or 1 40 499 86 [C]							
					Old (fine thread)	1 40 99 35 or 1 40 99 86 [C]							
		13.	1	Air valve		1 40 020 31 or 1 40 020 32							
				Air valve, circlip mount [D]		1 40 20 31 or 1 40 20 32							
		14.	1	Diaphragm shaft		1 40 440 50							
		16.	2	Central housing seal		1 40 85 22							
		30.	2	Central housing O-ring		1 40 85 10							
		82.	2	Shaft allen pin screw		1 40 540 50							

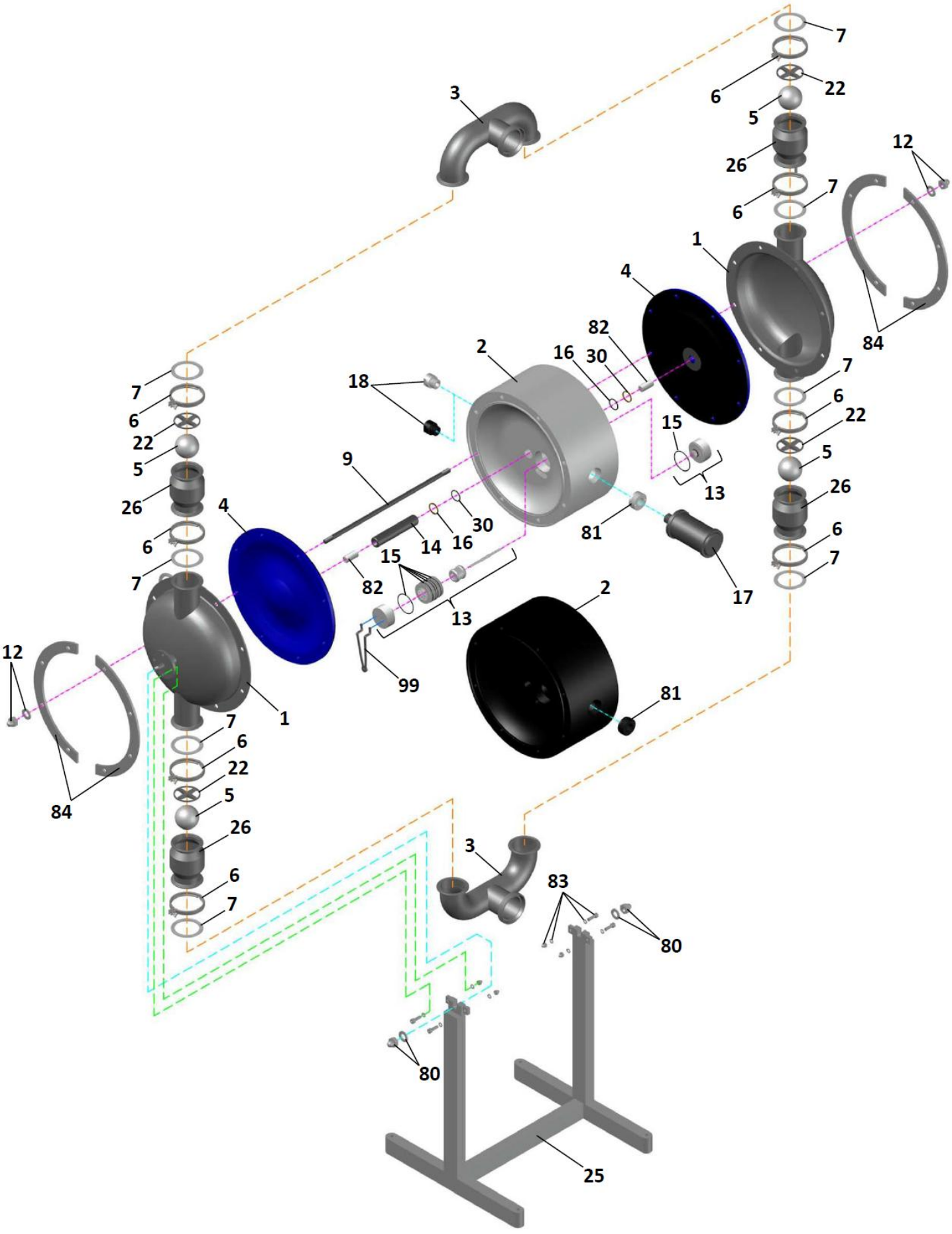
[A] - typical pump material executions (other material executions may require different spare parts);
[B] - actual exhaust muffler with coarse thread (implemented gradually from 2018), part number 1 40 499 35 (PE porous) or 1 40 499 86 (sintered bronze);
[C] - exhaust muffler from sintered bronze is available only for “ATEX 0” (standard “ATEX” execution is PE porous muffler), or on customer’s request;
[D] - circlip mounted air valve available for the pumps manufactured before August 2007 (pump’s serial number verification required).

List of parts for spare part kits SET 1 and SET 2 in Hygienic Series Pumps DM 65/565 H.. and H..-X (ATEX)

Spare part kit set type		Item	Quantity	Part description		Pump size					
						65/565					
						Material execution [A]					
						HEE HEE-X	HES HES-X	HNN HNN-X	HNS HNS-X	HTT HTT-X	HTS HTS-X
						Part number					
SET 2 (wet and dry side)	SET 1 (wet side)	4.	2	Diaphragm		1 50 50 08		1 50 50 10		1 50 50 05	
		5.	4	Valve ball		1 50 60 08	1 50 60 52	1 50 60 10	1 50 60 52	1 50 60 23	1 50 60 52
		7.	4	In-/outlet sealing		4 65 70 08		4 65 70 10		4 65 70 23	
		17.	1	Exhaust muffler	Actual (coarse thread) [B]	1 50 499 35 or 1 50 499 86 [C]					
					Old (fine thread)	1 50 99 35 or 1 50 99 86 [C]					
		13.	1	Air valve		1 40 020 31 or 1 40 020 32					
				Air valve, circlip mount [D]		1 40 20 31 or 1 40 20 32					
		14.	1	Diaphragm shaft		1 50 440 50					
		16.	2	Central housing seal		1 50 85 22					
		30.	4	Central housing O-ring		1 50 85 10					
		82.	2	Shaft allen pin screw		1 50 540 50					

[A] - typical pump material executions (other material executions may require different spare parts);
[B] - actual exhaust muffler with coarse thread (implemented gradually from 2018), part number 1 50 499 35 (PE porous) or 1 50 499 86 (sintered bronze);
[C] - exhaust muffler from sintered bronze is available only for “ATEX 0” (standard “ATEX” execution is PE porous muffler), or on customer’s request;
[D] - circlip mounted air valve available for the pumps manufactured before August 2007 (pump’s serial number verification required).

5.4. DM 80/850 H.., H..-X (ATEX) – exploded view



Spare parts list for DM 80/850 H.., H..-X (ATEX) Hygienic Series Pumps

				Pump size and material execution (H – AISI 316L, electropolished)	
Item	**Part name**	**Q-ty**	**Material**	**DM 80/850 H..**	**DM 80/850 H..-X**
1.	Pump housing	2	AISI 316L	**4 80 01 53**	
2.**	Central housing	1	PE	**1 80 10 20**	
			PE conductive		**1 80 10 21**
3.	Inlet/outlet manifold DIN 11851	2	AISI 316L	**4 80 30 53**	
	Inlet/outlet manifold SMS			**4 80 31 53**	
	Inlet/outlet manifold DIN Tri-Clamp			**4 80 32 53**	
	Inlet/outlet manifold DIN RJT			**4 80 37 53**	
4.	Diaphragm	2	EPDM	**1 80 50 08**	
			NBR	**1 80 50 10**	
			TFM(PTFE)	**1 80 50 05**	
5.	Ball valves	4	EPDM	**1 80 160 08**	
			NBR	**1 80 160 10**	
			PTFE	**1 80 160 23**	
6.	Clamp	8	AISI 304	**4 80 36 50**	
7.*	In-/outlet sealing	8	EPDM	**4 80 70 08**	
			NBR	**4 80 70 10**	
			PTFE	**4 80 70 23**	
			FKM	**4 80 70 09**	
			Silicone	**4 80 70 11**	
9.	Housing bolt	8	AISI 304	**4 80 42 50**	
12.	Nut with washer, set	16	AISI 304	**3 80 45 50**	
13.**	Air valve, complete (thread mount)	1	PET-NBR	**1 80 020 31**	
			PET-FKM	**1 80 020 32**	
14.	Diaphragm shaft	1	AISI 304	**1 80 440 50**	
15.[1)]	Air valve O-ring, external	6	NBR	**1 80 080 10**	
			FKM	**1 80 080 09**	
16.**	Central housing seal	2	PE	**1 80 85 22**	
17.**	Exhaust muffler	1	Diverse	**1 80 99 00**	
18.**	Air adapter	1	PP	**1 80 46 28**	
			PE conductive	**1 80 46 21** [2)]	
22.	Valve stopper	4	AISI 316L	**4 80 54 53**	
25.	Support with collar mounting	1	AISI 304	**4 80 596 50**	
26.	Valve seat	4	AISI 316L	**4 80 39 53**	
30.**	Central housing O-ring	2	NBR	**1 80 85 10**	
35.	Central housing complete	1	Diverse (non-ATEX)	**1 80 11 20**	
			Diverse (ATEX)	**1 80 11 21**	
80.	Support nut with washer, set	2	AISI 304	**1 80 45 50**	
81.**	Muffler adapter	1	PE	**1 80 299 20**	
			PE conductive	**1 80 299 21**	
82.	Shaft allen pin screw	2	AISI 304	**1 80 540 50**	
83.	Pump's collar mounting set	4	AISI 304	**4 80 696 50**	
84.	Side housing reinforcement	4	AISI 304	**4 80 529 50**	
99.***	Universal key	1	Structural steel	**1 10 58 00**	

***** - in-/outlet standard sealing material: EPDM seals for EPDM diaphragms, NBR seals for NBR diaphragms, PTFE seals for TFM(PTFE) diaphragms;
****** - parts included in Item 35 „Central housing complete";
******* - available on request (not delivered with the pump nor with spare part kit sets);
1) - included in Item 13 „Air valve, complete", but also can be ordered separately;
2) - obligatory for "ATEX 0" (for detailed information, please refer to "**Chapter 16.20**", page **84**), but also can be ordered separately.

List of parts for spare part kits SET 1 and SET 2 in Hygienic Series Pumps DM 80/850 H.. and H..-X (ATEX)

Spare part kit set type		Item	Quantity	Part description	Pump size		
					80/850		
					Material execution [A)]		
					HEE HEE-X	HNN HNN-X	HTT HTT-X
					Part number		
SET 2 (wet and dry side)	SET 1 (wet side)	4.	2	Diaphragm	**1 80 50 08**	**1 80 50 10**	**1 80 50 05**
		5.	4	Valve ball	**1 80 160 08**	**1 80 160 10**	**1 80 160 23**
		7.	8	In-/outlet sealing	**4 80 70 08**	**4 80 70 10**	**4 80 70 23**
		17.	1	Exhaust muffler	**1 80 99 00**		
		13.	1	Air valve	**1 80 020 31 or 1 80 020 32**		
		14.	1	Diaphragm shaft	**1 80 440 50**		
		16.	2	Central housing seal	**1 80 85 22**		
		30.	4	Central housing O-ring	**1 80 85 10**		
		82.	2	Shaft allen pin screw	**1 80 540 50**		

[A)] - typical pump material executions (other material executions may require different spare parts).

6. Assembly

CAUTION

! When installing accessories prevent any foreign matter from getting into the product.
Otherwise malfunction of the air-valve may follow.

7. Installation

7.1.Installing the pump

1) Decide where the pump is to be installed and secure a site.

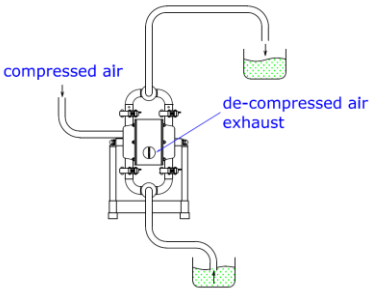
Note:

- The suction lift should be kept as short as possible.
- Sufficient space around the pump for maintenance must be provided.

When fixing the pump in place, use the cushions on the pump base. The tied-down bolts should be tightened a little at a time to secure the pump.

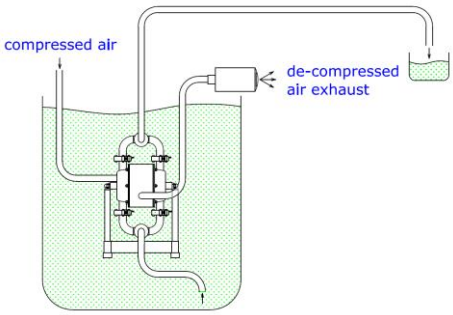
SELF PRIMING APPLICATION

Suction lift capability may vary depending on the construction materials and application parameters. The range is from 0.5÷5 meters (depends on the pump size) dry to 9 meters in a primed condition (values calculated for pumping water at 20°C).



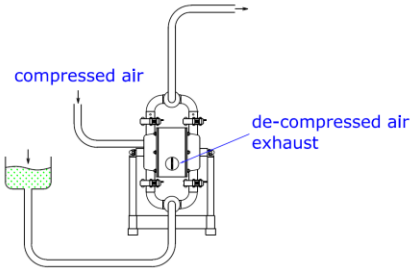
SUBMERGED OPERATION

All pumps may operate in full submersion. Construction materials must be compatible with surrounding liquid and the air exhaust must be placed above the liquid level.



POSITIVE SUCTION HEAD

Common as a method of drawing off the bottoms of holding tanks and clarifiers. Optimum inlet pressure should be kept at 0.2-0.3 bar g.



⚠ CAUTION

! Vibration generated by pump operation should be absorbed. Take it into consideration when mounting it.

! When using the pump in submerged position, follow the steps below:

- Verify the corrosion resistance of each component of the pump. DO NOT expose the pump to any fluid for which it does not have proper corrosion resistance.
- Exhaust should direct outside, not into the fluid in which the pump is submerged.

! The running pump may generate noise. Its level will depend upon conditions of use (kind of fluid being pumped, supply air pressure and discharge pressure).

⚠ WARNING

! The end of the hose must be equipped with a pit, a protection box, etc. at the end of the hose in case the diaphragm gets damaged and a leakage of the fluid follows.

! Pump exhaust should be directed to a safe place, away from people, animals and food.

Size	DM 15/30	DM 25/75	DM 40/125	DM 50/315	DM 50/565	DM 80/850
Max number of strokes/min. at nominal performance	430	240	160	140	100	100

⚠ CAUTION

! Before putting the pump into operation as well as after some hours of pumping, all housing bolts [9] have to be fixed according to the torque data of the following schedule, as the elements of construction “settle”. Fixing all these parts is necessary as well after longer periods of stoppage, at extreme temperature variations, after transport and dismantling the pump.

Torque value	Pump size and material	DM 15/30	DM 25/75	DM 40/125	DM 50/315	DM 65/565	DM 80/850
Housing bolts [Nm]	H.., H..-X (AISI 316L, electro-polished)	9	10	14	17	22	45

7.2. Connecting the ground wire

a) When installing the conductive pump, be sure to connect the ground wire at the specified position.

b) Ground wires should be connected to peripheral equipment and piping as well.

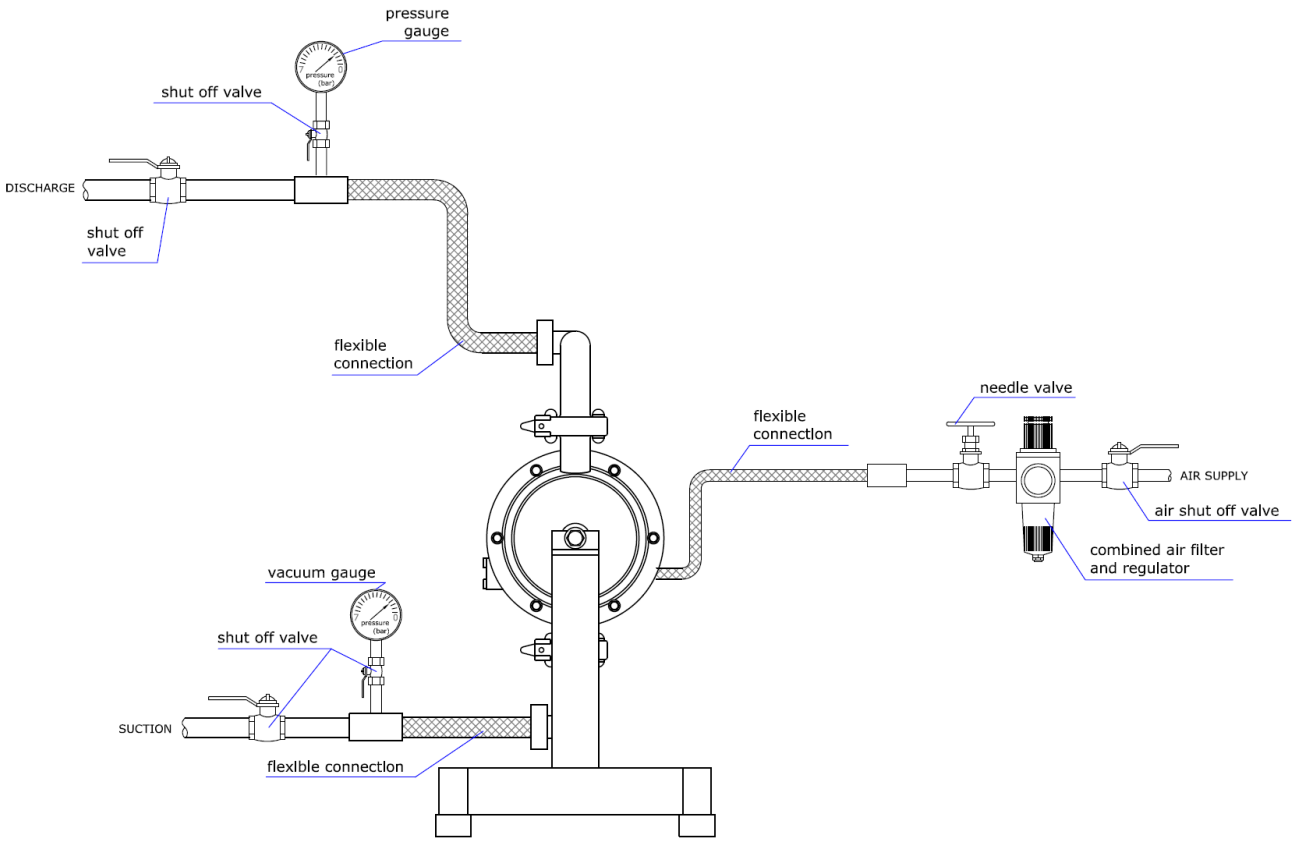
c) Use 2.0 mm^2 minimum ground wire.

⚠ WARNING

! Ground wires must be connected to the piping and any other peripheral equipment. When operating the pump make sure it is properly grounded. Otherwise friction between the parts and abrasion caused by some fluids flowing inside the casing may generate static electricity. In addition it may cause fire or electric shock, depending on the type of fluid being pumped and the installation environment (such as gases in the air or the surrounding mixtures).

8. Connection

8.1. Connecting fluid piping:



1) Connect a flow valve and a drain valve to the fluid discharge port of the pump.

2) Connect a valve for maintenance to the fluid suction intake port of the pump.

3) Connect a hose to the valve on the suction-port side and the valve of the discharge-port side of the pump.

4) Connect a hose on the suction-side intake and the discharge-port side to the respective vessels.

⚠ CAUTION

- A hose must be flexible to absorb pump vibration. The hose must be grounded.
- There must be NO external force on any connection part of the pump. Be especially careful not to have the pump support part of the weight of the hose and the piping.
- Use a sturdy hose that will not collapse under the strong suction of the pump. The hose must be of more than sufficient pressure rating.
- Use a hose of a diameter the same as or larger than the pump's ports. If the diameter of a hose is smaller, it will affect the pump's performance or cause its malfunction.
- Keep a vessel below the relief valve to catch any drain off.
- The product has been inspected using clean water at 8 bar discharge pressure.

8.2. Connecting air piping

⚠ WARNING

- Before starting work, make sure that the air compressor is shut off.

1) Connect an air valve, air filter, regulator to a hose connected to the compressor. Install items near the pump.
2) Connect the hose from the peripheral equipment to the air valve of the pump's supply port.

Note:

The diameter of the piping should be the same as the diameter of the pump supply port in order to supply sufficient air. Peripheral equipment with sufficient airflow should be chosen to meet the requirement of the pump air consumption. It must be installed nearest the pump unit, even using dry air. Usage and stability of air pressure must be considered.

9. Operation

9.1. Method of operation

⚠ CAUTION

- ! Before starting the pump, check that all piping is properly connected.
- ! Before starting the pump, check that **all the bolts are securely tightened.**
- ! Check that the regulator and the drain valve on the discharge side are closed and that the valve on the suction side is opened.

1) Start the air compressor.
2) Open the air valve. Using a regulator adjust the supply air pressure to within the permissible range.
3) Open the flow valve on the discharge side.
4) First, check that fluid is flowing inside the piping and is being pumped to the discharge side, and then fully open the air valve.

⚠ CAUTION

- Ø Do NOT open the air valve suddenly.

9.2. Flow adjustment

Adjust the flow valve on the discharge side, or adjust the supply air pressure.

⚠ CAUTION

- ! The supply air pressure may initially rise during closing the flow valve. Make sure that the pressure is kept within the normal operating range.
- ! The permissible suction flow speed can vary depending upon the viscosity and specific gravity of the fluid, the suction stroke and other factors. However in case of a rapid growth of the pump speed (flow speed of fluid), cavitation will occur. This will reduce pump performance and may cause a malfunction. In order to prevent cavitation, adjust the supply air pressure and the flow.
- ! If fluid is not discharged after you start the pump, or if you hear an abnormal noise or notice any irregularity, shut down the pump immediately.

9.3. Shutdown

Close the air valve of the pump and shut off the supply air. DO NOT stop the pump by closing the discharge valve while the compressed air is still supplied to the pump.

⚠ CAUTION

! When the pump is shut down while pumping slurry, particulate matter contained in the slurry will be deposited and get stuck inside the out chamber. Therefore after finishing work the pump must be purged of the remaining fluid. Otherwise when starting the pump again, the diaphragm may get damaged and the diaphragm shaft rod may bend.

⚠ CAUTION

! Keep a vessel below the relief valve for any drain off.

! Be careful! - Fluid under pressure will gush out the moment you open the valve.

! If the pump is unused for a prolonged period, purge and clean it.

10. Method of cleaning

⚠ WARNING

! Make sure that compressed air is not supplied to the pump BEFORE you start cleaning the pump.

! Make sure that the pump is not pressurized BEFORE you start cleaning the pump.

1) Remove the hose from the suction side of the pump.
2) Close the flow valve on the discharge side and open the drain valve. Then start air pressure for a while to discharge possibly much fluid remaining inside the pump.
3) Remove the hose from the discharge side, and attach different hoses to the suction side and the discharge side for cleaning.
4) Be ready with a vessel with cleaning solution, the kind appropriate for the type of fluid pumped. Next connect the suction-side and the discharge-side hoses of the pump.
5) Start the pump air pressure slowly, and let the cleaning solution circulate for sufficient cleaning.
6) Flush with clean water.
7) Remove the hose from the suction side of the pump, run the pump for a while to purge the pump of remaining fluid as much as possible.

⚠ CAUTION

! Be extremely careful when removing piping - the fluid will gush out.

! After cleaning with clean water, turn the pump upside-down to let the water flow out.

11. Daily check

Before starting pump operation, conduct the following check procedures every day. In case there appears any irregularity, do NOT start running the pump until the cause of the irregularity has been determined and corrective measures have been taken.

a) Make sure that there is no leakage of fluid from any connection part or the pump.

b) Make sure that there are no cracks in the pump casing or piping.

c) Check the tightness of every bolt of the pump.

d) Make sure that the connection parts of the piping and peripheral equipment are not loose.

e) Be sure that any pump parts to be replaced at regular intervals have been changed.

12. Possible problems

12.1. Pump does not run

Cause	Action to take
The exhaust port (muffler) of pump is clogged with sludge.	Check and clean the exhaust port and replace muffler.
Air is not supplied.	Start the compressor, and open the air valve and air regulator.
The supply air pressure is low.	Check the compressor and the configuration of air piping.
Air leaks from connection parts.	Check the connection parts and tightness of bolts.
The flow valve on the discharge side is not open.	Open the flow valve on the discharge side.
The fluid piping is clogged with sludge.	Check and clean the fluid piping.
The pump is clogged with sludge.	Disassemble the casing, check and clean.

12.2. Pump runs, but fluid does not come out	
Cause	**Action to take**
The suction lift or discharge head is long.	Confirm the piping configuration and shorten the length.
The discharge-side fluid piping (including the strainer) is clogged with sludge.	Check and clean the fluid piping.
The valve on the suction side is not open.	Open the valve on the suction side.
The pump is clogged with sludge.	Disassemble the casing, check and clean.
The balls and valve seats are worn out or damaged.	Disassemble the pump, check and replace parts.

12.3. Flow (discharge volume) decreased	
Cause	**Action to take**
The supply air pressure is low.	Check the compressor and configuration of air piping.
Air piping or peripheral equipment is clogged with sludge.	Check and clean the air piping.
The discharge-side flow valve opens differently.	Adjust the discharge-side flow valve.
Air is taken in together with fluid.	Replenish fluid and check the configuration of the suction-side piping.
Cavitation occur.	Adjust the supply air pressure and discharge pressure, and shorten the suction lift.
Chattering occurs.	Adjust the supply air pressure and discharge pressure. Reduce inlet flow valve to adjusting liquid pressure and volume.
The fluid piping (including the strainer) is clogged with sludge.	Check and clean the fluid piping and strainer.
The exhaust port (muffler) of the pump is clogged with sludge.	Check and clean the exhaust port and muffler.
The pump is clogged with sludge.	Disassemble the casing, check and clean.

12.4. Liquid leakage from exhaust port (silencer)	
Cause	**Action to take**
Damaged diaphragms.	Replace the diaphragms.

12.5. High air consumption during operation	
Cause	**Action to take**
The air valve O-rings and sleeves are worn out.	Disassemble the air-valve, check and clean. Replace parts as necessary.

12.6. Irregular noise	
Cause	**Action to take**
The supply air pressure too high.	Adjust the supply air pressure.
The pump is clogged with sludge with particles of larger than the permissible diameter.	Disassemble the casing, check and clean.

12.7. Irregular vibration	
Cause	**Action to take**
The supply air pressure too high.	Adjust the supply air pressure.
The sleeves are worn out.	Disassemble the air-valve, check and clean. Replace parts as necessary.
Connection parts and pump mounting are loose.	Check each connection part and tighten the bolts.

If any of the above mentioned causes do not apply to your problem, contact your dealer or our office.

13. Pump storage

Usually each DELLMECO pump is delivered packaged, but after unpacking it is ready for operation. If the pump unit is not to be installed right after delivery, proper storage conditions have to be ensured for a later trouble-free operating. The pump has to be protected from wetness, coldness, heat, dirtying, UV-radiation (especially PE parts) and mechanical influences.

Recommended storage conditions are as follows:

- Steady ventilated storage room, free of dust and vibration
- Ambient temperature between 15°C (59°F) and 25°C (77°F)
- Relative humidity below 65%
- Protection against direct thermal influences (sun, heating).

14. Returning the product for servicing

If you want to return the product for servicing, copy the **Trouble-Reporting Datasheet** (page 28)**,** fill it out giving the details of the problem and conditions of operation, scan it and send via e-mail to your dealer or our regional office. When you get an acceptance from your dealer or regional office:

1) Clean the pump.

2) Return the product in the same package as when it was first shipped from the factory.

Trouble-Reporting Datasheet

Your information will be most helpful in our efforts to improve our service as well as checking into causes of troubles and irregularities. We kindly request you therefore to fill out the following datasheet carefully, scan it and e-mail it to your dealer or our regional office. Thank you.

<table>
<tr><td>Company</td><td>Name of person in charge</td></tr>
<tr><td rowspan="3">Address</td><td>Department</td></tr>
<tr><td>Telephone</td></tr>
<tr><td>E-mail address</td></tr>
<tr><td>MODEL</td><td>Year of manufacturing</td></tr>
<tr><td>Period of use</td><td>Serial No.</td></tr>
<tr><td>Operating conditions
*Indoor * Outdoor</td><td>Date of Purchase</td></tr>
<tr><td>Frequency of operation
* Continuous * Intermittent

_____Hours/day/week/month</td><td rowspan="2">Name of Dealer

_____
Type of fluid pumped

_____
Specific gravity_____
Viscosity _____cP
Fluid temperature _____ *C/*F
Slurry:
*YES Density _____wt%
Particulate diameter _____mm
*NO</td></tr>
<tr><td>Operating air pressure _____ bar
Discharge pressure _____ bar
Discharge volume_____ l/min.
Suction side_____m
Suction side diameter_____m
Discharge side _____ m</td></tr>
<tr><td colspan="2">Problem</td></tr>
<tr><td colspan="2">Draw a summary drawing of application, including size, length of piping, and component parts (if more space for a drawing/sketch is required, please do it on the reverse side of this document, or send e-mail it as a separate file in one of the following formats: png, jpg, pdf)</td></tr>
</table>

WARNING

! It is the end-user responsibility to thoroughly wash and clean the pump to prevent any damages caused by accidental liquid leaks.

CAUTION

! Be sure to maintain the transport safety by preventing any liquid leaks from the pump.

14. Main body specification

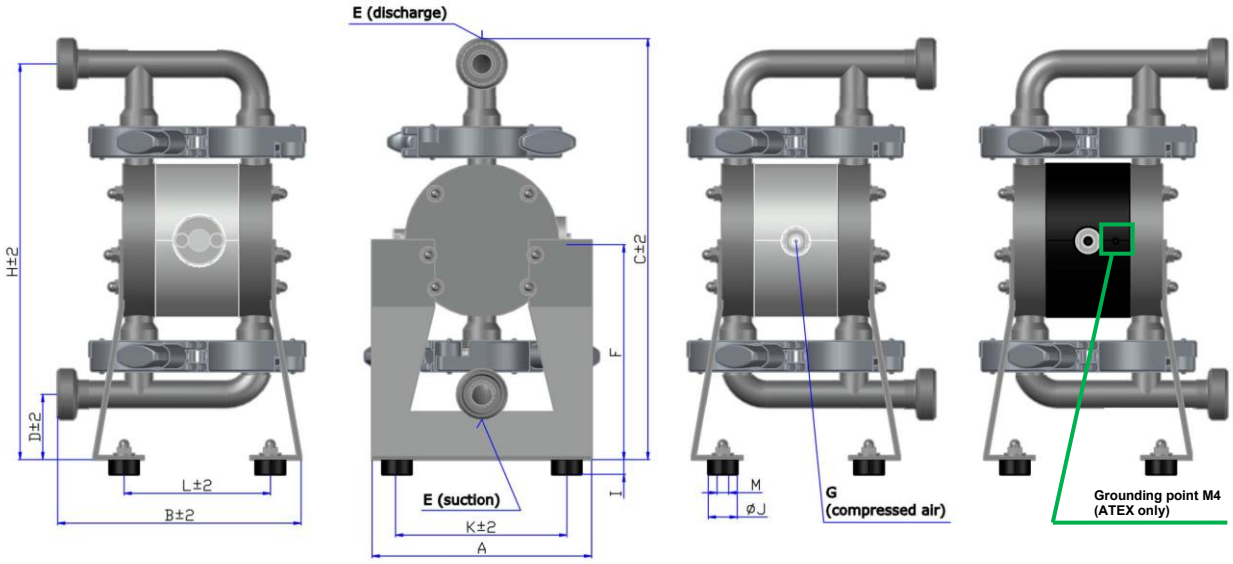
14.1. Main specification

CAUTION

! Due to constant improvements and/or modifications to our products, the dimensions and detailed technical specifications may be changed without prior information. Any claims concerning these changes shall not be considered. Please contact your dealer or our regional office for details.

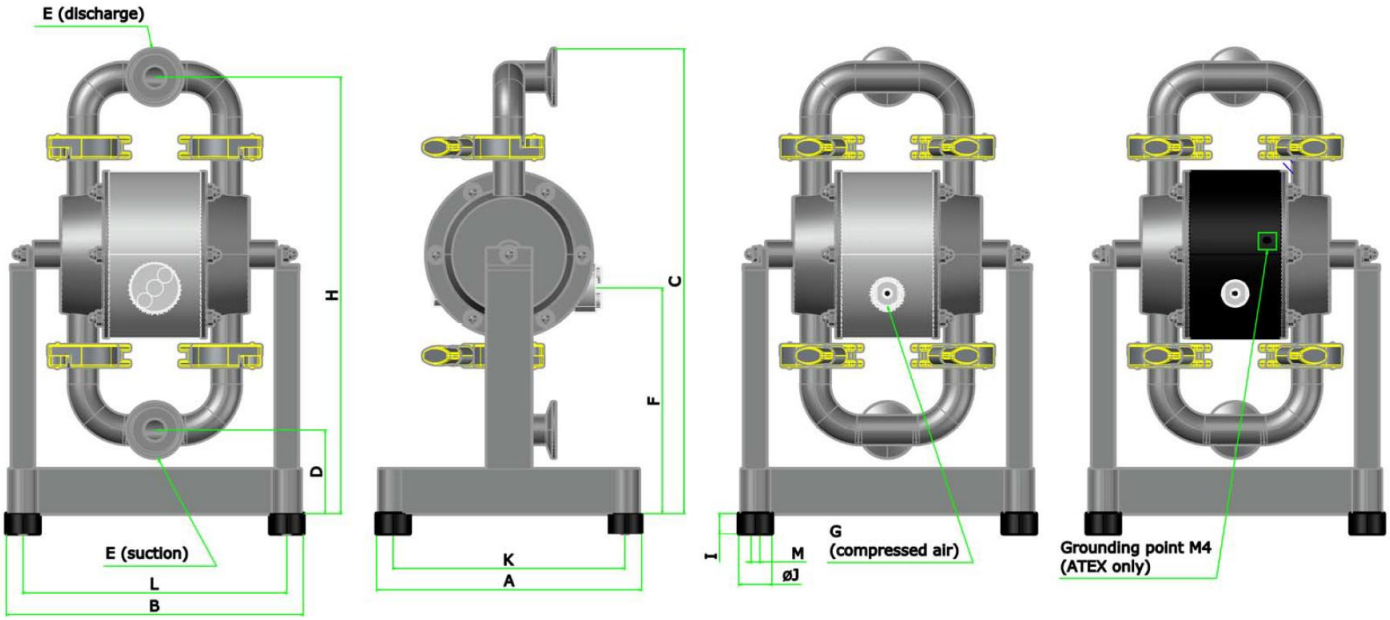
14.2. Appearance and dimensions

DM 15/30 H.., H..-X



H.., H..-X (AISI 316L, electro-polished)	A	B max.	C	D	E			F	G	H	I	ØJ	K	L	M
					DIN 11851	Tri-Clamp DIN 32676	SMS								
DM 15/30	150	170	298	44	Rd34x1/8”	Ø34	-	162	R ⅛”	282	18	30	116	101	M8

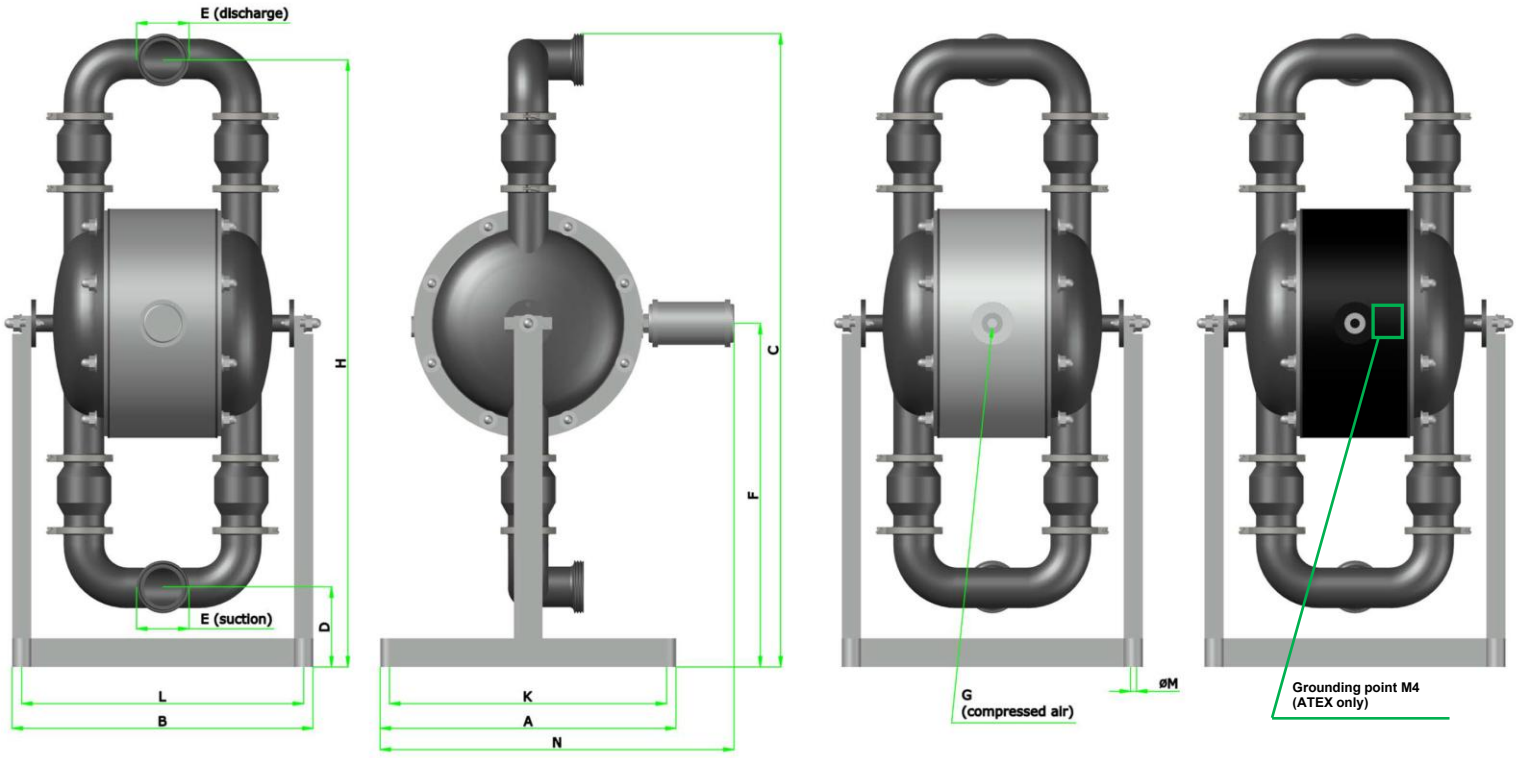
DM 25/75 H.., H..-X to DM 65/565 H.., H..-X:



H.., H..-X (AISI 316L, electro-polished)	A	B	C max	D	E			F	G	H	I	ØJ	K	L	M
					DIN 11851	Tri-Clamp DIN 32676	SMS 1145								
DM 25/75	241	270	421	76	Rd 52x1/6”	Ø50.5	Rd 40x1/6”	204	R ¼”	395	18	30	211	240	M8
DM 40/125	261	286	472	65	Rd 65x1/6”	Ø50.5	Rd 60x1/6”	220	R ¼”	438	18	30	231	256	M8
DM 50/315	358	387	678	111	Rd 78x1/6”	Ø64	Rd 70x1/6”	262	R ½”	639	18	30	328	357	M8
DM 65/565	358	465	885	95	Rd 95x1/6”	Ø91	Rd 85x1/6”	365	R ½”	845	18	30	330	435	M8

CAUTION: Standard (non-ATEX) and ATEX Hygienic Series Pumps have the same dimensions. In the case of ATEX Hygienic Pump (H..-X), grounding point (M4 internal threaded hole) is located on the central housing, right and up to the compressed air inlet connection (“G” symbol), as shown on the above drawing.

DM 80/850 H.. and DM 80/850 H..-X:



H.., H..-X (AISI 316L, electro-polished)	A	B	C	D	E	F	G	H	K	L	øM	N
DM 80/850 H.., H..-X (DN80, DIN 11851)	620	630	1325	168	Rd 110x1/4"	721	R ¾"	1270	580	590	11	741
DM 80/850 H..-TC, H..-X-TC (DN80, DIN 32676)			1323		Ø106							
DM 80/850 H..-SMS, H..-X-SMS (in., SMS 1145)			1319		Rd 98x1/6"							

14.3. Technical Data

Pump size	15/30	25/75	40/125	50/315	65/565	80/850
Wetted parts material	AISI 316L (electro-polished)					
Max. capacity [l/min.]	30	75	125	315	565	850
Max. pressure [bar g]	8					
Nominal port size, acc. to DIN 11851	DN15	DN25	DN40	DN50	DN65	DN80
Optional port size, Tri-Clamp (DIN 32676)	DN15	DN25	DN40	DN50	DN65	DN80
Optional port size, SMS (1145, inch)		1"	1 ½"	2"	2 ½"	3"
Air connection [in.]	R ⅛"	R ¼"		R ½"		R ¾"
Max. suction lift dry* [mWC]	2.0	2.0	3.0	4.0	5.0	5.0
Max. suction lift wet [mWC]	8.0					
Max. size of solids [mm]	3.0	4.0	7.0	10.0	12.0	15.0
Temp. limits: EPDM, NBR [°C]	70					
Temp. limits: TFM, TFM-PFA [°C]	100	110				
Weight – AISI 316L [kg]	5	9.5	14	31	70	105
Diaphragm material options	EPDM, NBR, TFM-PTFE, TFM-PFA				EPDM, NBR, TFM-PTFE	
Valve balls material options	AISI 316, PTFE	AISI 316, Ceramic, EPDM, NBR, PTFE, FKM (Viton)				EPDM, NBR, PTFE
O-rings material options	EPDM, NBR, PTFE					

* – real dry suction lift values can be smaller from the stated maximum values, due to: pump's diaphragm execution material, liquid properties (specific gravity, dynamic viscosity), suction hose inside diameter, etc.

14.4. Pump code

DM 25/75 HTS-TC-DM 1

DM – DELLMECO Pump
25 – In-/outlet standard connection size in Hygienic Pumps (acc. to DIN 11851)
75 – max capacity [l/min] at 8 bar g air supply pressure

H – Housing material:

AISI 316L (electro-polished), Hygienic

T – Diaphragm material:

E – EPDM
F – TFM/PTFE/PFA
N – NBR
T – TFM/PTFE

S - Material and kind of valve:

E - EPDM, ball valve
N - NBR, ball valve
S - AISI 316, ball valve
T - PTFE, ball valve
U - Polyurethane, ball valve
C - Ceramic, ball valve

TC – Optional in-/outlet ferrule type

TC – Tri-Clamp, DIN 32676
SMS – SMS 1145, inch
RJT – Rigid Joint Type

ATEX <u>not</u> included in standard version of the Hygienic Series Pumps

DM 1 - Optional equipment:

BC1 – Barrier Chamber with sensors (NAMUR)
BC2 – Barrier Chamber as BC1 with controllers
BC3 – Barrier Chamber as BC2, ATEX

BF1 – Back flushing system, hand operated, EPDM seals
BF2 – Back flushing system, hand operated, FEP/FKM seals
BF4 – Back flushing system, pneumatical, EPDM seals
BF5 – Back flushing system, pneumatical, FEP/FKM seals

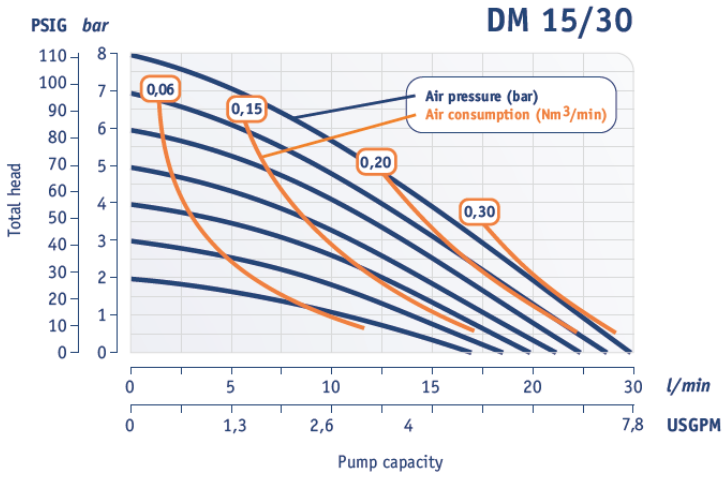
DM1 – Diaphragm Monitoring, NAMUR – ATEX
DM2 – Diaphragm Monitoring with controller

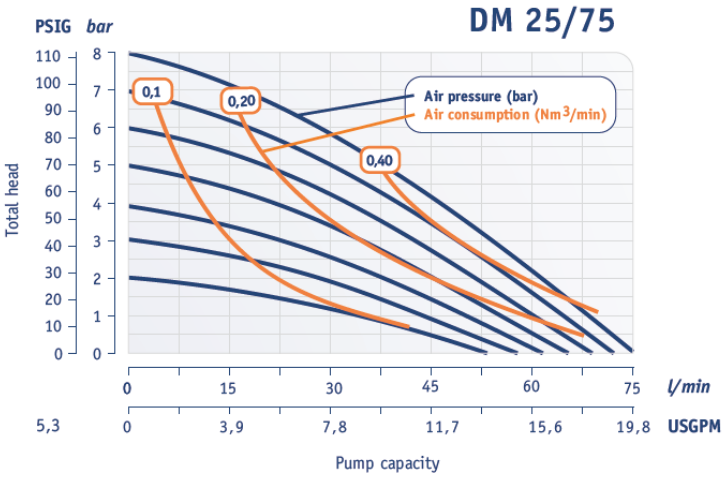
F4 – Flange Connection JIS 5K
F7 – Flange Connection PN10 DIN 2576
F8 – Flange Connection ANSI 150 RF-SO
F9 – Flange Connection PN16 DIN 2277/2278

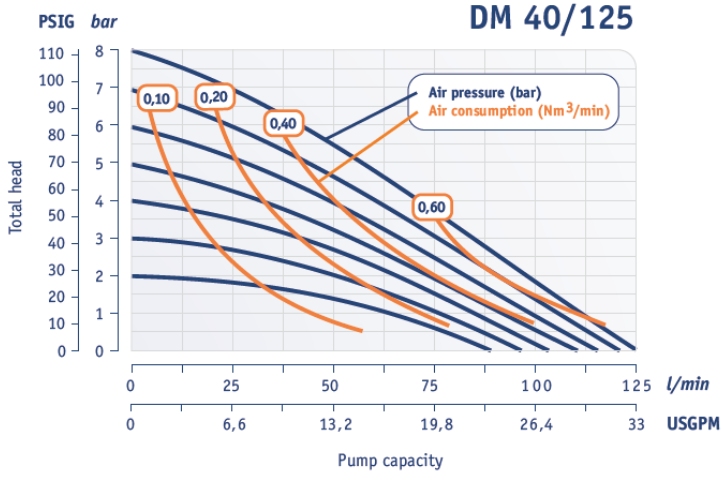
SC1 – Stroke sensor, ATEX
SC2 – SC1 plus stroke counter
SC3 – SC1 plus stroke counter – ATEX
SC5 – Stroke counting pneumatical with pressure transmitter
SC6 – SC5 plus stroke counter

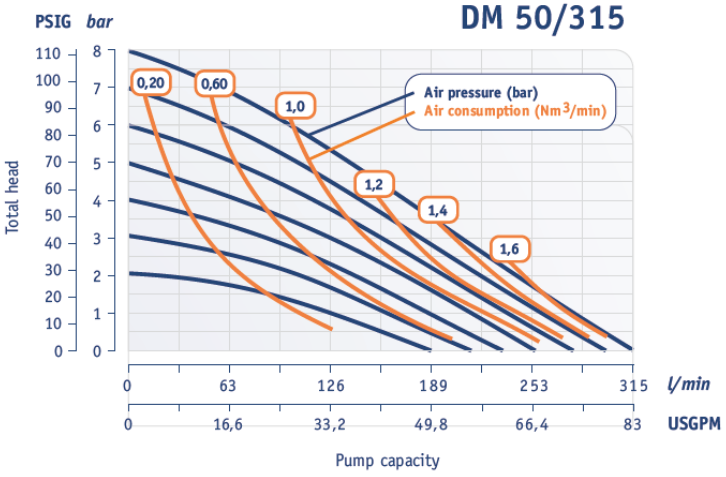
AF1, AF2, AF3 - Air filter, regulator, valve, nipple, connector
D – Drum pump
HJ – Heating/Cooling Jacket
HP – High pressure
MV – Pump with solenoid valve
P – Powder pump
RA – Additional polishing to 0.7 µm ≤ R_a ≤0.5 µm
S – Sleeve with split connections
T – Trolley
X – ATEX version
CLEAN – The clean package to meet enlarged purity requirements for special pump applications

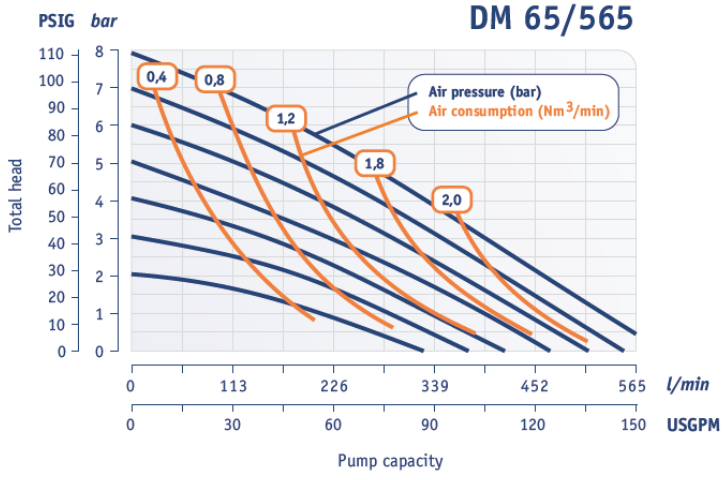
14.5. Performance curves

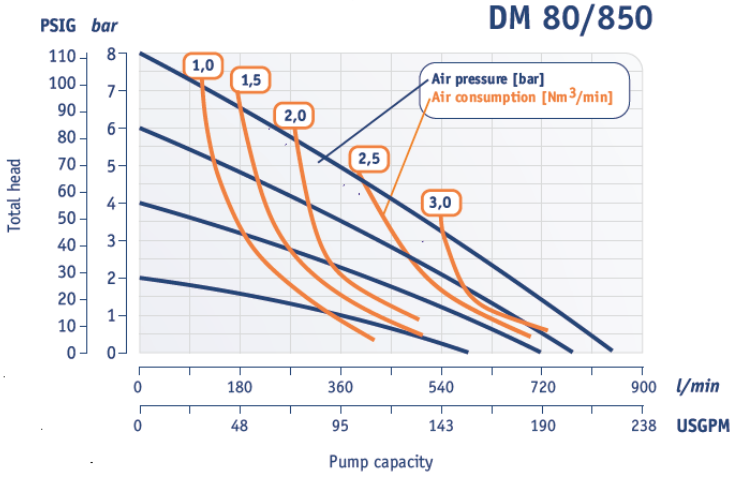












15. Dellmeco Active Pulsation Dampeners for Hygienic Pumps

15.1. Main specification

The DELLMECO Hygienic Series Active Pulsation Dampeners represent the latest generation of active pulsation dampeners. They are specially designed to be used along with DELLMECO pneumatic double diaphragm pumps of the Hygienic range. A general aspect to be considered is that a pulsation dampener slightly decreases total capacity of the system (depending on the point of operation).

Before putting a DELLMECO pulsation dampener into operation, make sure that the materials of construction are resistant to the chemicals to be pumped. To check this, the appropriate pulsation dampener code is required. This code, as well as the serial number, can be found in the following. Besides, these data are noted on the identification plates on the dampener itself.

Example of the dampener type code:

DM **15** **H** **E** **P**

- **P** - Material of dampener head: **P** - PE; **R** - PE conductive (for ATEX)
- **E** - Diaphragm material: **E** - EPDM; **F** - TFM-PFA; **N** - NBR; **T** - TFM(PTFE)
- **H** - Material of dampener housing: **H** - AISI 316L
- **15** - Size, nominal connection size DN 11851: **15**: DN15, **25**: DN25, **40**: DN40, **50**: DN50, **65:** DN65, **80**: DN80
- **DM** - DELLMECO Active Pulsation Dampener

Air supply connection: **DM 15**, **DM 25**, **DM 40:** R 1/8", **DM 50**, **DM 65**: R 1/4" , **DM 80**: R ½"

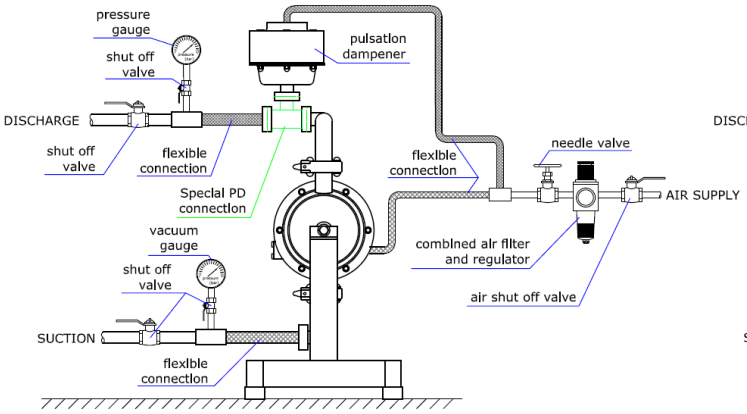
Max. operating pressure: 7 bar g

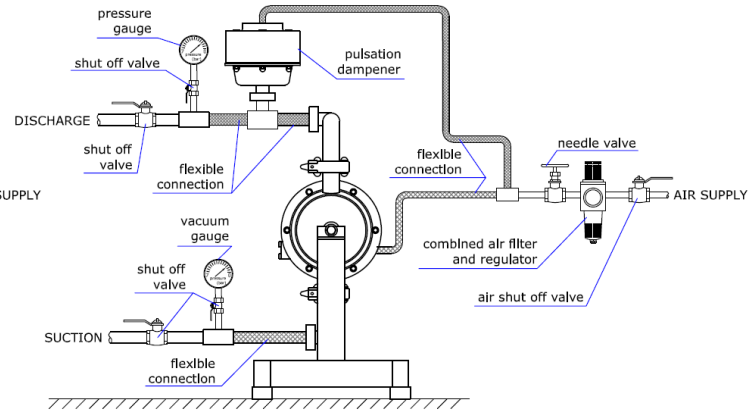
Max. operating temperature: 70°C (EPDM, NBR diaphragms), 110°C (TFM, TFM-PFA diaphragms).

For inflammable liquids as well as for applications in explosion protected areas, only ATEX approved Hygienic Series dampeners (with dampener head made from PE cond.) may be used. It is necessary to ground the dampener separately (by means of conductive T-connection, for which the PD unit is to be assembled), as the dampener is not connected conductively to the pump.

In general, pump and dampener from Hygienic Series ordered together are delivered as separated units, without possibility of connecting them together (left picture). However, it is available to order a special T-connection (from AISI 316L material) for assembling both pump and pulsation dampener together (right picture – for more info, please refer to **Chapter 15.3**, on the page **47**). In such case PD has to be assembled to the outlet connection (assembled on the pump's discharge port). Besides, a correct positioning of the seal within the groove connection has to be ensured.

The DELLMECO Pulsation Dampener of the Hygienic Series reduces the capacity of the complete system in dependence of the point of operation.





Before connecting the pump, take the yellow blind plugs out of air inlet which is located on the top of the dampener head [**41**]. For correct operation, the dampener absolutely needs an air-supply of its own, which has to be taken from the air-supply of the pump (pump and pulsation dampener have to be connected to the same air pressure source!). No stop or regulating valve has to be placed between pump and dampener. The driving air has to be oil-free, dry and clean. Together with the pump an empty dampener has to be driven slowly. Active pulsation dampeners are self-regulating for all changing operating conditions.

⚠ CAUTION

! Before putting the pulsation dampener into operation as well as after some hours of operating, the housing bolts **[42]** have to be tightened carefully, as the elements of construction tend to "settle". Fixing the bolts is necessary as well after longer periods of stoppage, at extreme temperature variations, transport and after dismantling. Torque value for each size and material execution of the Hygienic Series Pulsation Dampener is specified below.

! Pressure tests of the plant, the pump and the dampener are included and may only be carried out with the aggregate (pump and dampener) disconnected from the pressure on both ports or by using the pressure the aggregate develops while operating. The load of a pressure in the plant may damage the pump and the pulsation dampener.

! Before starting to disassemble pump with dampener or dampener itself, take care that pump and/or dampener have been emptied and rinsed. Further, both have to be cut off from any energy on the air and product side. If pump and dampener are being deported from the plant, a reference about the delivered liquid has to be attached.

! Please respect the relevant additional security advices, if the pump and/or the dampener will be used for aggressive, dangerous or toxic liquids.

! Before putting the pump and the dampener back into operation, the tightness of both (housing bolts) has to be checked.

Recommended tightening torque for the pulsation dampener housing bolts are presented in the below chart:

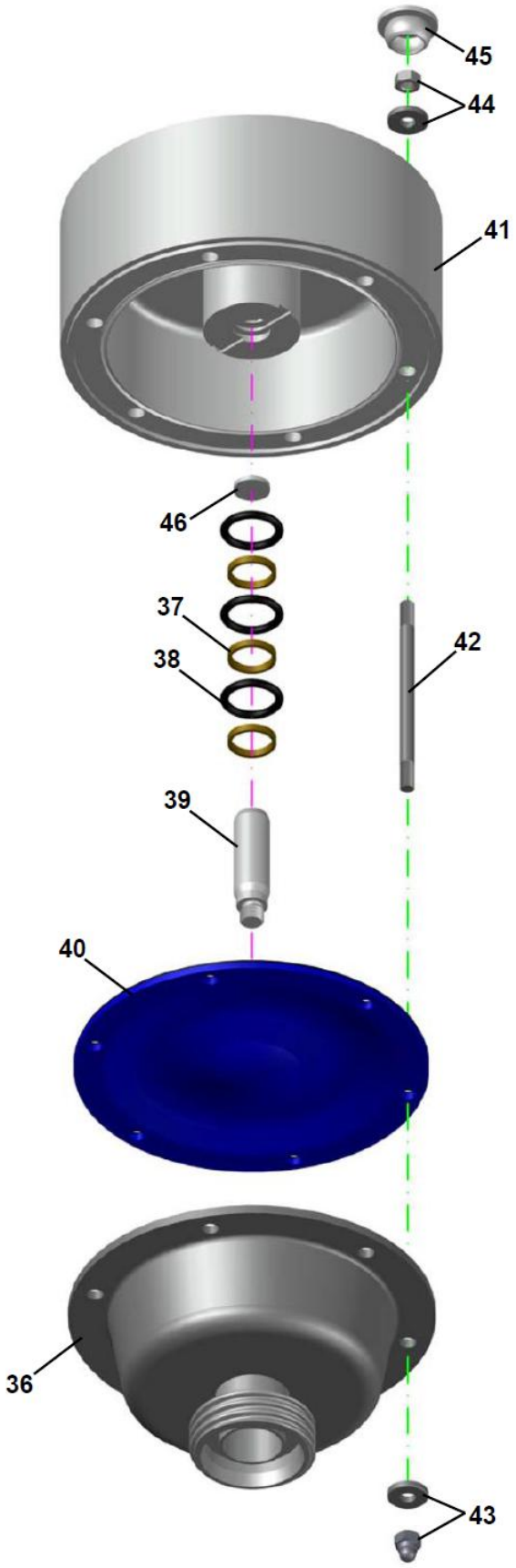
Torque values for the pulsation dampener housing bolts (Nm):						
Material execution	**Pulsation Dampener size**					
	DM 15	**DM 25**	**DM 40**	**DM 50**	**DM 65**	**DM 80**
HEP, HNP, HTP, HFP, HER, HNR, HTR, HFR	4	5	7	12	17	20

Disassembly instructions

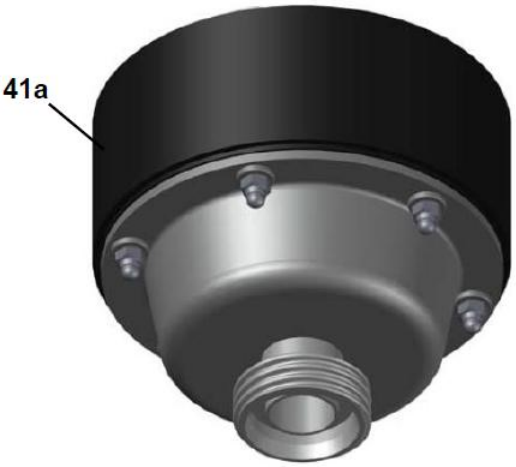
Remove the plugs [**45**] and unscrew the nuts [**43**, **44**] from the housing bolts [**42**] carefully. After that, all the main parts can be removed. Next, unscrew the diaphragm [**40**] from the actuator shaft [**39**]. A re-assembly of used piston rings [**37**] only is not recommended – they have to be replaced including the O-rings [**38**] underneath. To assemble new piston rings [**37**] carefully shape them like kidneys with locking ring pliers and insert the rings into the grooves, with previously installed O-rings [**38**]. After that completely press the piston rings into the grooves smoothly using some round tool.

HYGIENIC SERIES PULSATION DAMPENER – exploded view

Standard (PE dampener head)



ATEX (PE cond. dampener head)



Spare parts list for Hygienic Series Pulsation Dampeners, AISI 316L version (also for ATEX)

				PD size and material execution (DM xx H_P, DM xx H_R)					
Item	**Part name**	**Quantity**	**Material**	**DM 15**	**DM 25**	**DM 40**	**DM 50**	**DM 65**	**DM 80**
36.	Dampener housing, DIN 11851 ferrule	1	AISI 316L	8 15 01 53	8 25 01 53	8 40 01 53	8 50 01 53	8 65 01 53	8 80 01 53
	Dampener housing, TC ferrule (DIN 32676)			8 15 01 53-T	8 25 01 53-T	8 40 01 53-T	8 50 01 53-T	8 65 01 53-T	8 80 01 53-T
	Dampener housing, SMS ferrule (SMS 1145)				8 25 01 53-S	8 40 01 53-S	8 50 01 53-S	8 65 01 53-S	8 80 01 53-S
37.	Piston ring	3	PPS-PTFE	1 08 90 18	1 15 85 18[(1)]		1 25 85 18[(1)]	1 40 85 18[(1)]	1 50 85 18[(1)]
			PE				1 25 85 22	1 40 85 22	1 50 85 22
38.	O-ring	3/6*	NBR	1 08 82 10	1 15 85 10		1 25 85 10[(*)]	1 40 85 10	1 50 85 10
39.	Actuator shaft	1	PET	8 10 40 30	8 25 40 30				
			AISI 304				8 40 40 50	8 50 40 50	8 80 40 50
40.	Diaphragm	1	EPDM	1 10 50 08	1 15 50 08		1 25 50 08	1 40 50 08	1 50 50 08
			NBR	1 10 50 10	1 15 50 10		1 25 50 10	1 40 50 10	1 50 50 10
			TFM(PTFE)	1 10 50 05	1 15 50 05		1 25 50 05	1 40 50 05	1 50 50 05
			TFM(PTFE)-PFA	1 10 50 00	1 15 50 00		1 25 50 00	1 40 50 00	
41.	Dampener head	1	PE	8 10 203 20	8 25 203 20		8 40 203 20	8 50 203 20	8 80 203 20
41a.			PE cond. (ATEX)	8 10 203 21	8 25 203 21		8 40 203 21	8 50 203 21	8 80 203 21
42.	Housing bolt	4/6**/8***	AISI 304	8 15 42 50	8 25 42 50**		8 40 42 50**	8 50 42 50***	8 80 42 50***
43.	Cap nut with washer (for housing)	4/6**/8***	AISI 304	8 10 145 50	8 25 145 50**		8 40 145 50**	8 50 145 50***	8 80 145 50
44.	Nut with washer (for head)	4/6**/8***	AISI 304	8 10 045 50	8 25 045 50**		8 40 045 50**	8 50 045 50***	8 80 045 50
45.	Housing bolt plug	4/6**/8***	PE	8 10 058 20	8 25 058 20**		8 40 058 20**	8 50 058 20***	8 80 058 20***
46.	Muffler	1	PE porous	8 10 99 35	8 25 99 35		8 40 99 35	8 50 99 35	8 80 99 35

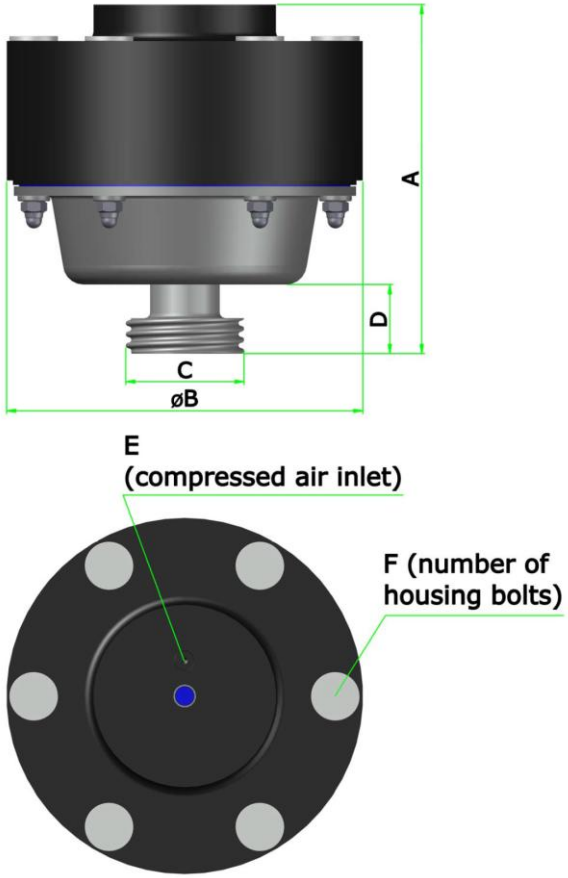
(1) – material execution only for “ATEX 0” version

Parts included in the repair kit (SET) for Hygienic Series Pulsation Dampener (also for ATEX)

	Item No.	**Quantity**	**Pulsation Dampener Model**	**Size and material execution**																			
				DM 15				**DM 25**				**DM 40**				**DM 50**				**DM 65**				**DM 80**		
				HEP, HER	**HNP, HNR**	**HTP, HTR**	**HFP, HFR**	**HEP, HER**	**HNP, HNR**	**HTP, HTR**	**HFP, HFR**	**HEP, HER**	**HNP, HNR**	**HTP, HTR**	**HFP, HFR**	**HEP, HER**	**HNP, HNR**	**HTP, HTR**	**HFP, HFR**	**HEP, HER**	**HNP, HNR**	**HTP, HTR**	**HFP, HFR**	**HEP, HER**	**HNP, HNR**	**HTP, HTR**
			Description	**Part no.:**																						
Spare part kit set content	37.	3	Piston ring	1 08 90 18				1 15 85 22								1 25 85 22				1 40 85 22				1 50 85 22		
								1 15 85 18[(1)]								1 25 85 18[(1)]				1 40 85 18[(1)]				1 50 85 18[(1)]		
	38.	3/6[(*)]	O-ring	1 08 82 10				1 15 85 10								1 25 85 10[(*)]				1 40 85 10				1 50 85 10		
	39.	1	Actuator shaft	8 10 40 30				8 25 40 30								8 40 40 50				8 50 40 50				8 80 40 50		
	40.	1	Diaphragm	1 10 50 08	1 10 50 10	1 10 50 05	1 10 50 00	1 15 50 08	1 15 50 10	1 15 50 05	1 15 50 00	1 15 50 08	1 15 50 10	1 15 50 05	1 15 50 00	1 25 50 08	1 25 50 10	1 25 50 05	1 25 50 00	1 40 50 08	1 40 50 10	1 40 50 05	1 40 50 00	1 50 50 08	1 50 50 10	1 50 50 05
	44.	1	Muffler	8 10 99 35				8 25 99 35								8 40 99 35				8 50 99 35				8 80 99 35		

(1) – material execution only for “ATEX 0” version

15.2. Appearance and dimensions of the Hygienic Series Pulsation Dampener



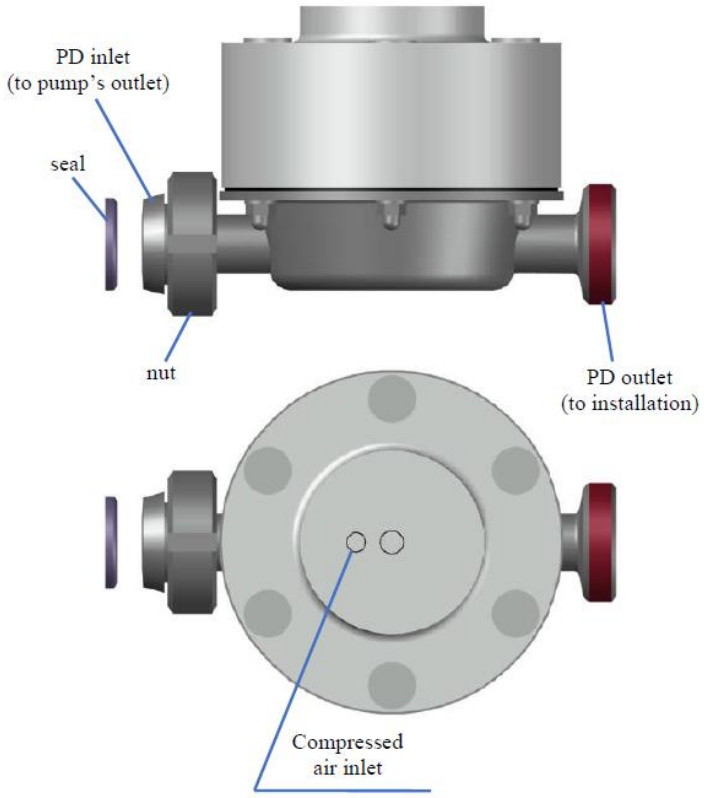
Dimension		DM 15 H.P DM 15 H.R	DM 25 H.P DM 25 H.R	DM 40 H.P DM 40 H.R	DM 50 H.P DM 50 H.R	DM 65 H.P DM 65 H.R	DM 80 H.P DM 80 H.R
A	DIN 11851	99	148	148	184	228	280
	Tri-Clamp	96	148	141	178	226	270
	SMS 1145		143	148	178	226	280
øB		110	156	156	204	273	365
C	DIN 11851	Rd34x1/8”	Rd 52x1/6”	Rd 65x1/6”	Rd 78x1/6”	Rd 95x1/6”	Rd 110x1/4”
	Tri-Clamp	Ø34	Ø50.5	Ø50.5	Ø64	Ø77.5	Ø91
	SMS 1145		Rd40x1/6”	Rd60x1/6”	Rd70x1/6”	Rd85x1/6”	Rd98x1/6”
D	DIN 11851	18	26	26	32	30	40
	Tri-Clamp	15	26	19	26	28	30
	SMS 1145		21	26	26	28	40
E		R ⅛”	R ⅛”	R ¼”	R ¼”	R ¼”	R ½”
F		4	6	6	6	8	8

Head material (for ATEX): PE conductive (DM xx ..**R**);
Housing material (in contact with medium) for ATEX: Aluminium (DM xx A.**R**), AISI 316 (DM xx S.**R**);
Diaphragm material: EPDM (DM xx .**E**R), NBR (DM xx .**N**R), TFM/PTFE (DM xx .**TR**);
ATEX (Zone 1) compliance: **EEx II 2GD IIB T1÷T5**;
ATEX 0 (Zone 0) compliance: **II 1/2 G Ex h IIC or IIB/IIC T4…T3 Ga/Gb PTB 18 ATEX 5008 X**.

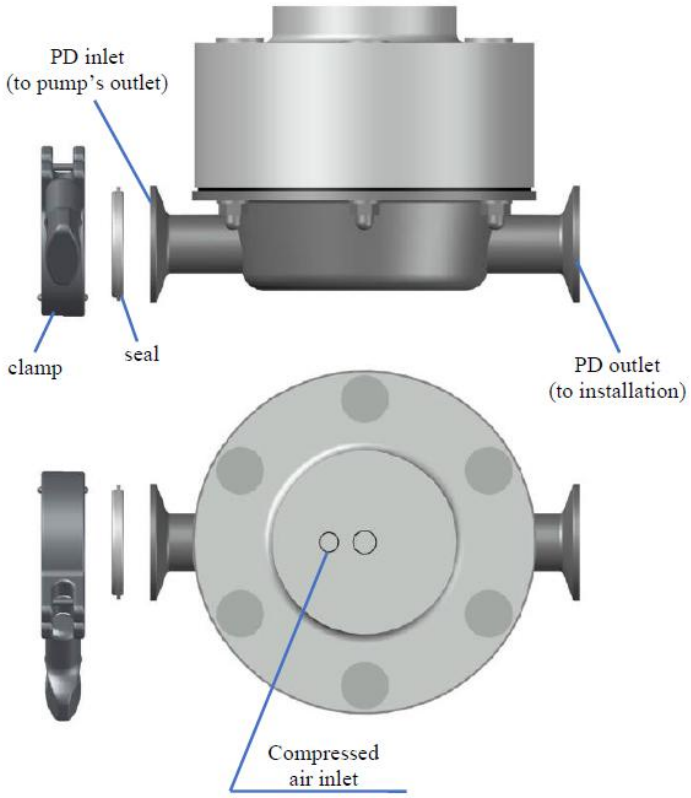
15.3. Special version of Pulsation Dampener for Hygienic Series Pumps - INLINE

Hygienic Pump ordered with Hygienic Series PD unit are delivered as non-integrated. However, you can order a special execution of PD that will allow you to mount it on the pump already bought (you have to assemble the PD connection port right to the pump's outlet). Such execution of Pulsation Dampener is known as "INLINE" – it has two separated connections (inlet and outlet), each located on the same axis (vertically), as presented on the below drawings:

PD INLINE version with DIN 11851 or SMS (screwed connections)



PD INLINE version with DIN 32676 (clamped connection)



The above execution of Pulsation Dampener do not require special T-connection, as in the case of PD with only one connection –

You can also order Hygienic Series Pump with integrated PD unit (extension with PD unit will be specially prepared and assembled on the pump's discharge connection). For more information, please contact our Office Department at: office@dellmeco.com

NOTE: Execution material of the special discharge port will always be in accordance with the pump's original wetted parts (AISI 316L). In order to obtain quotation for the special integrating connection, please send preliminary sketch or ask what solution we can propose. Once we have established the details together, we will prepare an offer for you.

16. Optional Equipment

Additional information to the operating and installation instructions
ought to be studied before installing the pump

For special requirements DELLMECO pneumatic diaphragm pumps of the Hygienic Series can be furnished with several optional equipment. The pump code informs, which of these are included in the pump.

16.1. Barrier Chamber System (Option codes: BC1, BC2, BC3)

To comply with high safety standards, the barrier system replaces the standard diaphragm [**4**] by a tandem arrangement of two additional EPDM diaphragms [**59**] and two barrier chambers [**52**, **53**] of conductive PE filled with a non-conductive liquid (de-ionized water) in between. To ensure the correct operation of the pump, the barrier chambers [**52**, **53**] have to be filled completely. Therefore, they are monitored by liquid sensors [**60**]. After loosening the plug [**57**] each barrier liquid can be refilled. In case a diaphragm in contact with pumped liquid breaks, the conductivity of the barrier liquid rises which is registered by the conductivity sensors [**56**]. The minimum conductivity of 22 µS covers a wide range of media. After using for some time the de-ionized water can be polluted with germs. In this case the water needs to be replaced.

The barrier system is available in three variations:

- BC 1 Barrier system with sensors, standard
- BC 2 Barrier system complete with sensors and controllers
- BC 3 Barrier system complete with sensors and controllers for explosion-proof zone

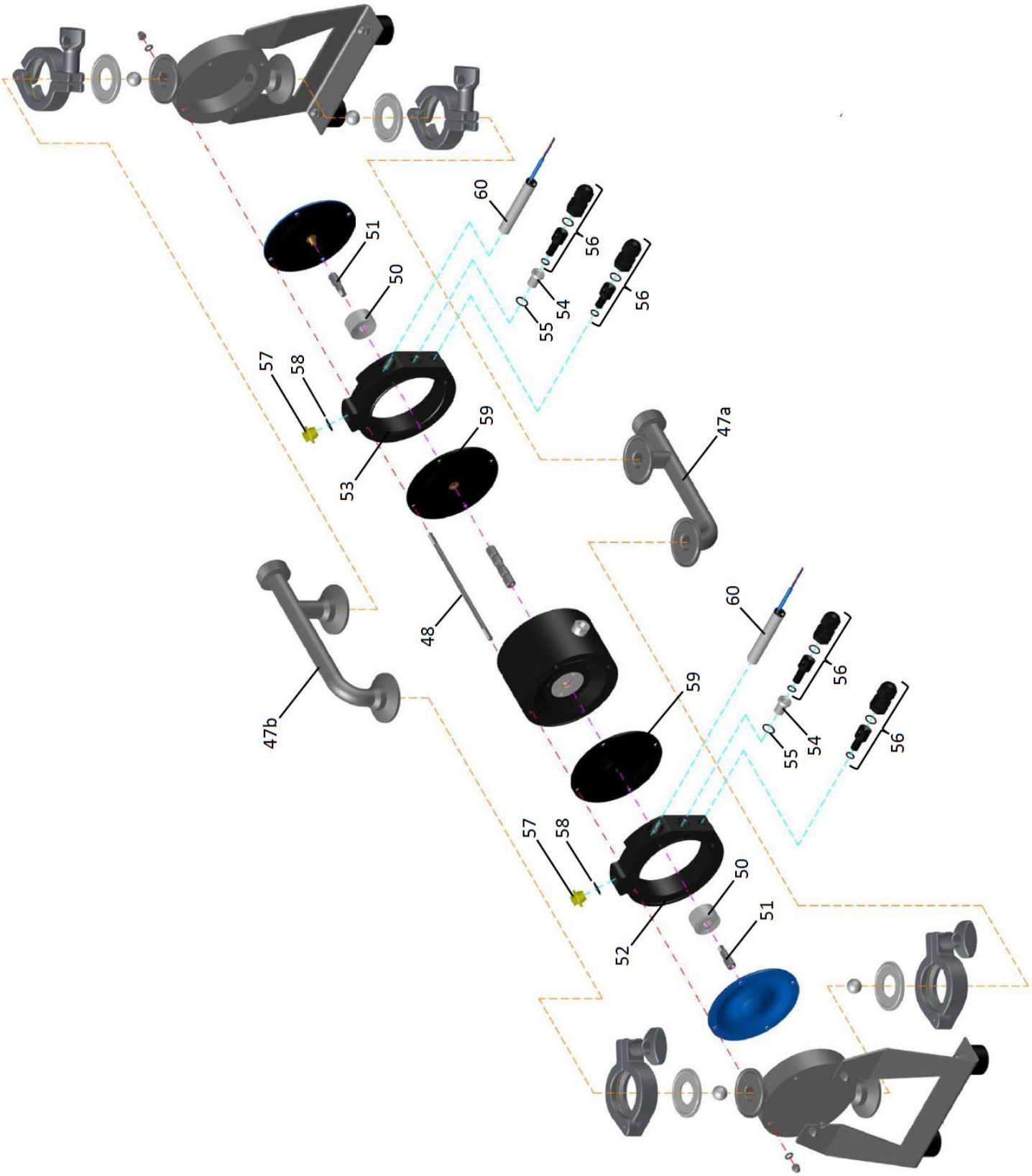
The four conductivity sensors [**56**] are pre-installed. After connection of the wire (wire not part of supply) only the PG-threads have to be screwed onto. Both liquid sensors [**60**] are installed completely.

The sensors can either be connected to an existing controller (code BC1) or to the controller included (code BC2 / BC3). The wiring diagram and technical data can be found on the controller itself. For further details, please refer to the data delivered by the manufacturers of the components.

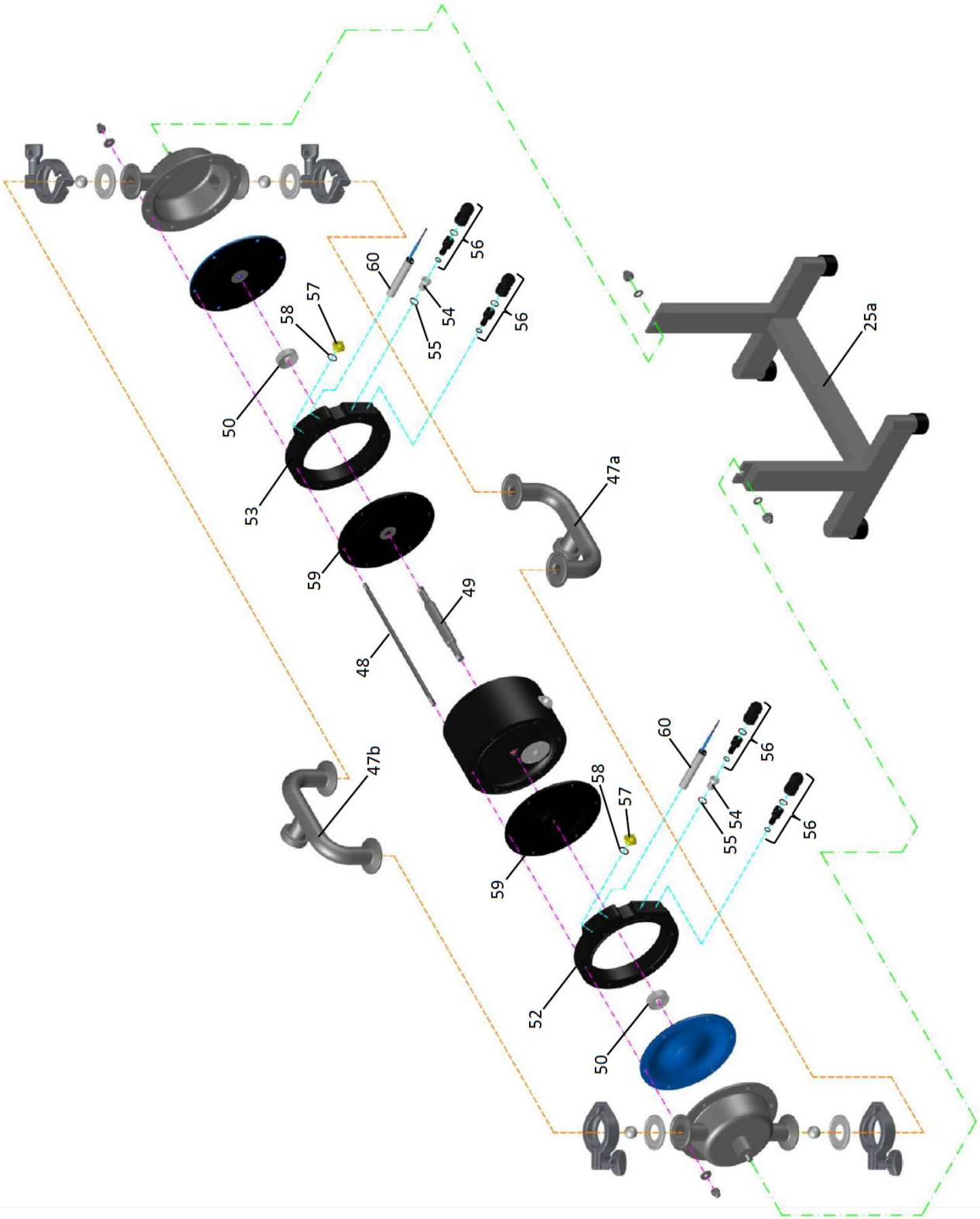
The controllers have to be installed in a suitable cabinet outside ATEX area.

CAUTION: *When assembling BC3 Option in the explosion-proof zone, controllers must be installed in a suitable cabinet outside ATEX area. DELLMECO* ***DO NOT*** *offer ATEX-approved cabinets for installing controllers.*

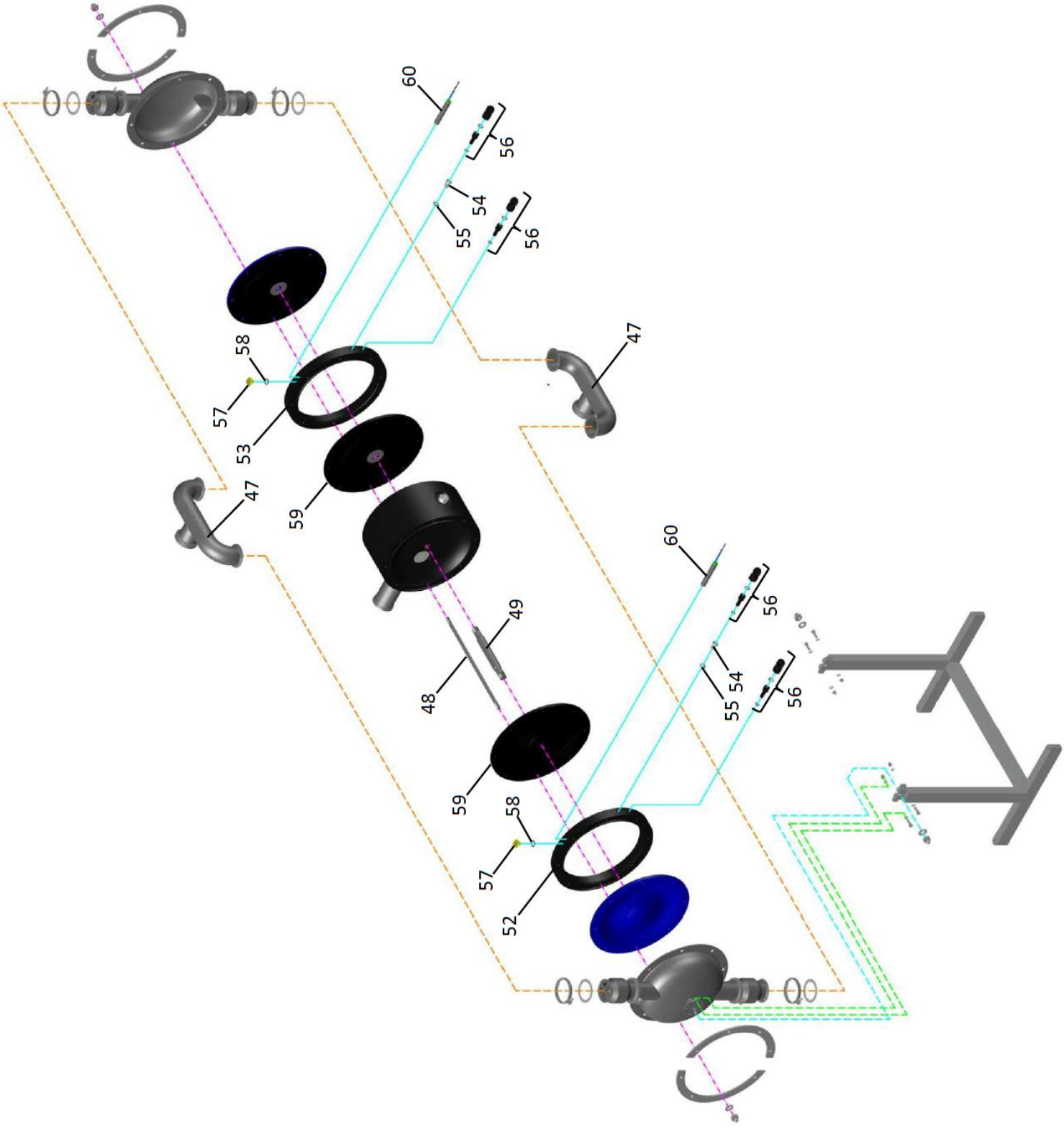
Exploded view, Barrier Chamber system for DM 15/30 Hygienic Series Pump (AISI 316L, also for ATEX)



Exploded view, Barrier Chamber system from DM 25/75 to DM 65/565 Hygienic Series Pump (AISI 316L, also for ATEX)



Exploded view, Barrier Chamber system for DM 80/850 Hygienic Series Pump (AISI 316L, also for ATEX)

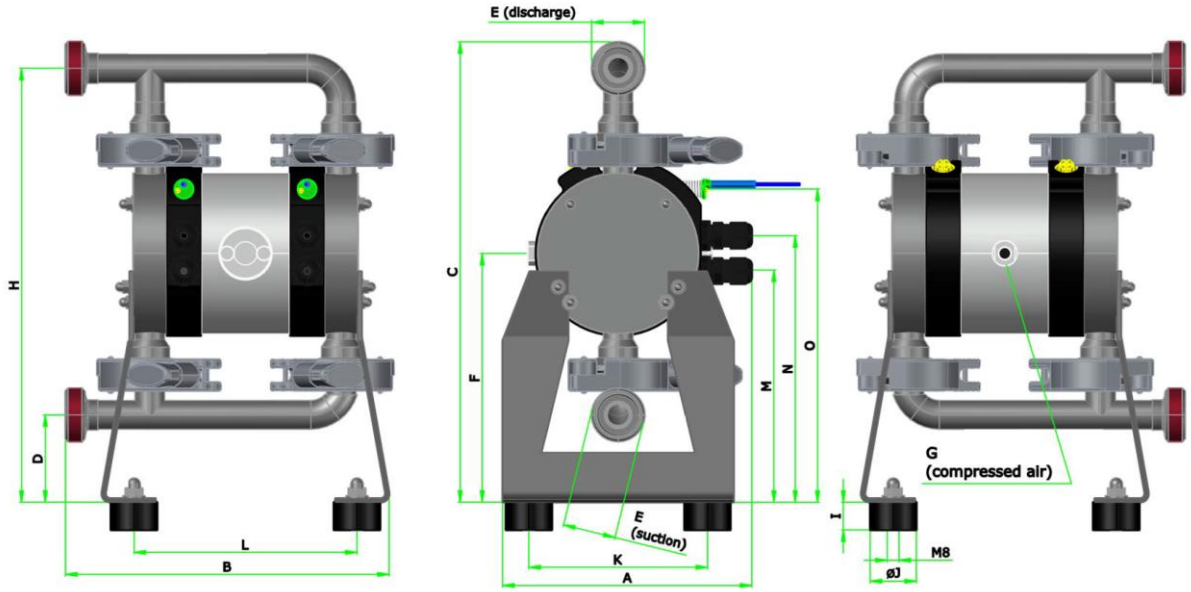


Spare part list, barrier chamber system

Pump size (wetted parts material execution)					DM 15/30 (H..) (H..-X)	DM 25/75 (H..) (H..-X)	DM 40/125 (H..) (H..-X)	DM 50/315 A..-X) (B..-X)	DM 65/565 (H..) (H..-X)	DM 80/850 (H..) (H..-X)
Code	Item	Quantity	Part name	Material	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
BC1	25a.	1/2[a]	Pump stand for BC Option	AISI 304	4 15 96 50[a]	4 25 096 50	4 40 096 50	4 50 096 50	4 65 096 50	4 80 096 50
	47a.	1	Inlet manifold for BC, DIN 11851	AISI 316L	4 15 030 53	4 25 030 53	4 40 030 53	4 50 030 53	4 65 030 53	4 80 030 53
			Inlet manifold for BC, SMS 1145			4 25 031 53	4 40 031 53	4 50 031 53	4 65 031 53	4 80 031 53
			Inlet manifold for BC, Tri-Clamp		4 15 032 53	4 25 032 53	4 40 032 53	4 50 032 53	4 65 032 53	4 80 032 53
	47b.	1	Outlet manifold for BC, DIN 11851		4 15 130 53	4 25 130 53	4 40 130 53	4 50 130 53	4 65 130 53	4 80 030 53
			Outlet manifold for BC, SMS 1145		4 15 131 53	4 25 131 53	4 40 131 53	4 50 131 53	4 65 131 53	4 80 031 53
			Outlet manifold for BC, Tri-Clamp		4 15 132 53	4 25 132 53	4 40 132 53	4 50 132 53	4 65 132 53	4 80 032 53
	48.	4 / 6* / 8**	Barrier chamber housing bolt	AISI 304	4 15 042 50	4 25 042 50*	4 40 042 50*	4 50 042 50**	4 65 042 50**	4 80 042 50**
	49.	1	Barrier chamber diaphragm shaft	AISI 304		1 15 41 50	1 25 41 50	1 40 41 50	1 50 41 50	1 80 41 50
	50.	2	Spacer	PET	1 10 63 30	1 15 63 30	1 25 63 30			
	51.	2	Spacer bolt	AISI 304	1 10 43 50					
	52.	1	Left barrier chamber	PE conductive	1 15 202 21	1 20 202 21	1 25 202 21	1 40 202 21	1 50 202 21	1 80 202 21
	53.	1	Right barrier chamber	PE conductive	1 15 302 21	1 20 302 21	1 25 302 21	1 40 302 21	1 50 302 21	1 80 302 21
	54.	2	Sensor sleeve	PE	2 10 62 20	2 15 62 20	2 25 62 20	2 40 62 20	2 50 62 20	2 80 62 20
	55.	2	Sensor sleeve O-ring	FKM	1 08 82 09	1 08 82 09	1 08 82 09	1 08 82 09	1 08 82 09	1 08 82 09
	56.	4	Conductivity sensor	diverse	9 15 15 00	9 15 15 00	9 15 15 00	9 15 15 00	9 15 15 00	9 15 15 00
	57.	2	Plug	PA	1 15 48 40	1 15 48 40	1 15 48 40	1 15 48 40	1 15 48 40	1 15 48 40
	58.	2	Plug O-ring	FKM	1 15 74 09	1 15 74 09	1 15 74 09	1 15 74 09	1 15 74 09	1 15 74 09
	59.	2	Inner diaphragm	EPDM	1 10 51 08	1 15 51 08	1 25 51 08	1 40 51 08	1 50 51 08	1 80 51 08
	60.	2	NAMUR liquid sensor	diverse	9 15 12 00	9 15 12 00	9 15 12 00	9 15 12 00	9 15 12 00	9 15 12 00
BC 2			as BC1, but additionally contains:							
	-	1	Controller	diverse	9 15 14 00	9 15 14 00	9 15 14 00	9 15 14 00	9 15 14 00	9 15 14 00
	-	1	Conductivity measuring transmitter	diverse	9 15 13 00	9 15 13 00	9 15 13 00	9 15 13 00	9 15 13 00	9 15 13 00
BC 3			as BC2, but for EEx II IIB:							
	-	1	Controller	diverse	9 15 14 00	9 15 14 00	9 15 14 00	9 15 14 00	9 15 14 00	9 15 14 00
	-	1	Conductivity measuring transmitter	diverse	9 15 08 00	9 15 08 00	9 15 08 00	9 15 08 00	9 15 08 00	9 15 08 00

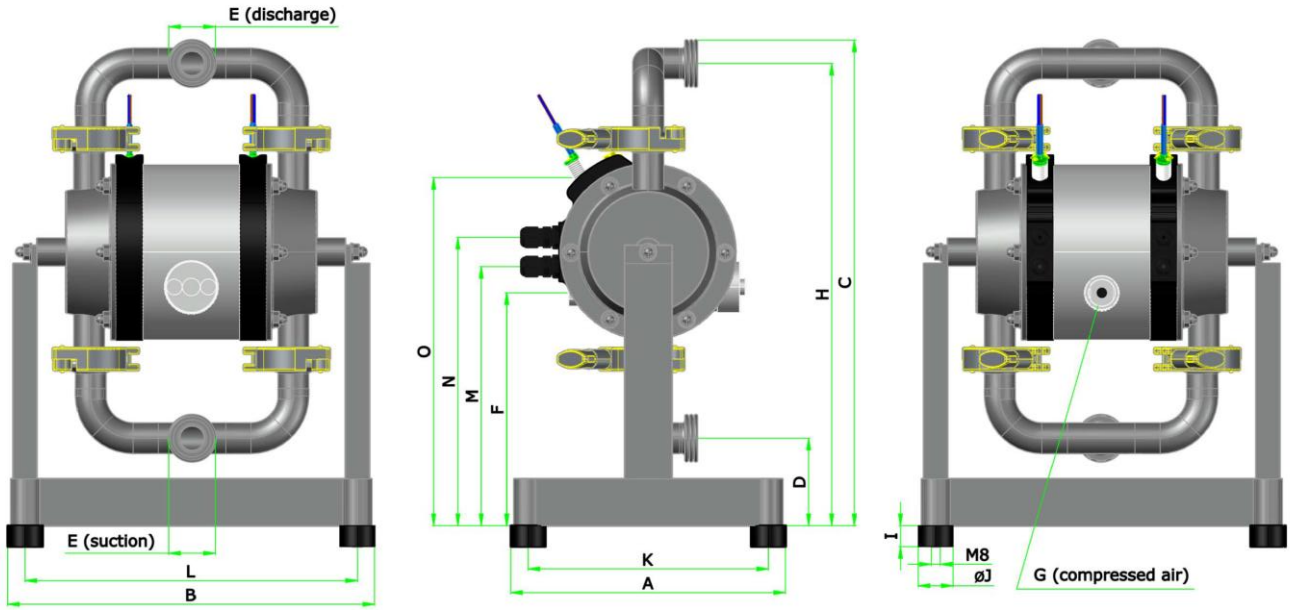
[a] – two-piece stand, as for standard DM 15/30 Hygienic Series Pump execution;

Appearance and dimensions of Hygienic Series Pump with Barrier Chamber System, size: DM 15/30 H..-BC1 (BC2, BC3) and H..-X-BC1 (BC2, BC3) for ATEX



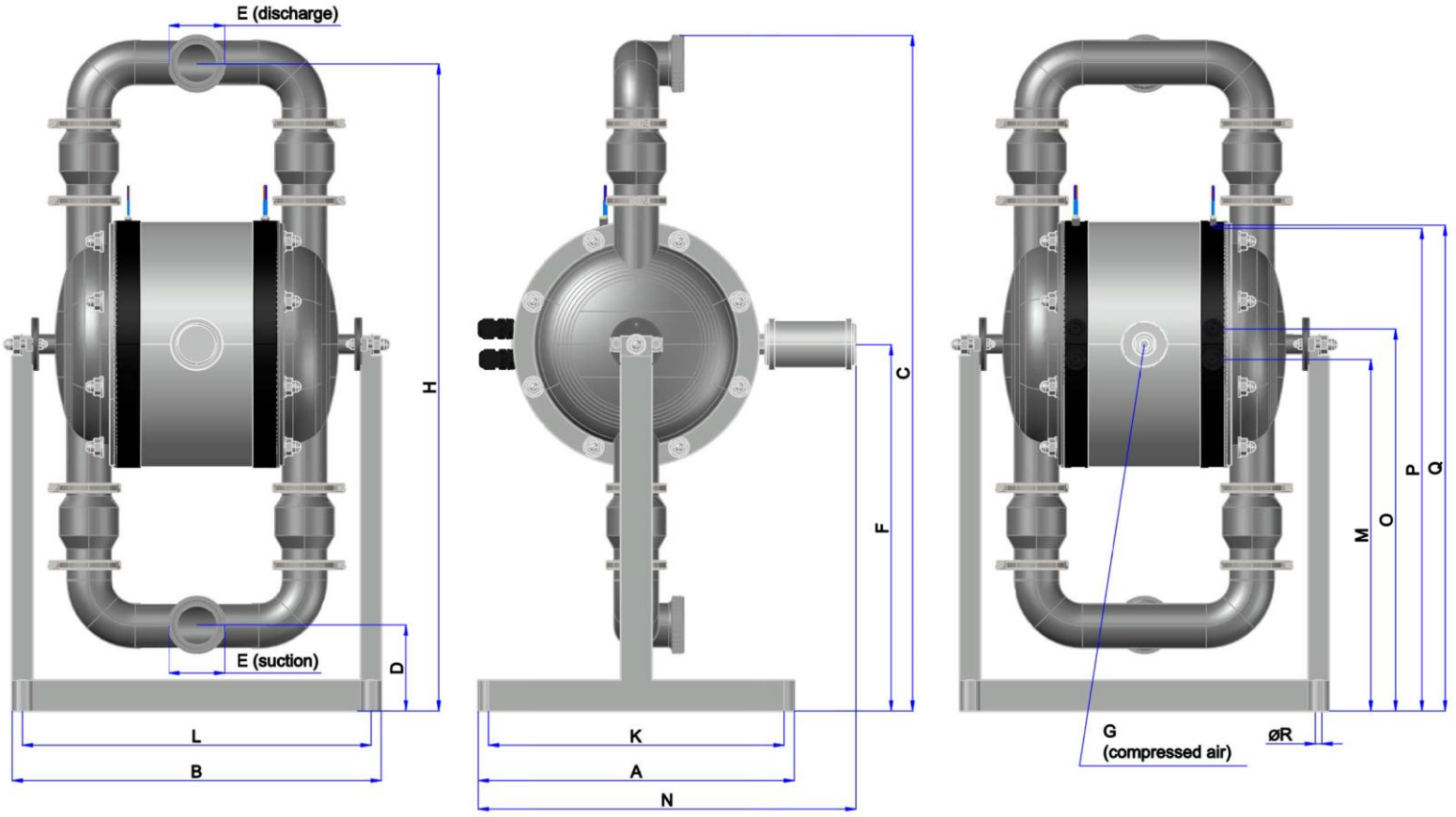
H..-BC H..-X-BC (AISI 316L, electro-polished)	A	B	C max	D	E			F	G	H	I	øJ	K	L	M	N	O
					DIN 11851	Tri-Clamp, DIN 32676	SMS 1145										
DM 15/30	162	208	299	44	as in selected pump execution			162	R ⅛"	282	18	30	116	142	151	173	204

Appearance and dimensions of Hygienic Series Pumps with Barrier Chamber System, sizes: from DM 25/75 to DM 65/565 H..-BC1 (BC2, BC3) and H..-X-BC1 (BC2, BC3) for ATEX



H..-BC H..-X-BC (AISI 316L, electro-polished)	A	B	C max	D	E			F	G	H	I	øJ	K	L	M	N	O
					DIN 11851	Tri-Clamp DIN 32676	SMS 1145										
DM 25/75	241	316	421	76	as in selected pump execution			204	R ¼"	395	18	30	211	286	222	247	298
DM 40/125	261	334	472	68				220	R ¼"	436	18	30	231	304	245	275	344
DM 50/315	358	435	685	102				262	R ½"	646	18	30	328	405	342	367	457
DM 65/565	358	513	893	95				365	R ½"	845	18	30	328	483	452	477	615

Appearance and dimensions of Hygienic Series Pump with Barrier Chamber System, size: DM 80/850 H..-BC1 (BC2, BC3) and H..-X-BC1 (BC2, BC3) for ATEX



H.. and H..-X (AISI 316L, electro-polished)	A	B	C max	D	E			F	G	H	K	L	M	N	O	P	Q	øR
					DIN 11851	Tri-Clamp DIN 32676	SMS 1145											
DM 80/850	620	726	1325	168	as in selected pump execution			721	R ¾"	1270	580	686	690	741	750	947	954	13

16.2. Stroke Counting (Option codes: SC1, SC2, SC3, SC5, SC6)

a) Code SC1, SC2, SC3

An inductive sensor is installed in the central pump housing to count the strokes. The diaphragm's shaft movement is scanned without contact by this sensor – a safe form of monitoring totally independent of external influences and the pump's mode of operation. The issued sensor pulses can be output to existing detectors or to a stroke counter, which can also be supplied on request. When the preset value is reached, the stroke counter outputs a signal which can then be processed further, for instance in order to shut down the pump via a solenoid valve.

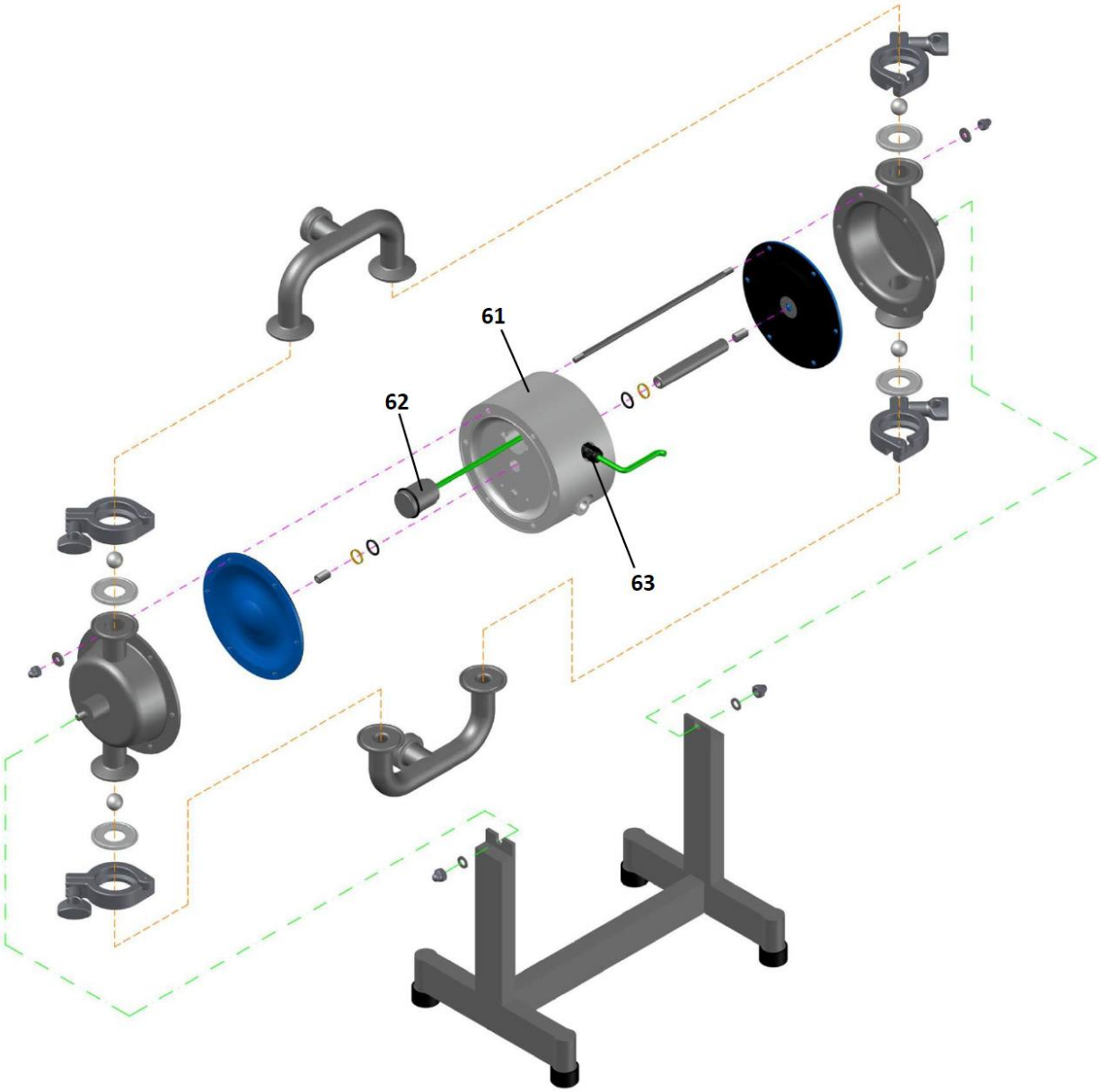
This is available for the pumps starting from DM 25/75 up to DM 80/850 of the Hygienic Series. In smaller Hygienic Series Pump (DM 15/30 size), only pneumatic stroke counting option (SC5 or SC6) is available.

The inductive stroke counting system is available in three variations:
- SC 1 Stroke sensor (NAMUR), also for explosion-proof (ATEX) zone
- SC 2 Stroke counting system complete with sensor and stroke counter
- SC 3 Stroke counting system complete with sensor, stroke counter and controller for explosion-proof zone*

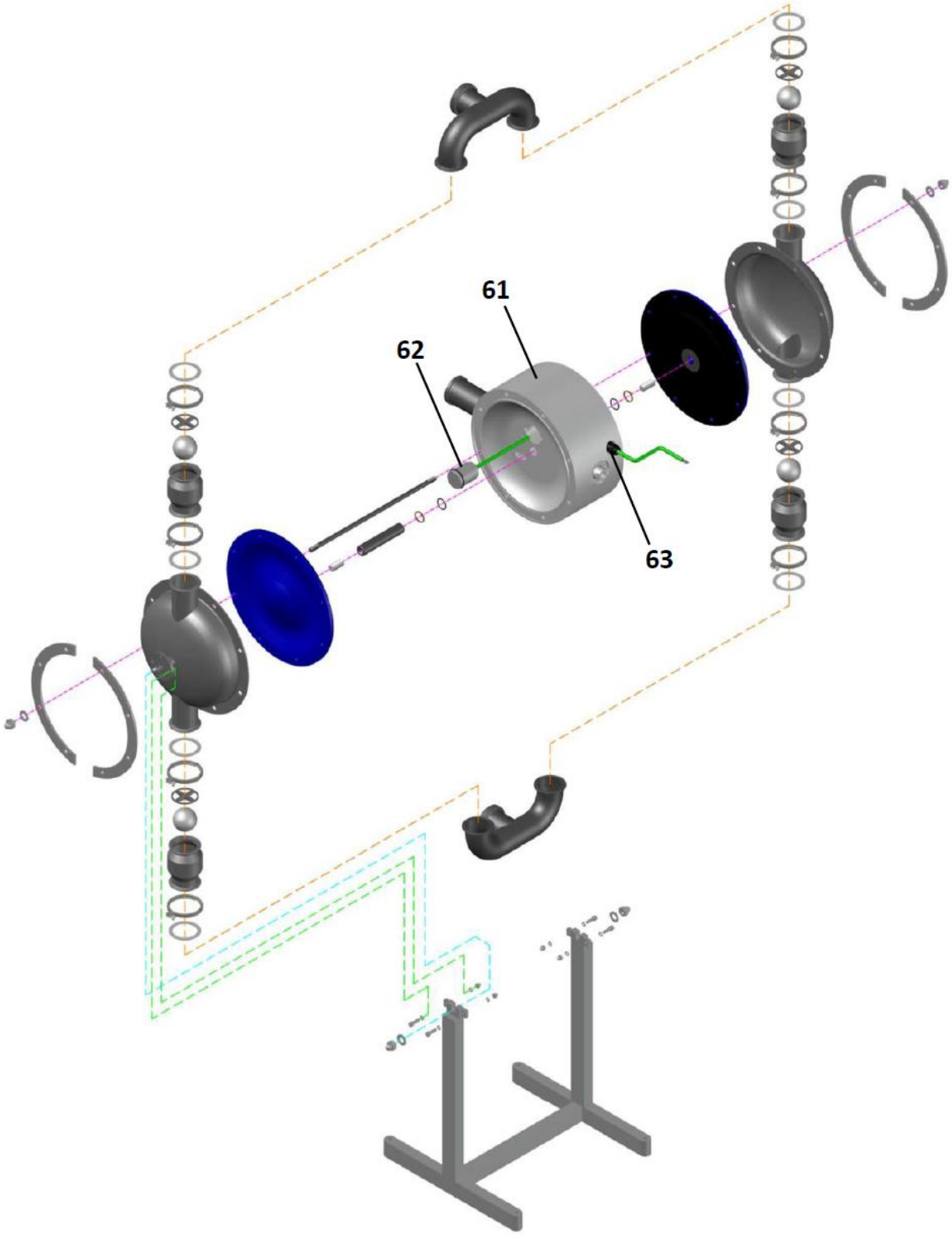
In case only the sensor is included (code SC1), it has to be connected to an existing controller with NAMUR inlet. For applications an explosion-proof device is required for (code SC3) the intrinsically safe controller has to be installed between the sensor and the counter. The wiring diagram and technical data can be found on the electric units themselves. For further details, please refer to the data delivered by the manufacturers of the components. The controllers have to be installed in a suitable cabinet.

**** - When assembling SC3 Option in the explosion-proof zone, stroke counter and controller must be installed in a suitable cabinet (ATEX approved).***

Exploded view, Stroke Counting SC1, SC2, SC3 system for Hygienic Series Pumps from DM 25/75 to DM 65/565



Exploded view, Stroke Counting SC1, SC2, SC3 system for Hygienic Series Pump DM 80/850



Spare part list, Stroke Counting Options: SC1, SC2, SC3 (with inductive sensor)

				Metal Pump size:	DM 25/75	DM 40/125	DM 50/315	DM 65/565	DM 80/850
Code	**Item**	**Quantity**	**Part name**	**Material**	**Part no.**	**Part no.**	**Part no.**	**Part no.**	**Part no.**
SC 1	61.	1	Center housing for sensor	PE	1 15 09 20	1 25 09 20	1 40 09 20	1 50 09 20	1 80 09 20
				PE conductive (for ATEX)	1 15 09 21	1 25 09 21	1 40 09 21	1 50 09 21	1 80 09 21
	62.	1	Stroke sensor	Diverse	9 15 16 00				
	63.	1	Cable gland	Diverse	9 15 367 00				
SC 2			as SC 1, but additionally contains:						
	-	1	Clamp amplifier	Diverse	9 15 18 00				
	-	1	Stroke counter	Diverse	9 15 17 00				
SC 3			as SC 1, but additionally contains:						
	-	1	Level controller	Diverse	9 15 14 00				
	-	1	Stroke counter	Diverse	9 15 17 00				

b) Code SC5, SC6

Differently from the optional equipment codes SC1, SC2 and SC3, strokes of the pump are registered pneumatically on the codes SC5 and SC6. Pressure transmitter registers changes in pressure (due to air valve reciprocating move) within the air chamber behind one of the diaphragms and converts each pneumatic impulse into an electrical signal.

This option is available for all the pumps of Hygienic Series – from DM 15/30 up to DM 80/850 size. However, ATEX Certificate for SC5 and SC6 Options is not available.

The pneumatic stroke counting system is available in two types:

- **SC 5** consist of:
- pressure transmitter 1-10 bar
- quick coupling for pressure transmitter-hose connection
- socket with cable (for pressure transmitter)
- adaptor elbow NPT ⅛”
- hose DN 4/6; 2,5m

- **SC 6** consist of:
- SC 5 plus stroke counter

For assembly, screw the quick-coupling connector into the pressure transmitter and the adaptor elbow into the additional air connection of the pump, located on the central housing (it is possible that the adaptors are already installed). The position of the additional air inlet varies depending in the pump type and the pump size. Link up both adaptor and quick-coupling with the hose. Connect the socket to the electrical connection plug of the pressure transmitter and the socket cable to existing registering devices (Option **SC5**) resp. to the enclosed stroke counter (Option **SC6**). Technical data, connection schemes and further details can be found in the technical documentation delivered by the manufacturers of the pressure transmitter and the stroke counter.

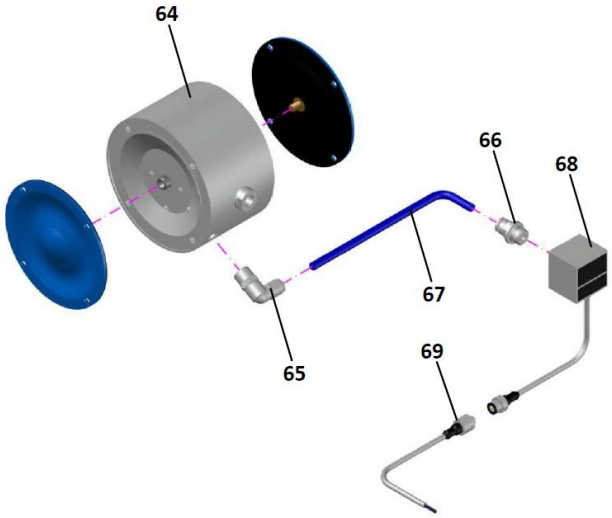
⚠ CAUTION

! The pneumatic stroke counting system requires a minimum air pressure of 1.5 bar for optimal function.

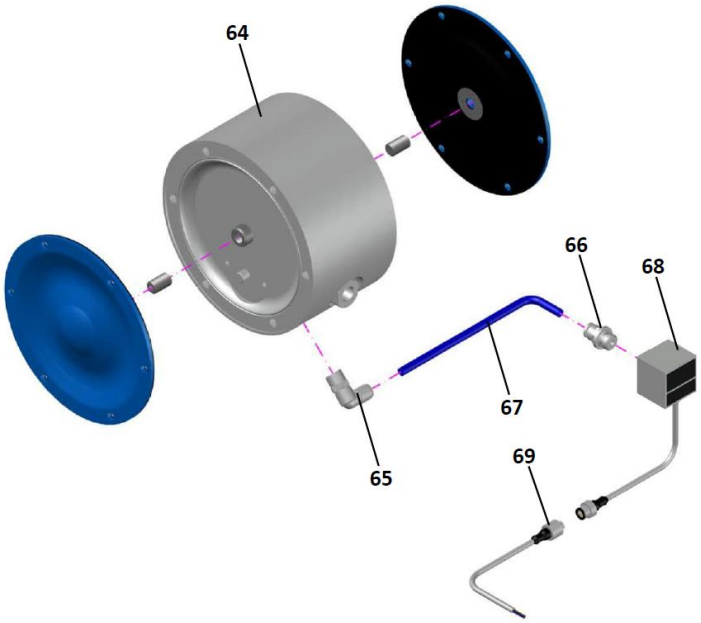
The air inlet for the pneumatic stroke counting system must not be confused with the actual air inlet of the pump. Therefore, you will find some advises adapted to the pump type and the pump size.

Exploded view, Stroke Counting SC5, SC6 Option, Hygienic Series

DM 15/30 H.. Pump with SC5 Option



DM 25/75, …, DM 80/850 H.. Pumps with SC5 Option



Spare part list, Stroke Counting Options: SC5, SC6 (pneumatic electronic sensor)

Pump size:					DM 15/30	DM 25/75	DM 40/125	DM 50/315	DM 65/565	DM 80/850
Code	Item	Quantity	Part name	Material	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
SC 5	64.	1	Center housing with additional air connection ⅛”	PE	1 10 109 20	1 15 109 20	1 25 109 20	1 40 109 20	1 50 109 20	1 80 109 20
				PE conductive (ATEX)	1 10 109 21	1 15 109 21	1 25 109 21	1 40 109 21	1 50 109 21	1 80 109 21
	65.	1	Adaptor elbow	Diverse	1 08 092 28					
	66.	1	Adaptor straight	Diverse	1 08 192 28					
	67.	1	Hose 2,5 m	PUR	1 08 292 20					
	68.	1	Pressure transmitter	Diverse	9 08 28 00					
	69.	1	Socket with cable 2,5m	Diverse	1 08 392 00					
SC 6			as SC5, but additionally contains:							
	-	1	Stroke counter	Diverse	9 15 17 00					

16.3. Diaphragm Monitoring (Option codes: DM1, DM2)

Although DELLMECO diaphragms with integrated metal core are designed for an optimum service life, diaphragm still remains a wear part. If it breaks, liquid can leak into the center housing and possibly emerge through the muffler. This can be prevented simply and effectively with the DELLMECO diaphragm monitoring system (Options: **DM1** or **DM2**).

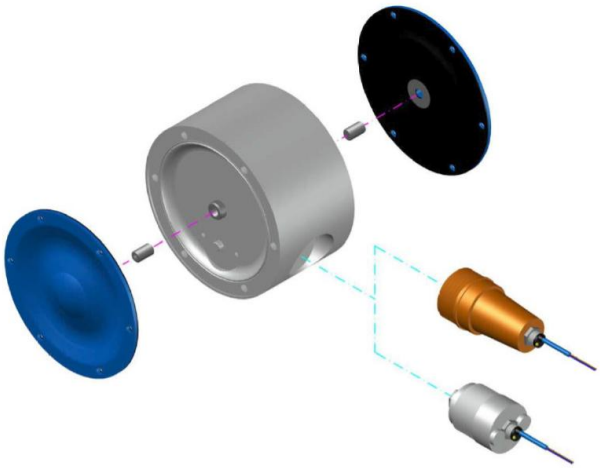
A capacitive diaphragm sensor with fixing [**70**] is mounted in the specially prepared exhaust muffler [**71**]. This sensor registers any liquid approaching to it, no matter whether the liquid is conductive or not. Hence, fast reaction to a damage of the diaphragm becomes possible (sensor in contact with liquid sends a signal to the controller). However, in case of humid surrounding area a false alert may occur despite operating the pump with dried compressed air.

The diaphragm monitoring system is available in two variations:
- **DM1** Diaphragm sensor (NAMUR), also for explosion-proof area
- **DM2** Diaphragm monitoring system complete with sensor and controller

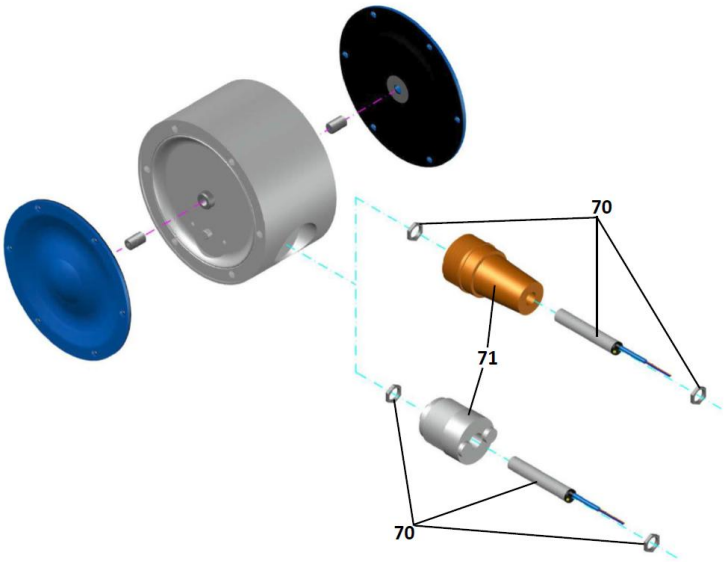
The diaphragm sensor can either be connected to an existing controller with NAMUR inlet (Option **DM1**) or to the controller included (Option **DM2**). The wiring diagram and technical data can be found on the controller itself. For further details, please refer to the data delivered by the manufacturers of the components. The controllers have to be installed in a suitable cabinet.

Exploded view, Diaphragm Monitoring DM1, DM2 Option – Hygienic Series pumps from DM 15/30 to DM 65/565:

Muffler with DM1 Option ready to install

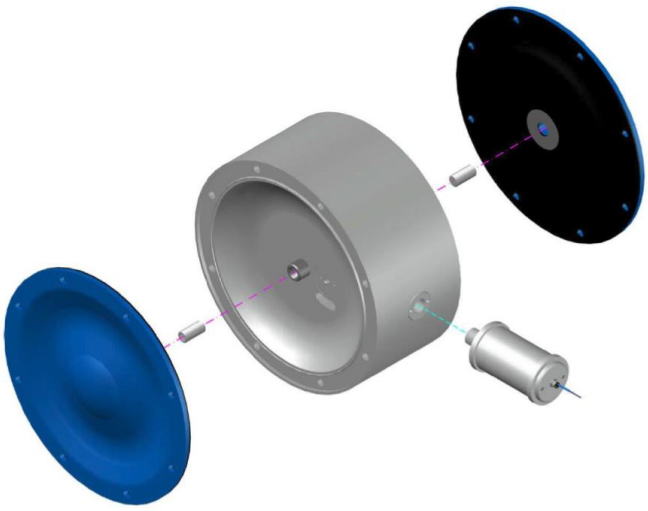


DM1 Option before assembling on the muffler

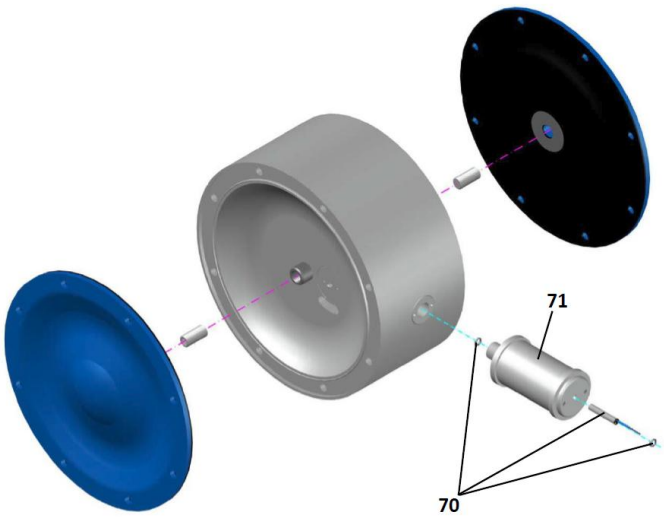


Exploded view, Diaphragm Monitoring DM1, DM2 Option – Hygienic Series pump DM 80/850 only:

Muffler with DM1 Option ready to install



DM1 Option before assembling on the muffler



Spare part list, diaphragm monitoring (DM1, DM2)

Pump size					15/30 H.. H..-X	25/75 H.. H..-X	40/125 H.. H..-X	50/315 H.. H..-X	65/565 H.. H..-X	80/850 H.. H..-X
Code	Item	Q-ty	Part name	Material	Part no.					
DM1	70.	1	Diaphragm sensor, NAMUR	Diverse	9 15 19 00					
	71.	1	Exhaust muffler for DM Option (with new thread)	PE porous	1 08 399 35	1 15 399 35		1 40 399 35	1 50 399 35	1 80 99 00
				Bronze	1 08 399 86	1 15 399 86		1 40 399 86	1 50 399 86	
DM2			as DM1, but additionally contains:							
	-	1	Level controller	diverse	9 15 14 00					

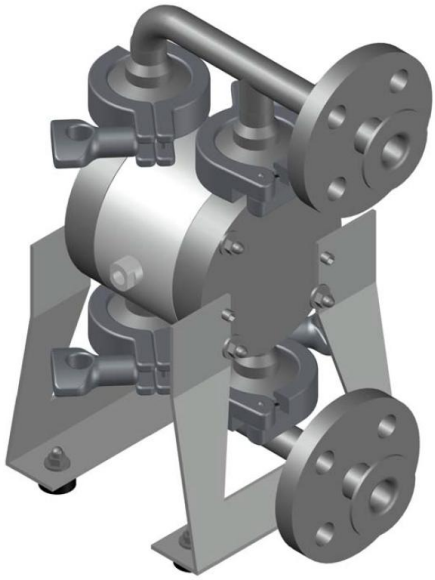
16.4. Flange Connections (Option codes: F4-I, F7-I, F8-I, F9-I, F10-I, F4-W, F7-W, F8-W, F9-W, F10-W)

This version offers the possibility to use flange connectors according to: **JIS B2220 10K** (options: **F4-I, F4-W**), **PN10 DIN 2576** (options: **F7-I, F7-W**), **ANSI 150 RF-SO** (options: **F8-I, F8-W**), **PN10/16 DIN 2277/2278** (options: **F9-I, F9-W**), or **EN1092-1:2018** (**F10-I, F10-W**).

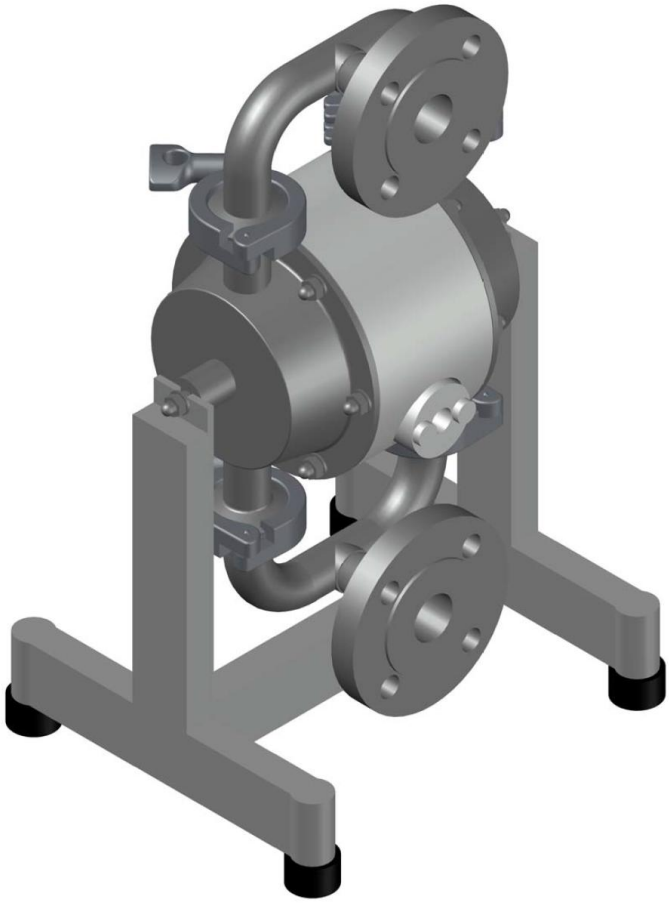
In the case of Hygienic Pump with flange option, AISI 316L pipe is welded to in-/outlet connection, while the collar made from AISI 316 is still movable (but the complete flanges are undetachable). Codification is: **F4-I**, **F7-I**, **F8-W**, **F9-I** and **F10-I**.

For the options: **F4-W**, **F7-W**, **F8-W**, **F9-W** and **F10-W**, pipe and flange collar are welded together (flange collars are non-movable).

More details on the below drawings:



F4-I, F7-I, F8-I, F9-I, F10-I
(welded AISI 316L flange pipes with movable collars) for DM 15/30 Hygienic Series Pump



F4-W, F7-W, F8-W, F9-W, F10-W
(welded AISI 316L flange pipes with non-movable collar) for DM 25/75 Hygienic Series Pump

NOTE: All flange connections have to be quoted individually – for more information, please contact Office Department (at: office@dellmeco.com).

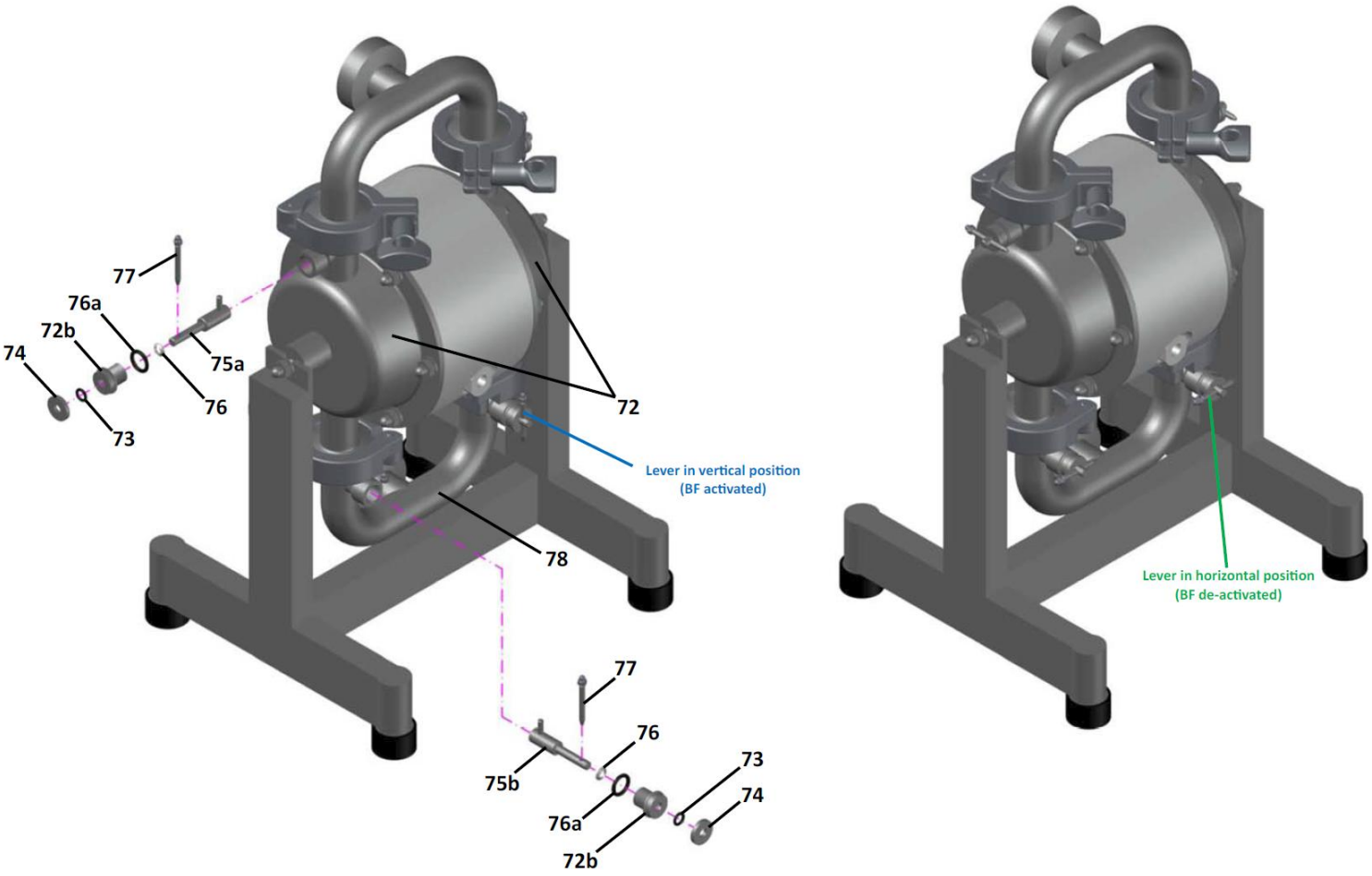
Spare part list, flange connection options

Pump size:					DM 15/30	DM 25/75	DM 40/125	DM 50/315	DM 65/565	DM 80/850
Material execution:					H.. H..-X	H.. H..-X	H.. H..-X	H.. H..-X	H.. H..-X	H.. H..-X
Code	Item	Q-ty	Part name	Material	Part no.					
F4-I	-	1	JIS 10K flange, movable collar, inlet connection	AISI 316L	4 15 52I 53	4 25 52I 53	4 40 52I 53	4 50 52I 53	4 65 52I 53	4 80 52I 53
		1	JIS 10K flange, movable collar, outlet connection		4 15 52O 53	4 25 52O 53	4 40 52O 53	4 50 52O 53	4 65 52O 53	4 80 52O 53
F7-I	-	1	PN10 DIN2576 flange, movable collar, inlet connection	AISI 316L	4 15 22I 53	4 25 22I 53	4 40 22I 53	4 50 22I 53	4 65 22I 53	4 80 22I 53
		1	PN10 DIN2576 flange, movable collar, outlet connection		4 15 22O 53	4 25 22O 53	4 40 22O 53	4 50 22O 53	4 65 22O 53	4 80 22O 53
F8-I	-	1	ANSI 150 RF flange, movable collar, inlet connection	AISI 316L	4 15 32I 53	4 25 32I 53	4 40 32I 53	4 50 32I 53	4 65 32I 53	4 80 32I 53
		1	ANSI 150 RF flange, movable collar, outlet connection		4 15 32O 53	4 25 32O 53	4 40 32O 53	4 50 32O 53	4 65 32O 53	4 80 32O 53
F9-I	-	1	PN16 DIN 2278 flange, movable collar, inlet connection	AISI 316L	4 15 42I 53	4 25 42I 53	4 40 42I 53	4 50 42I 53	4 50 42I 53	4 80 42I 53
		1	PN16 DIN 2278 flange, movable collar, outlet connection		4 15 42O 53	4 25 42O 53	4 40 42O 53	4 50 42O 53	4 50 42O 53	4 80 42O 53
F10-I	-	1	EN 1092-1 flange, movable collar, inlet connection	AISI 316L	4 15 42I 53	4 25 42I 53	4 40 42I 53	4 50 42I 53	4 50 42I 53	4 80 42I 53
		1	EN 1092-1 flange, movable collar, outlet connection		4 15 42O 53	4 25 42O 53	4 40 42O 53	4 50 42O 53	4 50 42O 53	4 80 42O 53
F4-W	-	1	JIS 10K flange, fixed collar, inlet connection	AISI 316L	4 15 52W 53	4 25 52W 53	4 40 52W 53	4 50 52W 53	4 65 52W 53	4 80 52W 53
		1	JIS 10K flange, fixed collar, outlet connection		4 15 52Y 53	4 25 52Y 53	4 40 52Y 53	4 50 52Y 53	4 65 52Y 53	4 80 52Y 53
F7-W	-	1	PN10 DIN2576 flange, fixed collar, inlet connection	AISI 316L	4 15 22W 53	4 25 22W 53	4 40 22W 53	4 50 22W 53	4 65 22W 53	4 80 22W 53
		1	PN10 DIN2576 flange, fixed collar, outlet connection		4 15 22Y 53	4 25 22Y 53	4 40 22Y 53	4 50 22Y 53	4 65 22O 53	4 80 22Y 53
F8-W	-	1	ANSI 150 RF flange, fixed collar, inlet connection	AISI 316L	4 15 32W 53	4 25 32W 53	4 40 32W 53	4 50 32W 53	4 65 32W 53	4 80 32W 53
		1	ANSI 150 RF flange, fixed collar, outlet connection		4 15 32Y 53	4 25 32Y 53	4 40 32Y 53	4 50 32Y 53	4 65 32Y 53	4 80 32Y 53
F9-W	-	1	PN16 DIN 2278 flange, fixed collar, inlet connection	AISI 316L	4 15 42W 53	4 25 42W 53	4 40 42W 53	4 50 42W 53	4 50 42W 53	4 80 42W 53
		1	PN16 DIN 2278 flange, fixed collar, outlet connection		4 15 42Y 53	4 25 42Y 53	4 40 42Y 53	4 50 42O 53	4 50 42Y 53	4 80 42Y 53
F10-W	-	1	EN 1092-1 flange, fixed collar, inlet connection	AISI 316L	4 15 42W 53	4 25 42W 53	4 40 42W 53	4 50 42W 53	4 50 42W 53	4 80 42W 53
		1	EN 1092-1 flange, fixed collar, outlet connection		4 15 42Y 53	4 25 42Y 53	4 40 42Y 53	4 50 42Y 53	4 50 42O 53	4 80 42Y 53

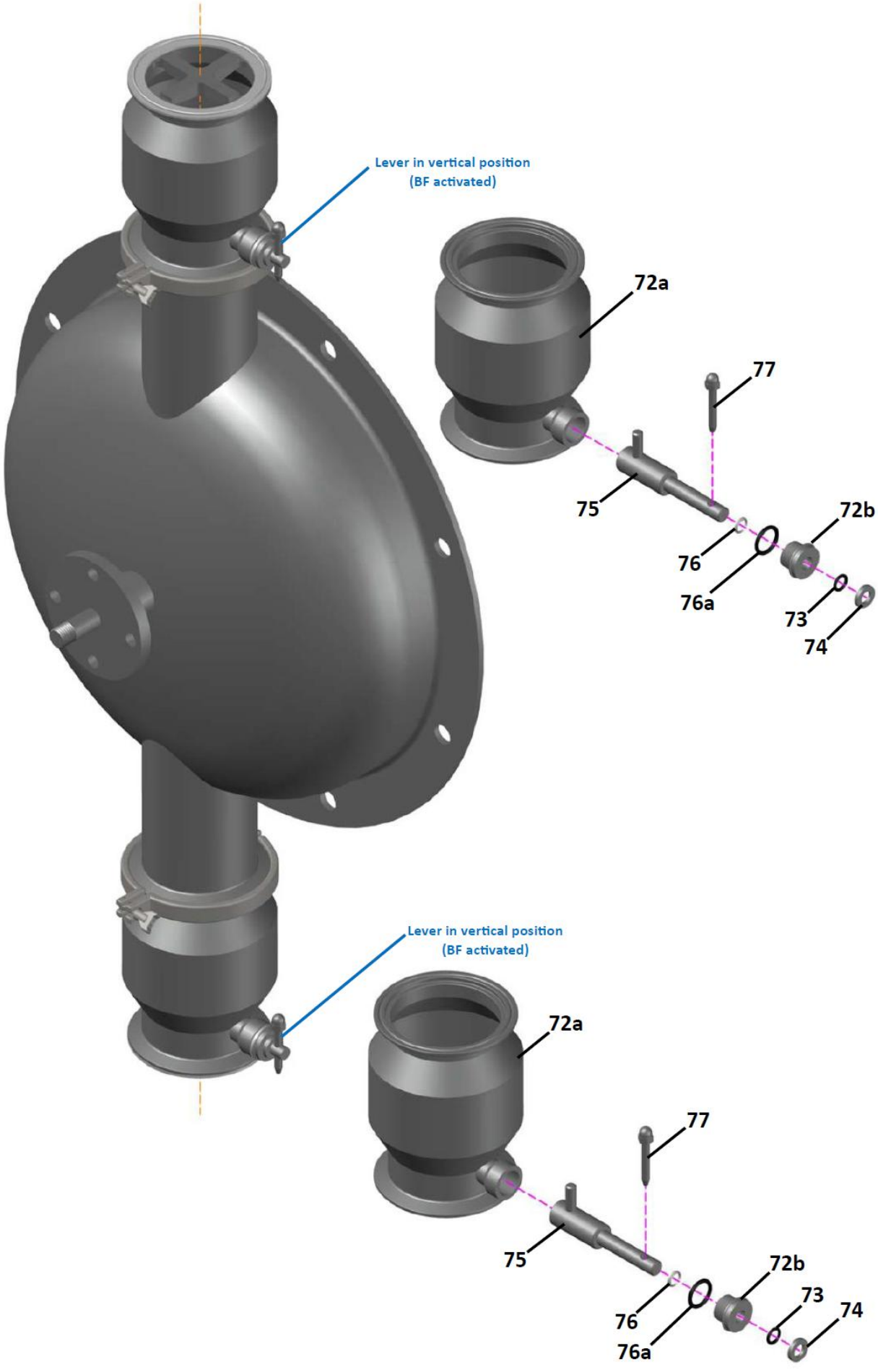
16.5 Manual Back Flushing System (Option codes: BF1, BF3)

A pump equipped with the back flushing system (ball lifting system) can be emptied along with an inclining discharge line while being installed within the plant. It consists of a ball valve lifting lever (in side housings and inlet connections on both sides of pump which can be activated by manual valves (code: **BF1** – EPDM O-rings, **BF3** – FKM O-rings).

Manual Back Flushing System (BF1, BF3) – from DM 25/75 to DM 65/565 Hygienic Pumps



Manual Back Flushing System (BF1, BF3) – for DM 80/850 Hygienic Pump



Manual Back-Flushing System is de-activated, when all blocking pins [**77**] are in horizontal position (leaning to the left or right) – each ball valve works in a standard way (alternately opening and closing flow through the valve seat). To activate the manual draining system, turn all the blocking pins 90° to vertical position – each ball lifter pin [**75a, 75b, 75**] does not allow ball valve to close the valve seat, so the liquid flows back to suction hose while the pump is still working (it should be kept in operation meanwhile). When the outlet side is empty, you can slow down the pump and finally stop it.

NOTE: All four lever pins must be activated in order to perform emptying of the pump in the right way.

Spare part list, back flushing system

Pump size:					DM 25/75 H.. H..-X	DM 40/125 H.. H..-X	DM 50/315 H.. H..-X	DM 65/565 H.. H..-X	DM 80/850 H.. H..-X
Code:	**Item**	**Q-ty**	**Part name**	**Material**	**Part no.**	**Part no.**	**Part no.**	**Part no.**	**Part no.**
BF…	72.	2	Pump housing left/right for BF1, BF3 Option	AISI 316L	4 25 001 53	4 40 001 53	4 50 001 53	4 65 001 53	
	72a.	2	Ball valve stopper for BF1, BF3 Option						4 80 54B 53
	78.	1	DIN 11851 inlet connection for BF1, BF3 Option	AISI 316L	4 25 536 53	4 40 536 53	4 50 536 53	4 65 536 53	
			SMS inlet connection for BF1, BF3 Option		4 25 636 53	4 40 636 53	4 50 636 53	4 65 636 53	
			Tri-Clamp inlet connection for BF1, BF3 Option		4 25 736 53	4 40 736 53	4 50 736 53	4 65 636 53	
BF1 – complete set of spare parts for 1 pump (AISI 316L), consists of:									
BF1	72b.	4	Screw cap	AISI 316L	4 25 957 53	4 40 957 53	4 50 957 53	4 65 957 53	4 80 957 53
	73.	4	BF washer O-ring	EPDM	4 25 372 08	4 40 372 08	4 50 372 08	4 65 372 08	4 80 372 08
	74.	4	Back-Flushing washer	AISI 316L	4 25 157 53	4 40 157 53	4 50 157 53	4 65 157 53	4 80 157 53
	75.	4	Ball lifter upper/lower lever	AISI 316L					4 80 657 53
	75a.	2	Ball lifter upper lever	AISI 316L	4 25 657 52	4 40 657 52	4 50 657 52	4 65 657 52	
	75b.	2	Ball lifter lower lever	AISI 316L	4 25 757 52	4 40 757 52	4 50 757 52	4 65 757 52	
	76.	4	Ball lifter seal, internal	PTFE	4 25 357 23	4 40 357 23	4 50 357 23	4 65 357 23	4 80 357 23
	76a.	4	Screw cap O-ring	EPDM	4 25 857 08	4 40 857 08	4 50 857 08	4 65 857 08	4 80 857 08
	77.	4	Blocking pin, complete	AISI 316L	4 25 457 52	4 40 457 52	4 50 457 52	4 65 457 52	4 80 457 52
BF3 – complete set of spare parts for 1 pump (AISI 316L), like BF1, but:									
BF3	76a.	4	Screw cap O-ring	FKM (Viton)	4 25 857 09	4 40 857 09	4 50 857 09	4 65 857 09	4 80 857 09

16.6. Compressed air preparation set (Option codes: AF1, AF2, AF3)

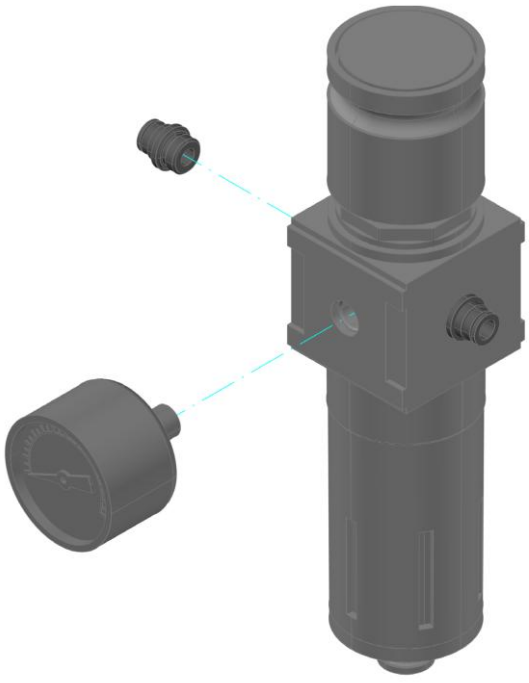
Compressed air delivered to the pump has to be dry, free from oil and humid (air valve installed inside the central housing do not require lubrification – it works completely oil-free). If you are not sure about the compressed air purity level or the available air is not of good quality, you can install the air preparation set, which consists of:

- Air filter-regulator unit with valve,
- Pressure gauge,
- Hose connectors (quick couplings).

Depending on the size of the pump, there are two available AF Options:

- AF1 – for the pumps from DM 25/75 up to DM 40/125 size;
- AF2 – for the pumps from DM 50/315 up to DM 65/565 size;
- AF3 – for the pump DM 80/850 only.

AF Option is also available in explosion-proof execution (AF1X or AF2X, with ATEX Certificate) – for more information please contact our Sales Department at office@dellmeco.com.



16.7. Drum Pump (Option code: D)

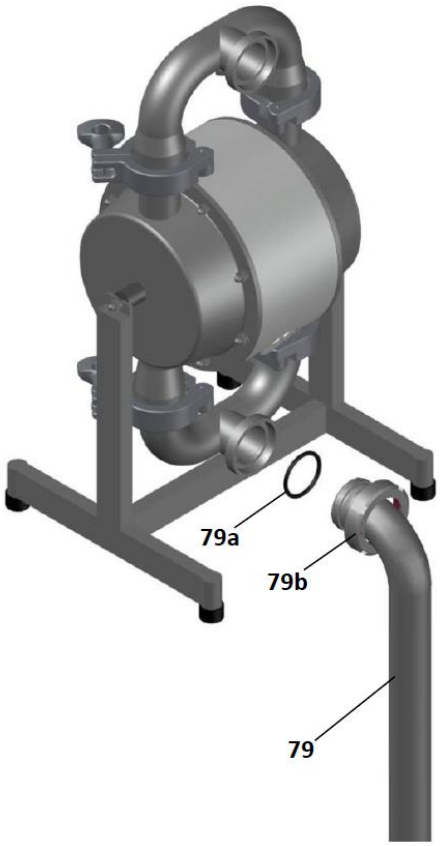
Hygienic Pumps from DM 15/30 up to 40/125 size are also available as adapted to empty drums and IBC containers.

As presented on the below pictures, additional equipment consists of:

- Drum pipe [79] integrated with bend and liner or TC ferrule (depending on the pump's connection type), seal [80] and nut [81] or clamp [82].

Appearance of the Hygienic Pump with Drum Option

Drum Option for DIN 11851 and SMS



Drum Option for Tri-Clamp

Spare part list for the Hygienic Pump with Drum Option

Pump size:						DM 15/30	DM 25/75	DM 40/125
Code	Item	Quantity	Part name		Material	Part No.		
D	79.	1	Drum pipe	DIN 11851	AISI 316L	4 15 96D 53	4 25 96D 53	4 40 96D 53
				SMS			4 25 96S 53	4 40 96S 53
				Tri-Clamp		4 15 96T 53	4 25 96T 53	4 40 96T 53
	79a.	1	Sealing DIN 11851		EPDM	4 15 70D 08	4 25 70D 08	4 40 70D 08
					NBR	4 15 70D 10	4 25 70D 10	4 40 70D 10
					PTFE	4 15 70D 23	4 25 70D 23	4 40 70D 23
			Sealing SMS		EPDM		4 25 70S 08	4 40 70S 08
					NBR		4 25 70S 10	4 40 70S 10
					PTFE		4 25 70S 23	4 40 70S 23
			Sealing Tri-Clamp		EPDM	4 15 70T 08	4 25 70T 08	4 40 70T 08
					NBR	4 15 70D 10	4 25 70T 10	4 40 70T 10
					PTFE	4 15 70T 23	4 25 70T 23	4 40 70T 23
	79b.	1	Nut	DIN 11851	AISI 304	4 15 36D 50	4 25 36D 50	4 40 36D 50
				SMS			4 25 36S 50	4 40 36S 50
	79c.	1	Clamp (TC)			4 15 36 50	4 25 36 50	4 25 36 50

The standard length of drum pipe is 1000 mm (measured from inlet ferrule horizontal axis to the bottom end of AISI 316L pipe), but specific order can be made to fit any container size (range: 800-1200 mm). Each Hygienic Pump with "D" Option is equipped with AISI 316L pipe.

In the case of other pipe material execution required, please contact us at: office@dellmeco.com.

16.8 High Pressure System (Option codes: HPM, HPS)

DELLMECO Hygienic Series diaphragm pumps can be fitted with High Pressure option. It is a very compact unit that can be mounted directly to the filter press. It has been designed for charging filter presses with chemical wastes and special sludge. An extern pressure booster doubles the delivery pressure.

Filter presses with DELLMECO HP pump

Automatic adaptation

When slurry is transferred to a chamber filter press, first the chambers get filled while the pressure tends to zero. Under the increasing filling-level the solids assemble at the filter cloths. This requires a pressure that continuously rises with the increasing content of solids. Under a constant flow quantity the pressure would rise extremely fast.

The drive of the HP pump by compressed air causes a diminution of the flow quantity according to the increasing counter-pressure in the filter press. This produces a soft filtration curve, automatically self-regulating according to the filling level of the filter press. This is independent from the properties of the slurry. No pressure tank nor pressure transmitter nor speed control are required. The complete HP pump works without electric energy.

End of filtration process

When the filter press is filled with the solids so far that no more slurry can be taken up, the pressing period is terminated. The air operation of the DELLMECO pumps then reduces the flow rate to zero while the outlet pressure holds the required level compressing the filter cake. Excellent results in drying are obtained. At the end of the pressing period the pump simply stops.

Pressure adjustment

The required pressure in the filter press is comfortably adjusted by the height of the air pressure supplying the charging station. For a required pressure of 12 bar the HP pump has to be supplied with 6 bar when the pump with a pressure transmission of 1:2 is applied. In the case that higher pressures are necessary or there is only a lower air pressure available, the HP pump with 1:4 transmission can be applied.

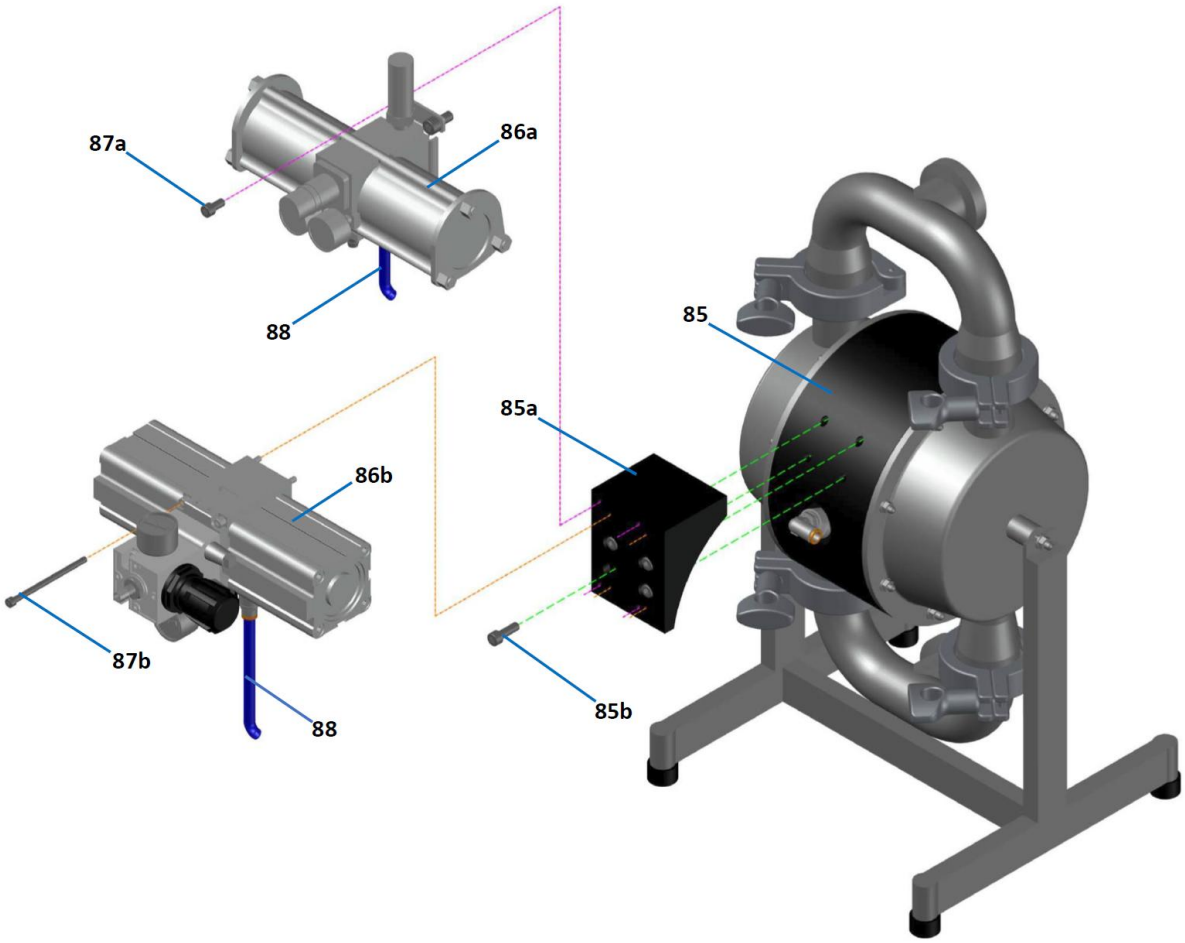
Low air consumption

The charging stations needs the maximum air quantity only during the filling period. The more the press is filled, the more slowly the pump works. So the air consumption slowly reaches zero during progressing filtration.

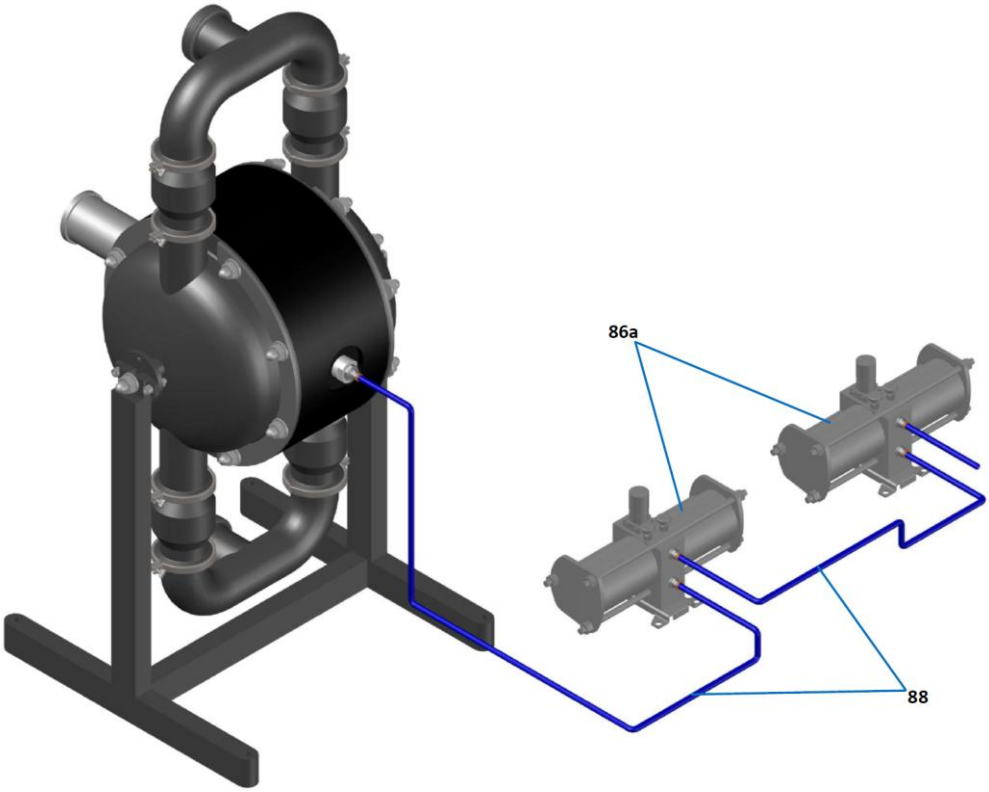
There are two types of boosters available:

1) High Pressure **HPM** Option – with Metalwork booster (Metalwork booster applicable for ATEX EEx II 2GD)
2) High Pressure **HPS** Option – with SMC booster (version with ATEX EEx II 3GD – available only for demand).

Hygienic Series Pumps with HPM or HPS Option – from DM 25/75 to DM 65/565 Pump sizes



Hygienic Series 3” Pump (DM 80/850 H..) with HPS Option (double SMC booster only!!!)

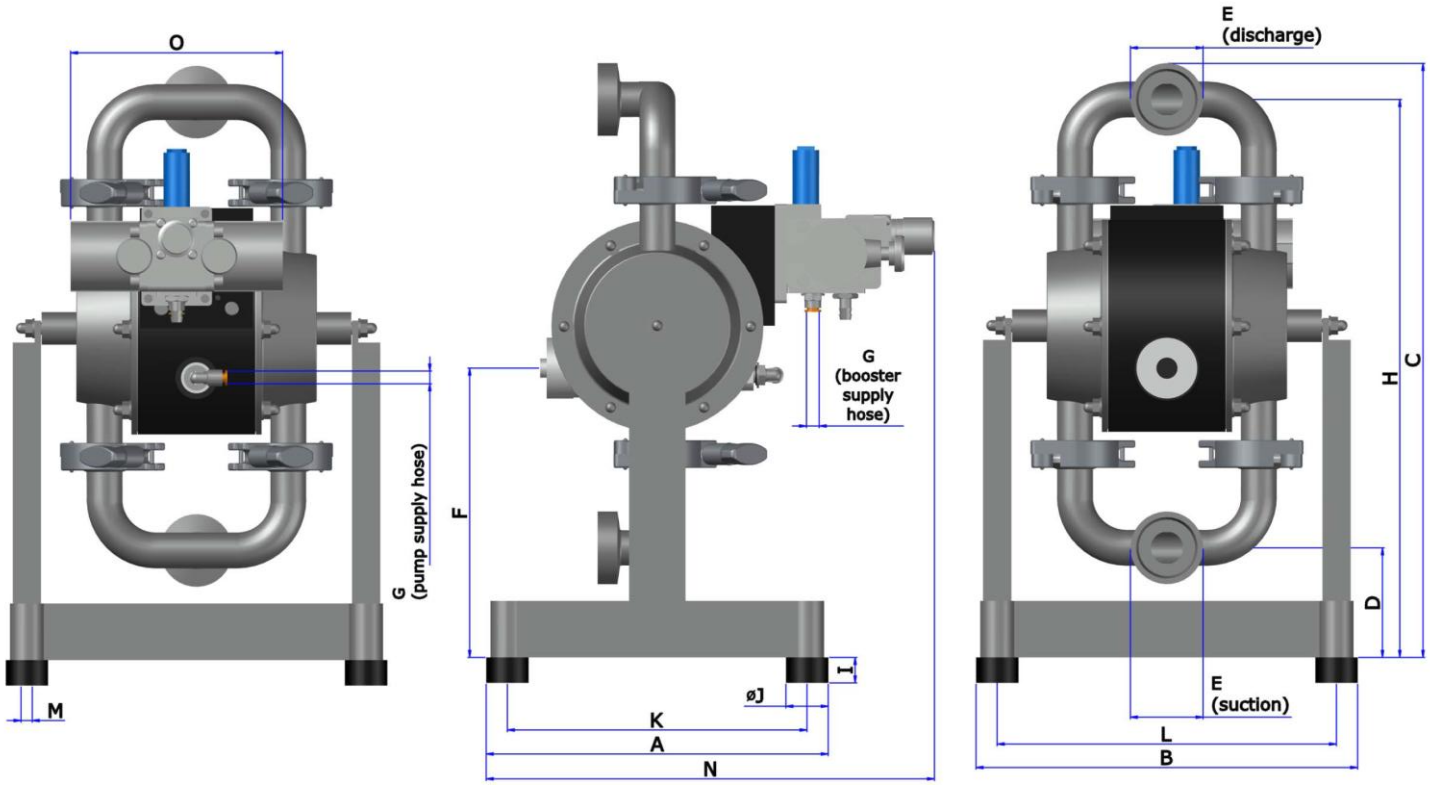


Spare part list, Hygienic Series Pumps with High Pressure Option

				Pump size	DM 25/75	DM 40/125	DM 50/315	DM 65/565	DM 80/850
Code	Item	Pcs.	Description	Material	Part No.	Part No.	Part No.	Part No.	Part No.
HP	85.	1	Central housing(*) for HP Option	PE conductive	1 15 210 21	1 25 210 00(**)	1 40 210 00(**)	1 50 210 00(**)	
	85a.	1	Booster mounting adapter	PE conductive	3 20 364 21	3 25 364 21	3 40 364 21	3 50 364 21	
	85b.	1	Adapter mounting bolts, set	AISI 304	3 20 442 50	3 25 442 50	3 40 442 50	3 50 442 50	
	86a.	1 / 2(2)	Air pressure booster HPS, complete (with manometers, couplings)	Diverse	9 15 64 00	9 25 64 00	9 25 64 00	9 50 64 00	9 50 64 00(2)
	86b.	1	Air pressure booster HPM, complete (with manometers, couplings)	Diverse	9 15 964 00	9 15 964 00	9 40 964 00	9 40 964 00	
	87a.	1	SMC booster mounting set	AISI 304	9 20 S242 50	9 25 S242 50	9 25 S242 50	9 50 S242 50	
	87b.	1	Metalwork booster mounting set	AISI 304	9 20 M242 50	9 25 M242 50	9 40 M242 50	9 50 M242 50	
	88.	1	Air supply hose with connections(***)	Diverse	3 20 592 00	3 25 592 00	3 40 592 00	3 50 592 00	3 80 592 00

(*) – central housing material for HP Option is always PE conductive (both for non-ATEX and ATEX versions)
(**) – central housing with Recoil inserts for adapter mounting bolts
(***) – while placing an order please specify the booster type (HPM – Metalwork or HPS- SMC)

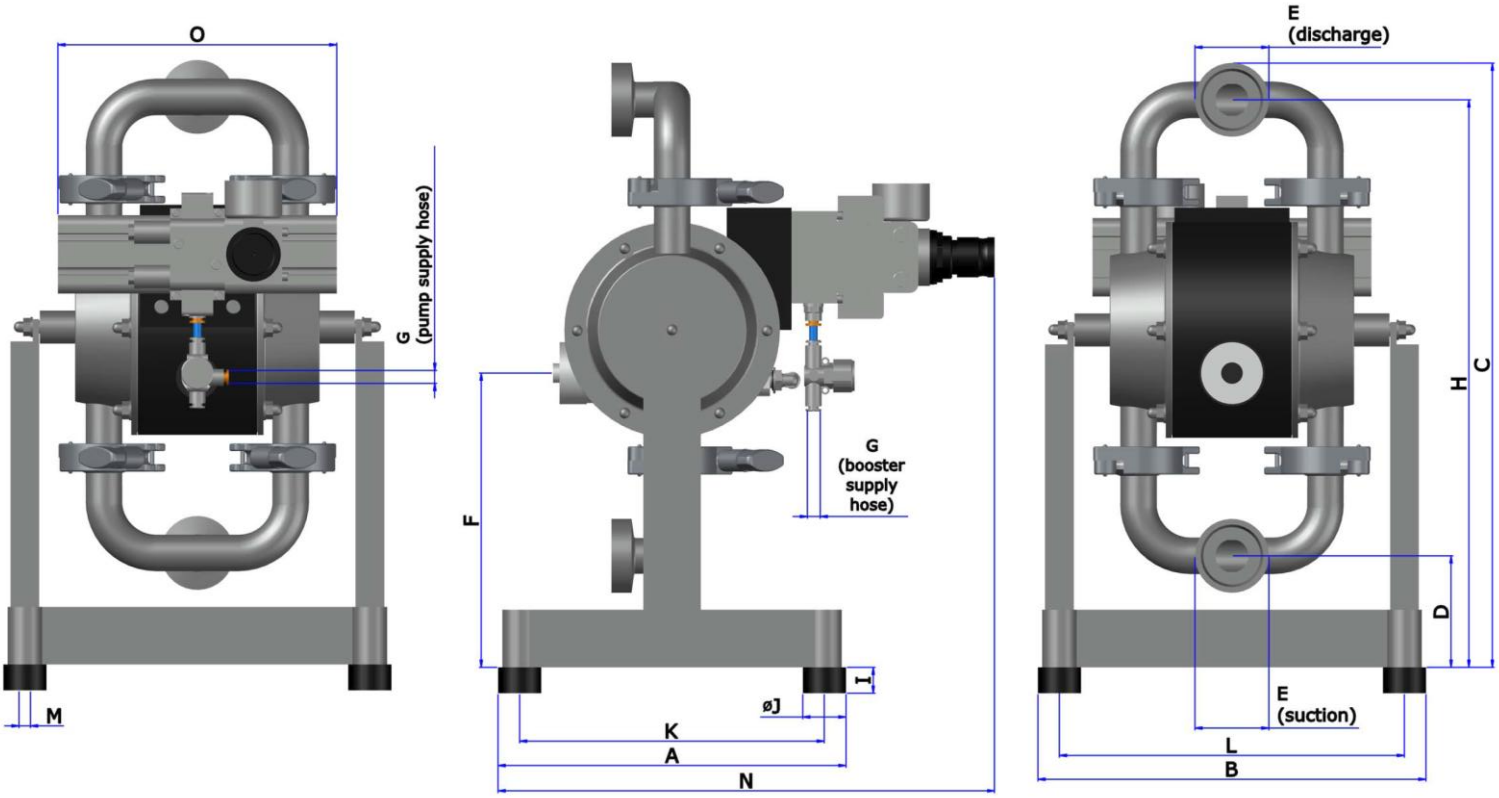
Appearance and dimensions of Hygienic Pump with HPS option (without ATEX)



Appearance and dimensions of Hygienic Series Pumps with HPS Option

Pump size	A	B	C max	D	E			F	G	H	I	øJ	K	L	M	N	O
DM 25/75 H-HPS	242	270	421	78	Rd 52x1/6" (DIN 11851)	Rd 40x1/6" (SMS 1145)	Ø50.5 (Tri-Clamp)	204	R ¼"	395	18	30	212	240	M8	317	150
DM 40/125 …-HPS	261	286	472	65	Rd 65x1/6" (DIN 11851)	Rd 60x1/6" (SMS 1145)	Ø50.5 (Tri-Clamp)	222	R ¼"	438	18	30	231	256	M8	415	300
DM 50/315 …HPS	358	387	685	102	Rd 78x1/6" (DIN 11851)	Rd 70x1/6" (SMS 1145)	Ø64 (Tri-Clamp)	260	R ½"	646	18	30	328	357	M8	500	300
DM 65/565 …-HPS	358	465	893	96	Rd 95x1/6" (DIN 11851)	Rd 85x1/6" (SMS 1145)	Ø91 (Tri-Clamp)	365	R ½"	845	18	30	328	435	M8	585	404

Appearance and dimensions of Hygienic Pump with HPM option (with ATEX)

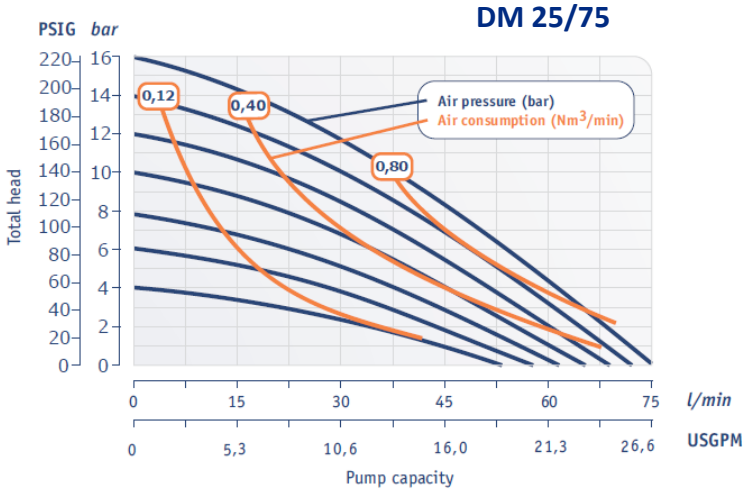


Appearance and dimensions of Hygienic Series Pumps with HPM Option

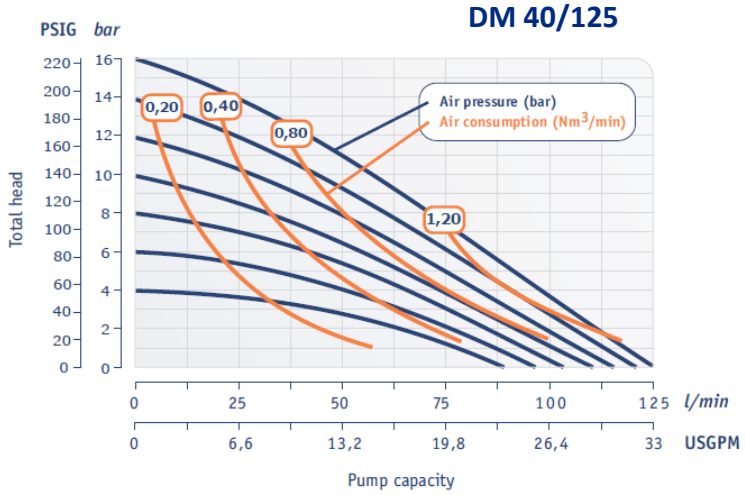
Pump size	A	B	C max	D	E			F	G	H	I	øJ	K	L	M	N	O
DM 25/75 H..-X-HPM	242	270	421	78	Rd 52x1/6" (DIN 11851)	Rd 40x1/6" (SMS 1145)	Ø50.5 (Tri-Clamp)	204	R ¼"	395	18	30	212	240	M8	345	194
DM 40/125 H..-X-HPM	261	286	472	65	Rd 65x1/6" (DIN 11851)	Rd 60x1/6" (SMS 1145)	Ø50.5 (Tri-Clamp)	222	R ¼"	438	18	30	231	256	M8	379	194
DM 50/315 H..-X-HPM	358	387	685	102	Rd 78x1/6" (DIN 11851)	Rd 70x1/6" (SMS 1145)	Ø64 (Tri-Clamp)	260	R ½"	646	18	30	328	357	M8	532	290
DM 65/565 H..-X-HPM	358	465	893	96	Rd 95x1/6" (DIN 11851)	Rd 85x1/6" (SMS 1145)	Ø91 (Tri-Clamp)	365	R ½"	845	18	30	328	435	M8	578	290

Performance curves

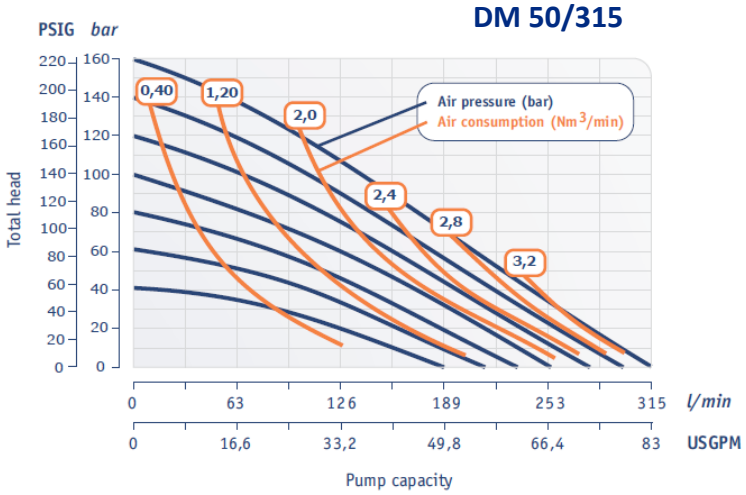
DM 25/75



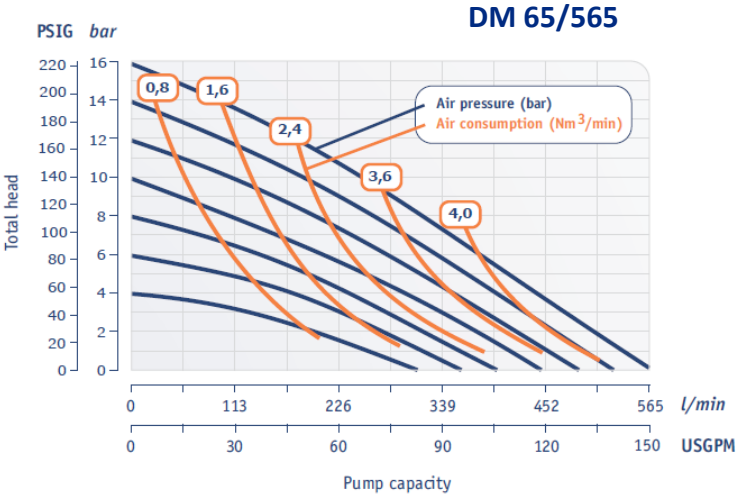
DM 40/125



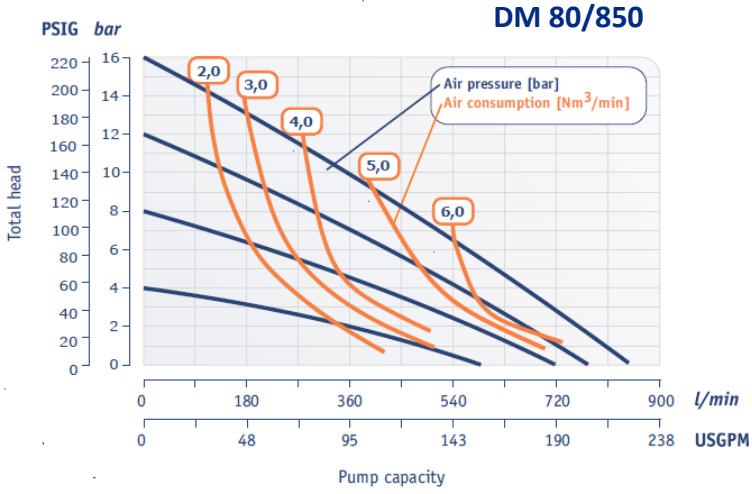
DM 50/315



DM 65/565



DM 80/850



16.9 Pump with solenoid valve (Option code: MV)

DELLMECO Hygienic Series Pump with MV option replaces the standard air valve with a solenoid air valve. This enables media to be delivered in precise and constant volumes for such applications as found in the chemical industry.

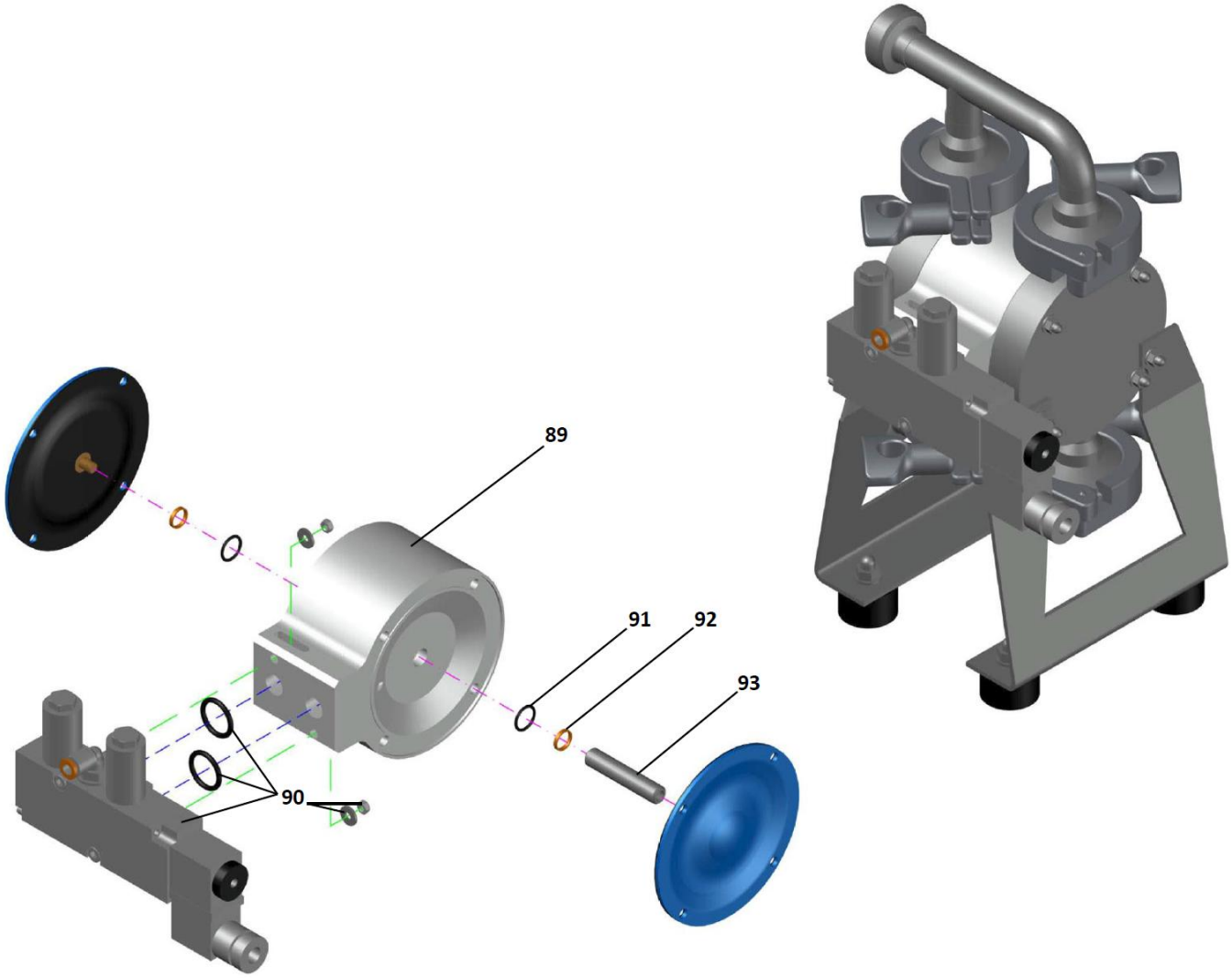
Pump with MV Option is fitted with a 5/2 electro-pneumatic monostable NAMUR solenoid valve. When the solenoid is unpowered and the pump is delivered with compressed air (air supply valve is opened), one chamber within the pump is pressurized with air whilst the opposite chamber is discharged. When electric power is applied to the coil (24 VDC), the solenoid re-pressurizes the discharged chamber and the opposite chamber is being charged. An appropriate timer unit is required to control the coil (electric signal has to be initiated and disrupted alternately).

By alternatively turned on and off the electric signal supplied to the solenoid valve (quantity of electric signals can be defined per specified unit time – e.g., 30 seconds, 1 minute, 1 hour etc.), MV Option enables the pump unit to run like a standard DELLMECO pump with precise dosing of the liquid to the system and without contaminating the exhausted air (no lubrication is needed).

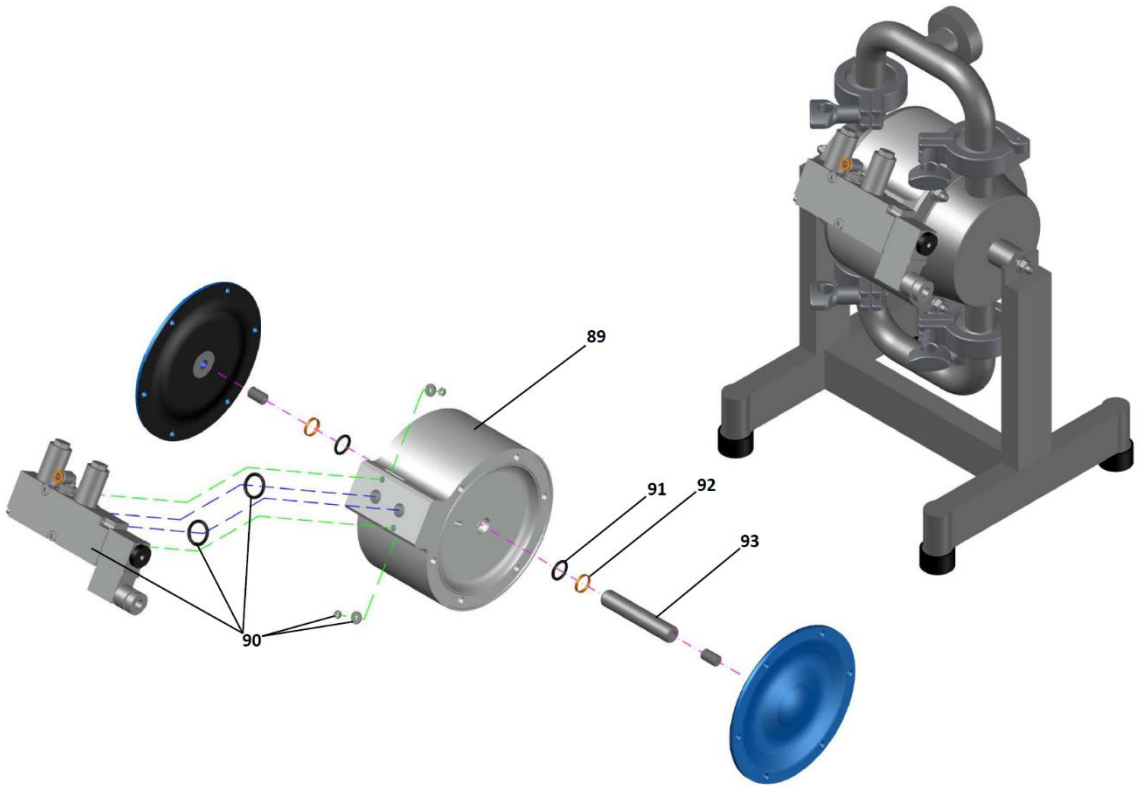
Solenoid valve is mounted outside the pump – directly on the central housing – which is specially designed for this purpose.

This option is available from DM 15/30 up to DM 65/565 Hygienic Series Pump sizes.

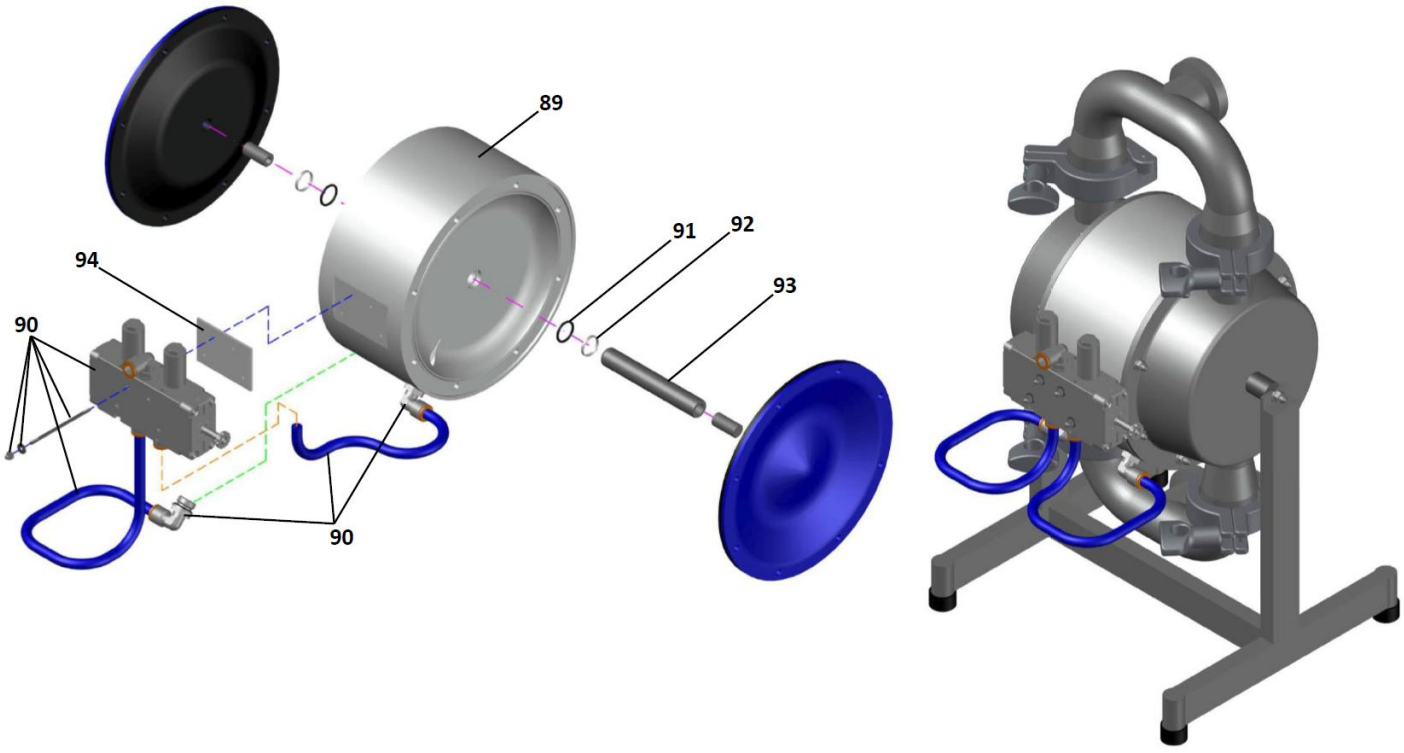
Appearance of DM 15/30 Hygienic Pump with MV Option



Appearance of DM 25/75, 40/125 Hygienic Pumps with MV Option



Appearance of DM 50/315, 65/565 Hygienic Pumps with MV Option



Spare part list for the Hygienic Series Pumps with MV Option(*)

				Pump size:	DM 15/30	DM 25/75	DM 40/125	DM 50/315	DM 65/565
Code	Item	Q-ty	Description	Material	Part no.				
MV	89.	1	Central housing, MV Option	PE	1 10 410 20	1 15 410 20	1 25 410 20	1 40 410 20	1 50 410 20
				PE conductive	1 10 410 21	1 15 410 21	1 25 410 21	1 40 410 21	1 50 410 21
	90.	1	External air valve for MV Option, complete(**)	Diverse	1 08 720 00	1 08 720 00	1 08 720 00	1 40 720 00	1 40 720 00
	91.	2/4(a)	Diaphragm shaft O-ring	NBR	1 08 82 10	1 15 85 10	1 25 85 10(a)	1 40 85 10	1 50 85 10
	92.	2	Diaphragm shaft gasket	PTFE-PPS(b) / PE	1 08 90 18(b)	1 15 85 22	1 25 85 22	1 40 85 22	1 50 85 22
	93.	1	Diaphragm shaft for MV Option	AISI 304	1 08 124 50	1 15 440 50	1 25 440 50	1 40 440 50	1 50 440 50
	94.	1	Central housing adapter for MV Option	PE				1 40 165 20	1 40 165 20
				PE cond.				1 40 165 21	1 40 165 21

(*) – spare parts not included in the above chart are the same as for standard Hygienic Series Pump (internal air valve)
(**) – MV Option Pump with ATEX certificate available on demand

16.10 Pump for transferring powders (Option code: P)

DELLMECO Pump with “P” Option can also be used to transfer dry powders more quickly, cleanly and at a fraction of the cost than many other system. Thanks to that you can replace manual powder transfer process with the following advantages:

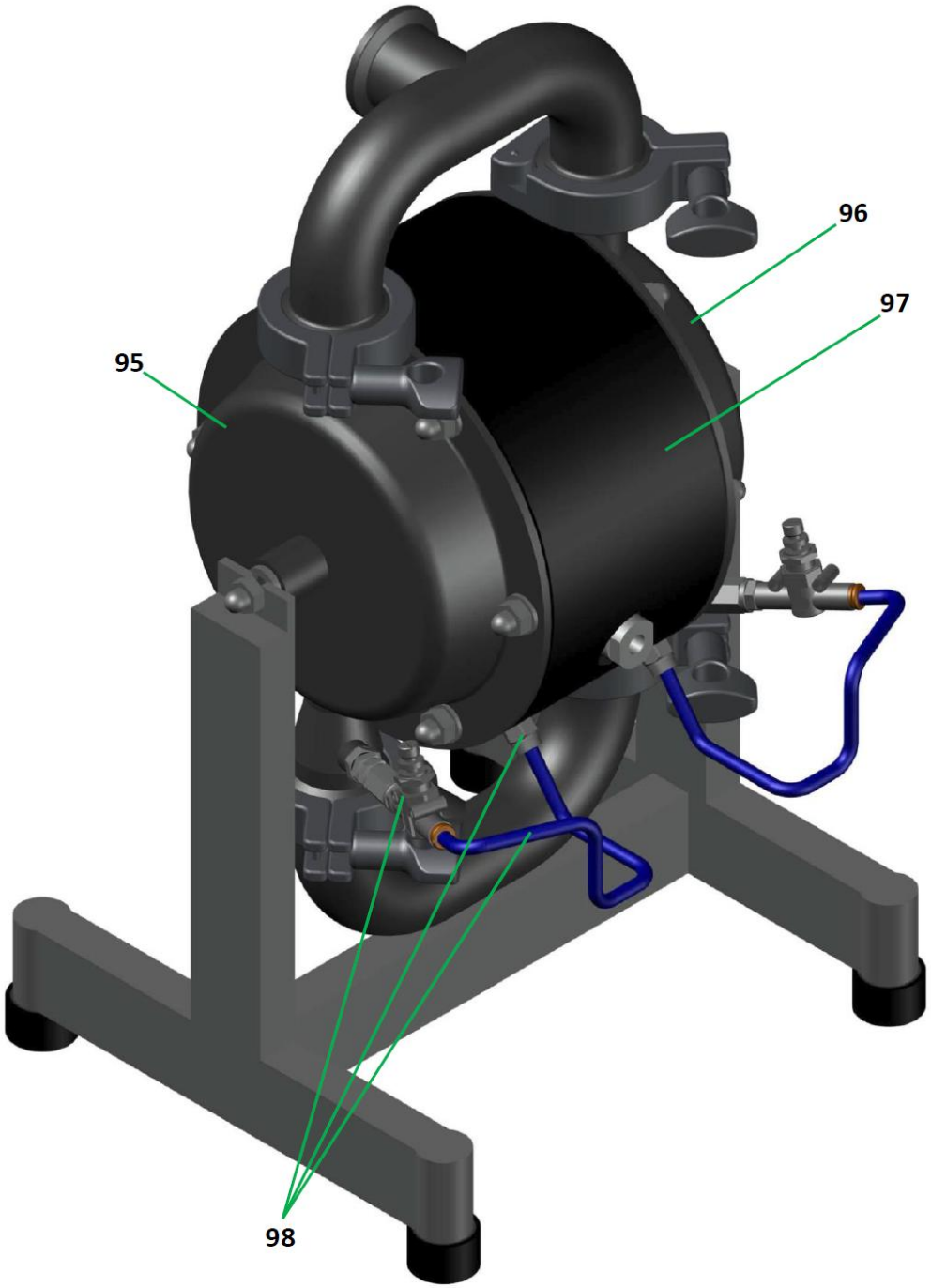
- Airborne contamination reducing (powders can be transferred directly in a closed system)
- Pump can be easily moved from site to site (also available trolley – as a “T” Option)
- Economic and simple system (the opposite of large and complex systems).

Pump is applicable for transferring fine powders up to 800 kg/m^3 (50 lb/ft^3). In addition, powder to be pumped has to be without tendency for sticking/caking and free of moisture.

A reliable, efficient and trouble-free transfer is possible for the following exemplary substances:

- Various types of dry food
- Limestone
- Pharmaceuticals
- Talcum
- Expanded mica
- Silicones and silicas
- Carbon black
- Acrylic resins.

Appearance of the ATEX Hygienic Pump with Powder Option



Spare part list for the Hygienic Pump with Powder Option

				Pump size:	DM 25/75	DM 40/125	DM 50/315	DM 65/565	DM 80/850
Code	Item	Q-ty	Description	Material	Part no.	Part No.	Part No.	Part No.	Part No.
P	95.	1	Left side housing for Powder Option	AISI 316L	4 25 401 53	4 40 401 53	4 50 401 53	4 65 401 53	
	96.	1	Right side housing for Powder Option	AISI 316L	4 25 501 53	4 40 501 53	4 50 501 53	4 65 501 53	
	97.	1	Central housing for Powder Option	PE	1 15 410 20	1 25 410 20	1 40 410 20	1 50 410 20	1 80 410 20
				PE conductive	1 15 410 21	1 25 410 21	1 40 410 21	1 50 410 21	1 80 410 21
	98.	2	Non-return valve for Powder Option, complete	Diverse	3 20 720 00	3 25 720 00	3 40 720 00	3 50 720 00	4 80 720 00

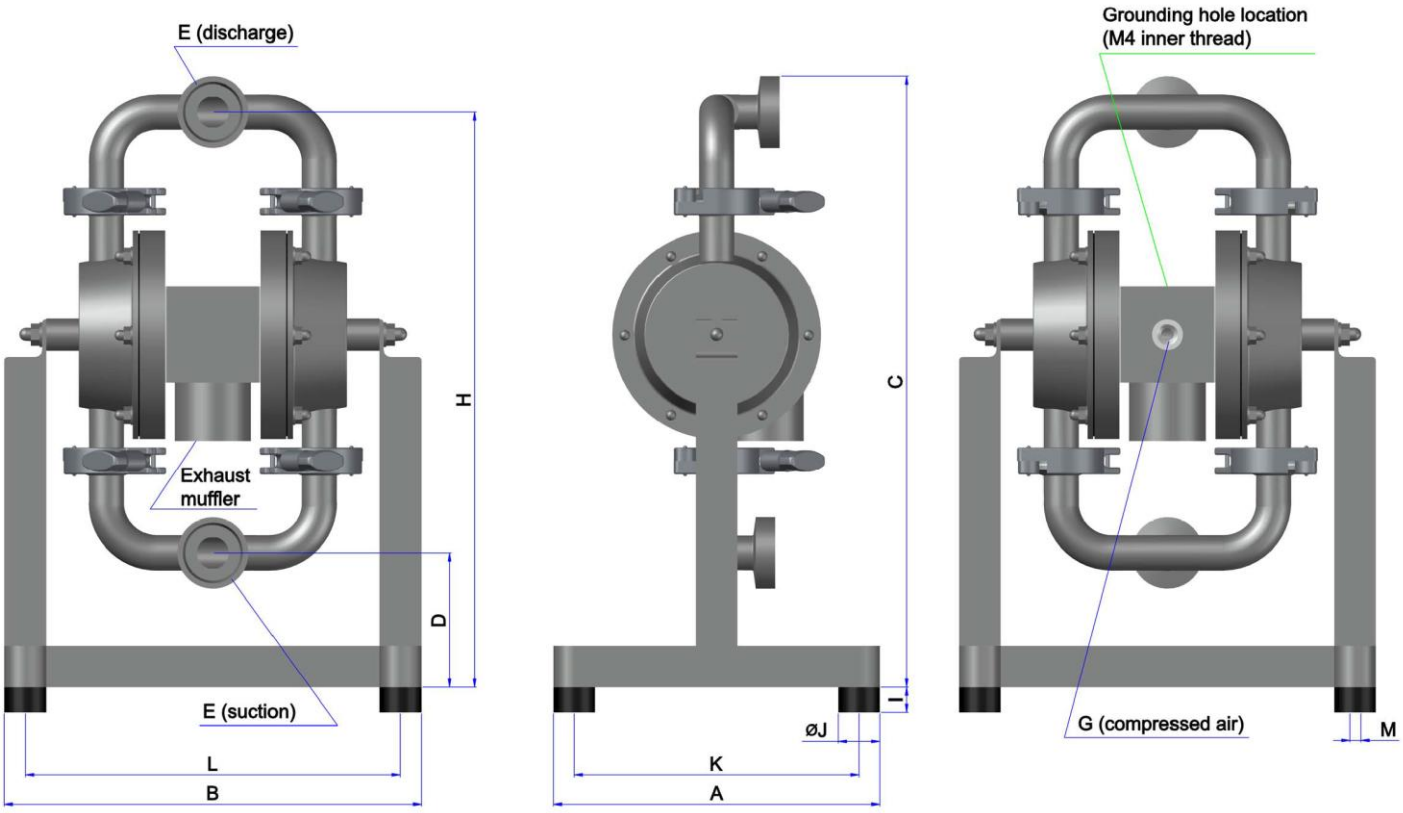
16.11. Hygienic Series Pumps with AISI 304 central housing (Option codes: HH.., HH..-X)

All DELLMECO Hygienic Series Pumps are normally equipped with PE (or PE conductive – ATEX approved) central housing material. However, it is possible to deliver Hygienic Series Pump with AISI 304 modular central housing. Stainless steel construction of the central housing ensures better reliability in the case of increased external temperatures, aggressive ambient conditions (for PE and PE conductive material versions) and – also – in the case of high pressure constant rate. Air valve in the case of AISI 304 central housing is located in the middle section and is assembled by means of two circlips (in opposite to standard DELLMECO thread-mounted air valves). In addition, housing bolts have been replaced with hexagon socket head screws and the exhaust muffler is located on the bottom of the central housing middle section.

Because AISI 304 central housing is longer than standard PE or PE conductive version, also inlet/outlet connections and diaphragm shaft are extended in refer to the standard pump's equivalent parts. Other pump's parts – not specified on the below drawing (also not included in the list of parts) – side housings, ball valves, stoppers, in-/outlet sealing sets, muffler, etc. – are the same as in standard version of DELLMECO AODD Hygienic Series Pumps.

AODD DELLMECO Hygienic Series Pump with AISI 304 stainless steel central housing execution is available from DM 25/75 HH.., HH..-X to DM 65/565 HH.., HH..-X size.

Hygienic Series Pumps with AISI 304 central housing – main dimensions

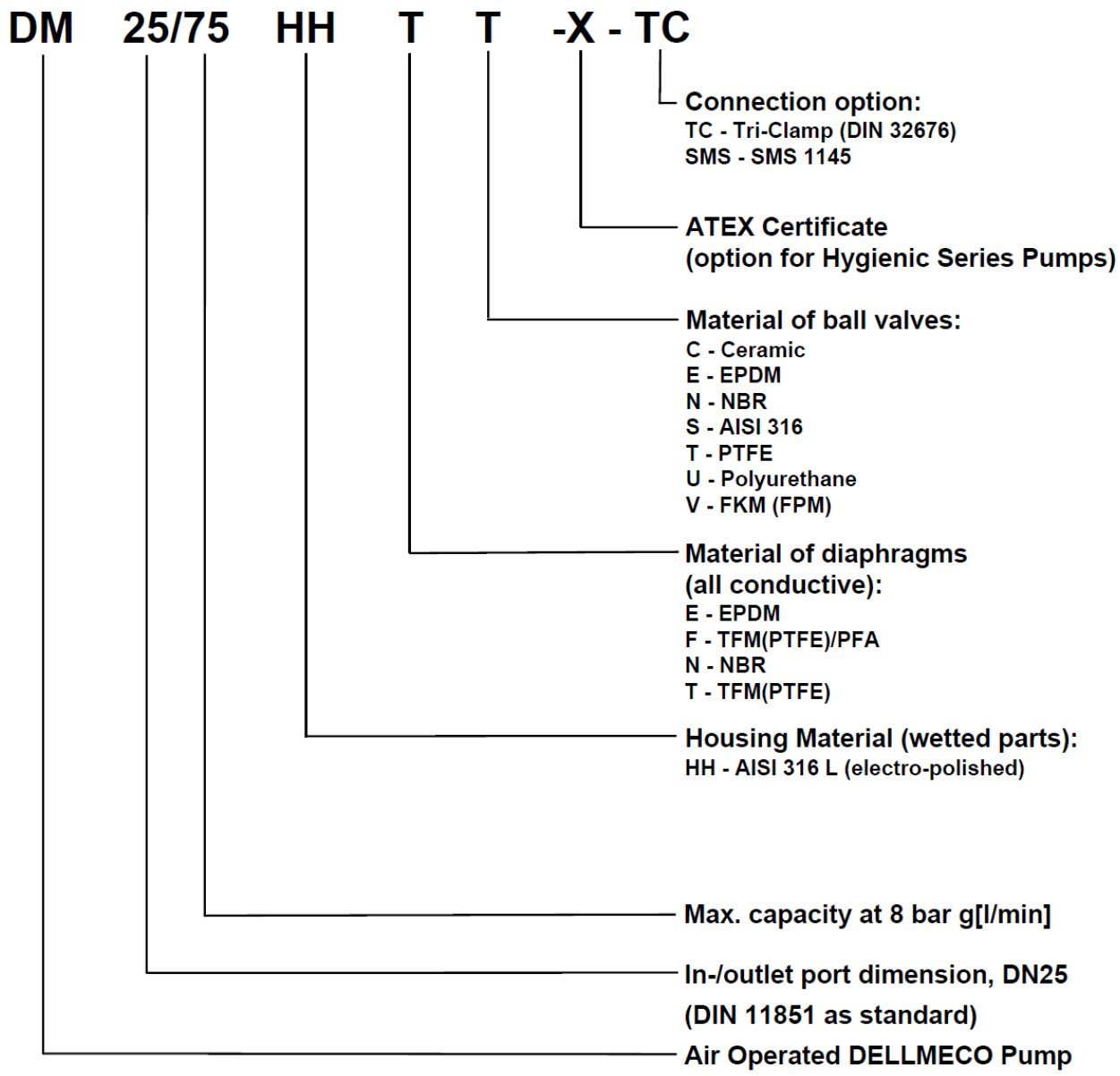


HH.., HH..-X (AISI 316L)	A	B	C max	D	E			G	H	I	øJ	K	L	M
					DIN 11851	Tri-Clamp DIN 32676	SMS 1145							
DM 25/75	235	300	439	69	Rd 52x1/6"	Ø50.5	Rd 40x1/6"	R 1/4"	414	18	30	205	270	M8
DM 40/125	255	320	467	62	Rd 65x1/6"	Ø50.5	Rd 60x1/6"	R 1/4"	435			225	290	
DM 50/315	382	432	694	117	Rd 78x1/6"	Ø64	Rd 70x1/6"	R 1/2"	655			432	392	
DM 65/565	478	505	907	144	Rd 95x1/6"	Ø91	Rd 85x1/6"	R 1/2"	860			438	465	

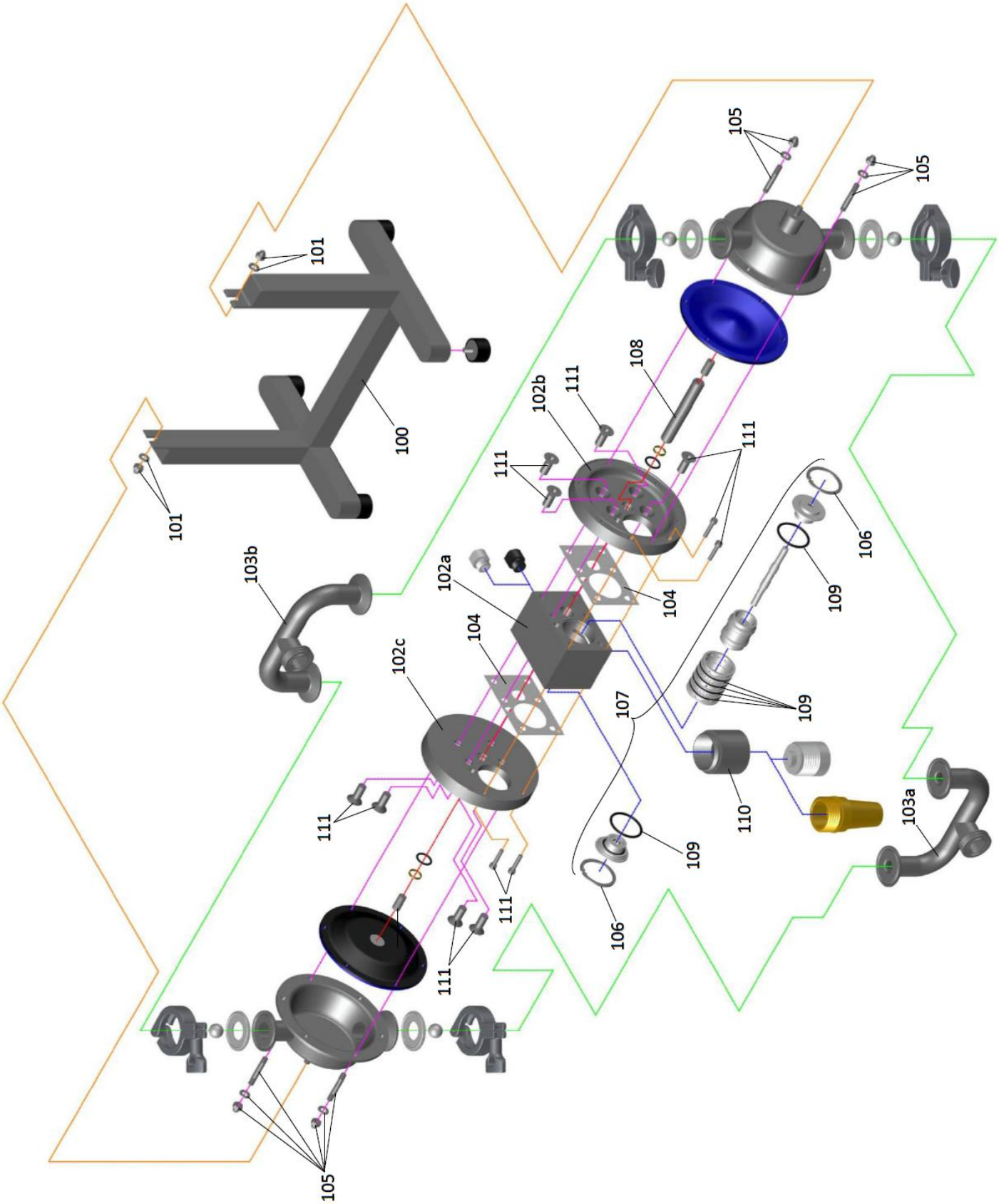
CAUTION: All Metal Series Pump with AISI 304 central housing are equipped with ATEX Certificate as a standard. Grounding point (M4 internal threaded hole) is located on the top central housing, as shown on the above drawing.

Please be advised that in-/outlet connections used in the Pumps with AISI 304 central housing do not fit DELLMECO Hygienic Series Pumps with standard PE or PE cond. central housing (and vice-versa)!

Codification for the Hygienic Series Pumps with AISI 304 central housing:



DM 25/75 HH.., HH..-X, DM 40/125 HH.., HH..-X Hygienic Series Pumps with AISI 304 central housing – exploded view



DM 25/75 HH.., HH..-X, DM 40/125 HH.., HH..-X Hygienic Series Pumps with AISI 304 central housing – list of parts

				DM 25/75 and DM 40/125 Hygienic Series Pumps	
Item	Part name	Q-ty	Material	DM 25/75 HH.., DM 25/75 HH..-X	DM 40/125 HH.., DM 40/125 HH..-X
100.	Pump stand	1	AISI 304	4 25 96H 50	4 40 96H 50
101.	Support nut with washer, set	2	AISI 304	4 25 138H 50	4 40 138H 50
102a.	Air valve casing	1	AISI 304	1 15 10H 50	
102b.	Left case	1	AISI 304	1 15 802 50	1 25 802 50
102c.	Right case	1	AISI 304	1 15 902 50	1 25 902 50
103a.	Inlet manifold DIN 11851	1	AISI 316L	4 25 30H 53	4 40 30H 53
	Inlet manifold SMS 1145			4 25 31H 53	4 40 31H 53
	Inlet manifold TC DIN 32676			4 25 32H 53	4 25 32H 53
103b.	Outlet manifold DIN 11851	1	AISI 316L	4 25 33H 53	4 40 33H 53
	Outlet manifold SMS 1145			4 25 34H 53	4 40 34H 53
	Outlet manifold TC DIN 32676			4 25 35H 53	4 40 35H 53
104.	Case seal	2	PTFE	3 20 73H 23	
105.	Socket + nut + washer, complete	12	AISI 304	4 25 42H 50	4 40 42H 50
106.	Circlip for air valve cover	2	Diverse	3 20 29 00	
107.	Air valve, complete (circlip mount)	1	PET-NBR	1 15 20H 31	
			PET-FKM	1 15 20H 32 [2)]	
108.	Diaphragm shaft, cpl. (with pin screws)	1	AISI 304	1 15 40H 50	
109.[1)]	Air valve O-ring, external	6	NBR	1 15 080 10	
			FKM	1 15 080 09	
110.	Exhaust muffler adapter	1	AISI 304	1 15 299 50	
111.	Left/right case mounting screws, set	1	AISI 304	1 20 44H 50	1 25 44H 50

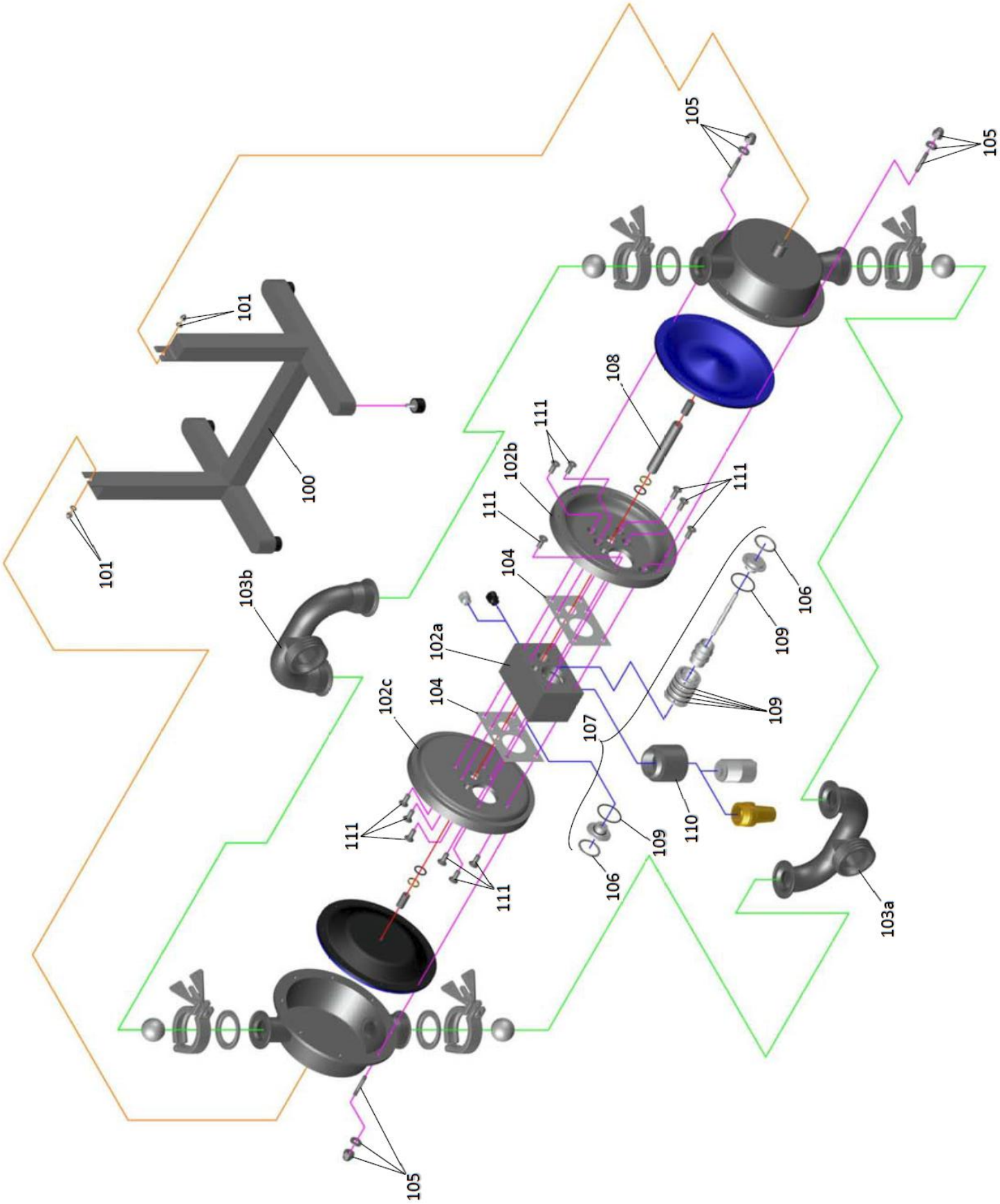
[1)] - included in Item 107 „Air valve, complete (circlip mounted)
[2)] - parts available only on customer's request

List of parts for spare part kits SET 1 and SET 2 for DM 25/75 HH.., HH..-X, DM 40/125 HH.., HH..-X Hygienic Series Pumps with AISI 304 central housing

Spare part kit SET type		Item	Q-ty	Part description	Pump size							
					DM 25/75				DM 40/125			
					Material version [a)]							
					HHEE HHEE-X	HHNN HHNN-X	HHTT HHTT-X	HHFT HHFT-X	HHEE HHEE-X	HHNN HHNN-X	HHTT HHTT-X	HHFT HHFT-X
					Part number							
SET 2 (wet and dry side)	SET 1 (wet side)	4.	2	Diaphragm	1 15 50 08	1 15 50 10	1 15 50 05	1 15 50 00	1 25 50 08	1 25 50 10	1 25 50 05	1 25 50 00
		5.	4	Valve ball	1 15 60 08	1 15 60 10	1 15 60 23		1 25 60 08	1 25 60 10	1 25 60 23	
		17.	1	Muffler (new type)	1 15 499 35							
		7.	4	In-/outlet sealing set	4 25 70 08	4 25 70 10	4 25 70 23		4 40 70 08	4 40 70 10	4 40 70 23	
		108.	1	Diaphragm shaft	1 15 440H 50				1 25 440H 50			
		107.	1	Air valve (circlip mounted)	1 15 20H 31							
		16.	2	Shaft sealing	1 15 85 22				1 25 85 22			
		30.	2/4*	Shaft sealing O-ring	1 15 85 10				1 25 85 10*			
		82.	2	Shaft allen pin screw	1 15 540 50				1 25 540 50			

[a)]- typical pump material executions (other material executions may require different spare parts).

DM 50/315 HH.., HH..-X, DM 65/565 HH.., HH..-X Hygienic Series Pumps with AISI 304 central housing – exploded view



DM 50/315 HH.., HH..-X, DM 65/565 HH.., HH..-X Hygienic Series Pumps with AISI 304 central housing – list of parts

				DM 50/315 and DM 65/565 Hygienic Series Pumps	
Item	Part name	Q-ty	Material	DM 50/315 HH.., DM 50/315 HH..-X	DM 65/565 HH.., DM 65/655 HH..-X
100.	Pump stand	1	AISI 304	4 50 96H 50	4 65 96H 50
101.	Support nut with washer, set	2	AISI 304	4 50 138H 50	4 65 138H 50
102a.	Air valve casing	1	AISI 304	1 40 10H 50	1 50 10H 50
102b.	Left case	1	AISI 304	1 40 802 50	1 50 802 50
102c.	Right case	1	AISI 304	1 40 902 50	1 50 902 50
103a.	Inlet manifold DIN 11851	1	AISI 316L	4 50 30H 53	4 65 30H 53
	Inlet manifold SMS 1145			4 50 31H 53	4 65 31H 53
	Inlet manifold TC DIN 32676			4 50 32H 53	4 65 32H 53
103b.	Outlet manifold DIN 11851	1	AISI 316L	4 50 33H 53	4 65 33H 53
	Outlet manifold SMS 1145			4 50 34H 53	4 65 34H 53
	Outlet manifold TC DIN 32676			4 50 35H 53	4 65 35H 53
104.	Case seal	2	PTFE	3 40 73H 23	3 50 73H 23
105.	Socket + nut + washer, complete	12	AISI 304	4 50 42H 50	4 65 42H 50
106.	Circlip for air valve cover	2	Diverse	3 40 29 00	
107.	Air valve, complete (circlip mount)	1	PET-NBR	1 40 20H 31	
			PET-FKM	1 40 20H 32 [2)]	
108.	Diaphragm shaft, cpl. (with pin screws)	1	AISI 304	1 40 40H 50	1 50 40H 50
109.[1)]	Air valve O-ring, external	6	NBR	1 40 080 10	
			FKM	1 40 080 09	
110.	Exhaust muffler adapter	1	AISI 304	1 40 299 50	1 50 299 50
111.	Left/right case mounting screws, set	1	AISI 304	1 40 44H 50	1 50 44H 50

[1)] - included in Item 107 „Air valve, complete (circlip mounted)
[2)] - parts available only on customer's request

List of parts for spare part kits SET 1 and SET 2 for DM 50/315 HH.., HH..-X, DM 65/565 HH.., HH..-X Hygienic Series Pumps with AISI 304 central housing

Spare part kit SET type		Item	Q-ty	Part description	Pump size							
					DM 50/315				DM 65/565			
					Material version [a)]							
					HHEE HHEE-X	HHNN HHNN-X	HHTT HHTT-X	HHFT HHFT-X	HHEE HHEE-X	HHNN HHNN-X	HHTT HHTT-X	HHFT HHFT-X
					Part number							
SET 2 (wet and dry side)	SET 1 (wet side)	4.	2	Diaphragm	1 40 50 08	1 40 50 10	1 40 50 05	1 40 50 00	1 50 50 08	1 50 50 10	1 50 50 05	
		5.	4	Valve ball	1 40 60 08	1 40 60 10	1 40 60 23		1 50 60 08	1 50 60 10	1 50 60 23	
		17.	1	Muffler (new type)	1 40 499 35				1 50 499 35			
		7.	4	In-/outlet sealing set	4 50 70 08	4 50 70 10	4 50 70 23		4 65 70 08	4 65 70 10	4 65 70 23	
		108.	1	Diaphragm shaft	1 40 440H 50				1 50 440H 50			
		107.	1	Air valve (circlip mounted)	1 40 20H 31							
		16.	2	Shaft sealing	1 40 85 22				1 50 85 22			
		30.	2	Shaft sealing O-ring	1 50 85 10				1 50 85 10			
		82.	2	Shaft allen pin screw	1 40 540 50				1 50 540 50			

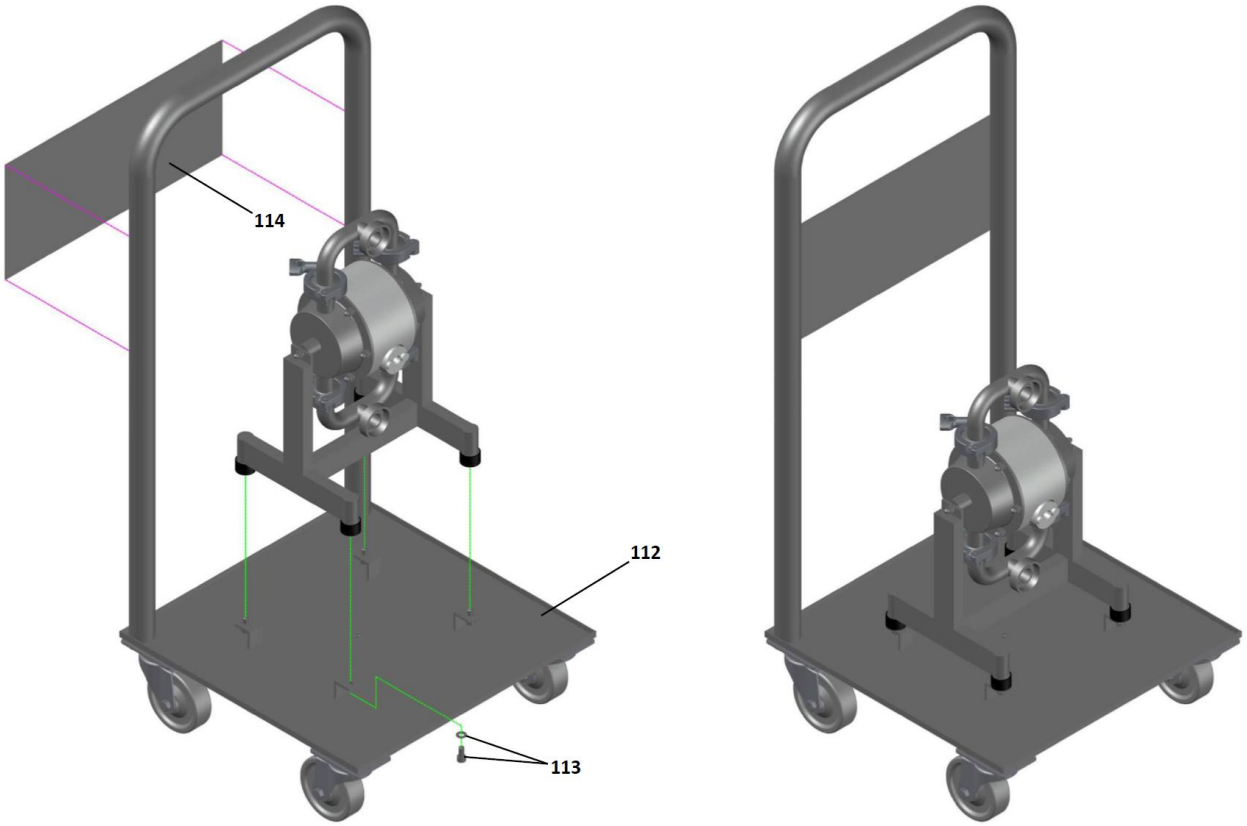
16.13. Trolley for pumps (Option code: T)

Using the trolley makes your DELLMECO Hygienic Series Pump mobile and easy to transport – especially in the case of heavy pumps and awkward workpieces (additional inlet/outlet hoses, air-filter regulators, valves, boosters etc.). Trolley is available for the entire range of Hygienic Series Pumps – from DM 15/30 up to 80/850 size. Trolley is made completely from AISI 304, except the wheel sets (4 wheel sets per 1 trolley). Pump trolley is also available for ATEX area (special wheel sets with conductive rolling elements).

Wheel sets can be customized on the demand (different material of execution, dimensions etc.). Standard execution refers to the non-ATEX wheel sets.

When the pump is being ordered together with trolley option, e.g., **DM 40/125 HTT-T** (or **DM 40/125 HTT-X**), intervals between the brackets for fixing will be adjusted to the ordered pump's model – here: **DM 40/125 HTT** (or **DM 40/125 HTT-X**). In the case of ordering trolley for the pump already bought, model of the pump has to be specified, in order to deliver the trolley with proper brackets that allow for trouble-free installing the pump on the purchased trolley. Fixing brackets do not apply to DM 80/850 Pump size (this pump is fixed directly to the trolley plate, without using brackets).

Appearance of the Hygienic Pump on Trolley



Spare part list for Trolley Option

				Pump size:	DM 15/30 H.., H..-X	DM 25/75 H.., H..-X	DM 40/125 H.., H..-X	DM 50/315 H.., H..-X	DM 65/565 H.., H..-X	DM 80/850 H.., H..-X
Code	**Position**	**Q-ty**	**Description**	**Material**	**Part no.**	**Part no.**	**Part no.**	**Part no.**	**Part no.**	**Part no.**
T	112.	1	Trolley with wheels (no ATEX)	AISI 304	4 15 193 00	4 25 193 00	4 40 193 00	4 50 193 00	4 65 193 00	4 80 193 00
		1	Trolley with wheels for ATEX	AISI 304	4 15 293 00	4 25 293 00	4 40 293 00	4 50 293 00	4 65 293 00	4 80 293 00
	113.	1	Pump fixing set (washers, bolts)	AISI 304	4 15 393 50	4 25 393 50	4 40 393 50	4 50 393 50	4 65 393 50	4 80 393 50
	114.	1	Vertical plate (optional)	AISI 304	1 08 493 50					1 80 493 50

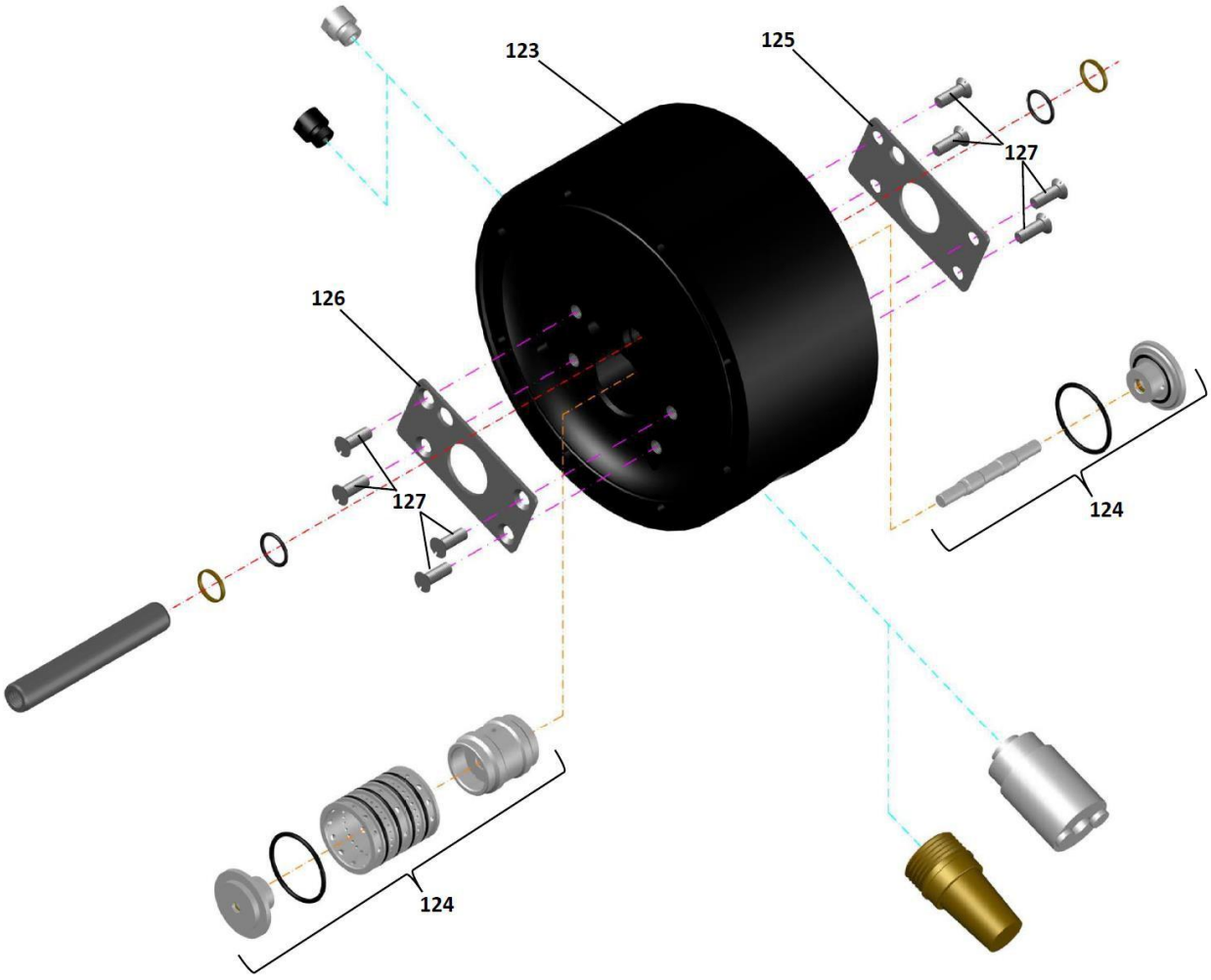
For the pumps from DM 15/30 up to DM 65/565 size, maximum dimensions of the trolley are: 480x480x1050 mm (length x width x height). In the case of DM 80/850 Hygienic Series Pump maximum dimensions of the trolley are: 650x650x1050 (length x width x height).

NOTE: Specified dimensions may change due to final execution of the pump and/or trolley (optional equipment, material and capacity of the wheels, handle execution etc.).

16.14. Central housing with Enhanced Air Valve (Option code: EAV)

DELLMECO Metal Series Pumps (from DM 25/125 to DM 50/565 Pump models) can be additionally equipped with air valve reinforcement – two opposite stainless steel plates fixed to the central housing. In such case, air valve is not thread-mounted – steel plates ensure the proper fixing (each plate is attached by means of four bolts). This modification extends the service life of both the air distributor and the central housing in the case of heavy applications and high pressure conditions – it is most recommended for the pumps with HP (High Pressure) Option. This modification does not affect the pump's external dimensions. In the case of standard pump, a complete central housing unit (together with thread-mounted air valve) has to be replaced.

Central housing with enhanced air valve (EAV Option) – exploded view with list of parts



Spare part list for Enhanced Air Valve Option

					DM 40/125	DM 50/315	DM 65/565
Code	Position	Q-ty	Description	Material	Part no.	Part no.	Part no.
EAV	123.	1	Central housing for EAV Option (with Recoil inserts)	PE cond.	1 25 810 21	1 40 810 21	1 50 810 21
	124.	1	Air valve for EAV Option	PET/NBR	1 15 220 31	1 40 220 31	
				PET/FKM	1 15 220 32	1 40 220 32	
	125.	1	Air valve plate, left	AISI 304	1 25 764L 50	1 40 764L 50	1 50 764L 50
	126.	1	Air valve plate, right	AISI 304	1 25 764R 50	1 40 764R 50	1 50 764R 50
	127.	2	Mounting screws set (per 1 plate)	AISI 304	1 25 744 50	1 40 744 50	1 50 744 50

16.15. Heating/cooling Jacket (Option code: HJ)

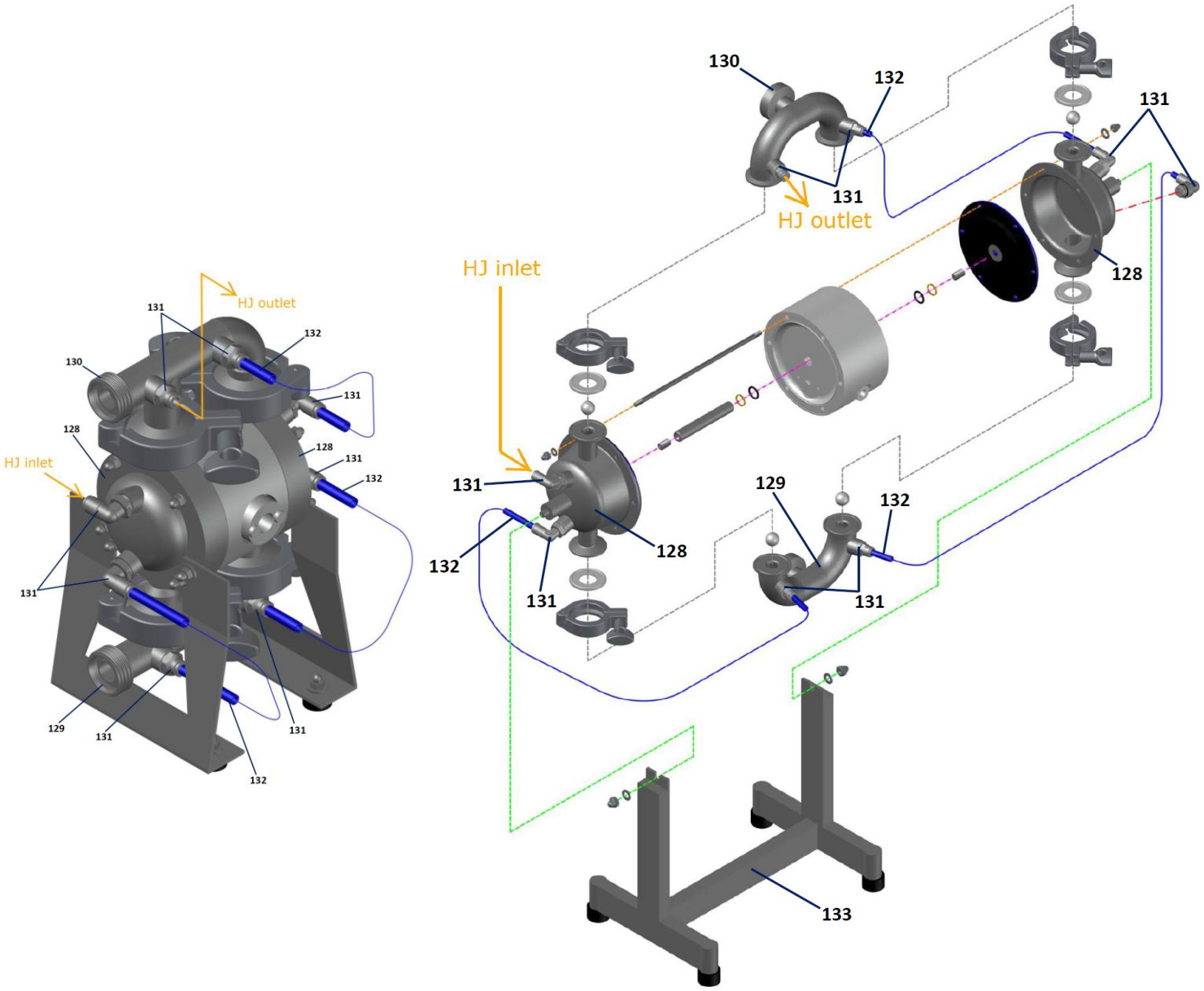
AISI 316L Hygienic Pump with Heating Jacket Option (pump code: **H..-HJ** or **H..-X-HJ**) can be used when the pumped product has to maintain a specific temperature, high or low, throughout the process. A heating or cooling medium (hot water, steam, oil) is continuously circulated in the heating jacket. The jacket is covering all the wetted parts of the pump. Available on all Hygienic (AISI 316L) series pumps.

Technical data for Heating Jacket (option code HJ):

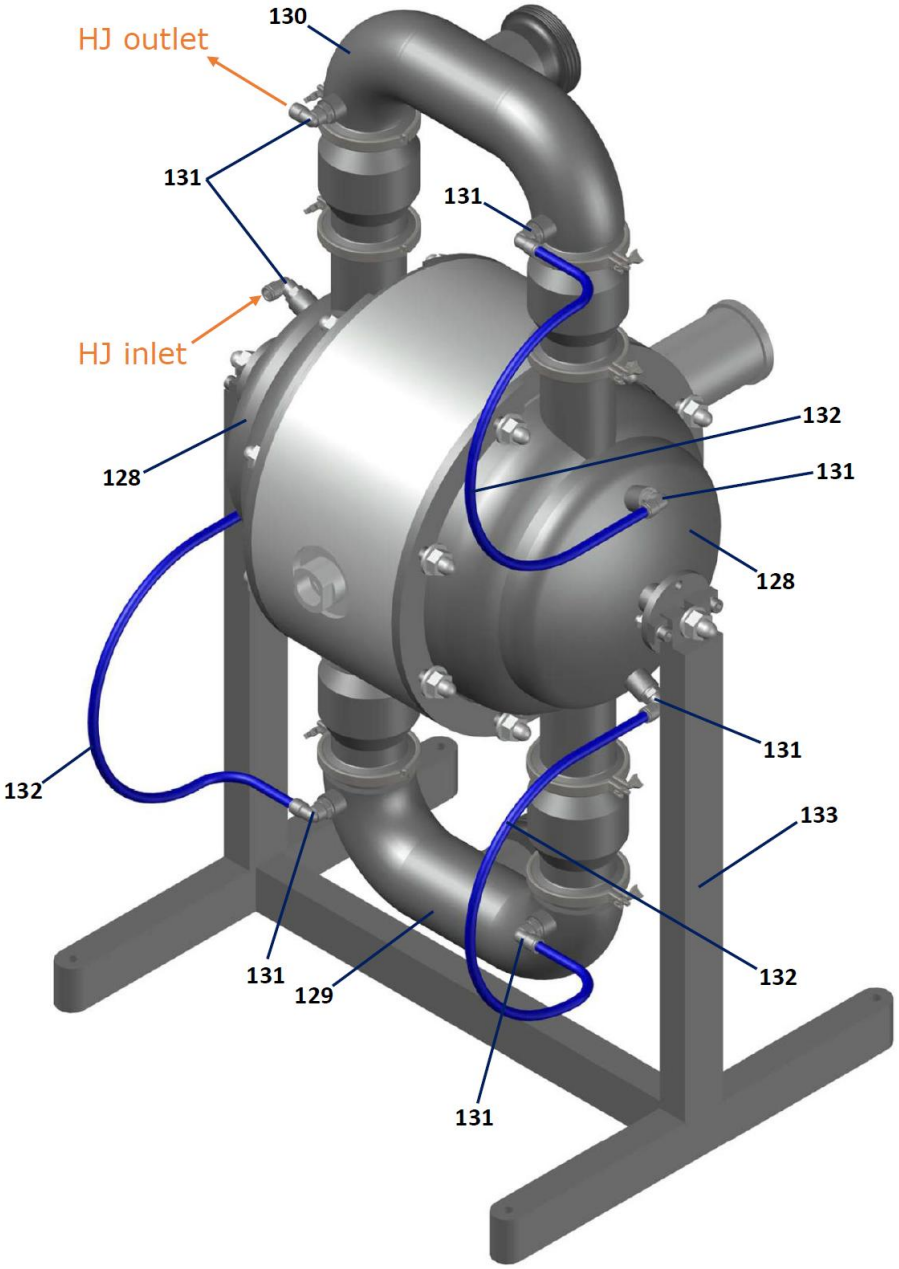
- Max. temperature: 120°C
- Max. pressure: 3 bar
- Flow rate: depending on product temperature
- Medium: hot water, steam, oil
- Connections: G ¼" (DM 15/30 H..-HJ, H..-X-HJ)
  G ⅜" (from DM 25/75 to DM 65/565 H..-HJ, H..-X-HJ)
  G ½" (only DM 80/850 H..-HJ, H..-X-HJ)

Flow of the heating (or cooling) medium in the circuit has to be forced by using an external pump (not included).

Hygienic Pump with Heating/cooling Jacket (HJ Option) for
DM 15/30 HTT-HJ (complete, left) and for DM 25/75 to DM 65/565 H..-HJ (exploded view, right)



Hygienic Pump with Heating/cooling Jacket (HJ Option) for DM 80/850 H..-HJ Pump (with standard DIN 11851 ferrules)



Spare part list for Heating/cooling Jacket Option

Pump size					DM 15/30 H..-HJ H..-X-HJ	DM 25/75 H..-HJ H..-X-HJ	DM 40/125 H..-HJ H..-X-HJ	DM 50/315 H..-HJ H..-X-HJ	DM 65/565 H..-HJ H..-X-HJ	DM 80/850 H..-HJ H..-X-HJ
Code	Pos.	Q-ty	Description	Material	Part no.					
HJ	128.	2	Side housing for HJ Option	AISI 316L	4 15 801 53	4 25 801 53	4 40 801 53	4 50 801 53	4 65 801 53	4 80 801 53
	129.	1	Inlet DIN connection for HJ Option	AISI 316L	4 15 130 53	4 25 130 53	4 40 130 53	4 50 130 53	4 65 130 53	4 80 130 53
			Inlet SMS connection for HJ Option			4 25 131 53	4 40 131 53	4 50 131 53	4 65 131 53	4 80 131 53
			Inlet TC connection for HJ Option		4 15 132 53	4 25 132 53	4 40 132 53	4 50 132 53	4 65 132 53	4 80 132 53
	130.	1	Outlet DIN connection for HJ Option	AISI 316L	4 15 133 53	4 25 133 53	4 40 133 53	4 50 133 53	4 65 133 53	4 80 130 53
			Outlet SMS connection for HJ Option			4 25 134 53	4 40 134 53	4 50 134 53	4 65 134 53	4 80 131 53
			Outlet TC connection for HJ Option		4 15 135 53	4 25 135 53	4 40 135 53	4 50 135 53	4 65 135 53	4 80 132 53
	131.	8	Hose quick couplings	Diverse	4 15 92 00	4 25 92 00	4 40 92 00	4 50 92 00	3 50 92 00	3 80 92 00
	132.	3	Hoses for HJ Option, cpl.	PA	4 15 692 00	4 25 692 00	4 40 692 00	4 50 692 00	4 65 692 00	4 80 692 00
	133.	1	Pump stand for HJ Option	AISI 304		4 25 196 50	4 40 196 50	4 50 196 50	4 65 196 50	4 80 196 50

16.16. Flap valve Option (Option code: FVF)

Flap Valve Option in Hygienic Series Pumps allows for pumping liquids with size of particles bigger than in the case of standard ball valve equipped Hygienic Series Pump. It also protects these particles from destroying during pumping process (there are no ball stoppers welded inside which reduce maximum particle size).

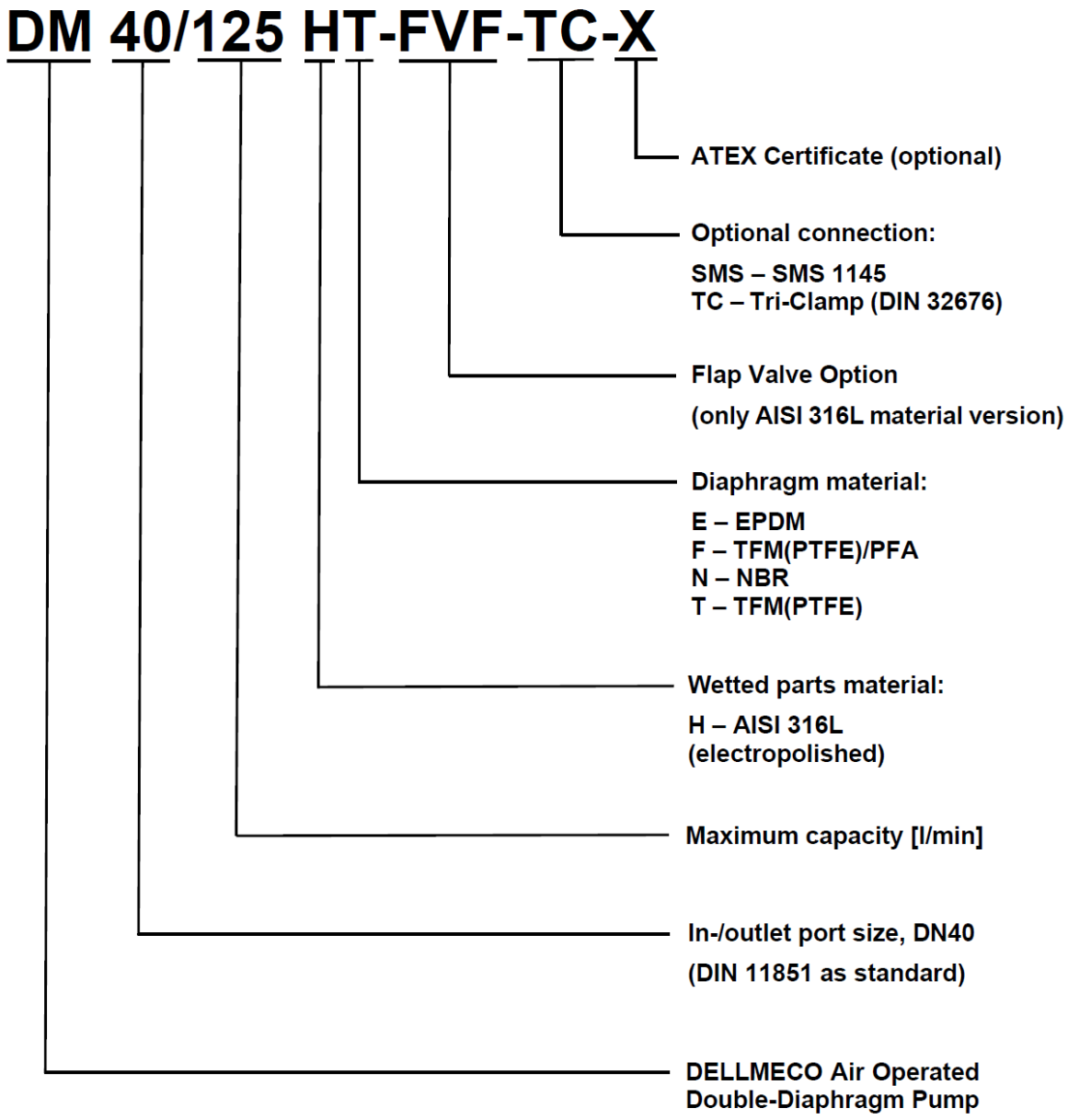
Flap Valve system provides easy maintenance and cleaning coupled with smooth and trouble-free operation. It is available for pump size from DM 40/125 … (1 ½") up to DM 80/850 (3"). Maximum size of particles is:

- For DM 40/125 H.-FVF, maximum size is 22 mm;
- For DM 50/315 H.-FVF, maximum size is 38 mm;
- For DM 65/565 H.-FVF, maximum size is 48 mm;
- For DM 80/850 H.-FVF, maximum size is 66 mm.

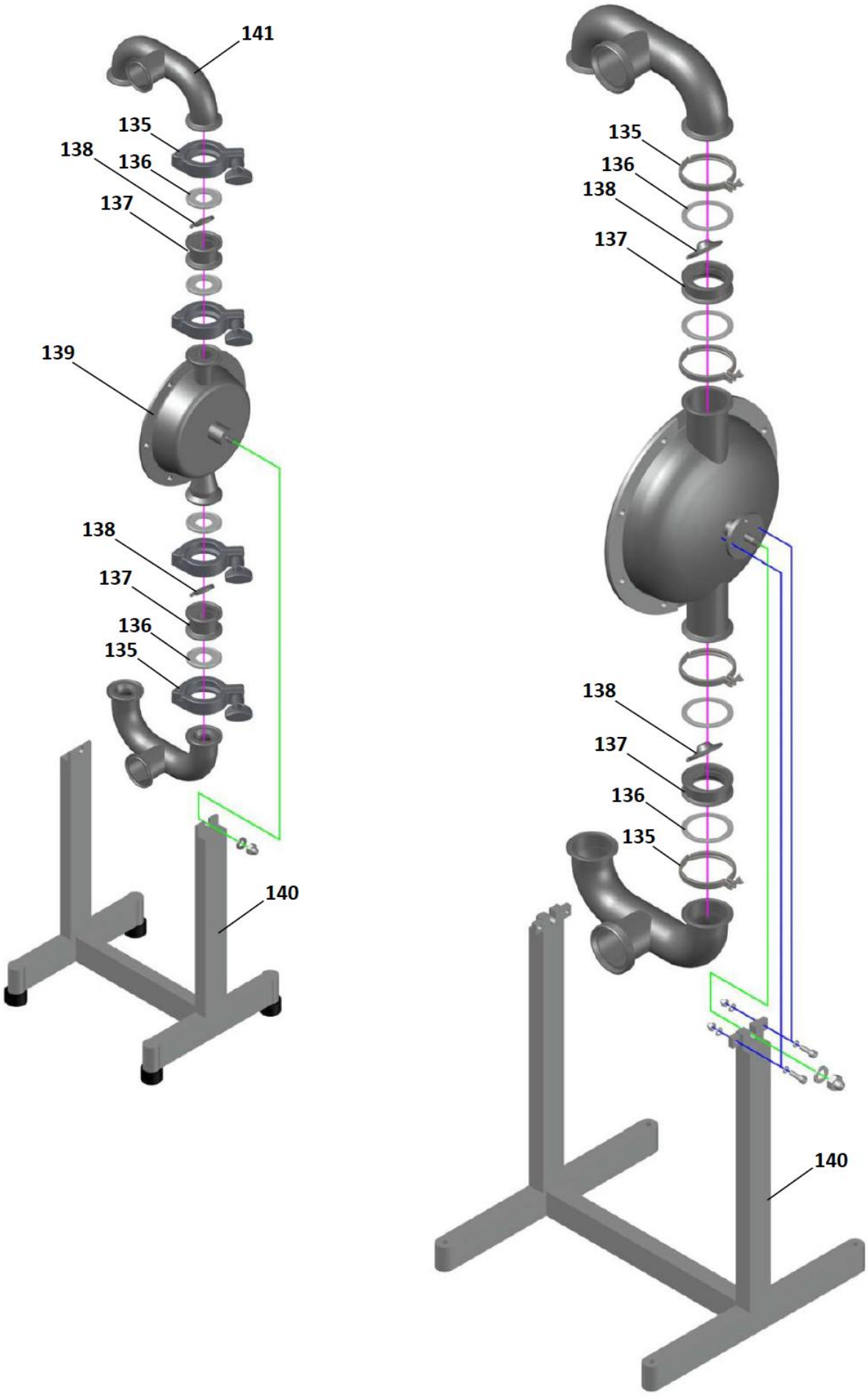
Examples of applications are food (chopped tomatoes) and poultry (chicken necks, hearts, livers, feet) products with big and delicate solids.
Hygienic Pumps with Flap Valve Option also ensures better dry suction.

Flap Valve Hygienic Pump differs from standard Hygienic Pump by side housing (except DM 80/850 Model), valve type, manifold outlet (except DM 80/850 Hygienic ump model) and pump stand. However, this option still can be implemented on already existing standard pumps.

Codification of Hygienic Series Pump with FVF Option



Hygienic Pump with Flap Valve Option - exploded view



Spare part list for Flap Valve Option (FVF)

Pump size:					DM 40/125	DM 50/315	DM 65/565	DM 80/850
Material versions					HE-FVF(-X), HN-FVF(-X), HT-FVF(-X)			
Code	Item	Pcs.	Description	Material	Part no.	Part no.	Part no.	Part no.
FVF	135.	4	FVF clamp	AISI 304	4 40 36 50	4 50 36 50	4 65 36 50	4 80 36 50
	136.	4	FVF sealing	PTFE	4 40 70 23	4 50 70 23	4 65 70 23	4 80 70 23
	137.	4	Flap check housing	AISI 316L	4 40 254 53	4 50 254 53	4 65 254 53	4 80 254 53
	138.	4	Flapper	AISI 316L	4 40 260 53	4 50 260 53	4 65 260 53	4 80 260 53
	139.	2	Side housing for FVF Option	AISI 316L	4 40 F1A 53	4 50 F1A 53	4 65 F1A 53	(1)
	140.	1	Pump stand for FVF Option	AISI 304	4 40 396 50	4 50 396 50	4 65 396 50	4 80 396 50
	141.	1	Manifold outlet DIN for FVF Option	AISI 316L	4 40 533 53	4 50 533 53	4 65 533 53	(1)
		1	Manifold outlet SMS for FVF Option	AISI 316L	4 40 534 53	4 50 534 53	4 65 534 53	(1)
		1	Manifold outlet TC for FVF Option	AISI 316L	4 40 535 53	4 50 535 53	4 65 535 53	(1)

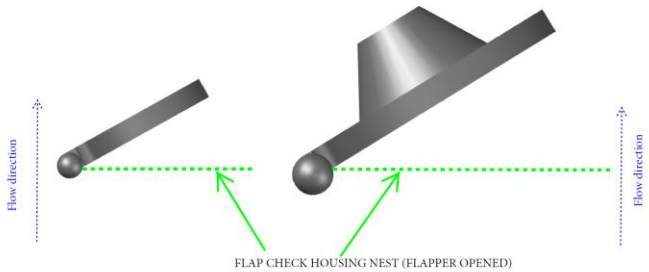
(1) – part for FVF Option is exactly the same as for standard pumps – please refer to **Chapter *5. Names of parts and materials*** (pages from 10 to 17).

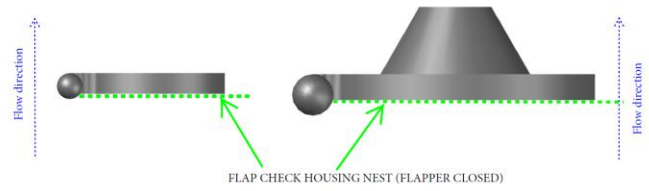
List of parts for spare part kits SET 1 and SET 2 for Hygienic Series Pumps with Flap Valve Option, models: DM 40/125, DM50/315, DM 65/565 and DM 80/850 H.-FVF., H.-FVF-X

Spare part kit SET type		Item	Q-ty	Part description	Pump size							
					DM 40/125		DM 50/315		DM 65/565		DM 80/850	
					Material version [a]							
					HE-FVF HE-FVF-X	HT-FVF HT-FVF-X	HE-FVF HE-FVF-X	HT-FVF HT-FVF-X	HE-FVF HE-FVF-X	HT-FVF HT-FVF-X	HE-FVF HE-FVF-X	HT-FVF HT-FVF-X
					Part number							
SET 2 (wet and dry side)	SET 1 (wet side)	4.	2	Diaphragm	1 25 50 08	1 25 50 05	1 40 50 08	1 40 50 05	1 50 50 08	1 50 50 05	1 80 50 08	1 80 50 05
		138.	4	Flapper	4 40 260 53		4 50 260 53		4 65 260 53		4 80 260 53	
		17.	1	Muffler (new type)	1 40 499 35				1 50 499 35		1 80 99 00	
		7.	4	In-/outlet sealing	4 40 70 08	4 40 70 23	4 50 70 08	4 50 70 23	4 65 70 08	4 65 70 23	4 80 70 08	4 80 70 23
		135.	4	FVF sealing								
		108.	1	Diaphragm shaft	1 25 440 50		1 40 440 50		1 50 440 50		1 80 440 50	
		107.	1	Air valve (thread-mounted)	1 15 020 31		1 40 020 31				1 80 020 31	
		16.	2	Shaft sealing	1 25 85 22		1 40 85 22		1 50 85 22		1 80 85 22	
		30.	2/4(*)	Shaft sealing O-ring	1 25 85 10(*)		1 40 85 10		1 50 85 10		1 80 85 10	
		82.	2	Shaft allen pin screw	1 25 540 50		1 40 540 50		1 50 540 50		1 80 540 50	

[a]- typical pump material executions (other material executions may require different spare parts).

Way of installing flappers in Hygienic Series Pumps





16.17. In-/outlet connections with inner thread (Option codes: BSPP, BSPT or NPT)

Although all DELLMECO Hygienic Series Pumps from DM 15/30 up to 80/850 size are equipped with DIN 11851 connections in standard version (SMS or Tri-Clamp connections are available as options) it is possible to order Hygienic Series Pump with BSPP (British Standard Pipe Parallel thread with angle 55°, whose diameter remains the same along the length of the thread), or BSPT internal thread (British Standard Pipe Taper thread with angle 55°, whose diameter increases or decreases along the length of the thread also denoted by the symbol R_c – internal taper). BSPT is the most popular thread in the UK & Australia.

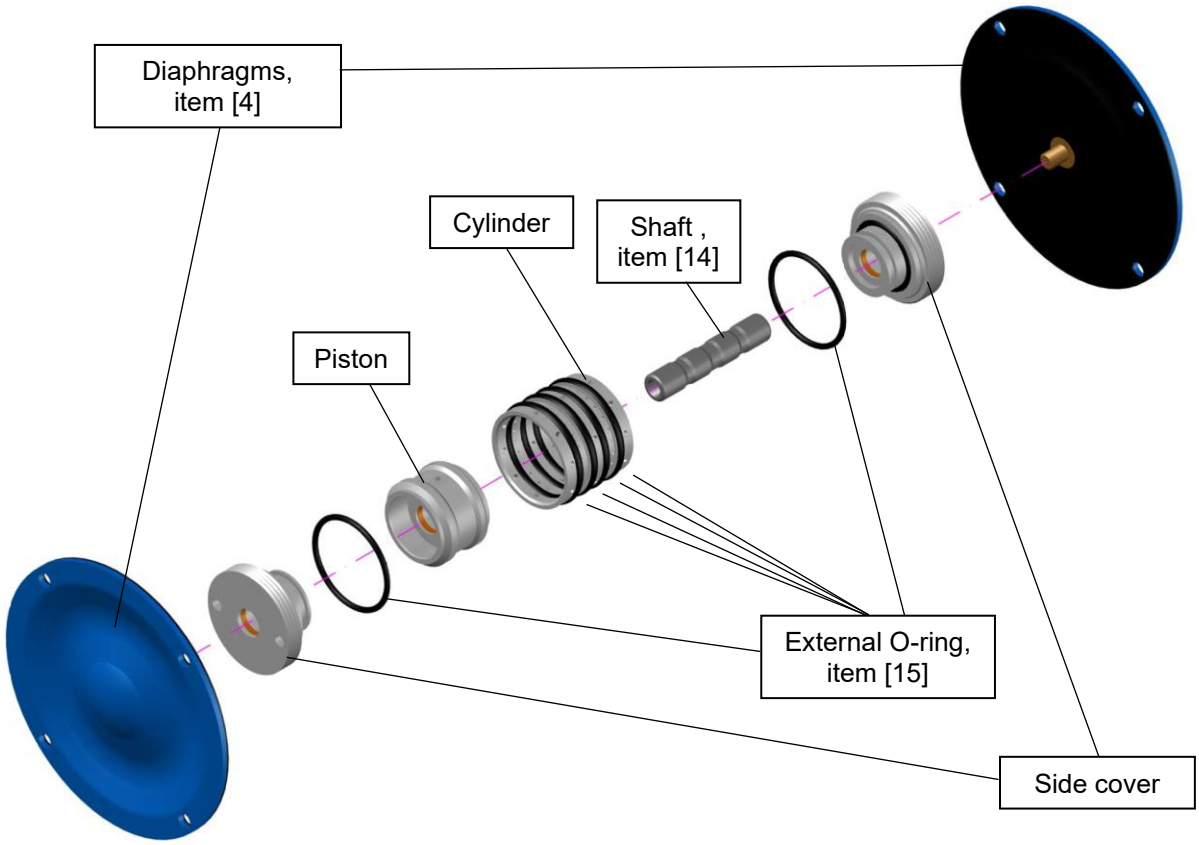
In refer to the above, Hygienic Series Pumps can be also equipped with NPT (National Pipe Taper a.k.a. American National Standard Taper Pipe Thread – a taper thread that has 60° thread angle) internal thread. NPT is used for sealing, often without any thread sealant and for connections in nearly every type of service. It is the most common thread for pipes in North America.

16.18. Air valve (thread-mounted) execution material option and spare parts kit set (AVD)

DELLMECO Metal Series Pumps from DM 15/30 up to 80/850 size are equipped with PET/NBR air valve (standard execution), where the main parts – cylinder, piston, side covers – are made from PET, while the external O-rings (Item No. 15 in the spare parts list) are made from NBR material. Optionally, the air valve can be offered as PET/FKM version (optional execution), where the external O-rings are made from FKM (a.k.a. FPM, or Viton®.) instead of NBR material (main parts material execution remains the same – PET).

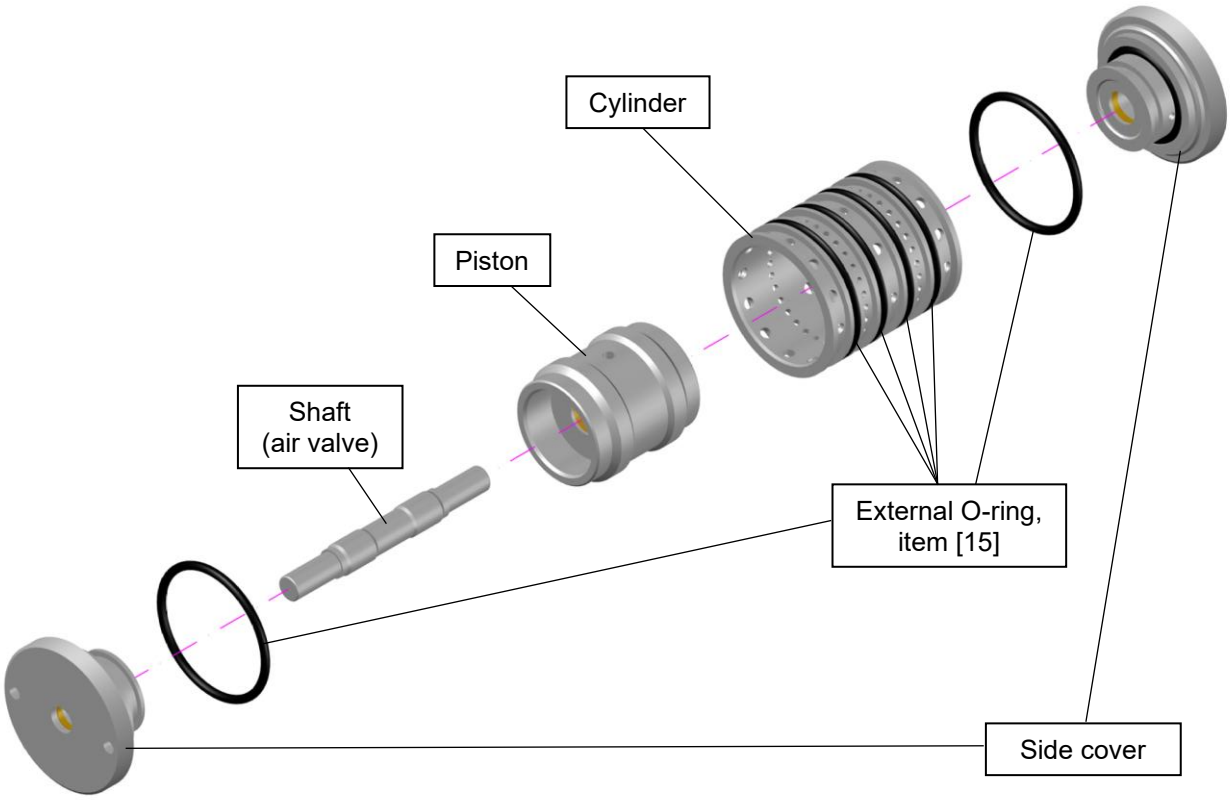
Appearance of the specific sizes of an air valve for DELLMECO Metal Series Pumps is presented below:

A. Air valve “08” size (part no.: 1 08 020 31, PET/NBR and 1 08 020 32, PET/FKM), applicable for DM 15/30 H.. Pump models:

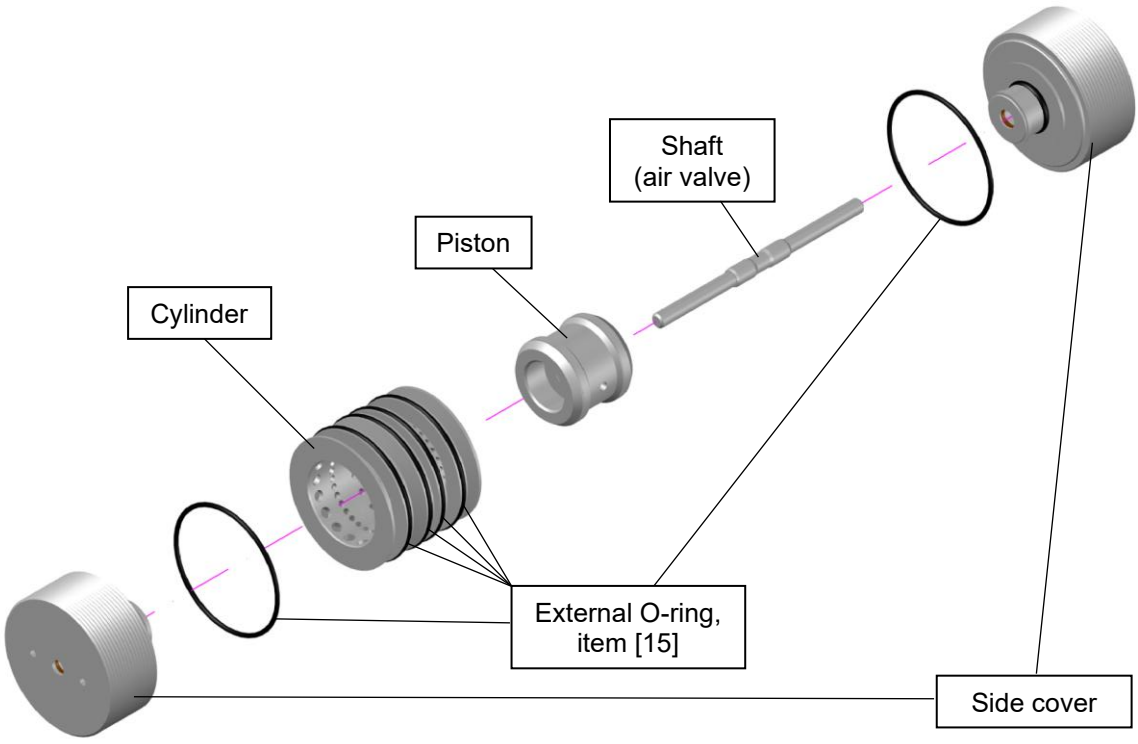


The distinguishing feature of the smallest “08” air valve is that the main shaft (made from AISI 304 material) is a common element for both diaphragms and air valve unit. Diaphragm (size “10” only – size “08” is not used for Hygienic Series Pumps) has external thread that allows to assemble them directly on the main shaft. The remaining sizes of air valves have two separated shafts – air valve shaft (made from PET) and diaphragm shaft (made from AISI 304), as presented below.

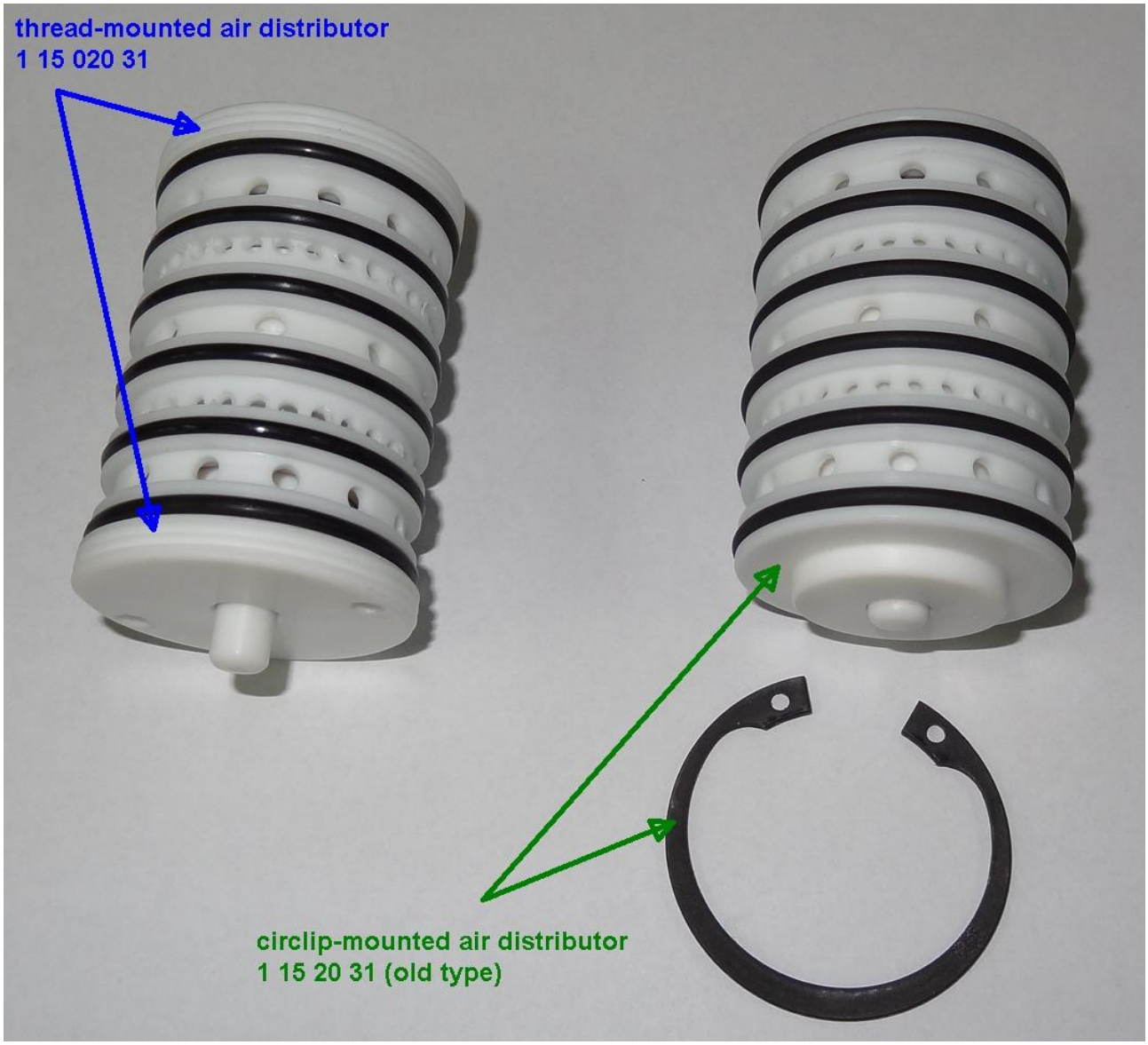
B. Air valve “15” size (part no.: 1 15 020 31, PET/NBR and 1 15 020 32, PET/FKM), applicable for DM 25/75 H.. and DM 40/125 H.. Pump models. Air valve “40” size (part no.: 1 40 020 31, PET/NBR and 1 40 020 32, PET/FKM), applicable for DM 50/315 H.. and DM 65/565 H.. Pump models:



C. Air valve “80” size (part no.: 1 80 020 31, PET/NBR and 1 80 020 32, PET/FKM), applicable for DM 80/850 H.. Pump models:



CAUTION: All the air valves stated above are thread-mounted type (actual version) – this type of assembling is available from August 2007. Before that date, air valves were assembled inside the central housing by means of circlip. Main difference between the both types of assembling are presented on the below picture:



Before placing an order for an air valve, please check the pump's serial number and/or the required air valve's appearance, then send this information to DELLMECO Office or to our Authorized Distributor's Office (in order to avoid receiving of an incorrect part).

For the Metal Series Pumps the following combinations of the main parts/O-ring execution materials can be offered:

1) AISI 316L/FKM (main parts – cylinder, piston, side covers – made from AISI 316L, the external O-rings are made from FKM) – for the sizes from DM 25/75 up to DM 65/565 size (air valves: "15" and "40" sizes).
2) Brass/EPDM (main parts – cylinder, piston, side covers – made from brass, the external O-rings are made from EPDM) – for the sizes from DM 15/30 up to DM 65/565 size (air valves: "08", "15" and "40" sizes).
3) Brass/FKM (main parts – cylinder, piston, side covers – made from brass, the external O-rings are made from FKM) – for the sizes from DM 15/30 up to DM 65/565 size (air valves: "08", "15" and "40" sizes).

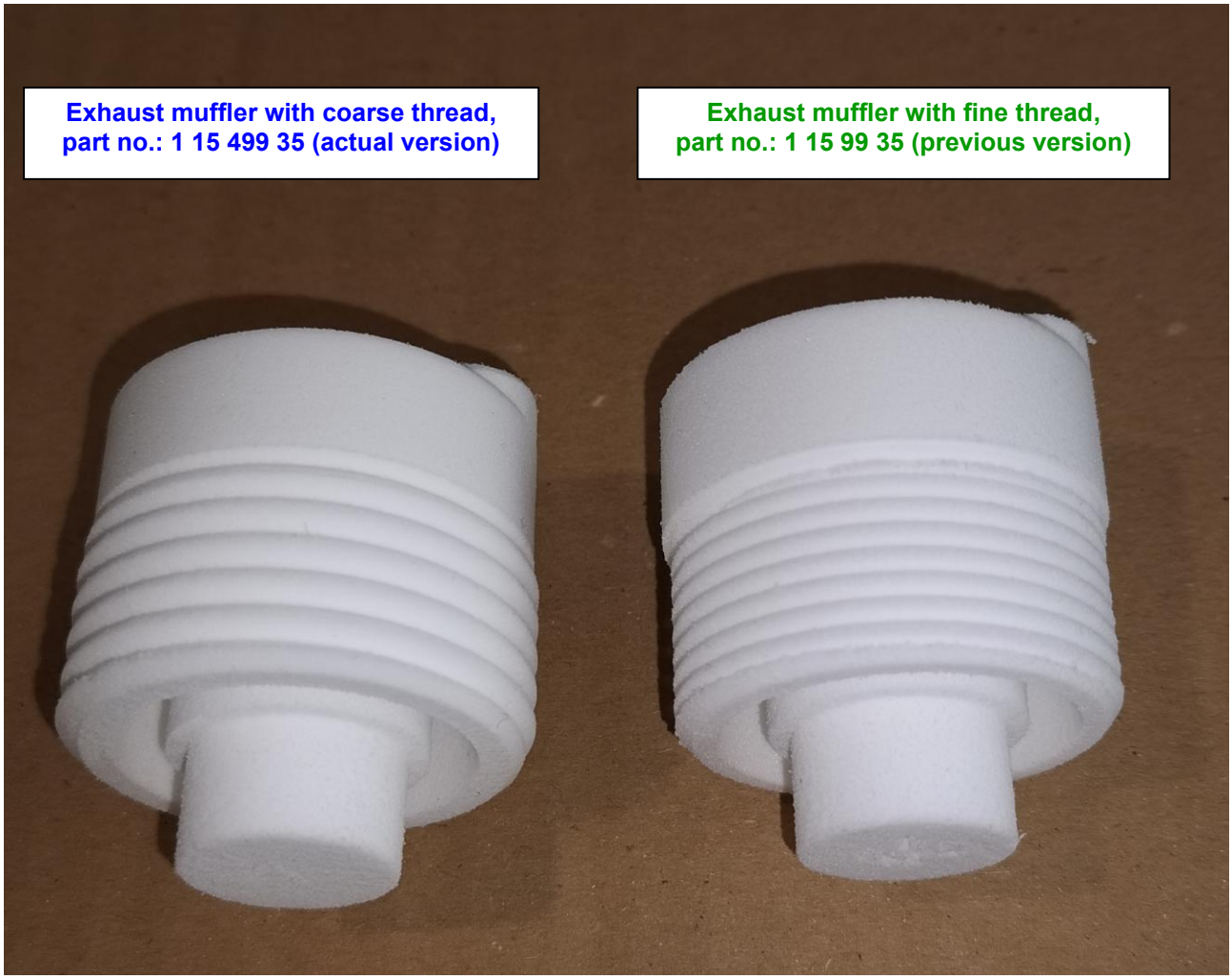
The above material executions are not available for "80" air valve size (Pump size DM 80/850).

Not always an air valve unit has to be replaced completely – in some cases, air valve may require replacement of all internal slides and O-rings only (these parts are getting wear during normal operation of the pump) – this is why we also offer DELLMECO Air Valve Spare Part Kit Set (**AVD"xx"**, where "XX" stands for the size of the air valve). Depending on the air valve size and material execution (also for the slides and O-rings), the following sets are available:

- AVD01F (“08” size air valve with FKM O-rings);
- AVD01N (“08” size air valve with NBR O-rings);
- AVD02F (“15” size air valve with FKM O-rings);
- AVD02N (“15” size air valve with NBR O-rings);
- AVD03F (“40” size air valve with FKM O-rings);
- AVD03N (“40” size air valve with NBR O-rings);
- AVD04F (“80” size air valve with FKM O-rings);
- AVD04N (“80” size air valve with NBR O-rings).

16.19. Actual version of the exhaust muffler (comparison with the previous execution)

All the DELLMECO Pumps supplied with compressed air have an exhaust muffler – its purpose is to decrease the noise caused by the de-compressed air coming out from the exhaust channel, which is situated in the central housing – on the opposite side of the pump’s compressed air inlet (air supply connection). Exhaust muffler is installed in the central housing by means of threaded connection. The connecting thread has been modified in 2018, but this amendment – implemented on both muffler and central housing – has been applied gradually (previous type of exhaust mufflers were still used, until their stocks were used up – however, old type mufflers are still available as spare parts). Difference between the actual and previously used type of thread is presented on the below picture (it applies to exhaust muffler sizes: “08”, “15”, “40” and “50”), on the example of size “15” exhaust muffler (dedicated to Hygienic Pumps: DM 25/75.. and DM 40/125 …):



CAUTION: Exhaust muffler’s previous version cannot be used as a spare part in an actual version of the central housing and vice-versa (both versions of thread are not interchangeable). To avoid any mistakes in the future, *please always ask your customer about the pump’s serial number and a picture of the actually used muffler or, at least, about a picture of the actually used muffler which has to be replaced*. This also refers to SET1 and/or SET2 spare part kit sets, where the exhaust muffler is always included (all AODD Pump models). We DO NOT take responsibility for any mistaken muffler type ordered without prior coordinating with DELLMECO, or its Authorized Distributor.

Available execution material for the exhaust mufflers:
- PE porous (standard version of pumps and also for ATEX purpose)
- Sintered bronze (only for ATEX “0”; standard version of pumps and/or for ATEX purpose – on demand).

16.20. ATEX Certificate

DELLMECO Metal Series Pumps can be used in potentially explosive atmospheres. This feature ensures the pump can safely transfer inflammable solvents, alcohols and other volatile liquids without the danger of static electricity build-up (through grounding PE conductive central housing). An appropriate combination of conductive materials makes DELLMECO Metal Series Pumps suitable to work in explosive gas and dust environments without the risk of spark formation.

Standard ATEX execution can be used for the following conditions:

CE Ex 2GD IIA/IIB T1÷T5

Optionally available is using Metal Series Pumps in ATEX “Zone 0” (on request only!):

CE 0408 Ex II 1/2 G Ex h IIB/IIC T4…T3 Ga/Gb

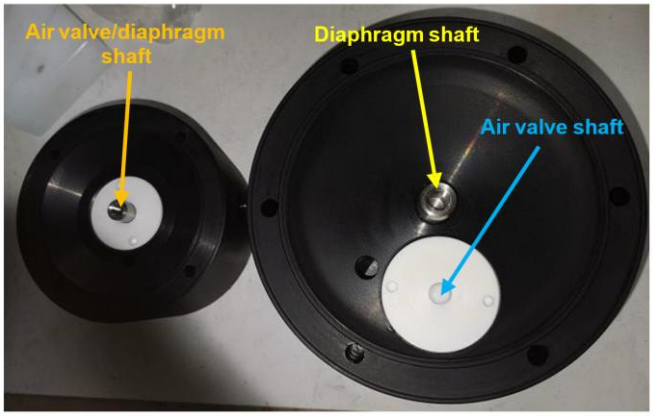
or

CE 0408 Ex II 1G Ex h IIC T4…T3 Ga/Gb

In order to obtain the additional information, please contact our customer support at: office@dellmeco.com

17. Differences in construction of air valve and special keys list

If you have any doubts when dismantling a pump, always refer to the mentioned procedures and safety notes from DELLMECO Manual for Hygienic Pumps. Among the different sizes of DELLMECO Hygienic Series (from DM 25/75 to DM 80/850), only the number of housing bolts **[9]** varies. For the size DM 15/30, the diaphragm shaft **[14]** additionally functions as the pilot piston for the air distributor (air valve). In this pump (DM 15/30 H.., H..-X), there are no central housing seals **[16]** and central housing O-rings **[30]**. Please keep these differences in construction in mind when reading the following dismantling instructions.



Comparison of two air valve types: DM 15/30 with common diaphragm/air valve shaft (left part) and from DM 25/75 to DM 80/850 – with separated air valve shaft (right part – air valve has its own shaft).

The general design of DELLMECO Hygienic Series Pumps is quite simple. However, some special tools are required in order to assemble/disassemble specific pump's parts. Each of the special tools listed below is not delivered with pump and has to be ordered separately:

1) Universal adjustable key **[99]**, with 2 pins (diameter of each pin is ca 4 mm):

This key can be used for air valve assembling/disassembling in all sizes of Hygienic Series Pumps.

2) Air valve special assembling/disassembling key, available in four sizes:

Air valve size (part no.):	Special key part no.:
"08" (1 08 020 31 and 1 08 020 32)	1 08 958 00
"15" (1 15 020 31 and 1 15 020 32)	1 15 958 00
"40" (1 40 020 31 and 1 40 020 32)	1 40 958 00
"80" (1 80 020 31 and 1 80 020 32)	1 80 958 00

NOTE: Stainless steel lever with cup nuts on each side is not a part of the key (not included).

18. Limited warranty

This product is shipped to customers only after meeting strict inspection standards. If an abnormality occurs during normal operation in accordance with the operating instructions and other operating cautions within the warranty period (24 months after date of purchase) that can be attributed to a manufacturing defect, the defective parts of this product will be serviced or the product will be replaced free of charge. However, this warranty will NOT cover compensation for incidental damage or any malfunction listed below.

1. Warranty period

This warranty is valid for 24 months after the date of purchase.

2. Warranty

If, during the warranty period, any of the material of the genuine parts of this product or the workmanship of this product is found defective, and is so verified by our company, the servicing cost will be fully covered by our company.

3. Exclusion

Even during the warranty period, this warranty DOES NOT cover the following:

1) Malfunction caused by the use of parts other than manufacturer-specified genuine parts.

2) Malfunction caused by misuse or operating errors, or lack of storage or maintenance care.

3) Malfunction caused by the use of a fluid that may cause corrosion, inflation or dissolution of the component parts of the product.

4) Irregularity caused by a repair made by other than our firm, our regional office, dealer or authorized service personnel.

5) Malfunction caused by a modification of the product by other than authorized service personnel.

6) Wear and tear of parts that must be regularly replaced in the course of normal operation, such as diaphragms, valve seats, balls, air motor sleeve valves and O-rings.

7) Malfunction and/or damage due to transportation, moving or droppage of the product after purchase.

8) Malfunction and/or damage due to fire, earthquake, flood or other force majeure.

9) Malfunction caused by the use of compressed air that contains impurities, air with oil or excessive moisture, or use of gases or fluids other than the specified compressed air.

10) Malfunction caused by the use of a fluid that causes excessive abrasion.

Furthermore, this warranty does not cover the rubber parts, or other parts that are subject to wear in normal operation, used in this product and its accessories.

4. Parts

Parts for this product will be kept available for 5 years after discontinuation of production. Once 5 years have elapsed after close of production, availability of parts for this product cannot be guaranteed.

Notes:

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