Dellmeco®

INSTRUCTION MANUAL

Air Operated Metal Series Double Diaphragm Pumps
(Aluminium, Aluminium+PTFE, Cast Iron, AISI 316, AISI 316+PTFE)

Ver. 3.29

Models (all for ATEX zones):

Standard version (with PE conductive central housing):

DM 15/25 A..-X, B..-X, C..-X

DM 20/75 A..-X, B..-X, C..-X, S..-X, V..-X

DM 25/125 A..-X, B..-X, C..-X, S..-X, V..-X

DM 40/315 A..-X, B..-X, C..-X, S..-X, V..-X

DM 50/565 A..-X, B..-X, C..-X, S..-X, V..-X

DM 80/850 A..-X, B..-X, C..-X, S..-X, V..-X

Version with stainless steel central housing:

DM 20/75 AS..-X, BS..-X, CS..-X, SS..-X, VS..-X

DM 25/125 AS..-X, BS..-X, CS..-X, SS..-X, VS..-X

DM 40/315 AS..-X, BS..-X, CS..-X, SS..-X, VS..-X

DM 50/565 AS..-X, BS..-X, CS..-X, SS..-X, VS..-X

Version with replaceable valve seats (AISI 316 Pumps only):

DM 20/75 SX..-X

DM 25/125 SX..-X

DM 40/315 SX..-X

DM 50/565 SX..-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 LTD**

Address: **Unit 1, Willow Row**
Longton, Stoke on Trent
Staffordshire, ST3 2PU, United Kingdom

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 the following material versions: Aluminium (code: A..-X), Aluminium coated with PTFE (code: B..-X), Cast Iron (code: C..-X), AISI 316 (code: S..-X) and AISI 316 coated with PTFE (code: V..-X).

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 Metal 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 [6] in all Metal Series Pumps, except DM 80/850 size, are thread-mounted with additional use of Loctite 243 Blue Medium Strenght Threadlocker. When assembling ball valve stoppers you have to use Loctite 243 necessarily to reinforce both stoppers while assembling them into the side housing.

! 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 15/25 A..-X, DM 15/25 B..-X, DM 15/25 C..-X – exploded view

Spare parts list for DM 15/25 A..-X, B..-X and C..-X Metal Series Pumps

				Pump size and material execution (A – Aluminium, B – Aluminium covered with PTFE, C – Cast Iron)		
Item	**Part name**	**Quantity**	**Material**	**DM 15/25 A..-X**	**DM 15/25 B..-X**	**DM 15/25 C..-X**
1.	Pump housing	2	Aluminium	**3 15 01 60**		
			Aluminium + PTFE		**3 15 01 61**	
			Cast Iron			**3 15 01 65**
2.**	Central housing	1	PE conductive	**1 10 10 21**		
3.	Suction/discharge port	2	Aluminium	**3 15 30 60**		
			AISI 316L		**3 15 30 53**	
			Cast Iron			**3 15 30 65**
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 valves	4	EPDM	**1 10 60 08**		
			NBR	**1 10 60 10**		
			PTFE	**1 10 60 23**		
			AISI 316	**1 10 60 52**		
			Ceramic	**1 10 60 90**		
6.	Ball valve stopper	4	AISI 304	**3 15 39 50**		
7.*	In-/outlet sealing, set (Klingersil® + O-ring)	4	EPDM	**3 15 70 08**		
			FKM	**3 15 70 09**		
			NBR	**3 15 70 10**		
9.	Housing bolt	4	AISI 304	**3 15 42 50**		
11.	Shock absorber	4	NR/St37	**1 10 69 06**		
12.	Nut with washer set	8	Zinc-plated steel	**3 15 45 48**		
			AISI 304		**3 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)]		
35.	Central housing complete	1	Diverse	**1 10 11 21**		
72.	Shock absorber mounting set (nut with washer)	4	Zinc-plated steel	**3 15 845 48**		
99.***	Universal key	1	Structural steel	**1 10 58 00**		

***** - in-/outlet standard sealing O-rings material: EPDM for EPDM diaphragms, NBR for NBR diaphragms, EPDM 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;

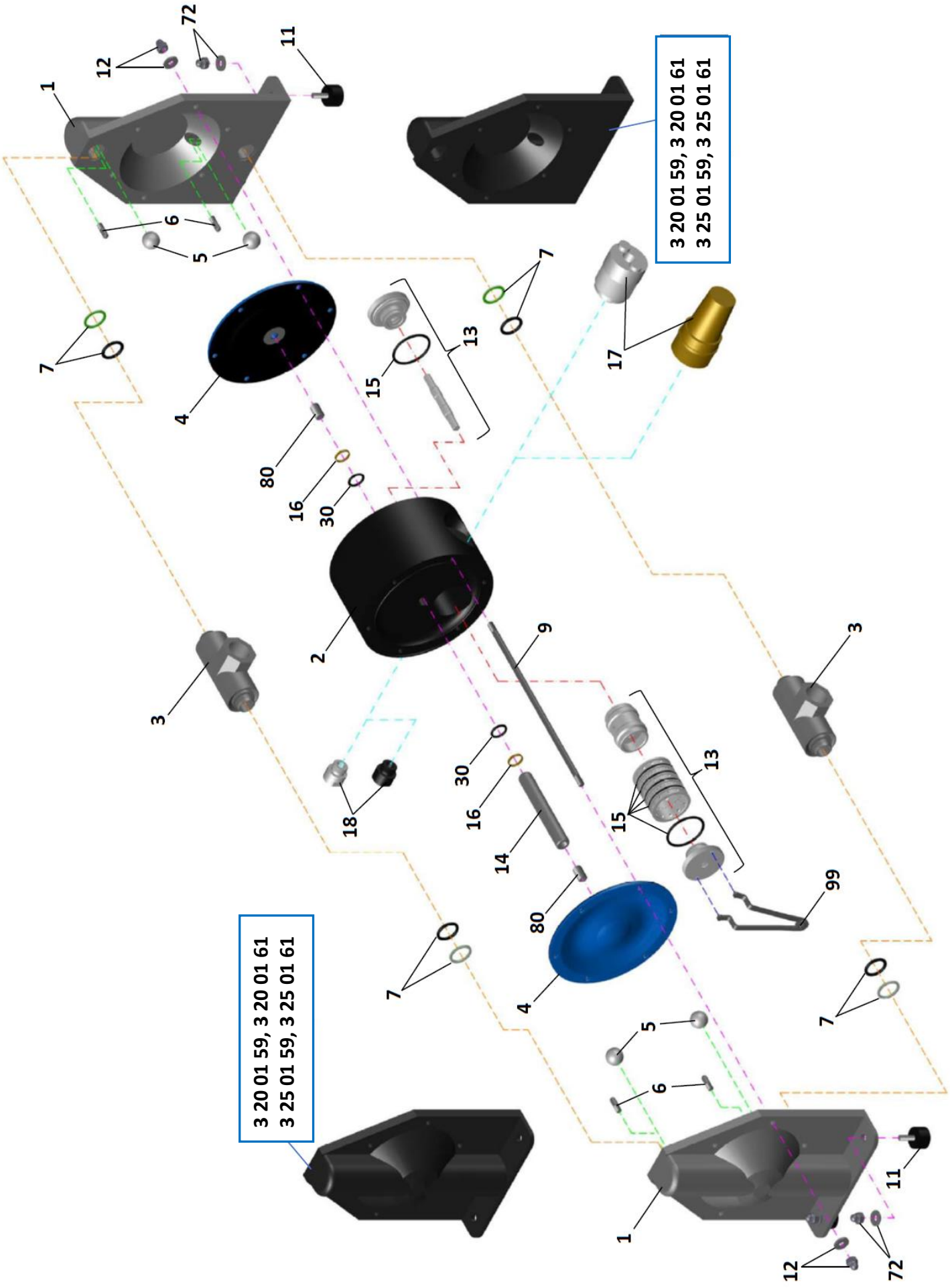
2) - obligatory for "ATEX 0" (for detailed information, please refer to "**Chapter 16.21**", page **92**), but also can be ordered separately.

List of parts for spare part kits SET 1 and SET 2 in Metal Series Pumps DM 15/25 A..-X, B..-X, C..-X

Spare part kit set type		Item	Quantity	Part description		Pump size							
						15/25							
						Material execution [A]							
						AEE-X BEE-X CEE-X	AES-X BES-X CES-X	ANN-X BNN-X CNN-X	ANS-X BNS-X CNS-X	ATT-X BTT-X CTT-X	ATS-X BTS-X CTS-X	AFT-X BFT-X CFT-X	AFS-X BFS-X CFS-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 10 60 08	1 10 60 52	1 10 60 10	1 10 60 52	1 10 60 23	1 10 60 52	1 10 60 23	1 10 60 52
		7.	4	In-/outlet sealing set		3 15 70 08		3 15 70 10		3 15 70 08			
		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 20/75 and DM 25/125 A..-X, B..-X, C..-X, S..-X, V..-X– exploded view



Spare parts list for DM 20/75 A..-X, B..-X, C..-X, S..-X, V..-X Metal Series Pumps (with ATEX)

				Pump size and material execution (A – Aluminium, B – Aluminium + PTFE, C – Cast Iron, S – AISI 316 cast, V- AISI 316 cast + PTFE)				
Item	**Part name**	**Q-ty**	**Material**	**DM 20/75 A..-X**	**DM 20/75 B..-X**	**DM 20/75 C..-X**	**DM 20/75 S..-X**	**DM 20/75 V..-X**
1.	Pump housing	2	Aluminium	**3 20 01 60**				
			Aluminium + PTFE		**3 20 01 61**			
			Cast Iron			**3 20 01 65**		
			AISI 316				**3 20 01 52**	
			AISI 316 + PTFE					**3 20 01 59**
2.**	Central housing	1	PE conductive	**1 15 10 21**				
3.	Suction/discharge port	2	Aluminium	**3 20 30 60**				
			Cast Iron			**3 20 30 65**		
			AISI 316		**3 20 30 52**		**3 20 30 52**	
			AISI 316 + PTFE					**3 20 30 59**
4.	Diaphragm	2	EPDM	**1 15 50 08**				
			NBR	**1 15 50 10**				
			TFM(PTFE)	**1 15 50 05**				
			TFM(PTFE)-PFA	**1 15 50 00**				
5.	Ball valves	4	AISI 316	**1 15 60 52**				
			EPDM	**1 15 60 08**				
			NBR	**1 15 60 10**				
			PTFE	**1 15 60 23**				
			PU	**1 50 60 07**				
			Ceramic	**1 15 60 90**				
6.	Ball valve stopper	4	AISI 304	**3 20 39 50**				
			AISI 316				**5 20 39 52**	
7.*	In-/outlet sealing, set (Klingersil® + O-ring)	4	EPDM	**3 20 70 08**				
			FEP/Silicone core				**3 20 70 03**	
			FEP/FKM core				**3 20 70 04**	
			FKM	**3 20 70 09**				
			NBR	**3 20 70 10**				
9.	Housing bolt	4	AISI 304	**3 20 42 50**		**3 20 42C 50**	**5 20 42 50**	
11.	Shock absorber	4	NR/St37	**1 15 69 06**				
			NR/A2				**1 15 69 52**	
12.	Nut with washer set	8	Zinc-plated steel	**3 20 45 48**				
			AISI 304		**3 20 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**				
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**				
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)]				
30.**	Central housing O-ring	2	NBR	**1 15 85 10**				
35.	Central housing complete	1	Diverse	**1 15 11 21**				
72.	Shock absorber mounting set	4	Zinc-plated steel	**3 20 845 48**				
			AISI 304				**3 20 845 50**	
80.	Shaft allen pin screw	2	AISI 304	**1 15 540 50**				
99.***	Universal key	1	Structural steel	**1 10 58 00**				

***** - in-/outlet standard sealing O-rings material for:
A..-X, B..-X, C..-X Pump models: EPDM for EPDM, TFM(PTFE) and TFM(PTFE)-PFA diaphragms, NBR for NBR diaphragms;
S..-X, V..-X Pump models: EPDM for EPDM diaphragms, NBR for NBR diaphragms, FEP-Silicone (FEP encapsulated Silicone core) 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 16.21**", page **92**), but also can be ordered separately.

List of parts for spare part kits SET 1 and SET 2 in Metal Series Pumps DM 20/75 A..-X, B..-X, C..-X

Spare part kit set type		Item	Quantity	Part description		Pump size							
						20/75							
						Material execution [A]							
						AEE-X BEE-X CEE-X	AES-X BES-X CES-X	ANN-X BNN-X CNN-X	ANS-X BNS-X CNS-X	ATT-X BTT-X CTT-X	ATS-X BTS-X CTS-X	AFT-X BFT-X CFT-X	AFS-X BFS-X CFS-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		3 20 70 08		3 20 70 10		3 20 70 08			
		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 Metal Series Pumps DM 20/75 S..-X, V..-X

Spare part kit set type		Item	Quantity	Part description		Pump size							
						20/75							
						Material execution [A]							
						SEE-X VEE-X	SES-X VES-X	SNN-X VNN-X	SNS-X VNS-X	STT-X VTT-X	STS-X VTS-X	SFT-X VFT-X	SFS-X VFS-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		3 20 70 08		3 20 70 10		3 20 70 03			
		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).

Spare parts list for DM 25/125 A..-X, B..-X, C..-X, S..-X, V..-X Metal Series Pumps (with ATEX)

				Pump size and material execution (A – Aluminium, B – Aluminium + PTFE, C – Cast Iron, S – AISI 316 cast, V – AISI 316 cast + PTFE)				
Item	**Part name**	**Q-ty**	**Material**	**DM 25/125 A..-X**	**DM 25/125 B..-X**	**DM 25/125 C..-X**	**DM 25/125 S..-X**	**DM 25/125 V..-X**
1.	Pump housing	2	Aluminium	**3 25 01 60**				
			Aluminium + PTFE		**3 25 01 61**			
			Cast Iron			**3 25 01 65**		
			AISI 316				**3 25 01 52**	
			AISI 316 + PTFE					**3 25 01 59**
2.**	Central housing	1	PE conductive	**1 25 10 21**				
3.	Suction/discharge port	2	Aluminium	**3 25 30 60**				
			Cast Iron			**3 25 30 65**		
			AISI 316		**3 25 30 52**		**3 25 30 52**	
			AISI 316 + PTFE					**3 25 30 59**
4.	Diaphragm	2	EPDM	**1 25 50 08**				
			NBR	**1 25 50 10**				
			TFM(PTFE)	**1 25 50 05**				
			TFM(PTFE)-PFA	**1 25 50 00**				
5.	Ball valves	4	AISI 316	**1 25 60 52**				
			EPDM	**1 25 60 08**				
			NBR	**1 25 60 10**				
			PTFE	**1 25 60 23**				
			PU	**1 25 60 07**				
			Ceramic	**1 25 60 90**				
6.	Ball valve stopper	4	AISI 304	**3 25 39 50**				
			AISI 316				**5 25 39 52**	
7.*	In-/outlet sealing, set (Klingersil® + O-ring)	4	EPDM	**3 25 70 08**				
			FEP/Silicone core				**3 25 70 03**	
			FEP/FKM core				**3 25 70 04**	
			FKM	**3 25 70 09**				
			NBR	**3 25 70 10**				
9.	Housing bolt	6	AISI 304	**3 25 42 50**		**3 25 42C 50**	**5 25 42 50**	
11.	Shock absorber	4	NR/St37	**1 25 69 06**				
			NR/A2				**1 25 69 52**	
12.	Nut with washer set	12	Zinc-plated steel	**3 25 45 48**				
			AISI 304		**3 25 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 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 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)]				
30.**	Central housing O-ring	4	NBR	**1 25 85 10**				
35.	Central housing complete	1	Diverse	**1 25 11 21**				
72.	Shock absorber mounting set	4	Zinc-plated steel	**3 25 845 48**				
			AISI 304				**3 25 845 50**	
80.	Shaft allen pin screw	2	AISI 304	**1 25 540 50**				
99.***	Universal key	1	Structural steel	**1 10 58 00**				

***** - in-/outlet standard sealing O-rings material for:
A..-X, B..-X, C..-X Pump models: EPDM for EPDM, TFM(PTFE) and TFM(PTFE)-PFA diaphragms, NBR for NBR diaphragms;
S..-X, V..-X Pump models: EPDM for EPDM diaphragms, NBR for NBR diaphragms, FEP-Silicone (FEP encapsulated Silicone core) 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 16.21**", page **92**), but also can be ordered separately.

List of parts for spare part kits SET 1 and SET 2 in Metal Series Pumps DM 25/125 A..-X, B..-X, C..-X

Spare part kit set type		Item	Quantity	Part description		Pump size							
						25/125							
						Material execution [A]							
						AEE-X BEE-X CEE-X	AES-X BES-X CES-X	ANN-X BNN-X CNN-X	ANS-X BNS-X CNS-X	ATT-X BTT-X CTT-X	ATS-X BTS-X CTS-X	AFT-X BFT-X CFT-X	AFS-X BFS-X CFS-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		3 25 70 08		3 25 70 10		3 25 70 08			
		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							

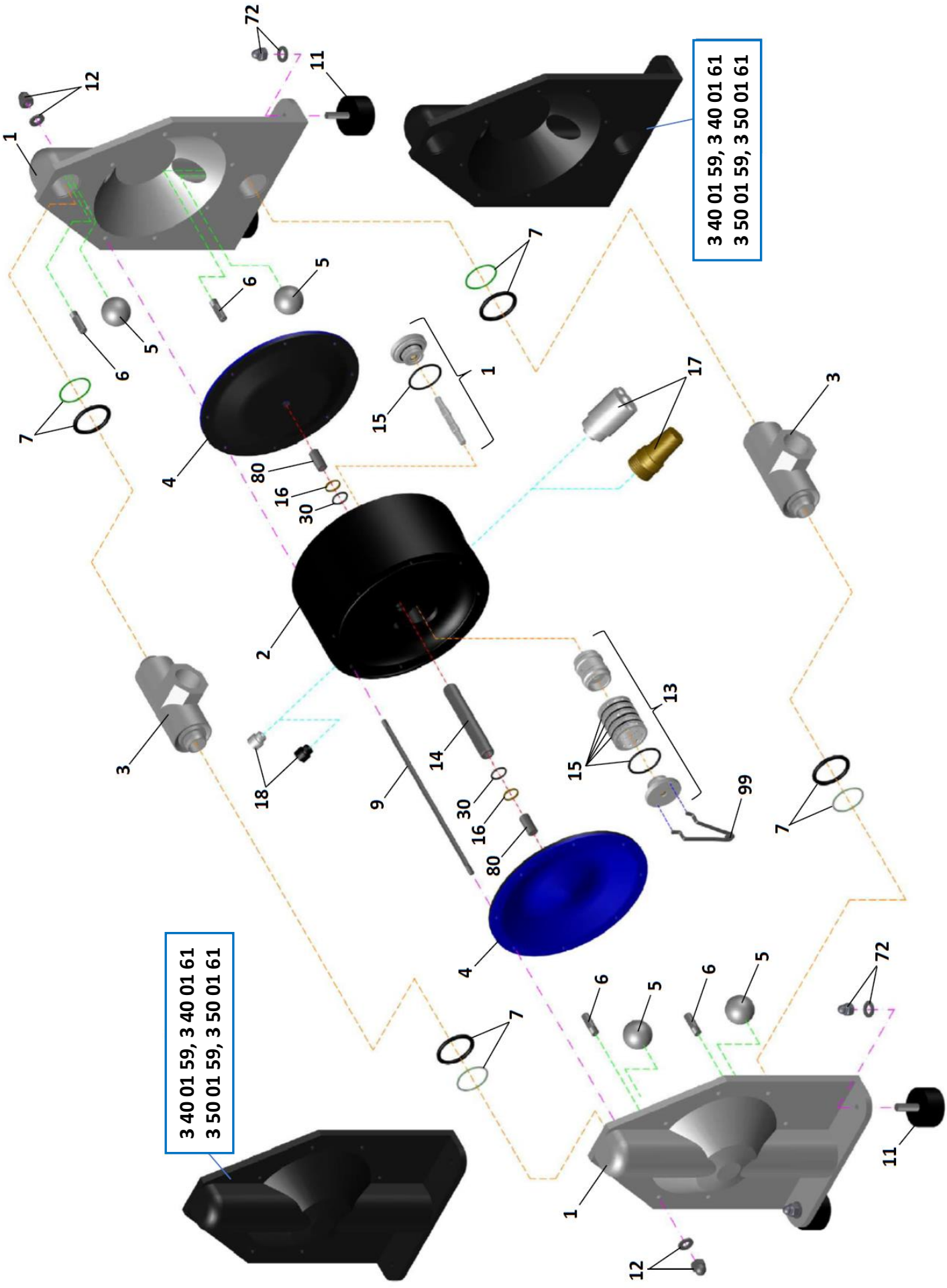
[A] - typical pump material executions (other material executions may require different spare parts);
[B] - actual exhaust muffler with coarse thread (implemented gradually from 2018), part number 1 15 499 35 (PE porous) or 1 15 499 86 (sintered bronze);
[C] - exhaust muffler from sintered bronze is 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).

List of parts for spare part kits SET 1 and SET 2 in Metal Series Pumps DM 25/125 S..-X, V..-X

Spare part kit set type		Item	Quantity	Part description		Pump size							
						25/125							
						Material execution [A]							
						SEE-X VEE-X	SES-X VES-X	SNN-X VNN-X	SNS-X SNS-X	STT-X VTT-X	STS-X VTS-X	SFT-X VFT-X	SFS-X VFS-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		3 25 70 08		3 25 70 10		3 25 70 03			
		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 40/315 and DM 50/565 A..-X, B..-X, C..-X, S..-X, V..-X – exploded view



Spare parts list for DM 40/315 A..-X, B..-X, C..-X, S..-X and V..-X Metal Series Pumps

				Pump size and material execution (A – Aluminium, B – Aluminium + PTFE, C – Cast Iron, S – AISI 316 cast, V – AISI 316 cast + PTFE)				
Item	**Part name**	**Q-ty**	**Material**	**DM 40/315 A..-X**	**DM 40/315 B..-X**	**DM 40/315 C..-X**	**DM 40/315 S..-X**	**DM 40/315 V..-X**
1.	Pump housing	2	Aluminium	**3 40 01 60**				
			Aluminium + PTFE		**3 40 01 61**			
			Cast Iron			**3 40 01 65**		
			AISI 316				**3 40 01 52**	
			AISI 316 + PTFE					**3 40 01 59**
2.**	Central housing	1	PE conductive	**1 40 10 21**				
3.	Suction/discharge port	2	Aluminium	**3 40 30 60**				
			Cast Iron			**3 40 30 65**		
			AISI 316		**3 40 30 52**		**3 40 30 52**	
			AISI 316 + PTFE					**3 40 30 59**
4.	Diaphragm	2	EPDM	**1 40 50 08**				
			NBR	**1 40 50 10**				
			TFM(PTFE)	**1 40 50 05**				
			TFM(PTFE)-PFA	**1 40 50 00**				
5.	Ball valves	4	AISI 316	**1 40 60 52**				
			EPDM	**1 40 60 08**				
			FKM	**1 40 60 09**				
			NBR	**1 40 60 10**				
			PTFE	**1 40 60 23**				
			PU	**1 40 60 07**				
6.	Ball valve stopper	4	AISI 304	**3 40 39 50**				
			AISI 316				**5 40 39 52**	
7.*	In-/outlet sealing, set (Klingersil® + O-ring)	4	EPDM	**3 40 70 08**				
			FEP/Silicone core				**3 40 70 03**	
			FEP/FKM core				**3 40 70 04**	
			FKM	**3 40 70 09**				
			NBR	**3 40 70 10**				
9.	Housing bolt	8	AISI 304	**3 40 42 50**		**3 40 42C 50**	**5 40 42 50**	
11.	Shock absorber	4	NR/St37	**1 25 69 06**				
			NR/A2				**1 25 69 52**	
12.	Nut with washer set	16	Zinc-plated steel	**3 40 45 48**				
			AISI 304		**3 40 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**				
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**				
17.**	Exhaust muffler, old version	1	PE porous	**1 40 99 35**				
			Bronze (sintered)	**1 40 99 86**				
	Exhaust muffler, actual version	1	PE porous	**1 40 499 35**				
			Bronze (sintered)	**1 40 499 86** [(2)]				
18.**	Air adapter	1	PP	**1 40 46 28**				
			PE conductive	**1 40 46 21** [(2)]				
30.**	Central housing O-ring	2	NBR	**1 40 85 10**				
35.	Central housing complete	1	Diverse	**1 40 11 21**				
72.	Shock absorber mounting set	4	Zinc-plated steel	**3 40 845 48**				
			AISI 304				**3 40 845 50**	
80.	Shaft allen pin screw	2	AISI 304	**1 40 540 50**				
99.***	Universal key	1	Structural steel	**1 10 58 00**				

***** - in-/outlet standard sealing O-rings material for:
A..-X, B..-X, C..-X Pump models: EPDM for EPDM, TFM(PTFE) and TFM(PTFE)-PFA diaphragms, NBR for NBR diaphragms;
S..-X, V..-X Pump models: EPDM for EPDM diaphragms, NBR for NBR diaphragms, FEP-Silicone (FEP encapsulated Silicone core) 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 16.21**", page **92**), but also can be ordered separately.

List of parts for spare part kits SET 1 and SET 2 in Metal Series Pumps DM 40/315 A..-X, B..-X, C..-X

Spare part kit set type		Item	Quantity	Part description		Pump size							
						40/315							
						Material execution [A]							
						AEE-X BEE-X CEE-X	AES-X BES-X CES-X	ANN-X BNN-X CNN-X	ANS-X BNS-X CNS-X	ATT-X BTT-X CTT-X	ATS-X BTS-X CTS-X	AFT-X BFT-X CFT-X	AFS-X BFS-X CFS-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		3 40 70 08		3 40 70 10		3 40 70 08			
		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 Metal Series Pumps DM 40/315 S..-X, V..-X

Spare part kit set type		Item	Quantity	Part description		Pump size							
						40/315							
						Material execution [A]							
						SEE-X VEE-X	SES-X VES-X	SNN-X VNN-X	SNS-X VNS-X	STT-X VTT-X	STS-X VTS-X	SFT-X VFT-X	SFS-X VFS-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		3 40 70 08		3 40 70 10		3 40 70 03			
		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).

Spare parts list for DM 50/565 A..-X, B..-X, C..-X, S..-X and V..-X Metal Series Pumps

				Pump size and material execution (A – Aluminium, B – Aluminium + PTFE, C – Cast Iron, S – AISI 316 cast)				
Item	**Part name**	**Q-ty**	**Material**	**DM 50/565 A..-X**	**DM 50/565 B..-X**	**DM 50/565 C..-X**	**DM 50/565 S..-X**	**DM 50/565 V..-X**
1.	Pump housing	2	Aluminium	**3 50 01 60**				
			Aluminium + PTFE		**3 50 01 61**			
			Cast Iron			**3 50 01 65**		
			AISI 316				**3 50 01 52**	
			AISI 316 + PTFE					**3 50 01 59**
2.**	Central housing	1	PE conductive	**1 50 10 21**				
3.	Suction/discharge port	2	Aluminium	**3 50 30 60**				
			Cast Iron			**3 50 30 65**		
			AISI 316		**3 50 30 52**		**3 50 30 52**	
			AISI 316 + PTFE					**3 50 30 59**
4.	Diaphragm	2	EPDM	**1 50 50 08**				
			NBR	**1 50 50 10**				
			TFM(PTFE)	**1 50 50 05**				
5.	Ball valves	4	AISI 316	**1 50 60 52**				
			EPDM	**1 50 60 08**				
			NBR	**1 50 60 10**				
			PTFE	**1 50 60 23**				
			PU	**1 50 60 07**				
6.	Ball valve stopper	4	AISI 304	**3 50 39 50**				
			AISI 316				**5 50 39 52**	
7.*	In-/outlet sealing, set (Klingersil® + O-ring)	4	EPDM	**3 50 70 08**				
			FEP/Silicone core				**3 50 70 03**	
			FEP/FKM core				**3 50 70 04**	
			FKM	**3 50 70 09**				
			NBR	**3 50 70 10**				
9.	Housing bolt	8	AISI 304	**3 50 42 50**		**3 50 42C 50**	**5 50 42 50**	
11.	Shock absorber	4	NR/St37	**1 40 69 06**				
			NR/A2				**1 40 69 52**	
12.	Nut with washer set	16	Zinc-plated steel	**3 50 45 48**				
			AISI 304		**3 50 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 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 50 85 22**				
17.**	Exhaust muffler, old version	1	PE porous	**1 50 99 35**				
			Bronze (sintered)	**1 50 99 86**				
	Exhaust muffler, actual version	1	PE porous	**1 50 499 35**				
			Bronze (sintered)	**1 50 499 86** [(2)]				
18.**	Air adapter	1	PP	**1 40 46 28**				
			PE conductive	**1 40 46 21** [(2)]				
30.**	Central housing O-ring	2	NBR	**1 50 85 10**				
35.	Central housing complete	1	Diverse	**1 50 11 21**				
72.	Shock absorber mounting set	4	Zinc-plated steel	**3 50 845 48**				
			AISI 304				**3 50 845 50**	
80.	Shaft allen pin screw	2	AISI 304	**1 50 540 50**				
99.***	Universal key	1	Structural steel	**1 10 58 00**				

***** - in-/outlet standard sealing O-rings material for:
A..-X, B..-X, C..-X Pump models: EPDM for EPDM, TFM(PTFE) and TFM(PTFE)-PFA diaphragms, NBR for NBR diaphragms;
S..-X, V..-X Pump models: EPDM for EPDM diaphragms, NBR for NBR diaphragms, FEP-Silicone (FEP encapsulated Silicone core) 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 16.21**", page **92**), but also can be ordered separately.

List of parts for spare part kits SET 1 and SET 2 in Metal Series Pumps DM 50/565 A..-X, B..-X, C..-X

Spare part kit set type		Item	Quantity	Part description		Pump size					
						50/565					
						Material execution [A]					
						AEE-X BEE-X CEE-X	AES-X BES-X CES-X	ANN-X BNN-X CNN-X	ANS-X BNS-X CNS-X	ATT-X BTT-X CTT-X	ATS-X BTS-X CTS-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		3 50 70 08		3 50 70 10		3 50 70 08	
		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.	2	Central housing O-ring		1 50 85 10					
		82.	2	Shaft allen pin screw		1 50 540 50					

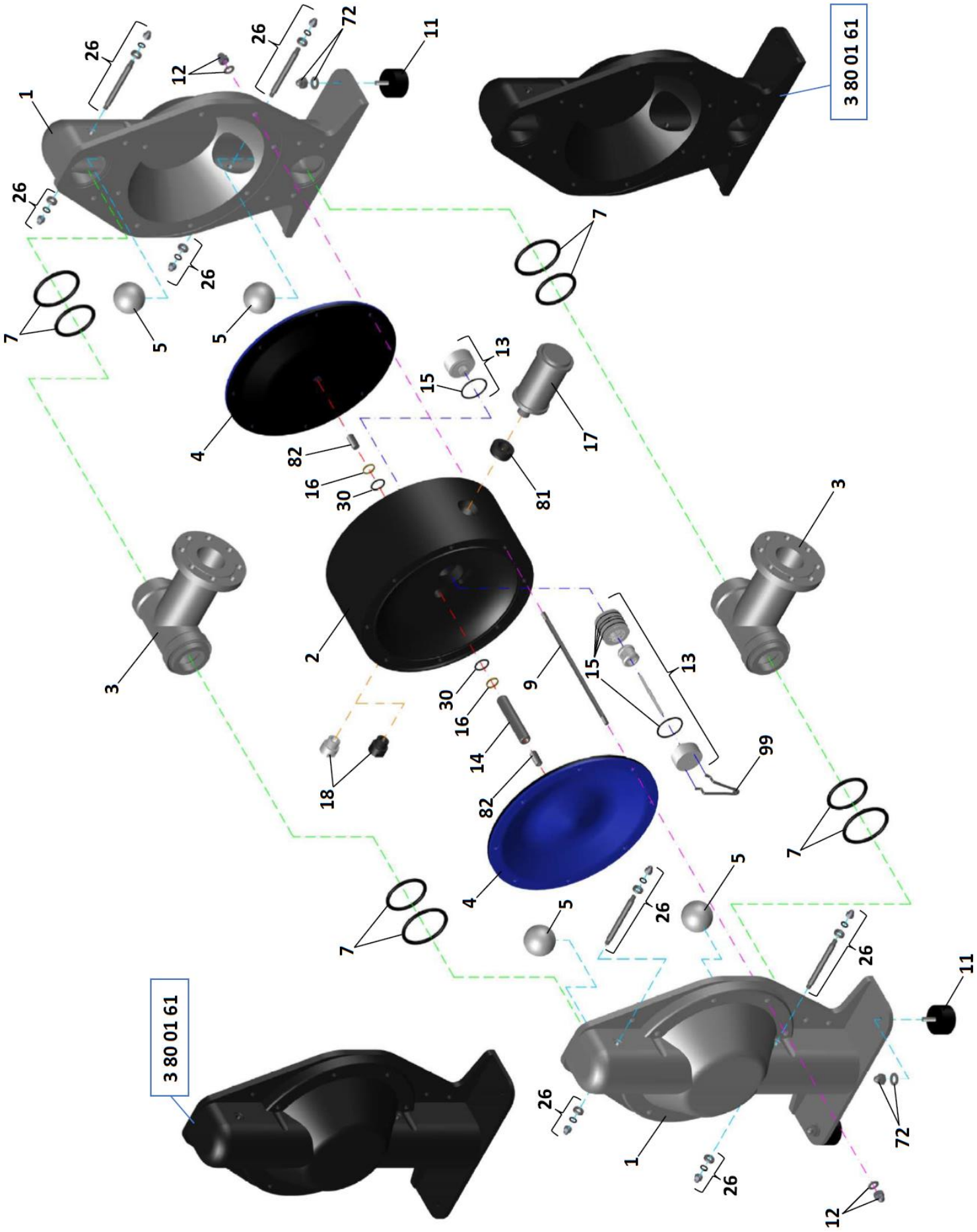
[A] - typical pump material executions (other material executions may require different spare parts);
[B] - actual exhaust muffler with coarse thread (implemented gradually from 2018), part number 1 50 499 35 (PE porous) or 1 50 499 86 (sintered bronze);
[C] - exhaust muffler from sintered bronze is 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).

List of parts for spare part kits SET 1 and SET 2 in Metal Series Pumps DM 50/565 S..-X, V..-X

Spare part kit set type		Item	Quantity	Part description		Pump size					
						50/565					
						Material execution [A]					
						SEE-X VEE-X	SES-X VES-X	SNN-X VNN-X	SNS-X VNS-X	STT-X VTT-X	STS-X VTS-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		3 50 70 08		3 50 70 10		3 50 70 03	
		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.	2	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 A..-X, B..-X, C..-X – exploded view



Spare parts list for DM 80/850 A..-X, B..-X, C..-X Metal Series Pumps (with ATEX)

				Pump size and material execution (A – Aluminium, B – Aluminium + PTFE, C – Cast Iron)		
Item	**Part name**	**Q-ty**	**Material**	**DM 80/850 A..-X**	**DM 80/850 B..-X**	**DM 80/850 C..-X**
1.	Pump housing	2	Aluminium	**3 80 01 60**		
			Aluminium + PTFE		**3 80 01 61**	
			Cast Iron			**3 80 01 65**
2.**	Central housing	1	PE conductive	**1 80 10 21**		
3.	Suction/discharge port with integrated flange connection (UNI 2278, PN16)	2	Aluminium	**3 80 30 60**		
			Aluminium + PTFE		**3 80 30 61**	
			Cast Iron			**3 80 30 65**
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 60 08**		
			NBR	**1 80 60 10**		
			PTFE	**1 80 60 23**		
7.*	In-/outlet sealing, set (O-ring, int. + O-ring, ext.)	4	EPDM + EPDM	**3 80 70 08**		
			NBR + NBR	**3 80 70 10**		
			EPDM +FKM	**3 80 570 00**		
			EPDM + FEP/FKM	**3 80 670 00**		
9.	Housing bolt	8	AISI 304	**3 80 42 50**		
11.	Shock absorber	4	NR/St37	**1 80 69 06**		
12.	Nut with washer set	16	Zinc-plated steel	**3 80 45 48**		
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)]		
26.	Valve stopper, complete	4	AISI 304 + PTFE	**3 80 139 00**		
30.**	Central housing O-ring	2	NBR	**1 80 85 10**		
35.	Central housing complete	1	Diverse	**1 80 11 21**		
72.	Shock absorber mounting set	4	Zinc-plated steel	**3 80 845 48**		
81.**	Muffler adapter	1	PE conductive	**1 80 299 21**		
82.	Shaft allen pin screw	2	AISI 304	**1 80 540 50**		
99.***	Universal key	1	Structural steel	**1 10 58 00**		

***** - in-/outlet standard sealing material: EPDM O-rings for EPDM diaphragms, NBR O-rings for NBR diaphragms, EPDM+FEP/FKM O-ring 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;

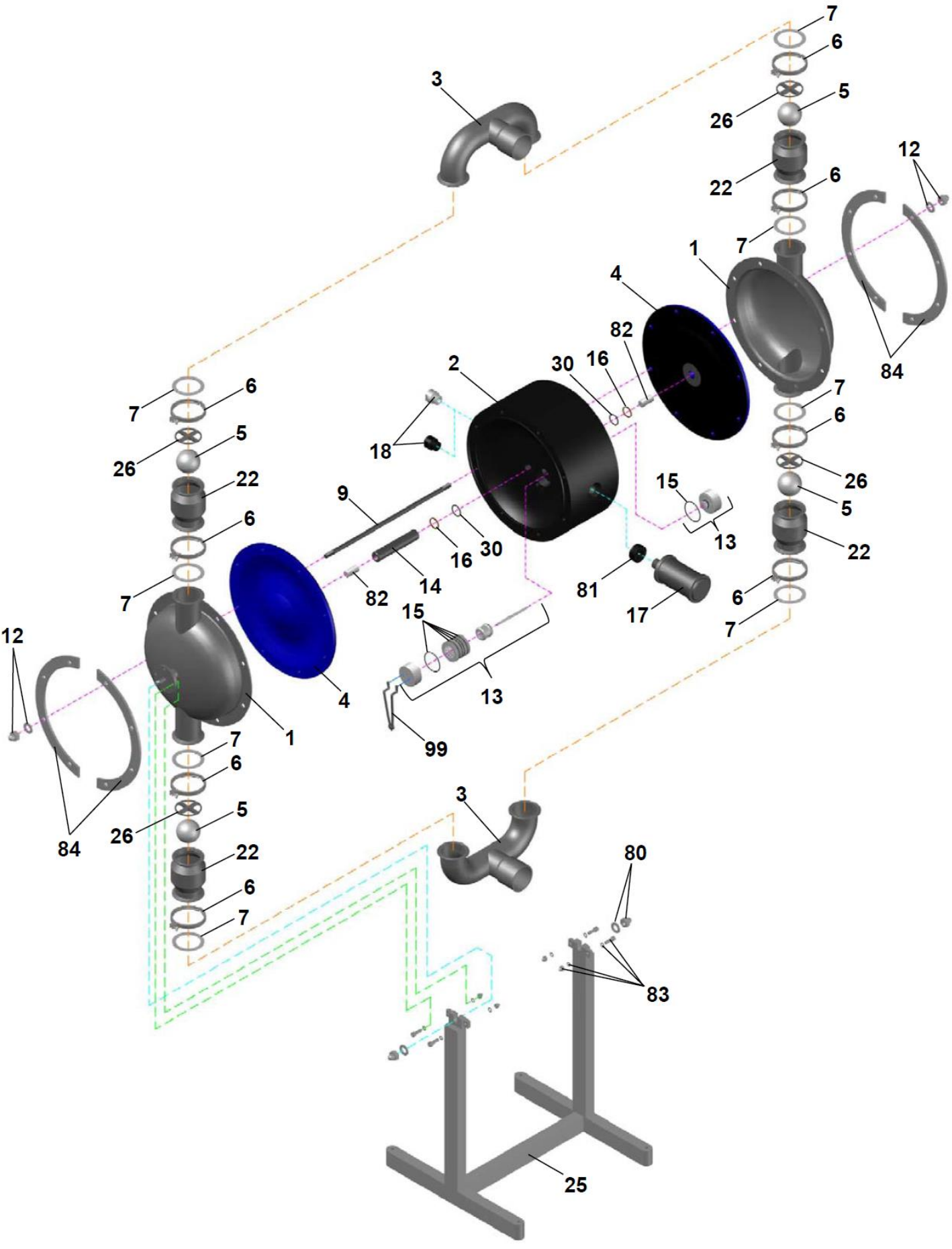
2) – available on demand.

List of parts for spare part kits SET 1 and SET 2 in Metal Series Pumps DM 80/850 A..-X, B..-X, C..-X (with ATEX)

Spare part kit set type		Item	Quantity	Part description	Pump size DM 80/850		
					Material execution [A)]		
					AEE-X BEE-X CEE-X	ANN-X BNN-X CNN-X	ATT-X BTT-X CTT-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 60 08**	**1 80 60 10**	**1 80 60 23**
		7.	4	In-/outlet sealing	**3 80 70 08**	**3 80 70 10**	**3 80 70 08**
		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.	2	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).

5.5. DM 80/850 S..-X – exploded view



Spare parts list for DM 80/850 S..-X Industrial Series Pumps (with ATEX)

				Pump size and material execution (S – AISI 316L, (S) – sand-blasted)
Item	**Part name**	**Q-ty**	**Material**	**DM 80/850 S..-X**
1.	Pump housing	2	AISI 316L	**5 80 01 53(S)**
2.**	Central housing	1	PE conductive	**1 80 10 21**
3.	Suction/discharge port	2	AISI 316L	**5 80 30 53(S)**
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 seat	4	AISI 316L	**5 80 54 53(S)**
25.	Support with collar mounting	1	AISI 304	**5 80 596 50(S)**
26.	Valve stopper	4	AISI 316L	**5 80 39 53(S)**
30.**	Central housing O-ring	2	NBR	**1 80 85 10**
35.	Central housing complete	1	Diverse	**1 80 11 21**
80.	Support nut with washer, set	2	AISI 304	**1 80 45 50**
81.**	Muffler adapter	1	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, set	4	AISI 304	**5 80 529 50(S)**
99.***	Universal key	1	Structural steel	**1 10 58 00**

***** - in-/outlet standard sealing material: EPDM O-rings for EPDM diaphragms, NBR O-rings for NBR diaphragms, PTFE 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) – available on demand;
(S) - sand-blasted parts.

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

Spare part kit set type		Item	Quantity	Part description	Pump size DM 80/850 S..-X		
					Material execution [A)]		
					SEE-X	SNN-X	STT-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 60 08**	**1 80 60 10**	**1 80 60 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.	2	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.

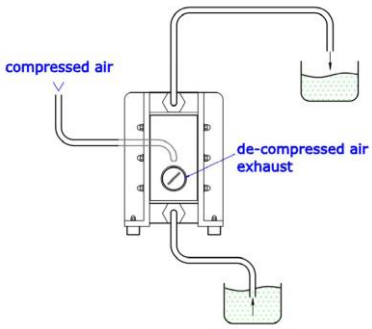
Note:

- 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.

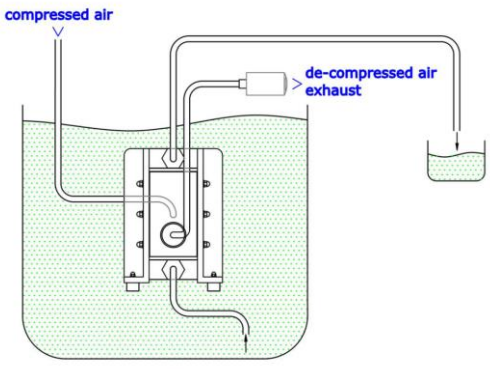
SELF PRIMING APPLICATION

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).



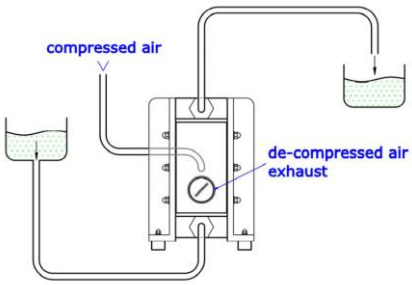
SUBMERGED OPERATION

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.



⚠ 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 15/25	DM 20/75	DM 25/125	DM 40/315	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 15/25	DM 20/75	DM 25/125	DM 40/315	DM 50/565	DM 80/850
Housing bolts [Nm]	A..-X (Aluminium) B..-X (Aluminium + PTFE) C..-X (Cast Iron)	6	8	13	17	22	25
	S..-X (AISI 316)		8	13	17	22	40
Ball valve stoppers [Nm] (use LOCTITE 243)	A..-X (Aluminium) B..-X (Aluminium + PTFE) C..-X (Cast Iron)	5	7	7	8	8	
	S..-X (AISI 316)		7	7	8	8	

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.

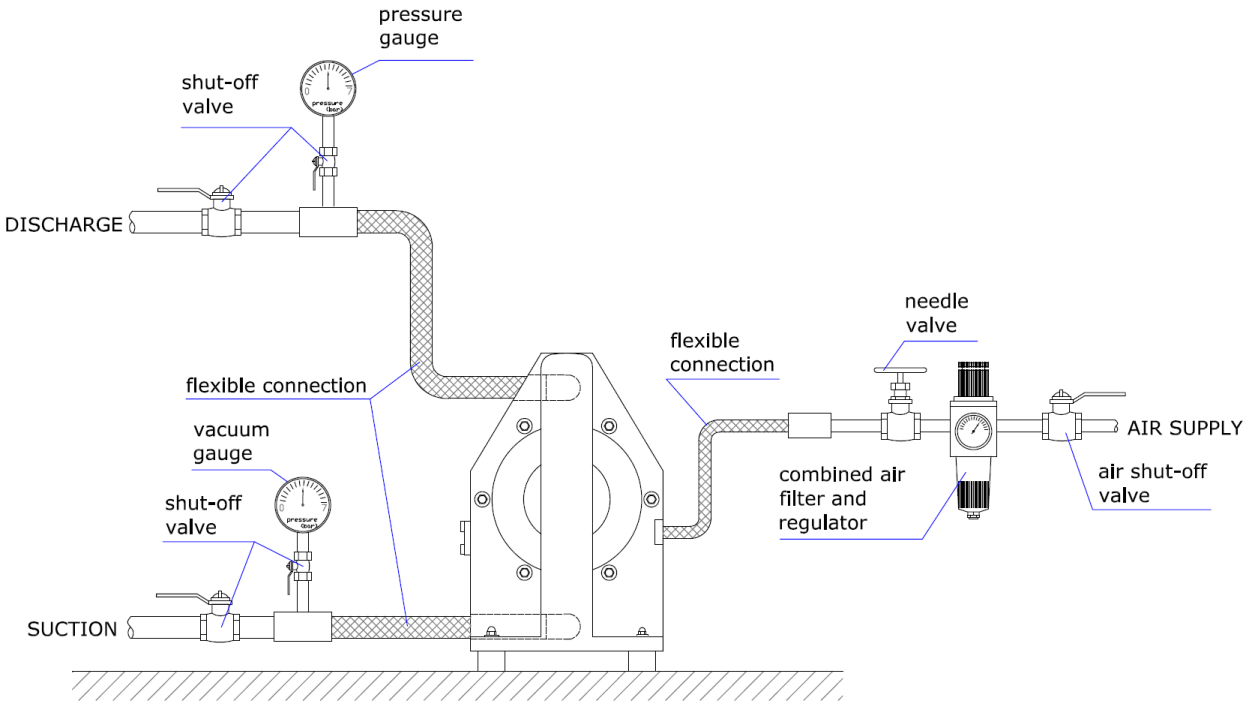
c) Use 2.0 mm^2 minimum ground wire.

⚠ 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 Pumps) 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 35)**,** 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

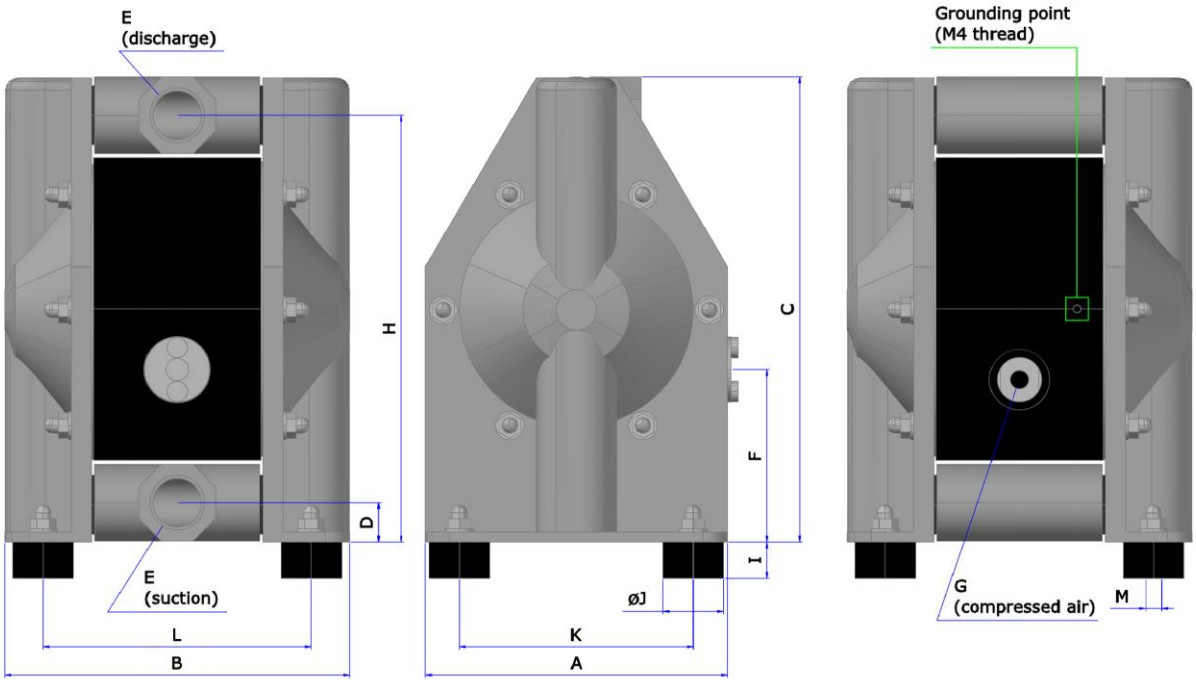
14.1. Main specification

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 15/25 A..-X, B..-X, C..-X to DM 50/565 A..-X, B..-X, C..-X, S..-X, V..-X:

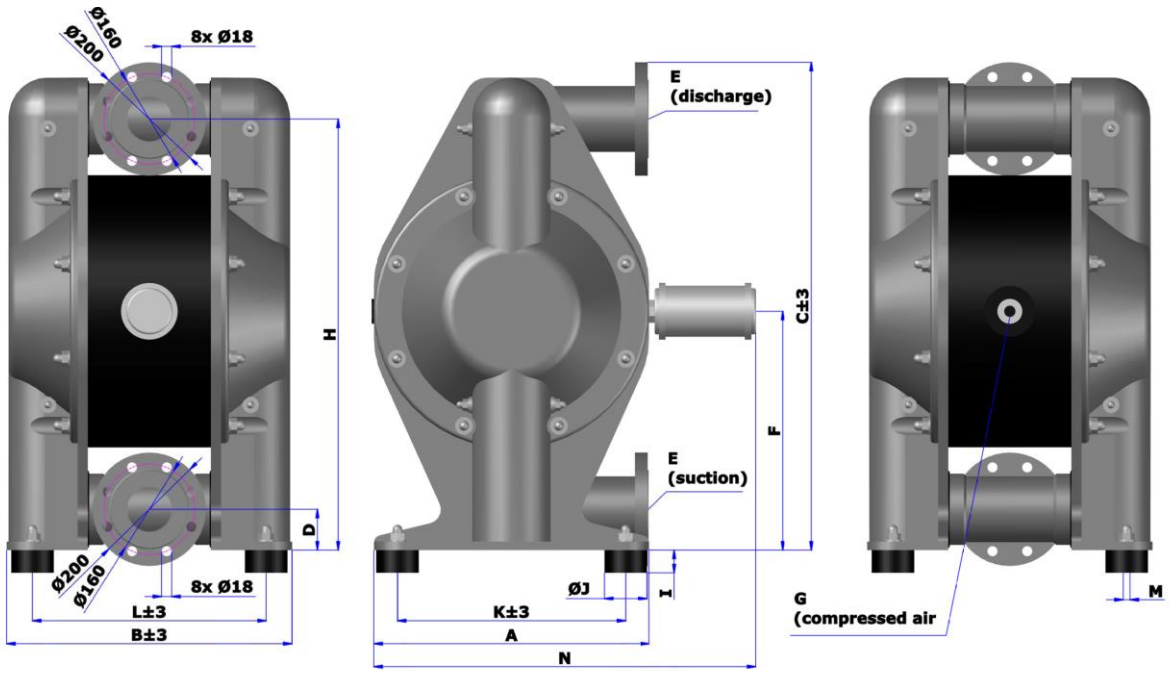


A..-X (Aluminium) B..-X (Alu+PTFE) C..-X (Cast iron)	A	B	C	D	E	F	G	H	I	ØJ	K	L	M
DM 15/25	104	122	168	17	G ½"	85	R 1/8"	153	10	15	84	98	M4
DM 20/75	150	171	230	21	G ¾"	86	R ¼"	212	18	30	116	133	M8
DM 25/125	200	202	305	27	G 1"	115	R ¼"	280	28	40	160	164	
DM 40/315	270	267	415	34	G 1 ½"	108	R ½"	382	28	40	220	213	
DM 50/565	352	345	546	48	G 2"	167	R ½"	501	30	60	282	281	

S..-X (AISI 316, Industrial) V..-X (AISI 316 + PTFE)	A	B	C	D	E	F	G	H	I	ØJ	K	L	M
DM 20/75	153	177	235	25	G 1/2"	87	R 1/4"	217	18	30	112	136	M8
DM 25/125	200	232	312	35	G 1"	123	R 1/4"	287	28	40	140	170	
DM 40/315	270	312	426	42	G 1 1/2"	109	R 1/2"	388	30	60	190	227	
DM 50/565	350	345	540	45	G 2"	158	R 1/2"	493	30	60	286	284	

CAUTION: All Metal Series Pump are equipped with ATEX Certificate as a standard. 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.

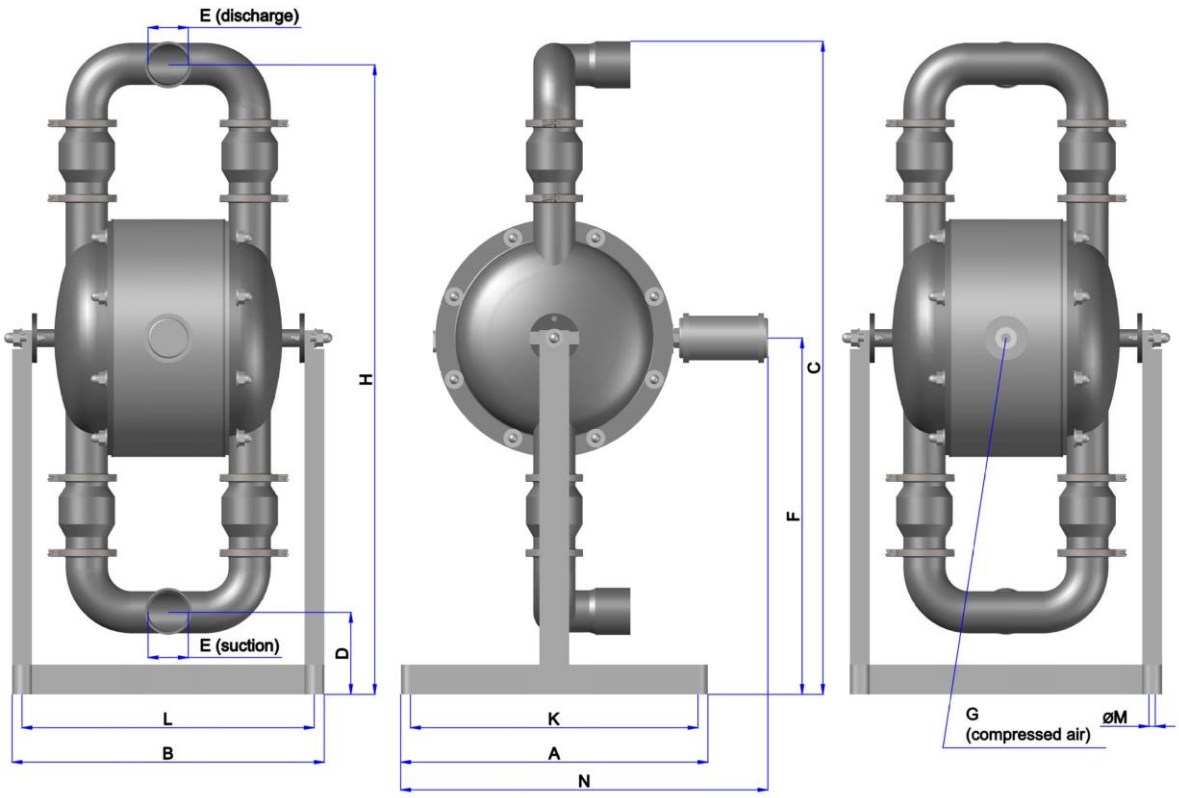
DM 80/850 A..-X, B..-X, C..-X:



A..-X (Aluminium) B..-X (Alu+PTFE) C..-X (Cast iron)	A	B	C	D	E	F	G	H	I	ØJ	K	L	M	N
DM 80/850	485	500	900	72	DN80 PN16 DIN 2577 flanges(*)	421	R ¾"	760	40	75	402	414	M12	673

(*) – also available internal 3" BSPP thread (as additional type of connection)

DM 80/850 S..-X:



S..-X (AISI 316L, sand-blasted)	A	B	C	D	E	F	G	H	I	øJ	K	L	øM	N
DM 80/850	620	630	1318	165	BSPP 3"	719	R ¾"	1270			580	590	13	741

14.3. Technical Data

Pump size	15/25	20/75	25/125	40/315	50/565	80/850	
Wetted parts material	Alu, Alu+PTFE(*), CI	Alu, Alu+PTFE, CI, AISI 316, AISI 316+PTFE				Alu, Alu+PTFE(*), CI	AISI 316L (sand-blasted)
Max. capacity [l/min.]	15	75	125	315	565	850	
Max. pressure [bar g]	8						
Nominal port size [in.]	BSPP ½"	BSPP ¾"	BSPP 1"	BSPP 1 ½"	BSPP 2"	DN80 DIN/PN16 (incl. BSPP 3")	BSPP 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 – Alu, Alu+PTFE [kg]	2	5	8	18	33	118	
Weight – Cast Iron [kg]	4	10	16	37	75		340
Weight – AISI 316 [kg]		9.5	14	31	70		105
Diaphragm material options	**EPDM, NBR, TFM, TFM-PFA**				**EPDM, NBR, TFM**		
Valve balls material options	**AISI 316, PTFE**	**AISI 316, Ceramic, EPDM, NBR, PTFE, FKM (Viton)**					**EPDM, NBR, PTFE**
O-rings material options	**EPDM, NBR**	**EPDM, NBR, FEP/Silicone, FEP/FKM**				**EPDM, NBR**	**EPDM, NBR, PTFE**

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

14.4. Pump code

DM 20/75 STS-X-DM 1

DM – Dellmeco Pump

20 – ¾" BSPP port dimension

75 – max capacity l/min at 8 bar air supply pressure

S – Housing material:

A – Aluminium

B – Aluminium covered with PTFE

C – Cast Iron

S – AISI 316

V – AISI 316 covered with PTFE

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

ATEX Certificate included in standard version of the Metal 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

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

DM1 – Diaphragm Monitoring, NAMUR – ATEX

DM2 – Diaphragm Monitoring with controller

F1 – Flange Connection PN10 with EPDM O-ring

F2 – Flange Connection PN10 with NBR O-ring

F3 – Flange Connection PN10 with FEP/FKM O-ring

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

NPT – NPT thread connection (female)

BSPT – BSPT thread connection (female)

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

AF1, AF2 - Air filter, regulator, valve, nipple, connector

D – Drum pump

HP – High pressure

MV – Pump with solenoid valve

S – Sleeve with split connections

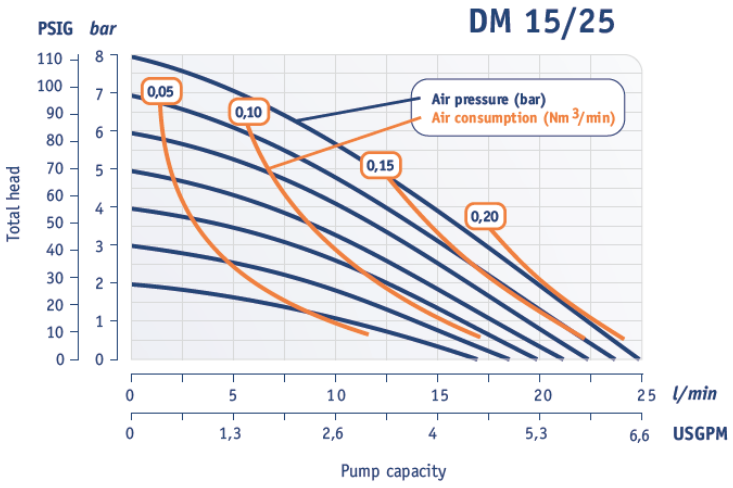
SSC – Pump with AISI 316 inlet/outlet connections

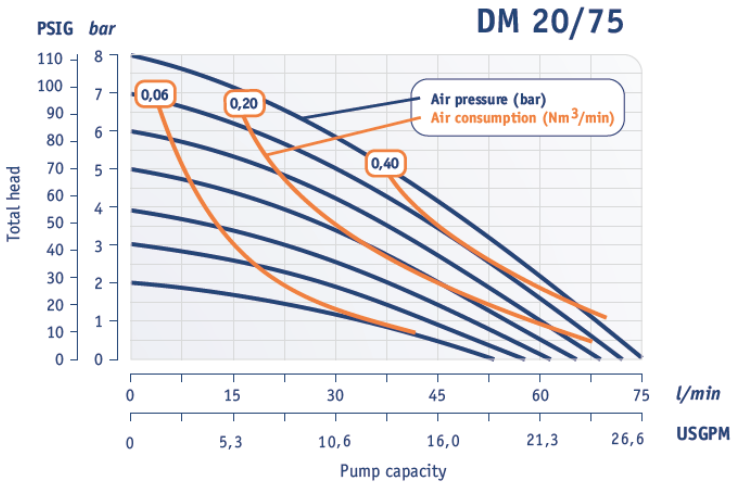
P – Powder pump

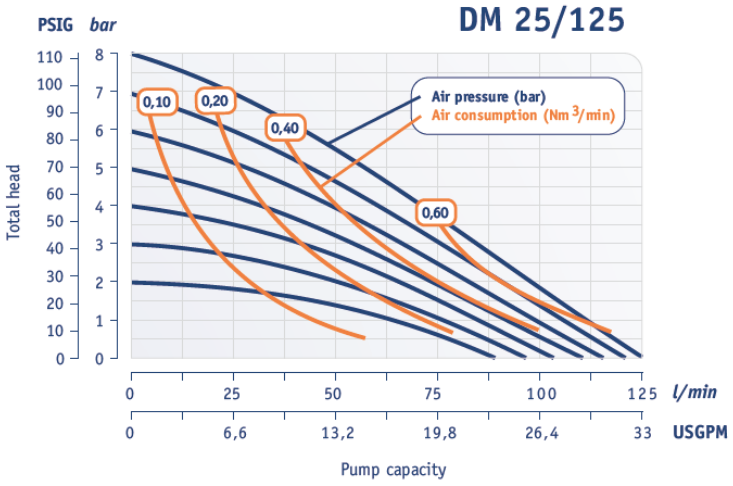
T – Trolley

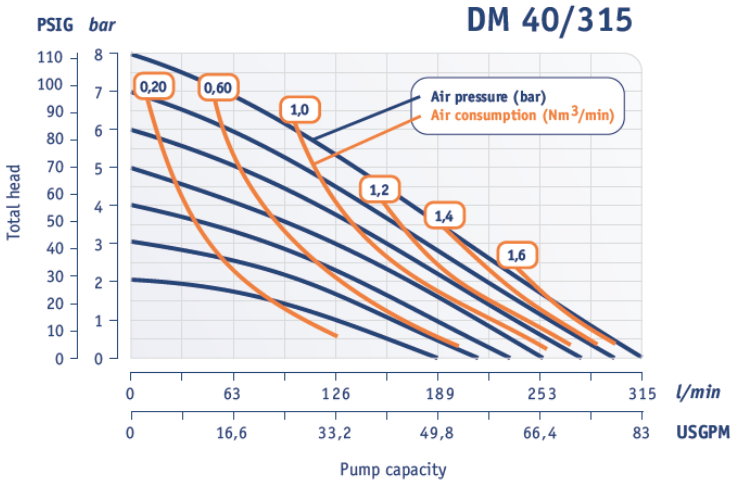
CLEAN – The clean package to meet enlarged purity requirements for special pump applications

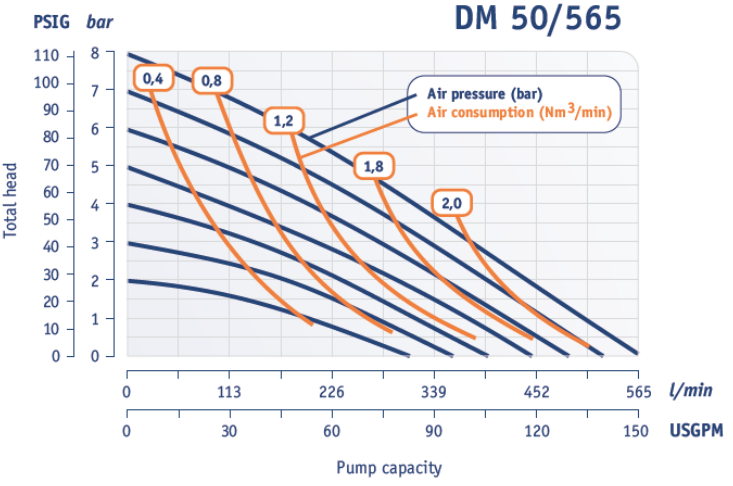
14.5. Performance curves

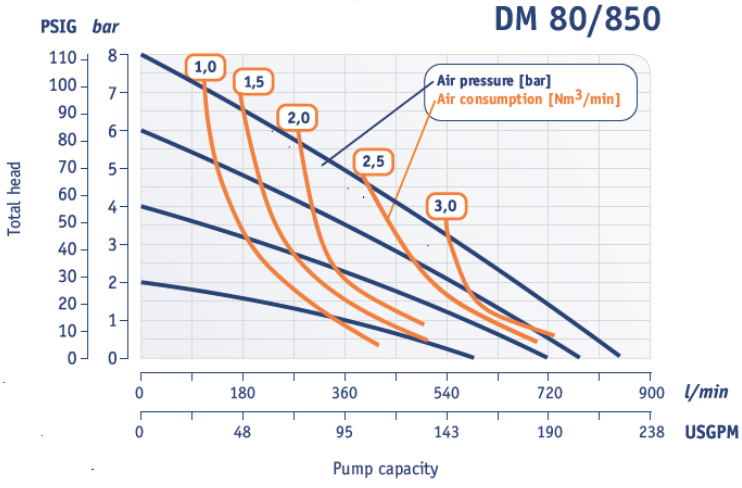












15. Dellmeco Active Pulsation Dampeners for Metal Pumps

15.1. Main specification

The Dellmeco Metal 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 Metal 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** **A** **E** **R**

Material of dampener head: **R** - PE conductive

Diaphragm material: **E** - EPDM, **F** - TFM-PFA, **N** - NBR, **T** - TFM(PTFE)

Material of dampener housing: **A** - Aluminium, **S** - AISI 316L

Size, nominal connection size: **15**: G ½", **20**: G ¾", **25**: G 1", **40**: G 1 ½"', **50**: G 2", **80**: G 3"

DELLMECO Active Pulsation Dampener

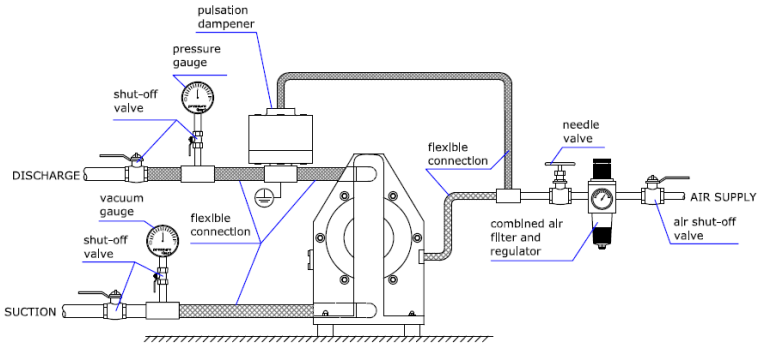
Air supply connection: **DM 15-25**: R 1/8", **DM 40-50**: R 1/4" , **DM 80**: R ½"

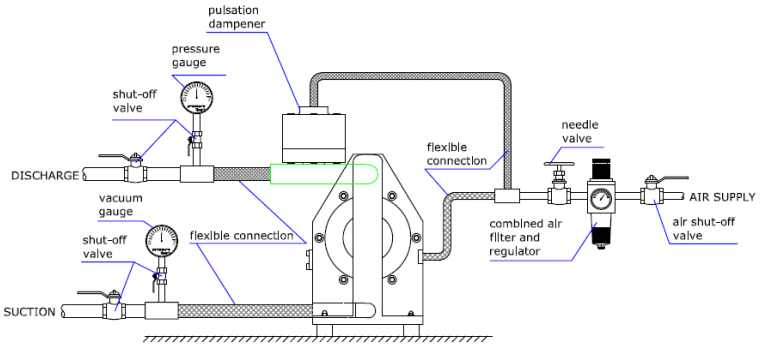
Max. operating pressure: 7 bar g

Max. operating temperature: 110˚C.

For inflammable liquids as well as for applications in explosion protected areas, all Metal Series dampeners 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 Metal Series are dispatched as separated units, without possibility of connecting them together (left picture). However, it is available to order a special T-connection (from conductive 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 carefully screwed into the thread at the top of T-connection (assembled on the pump's discharge port). Be careful - exceeded tightening may damage the thread. Besides, a correct positioning of the O-ring [**45**] within the groove has to be ensured.





The DELLMECO Pulsation Dampener of the Metal 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 Plastic 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 the pump, take care that pump and 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 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 20**	**DM 25**	**DM 40**	**DM 50**	**DM 80(*)**
AER, AFR, ANR, ATR	4	4	6	10	16	20
SER, SFR, SNR, STR	-	5	8	12	18	20

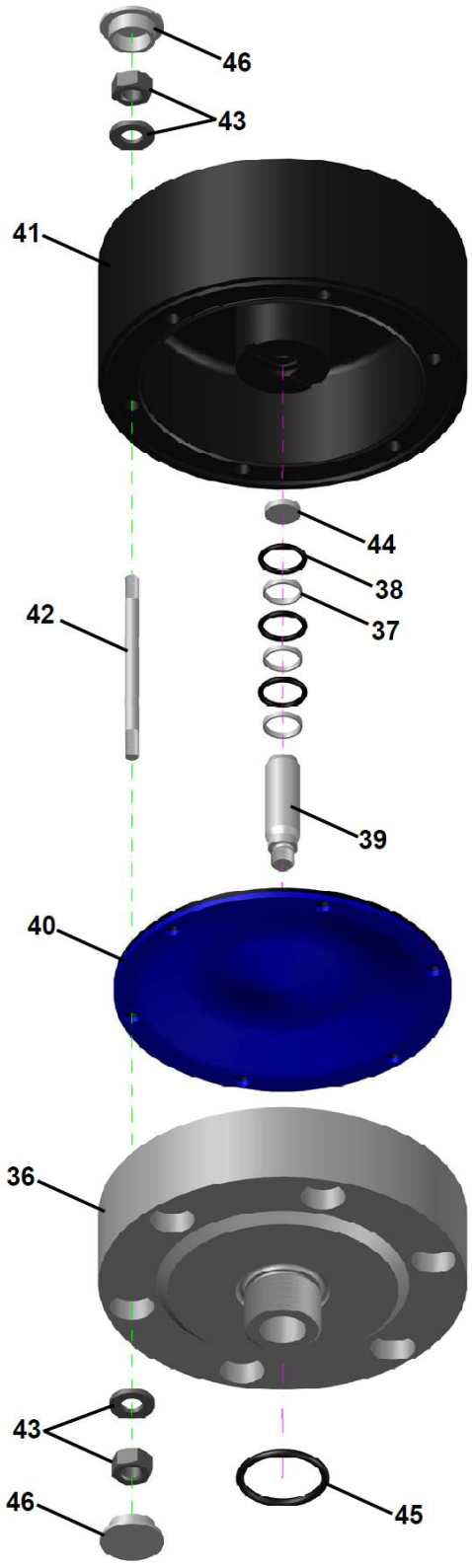
* - 3” version (DM 80 size) not available in AFR or SFR execution (with TFM-PFA diaphragm)

Disassembly instructions

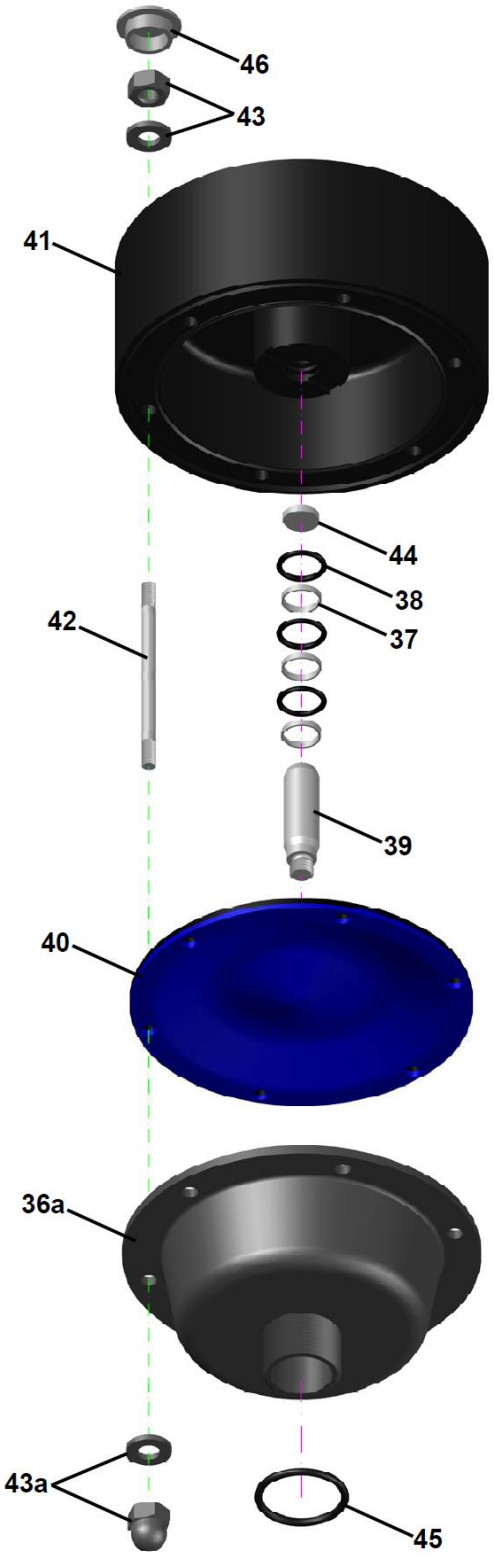
Remove the plugs [**46**] and unscrew the nuts [**43, 43a**] from the housing bolts [**42**] carefully. After that, all the parts can be removed. Screw the diaphragm [**40**] off the actuator shaft [**39**]. A re-assembly of used piston rings [**37**] is impossible; they have to be replaced including 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; completely press the rings into the grooves smoothly using some round tool.

METAL SERIES PULSATION DAMPENER – exploded view

Aluminium version



AISI 316L version



Spare parts list for Metal Series Pulsation Dampeners, Aluminium version (ATEX in standard)

				PD size and material execution (DM xx A_R)					
Item	**Part name**	**Quantity**	**Material**	**DM 15**	**DM 20**	**DM 25**	**DM 40**	**DM 50**	**DM 80**
36.	Dampener housing	1	Aluminium	8 15 01 60	8 20 01 60	8 25 01 60	8 40 01 60	8 50 01 60	8 80 01 60
37.	Piston ring	3	PPS-PTFE(1)	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 15 85 22	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 conductive	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 10 42 50		8 25 42 50**	8 40 42 50**	8 50 42 50***	8 80 42 50***
43.	Nut with washer	8/12**/16***	Zinc-plated steel	8 10 045 48		8 25 045 48**	8 40 045 48**	8 50 045 48***	8 80 045 48
44.	Muffler	1	PE porous	8 10 99 35		8 25 99 35	8 40 99 35	8 50 99 35	8 80 99 35
45.	Dampener housing O-ring(2)	1	EPDM	2 15 70 08	8 20 70 08	3 25 70 08	8 40 79 08	2 40 78 08	8 80 79 08
			NBR	2 15 70 10	8 20 70 10	3 25 70 10	8 40 79 10	2 40 78 10	8 80 79 10
			FEP/FKM core	2 15 70 04	8 20 70 04	3 25 70 04	8 40 79 04	2 40 78 04	8 80 79 04
			FEP/Silicone core		8 20 70 03	3 25 70 03			
46.	Housing bolt plug	8/12**/16***	PE	8 10 058 20		8 25 058 20**	8 40 058 20**	8 50 058 20***	8 80 058 20***

(1) – material execution for "ATEX 0" version (for standard ATEX version material execution is PE)
(2) – standard material execution: EPDM for EPDM diaphragms, NBR for NBR diaphragms, FEP-FKM (FEP-Silicone where available) for TFM(PTFE) and TFM(PTFE)-PFA diaphragms

Parts included in the repair kit (SET) for Aluminium Series Pulsation Dampener (ATEX in standard)

	Item No.	**Quantity**	**Pulsation Dampener Model**	**Size and material execution**																			
				DM 15		**DM 20**				**DM 25**				**DM 40**				**DM 50**				**DM 80**		
				ATR	**AFR**	**AER**	**ANR**	**ATR**	**AFR**	**AER**	**ANR**	**ATR**	**AFR**	**AER**	**ANR**	**ATR**	**AFR**	**AER**	**ANR**	**ATR**	**AFR**	**AER**	**ANR**	**ATR**
			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 05	1 10 50 00	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 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 for "ATEX 0" version

Spare parts list for Metal Series Pulsation Dampeners, AISI 316 version, with ATEX

				PD size and material execution (DM xx S_R)				
Item	**Part name**	**Quantity**	**Material**	**DM 20**	**DM 25**	**DM 40**	**DM 50**	**DM 80**
36a.	Dampener housing	1	AISI 316L[(1)]	8 20 01 53	8 25 01 53	8 40 01 53	8 50 01 53	8 80 01 53
37.	Piston ring	3	PPS-PTFE[(2)]	1 15 85 18		1 25 85 18	1 40 85 18	1 50 85 18
			PE	1 15 85 22		1 25 85 22	1 40 85 22	1 50 85 22
38.	O-ring	3/6[(*)]	NBR	1 15 85 10		1 25 85 10[(*)]	1 40 85 10	1 50 85 10
39.	Actuator shaft	1	PET	8 25 40 30				
			AISI 304			8 40 40 50	8 50 40 50	8 80 40 50
40.	Diaphragm	1	EPDM	1 15 50 08		1 25 50 08	1 40 50 08	1 50 50 08
			NBR	1 15 50 10		1 25 50 10	1 40 50 10	1 50 50 10
			TFM(PTFE)	1 15 50 05		1 25 50 05	1 40 50 05	1 50 50 05
			TFM(PTFE)-PFA	1 15 50 00		1 25 50 00	1 40 50 00	
41.	Dampener head	1	PE conductive	8 25 203 21		8 40 203 21	8 50 203 21	8 80 203 21
42.	Housing bolt	6*/8**	AISI 304	8 25 642 50*		8 40 642 50*	8 50 642 50**	8 80 642 50**
43.	Nut with washer	6*/8**	AISI 304	8 25 045 50*		8 40 045 50*	8 50 045 50**	8 80 045 50**
43a.	Cap nut with washer	6*/8**	AISI 304	8 25 145 50*		8 40 145 50*	8 50 145 50**	8 80 145 50**
44.	Muffler	1	PE porous	8 25 99 35		8 40 99 35	8 50 99 35	8 80 99 35
45.	Dampener housing O-ring[(1)]	1	EPDM	8 20 70 08	3 25 70 08	8 40 79 08	2 40 78 08	8 80 79 08
			NBR	8 20 70 10	3 25 70 10	8 40 79 10	2 40 78 10	8 80 79 10
			FEP/FKM core	3 20 70 04	3 25 70 04	8 40 79 04	2 40 78 04	8 80 79 04
			FEP/Silicone core	8 20 70 03	3 25 70 03			
46.	Housing bolt plug	6*/8**	PE	8 25 058 20*		8 40 058 20*	8 50 058 20**	8 80 058 20**

[(1)] – dampener housing material AISI 316L is not subjected to any surface treatment (e.g., electro-polishing, sand-blasting)
[(2)] – material execution for “ATEX 0” version (for standard ATEX version material execution is PE)

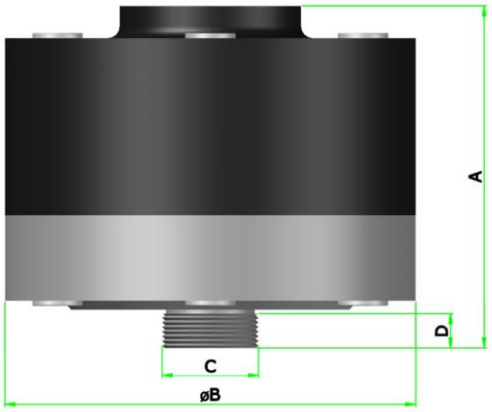
Parts included in the repair kit (SET) for AISI 316 Series Pulsation Dampener (ATEX in standard)

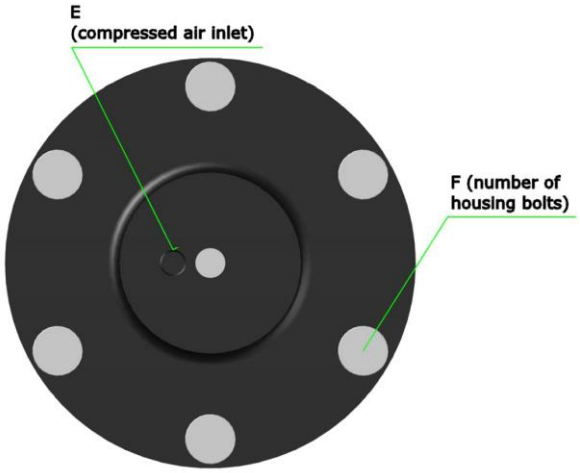
	Item No.	**Quantity**	**Pulsation Dampener Model**	**Size and material execution**																	
				DM 20				**DM 25**				**DM 40**				**DM 50**				**DM 80**		
				SER	**SNR**	**STR**	**SFR**	**SER**	**SNR**	**STR**	**SFR**	**SER**	**SNR**	**STR**	**SFR**	**SER**	**SNR**	**STR**	**SFR**	**SER**	**SNR**	**STR**
			Description	**Part no.:**																		
Spare part kit set content	37.	3	**Piston ring**	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 15 85 10								1 25 85 10[(*)]				1 40 85 10				1 50 85 10		
	39.	1	**Actuator shaft**	8 25 40 30								8 40 40 50				8 50 40 50				8 80 40 50		
	40.	1	**Diaphragm**	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 for “ATEX 0” version

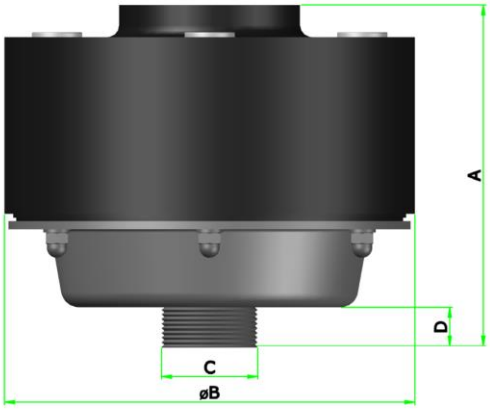
15.2. Appearance and dimensions of the Metal Series Pulsation Dampener

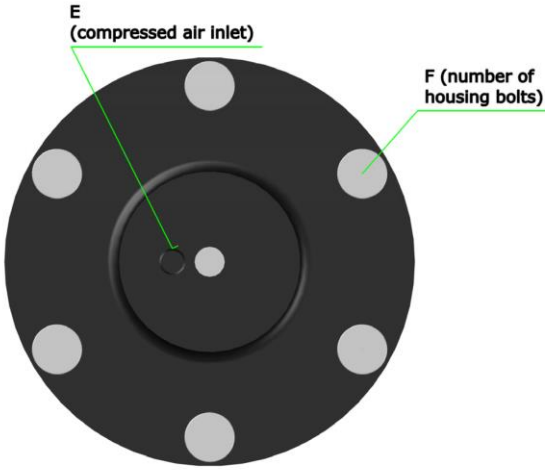
Aluminium version (with ATEX)





AISI 316 version (with ATEX)





Dimension	DM 15 A..	DM 20 A..	DM 20 S..	DM 25 A..	DM 25 S..	DM 40 A..	DM 40 S..	DM 50 A..	DM 50 S..	DM 80 A..	DM 80 S..
A	98	98	141	138	141	170	170	216	216	287	280
øB	110	110	156	156	156	204	204	273	273	365	365
C	G ½"	G ¾"	G ¾"	G 1"	G 1"	G 1 ½"	G 1 ½"	G 2"	G 2"	G 3"	G 3"
D	13	13	18	18	18	17	21	26	32	36	36
E	R ⅛"	R ⅛"	R ⅛"	R ⅛"	R ⅛"	R ¼"	R ¼"	R ¼"	R ¼"	R ½"	R ½"
F	4	4	6	6	6	6	6	8	8	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 integrating connection for Pulsation Dampener in Metal Series Pumps

Metal Pump ordered with Metal Series PD unit are delivered as non-integrated. However, you can order a special discharge extension (integrating connection) that will allow you to mount the Pulsation Dampener on the pump already bought (you have to assemble the integrating port right after the pump's outlet). You can also order Metal Series Pump with integrated PD unit (extension with PD unit will be specially prepared and assembled on the pump's discharge connection).

NOTE: Execution material of the special discharge port may not always be in accordance with the pump's original wetted parts. 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 Plastic 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 EPDM diaphragms [**4**, **59**] and two barrier chambers [**53**, **54**] 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 [**53**, **54**] 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

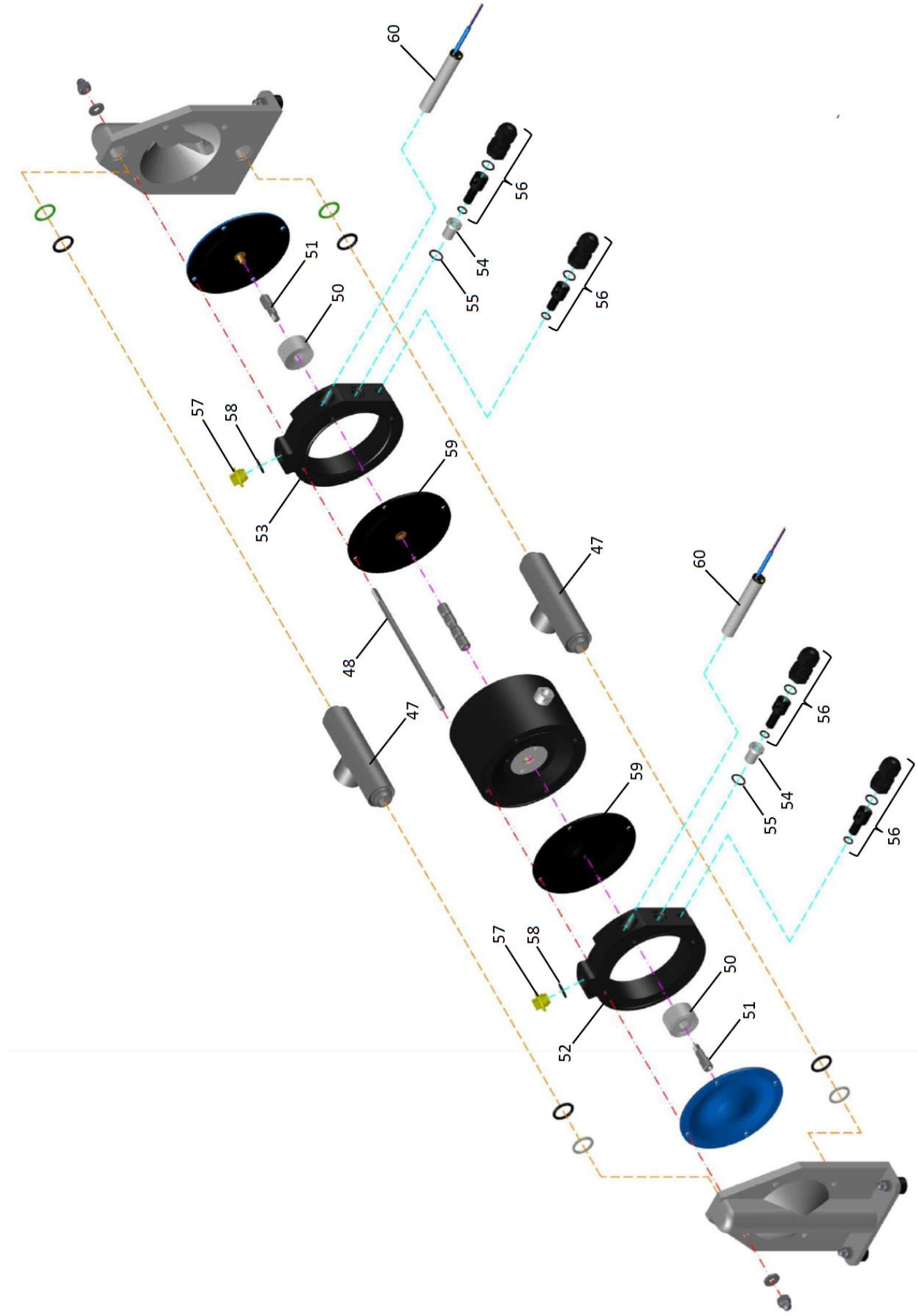
The four conductivity sensors [**56**] are pre-installed. After connection of the wire (wire not part of supply) only the PG-threads have to be screwed onto. Both liquid sensors [**60**] are installed completely.

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.

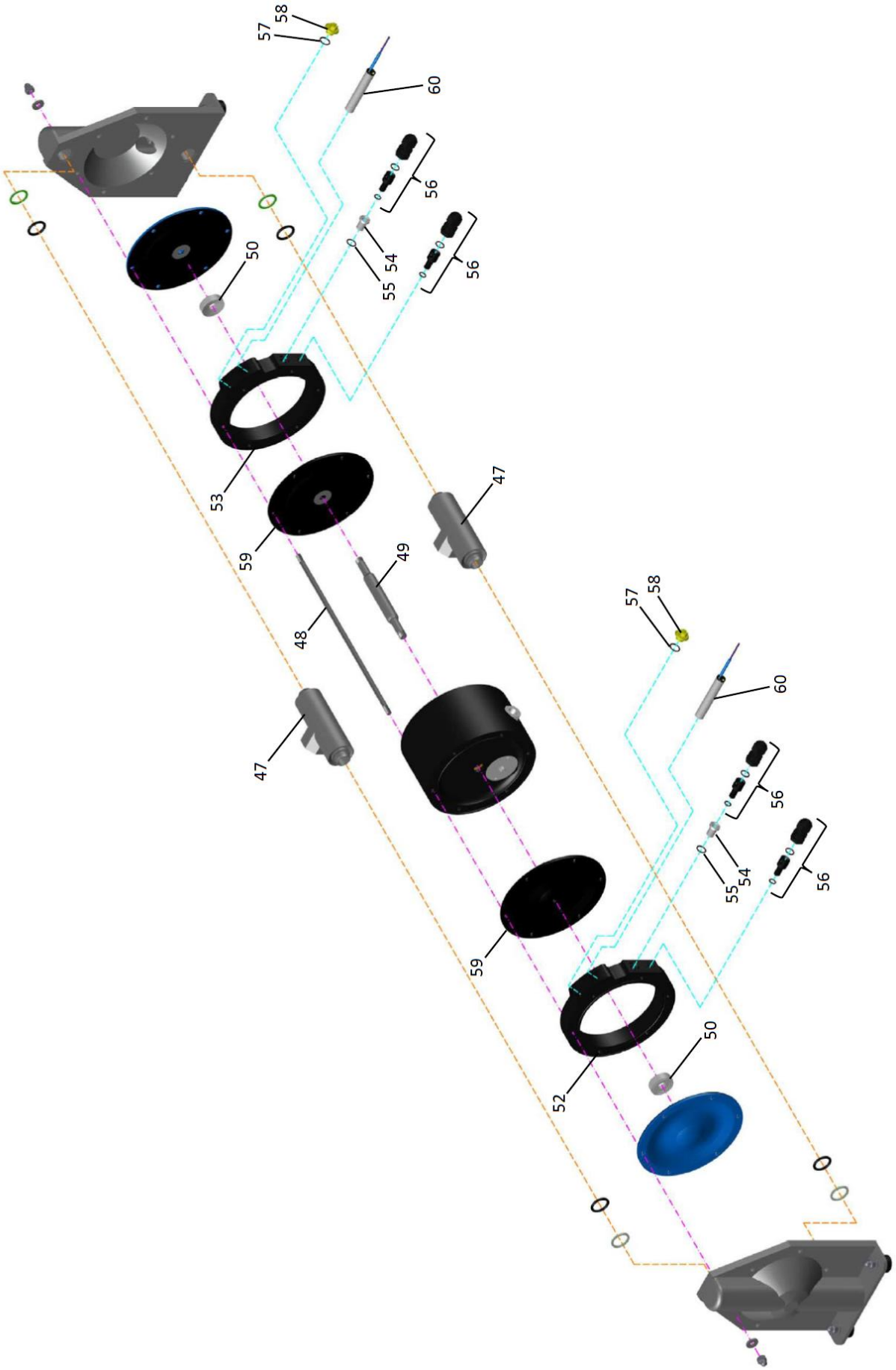
The controllers have to be installed in a suitable cabinet outside ATEX area.

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.*

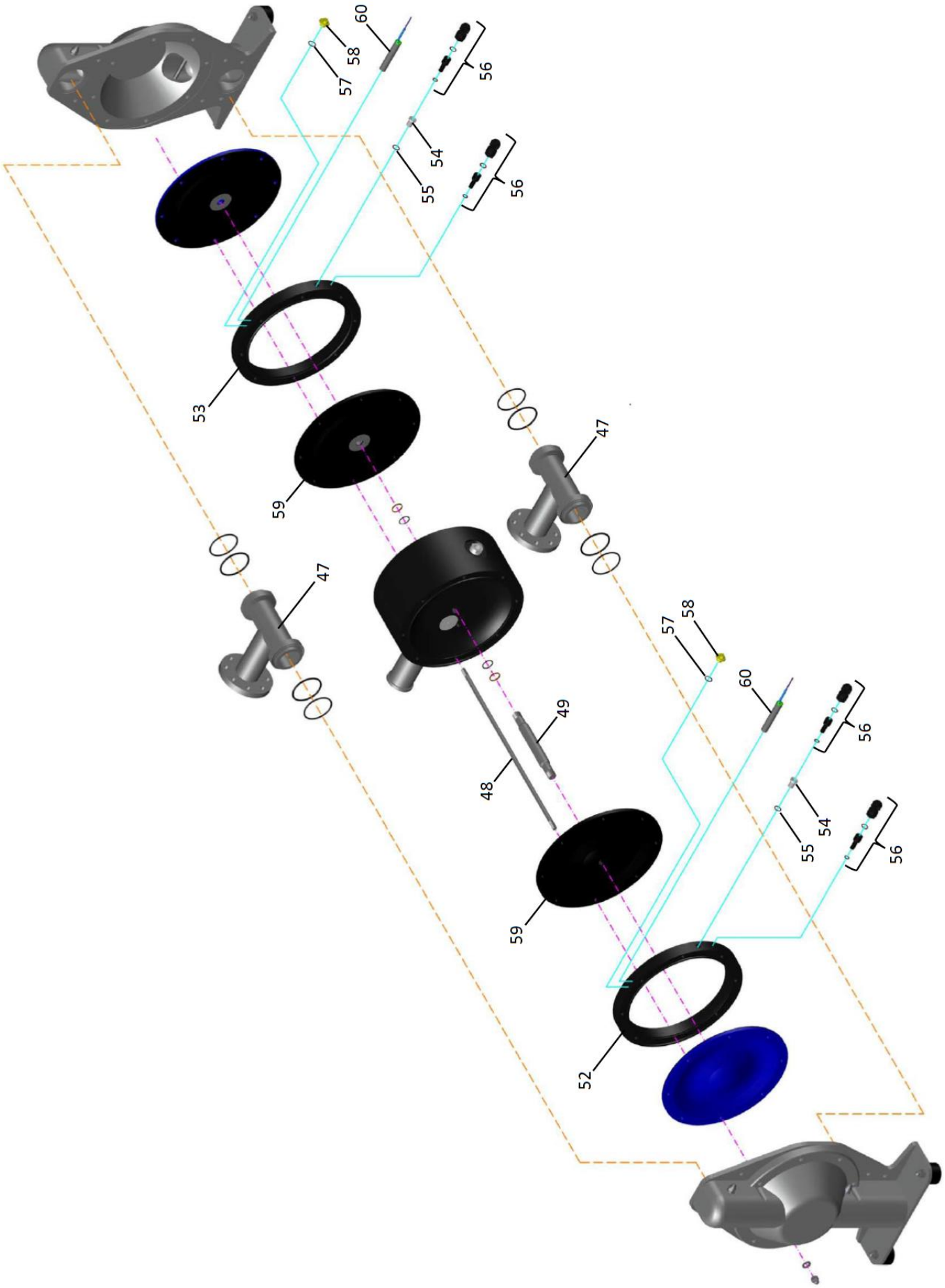
Exploded view, Barrier Chamber system for DM 15/25 Metal Series Pump (Alu, Alu+PTFE and Cast Iron)



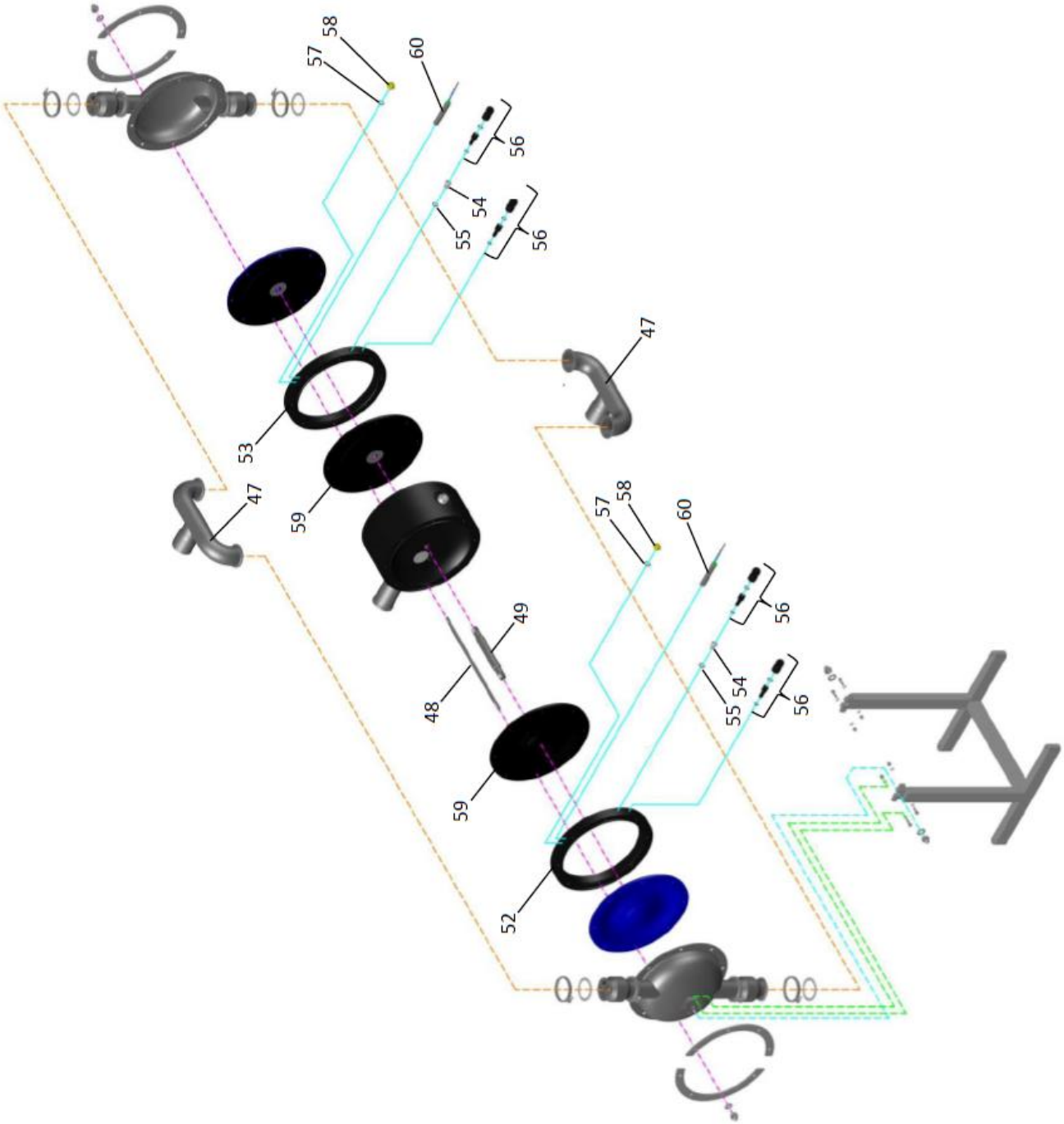
Exploded view, Barrier Chamber system from DM 20/75 to DM 50/565 Metal Series Pump (Alu, Alu+PTFE, Cast Iron and AISI 316)



Exploded view, Barrier Chamber system for DM 80/850 Metal Series Pump (Alu, Alu+PTFE and Cast Iron)



Exploded view, Barrier Chamber system for DM 80/850 Industrial Series Pump (AISI 316)

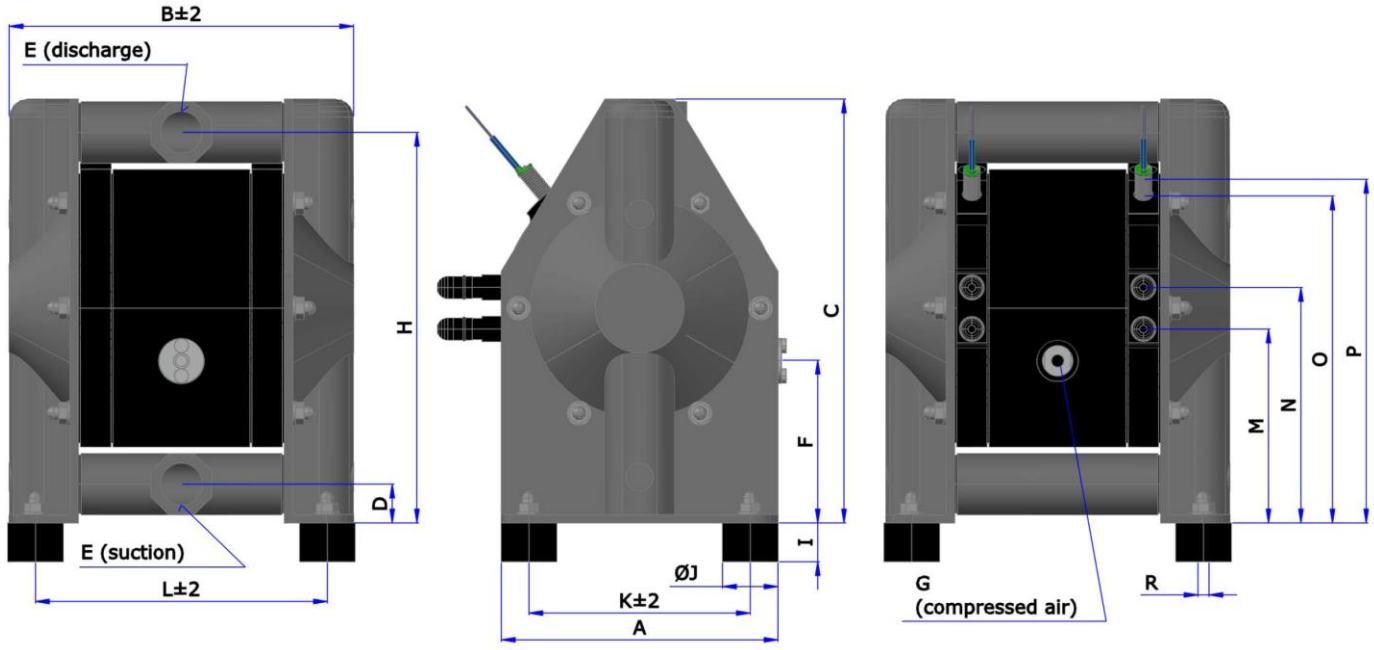


Spare part list, barrier chamber system

Pump size (wetted parts material execution)					DM 15/25 (A..-X) (B..-X) (C..-X)	DM 20/75 (A..-X) (B..-X) (C..-X) (S..-X)	DM 25/125 (A..-X) (B..-X) (C..-X) (S..-X)	DM 40/315 A..-X) (B..-X) (C..-X) (S..-X)	DM 50/565 A..-X) (B..-X) (C..-X) (S..-X)	DM 80/850 (A..-X) (B..-X) (C..-X)	DM 80/850 (S..-X)
Code	Item	Quantity	Part name	Material	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
	47		Suction/discharge port	AISI 316	3 15 32 52	3 20 32 52	3 25 32 52	3 40 32 52	3 50 32 52	3 80 32 52	
				AISI 316L							5 80 32 53(S)
	48.	4 / 6* / 8**	Barrier chamber housing bolt	AISI 304	3 15 042 50	3 20 042 50*	3 25 042 50*	3 40 042 50**	3 50 042 50**	3 80 042 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	

(***) – standard air valve/diaphragm shaft (part no.: 1 08 24 50), additionally equipped with extensions (Item 51, spacer bolt, part no.:1 10 43 50, 2 pcs)
(S) – sand-blasted parts

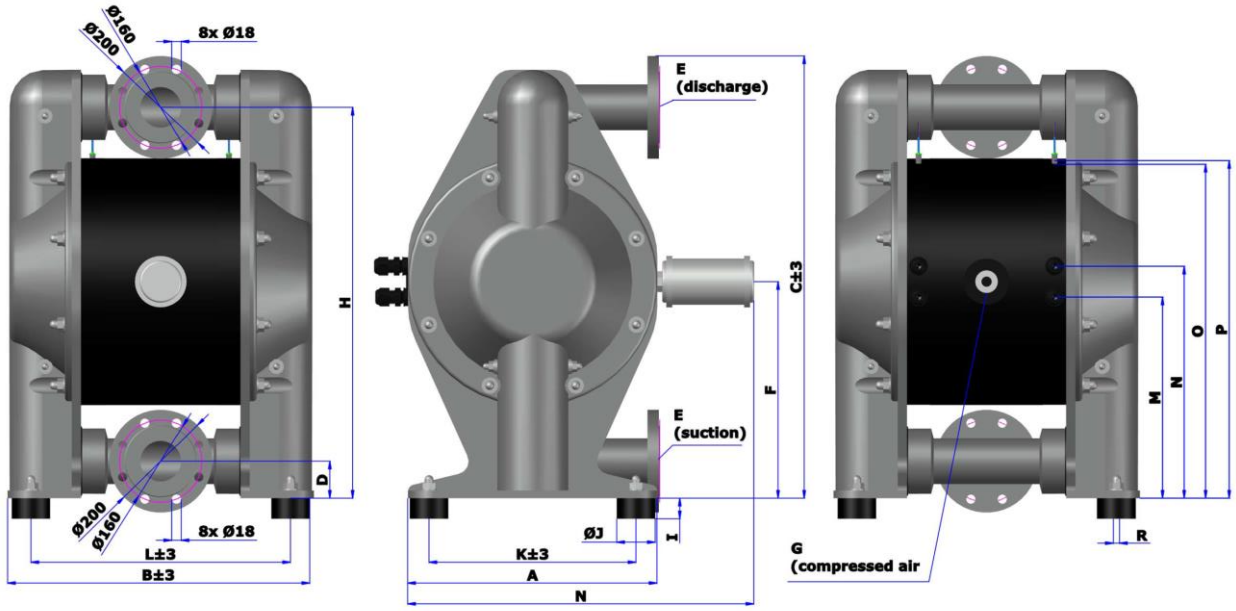
Appearance and dimensions of Metal Series ATEX Pumps with Barrier Chamber System), sizes from DM 15/25 A(B,C)..-X-BC. to DM 50/565 A(B, C, S)..-X-BC.



A..-X-BC. (Aluminium) B..-X-BC. (Alu+PTFE) C..-X-BC. (Cast iron)	A	B	C	D	E	F	G	H	I	ØJ	K	L	M	N	O	P	R
DM 15/25	104	167	168	17	BSPP ½”	85	R ⅛”	153	10	15	84	143	74	97	129	137	M4
DM 20/75	152	217	230	21	BSPP ¾”	86	R ¼”	212	18	30	116	179	105	130	181	191	M8
DM 25/125	200	252	305	27	BSPP 1”	115	R ¼”	280	28	40	160	214	138	168	237	247	
DM 40/315	270	267	415	34	G 1 ½”	108	R ½”	382	28	40	220	213	195	220	310	337	
DM 50/565	352	397	546	48	G 2"	167	R ½”	501	30	60	282	333	265	290	428	442	

S..-X-BC. (AISI 316, Industrial)	A	B	C	D	E	F	G	H	I	ØJ	K	L	M	N	O	P	R
DM 20/75	153	223	235	25	BSPP ¾”	87	R 1/4"	217	18	30	112	182	102	127	177	187	M8
DM 25/125	200	232	312	35	BSPP 1”	123	R 1/4"	287	28	40	140	220	138	168	237	247	
DM 40/315	270	312	426	42	BSPP 1 ½”	109	R 1/2"	388	30	60	190	275	195	220	310	337	
DM 50/565	350	397	540	45	BSPP 2"	158	R 1/2"	493	30	60	286	336	260	285	422	437	

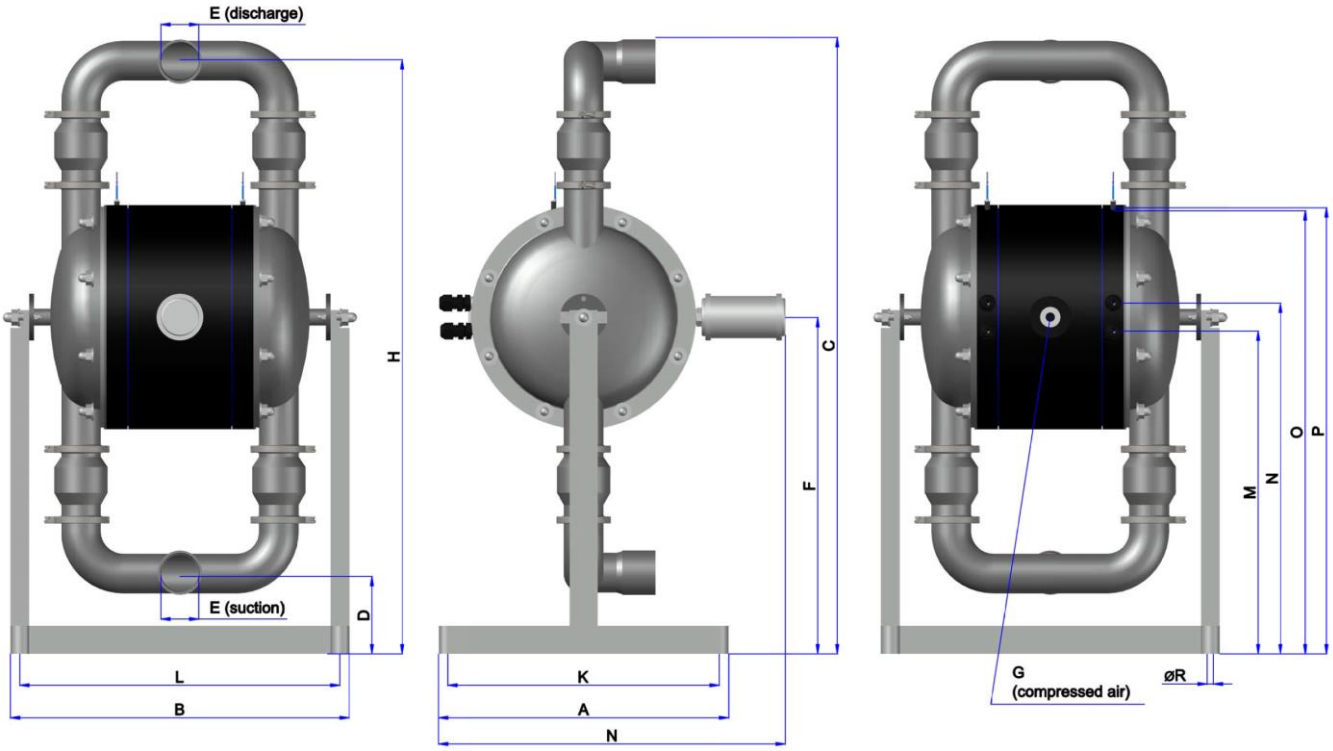
Appearance and dimensions of Metal Series ATEX Pumps with Barrier Chamber System), size DM 80/850 A..-X-BC., B..-X-BC., C..-X-BC.)



A..-X-BC. (Aluminium) B..-X-BC. (Alu+PTFE) C..-X-BC. (Cast iron)	A	B	C	D	E	F	G	H	I	ØJ	K	L	M	N	O	P	R
DM 80/850	485	596	900	72	DN80 PN16 DIN 2577 flanges(*)	421	R ¾"	760	40	75	402	505	391	451	649	656	M12

(*) – also available internal 3" BSPP thread (as additional type of connection)

Appearance and dimensions of Metal Series ATEX Pumps with Barrier Chamber System), size DM 80/850 S..-X-BC., V..-X-BC.



S..-X (AISI 316L, sand-blasted)	A	B	C	D	E	F	G	H	K	L	M	N	O	P	øR
DM 80/850	620	724	1318	165	BSPP 3"	719	R ¾"	1270	580	684	690	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 20/75 up to DM 80/850 of the Metal Series. In smaller Metal Series Pump (DM 15/25 size), only pneumatic stroke counting option (SC5 or SC6) is available.

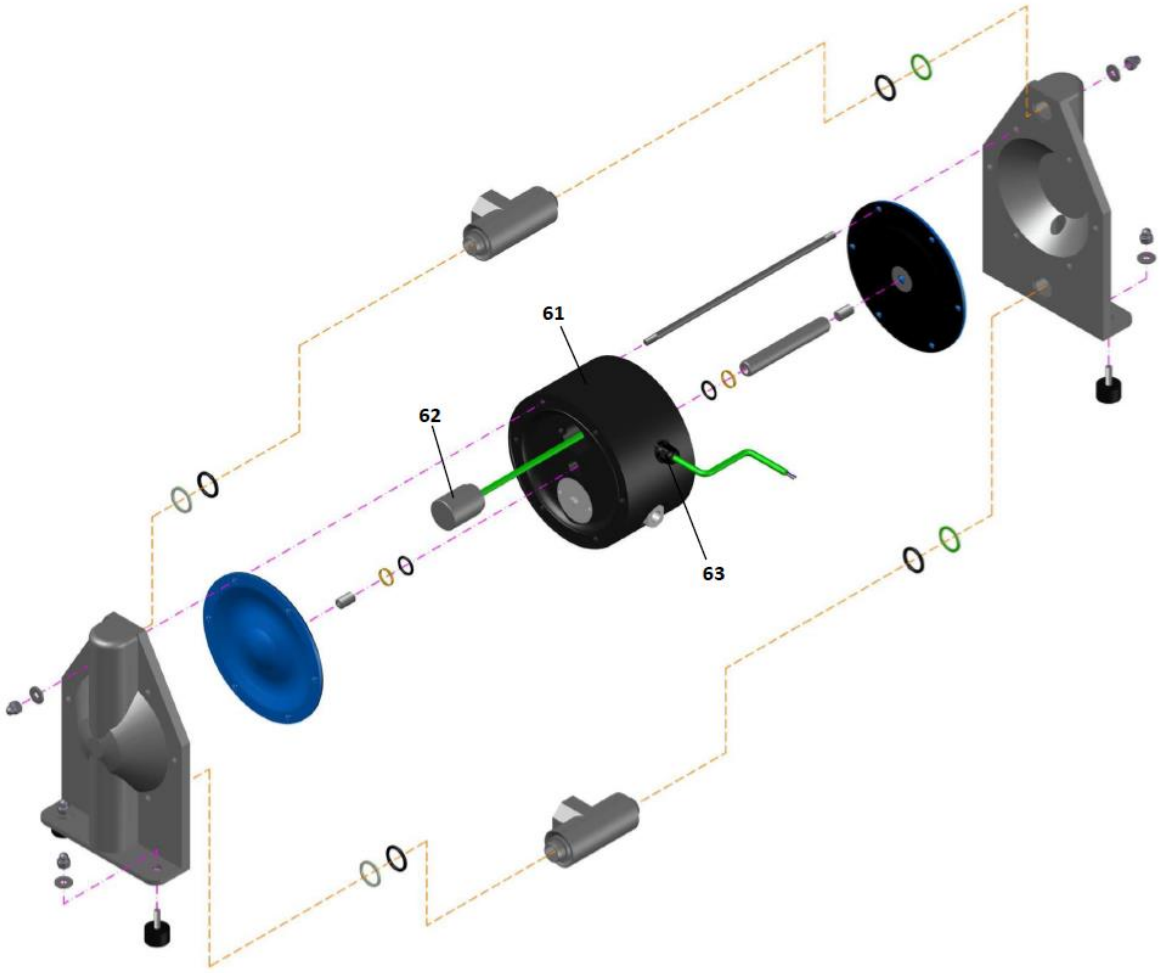
The inductive stroke counting system is available in three variations:

- 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*****

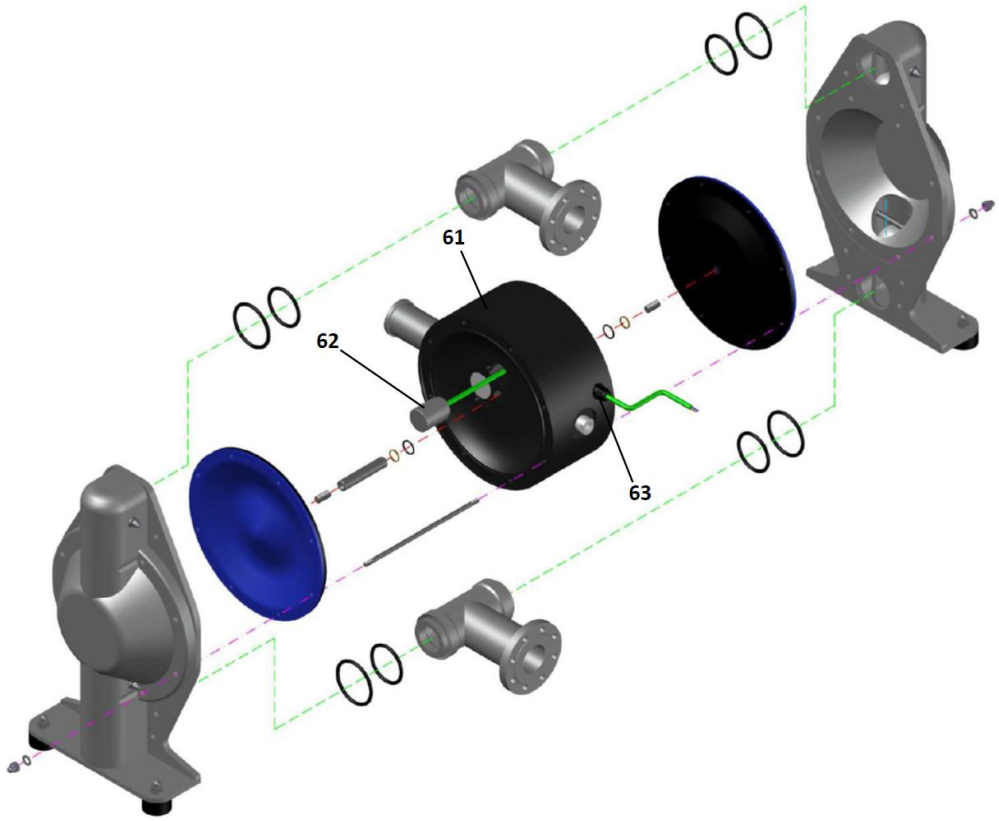
In case only the sensor is included (code SC1), it has to be connected to an existing controller with NAMUR inlet. For applications an explosion-proof device is required for (code SC3) the intrinsically safe controller has to be installed between the sensor and the counter. The wiring diagram and technical 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).***

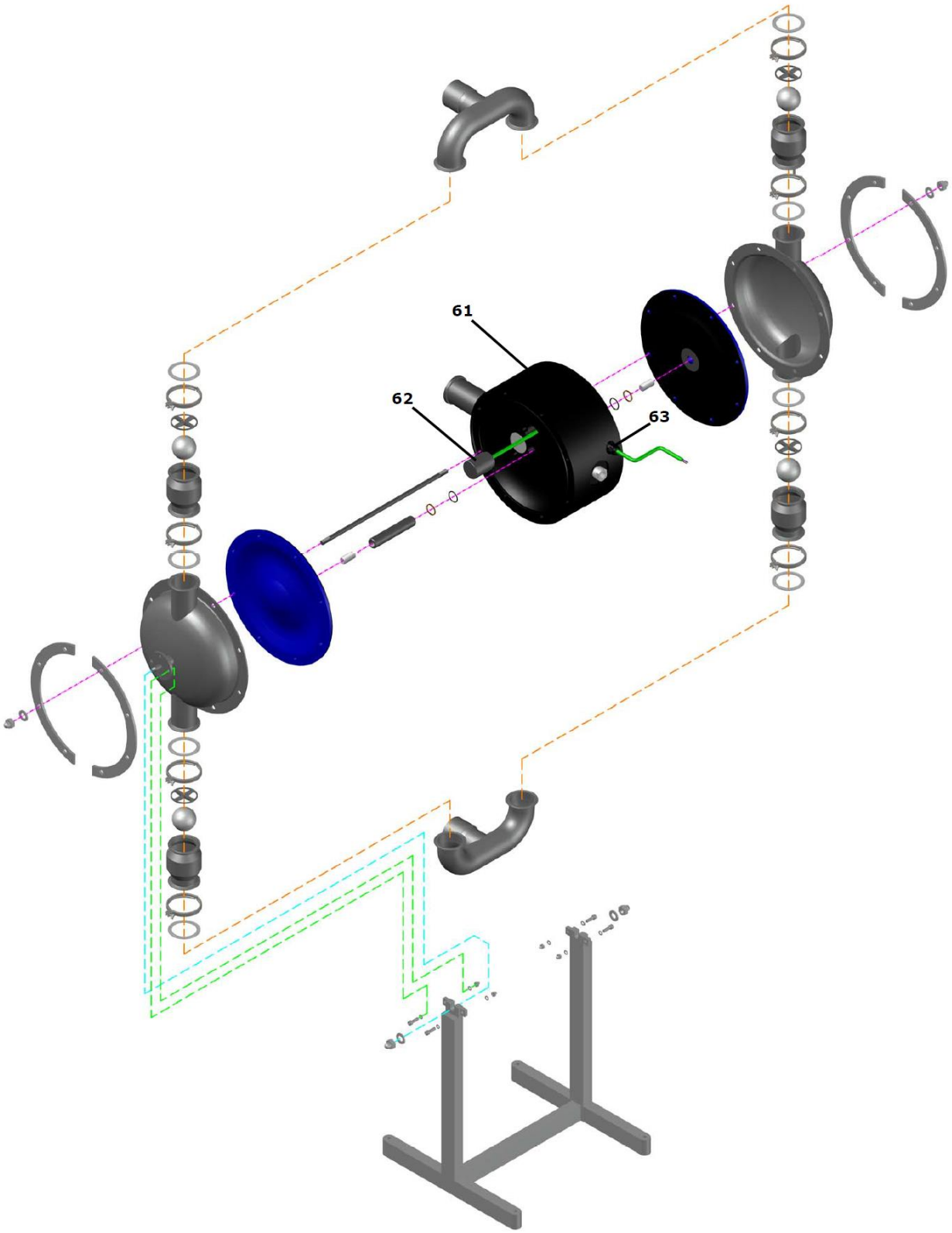
Exploded view, Stroke Counting SC1, SC2, SC3 system for Metal Series Pumps from DM 20/75 to DM 50/565



Exploded view, Stroke Counting SC1, SC2, SC3 system for Metal Series Pumps DM 80/850 A..-X, B..-X, C..-X



Exploded view, Stroke Counting SC1, SC2, SC3 system for Metal Series Pump DM 80/850 S..-X



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

				Metal Pump size:	DM 20/75	DM 25/125	DM 40/315	DM 50/565	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 conductive**	**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 Metal Series – from DM 15/25 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.

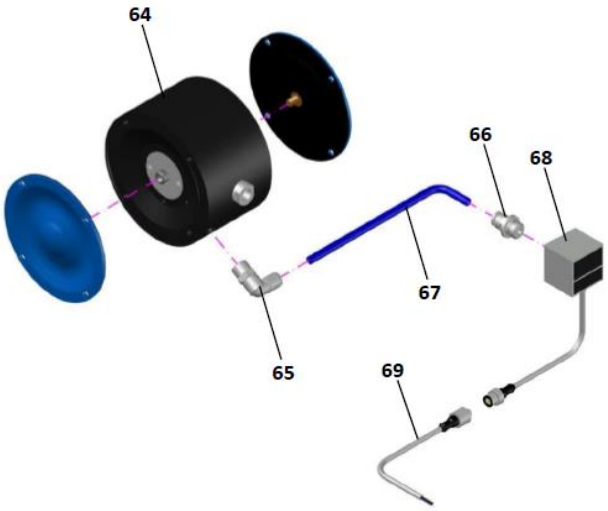
CAUTION

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

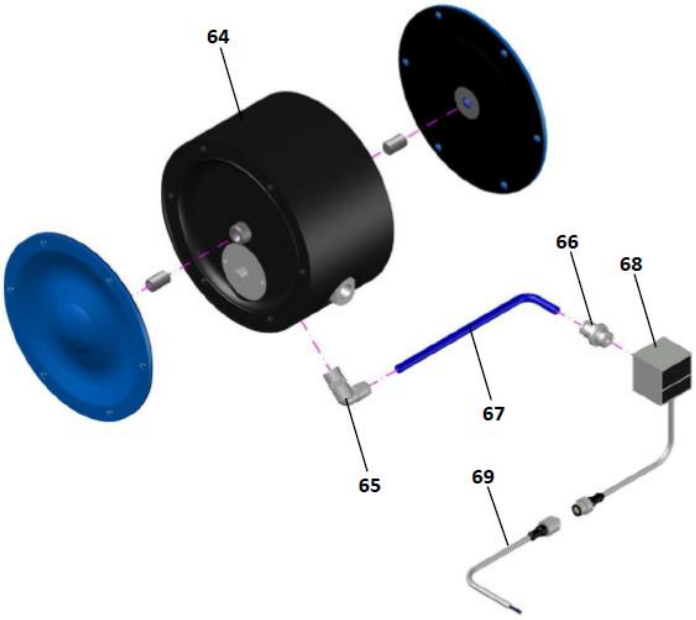
The air inlet for the pneumatic stroke counting system must not be confused with the actual air inlet of the pump. Therefore, you will find some advises adapted to the pump type and the pump size.

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

DM 15/25 A, B, C..-X Pump with SC5 Option



DM 20/75, …, DM 80/850 A, B, C, S..-X Pumps with SC5 Option



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

Pump size:					DM 15/25	DM 20/75	DM 25/125	DM 40/315	DM 50/565	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 conductive	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).

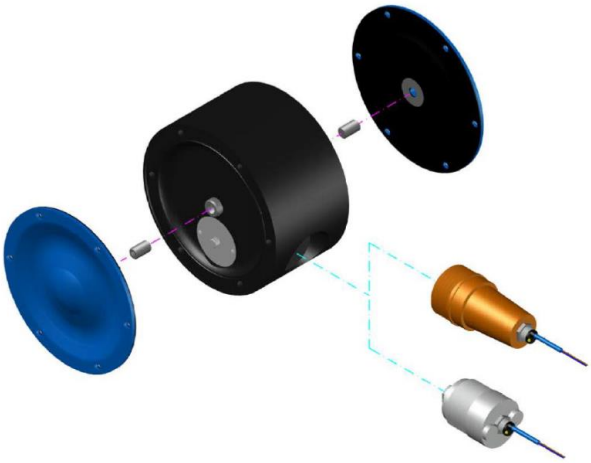
A capacitive diaphragm sensor with fixing [**70**] is mounted in the specially prepared exhaust muffler [**71**]. This sensor registers any liquid approaching to it, no matter whether the liquid is conductive or not. Hence, fast reaction to a damage of the diaphragm becomes possible (sensor in contact 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

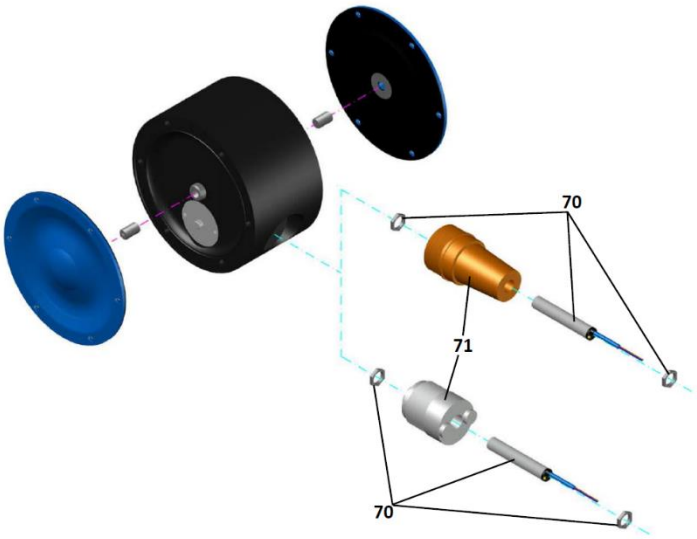
The diaphragm sensor can either be connected to an existing controller with NAMUR inlet (Option DM1) or to the controller included (Option DM2). The wiring diagram and technical data can be found on the controller itself. For further details, please refer to the data delivered by the manufacturers of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

Exploded view, Diaphragm Monitoring DM1, DM2 Option – Metal Series pumps from DM 15/25 to DM 50/565

Muffler with DM1 Option ready to install

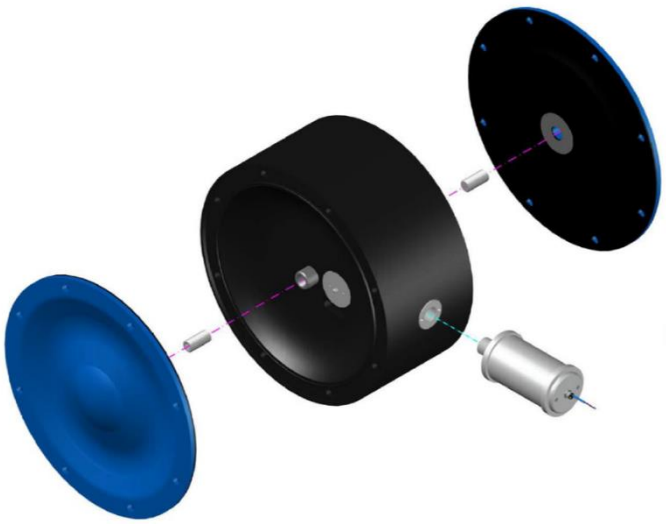


DM1 Option before assembling on the muffler

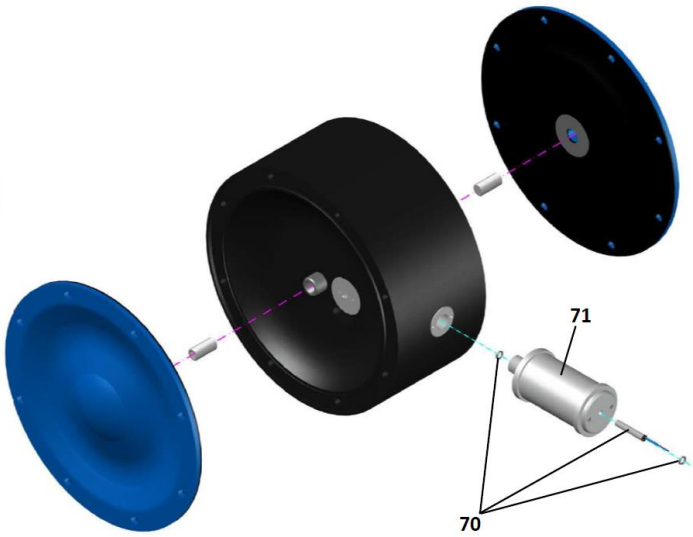


Exploded view, Diaphragm Monitoring DM1, DM2 Option – Metal Series pump DM 80/850 only

Muffler with DM1 Option ready to install



DM1 Option before assembling on the muffler



Spare part list, diaphragm monitoring (DM1, DM2)

Pump size					15/25	15/55	25/125	40/315	50/565	80/850
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, F7, F8, F9, F10, F4-M, F7-M, F8-M, F9-M, F10-M, F4-W, F7-W, F8-W, F9-W, F10-W, F4-I, F7-I, F8-I, F9-I, F10-I)

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

DM 80/850 Aluminium, Aluminium + PTFE and Cast Iron Series Pumps are standardly equipped with integrated flange connections in acc. with PN16 DIN 2278, but it is also possible to use BSPP 3" female thread connection. In the case of 3" Industrial Pump (DM 80/850 S..-X), flange connections (DN80) available only on request!

For the options: **F4**, **F7**, **F8**, **F9 and F10**, thread-mounted pipes (1 per each connection) are made from AISI 316 material, but the movable flange collars are always made from PE conductive material (collars are not in direct contact with liquid, so both pipe and collar parts are not integrated). On customer's request, movable flange collars can be prepared also from AISI 316 material – in that case we have: **F4-M**, **F7-M**, **F8-M**, **F9-M** and **F10-M**.

It is also possible to integrate AISI 316 flange pipe with in-/outlet connection: both elements are welded together, while the collar made from AISI 316 is still movable (available on request). Codification is: **F4-W**, **F7-W**, **F8-W**, **F9-W** and **F10-W**. This execution is available only for AISI 316 (Industrial) Pumps Series (**S**..-X-F10-W).

For the options: **F4.1-I**, **F7.1-I**, **F8.1-I**, **F9.1-I** and **F10-W**, pipes and flanges (made from AISI 316) are welded together (flange collars are non-movable). This execution is available only for AISI 316 (Industrial) Pumps Series (**S**..-X-F10-I).

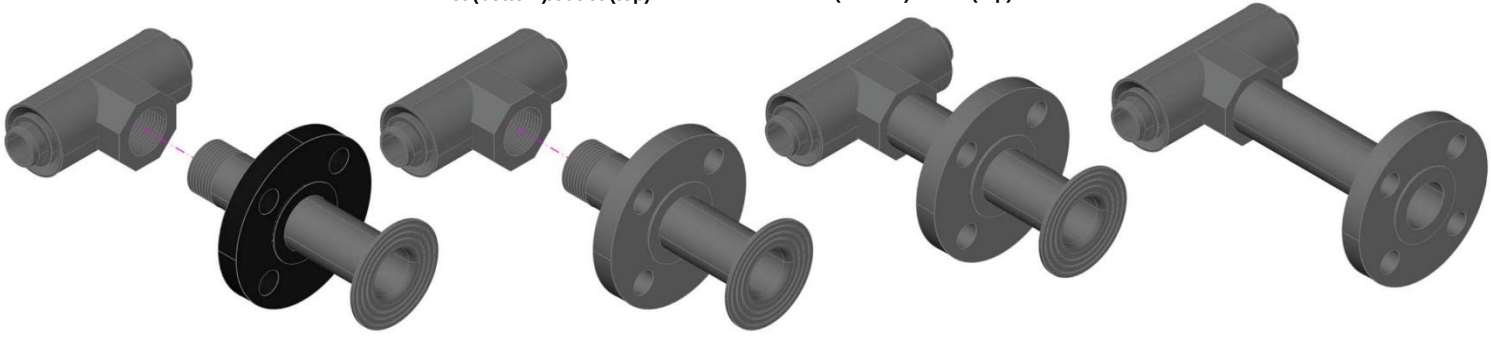
More details on the below drawings:

Options: F4, F7, F8, F9, F10 (thread mounted flanges with PE cond. movable collar).

F4-M, F7-M, F8-M, F9-M, F10-M (thread mounted flanges with AISI 316 movable collar), inlet (bottom)/outlet (top)

F4-I, F7-I, F8-I, F9-I, F10-I (welded AISI 316 flanges with AISI 316 movable collar), inlet (bottom)/outlet (top)

F4-W, F7-W, F8-W, F9-W, F10-W (welded AISI 316 flanges with AISI 316 fixed collar), inlet (bottom)/outlet (top)



NOTE: Options from F4-M to F10-M and from F4-W to F10-W 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 15/25	DM 20/75	DM 25/125	DM 40/315	DM 50/565	DM 80/850	DM 80/850
Material execution:					A..-X B..-X C..-X	A..-X B..-X C..-X S..-X	A..-X B..-X C..-X S..-X	A..-X B..-X C..-X S..-X	A..-X B..-X C..-X S..-X	A..-X B..-X C..-X	S..-X
Code	Item	Q-ty	Part name	Material	Part no.						
F4	-	2	Flange pipe	AISI 316	3 15 125 52	3 20 125 52	3 25 125 52	3 40 125 52	3 50 125 52	-	3 80 125 52
	-	2	JIS 10K flange collar	PE conductive	2 15 525 21	3 20 525 21	2 25 525 21	2 40 525 21	2 50 525 21	-	3 80 525 21
F7			as F4, but:								
	-	2	PN10/DIN 2576 flange collar	PE conductive	2 15 225 21	3 20 225 21	2 25 225 21	2 40 225 21	2 50 225 21	-	3 80 225 21
F8			as F4, but:								
	-	2	ANSI 150 RF-SO flange collar	PE conductive	2 15 325 21	3 20 325 21	2 25 325 21	2 40 325 21	2 50 325 21	-	3 80 325 21
F9			as F4, but:								
	-	2	PN16 DIN 2278 flange collar	PE conductive	2 15 425 21	3 20 425 21	2 25 425 21	2 40 425 21	2 50 425 21	-	3 80 425 21
F10			as F4, but:								
	-		EN 1092-1 flange collar	PE conductive	2 15 425 21	3 20 425 21	2 25 425 21	2 40 425 21	2 50 425 21	-	3 80 425 21
F4-M	-	2	as F4, but:	AISI 316	3 15 125 52	3 20 125 52	3 25 125 52	3 40 125 52	3 50 125 52	-	3 80 125 52
	-	2	JIS 10K flange collar	AISI 316	2 15 525 52	3 20 525 52	2 25 525 52	2 40 525 52	2 50 525 52	-	3 80 525 52
F7-M			as F4, but:								
	-	2	PN10/DIN 2576 flange collar	AISI 316	2 15 225 52	3 20 225 52	2 25 225 52	2 40 225 52	2 50 225 52	-	3 80 225 52
F8-M			as F4, but:								
	-	2	ANSI 150 RF-SO flange collar	AISI 316	2 15 325 52	3 20 325 52	2 25 325 52	2 40 325 52	2 50 325 52	-	3 80 325 52
F9-M			as F4, but:								
	-	2	PN16 DIN 2277/2278 flange collar	AISI 316	2 15 425 52	3 20 425 52	2 25 425 52	2 40 425 52	2 50 425 52	-	3 80 425 52
F10-M			as F4, but:								
			EN 1092-1 flange collar	AISI 316	2 15 425 52	3 20 425 52	2 25 425 52	2 40 425 52	2 50 425 52	-	3 80 425 52
F4-I[(1)]	-	2	JIS 10K movable flange, but pipe integrated with in-/outlet connection	AISI 316	-	3 20 52I 52	3 25 52I 52	3 40 52I 52	3 50 52I 52	-	3 80 52I 52
F7-I[(1)]	-	2	PN10 DIN2576 movable flange, but pipe integrated with in-/outlet connection	AISI 316	-	3 20 22I 52	3 25 22I 52	3 40 22I 52	3 50 22I 52	-	3 80 22I 52
F8-I[(1)]	-	2	ANSI 150 RF movable flange, but pipe integrated with in-/outlet connection	AISI 316	-	3 20 32I 52	3 25 32I 52	3 40 32I 52	3 5032I 52	-	3 80 32I 52
F9-I[(1)]	-	2	PN16 DIN 2278 movable flange, but pipe integrated with in-/outlet connection	AISI 316	-	3 20 42I 52	3 25 42I 52	3 40 42I 52	3 50 42I 52	-	3 80 42I 52
F10-I[(1)]	-	2	EN 1092-1 movable flange, but pipe integrated with in-/outlet connection	AISI 316	-	3 20 42I 52	3 25 42I 52	3 40 42I 52	3 50 42I 52	-	3 80 42I 52
F4-W[(1)]	-	2	JIS10K fixed flange, pipe welded with inlet/outlet connection	AISI 316	-	3 20 52W 52	2 25 52W 23	2 40 52W 23	2 50 52W 23	(*)	3 80 52W 52
F7-W[(1)]	-	2	PN10 DIN2576 fixed flange, pipe welded with inlet/outlet connection	AISI 316	-	3 20 22W 52	3 25 22W 52	3 40 22W 52	3 50 22W 52	(*)	3 80 22W 52
F8-W[(1)]	-	2	ANSI 150 RF fixed flange, pipe welded with inlet/outlet connection	AISI 316	-	3 20 32W 52	3 25 32W 52	3 40 32W 52	3 50 32W 52	(*)	3 80 32W 52
F9-W[(1)]	-	2	PN16 DIN 2278 fixed flange, pipe welded with inlet/outlet connection	AISI 316	-	3 20 42W 52	3 25 42W 52	3 40 42W 52	3 50 42W 52	(**)	3 80 42W 52
F10WI[(1)]	-	2	EN 1092-1 fixed flange, pipe welded with inlet/outlet connection	AISI 316	-	3 20 42W 52	3 25 42W 52	3 40 42W 52	3 50 42W 52	(**)	3 80 42W 52

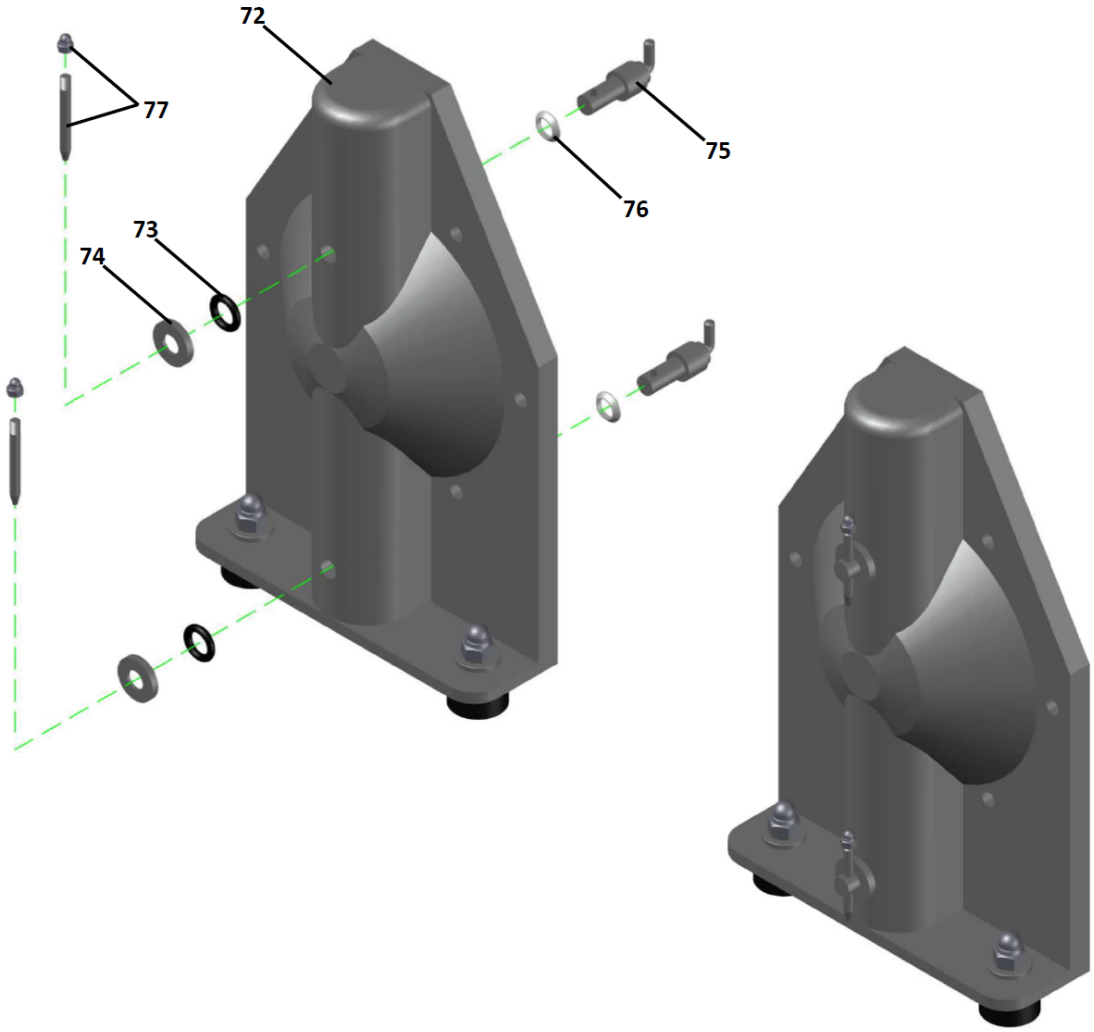
(*) – for DM 80/850 A..X (Aluminium flanges), B..-X (Aluminium + PTFE flanges) and C..-X (Cast Iron flanges), available on demand (possible extended delivery time);
(**) – available in standard version of DM 80/850 A..X (Aluminium flanges), B..-X (Aluminium + PTFE flanges), C..-X (Cast Iron flanges);
(1) – not available for A..-X (Alu Pumps), B..-X (Aluminium + PTFE Pumps) and C..-X (Cast Iron Pumps).

16.5 Back Flushing System (Option codes: BF1, BF2, BF4, BF5)

A pump equipped with the back flushing system (ball lift system) can be emptied along with an inclining discharge line while being installed within the plant. It consists of a bypass-system in the side housings which can be activated by manual valves (codes: **BF1**, **BF3** – for Aluminium, Alu + PTFE and Cast Iron Series Pumps, **BF2** – for AISI 316 Series Pumps) or pneumatically (code **BF5**).

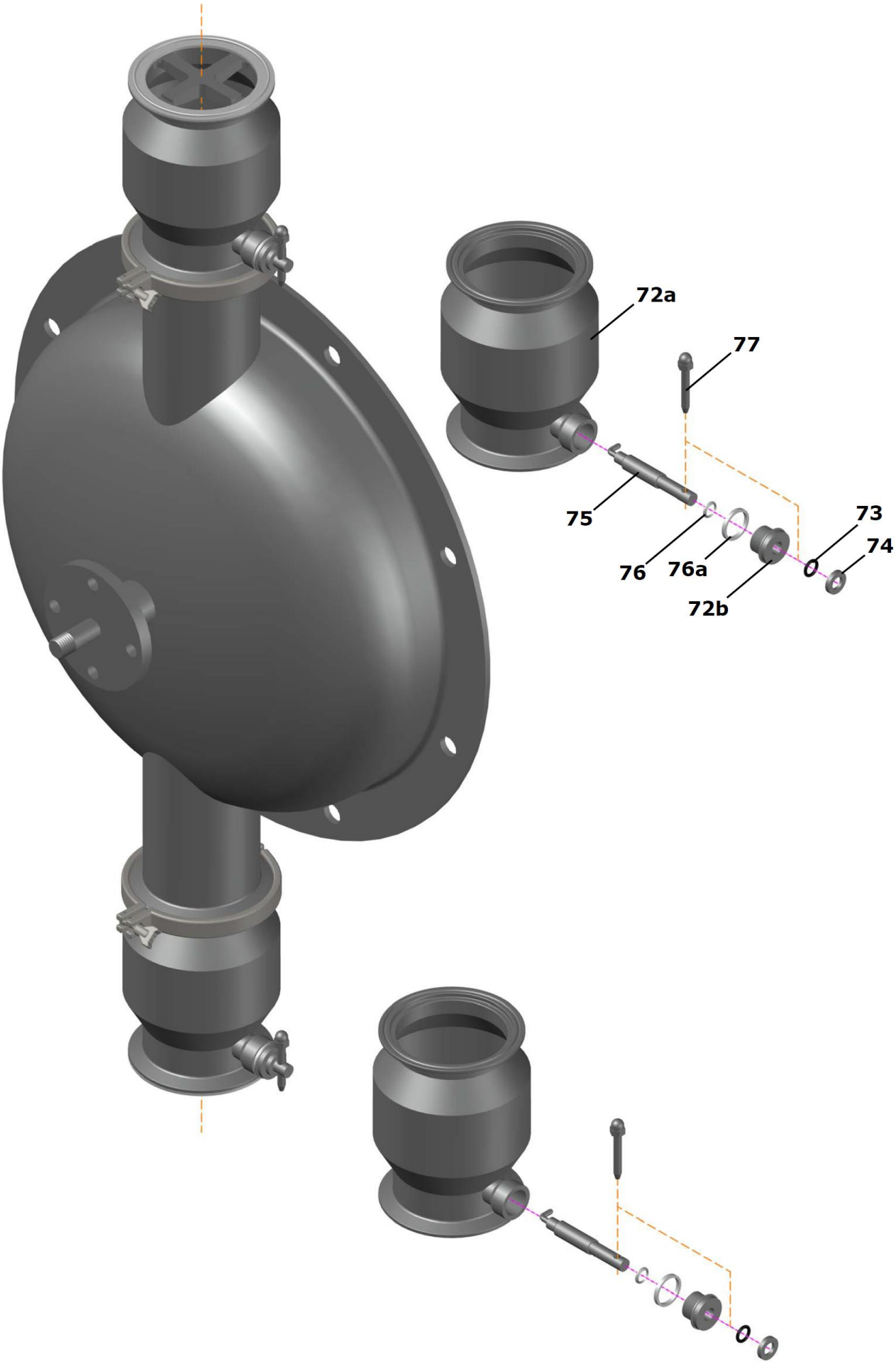
NOTE: Pneumatic Back-Flushing System (BF5 Option) is available only for AISI 316 Series Pumps.

Manual Back Flushing System (BF1, BF2, BF3) – from DM 20/75 to DM 50/565 Pump sizes



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 (right picture above) – each ball lifter [**75**] pin 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.

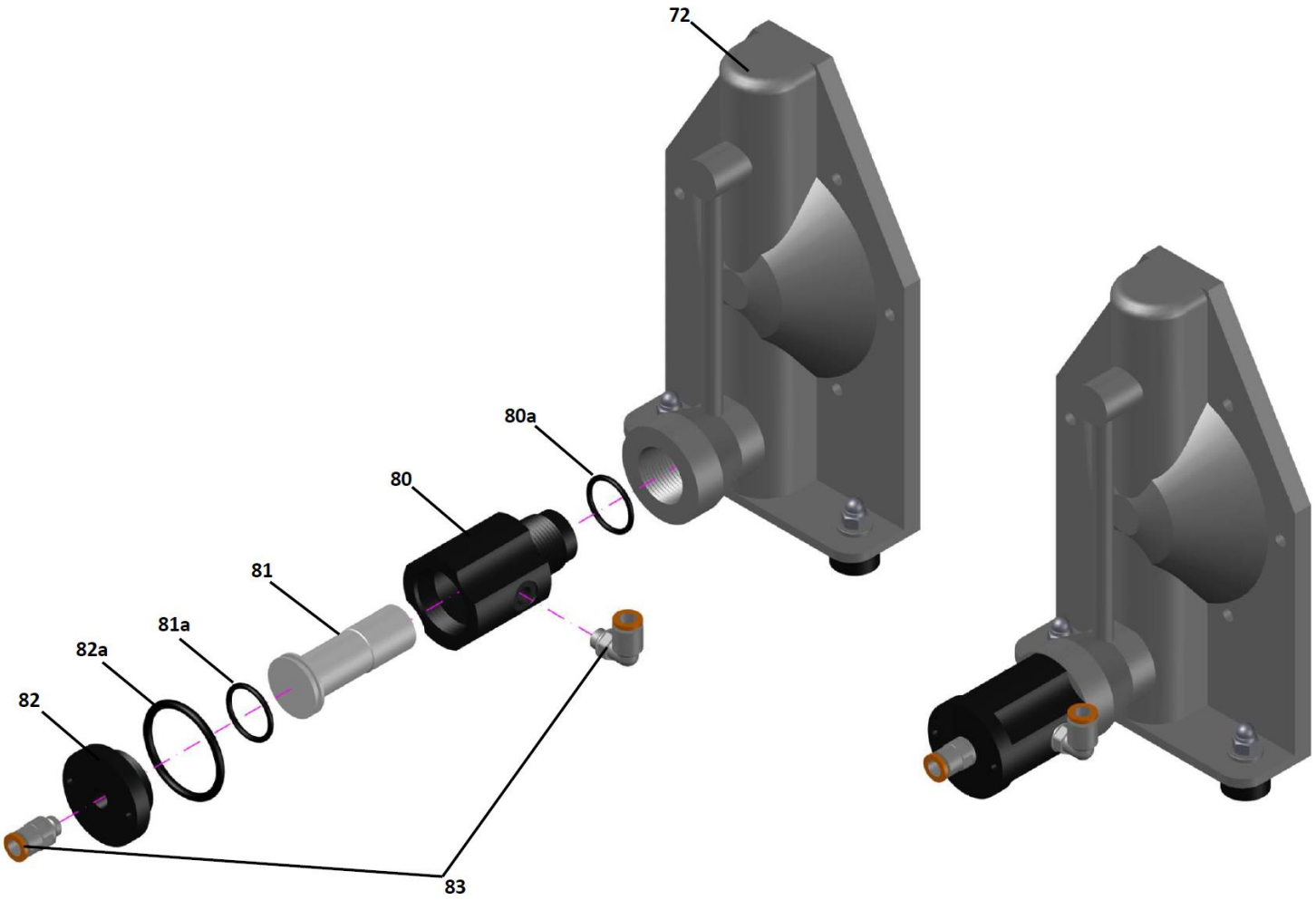
Manual Back Flushing System (BF2) – for DM 80/850 AISI 316 Pump only



Pneumatic Back Flushing System (BF5)

The drawing below illustrates the flushing system (code **BF5**, minimum required air supply pressure value: 3 bar g). By attaching a 4-2-way valve (not included in the delivery), the back flushing system can be activated automatically when cutting off the pump.

O-ring for pump housing [**80a**] is made from FEP-FKM (FEP encapsulated FKM core). Piston O-ring [**81a**] and piston cover O-ring [**82a**] are made from EPDM material (these O-rings are not in direct contact with pumped liquid).



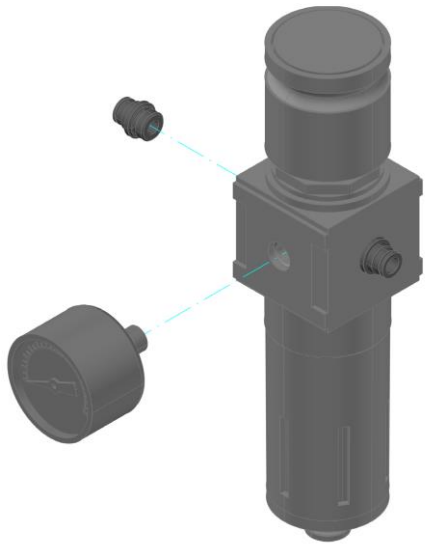
Spare part list, back flushing system

Pump size:					DM 20/75	DM 25/125	DM 40/315	DM 50/565	DM 80/850
Code:	Item	Q-ty	Part name	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
BF1 BF3	72.	2	Pump housing left/right for BF1, BF3 system	Aluminium	3 20 001 60	3 25 001 60	3 40 001 60	3 50 001 60	
				Aluminium+PTFE	3 20 001 61	3 25 001 61	3 40 001 61	3 50 001 61	
				Cast Iron	3 20 001 65	3 25 001 65	3 40 001 65	3 50 001 65	
BF2			Pump housing left/right for BF2 system	AISI 316	3 20 001 52	3 25 001 52	3 40 001 52	3 50 001 52	
BF5			Pump housing left/right for BF5 system	AISI 316	3 20 301 52	3 25 301 52	3 40 301 52	3 50 301 52	
BF1 – complete set of spare parts for 1 pump (Alu, Alu+PTFE, Cast Iron), consists of:									
BF1	73.	4	O-ring for pump housing	EPDM	3 20 372 08	3 25 372 08	3 40 372 08	3 50 372 08	
	74.	4	Back-Flushing washer	AISI 316	3 20 157 52	3 25 157 52	3 40 157 52	3 50 157 52	
	75.	4	Ball lifter	AISI 316	3 20 657 52	3 25 657 52	3 40 657 52	3 50 657 52	
	76.	4	Ball lifter seal, internal	PTFE	3 20 357 23	3 25 357 23	3 40 357 23	3 50 357 23	
	77.	4	Blocking pin, complete	AISI 316	3 20 457 52	3 25 457 52	3 40 457 52	3 50 457 52	
BF2 – complete set of spare parts for 1 pump (AISI 316), consists of:									
BF2	73.	2	O-ring for pump housing	FKM	5 20 372 09	5 25 372 09	5 40 372 09	5 50 372 09	4 80 372 09
	74.	4	Back-Flushing washer	AISI 316, AISI 316L(*)	5 20 157 52	5 25 157 52	5 40 157 52	5 50 157 52	4 80 157 53(*)
	75.	4	Ball lifter	AISI 316,AISI 316L(*)	5 20 657 52	5 25 657 52	5 40 657 52	5 50 657 52	4 80 657 53(*)
	76.	4	Ball lifter seal	PTFE	5 20 357 23	5 25 357 23	5 40 357 23	5 50 357 23	4 80 357 23
	76a.	4	Screw cap seal	PTFE					4 80 857 23
	77.	4	Blocking pin, complete	AISI 316	3 20 457 52	3 25 457 52	3 40 457 52	3 50 457 52	4 80 457 52
	78.	4	Valve seat for BF Option	AISI 316L					4 80 54B 53
	79.	4	Screw cap	AISI 316L					4 80 957 53
BF3 – complete set of spare parts for 1 pump (Alu, Alu+PTFE, Cast Iron), like BF1, but:									
BF3	73.	4	O-ring for pump housing	FKM (Viton)	3 20 372 09	3 25 372 09	3 40 372 09	3 50 372 09	
BF5 – complete set of spare parts for 1 pump (AISI 316), consists of:									
BF5	80.	2	Piston housing	PE conductive	2 15 266 21	2 25 266 21	2 40 266 21	2 50 266 21	
	80a.	2	O-ring for side housing	FEP/FKM	2 15 70 04	2 15 70 04	3 25 70 04	3 25 70 04	
	81.	2	Back-Flushing piston	PTFE	2 15 068 23	2 25 068 23	2 40 068 23	2 50 068 23	
	81a.	2	Piston O-ring	EPDM	2 15 78 08	2 15 78 08	2 40 266 21	2 50 266 21	
	82a.	2	Piston cover O-ring	EPDM	1 10 080 08	1 10 080 08	1 40 080 08	1 40 080 08	
	82.	2	Piston cover	PE conductive	2 15 168 21	2 25 168 21	2 40 168 21	2 50 168 21	
	83.	1	Quick couplings, set	Diverse	2 15 065 00				

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

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 15/25 up to DM 25/125 size;
- AF2 – for the pumps from DM 40/315 up to DM 80/850 size.

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

16.7. Drum Pump (Option codes: D1, D2)

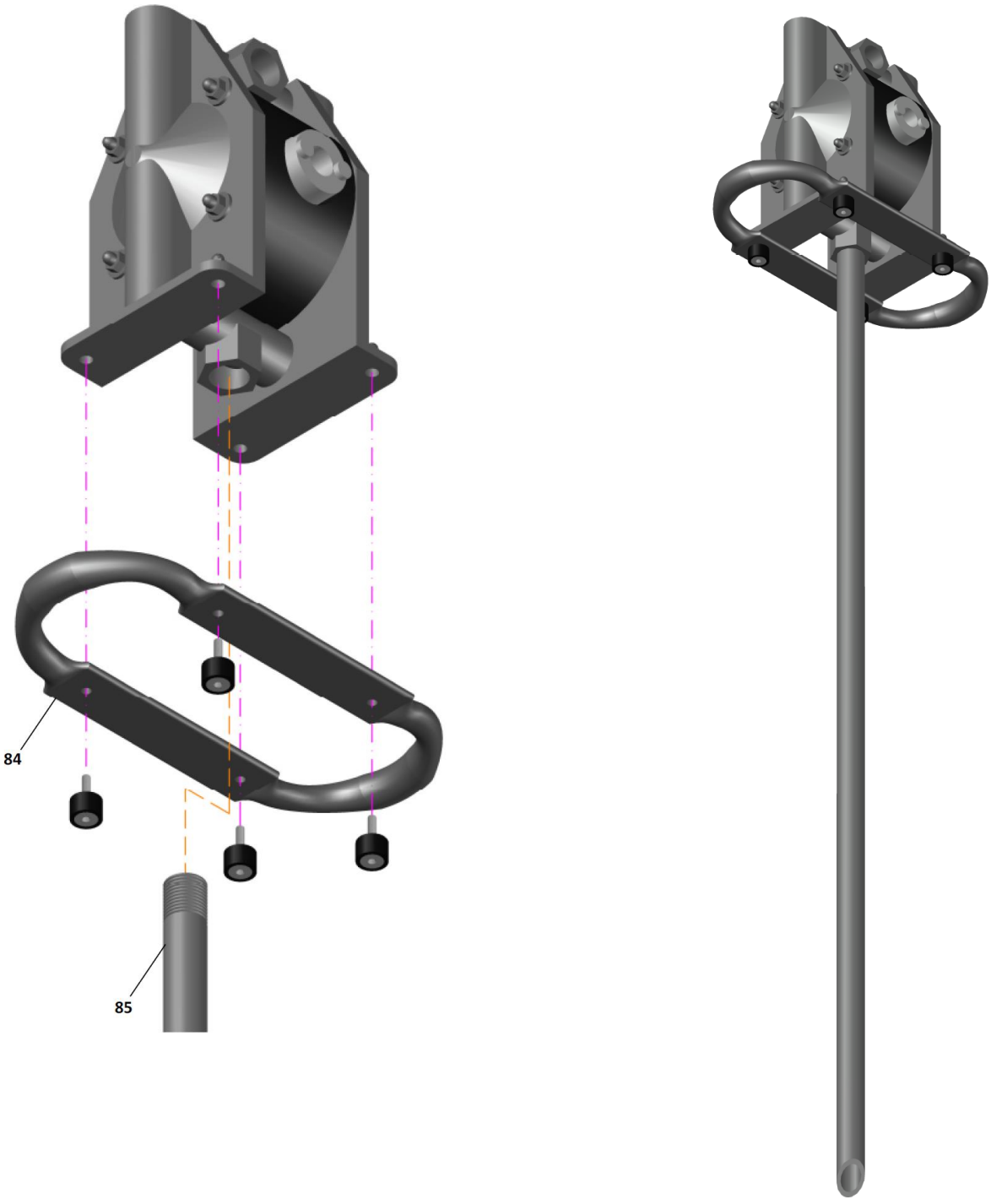
DELLMECO Metal Series Pumps from DM 15/25 up to 25/125 size are also available as adapted to empty drums and IBC containers.

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

- Pump support [84].
- Drum pipe [85], with BSPP thread (external).

Standard Metal Series Pump can be also re-assembled into the Drum Pump, by adding Items [84], [85] and by rotating downward standard inlet connection [3].

Appearance of the Metal Pump with Drum Option



Spare part list for the Metal Pumps with Drum Option

Pump size:					DM 15/25	DM 20/75	DM 25/125
Code	Item	Quantity	Part name	Material	Part No.		
D	84.	1	Pump support	AISI 304	3 15 98 50	3 20 98 50	3 25 98 50
	85.	1	Drum pipe	Aluminium (for A..-X Pumps)	3 15 96 60	3 20 96 60	3 25 96 60
				AISI 316 (for C..-X and S..-X Pumps)		3 20 96 52	3 25 96 52

The standard length of drum pipe is 1000 mm, but specific order can be made to fit any container size (e.g., 800 mm, 1200 mm).

Standard Alu Series Pump (A..-X) is equipped with aluminium pipe. Cast Iron (C..-X) and AISI 316 (AISI 316) material executions are equipped with AISI 316 pipe. In the case of other pipe material execution requirement, please contact us at: office@dellmeco.com.

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

DELLMECO 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 14 bar g the HP pump has to be supplied with 7 bar g 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.

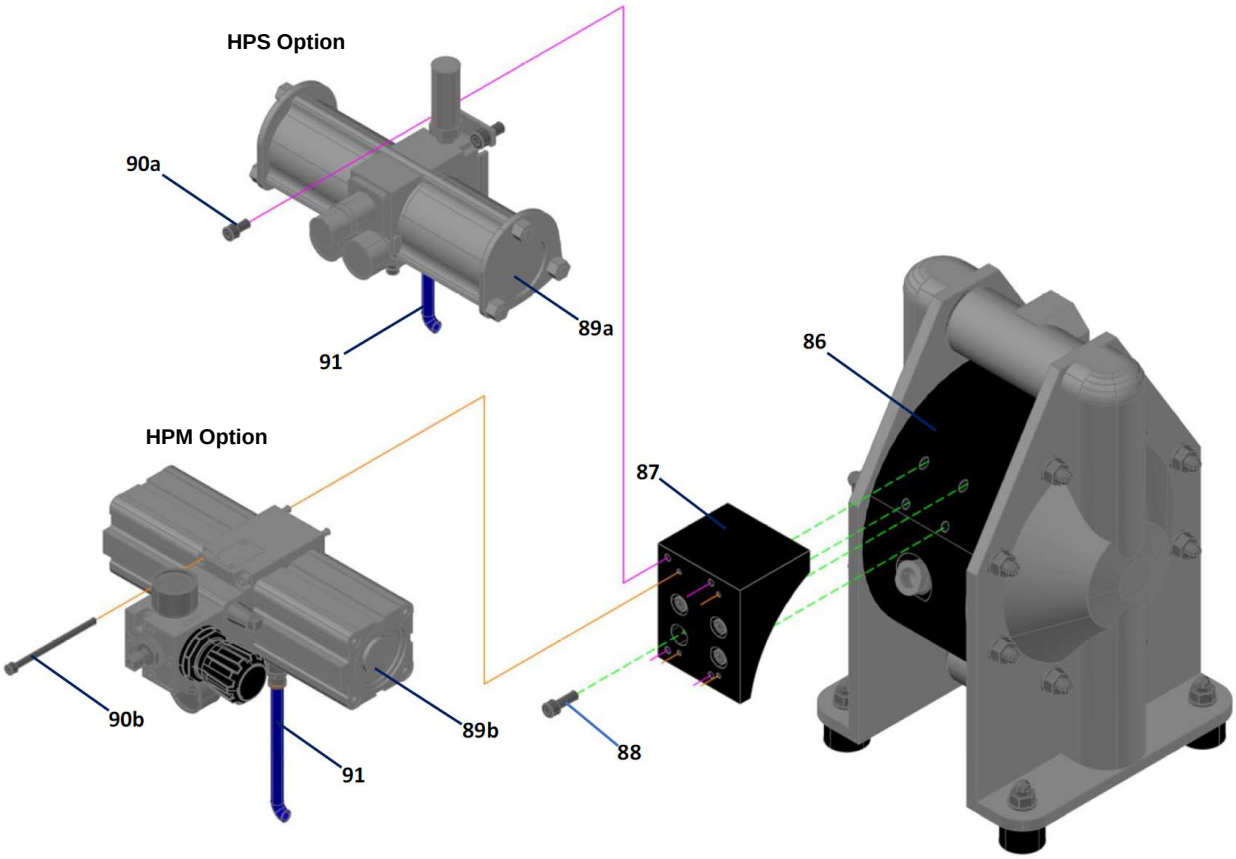
Low air consumption

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.

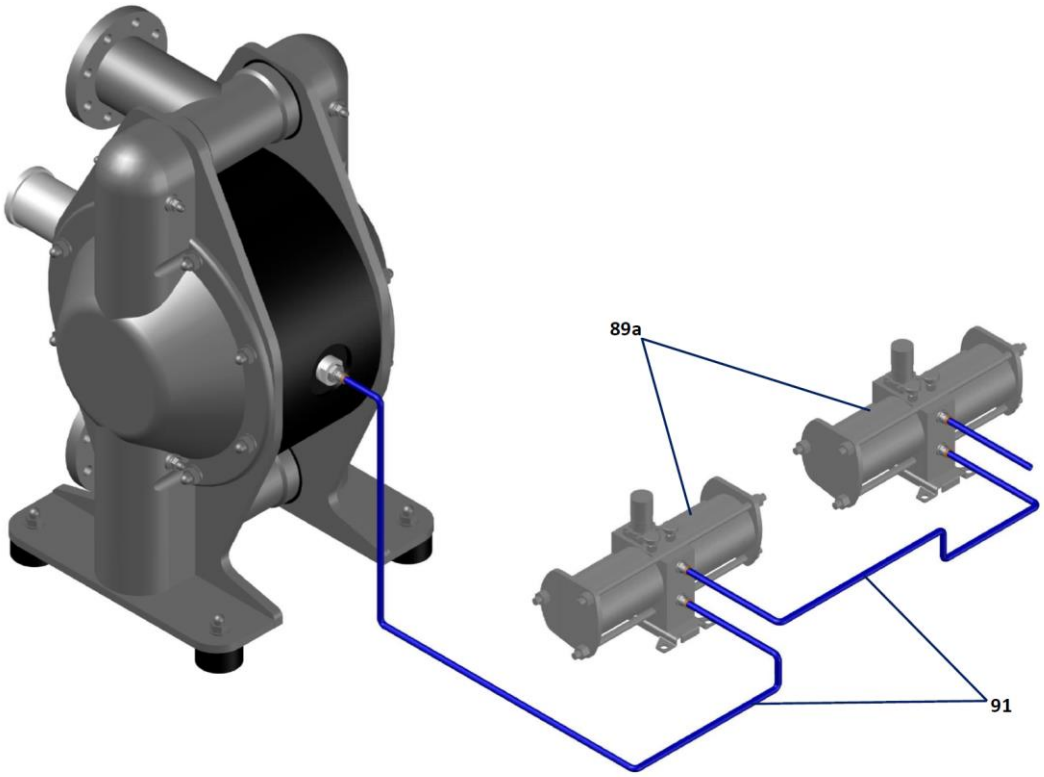
There are two types of boosters available:

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).

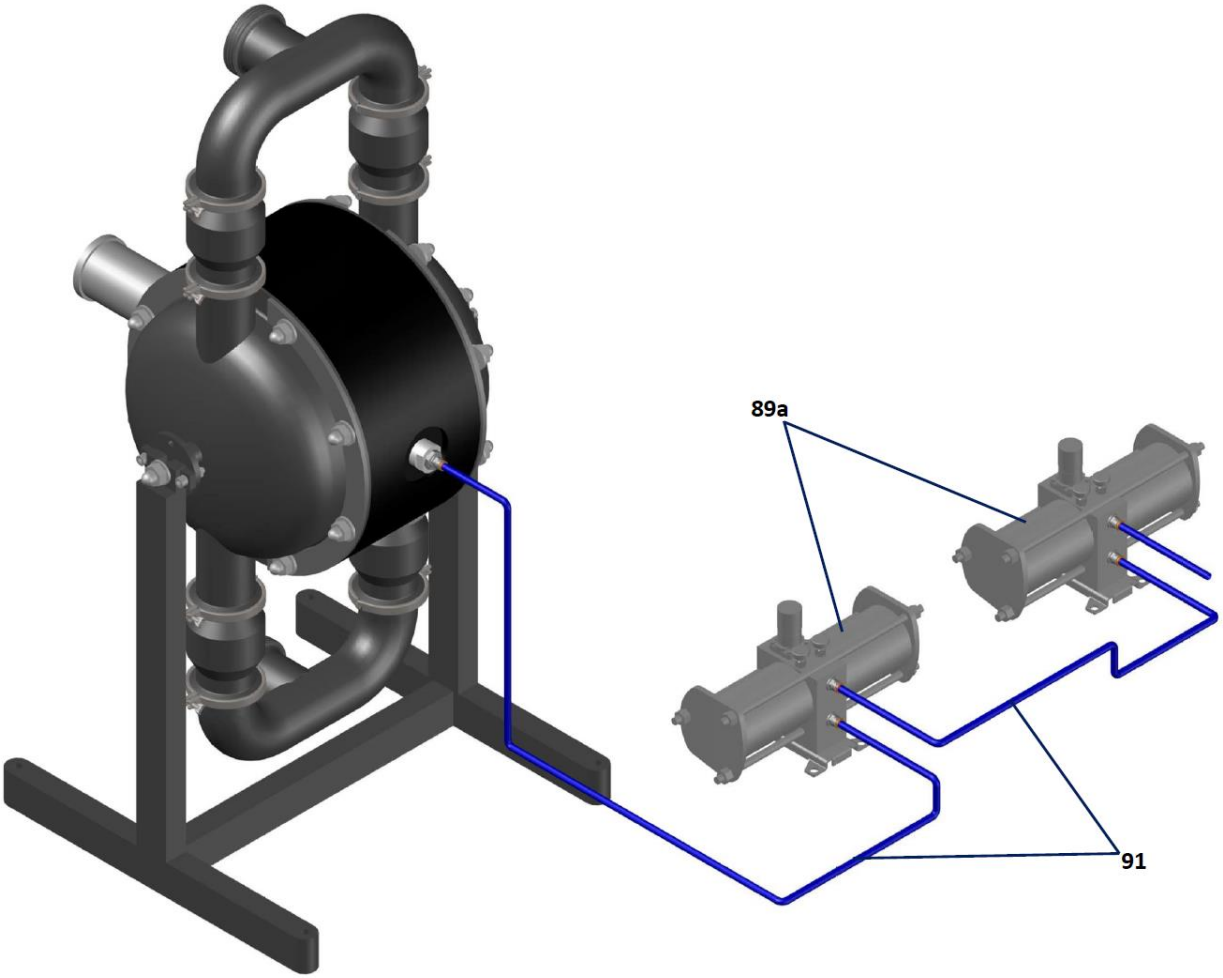
Metal Series Pumps with HPM or HPS Option – from DM 20/75 to DM 50/565 Pump sizes



Metal Series Pump DM 80/850 A..-X, B..-X ,C..-X with HPS Option
(double SMC booster only!!!)



Metal Series Pump DM 80/850 S..-X (Industrial) with HPS Option (double SMC booster only!!!)

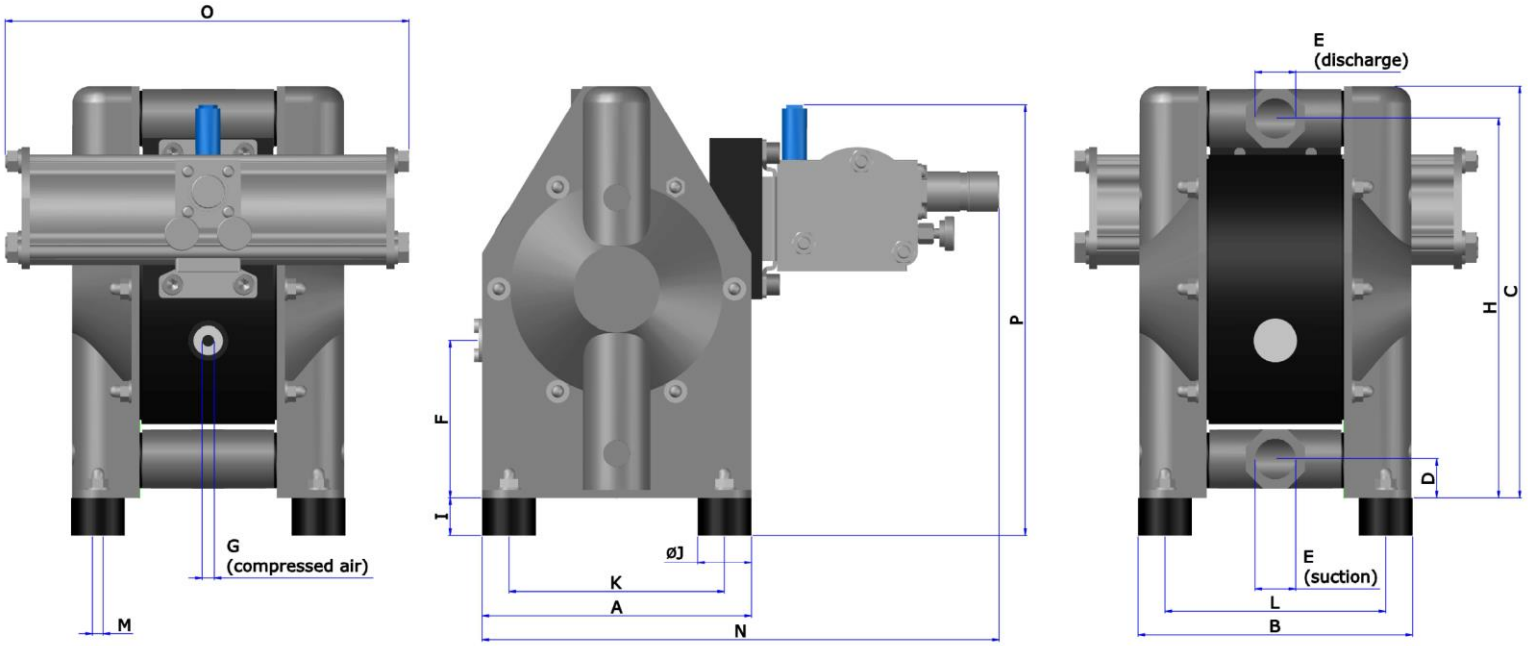


Spare part list, Metal Series Pumps with High Pressure Option

				Pump size	DM 20/75	DM 25/125	DM 40/315	DM 50/565	DM 80/850
Code	Item	Pcs.	Description	Material	Part No.	Part No.	Part No.	Part No.	Part No.
HP	86.	1	Central housing for booster support	PE conductive	1 15 210 21	1 25 210 21	1 40 210 21	1 50 210 21	
	87.	1	Air pressure booster connection	PE conductive	3 20 364 21	3 25 364 21	3 40 364 21	3 50 364 21	
	88.	1	Booster connection mounting set	AISI 304	3 20 442 50	3 25 442 50	3 40 442 50	3 50 442 50	
	89a.	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]
	89b.	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	
	90a.	1	SMC booster mounting set	AISI 304	9 15 S42 50	9 25 S42 50	9 25 S42 50	9 50 S42 50	
	90b.	1	Metalwork booster mounting set	AISI 304	9 15 M42 50	9 15 M42 50	9 40 M42 50	9 40 M42 50	
	91.	1	Air supply hose with connections	Diverse	2 15 592 60	2 25 592 60	2 40 592 60	2 50 592 60	2 80 592 60

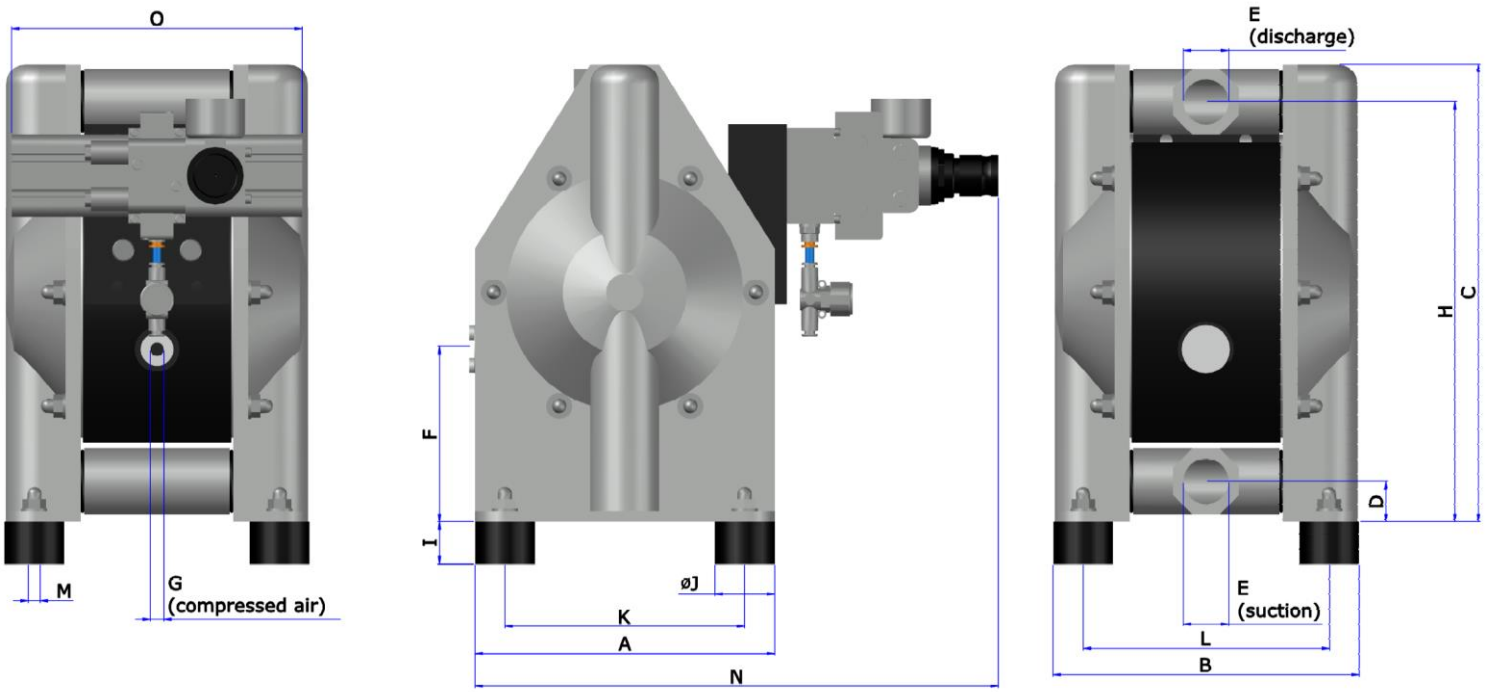
Torque values for housing bolts, HP Option [Nm]:					
Pump's material execution	Size of the Plastic Pump with HPM or HPS Option				
	DM 20/75	DM 25/125	DM 40/315	DM 50/565	DM 80/850
A..-X, B..-X, C..-X	10	16	20	23	24
S..-X	11	17	21	24	40

Appearance and dimensions of high pressure system with HPS Option (no ATEX) (from DM 20/75 to DM50/565 Metal Pumps)



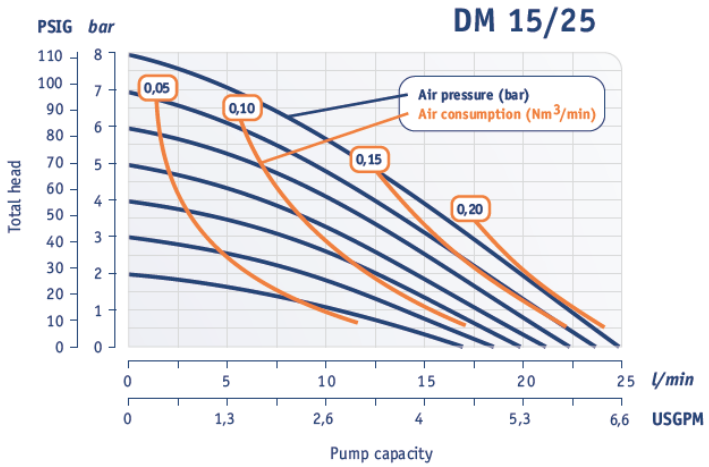
Pump size	A	B	C	D	E	F	G	H	I	ØJ	K	L	M	N	O	P
DM 20/75 A..-HPS	150	171	230	21	G ¾"	86	R ¼"	212	18	30	116	133	M8	271	150	261
DM 20/75 S..-HPS	153	177	235	25	G ¾"	87	R ¼"	217	18	30	112	136	M8	271	150	261
DM 25/125 A..-HPS	200	202	305	27	G 1"	115	R ¼"	280	28	40	160	164	M8	384	300	335
DM 25/125 S..-HPS	200	202	312	29	G 1"	115	R ¼"	282	28	40	162	164	M8	384	300	335
DM 40/315 A..-HPS	270	272	417	34	G 1 ½"	108	R ½"	382	28	40	219	210	M8	457	300	416
DM 40/315 S..-HPS	273	268	412	34	G 1 ½"	106	R ½"	380	20	40	213	210	M8	457	300	416
DM 50/565 A..-HPS	355	345	544	48	G 2"	167	R ½"	501	30	60	282	281	M8	580	404	587
DM 50/565 S..-HPS	350	345	540	46	G 2"	167	R ½"	495	30	60	286	281	M8	580	404	587

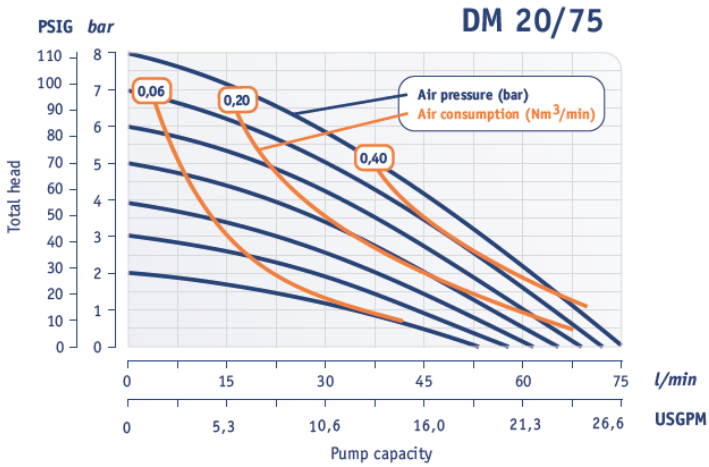
Appearance and dimensions of high pressure system with HPM Option (ATEX) (from DM 20/75 to DM50/565 Metal Pumps)

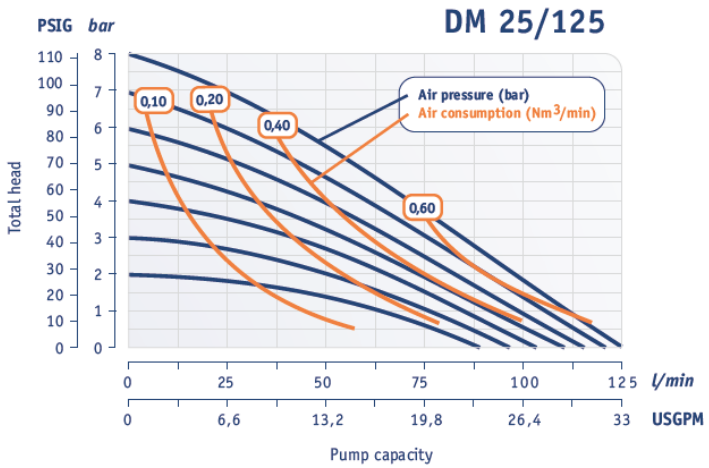


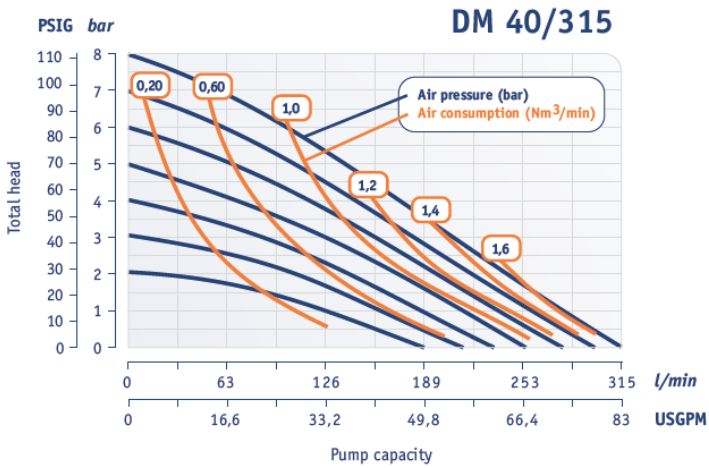
Pump size	A	B	C	D	E	F	G	H	I	ØJ	K	L	M	N	O
DM 20/75 A..-X-HPM	150	171	230	21	G ¾"	86	R ¼"	212	18	30	116	133	M8	299	194
DM 20/75 S..-X-HPM	153	177	235	25	G ¾"	87	R ¼"	214	18	30	112	136	M8	299	194
DM 25/125 A..-X-HPM	200	202	305	27	G 1"	115	R ¼"	280	28	40	160	164	M8	349	194
DM 25/125 S..-X-HPM	200	202	312	29	G 1"	115	R ¼"	282	28	40	162	164	M8	349	194
DM 40/315 A..-X-HPM	270	272	417	34	G 1 ½"	108	R ½"	382	28	40	219	210	M8	463	290
DM 40/315 S..-X-HPM	273	268	412	34	G 1 ½"	106	R ½"	380	28	40	213	210	M8	463	290
DM 50/565 A..-X-HPM	355	345	544	48	G 2"	167	R ½"	501	30	60	282	281	M8	548	290
DM 50/565 S..-X-HPM	350	345	540	46	G 2"	167	R ½"	495	30	60	286	281	M8	547	290

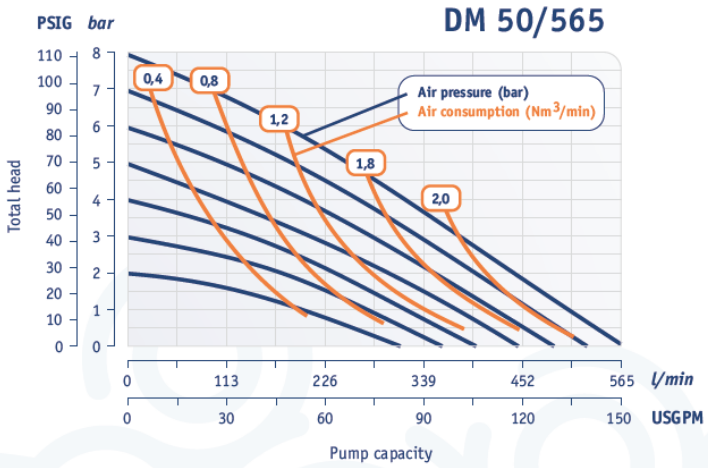
Performance curves

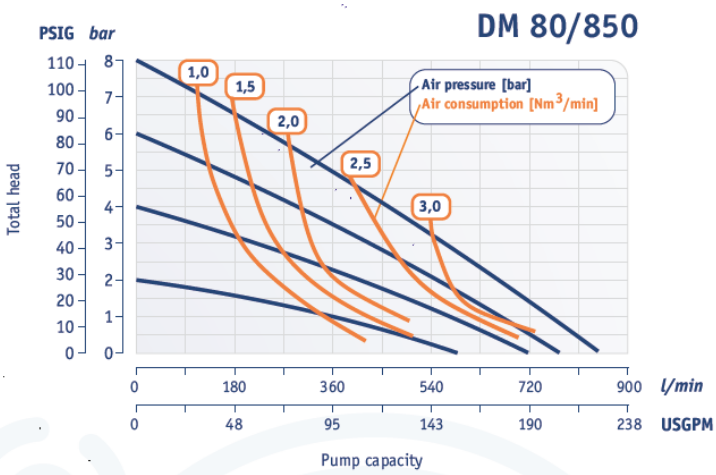












16.9 Pump with solenoid valve (Option code MV)

DELLMECO Metal Series Pump with the 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.

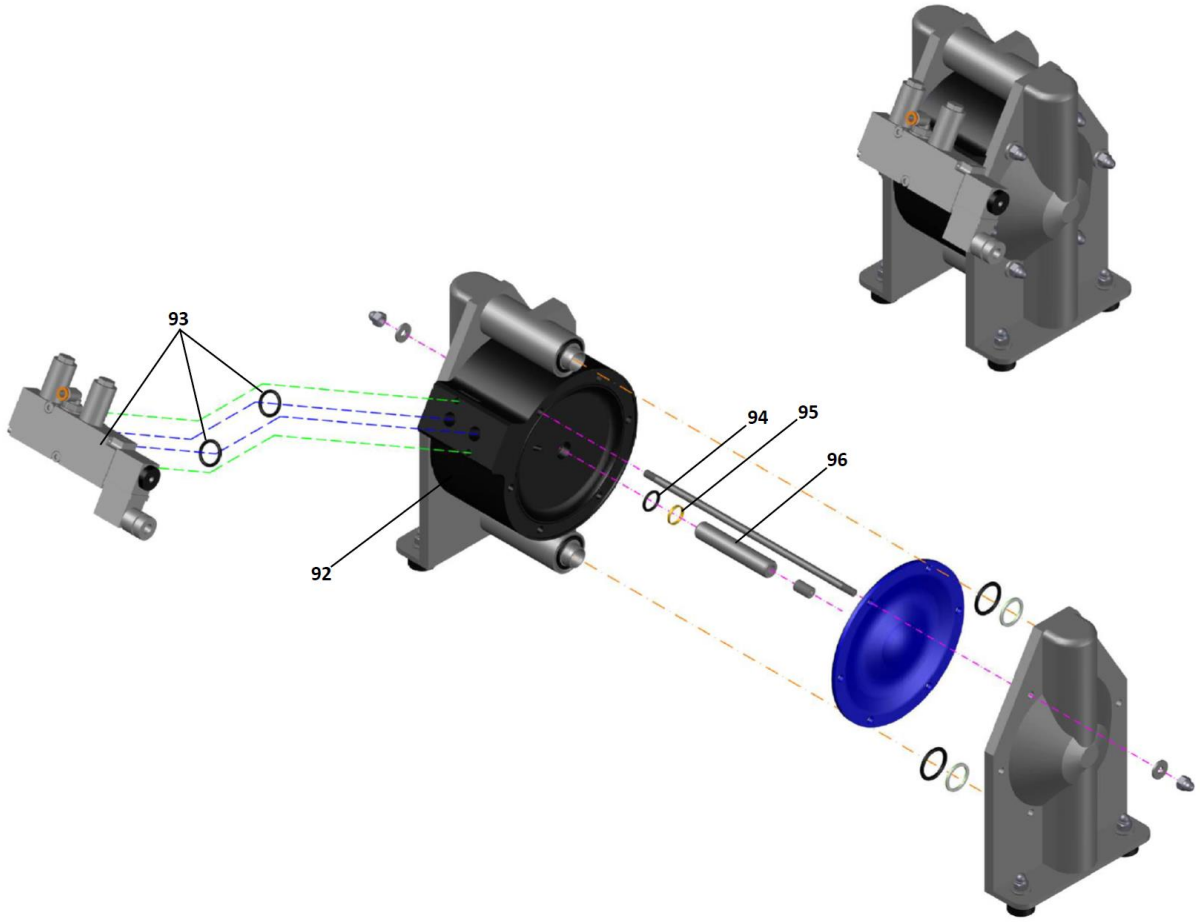
Pump with MV Option is fitted with a 5/2 electro-pneumatic monostable NAMUR solenoid valve. When the solenoid is unpowered and the pump is delivered with compressed air (air supply valve is opened), one chamber within the pump is pressurized with air whilst the opposite chamber is discharged. When electric 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 15/25 up to DM 40/315 Metal Series Pump sizes.

Appearance of the Metal Pump with MV Option



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

				Pump size:	DM 15/25	DM 20/75	DM 25/125	DM 40/315
Code	Item	Q-ty	Description	Material	Part no.	Part no.	Part No.	Part No.
MV	92.	1	Central housing, MV Option	PE conductive	1 10 410 21	1 15 410 20	1 25 410 21	1 40 410 21
	93.	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
	94.	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
	95.	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
	96.	1	Diaphragm shaft for MV Option	AISI 304	1 08 124 50	1 15 40 50	1 25 40 50	1 40 40 50

(*) – parts not included in the above chart are the same as for standard Metal Series Pump (with 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:

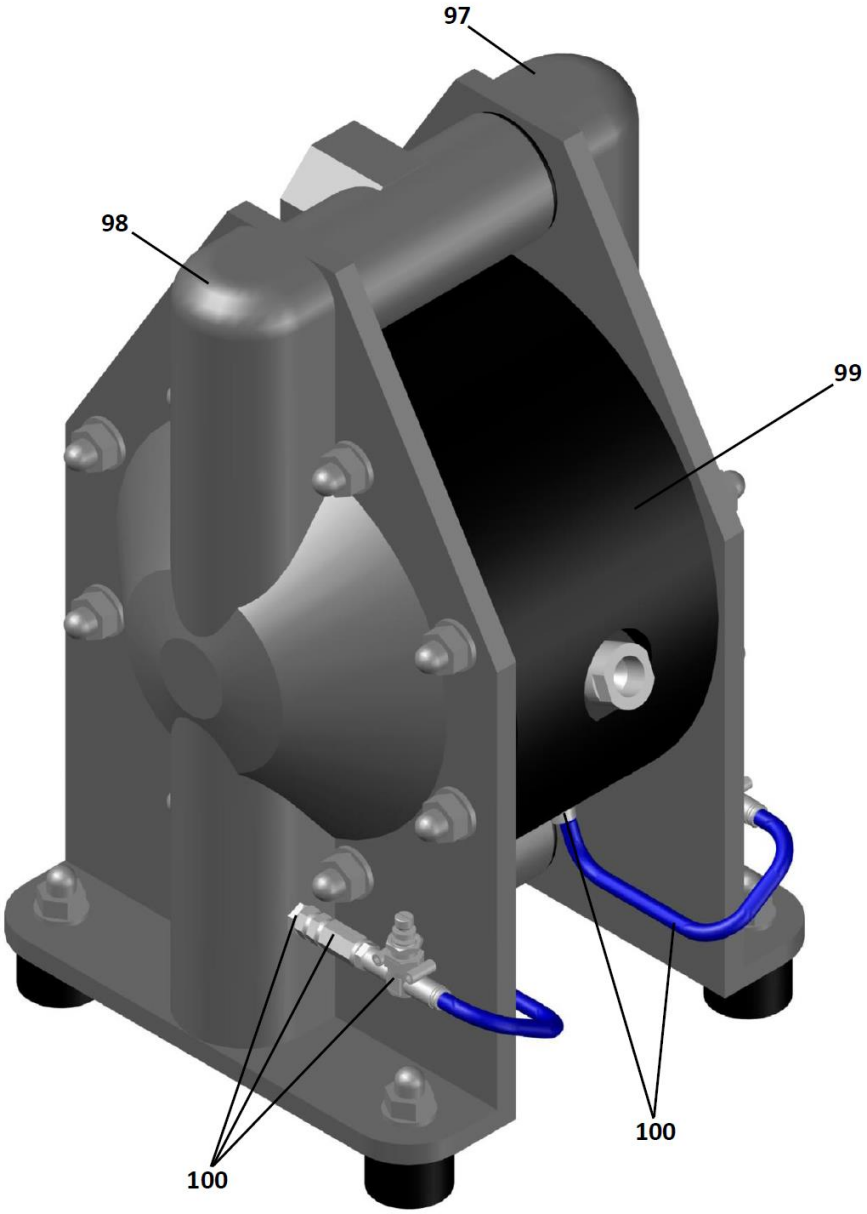
- Airborne contamination reducing (powders can be transferred directly in a closed system)
- Pump can be easily moved from site to site (also available trolley – as a “T” Option)
- Economic and simple system (the opposite of large and complex systems).

Such 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 Metal Pump with Powder Option



Spare part list for the Metal Pumps with Powder Option

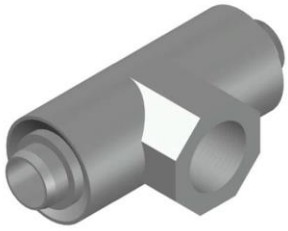
				Pump size:	DM 20/75	DM 25/125	DM 40/315	DM 50/565	DM 80/850
Code	Item	Q-ty	Description	Material	Part no.	Part No.	Part No.	Part No.	Part No.
P	97.	1	Left side housing for Powder Option	Alu (A..-X)	3 20 401 60	3 25 401 60	3 40 401 60	3 50 401 60	3 80 401 60
				Alu+PTFE (B..-X)	3 20 401 61	3 25 401 61	3 40 401 61	3 50 401 61	3 80 401 61
				Cast Iron (C..-X)	3 20 401 65	3 25 401 65	3 40 401 65	3 50 401 65	3 80 401 65
				AISI 316 (S..-X)	3 20 401 52	3 25 401 52	3 40 401 52	3 50 401 52	5 80 401 53
	98.	1	Right side housing for Powder Option	Alu (A..-X)	3 20 501 60	3 25 501 60	3 40 501 60	3 50 501 60	3 80 501 60
				Alu+PTFE (B..-X)	3 20 501 61	3 25 501 61	3 40 501 61	3 50 501 61	3 80 501 61
				Cast Iron (C..-X)	3 20 501 65	3 25 501 65	3 40 501 65	3 50 501 65	3 80 501 65
				AISI 316 (S..-X)	3 20 501 52	3 25 501 52	3 40 501 52	3 50 501 52	5 80 501 53
	99.	1	Central housing for Powder Option	PE conductive	1 15 410 20	1 25 410 21	1 40 410 21	1 50 410 21	1 80 410 21
	100.	2	Non-return valve for Powder Option, complete	Diverse	1 15 720 00	1 25 720 00	1 40 720 00	1 50 720 00	1 80 720 00

16.11. Sleeve with Split Connections (option code S)

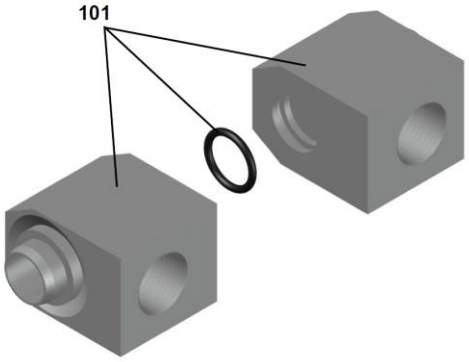
Metal pump from DM 15/25 up to 50/565 size can be converted from a double-acting air-driven diaphragm pump into two separated single-acting ones. Standard inlet/outlet connections with one suction and one discharge are then exchanged for inlet/outlet connections with separated suction and discharge connections for both pump chambers. Owing to this, you obtain pump ready to transfer two different liquids with liquid streams in 1:1 ratio.

Below drawing shows difference between the standard inlet/outlet connection (left side) and the split inlet/outlet connection – "S" Option (right side). Nominal twin-port size is different from standard connection (e.g., for DM 15/25 Metal Pump with "S" option all connections are BSPP ⅜", instead of BSPP ½"), except for DM 50/565 Metal Pump with "S" Option (DM 50/565 and DM 50/565 with "S" Option have the same sizes of all connections – BSPP 2"). In-/outlet connections' size and material execution is specified in the below chart.
O-ring situated between halves ensures stable connection and allows to rotate connections in different directions.

Standard in-/outlet connection



Split in-/outlet connection



Spare part list, split connections

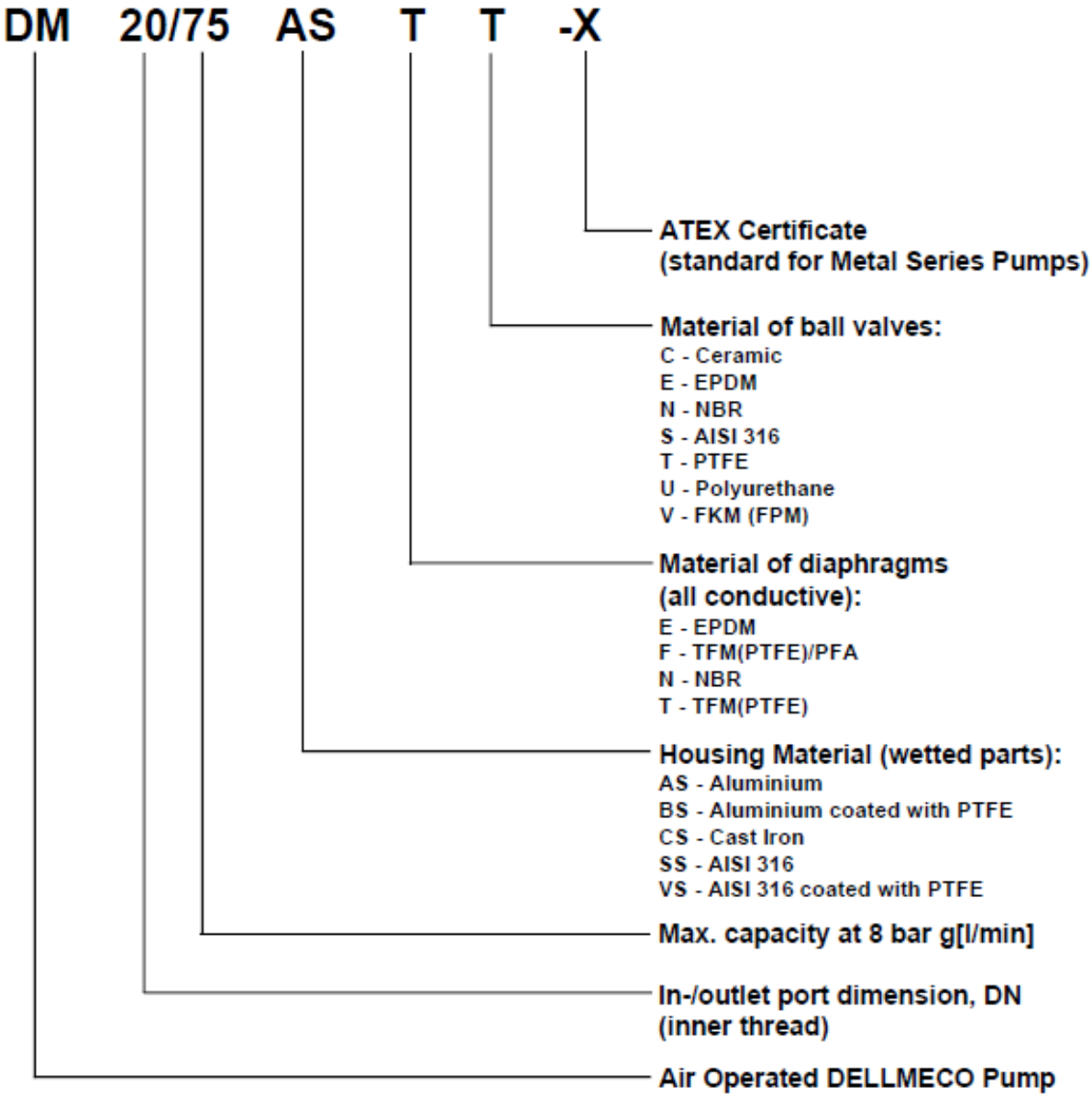
				Pump size:	DM 15/25	DM 20/75	DM 25/125	DM 40/315	DM 50/315
Code	Pos.	Q-ty	Description	Material	Part no.	Part no.	Part no.	Part no.	Part no.
S	101.	2	Sleeve with split connections (O-ring included)	Alu (A..-X)	3 15 31 60	3 20 31 60	3 25 31 60	3 40 31 60	3 50 31 60
				Alu+PTFE (B..-X)	3 15 31 52	3 20 31 52	3 25 31 52	3 40 31 52	3 50 31 52
				Cast Iron (C..-X)(*)					
				AISI 316 (S..-X)		5 20 31 52	5 25 31 52	5 40 31 52	5 50 31 52
"S" Option in-/outlet connection size					BSPP ⅜"	BSPP ½"	BSPP ¾"	BSPP 1 ¼"	BSPP 2"

16.12. Metal Series Pumps with stainless steel central housing (AISI 304), option code: AS..-X, BS..-X, CS..-X, SS..-X and VS..-X

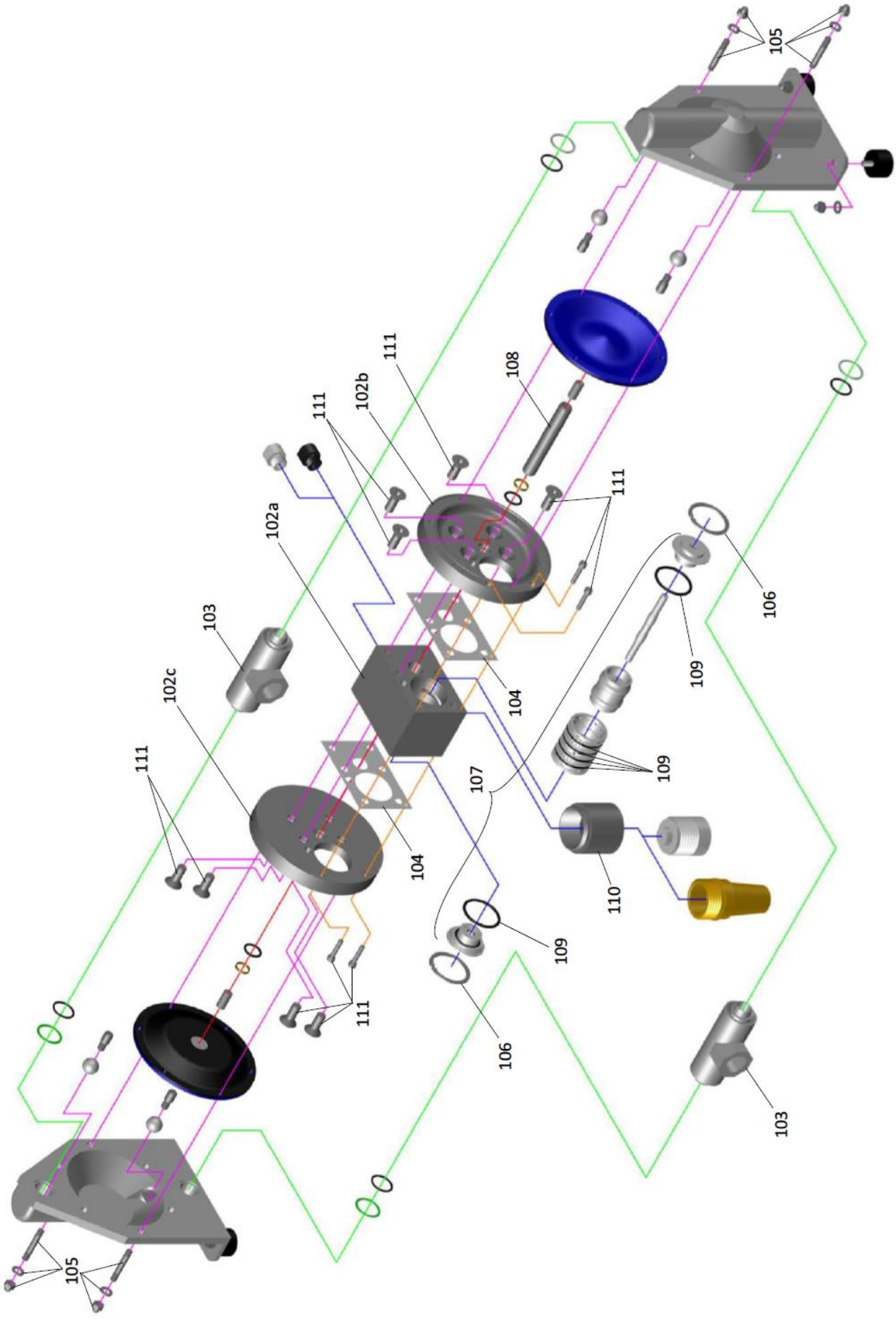
Metal Series Pumps from DM 20/75 up to DM 50/565 size can be equipped with AISI 304 stainless steel central housing. This solution ensures resistance against high temperatures and contact with media for which standard central housing material (PE conductive) is not resistant.

NOTE: In the case of Metal Series Pump with AISI 304 stainless steel central housing, inlet/outlet connections are available only in AISI 316 version, regardless of the side housing material execution. It means that Aluminium, Aluminium covered with PTFE and Cast Iron pumps are also equipped with AISI 316 in-/outlet connections. Industrial Series Pump have AISI 316 in-/outlet connections as a standard). In the case of AISI 316 covered with PTFE Pumps (e.g., DM 25/125 VSTT-X), AISI 316 in-/outlet connections are also coated with PTFE layer (as side housings).
Please be advised that inlet/outlet connections used in the Pumps with stainless steel central housing do not fit DELLMECO Metal Series Pumps with standard PE conductive central housing (and vice-versa)!

Codification for the Metal Series Pumps with stainless steel central housing is as follows:



DM 20/75 AS..-X, BS..-X, CS..-X, SS..-X, VS..-X and DM 25/125 AS..-X, BS..-X, CS..-X, SS..-X, VS..-X
Metal Series Pumps with AISI 304 central housing – exploded view



DM 20/75 AS..-X, BS..-X, CS..-X, SS..-X, VS..-X Metal Series Pumps with AISI 304 central housing – spare parts list

				DM 20/75 Metal Series Pump material execution (AS – Aluminium, BS – Alu+PTFE, CS – Cast Iron, SS – AISI 316 cast, VS – AISI 316+PTFE)				
Item	**Part name**	**Q-ty**	**Material**	**DM 20/75 AS..-X**	**DM 20/75 BS..-X**	**DM 20/75 CS..-X**	**DM 20/75 SS..-X**	**DM 20/75 VS..-X**
102a.	Air valve casing	1	AISI 304	1 15 10H 50				
102b.	Left case	1	AISI 304	1 15 802 50				
102c.	Right case	1	AISI 304	1 15 902 50				
103.	Suction/discharge port	2	AISI 316	3 20 30H 52				
			AISI 316+PTFE					3 20 30H 59
	Suction/discharge twin port (Option S-"splitted")	2	AISI 316	3 20 31H 52				
104.	Case seal	2	PTFE	3 20 73H 23				
105.	Sockets + nuts + washers, cpl (1 pump)	4	AISI 304	3 20 42H 50			5 20 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	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)] - included in Item 107 „Air valve, complete (circlip mounted)
[2)] - parts available only on customer's request

DM 25/125 AS..-X, BS..-X, CS..-X, SS..-X, VS..-X Metal Series Pumps with AISI 304 central housing – spare parts list

				DM 25/125 Metal Series Pump material execution (AS – Aluminium, BS – Alu+PTFE, CS – Cast Iron, SS – AISI 316 cast, VS – AISI 316+PTFE)				
Item	**Part name**	**Q-ty**	**Material**	**DM 25/125 AS..-X**	**DM 25/125 BS..-X**	**DM 25/125 CS..-X**	**DM 25/125 SS..-X**	**DM 25/125 VS..-X**
102a.	Air valve casing	1	AISI 304	1 15 10H 50				
102b.	Left case	1	AISI 304	1 25 802 50				
102c.	Right case	1	AISI 304	1 25 902 50				
103.	Suction/discharge port	2	AISI 316	3 25 30H 52				
			AISI 316+PTFE					3 25 30H 59
	Suction/discharge twin port (Option S-"splitted")	2	AISI 316	3 25 31H 52				
104.	Case seal	2	PTFE	3 20 73H 23				
105.	Sockets + nuts + washers, cpl (1 pump)	4	AISI 304	3 25 42H 50			5 25 42H 50	
106.	Circlip for air valve cover	2	Diverse	3 25 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	1	AISI 304	1 25 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 25 44H 50				

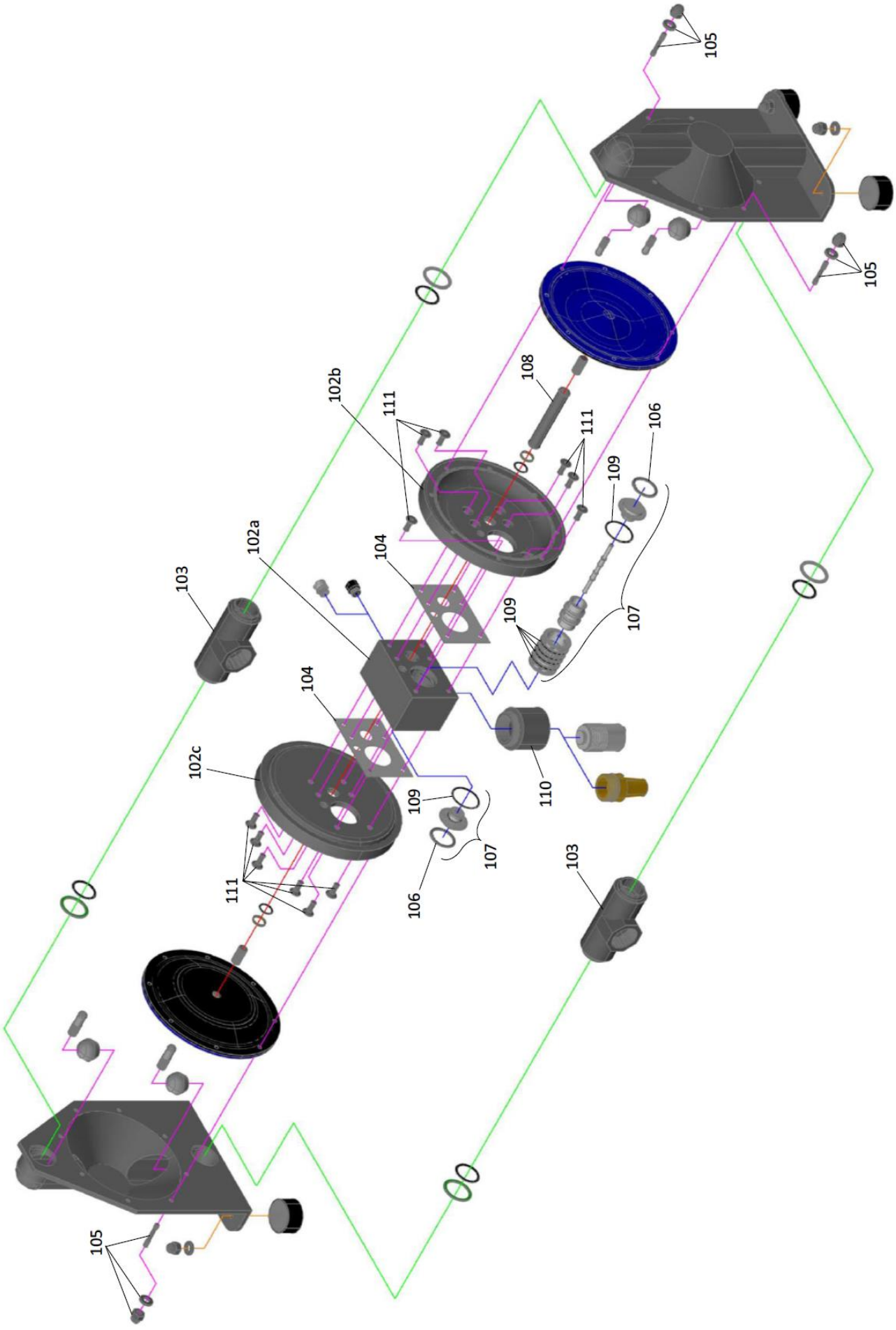
[1)] - included in Item 13 „Air valve, complete (circlip mounted)
[2)] - parts available only on customer's request

List of parts for spare part kits SET 1 and SET 2 in the pumps DM 20/75 and DM 25/125 with stainless steel central housing

Spare part kit set type		Item	Q-ty	Part description	Pump size							
					DM 20/75				DM 25/125			
					Material version [a]							
					ASEE-X BSEE-X CSEE-X SSEE-X	ASNN-X BSNN-X CSNN-X SSNN-X	ASTT-X BSTT-X CSTT-X	SSTT-X VSTT-X	ASEE-X BSEE-X CSEE-X SSEE-X	ASNN-X BSNN-X CSNN-X SSNN-X	ASTT-X BSTT-X CSTT-X	SSTT-X VSTT-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 25 50 08	1 25 50 10	1 25 50 05	
		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	3 20 70 08	3 20 70 10	3 20 70 08	3 20 70 03	3 25 70 08	3 25 70 10	3 20 70 08	3 25 70 03
		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-rings	1 15 85 10				1 25 85 10**			
		80.	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 40/315 AS..-X, BS..-X, CS..-X, SS..-X, VS..-X and DM 50/565 AS..-X, BS..-X, CS..-X, SS..-X, VS..-X Metal Series Pumps with AISI 304 central housing – exploded view



DM 40/315 AS..-X, BS..-X, CS..-X, SS..-X, VS..-X Metal Series Pumps with AISI 304 central housing – spare parts list

				DM 40/315 Metal Series Pump material execution (AS – Aluminium, BS – Alu+PTFE, CS – Cast Iron, SS – AISI 316 cast, VS – AISI 316+PTFE)				
Item	**Part name**	**Q-ty**	**Material**	**DM 40/315 AS..-X**	**DM 40/315 BS..-X**	**DM 40/315 CS..-X**	**DM 40/315 SS..-X**	**DM 40/315 VS..-X**
102a.	Air valve casing	1	AISI 304	1 40 10H 50				
102b.	Left case	1	AISI 304	1 40 802 50				
102c.	Right case	1	AISI 304	1 40 902 50				
103.	Suction/discharge port	2	AISI 316	3 40 30H 52				
			AISI 316+PTFE					3 40 30H 59
	Suction/discharge twin port (Option S-"splitted")	2	AISI 316	3 40 31H 52				
104.	Case seal	2	PTFE	3 40 73H 23				
105.	Sockets + nuts + washers, cpl (1 pump)	4	AISI 304	3 40 42H 50			5 40 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	1	AISI 304	1 40 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				
111.	Left/right case mounting screws, set	1	AISI 304	1 40 44H 50				

[1)] - included in Item 13 „Air valve, complete (circlip mounted)
[2)] - parts available only on customer's request

DM 50/565 AS..-X, BS..-X, CS..-X, SS..-X, VS..-X Metal Series Pumps with AISI 304 central housing – spare parts list

				DM 50/565 Metal Series Pump material execution (AS – Aluminium, BS – Alu+PTFE, CS – Cast Iron, SS – AISI 316 cast, VS – AISI 316+PTFE)				
Item	**Part name**	**Q-ty**	**Material**	**DM 50/565 AS..-X**	**DM 50/565 BS..-X**	**DM 50/565 CS..-X**	**DM 50/565 SS..-X**	**DM 50/565 VS..-X**
102a.	Air valve casing	1	AISI 304	1 50 10H 50				
102b.	Left case	1	AISI 304	1 50 802 50				
102c.	Right case	1	AISI 304	1 50 902 50				
103.	Suction/discharge port	2	AISI 316	3 50 30H 52				
			AISI 316+PTFE					3 50 30H 59
	Suction/discharge twin port (Option S-"splitted")	2	AISI 316	3 50 31H 52				
104.	Case seal	2	PTFE	3 50 73H 23				
105.	Sockets + nuts + washers, cpl (1 pump)	4	AISI 304	3 40 42H 50			5 50 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	1	AISI 304	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 50 299 50				
111.	Left/right case mounting screws, set	1	AISI 304	1 50 44H 50				

[1)] - included in Item 13 „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 in the pumps DM 40/315 and DM 50/565 with stainless steel central housing

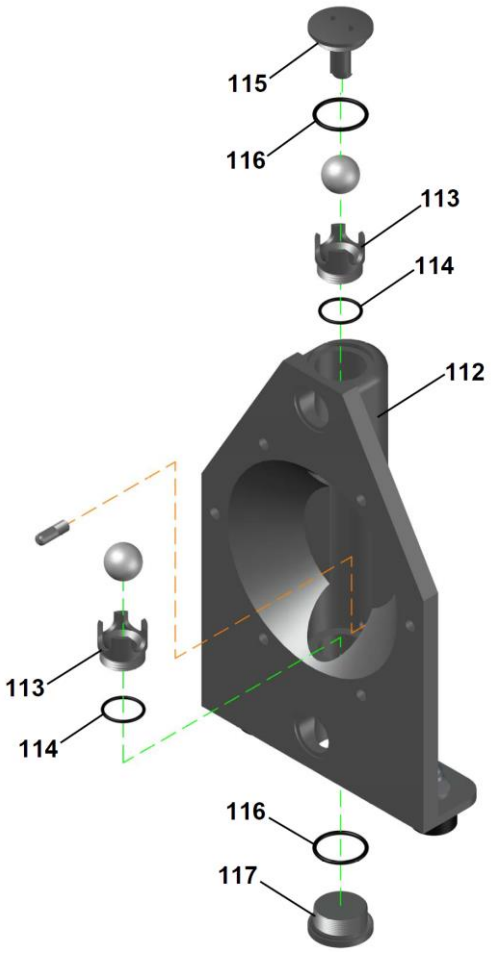
Spare part kit set type		Item	Q-ty	Part description	Pump size							
					DM 40/315				DM 50/565			
					Material version [a]							
					ASEE-X BSEE-X CSEE-X SSEE-X	ASNN-X BSNN-X CSNN-X SSNN-X	ASTT-X BSTT-X CSTT-X	SSTT-X VSTT-X	ASEE-X BSEE-X CSEE-X SSEE-X	ASNN-X BSNN-X CSNN-X SSNN-X	ASTT-X BSTT-X CSTT-X	SSTT-X VSTT-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 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 40 60 08	1 40 60 10	1 40 60 23	
		17.	1	Muffler (new type)	1 40 499 35				1 50 499 35			
		7.	4	In-/outlet sealing set	3 40 70 08	3 40 70 10	3 40 70 08	3 40 70 03	3 50 70 08	3 50 70 10	3 50 70 08	3 50 70 03
		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-rings	1 40 85 10				1 50 85 10			
		80.	2	Shaft allen pin screw	1 40 540 50				1 50 540 50			

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

16.13. Industrial (AISI 316) Series Pumps with replaceable valve seats (SX..-X Series)

In order to improve the AISI 316 (Industrial) Metal Series Pumps' efficiency and to reduce the cost of replacing worn parts, we have re-designed the construction of the AISI 316 side housings to make available replacement of both valve seats (in standard execution of Metal Series Pumps valve seats are integrated with side housing and cannot be disassembled, so the whole side housing has to be replaced). New side housing additionally has upper and lower plugs (like in the Plastic Series Pumps). Key dimensions have not changed, so the standard side housing can be replaced with a new version, which has interchangeable valve seats and upper/lower plugs.

DM 20/75, DM 25/125, DM 40/315, DM 50/565 SX..-X Metal Series Pumps with replaceable valve seats – exploded view



DM 20/75, DM 25/125, DM 40/315, DM 50/565 SX..-X Metal Series Pumps with replaceable valve seats – spare parts list

				Industrial (AISI 316 cast) Series Pumps with replaceable valve seats			
Item	**Part name**	**Q-ty**	**Material**	**DM 20/75 SX..-X**	**DM 25/125 SX..-X**	**DM 40/315 SX..-X**	**DM 50/565 SS..-X**
112.	**Pump housing with replaceable valve seats**	**2**	**AISI 316**	**5 20 01S 52**	**5 25 01S 52**	**5 40 01S 52**	**5 50 01S 52**
113.	**Upper/lower valve seat**	**4**	**AISI 316**	**5 20 54 52**	**5 25 54 52**	**5 40 54 52**	**5 50 54 52**
114.	**Valve seat O-ring(*)**	**4**	**EPDM**	**5 20 754 08**	**5 25 754 08**	**5 40 754 08**	**5 50 754 08**
			FKM	**5 20 754 09**	**5 25 754 09**	**5 40 754 09**	**5 50 754 09**
			NBR	**5 20 754 10**	**5 25 754 10**	**5 40 754 10**	**5 50 754 10**
115.	**Upper plug**	**2**	**AISI 316**	**5 20 55 52**	**5 25 55 52**	**5 40 55 52**	**5 50 55 52**
116.	**Upper/lower plug O-ring(*)**	**4**	**EPDM**	**5 20 78 08**	**5 25 78 08**	**5 40 78 08**	**5 50 78 08**
			FKM	**5 20 78 09**	**5 25 78 09**	**5 40 78 09**	**5 50 78 09**
			NBR	**5 20 78 10**	**5 25 78 10**	**5 40 78 10**	**5 50 78 10**
117.	**Lower plug**	**2**	**AISI 316**	**5 20 59 52**	**5 25 59 52**	**5 40 59 52**	**5 50 59 52**

***** - standard sealing O-rings material for:
SX**E**E-X Pump models (with EPDM diaphragms): EPDM;
SX**T**T-X Pump models (with TFM/PTFE diaphragms): FKM;
SX**N**N-X Pump models (with NBR diaphragms): NBR.
Other sealing materials available on request

NOTE: Other spare parts (not specified in the above chart) are the same as for standard AISI 316 Industrial Series Pumps – see "**Chapter 5. Names of parts and materials"**, pages:10-19 (only Industrial Series Pumps: **S..-X**).

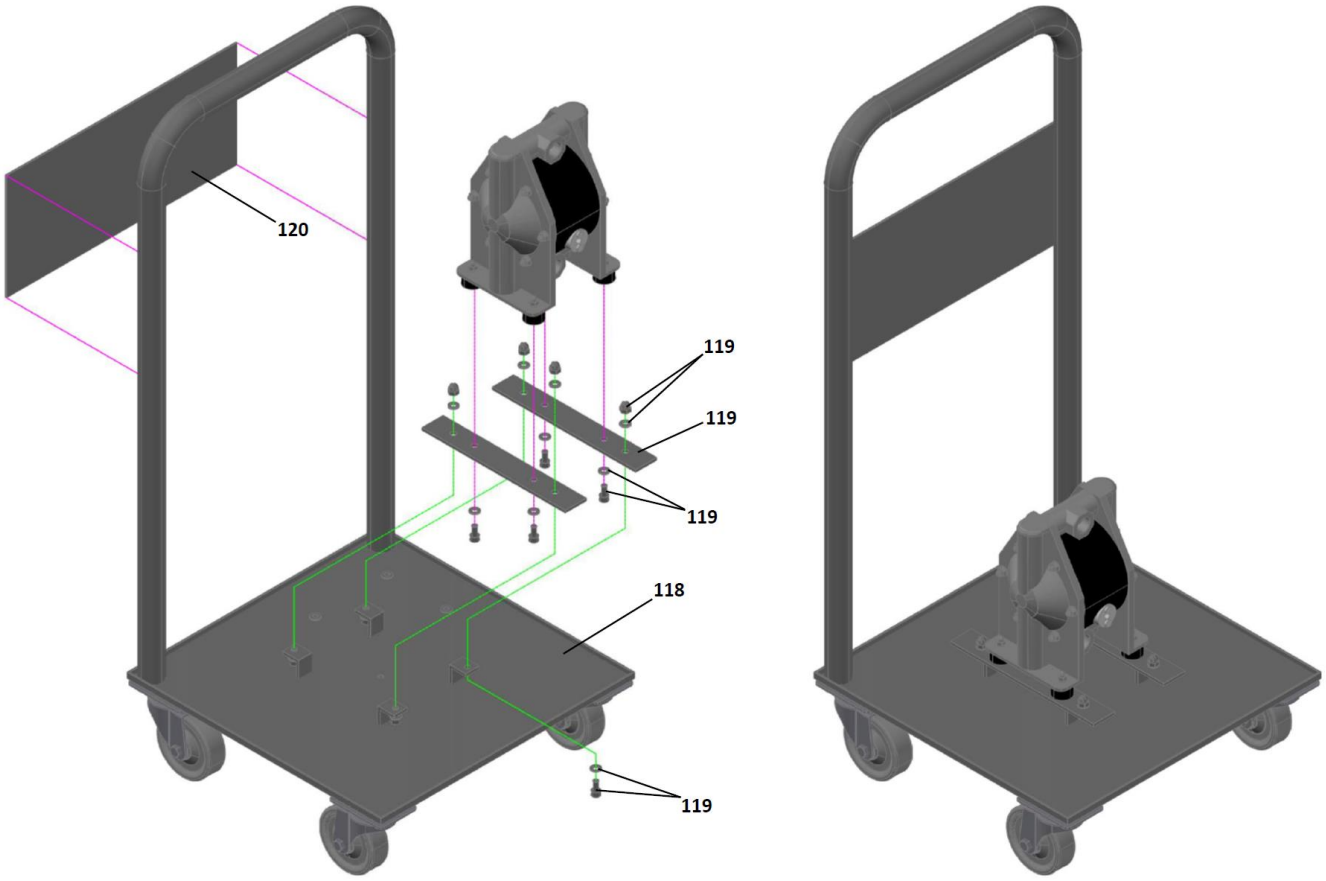
16.14. Trolley for pumps (Option code T)

Using the trolley makes your DELLMECO Metal 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 DELLMECO Metal Series Pumps – from DM 15/25 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 ATEX-approved 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 25/125 STT-X-T**), intervals between the brackets for fixing will be adjusted to the ordered pump's model – here: DM 25/125 STT-X. In the case of ordering trolley for the pump already bought, model of the pump has to be specified and distances between the shock absorbers [11] have to be measured, 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 Metal Pump on Trolley



Spare part list for Trolley Option

					Pump size	DM 15/25	DM 20/75	DM 25/125	DM 40/315	DM 50/565	DM 80/850
Code	Position	Q-ty	Description	Material	Pump material version	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
T	118.	1	Trolley with wheels for ATEX, complete	AISI 304	Aluminium Alu+PTFE Cast Iron	3 15 293 00	3 20 293 00	3 25 293 00	3 40 293 00	3 50 293 00	3 80 293 00
					AISI 316 (Industrial)		5 20 293 00	3 25 293 00	3 40 293 00	3 50 293 00	3 80 293 00
	119.	1	Pump fixing set (brackets, nuts washers, bolts)	AISI 304	Aluminium Alu+PTFE Cast Iron AISI 316(*)	3 15 393 50	3 20 393 50	3 25 393 50	3 40 393 50	3 50 393 50	3 80 393 50
	120.	1	Vertical plate (optional)	AISI 304		3 15 493 50	3 20 493 50	3 25 493 50	3 40 493 50	3 50 493 50	1 80 493 52

(*) – available from **DM 20/75 S..-X-T** Pump model

For the pumps from DM 15/25 up to DM 50/565 size, maximum dimensions of the trolley are: 480x480x1050 mm (length x width x height). In the case of DM 80/850 Metal 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.).

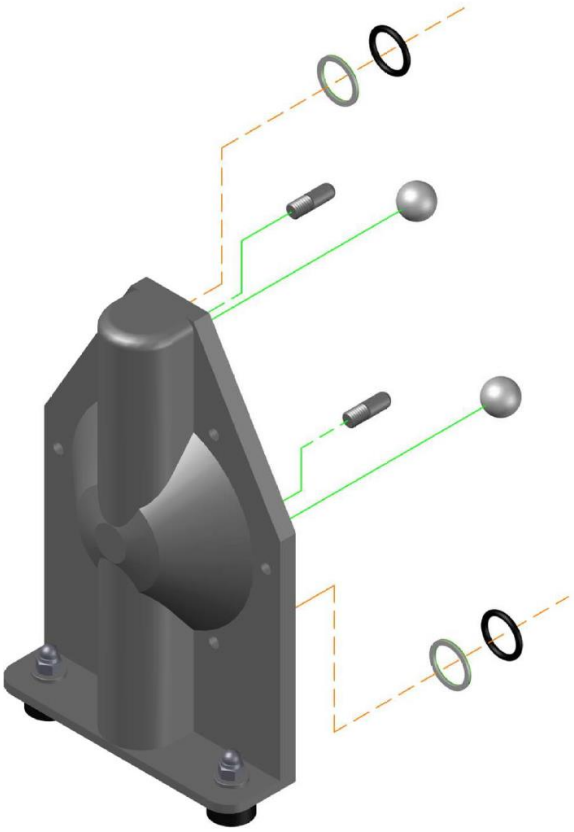
16.15. Extended ball valve stoppers (Option code EVS)

DELLMECO Metal Series Pumps from DM 20/75 up to 50/565 size are equipped with thread-mounted ball valve stoppers, assembled into the side housings with specified torque for each size of the pump. Additionally, these stoppers are reinforced with Loctite 243 Medium Strenght Threadlocker, in order to prevent self-unscrewing of the stoppers, especially in the case of prolonged period of dry-pumping and/or when the pump is equipped with stainless steel ball valves.

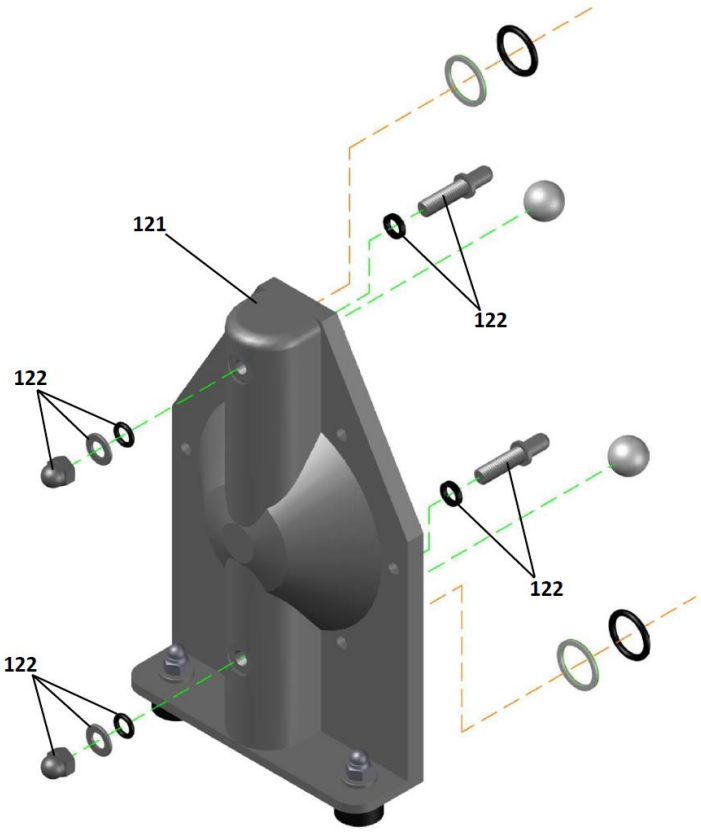
It is also possible to prepare a pump with extended ball valve stoppers, where valve stopper thread is screwed into the side housing and additionally tightened with nut cover on the back of the side housing – this execution enhances the connection: side housing<->ball valve stoppers and protects against self-unscrewing of the ball valve stoppers while handling with heavy applications (e.g., requiring stainless steel ball valves or exposed to dry working conditions, where there is difficult to control if the pump isn't working without liquid with high air supply pressure).

Comparison of standard and extended ball valve stoppers appearance is presented on the below picture:

Metal Pump with standard ball valve stoppers



Metal Pump with extended ball valve stoppers (EVS)



Spare part list for Extended Valve Stopper Option

					DM 20/75	DM 25/125	DM 40/315	DM 50/565
Code	Position	Q-ty	Description	Material	Part no.	Part no.	Part no.	Part no.
EVS	121.	2	Side housing for EVS Option	Aluminium	3 20 01V 60	3 25 01V 60	3 40 01V 60	3 50 01V 60
				Alu+PTFE	3 20 01V 61	3 25 01V 61	3 40 01V 61	3 50 01V 61
				Cast Iron	3 20 01V 65	3 25 01V 65	3 40 01V 65	3 50 01V 65
				AISI 316	3 20 01V 52	3 25 01V 52	3 40 01V 52	3 50 01V 52
	122.	4	Extended ball valve stopper set (includes: stopper, internal seal, O-ring, washer and nut)	Diverse	3 20 339 00	3 25 339 00	3 40 339 00	3 50 339 00

16.16. Inlet/outlet connections with BSPT thread (Option code BSPT)

Although all DELLMECO Metal Series Pumps from DM 15/25 up to 50/565 size (DM 80/850 Pumps are standardly equipped with DIN PN10/16 flange connections, but 3" BSPP is also possible) are equipped with internal BSPP thread (British Standard Pipe Parallel thread with angle 55° and constant diameter, denoted by the letter "G"), it is possible to order the Meyal Series Pump with 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.

16.17. Inlet/outlet connections with NPT thread (Option code NPT)

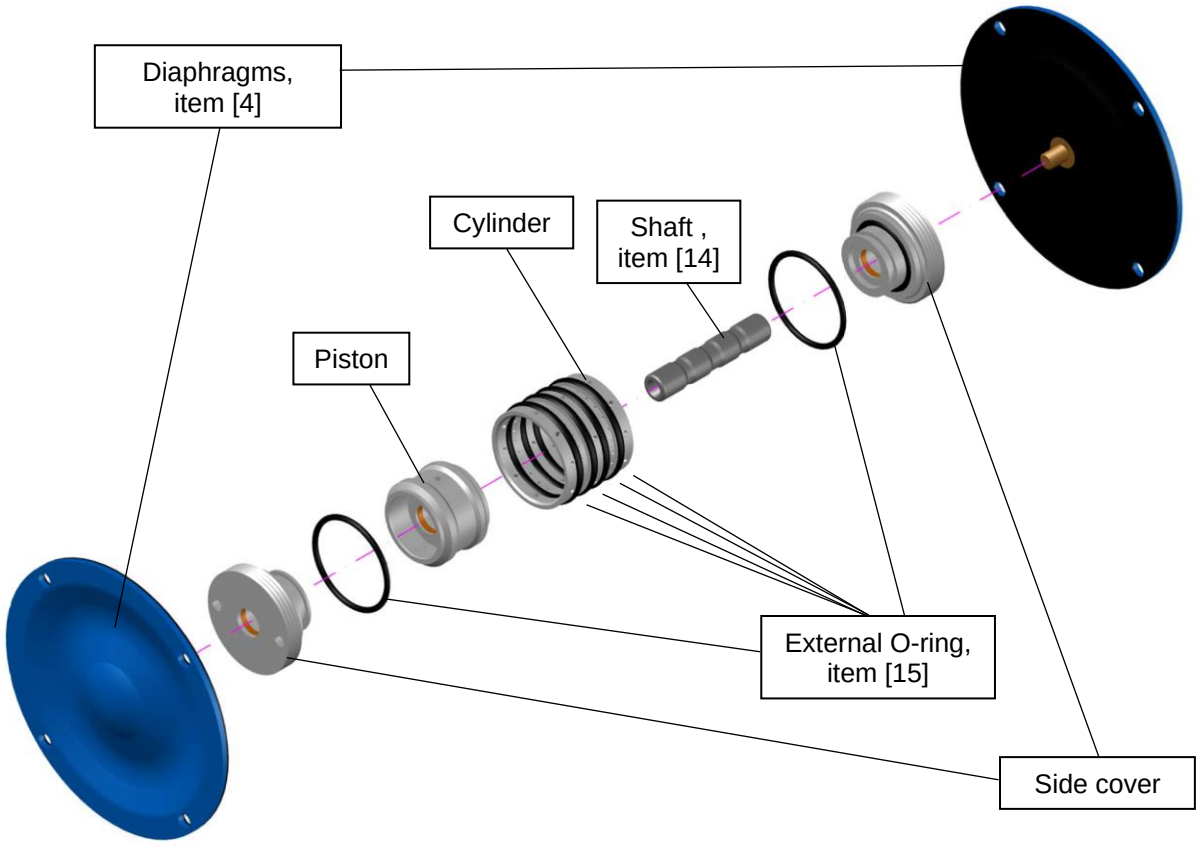
DELLMECO Metal Series Pumps from DM 15/25 up to 50/565 size are equipped with internal BSPP thread (as described in the Chapter 16.13), but it is also possible to order the Metal Series Pump with NPT (National Pipe Taper a.k.a. American National Standard Taper Pipe Thread – a taper thread that has 60° 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 15/25 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).

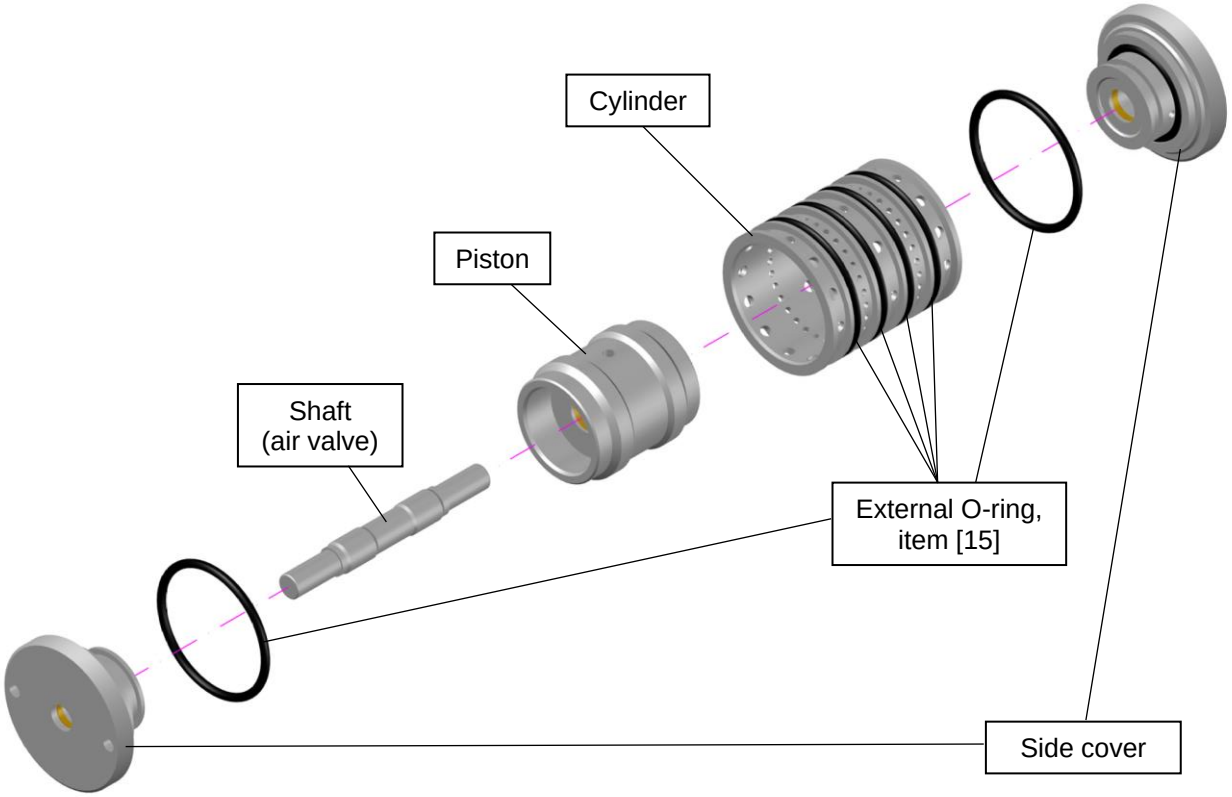
Appearance of the specific sizes of an air valve for DELLMECO Plastic Series Pumps is presented below:

A. Air valve "08" size (part no.: 1 08 020 31, PET/NBR and 1 08 020 32, PET/FKM), applicable for DM 15/25 … Pump models:

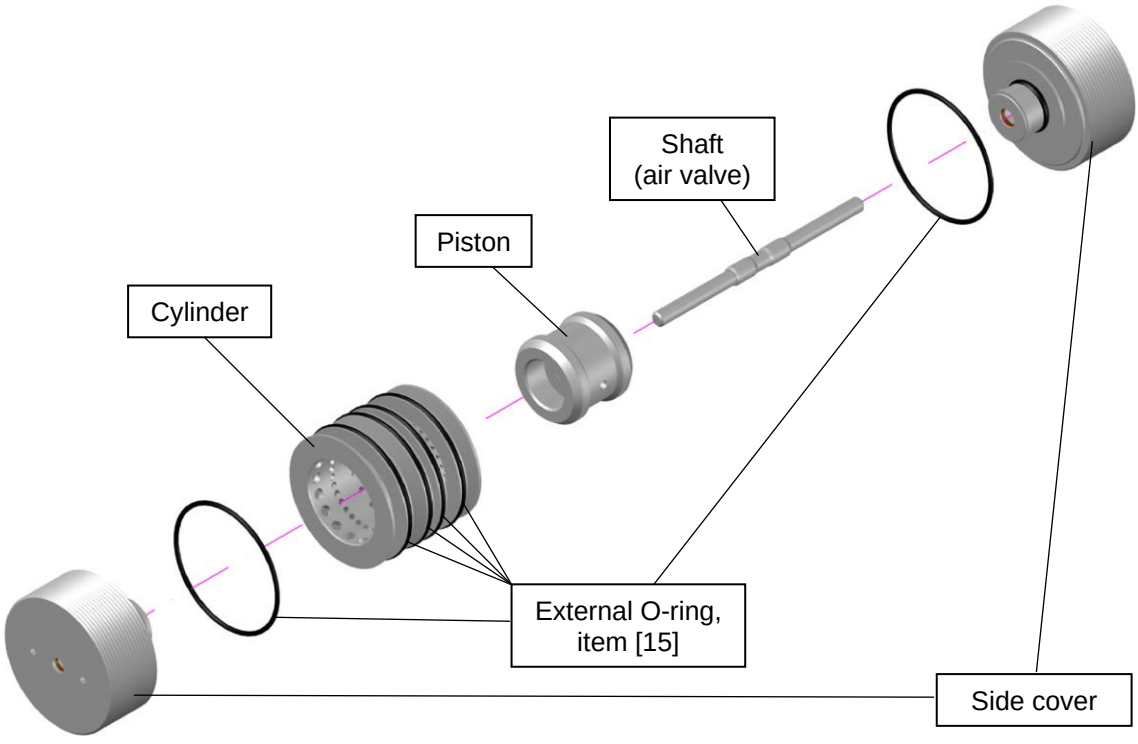


The distinguishing feature of the smallest "08" air valve is that the main shaft (made from AISI 304 material) is a common element for both diaphragms and air valve unit. Each diaphragm (for Metal Series Pumps - diaphragm size "10" only!) has external thread that allows to assemble them directly on the 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.

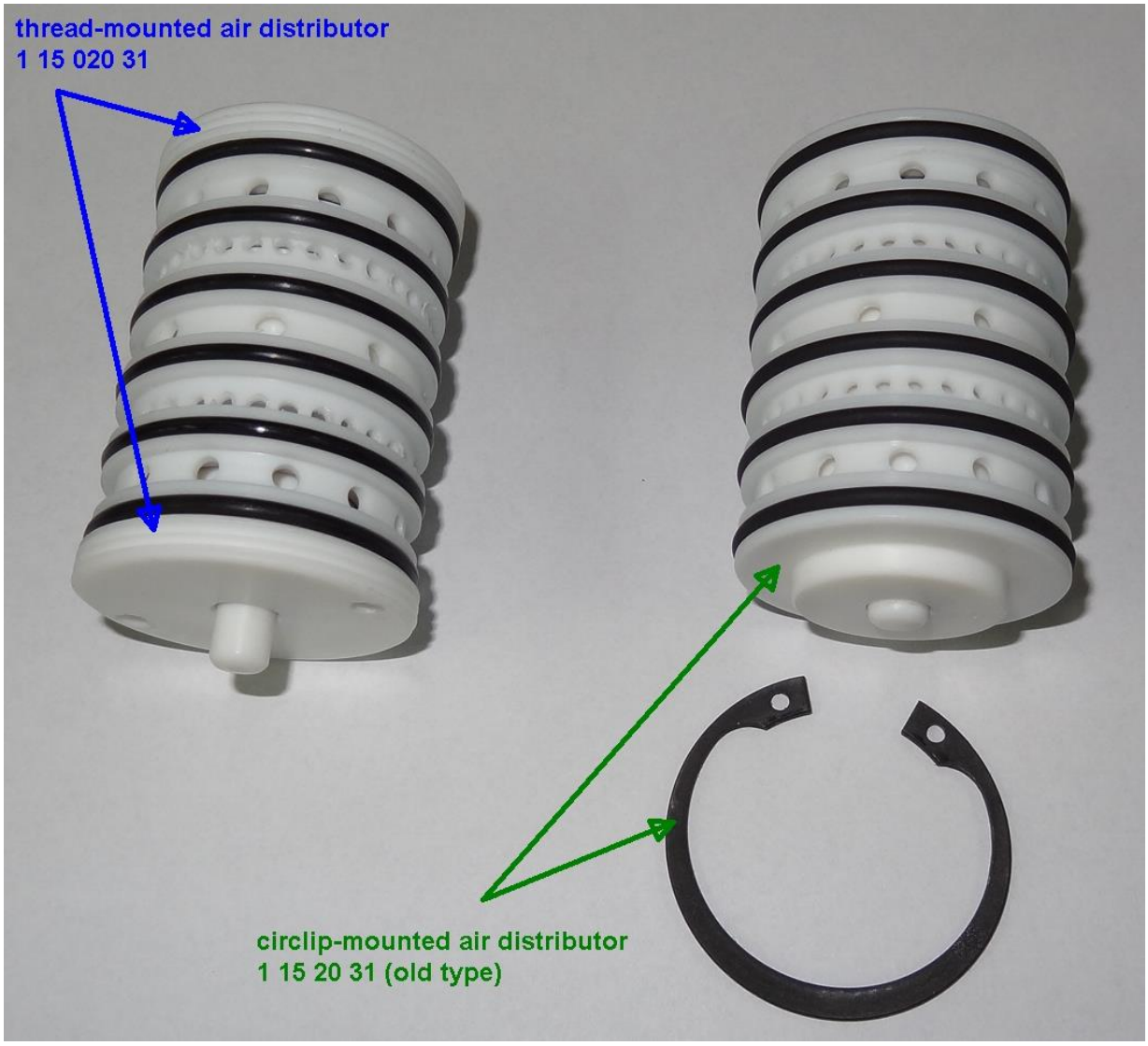
B. Air valve "15" size (part no.: 1 15 020 31, PET/NBR and 1 15 020 32, PET/FKM), applicable for DM 20/75 … and DM 25/125… Pump models; air valve "40" size (part no.: 1 15 020 31, PET/NBR and 1 15 020 32, PET/FKM), applicable for DM 40/315 … and DM 50/565… Pump models:



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 … 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:



<u>NOTE:</u> Before placing 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' Office (in order to avoid receiving of an incorrect part).

For DELLMECO 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 20/75 up to DM 50/565 (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 15/25 up to DM 50/565 (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 15/25 up to DM 50/565 (air valves: "08", "15" and "40" sizes).

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

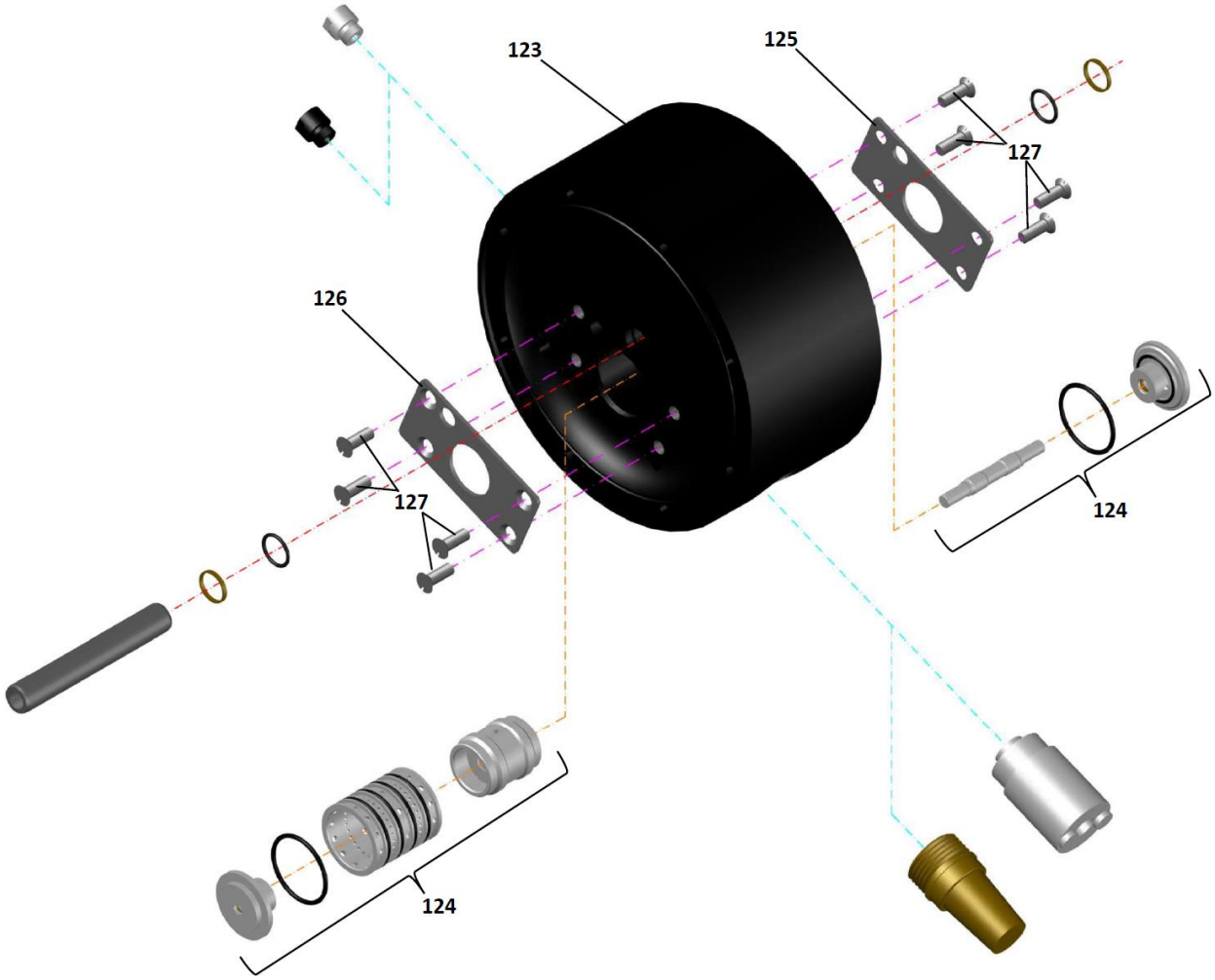
Not always an air valve unit has to be replaced completely – in some cases, air valve may require replacement of all internal slides and O-rings only (these parts are getting wear during normal operation of the pump) – this is why we also offer DELLMECO Air Valve Spare Part Kit Set (**AVD"xx"**, where "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. Central housing with Enhanced Air Valve (EAV Option)

DELLMECO Metal Series Pumps from DM 25/125 to DM 50/565 can be additionally equipped with air valve reinforcement – two opposite stainless steel plates fixed to the central housing by means of mounting screws (4 pcs of screws for each mounting plate). In such case air valve is not thread-mounted – assembled steel plates ensure the proper fixing. This modification extends the service life of both air distributor and central housing in the case of heavy applications and high pressure conditions – it can be applied especially for the pumps with HP Option, without changing the pump's external dimensions. Standard pump can be also re-assembled into EAV Option, but a complete central housing (made from PE conductive material for EAV Option) with an air valve has to be replaced.

Central housing with Enhanced Air Valve (EASV Option) – exploded view with list of parts:

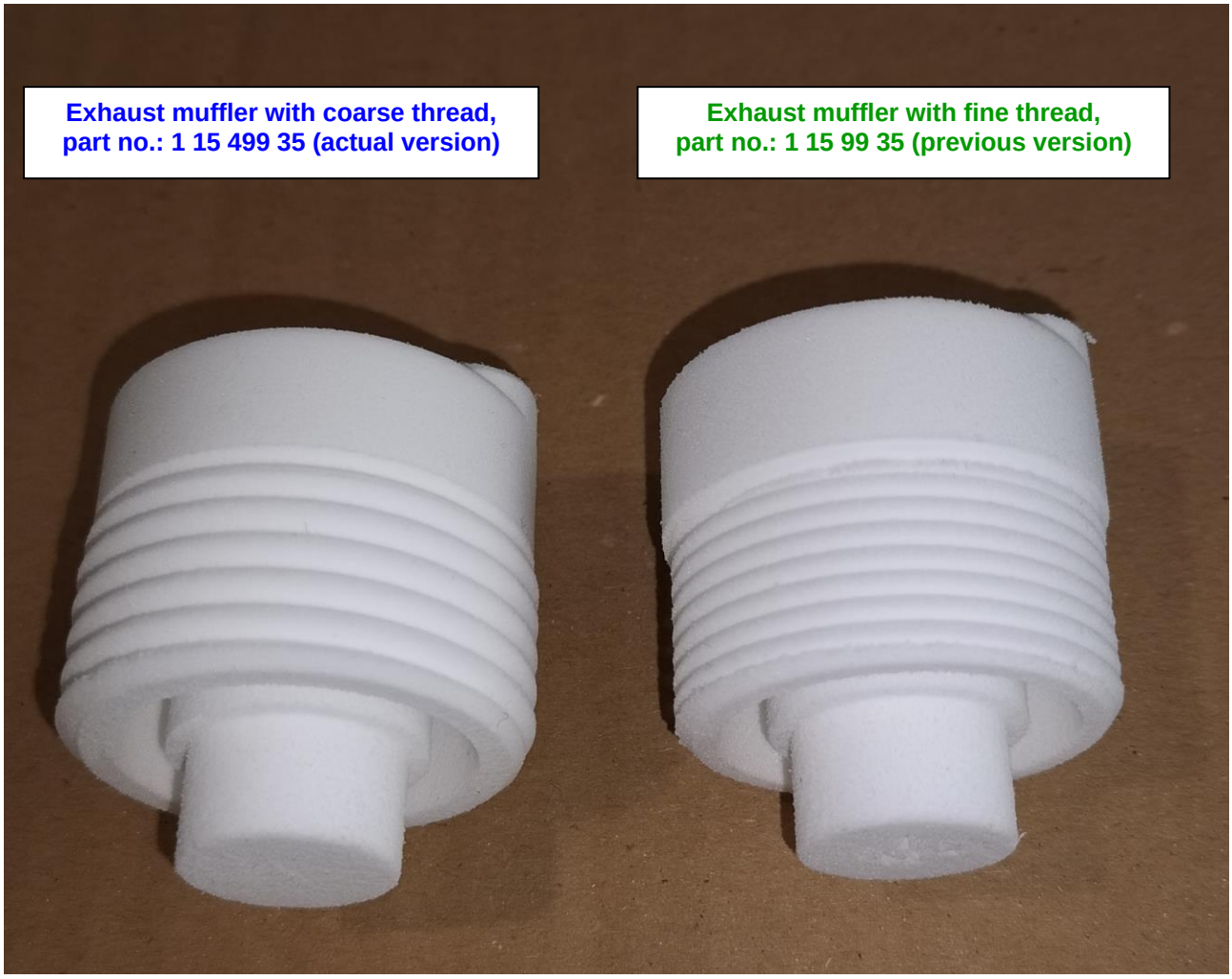


Spare part list for Enhanced Air Valve Option

					DM 25/125	DM 40/315	DM 50/565
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

16.20. 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", "10", "15", "40" and "50"), on the example of size "15" exhaust muffler (dedicated to pump models: DM 20/75.. and DM 25/125 … Pump models):



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).

16.21. ATEX Certificate

All DELLMECO Metal Series Pumps (equipped with PE conductive central housing in standard execution) can be adapted for installation and use 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 of non-metallic pumps). 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.

DELLMECO Metal Series Pumps dedicated for ATEX (with PE conductive central housing)

Standard ATEX execution can be used for the following conditions:

CE Ex 2GD IIA/IIB T1÷T5

Optionally available are Metal Series Pumps to be used in ATEX “Zone 0” (on request only!):

CE 0408 Ex II 1/2 G Ex h IIB/IIC T4…T3 Ga/Gb PTB 18 ATEX 5008 X

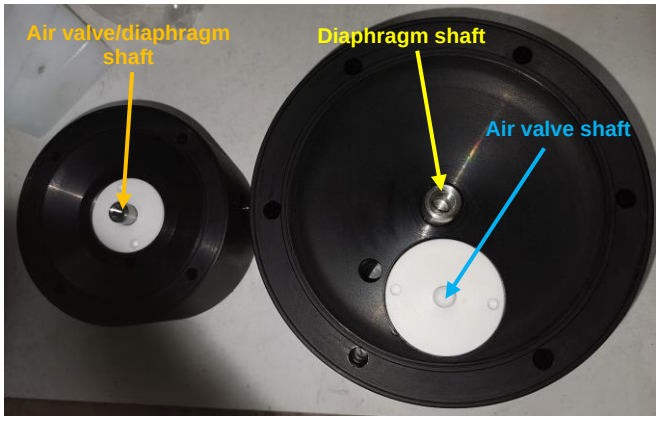
or

CE 0408 Ex II 1G Ex h IIC T4…T3 Ga/Gb PTB 18 ATEX 5008 X

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

17. Differences in construction of the 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 Plastic Pumps. Among the different sizes of DELLMECO Metal series (from DM 20/75 to DM 80/850), only the number of housing bolts [9] varies. Besides, for the size DM 15/25, the diaphragm shaft [**14**] additionally functions as the pilot piston for the air distributor (air valve). In these pumps (DM 08/10 and DM 10/25), 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 15/25 with common diaphragm/air valve shaft (left part) and from DM 20/75 to DM 80/850 – with separated air valve shaft (right part – air valve has its own shaft).

The general design of DELLMECO Metal Series 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 [**100**], 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 Metal Series Pumps.

2) Special air valve [**13**] 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 guarante

Notes:

DELLMECO

Świerkowa 2
83-330 Glincz
POLAND
Tel.: +48 532 220 722

office@dellmeco.com
www.dellmeco.com