

Operating Instructions as translated from the original German

### **Operating and Repair Instructions**

Pneumatic double diaphragm pump DM range model and pulsation damper PE, PTFE housing PE and PTFE conducting



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#### General description of the machine

The Dellmeco pneumatic double diaphragm pump is a positive displacement pump designed to convey fluids. The conveying diaphragm is driven by gas pressure.

The housing parts in contact with the medium are made of PE, PTFE, electrostatically conductive PE or electrostatically conductive PTFE.

The nameplate shows the product code which fully describes the pump design.

Position and exemplary representation of the nameplate:





The item numbers of the individual components refer to the exploded drawings and spare parts lists.

#### Safety

These Instructions will enable suitably qualified staff to manage the pump throughout its service life. Residual risks to persons and material are unavoidable during certain operations. These operations will be identified by means of warnings.

#### Explanation of symbols and warnings

The following sections explain all symbols and abbreviations used here.

#### **Explanation of symbols**

This section describes the symbols used in these Instructions.

Symbol	Meaning
	Warning signs are triangular with a black border and a symbol on a yellow background
<mark>∕£x</mark>	Highlighting sections of these Operating and Repair Instructions for explosion-protected pump versions, with the Atex symbol and text on a grey background
	Mandatory signs are round with a white symbol on a blue background
i	Information is pointed out with an i. This information describes optimal use.
X	Environmental requirements are pointed out by a crossed-out dustbin. Environmental requirements refer to statutory requirements for disposal of substances.



Warnings Structure of the warnings

<b>S</b> ev	verity of the hazard indicated by signal words
<b>7</b> ур <b>С</b> оп	e and source of the hazard nsequences
<b>E</b> sc	aping the hazard

**Signal words** Signal words in the header of the warning indicate the severity of the hazard unless the escape action is followed.

Signal word and colour	Severity
	Indicates a hazard with high risk of death or serious injury.
A warning	Indicates a hazard with medium risk potentially resulting in death or serious injury.
	Indicates a hazard with potential risk of minor or moderate injury.
ATTENTION	Warns of possible material or environmental damage and potential operational interference.

Warning signs These are the signs used in the warnings.

Symbol	Meaning
	General warning
EX	Warning against explosive atmosphere
	Warning against suspended loads
	Warning against hot surface
	Warning against low temperatures/frost
	Warning against flammable substances
	Warning against caustic substances
	Warning against toxic substances
4	Warning against electric shock



#### Mandatory signs

These mandatory signs indicate a requirement for personal protective equipment. Also observe local regulations.

Symbol	Meaning
	Use ear protection
	Use eye protection
	Use hand protection
	Use foot protection

#### \Lambda warning

Defective personal protective equipment provides inadequate protection against these hazards and could result in death or serious injury. Replace defective protective equipment.

#### **Target groups**

The Instructions distinguish between three groups of skilled staff:

- Planner/Project planner
- Specialist/Operator
- Service/Repairs

The groups will be experienced in:

- Certificates, regulations; accident prevention regulations and standards
- Techniques for selecting and erecting mechanical equipment
- Work permit system

	For explosion-protected versions, also:
< <u>&lt;</u> x </th <th>Project planning, selection and installation of electrical systems in explosive</th>	Project planning, selection and installation of electrical systems in explosive
	atmospheres as per DIN EN 60079-14
	Explosion protection principles
	<ul> <li>Types of ignition protection, equipment markings</li> </ul>
	<ul> <li>Tests for DIN EN 60079-17 compliance</li> </ul>

Depth of experience:

- Planner/Project planner:
  - In-depth knowledge of the items listed under Experience above, in terms of planning, scheduling and supervisory activities.
- Specialist/Operator:
  - Understanding of the items listed under Experience above, required to perform the activities.
- Service/Repairs:
  - Understanding of the items listed under Experience above, required to perform the activities.

Practical experience in carrying out repairs.



#### Safety-conscious working

All persons carrying out work relating to installation, commissioning, operation, maintenance and service/repair must assiduously and entirely read these Operating Instructions and observe all the safety rules and warnings.

- Planner/Project planner:
  - o Planning installation of the equipment and type
  - Marking surfaces as HOT SURFACE depending on the temperature of the pumped medium

<mark>⟨£x</mark> ⟩	For explosion-prote	ected versions, also: Determining the temperature class depending on the temperatures of pumped media
	•	Determining the explosion subgroup depending on the conductivity of pumped media or for suspensions
	•	Checking the suitability of the category

- Specialist/Operator:
  - Implementation of scheduled activities
  - Operating the pump
- Service/Repairs:
  - Implementation of scheduled activities
  - $\circ$  Operating the pump
  - Proven practical experience in the repairs required

Safekeep these Instructions in a suitable place. Hand over these Instructions together with the pump should the operator change.

Explosion s	subgroup	Catego	ry/EPL	Product code Hou
Inside	Outside	Inside	Outside	
IIC or IIB	IIC	1/Ga	2/Gb	R or Z
	sure and temps	erature suitabil	ity of this num	n means that IIC substan
t Press not b formi howe	e in liquid form ng substances ver, exist.	and therefore allowed to be	cannot be pui pumped insid	Instructions and the pr

EX	Anger			
X Spe	ecial requirements			
•	The resistance of hos between hose ends.	es connected to	the diaphragn	n pump must not exceed 10
•	The diaphragm pur	mp must be	included in	equipotential bonding be
•	commissioning. Vessels must be separate	arately earthed	should the typ	e of installation not ensure
•	The maximum media exceeded.	a temperature	as per Opera	ting Instructions must not
•	Operation must be s pump housing or sour	topped immediand suppressors.	ately should fl	luids leak from the diaphra
•	Operation of the pump	p may electrosta	tically charge	flowing fluids.
•	The pumps may be u conductivity (k > 50 p pump/line or whe droplet/particle/air mix	sed to pump flu S/m) without re n pumping o ktures in the diat	ids, also flamr striction of dry empty, unde ohragm space:	mable fluids, of medium to l running time when venting r associated formation s or lines.
-	long dry runs (ie le	nger than 30 s	· · · · · · · · · · · · · · · · · · ·	n is vented or numped om
The pla	thereby potentially for or lines, must be av- ( $k \le 50 \text{ pS/m}$ ), includin anner/project planner wi tivity, conveyance of sus	rming droplet/pa oided only whe ng flammable liq Il assign explos spensions or en	in as the pum rticle/air mixtu n suspensions uids of groups ion subgroups rained solids:	res in the diaphragm chamb s or liquids of low conduct IIA and IIB, are pumped. IIC or IIB inside, dependir
The pla conduc	thereby potentially for or lines, must be ave $(k \le 50 \text{ pS/m})$ , includin anner/project planner wi tivity, conveyance of sus	rming droplet/pa oided only whe ng flammable liq Il assign explos spensions or en	) as the pum rticle/air mixtu n suspensions uids of groups ion subgroups rained solids:	or
The pla conduc Explos	thereby potentially for or lines, must be ave (k ≤ 50 pS/m), includia anner/project planner wi tivity, conveyance of sus	Il assign explos spensions or en Conductivity	) as the pum rticle/air mixtu n suspensions uids of groups ion subgroups rained solids:	or suspensions / solids
The pla conduc Explos	thereby potentially for or lines, must be ave $(k \le 50 \text{ pS/m})$ , includin anner/project planner wi tivity, conveyance of sus sion subgroup inside	rming droplet/pa oided only whe ng flammable liq Il assign explos spensions or en Conductivity $\kappa > 50 \text{ pS/m}$	) as the pum rticle/air mixtu n suspensions <u>uids of groups</u> ion subgroups rained solids:	or suspensions / solids
The pla conduc Explos IIC IIB	thereby potentially for or lines, must be av (k ≤ 50 pS/m), includii anner/project planner wi tivity, conveyance of sus sion subgroup inside	rming droplet/pa oided only whe ng flammable lic Il assign explos spensions or en Conductivity $\kappa > 50 \text{ pS/m}$ $\kappa \leq 50 \text{ pS/m}$	) as the pum rticle/air mixtu n suspensions uids of groups ion subgroups rained solids:	or suspensions / solids Not permissible
The pla conduc Explos IIC IIB Frame suspen The pla The pla The ac depend Inlet ter	thereby potentially for or lines, must be av- (k ≤ 50 pS/m), includii anner/project planner wi tivity, conveyance of sus sion subgroup inside size DM 80/850 is sions/solids, thus always inner/project planner wil tual maximum surface of l on the inlet temperature mperature and temperature	rming droplet/pa oided only whe ng flammable lic ill assign explos spensions or en Conductivity $\kappa > 50 \text{ pS/m}$ $\kappa \le 50 \text{ pS/m}$ limited to pur s IIC inside. I stipulate the te temperature of e of the pumped ure class correlation	) as the pum rticle/air mixtu n suspensions uids of groups ion subgroups rained solids: nping liquids mperature class the pump and medium. ate as follows:	res in the diaphragm chamb s or liquids of low conduct IIA and IIB, are pumped. IIC or IIB inside, dependir or suspensions / solids Not permissible permissible with $\kappa$ > 50 pS/m with ss.
The pla conduc Explos IIC IIB Frame suspen The pla The pla The pla Inlet ter	thereby potentially for or lines, must be av (k ≤ 50 pS/m), includii anner/project planner wi tivity, conveyance of sus sion subgroup inside size DM 80/850 is sions/solids, thus alway unner/project planner wil tual maximum surface to l on the inlet temperature mperature and temperature Max. media infeed temp	rming droplet/pa oided only whe ng flammable lic ill assign explos spensions or en Conductivity $\kappa > 50 \text{ pS/m}$ $\kappa \le 50 \text{ pS/m}$ limited to pur s IIC inside. I stipulate the te temperature of e of the pumped ure class correla	) as the pum rticle/air mixtu n suspensions uids of groups ion subgroups rained solids: nping liquids mperature clas the pump and medium. ate as follows:	res in the diaphragm chamb s or liquids of low conduct IIA and IIB, are pumped. IIC or IIB inside, dependir or suspensions / solids Not permissible permissible with $\kappa$ > 50 pS/m with ss. thus the temperature class
The pla conduc Explos IIC IIB Frame suspen The pla The pla The ac depend Inlet ter	thereby potentially for or lines, must be av (k ≤ 50 pS/m), includii anner/project planner wi stivity, conveyance of sus sion subgroup inside size DM 80/850 is isions/solids, thus alway anner/project planner wil tual maximum surface to l on the inlet temperature mperature and temperature <u>Max. media infeed temp</u> 120 °C	rming droplet/pa oided only whe ng flammable lic ill assign explos spensions or en Conductivity $\kappa > 50 \text{ pS/m}$ $\kappa \le 50 \text{ pS/m}$ limited to pur s IIC inside. I stipulate the te temperature of e of the pumped ure class correla	) as the pum rticle/air mixtu n suspensions uids of groups ion subgroups trained solids: nping liquids mperature clas the pump and medium. ate as follows:	res in the diaphragm chamb s or liquids of low conduct IIA and IIB, are pumped. IIC or IIB inside, dependir or suspensions / solids Not permissible permissible with $\kappa$ > 50 pS/m with ss. thus the temperature class Temperature class T 3



# dellmecn

#### DANGER

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Incorrect operation or misuse may pose a risk of personal injury and/or damage to property, including explosion. The pumps may only be used for their intended purpose and provided in perfectly safe condition.

#### Intended use of electrostatically non-conductive pumps

The intended use of Dellmeco compressed gas operated double diaphragm pumps is pumping of liquid media. The operating parameters specified in these Operating Instructions and the prescribed conditions for installation, assembly, commissioning, operation, maintenance and disassembly must be maintained.

The planner/project planner will stipulate the temperature.

The actual maximum surface temperature of the pump will also depend on the inlet temperature of the pumped medium.

Refer to the "Technical data" section for further limits to the maximum temperature of the pumped medium.

The operator must ensure that pumps are suitably labelled for media temperatures > 65 °C.



#### WARNING

- Pumping of hot media will heat up the surface of the pump, potentially causing severe burns if touched. For media temperatures of 65°C and higher, the planner/project planner must affix a warning to the pump or cordon off the area to ensure that the HOT SURFACE hazard is evident and the potential for contact limited.
- Heat build-up on the pump and ambient temperatures > 40 °C will cause permissible pump temperature to be exceeded, with the potential for leakages. Health may be affected, depending on pumped media. Do not exceed the maximum ambient temperature and allow free circulation of ambient air at the installation site.

The pump is suitable for installation indoors and outdoors.

Foreseeable misuse:

The pump is **NOT** suited for the following applications:

- Spraying of flammable liquids
- Pumping of flammable liquids •
- Conveyance of dust •
- Continuous dry running
- Installation in explosive atmospheres

DANGER

The pump materials will become electrostatically charged during pumping, causing vapours of flammable liquids to ignite. The outer surface of this pump design can also become electrostatically charged and thereby ignite explosions.

Only pump designs using electrostatically conductive material - observe product codes - may be operated in explosive atmospheres.



#### **Technical data**

#### Pump code

DM	40	315 Z	T '	T -	F3.1
					Special type - Flange F1- Flange connection PN10 with EPDM O-ring F2 - Flange connection PN10 with NBR O-ring F3 - Flange connection PN10 with FEP/FPM O-ring F3.1 - Flange connection PN10 with FEP/FPM O-ring F7 - Flange connection PN10 DIN 2576 F8 - Flange connection ANSI 150 RF-SO F9 - Flange connection PN16 DIN 2277/2278 F7.1 - Flange connection PN10 DIN 2576 F8.1 - Flange connection ANSI 150 RF-SO F9.1 - Flange connection PN16 DIN 2277/2278
				Valve body	E - EPDM N - NBR S - AISI 316 T - PTFE U - PU C - Ceramics F - PTFE – cylinder valve
			Diap	hragm	E - EPDM N - NBR T - TFM / PTFE V - Viton (FKM) L - PTFE electrostatically conducting, bronze silencer K - TFM/PTFE with PTFE diaphragm collar, electrostatically conducting.
	Housing m			aterial	P - PE T - PTFE R - PE, electrostatically conducting Z - PTFE electrostatically conducting
		Capacit	ty		315 l/min at 8.0 bar
	Nc siz	ominal :e			DN 40 (1 1/2")

Dellmeco pneumatic double diaphragm pump - DM series

Note on Flange option:

Flanges with designation F1, F2, F3, F7, F8 and F9 are made of PE or PE, depending on housing material,

electrostatically conducting. Flanges with designation F3.1, F7.1, F8.1 und F9.1 are made of PTFE or PTFE, depending on housing material, electrostatically conducting.

#### **Presentation and dimensions**



#### Dimensions in [mm]

	Α	В	С	D	E	F	G	н	I	ØJ	К	L	<b>Y</b> *	Z*
DM 08/10	70	113	120	15	G 1/4"	58	R 1/8"	107	10	15	50	86	M4	3
DM 10/25	105	128	164	18	G 3/8"	84	R 1/8"	150	10	15	75	93	M4	3
DM 15/55	153	177	235	40	G 1/2"	87	R 1/4"	202	18	30	112	136	M8	5
DM 25/125	200	232	312	50	G 1"	123	R 1/4"	272	28	40	140	170	M8	5
DM 40/315	270	312	426	57	G 1 1/2"	109	R 1/2"	373	30	60	190	227	M8	10
DM 50/565	350	385	540	52	G 2"	158	R 1/2"	478	30	60	270	282	M8	12
DM 80/850	480	580	800	100	G 3"	388	R 3/4"	690	40	75	395	495	M10	12

Dimensions may vary Y\* Internal thread of vibration damper Z\* Torque for vibration damper [Nm]

#### **Technical data**

	DM 08/10	DM 10/25	DM 15/55	DM 25/125	DM 40/315	DM 50/565	DM 80/850	
Max. capacity [l/min]	10	25	55	125	315	565	850	
Max. pressure [bar]**	8.0	8.0	8.0	8.0	8.0	8.0	8.0	
Material connection	BSP* 1/4"	BSP* 3/8"	BSP* 1/2"	BSP* 1"	BSP* 1 1/2"	BSP* 2"	BSP* 3"	
Air connection	R 1/8"	R 1/8"	R 1/4"	R 1/4"	R 1/2"	R 1/2"	R 3/4"	
Max. compressed air consumption [m <sup>3</sup> /min.]	0.15	0.3	0.5	0.6	1.6	2	3.5	
Suction height dry [mH <sub>2</sub> O]	0.5 / 1.0	2.0	3.0	4.0	4.0	5.0	5.0	
Suction height wet [mH <sub>2</sub> O]				9.0				
Max. solids size [mm]	2	3	4	7	10	12	15	
Max. pumped medium temperature - PE [°C]	70	70	70	70	70	70	70	
Max. pumped medium temperature - PTFE [°C]	110	110	120	120	120	120	-	
Min. media infeed temperature [°C]	-20	-20	-20	-20	-20	-20	-20	
Weight - PE [kg]	0.9	1.6	4.2	9.7	23.8	45.0	170	
Weight - PTFE [kg]	1.5	2.4	6.8	16.5	44.5	87.0	-	
Housing material	PE, PE-conducting, PTFE, PTFE-conducting							
Diaphragm options	TFM/PTFE EPDM, NBR, TFM/PTFE							
Valve ball	PTFE, AISI 316 EPDM, NBR, TFM/PTFE, AISI 316, PU EPDM, NBR,							
Cylinder valve	PTFE PE, PTFE							
O-rings	EF	DM, NBR, FEP/FK	M, PTFE+EPDM, P	FE-conducting +EP	DM, PTFE+FKM, P	TFE-conducting+ Fł	KM	
Sound pressure level [dB (A)]								
Drive air pressure 3.0 bar	70,3	67,5	74,9	71,9	73,9	71,7	72,6	
Drive air pressure 5.0 bar	73,1	70,8	80,1	75,5	82,8	78,3	79,5	
Drive air pressure 7.0 bar	73,8	72,1	82,0	78,8	81,7	82,8	83,9	
Max. pumped media infeed pressure [bar]	0,3	0,3	0,3	0,3	0,3	0,3	0,3	
Test pressure [bar]	12	12	12	12	12	12	12	
Max. stroke rate	500	430	240	160	140	100	100	
Recommended stroke rate / min.	340	280	180	120	100	60	60	
Max. air inlet pressure**	8,0	8,0	8,0	8,0	8,0	8,0	8,0	
Housing screws torque (PE-housing)	3	6	8	13	17	22	28	
Housing screws torque (PTFE-housing)	2	5	7	11	15	19	26	
Torque, air connection	2	2	4	6	6	10	10	
Torque, suction /pressure connection	3	4	5	12	15	19	23	
Ambient temperature	-20 to +40°C							
Installation altitude				4000 NHN				

Technical data may vary \* NPT material connection possible on request \*\* \*\* up to 16.0 bar on request

#### Characteristics

(Characteristics measured with water (20 °C) with pump infeed and free pump outlet, properties such as viscosity, solids or entrained solids transport were ignored).





#### Planning

The planner/project planner must check that the Dellmeco pneumatic double diaphragm pump and the connected hoses and piping are suitable for the application as per specifications, specifically concerning materials. For details of the materials used refer to the Technical Data section for the pump code as per the pump nameplate.

#### 

- The chemical properties of pump materials that are not resistant to the pumped liquid may cause leakages and serious injury, even death. Check the chemical resistance of the materials to the pumped medium.
- Should the diaphragm rupture or tear, drive gas will enter the pumped medium and potentially
  create ignitable atmospheres there and in the connected parts of the system. To minimise the
  risk of diaphragm rupture, service the pump as instructed in the maintenance and servicing
  section and switch off should the diaphragm be ruptured or torn. Nitrogen may be used as the
  drive gas to prevent the formation of explosive atmospheres even in cases of rupture.

<mark>∕£x</mark>	
	<ul> <li>The pump may lose heat to the environment, depending on the temperature of the pumped medium. Build-up of heat will lead to overheating and temperatures exceeding the permissible temperatures, including danger of explosion. Ensure natural convection (ventilation) to ensure heat dissipation.</li> <li>Electrostatic charge may build up when pumping flammable liquids in explosion subgroup IIA or IIB or IIC hydrogen formers, even in IIC environments. Electrostatic charge may cause explosions and considerable damage to property and the environment, even personal injury or death. Applicable national guidelines must be observed (in Germany: TRGS 727) to avoid electrostatic charging. Only conductive or electrostatically conductive devices, e.g. hoses, containers and valves, shall be used for pumping. The resistance of hoses connected to the diaphragm pump must not exceed 106 Ω between hose ends. All objects and thus also the pumped liquid must be earthed or connected to earth. Use the specific connection on the air motor housing of the pump (Pos. 2) for earthing. Vessels must be separately earthed should the type of installation not ensure this already. Operators and maintenance personnel must also be connected to earth via appropriate footwear.</li> <li>Electrostatic charging caused by splashing of the fluid may ignite an explosion. Such electrostatic charging must be avoided by decanting below the fluid level and using fill-pipes reaching down to the bottom for filling from the top.</li> <li>Lightning will be an effective source of ignition of explosive atmospheres. Lightning protection, especially for outdoor installation, must be installed.</li> </ul>



If necessary, install a pulsation damper at the pump outlet to smoothen media pulsations. Observe the sections in these Instructions that deal with pulsation dampers.

#### Installation

Installation position

Install the pump on a horizontal surface with the vibration dampers (Pos. 11) facing downward. A maximum inclination of 30° in any direction is allowed.

Vibrations caused by pumping must be absorbed. This must be considered during installation by securing the vibration damper fastening screws against loosening.

Two types of installation must be distinguished:

1. Self-priming

The pumps are dry self-priming. Greater suction heights are possible with filled pumps. Suction heights will vary depending on pumped medium and application parameters. The values given in the "Technical data" section are based on water at 20 °C.



#### 2. Primary pressure fed

This situation arises when suction is required from the bottom of a storage, mixing or septic tank. The primary pressure must be limited to 0.3 bar (gauge).





3. Submersible pump



All pump sizes may be operated submerged. The pump materials must be chemically compatible with the respective fluid. The exhaust air must be vented to the atmosphere via an exhaust pipe. The pump's pressure line must exit the container vertically. Should this not be possible, a valve must be provided in the pressure line to close when the pump is not running. This valve will prevent the flow of fluid (capillary effect) when the pump is not running. The maximum submersion depth is 15.0 m.



Check the housing screw connection torques (through bolts, Pos. 9) before installing the pump. Electrostatic charge build-up in the pumped medium must be

prevented by ensuring that no bubbles (created by the drive gas) will enter the pumped medium via the pumps and their connections.

Service the pump annually. Replace wearing parts.

### 🛕 🛕 🛕 warning

- Pump materials that are not resistant to the pumped medium in which the pump is submerged may lead to media leakage, causing serious injury, even death, due to the chemical properties of the media. Check the chemical resistance of the materials to the pumped medium.
- Discharging the exhaust air into the fluid will create foam, causing the container to overflow. Such escaped volumes may cause serious injury, even death, due to their chemical properties. The exhaust air must be vented to the outside.

Connection of suction and pressure lines

The pump cannot be screwed into the piping system and cannot absorb forces caused by piping.

### 

Oscillations may damage the pump and system, including leakage. Depending on the pumped medium and the seriousness of the leakage, the medium may escape and cause serious injury, even death. Pumps must always be installed in pipelines free of stress by using electrostatically conducting, flexible hoses or compensators for compressed air supply and suction and pressure side lines.

### <u> </u> 🔬 warning

Diaphragm rupture may in the absence of compressed air supply cause pumped media to escape through the exhaust air silencer. Such leakage may lead to serious injury, even death, due to the chemical properties of pumped media. Discharge the exhaust air safely, away from people, animals or food.

Pump connection **E** determines the nominal size of the connecting line.

The pressure levels of the lines must be selected to suit the relevant pump pressure.

Pump performance may suffer if this is disregarded.

Suction lines rising to the pump gradually will prevent air bubbles from forming in the line, yet also reduce the pump's suction performance.



It must be possible, where two or more pumps pump into the same pipeline and not all the pumps are operating, to isolate stationary pumps by means of shut-off valves on the pressure and suction sides.

Appropriate shut-off valves must be provided on installation.

in u

Use appropriate hoses or compensators that will not contract under suction and thereby impede pumping. Restoring forces on the pump must be ZERO.

Compressed air connection

One of the following gases, referred to as "compressed air" in this document, will be required to operate the pumps:

- Dry compressed air, containing no dust or oil
- Nitrogen



- DANGER
- Using other or inferior quality gases may cause air pollution, destruction of the pump or even explosion. Only compressed air or nitrogen may be used to drive the pump.
- The compressed air will in the event of a diaphragm rupture block the pumped medium from entering the air motor. The compressed air will enter the pumped medium, creating an ignitable atmosphere. Nitrogen used as the drive gas will exclude the potential creation of explosive atmospheres.

DIN ISO 8573-1 quality compressed air of the following classes should be maintained to prevent malfunctioning of the air motor:

- Solids content Class 2 at least
- Water content Class 3 at least
- Oil content Class 3 at least

The pressure of the pump's compressed air supply must remain constant.

#### 

Freezing may despite dried compressed air occur on the silencer if the humidity of ambient air is high. Such freezing may cause minor injury when touched. Such freezing may be prevented by means of an exhaust hose (at least 0.5 m long). Ventilation must be provided when installing in very confined spaces, to ensure that no "cold build-up" occurs at the silencer. Wear protective gloves during work.

#### DANGER

Nitrogen used as driving gas will in normal operation escape from the air motor's silencer. This may pose a suffocation hazard in closed areas. Ensure adequate ventilation; for maximum nitrogen volume see section "Technical data" and discharge exhaust air safely away from people, animals and food.

Using other or inferior quality gases may cause air pollution, destruction of the pump or even explosion. Only compressed air or nitrogen may be used to drive the pump.

Conveying solids

The pump is in principle capable of conveying solids up to sizes specified in section "Technical data".

<b>x</b> 3	DANGER
•	Particles will heat up the pump and such hot surfaces will ignite explosive atmospheres. Ensure that no unacceptably large solids will be pumped. This may be achieved using a sieve with mesh size 80% of the permitted solids size. When pumping suspensions or entrained solids in continuous operation during bleeding or empty pumping, the associated formation of mixtures of droplets, particles or air in the diaphragm chambers and connected lines may charge up the fluids electrostatically and ignite explosive atmospheres. To avoid this situation, such pumping with suspensions or entrained solids must be limited to 30 seconds max.

#### **Regulation of delivery**

#### Delivery pressure

The delivery pressure may be adjusted via the pressure of the compressed air supply and air filter regulator. The minimum starting pressure for the DELLMECO pump is 1.5 bar (gauge) or less. For the maximum permissible supply pressure refer to section "Technical data".

### $\widehat{\mathbb{A}} \ \widehat{\mathbb{A}} \ \widehat{\mathbb{A}} \ \widehat{\mathbb{A}} \ DANGER$

Exceeding the maximum pressure will damage pump and system, causing leakages. Pumped media will escape and lead to explosion and serious injury, even death, depending on the medium and the severity of the leakage.

Pressure in the air motor and pressure line must not exceed the permissible pressure ranges as per the "Technical data".

#### Delivery volume

The delivery volume of the pump may be adjusted via the needle valve in the compressed air line to regulate the compressed air delivery.

### 🛕 🛕 🛕 warning

Closing the shut-off valve will briefly increase pressures in the air motor and pressure line. Exceeding the permissible pressure may cause leakages and possibly serious injury, even death, due to chemical properties of the pumped medium. Close and open the valve slowly.

The permissible flow rate of the pumped medium may vary due to viscosity, density, material friction coefficients, suction cycle, etc. Strong increase in the flow velocity may cause cavitation. This will affect performance and impair pump functionality.

#### ATTENTION

Cavitation will damage the pump. To avoid this, match media supply on the suction side with flow rate on the pressure side. Immediately switch off the pump and check the installation should no media flow take place after starting the pump or should abnormal noises or other complications occur.



The connection thread **G** for the compressed air supply of the pump is located in the air motor housing (Pos. 2) opposite the silencer (Pos. 17).

The cross-section of the compressed air supply line should correspond at least to the cross-section of the pump's air connection.

Refer to illustration "Example of an installation" for components needed for operation:

- 1. Compressed air supply:
  - Air shut-off valve
  - Air filter regulator

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- Needle valve Install all the components as close as possible to the pump.
- 2. Pumped media connection
  - Pressure line shut-off valve
  - Suction line shut-off valve
  - Pressure gauge with shut-off valve in the suction line
  - Pressure gauge with shut-off valve in the pressure line

#### Pressure test on the entire system

The design of the pump requires that system pressure tests may only be carried out with the shut-off valves on the suction and pressure lines closed or by briefly increasing pump pressure.

### 🛕 🛕 🛕 warning

Pressurising the pump without compressed air supply may rupture the diaphragm and cause leakages and risk of serious injury, even death, due to chemical properties of the pumped medium. Do not pressurise unless in the presence of compressed air.

#### Example of a set up



To be provided on site:

- o Suction side strainer for the pumped medium
- Pumped medium draining valve
- Flushing the conveyance space across the assembly



Running pumps will generate high noise levels. Noise levels will vary depending on application. For the maximum value, refer to "Technical data".

#### Transport



Crushing may occur in the presence of suspended loads. Wear protective gloves and safety shoes as prescribed under local regulations.

To transport the pump, use lifting or slinging equipment suitable for the respective environment and weight. Pumps from size 40/315 must be lifted with a lifting sling according to DIN EN 1492-1 as shown in the illustration.





Crushing may occur in the presence of suspended loads. Wear protective gloves and safety shoes as prescribed under local regulations.

To transport the pump, use lifting or slinging equipment suitable for the respective environment and weight. Pumps from size 40/315 must be lifted with a lifting strap according to DIN EN 1492-1 as shown in the illustration.



#### Unpacking



#### DANGER

Unpacking from the foil packaging will cause electrostatic charging of the foil and pump. Uncontrolled discharge will cause sparking and possibly explosions.

Remove the foil packaging of the pumps away from potentially explosive areas and also discharge electrical charge to earth outside such areas.



#### **ATTENTION**

Dispose of packaging in accordance with local regulations.

#### Assembly

Install the pulsation damper, if supplied, at the pump outlet. Observe the sections in these Instructions that deal with pulsation dampers.

#### **Connection instructions**

Mount the pump into the vibration dampers at the installation site from underneath. Thread size and tightening torques as specified in section "Technical data".

#### **Equipotential bonding**

The pump must be included in the equipotential bonding of the entire system. The connection on the air motor housing is marked according to the symbol shown opposite.



#### Installation into the piping system

Always install the DELLMECO pumps into piping systems stress-free, using electrostatically conducting, flexible hoses or compensators on the compressed air supply and on the suction and pressure sides to prevent damage from oscillations, since the pump cannot absorb any weight or forces introduced by piping.

Installation as per illustration "Exemplified connection" in the Planning section.

### <u>À </u> 🔬 😔 🐧 🛛 warning

Escaping media may cause serious injury, even death, by direct jets or due to their chemical properties. Work only on depressurised pumps and clean media lines and wear personal protective equipment.

#### **Compressed air connection**

### A 🕜 😔 CAUTION

Escaping compressed air may cause injury due to direct jet or ejected parts. Work only on depressurised pumps and wear personal protective equipment.

- Connect the air shut-off valve, air filter regulator and needle valve to the compressed air line.
- Connect this subassembly to air inlet G of the pump.
- The pump will be ready for operation when all lines are properly connected.

#### Commissioning

Check and, if necessary, adjust the torques of the screwed casing connections (through bolts Pos. 9) before commissioning. To do this, remove the plugs (Pos. 70) using a screwdriver. The required torques are given in section "Technical data" in these Operating Instructions. Re-insert the plugs.

Check proper fastening of all pipework.

#### Operation



Leaks caused by cracks in the pump or loose pump housing or piping screws may cause hazardous media to escape, with potential injury, even death.

Before each start-up, check the pump for cracks and check the screw connection torques as specified in section "Technical data". Report any discrepancies to the responsible officer.

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The pump should only be operated with the minimum air pressure necessary since higher air pressure will result in higher air consumption and increase wear of the pump.

#### Regulation of delivery

#### Delivery pressure

The delivery pressure is adjusted via the compressed air supply pressure on the air filter regulator. The minimum start-up pressure of the DELLMECO pump is 1.5 bar(gauge) or less. For the maximum pressure refer to section "Technical data".

#### Delivery volume

The delivery volume of the pump may be adjusted via the needle valve in the compressed air line to regulate the compressed air delivery.



- Closing the shut-off valve will briefly increase pressures in the air motor and pressure line. Exceeding the permissible pressure may cause leakages and possibly serious injury, even death, due to chemical properties of the pumped medium. Close and open the valve slowly.
- Pressurising the pump without compressed air supply may rupture the diaphragm and cause leakages and risk of serious injury, even death, due to chemical properties of the pumped medium. Do not pressurise unless in the presence of compressed air.

Strong increase of flow velocity may cause cavitation.



### CAUTION

Running pumps will generate high noise levels. Noise levels will vary depending on application. For the maximum value, refer to "Technical data". Wear ear protection.

The pump is dry self-priming. It is not necessary to fill the suction line before operation. The pump's suction capacity may, however, be increased if the suction line is filled before operation. The pump will have a high stroke rate when running dry. Do not exceed the maximum value specified under "Technical data".



#### 

Negative pressure at the suction connection of the pump may cause injury.

Do not close the suction connection by hand.

In the event that two or more pumps pump into a pipeline, any stationary pumps on the pipeline must be shut off on the pressure and suction side by means of shut-off valves.

#### Starting to pump

The pump will start up when the compressed air switches on.

- 1. Start compressed air supply.
- 2. Slowly open the air shut-off valve only partially.
- 3. Adjust the air filter regulator to the desired medium delivery pressure.
- 4. Open the shut-off valve in the media suction line.
- 5. Open the shut-off valve in the media pressure line.
- 6. Check whether the medium is being pumped into the pressure line.
- 7. Fully open the air shut-off valve.
- 8. Set the delivery volume on the needle valve.



#### Stopping to pump

Stop the pump by closing the air shut-off valve.

The pump can also be stopped by closing the external shut-off valve in the pressure line for the delivery medium whilst compressed air remains.



There is a risk of leakage from pump and connections in this situation, with resultant continuing media flow. Environmental risks exist, depending on pumped medium. Do not in this situation leave the pump unattended for hours.

#### Stopping

Close the external air shut-off valve upstream from the pump and if required shut off the compressed air supply.

Always flush the pump via the connection pipes after pumping is complete in order to

- prevent pumped media from clogging the diaphragm chambers when media with strong tendency to sedimentation are pumped,
- minimise wear and tear and
- prevent damage caused by thermal expansion as a result of frost or heat.



### 🛕 🛕 🛕 🕅 🛛 warning

A risk exists of pumped media leaking from the pump and connections when the air motor is depressurised. Environmental risks exist, depending on pumped medium. Use the drain valve installed on site to relieve the pressure in pump chambers and media lines.

Collect and dispose of residual quantities as per local regulations.

See section "Flushing the pump" in this respect.



### Troubleshooting

Fault	Cause	Remedy	Qualification
Pump not	Drive pressure too low	Increase air pressure	Operator
running	Air supply blocked	Open valve	Operator
	Silencer (Pos. 17) dirty or iced up	Clean or replace	Operator
	External suction line shut-off valve of faulty	Replace	Specialist/Operator
	Pump chamber clogged	Clean	Specialist/Operator
	Diaphragm (Pos. 4) faulty	Replace	Repair
Poor	Suction connection leaking	Reseal	Specialist/Operator
suction			Specialist/Operator
capacity	Suction line clogged	Clean suction line	
	Silencer (Pos. 17) dirty or iced up	Clean or replace	Specialist/Operator
	Valve balls (Pos. 5) blocked	Clean pump chamber	Specialist/Operator
	Valve balls (Pos. 5) damaged	Replace	Repair
	1	-	
Pump runs			Specialist/Operator
irregular	Valve balls (Pos. 5) blocked	Clean pump chamber	
	Seals (Pos. 16) in air motor housing (Pos. 2) or	Destas	Repair
	air vaive (Pos. 13) faulty	Replace	Deneir
	Diaphragm (Pos.4) faulty	Replace	Repair
		· ·	Onersten
Inadequate	Pressure drop in air supply line	Increase air pressure	Operator
power/pressure	Suction or air line blocked	Flush	Operator
	Silencer (Pos. 17) clogged or iced up	Replace	Operator
	Air valve (Pos. 13) faulty	Replace	Specialist/Operator
	Valve balls (Pos. 5) worn/damaged	Replace	Repair
	Air in fluid	Check seals	Specialist/Operator
	Diaphragm (Pos. 4) faulty	Replace	Repair
			1
Leakage on			Specialist/Operator
pump	Through bolts (Pos. 9) are loose	Check torque	

Leakage on			Repair
silencer	Diaphragm (Pos.4) faulty	Replace	

Problem not solved, contact seller or Dellmeco.

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#### Service and maintenance



#### DANGER

Working in explosive areas may lead to explosions. Observe work permit systems.

### 

- Hazardous pumped media may escape when dismantling or opening the pump and connections, resulting in injury, even death. Depressurise the pump before starting work, using customer-side valves. Collect and dispose of residual quantities compliant with local regulations.
- Spare parts from third-party suppliers may cause the pump to leak or malfunction. Leakage of hazardous media may cause injury, even death, or explosions. Use only genuine Dellmeco spare parts for servicing.

#### Checks

#### Daily

- 1. Ensure that there are no fluid leakages at the pump connections.
- 2. Ensure that there are no cracks in the pump or the piping.
- 3. Check the connections to accessories and piping for leakage.
- 4. Check that drive gas supply is clean; check that the upstream service unit is clean.

#### Every two months

Check the housing screw connection torques (through bolts, Pos. 9). To do this, remove the plugs (Pos. 70) using a screwdriver. The required torques are given in section "Technical data" in these Operating Instructions. Re-insert the plugs.

Do not start the pump should there be discrepancies; first eliminate the cause and take appropriate countermeasures.



- Leaks caused by cracks in the pump or loose pump housing or piping screws may cause hazardous media to escape, with potential injury, even death. Check the pump for cracks every day. Report any discrepancies to the responsible officer.
- Dust deposits on the pump may turn into sources of ignition. Wipe dust deposits and general dirt, even on conductive materials, using a damp cloth.



#### Maintenance

Clean or replace blocked or iced up silencers (Pos. 17). Screw in the silencer hand-tight.

#### Flushing the pump



Observe local situations and regulations when disposing of flushing/cleaning agents.

Pumps remain connected during flushing; they are neither opened nor unmounted. Suitable flushing facilities must be provided on site.

- 1. A suitable receptacle, depending on pumped and flushing medium, must be provided on the pressure side.
- 2. Flushing medium must be fed in from the suction side after flushing.
- 3. Duration, flushing medium and quantity will be selected by the operator, according to the medium to pump.
- 4. Flush conveyance takes place by compressed air drive, as in conveyance in operation.

#### Decommissioning, disassembly and disposal

Clean the pump before decommissioning.

#### Cleaning the pump



Residual quantities may splash when opening connections or disassembling; avoid risks of eye or skin damage.

Before starting work, depressurise the pump using customer-side valves; collect and dispose of residual quantities compliant with local regulations. Wear personal protective equipment. This may also, depending on the pumped medium, include self-contained breathing apparatus or wearing full protection.

Pumps should, prior to cleaning, be flushed whilst remaining in circuit – as also recommended after every operation (as described in section "Flushing the pump").

Cleaning:

- 1. Close the compressed air shut-off valve.
- 2. Close the shut-off valve in the suction line.
- 3. Close the shut-off valve in the pressure line.
- 4. Remove the suction line hose from the pump inlet side.
- 5. Remove the pressure line hose from the pump outlet side.
- 6. Position a container suitable for collecting residual quantities under the pump outlet.
- 7. Open the compressed air shut-off valve. Briefly open the compressed air (max. 1.5 bar (gauge)) to convey any residual quantities of material out of the pump.
- 8. Attach cleaning hoses for flushing and cleaning to the pump.
- 9. Have a container with suitable cleaning agent at hand, the type and volume will depend on the pumped medium and should be specified by the operator.
- 10. Start pumping by slowly opening the compressed air shut-off valve (max. 1.5 bar (gauge)) and allow the cleaning agent to circulate between its container and the pump for a few minutes to ensure thorough cleaning.
- 11. Rinse with clean water, provided the operator's specifications allow this for the pumped medium.
- 12. Remove the cleaning and flushing hoses. To drain any remaining cleaning agent, turn the pump 180° on its head for approx. 2 minutes. Collect residual quantities. Use a lifting strap as described under "Transport" to turn the pumps.



Observe local situations and regulations when disposing of flushing/cleaning agents.



#### Repairing the diaphragm pump

#### Disassembly:

The DELLMECO diaphragm pump frame sizes DM15 - DM80 differ in the number of through bolts. In the case of frame sizes DM08 and DM10, the piston rod (Pos. 14) also functions as pilot piston. These two pump models have no piston rod seals. These minor design differences must be taken into account in the disassembly instructions below.



Residual quantities may splash when opening connections or disassembling; avoid risks of eye or skin damage.

Before starting work, depressurise the pump using customer-side valves; collect and dispose of residual quantities compliant with local regulations. Wear personal protective equipment. This may also, depending on the pumped medium, include self-contained breathing apparatus or wearing full protection.

Remove the plugs (Pos. 70) on the pump end housings (Pos. 1) using a screwdriver. Loosen the nuts with washer (Pos. 12) of the through bolts (Pos. 9) on one side and remove. Position the pump squarely on the remaining pump housing. Remove the suction and pressure manifold (Pos. 3) with the inlet/outlet seals (Pos. 7). Pull the air motor housing (Pos. 2) with diaphragms (Pos. 4) off the through bolts (Pos. 9). Remove through bolts (Pos. 9) with nuts and washers (Pos. 12) from the second pump housing (Pos. 1).

The diaphragms (Pos. 4) are hand-tightened only on the diaphragm piston (Pos. 14); unscrew and pull the diaphragm piston out of the air motor housing. Unscrew the diaphragm piston grub screws (Pos. 82) from both diaphragms. Carefully remove the diaphragm piston seals (Pos. 16) and O-rings (Pos. 30) from the air motor housing. Unscrew the air connection adapter (Pos. 18) and the silencer (Pos. 17). Unscrew both end pieces of the air valve (Pos. 13) using an adjustable two-hole nut wrench (item SK4) and check the seals for damage.

Unscrew the upper (Pos. 25) and lower (Pos. 24) plugs using an adjustable two-hole nut wrench or special spanners SK1 for  $\frac{1}{4}$ " pumps, SK2 for  $\frac{3}{8}$ " pumps or SK3 for  $\frac{1}{2}$ " – 3" pumps. Check the upper plug seal (Pos. 28) for damages. Unscrew the valve stop screws (Pos. 27) using a screwdriver and push both valve stops (Pos. 26) upwards. Remove valve balls / cylinder valve (Pos. 5). Use the special spanner included with every pump to unscrew the valve seats (Pos. 22).

Suction side: Insert the narrow side of the special spanner from below into the valve seat groove and unscrew upwards.

Pressure side: Insert the wide side of the special spanner from above into the valve seat groove and unscrew upwards.

After disassembly, check all components such as seals, balls, diaphragms etc. for damage and replace as needed.



#### Assembly:

The individual subassemblies are assembled as described for disassembly, but in reverse order.

To fit the air valve with end piece (Pos. 13), first screw on an air valve end piece flush with the air motor housing (Pos. 2). Insert one O-ring (Pos. 15) of the air valve from the inside, through the air motor housing and into the air valve end piece. Moisten the four remaining air valve O-rings (Pos. 15) and press them into the air motor housing (Pos. 2). Should the air valve jam or not move easily, remove and reposition again. Screw the sixth O-ring (Pos. 15) onto the remaining second end piece.

Use circlip pliers to carefully bend the diaphragm piston seals (Pos. 16) and O-rings (Pos. 30) inwards, kidney shaped, and insert them into their respective air motor housing (Pos. 2) grooves. Then press the inside bulge of the diaphragm piston seal fully into the groove using a round object (possibly diaphragm piston).

Screw the diaphragm piston (Pos. 14) grub screws (Pos. 82) into the diaphragms (Pos. 4) and tighten finger-tight with a hex spanner. Use the grub screw to screw one diaphragm (Pos. 4) into the diaphragm piston (Pos. 14) and push into the air motor housing. Screw the second diaphragm onto the diaphragm piston. Make sure that the outer diaphragm bores are aligned with the holes in the air motor housing. Adjust the diaphragms as needed. Absolutely ensure that the sealing surfaces are undamaged. Damaged sealing surfaces will result in leaks.

Screw nuts without washers (Pos. 12) onto one end of the through bolts (Pos. 9). Insert washers (Pos. 12) into both pump housings (Pos. 1). Insert through bolts into the pump housing and carefully slide the preassembled air motor housing and diaphragms over the through bolts. Insert the inlet/outlet seals (Pos. 7) of the suction and pressure manifolds into both pump housings. Carefully insert the suction and pressure manifolds into both pump housings. Carefully insert the suction and pressure manifold into a pump housing. Ensure that the inlet/outlet seal (Pos. 7) is properly seated. Position the second pump housing (Pos. 1) and again ensure that the inlet/outlet seals (Pos. 7) are properly seated. Insert washers (Pos. 12) into the second pump housing and screw on the nuts (Pos. 12). Evenly and crosswise tighten the through bolt nuts with the specified torque until both pump housings rest on the air motor housing.

Insert the plugs. Check for leaks before again starting the pump.

### Exploded drawings and pump spare parts lists

### Models DM 08/10 and DM 10/25



#### Models DM 15/55 and DM 25/125



#### Models DM 40/315 and DM 50/565







### Spare parts list, Housing code P

Pos	Description	Material	Qty	DM 08/10	DM 10/25	DM 15/55	DM 25/125	DM 40/315	DM 50/565	DM 80/850
1	Pump housing	PE	2	2 08 01 20	2 10 01 20	2 15 01 20	2 25 01 20	2 40 01 20	2 50 01 20	2 80 01 20
2	Air motor housing	PE	1	1 08 10 20	1 10 10 20	1 15 10 20	1 25 10 20	1 40 10 20	1 50 10 20	1 80 10 20
3	pressure manifold	PE	2	2 08 30 20	2 10 30 20	2 15 30 20	2 25 30 20	2 40 30 20	2 50 30 20	-
	Suction connection Pressure side	PE	1	-	-	-	-	-	-	2 80 25 20
	connection	PE	1	-	-	-	-	-	-	2 80 025 20
	Split inlet / outlet	PE	2	-	2 10 31 20	2 15 31 20	2 25 31 20	2 40 31 20	2 50 31 20	-
4	Diaphragm, Code PT.	TFM (PTFE)	2	D1 08 50 05	D1 10 50 05	D1 15 50 05	D1 25 50 05	D1 40 50 05	D1 50 50 05	D1 80 50 05
	Diaphragm, Code PE.	EPDM	2	-	D1 10 50 08	D1 15 50 08	D1 25 50 08	D1 40 50 08	D1 50 50 08	D1 80 50 08
	Diaphragm, Code PN.	NBR	2	-	D1 10 50 10	D1 15 50 10	D1 25 50 10	D1 40 50 10	D1 50 50 10	D1 80 50 10
	Diaphragm, Code PZ.	EPDM/TFM/PFA	2	-	D1 10 50 00	D1 15 50 00	D 1 25 50 00	-	-	-
	Diaphragm, Code PV.	FKM	2	-	-	D1 15 00 09	D1 25 00 09	-	-	-
5	Cylinder valve, Code P.Z	PTFE	4	2 08 56 23	2 10 56 23	2 15 56 23	2 25 56 23	2 40 56 23	2 50 56 23	-
	Ball valve, Code P.T	PTFE	4	1 08 60 23	1 10 60 23	1 15 60 23	1 25 60 23	1 40 60 23	1 50 60 23	1 80 60 23
	Ball valve, Code P.E	EPDM	4	-	1 10 60 08	1 15 60 08	1 25 60 08	1 40 60 08	1 50 60 08	1 80 60 08
	Ball valve, Code P N	NBR	4	-	1 10 60 10	1 15 60 10	1 25 60 10	1 40 60 10	1 50 60 10	1 80 60 10
	Ball valve, Code P.S	AISI 316	4	1 08 60 52	1 10 60 52	1 15 60 52	1 25 60 52	1 40 60 52	1 50 60 52	-
	Ball valve, Code P U	Polyurethane	4	-	1 10 60 07	1 15 60 07	1 25 60 07	1 40 60 07	1 50 60 07	-
	Ball valve, Code P.C	Ceramic	4	-	1 10 60 90	1 15 60 90	1 25 60 90	-	-	-
7	Seal, inlet/outlet, Code PT./PV./PZ.	FEP/FPM	4	2 08 70 04	2 10 70 04	2 15 70 04	-	-	-	-
	Seal, inlet/outlet, Code PT./PV./PZ.	PTFE/EPDM	4	-	-	-	2 25 73 15	2 40 73 15	2 50 73 15	2 80 73 15
	Seal, inlet/outlet, Code PE.	EPDM	4	-	2 10 70 08	2 15 70 08	2 25 70 08	2 40 70 08	2 50 70 08	2 80 70 08
	Seal, inlet/outlet, Code PN.	NBR	4	-	2 10 70 10	2 15 70 10	2 25 70 10	2 40 70 10	2 50 70 10	2 80 70 10
9	Through bolt	AISI 304	4	2 08 042 50	2 10 042 50	-	-	-	-	-
			6	-	-	2 15 042 50	2 25 042 50	-	-	-
11	Vibration	NR-c/Steel	4	1 08 69 06	1 08 69 06	1 15 69 06	1 25 69 06	1 40 69 06	1 40 69 06	1 80 69 06
12	damper Nut with washer	AISI 304	8	2 08 045 50	2 10 045 50	-	-	-	-	-
			12			2 15 045 50	2 25 045 50	-	-	-
			16	-	-	-	-	2 40 045 50	2 50 045 50	2 80 045 50
13	Air valve with end piece	PET/NBR	1	1 08 020 31	1 08 020 31	1 15 020 31	1 15 020 31	1 40 020 31	1 40 020 31	1 80 020 31
14	Diaphragm, piston	AISI 304	1	1 08 24 50	1 08 24 50	1 15 40 50	1 25 40 50	1 40 40 50	1 50 40 50	1 80 40 50
15	O-ring Seal for air motor	NBR PTFF-PPS-	6	1 08 080 10	1 08 080 10	1 15 080 10	1 15 080 10	1 40 87 10	1 40 87 10	1 40 87 10
16	housing	conducting	2	-	-	1 15 85 18	1 25 85 18	1 40 85 18	1 50 85 18	1 80 85 18
17	Silencer	PE porous Metal	1	1 08 499 35	1 08 499 35	1 15 499 35	1 15 499 35	1 40 499 35	1 50 499 35	- 1 80 99 00
18	Air connection-	PP	1	1 08 46 28	1 08 46 28	1 15 46 28	1 15 46 28	1 40 46 28	1 40 46 28	1 80 46 28
19	Tank pump handle	AISI 304	1	3 08 98 50	3 10 98 50	3 15 98 50	3 25 98 50	-	-	-
22	Valve seat	PE	4	2 08 54 20	2 10 54 20	2 15 54 20	2 25 54 20	2 40 54 20	2 50 54 20	2 80 54 20
24	Bottom plug	PE	2	2 08 59 20	2 10 59 20	2 15 59 20	2 25 59 20	2 40 59 20	2 50 59 20	2 80 59 20
25	Top plug	PE	2	2 08 055 20	2 10 055 20	2 15 55 20	2 25 55 20	2 40 55 20	2 50 55 20	2 80 55 20
26	Valve stop	PE	2	2 08 39 20	2 10 39 20	2 15 39 20	2 25 39 20	2 40 39 20	2 50 39 20	2 80 39 20
21	Screw, valve stop	PE	2	2 08 38 20	2 10 38 20	2 15 38 20	2 25 38 20	2 40 38 20	2 50 38 20	2 80 38 20
28	Code PT./PV./PZ.	FEP/FPM	2	2 08 78 04	2 10 78 04	2 15 78 04	2 25 78 04	2 40 78 04	2 50 78 04	2 80 78 04
	Code PE. Seal, top plug.		2	-	2 10 78 08	2 15 78 08	2 25 78 08	2 40 78 08	2 50 78 08	2 80 78 08
	Code PN. O-ring, Dianhragm	NBR	2	-	2 10 78 10	2 15 78 10	2 25 78 10	2 40 78 10	2 50 78 10	2 80 78 10
30	piston	NBR	2	-	-	1 15 85 10	1 25 85 10	1 40 85 10	1 50 85 10	1 80 85 10
35	All motor, complete		1	2 08 050 00	2 10 050 00	1 15 11 20	1 25 11 20	1401120	1501120	1 60 11 20
70	Plug, ena housing	PE	8	2 08 058 20	2 10 058 20	-	-	-	-	-
			12	-	-	- 2 15 058 20	- 2 25 058 20	- 2 40 058 20	- 2 50 058 20	- 2 80 058 20
82	Grub screw,	AISI 304	2	-	-	-	-	1 40 540 50	1 50 540 50	1 80 540 50
83	Adapter for Silencer	PE	1	-	-	-	-	-	-	1 80 299 20

A separately specified diaphragm rupture sensor (Item no. 9 15 19 00) may be installed instead of the exhaust air silencer (Pos. 17). Sensors not used in explosive atmospheres must be permanently marked as not Ex.

### Spare parts list, Housing code T

Pos	Description	Material	Qty	DM 08/10	DM 10/25	DM 15/55	DM 25/125	DM 40/315	DM 50/565	DM 80/850
1	Pump housing	PTFE	2	2 08 01 23	2 10 01 23	2 15 01 23	2 25 01 23	2 40 01 23	2 50 01 23	-
2	Air motor housing	PE	1	1 08 10 20	1 10 10 20	1 15 10 20	1 25 10 20	1 40 10 20	1 50 10 20	1 80 10 20
3	Suction and pressure manifold	PTFE	2	2 08 30 23	2 10 30 23	2 15 30 23	2 25 30 23	2 40 30 23	2 50 30 23	-
4	Diaphragm, Code TT.	TFM (PTFE)	2	D1 08 50 05	D1 10 50 05	D1 15 50 05	D1 25 50 05	D1 40 50 05	D1 50 50 05	D1 80 50 05
	Diaphragm, Code TE.	EPDM	2	-	D1 10 50 08	D1 15 50 08	D1 25 50 08	D1 40 50 08	D1 50 50 08	D1 80 50 08
	Diaphragm, Code TN.	NBR	2	-	D1 10 50 10	D1 15 50 10	D1 25 50 10	D1 40 50 10	D1 50 50 10	D1 80 50 10
	Diaphragm, Code TZ.	EPDM/TFM/PFA	2	-	D1 10 50 00	D1 15 50 00	D 1 25 50 00	-	-	-
	Diaphragm, Code TV.	FKM	2	-	-	D1 15 00 09	D1 25 00 09	-	-	-
5	Cylinder valves, Code T.F	PTFE	4	2 08 56 23	2 10 56 23	2 15 56 23	2 25 56 23	2 40 56 23	2 50 56 23	-
	Ball valves, Code T.T	PTFE	4	1 08 60 23	1 10 60 23	1 15 60 23	1 25 60 23	1 40 60 23	1 50 60 23	1 80 60 23
	Ball valves, Code T.E	EPDM	4	-	1 10 60 08	1 15 60 08	1 25 60 08	1 40 60 08	1 50 60 08	1 80 60 08
	Ball valves, Code T.N	NBR	4	-	1 10 60 10	1 15 60 10	1 25 60 10	1 40 60 10	1 50 60 10	1 80 60 10
	Ball valves, Code T.S	AISI 316	4	1 08 60 52	1 10 60 52	1 15 60 52	1 25 60 52	1 40 60 52	1 50 60 52	-
	Ball valves, Code T.U	Polyurethane	4	-	1 10 60 07	1 15 60 07	1 25 60 07	1 40 60 07	1 50 60 07	-
	Ball valves, Code T.C	Ceramic	4	-	1 10 60 90	1 15 60 90	1 25 60 90	-	-	-
7	Seal, inlet/outlet, Code TT./TV./TZ.	FEP/FPM	4	2 08 70 04	2 10 70 04	2 15 70 04	-	-	-	-
	Seal, inlet/outlet, Code TT./TV./TZ.	PTFE/EPDM	4	-	-	-	2 25 73 15	2 40 73 15	2 50 73 15	2 80 73 15
	Seal, inlet/outlet, Code TE.	EPDM	4	-	2 10 70 08	2 15 70 08	2 25 70 08	2 40 70 08	2 50 70 08	2 80 70 08
	Seal, inlet/outlet, Code TN.	NBR	4	-	2 10 70 10	2 15 70 10	2 25 70 10	2 40 70 10	2 50 70 10	2 80 70 10
9	Through bolt	AISI 304	4	2 08 042 50	2 10 042 50	-	-	-	-	-
			6	-	-	2 15 042 50	2 25 042 50	-	-	-
			8	-	-	-	-	2 40 042 50	2 50 042 50	2 80 042 50
11	Vibration damper	NR-c/Steel	4	1 08 69 06	1 08 69 06	1 15 69 06	1 25 69 06	1 40 69 06	1 40 69 06	1 80 69 06
12	Nut with washer	AISI 304	8	2 08 045 50	2 10 045 50	-	-	-	-	-
			12	-	-	2 15 045 50	2 25 045 50	-	-	-
			16	-	-	-	-	2 40 045 50	2 50 045 50	2 80 045 50
13	Air valve with end piece	PET/NBR	1	1 08 020 31	1 08 020 31	1 15 020 31	1 15 020 31	1 40 020 31	1 40 020 31	1 80 020 31
14	Diaphragm, piston	AISI 304	1	1 08 24 50	1 08 24 50	1 15 40 50	1 25 40 50	1 40 40 50	1 50 40 50	1 80 40 50
15	O-ring	NBR PTFF-PPS-	6	1 08 080 10	1 08 080 10	1 15 080 10	1 15 080 10	1 40 87 10	1 40 87 10	1 40 87 10
16	Seal for air motor housing	conducting	2	-	-	1 15 85 18	1 25 85 18	1 40 85 18	1 50 85 18	1 80 85 18
17	Silencer	PE porous	1	1 08 499 35	1 08 499 35	1 15 499 35	1 15 499 35	1 40 499 35	1 50 499 35	-
		Metal	1	-	-	-	-	-	-	1 80 99 00
18	Air connection adapter	PP	1	1 08 46 28	1 08 46 28	1 15 46 28	1 15 46 28	1 40 46 28	1 40 46 28	1 80 46 28
19	I ank pump handle	AISI 304	1	3 08 98 50	3 10 98 50	3 15 98 50	3 25 98 50	-	-	-
22	Vaive seat	PIFE	4	2 08 54 23	2 10 54 23	2 15 54 23	2 25 54 23	2 40 54 23	2 50 54 23	-
24		DTEE	2	2 08 59 23	2 10 59 23	2 15 59 23	2 25 59 23	2 40 59 23	2 50 59 23	-
20	Volvo stop	DTEE	2	2 00 000 20	2 10 000 20	2 10 00 20	2 20 00 20	2 40 33 23	2 50 55 25	-
20	Scrow Valvo stop	DTEE	2	2 00 39 23	2 10 39 23	2 15 39 23	2 25 39 25	2 40 39 23	2 50 39 23	-
28	Seal, top plug,	FEP/FPM	2	2 08 78 04	2 10 78 04	2 15 78 04	2 25 78 04	2 40 78 04	2 50 78 04	2 80 78 04
-	Seal, top plug, Code TE.	EPDM	2	-	2 10 78 08	2 15 78 08	2 25 78 08	2 40 78 08	2 50 78 08	2 80 78 08
	Seal, top plug, Code TN.	NBR	2	-	2 10 78 10	2 15 78 10	2 25 78 10	2 40 78 10	2 50 78 10	2 80 78 10
30	O-ring, Diaphragm, piston	NBR	2	-	-	1 15 85 10	1 25 85 10	1 40 85 10	1 50 85 10	1 80 85 10
35	Air motor, complete	PE	1	1 08 11 20	1 10 11 20	1 15 11 20	1 25 11 20	1 40 11 20	1 50 11 20	1 80 11 20
70	Plug, end housing	PE	8	2 08 058 20	2 10 058 20	-	-	-	-	-
			12	-	-	2 15 058 20	2 25 058 20	-	-	-
			16	-	-	-	-	2 40 058 20	2 50 058 20	2 80 058 20
82	Grub screw, Diaphragm,	AISI 304	2	-	-	-	-	1 40 540 50	1 50 540 50	1 80 540 50
83	Adapter for Silencer	PE	1	-	-	-	-	-	-	1 80 299 20

A separately specified diaphragm rupture sensor (Item no. 9 15 19 00) may be installed instead of the exhaust air silencer (Pos. 17). Sensors not used in explosive atmospheres must be permanently marked as not Ex.

### Spare parts list, Housing code R

Pos	Description	Material	Qty	DM 08/10	DM 10/25	DM 15/55	DM 25/125	DM 40/315	DM 50/565	DM 80/850
1	Pump housing	PE conducting	2	2 08 01 21	2 10 01 21	2 15 01 21	2 25 01 21	2 40 01 21	2 50 01 21	2 80 01 21
2	Air motor housing	PE conducting	1	1 08 10 21	1 10 10 21	1 15 10 21	1 25 10 21	1 40 10 21	1 50 10 21	1 80 10 21
3	Suction and pressure	PE conducting	2	2 08 30 21	2 10 30 21	2 15 30 21	2 25 30 21	2 40 30 21	2 50 30 21	-
	mannoid	AISI 316L	2	2 08 35 53	2 10 35 53	2 15 35 53	2 25 35 53	2 40 35 53	2 50 35 53	-
	Suction side connector	PE conducting	1	-	-	-	-	-	-	2 80 25 21
	Pressure side connector	PE conducting	1	-	-	-	-	-	-	2 80 025 21
4	Diaphragm, Code RF.	TFM (PTFE)	2	D1 08 50 05	D1 10 50 05	D1 15 50 05	D1 25 50 05	D1 40 50 05	D1 50 50 05	D1 80 50 05
	Diaphragm, Code RE.	EPDM	2	-	D1 10 50 08	D1 15 50 08	D1 25 50 08	D1 40 50 08	D1 50 50 08	D1 80 50 08
	Diaphragm, Code RN.	NBR	2	-	D1 10 50 10	D1 15 50 10	D1 25 50 10	D1 40 50 10	D1 50 50 10	D1 80 50 10
	Diaphragm, Code RZ.	EPDM/TFM/PFA	2	-	D1 10 50 00	D1 15 50 00	D 1 25 50 00	-	-	-
	Diaphragm, Code RL.	PTFE, conducting	2	D1 08 00 24	D1 10 00 24	D1 15 00 24	D1 25 00 24	D1 40 00 24	D1 50 00 24	-
	Diaphragm, Code RV.	FKM	2	-	-	D1 15 00 09	D1 25 00 09	-	-	-
5	Cylinder valves, Code R.F	PTFE	4	2 08 56 23	2 10 56 23	2 15 56 23	2 25 56 23	2 40 56 23	2 50 56 23	-
	Ball valves, Code R.T	PTFE	4	1 08 60 23	1 10 60 23	1 15 60 23	1 25 60 23	1 40 60 23	1 50 60 23	1 80 60 23
	Ball valves, Code R.E	EPDM	4	-	1 10 60 08	1 15 60 08	1 25 60 08	1 40 60 08	1 50 60 08	1 80 60 08
	Ball valves, Code R.N	NBR	4	-	1 10 60 10	1 15 60 10	1 25 60 10	1 40 60 10	1 50 60 10	1 80 60 10
	Ball valves, Code R.S	AISI 316	4	1 08 60 52	1 10 60 52	1 15 60 52	1 25 60 52	1 40 60 52	1 50 60 52	-
	Ball valves, Code R.U	Polyurethane	4	-	1 10 60 07	1 15 60 07	1 25 60 07	1 40 60 07	1 50 60 07	-
	Ball valves, Code R.C	Ceramic	4	-	1 10 60 90	1 15 60 90	1 25 60 90	-	-	-
7	Seal, inlet/outlet, Code RT./RV./RZ./RL.	FEP/FPM	4	2 08 70 04	2 10 70 04	2 15 70 04	-	-	-	-
	Seal, inlet/outlet, Code RT./RV./RZ./RL.	PTFE-I/EPDM	4	-	-	-	2 25 73 17	2 40 73 17	2 50 73 17	2 80 73 17
	Seal, inlet/outlet, Code RE.	EPDM	4	-	2 10 70 08	2 15 70 08	2 25 70 08	2 40 70 08	2 50 70 08	2 80 70 08
	Seal, inlet/outlet, Code RN.	NBR	4	-	2 10 70 10	2 15 70 10	2 25 70 10	2 40 70 10	2 50 70 10	2 80 70 10
9	Through bolt	AISI 304	4	2 08 042 50	2 10 042 50	-	-	-	-	-
			6	-	-	2 15 042 50	2 25 042 50	-	-	-
			8	-	-	-	-	2 40 042 50	2 50 042 50	2 80 042 50
11	Vibration damper	NR-c/Steel	4	1 08 69 52	1 08 69 52	1 15 69 52	1 25 69 52	1 40 69 52	1 40 69 52	1 80 69 52
12	Nut with washer	AISI 304	8	2 08 045 50	2 10 045 50	-	-	-	-	-
			12	-	-	2 15 045 50	2 25 045 50	-	-	-
13	Air valve with end piece		10	1 08 020 31	1 08 020 31	1 15 020 31	1 15 020 31	1 /0 020 31	2 30 043 30	1 80 020 31
14	Diaphragm, piston	AISI 304	1	1 08 24 50	1 08 24 50	1 15 40 50	1 25 40 50	1 40 40 50	1 50 40 50	1 80 40 50
15	O-ring	NBR	6	1 08 080 10	1 08 080 10	1 15 080 10	1 15 080 10	1 40 87 10	1 40 87 10	1 40 87 10
16	Seal for air motor housing	PTFE-PPS-	2	-	-	1 15 85 18	1 25 85 18	1 40 85 18	1 50 85 18	1 80 85 18
17	Silencer	Bronze	1	1 08 499 86	1 08 499 86	1 15 /09 86	1 15 /00 86	1 /0 /99 86	1 50 499 86	-
	Oliencer	Metal	1	-	-	-	-	-	-	1 80 99 00
18	Air connection adapter	PP conducting	1	1 08 46 21	1 08 46 21	1 15 46 21	1 15 46 21	1 40 46 21	1 40 46 21	1 80 46 21
19	Tank pump handle	AISI 304	1	3 08 98 50	3 10 98 50	3 15 98 50	3 25 98 50	-	-	-
22	Valve seat	PE conducting	4	2 08 54 21	2 10 54 21	2 15 54 21	2 25 54 21	2 40 54 21	2 50 54 21	2 80 54 21
24	Bottom plug	PE conducting	2	2 08 59 21	2 10 59 21	2 15 59 21	2 25 59 21	2 40 59 21	2 50 59 21	2 80 59 21
25	Top plug	PE conducting	2	2 08 055 21	2 10 055 21	2 15 55 21	2 25 55 21	2 40 55 21	2 50 55 21	2 80 55 21
26	Valve stop	PE conducting	2	2 08 39 21	2 10 39 21	2 15 39 21	2 25 39 21	2 40 39 21	2 50 39 21	2 80 39 21
27	Screw, Valve stop	PE conducting	2	2 08 38 21	2 10 38 21	2 15 38 21	2 25 38 21	2 40 38 21	2 50 38 21	2 80 38 21
28	Seal, top plug, Code RT./RV./RZ./RL.	FEP/FPM	2	2 08 78 04	2 10 78 04	2 15 78 04	2 25 78 04	2 40 78 04	2 50 78 04	2 80 78 04
	Seal, top plug, Code RE.	EPDM	2	-	2 10 78 08	2 15 78 08	2 25 78 08	2 40 78 08	2 50 78 08	2 80 78 08
	Seal, top plug, Code RN.	NBR	2	-	2 10 78 10	2 15 78 10	2 25 78 10	2 40 78 10	2 50 78 10	2 80 78 10
30	O-ring, Diaphragm, piston	NBR	2	-	-	1 15 85 10	1 25 85 10	1 40 85 10	1 50 85 10	1 80 85 10
35	Air motor, complete	PE conducting	1	1 08 11 21	1 10 11 21	1 15 11 21	1 25 11 21	1 40 11 21	1 50 11 21	1 80 11 21
70	Plug, end housing	PE	8	2 08 058 20	2 10 058 20	-	-	-	-	-
			12	-	-	2 15 058 20	2 25 058 20	-	-	-
			16	-	-	-	-	2 40 058 20	2 50 058 20	2 80 058 20
82	Grub screw, Diaphragm, piston	AISI 304	2	-	-	1 15 054 20	1 25 054 20	1 40 540 50	1 50 540 50	1 80 540 50
83	Adapter for Silencer	PE conducting	1	-	-	-	-	-	-	1 80 299 21

A separately specified diaphragm rupture sensor (Item no. 9 15 19 00) may be installed instead of the exhaust air silencer (Pos. 17). Sensors not used in exolosive atmospheres must be permanently marked as not Ex.

### Spare parts list, Housing code Z

Pos	Description	Material	Qty	DM 08/10	DM 10/25	DM 15/55	DM 25/125	DM 40/315	DM 50/565	DM 80/850
1	Pump housing	PTFE conducting	2	2 08 01 24	2 10 01 24	2 15 01 24	2 25 01 24	2 40 01 24	2 50 01 24	-
2	Air motor housing	PE conducting	1	1 08 10 21	1 10 10 21	1 15 10 21	1 25 10 21	1 40 10 21	1 50 10 21	1 80 10 21
3	Suction and pressure	PTFE conducting	2	2 08 30 24	2 10 30 24	2 15 30 24	2 25 30 24	2 40 30 24	2 50 30 24	-
		AISI 316L	2	2 08 35 53	2 10 35 53	2 15 35 53	2 25 35 53	2 40 35 53	2 50 35 53	-
-	Suction side connector	PTFE conducting	1	-	-	-	-	-	-	2 80 25 24
	Pressure side connector	PTFE conducting	1	-	-	-	-	-	-	2 80 025 24
4	Diaphragm, Code ZT.	TFM (PTFE)	2	D1 08 50 05	D1 10 50 05	D1 15 50 05	D1 25 50 05	D1 40 50 05	D1 50 50 05	D1 80 50 05
	Diaphragm, Code ZE.	EPDM	2	-	D1 10 50 08	D1 15 50 08	D1 25 50 08	D1 40 50 08	D1 50 50 08	D1 80 50 08
	Diaphragm, Code ZN.	NBR	2	-	D1 10 50 10	D1 15 50 10	D1 25 50 10	D1 40 50 10	D1 50 50 10	D1 80 50 10
	Diaphragm, Code ZZ.	EPDM/TFM/PFA	2	-	D1 10 50 00	D1 15 50 00	D 1 25 50 00	-	-	-
	Diaphragm, Code ZL.	PTFE, electrostatically conducting	2	D1 08 00 24	D1 10 00 24	D1 15 00 24	D1 25 00 24	D1 40 00 24	D1 50 00 24	-
	Diaphragm, Code ZV.	FKM	2	-	-	D1 15 00 09	D1 25 00 09	-	-	-
5	Cylinder valves, Code Z.F	PTFE	4	2 08 56 23	2 10 56 23	2 15 56 23	2 25 56 23	2 40 56 23	2 50 56 23	-
	Ball valves, Code Z.T	PTFE	4	1 08 60 23	1 10 60 23	1 15 60 23	1 25 60 23	1 40 60 23	1 50 60 23	1 80 60 23
	Ball valves, Code Z.E	EPDM	4	-	1 10 60 08	1 15 60 08	1 25 60 08	1 40 60 08	1 50 60 08	1 80 60 08
	Ball valves, Code Z.N	NBR	4	-	1 10 60 10	1 15 60 10	1 25 60 10	1 40 60 10	1 50 60 10	1 80 60 10
	Ball valves, Code Z.S	AISI 316	4	1 08 60 52	1 10 60 52	1 15 60 52	1 25 60 52	1 40 60 52	1 50 60 52	-
	Ball valves, Code Z.U	Polyurethane	4	-	1 10 60 07	1 15 60 07	1 25 60 07	1 40 60 07	1 50 60 07	-
	Ball valves, Code Z.C	Ceramic	4	-	1 10 60 90	1 15 60 90	1 25 60 90	-	-	-
7	Seal, inlet/outlet, Code ZT./ZV./ZZ./ZL.	FEP/FPM	4	2 08 70 04	2 10 70 04	2 15 70 04	-	-	-	-
L	ZT./ZV./ZZ./ZL.	PTFE-I/FPM	4	-	-	-	2 25 73 16	2 40 73 16	2 50 73 16	2 80 73 16
	Seal, inlet/outlet, Code ZE.	EPDM	4	-	2 10 70 08	2 15 70 08	2 25 70 08	2 40 70 08	2 50 70 08	2 80 70 08
	Seal, inlet/outlet, Code ZN.	NBR	4	-	2 10 70 10	2 15 70 10	2 25 70 10	2 40 70 10	2 50 70 10	2 80 70 10
9	Through bolt	AISI 304	4	2 08 042 50	2 10 042 50	-	-	-	-	-
			6	-	-	2 15 042 50	2 25 042 50	-	-	-
			8	-	-	-	-	2 40 042 50	2 50 042 50	2 80 042 50
11	Vibration damper	NR-c/Steel	4	1 08 69 52	1 08 69 52	1 15 69 52	1 25 69 52	1 40 69 52	1 40 69 52	1 80 69 52
12	Nut with washer	AISI 304	8	2 08 045 50	2 10 045 50	-	-	-	-	-
			12	-	-	2 15 045 50	2 25 045 50	-	-	-
- 10		DETAIDD	16	-	-	-	-	2 40 045 50	2 50 045 50	2 80 045 50
13	Air valve with end piece		1	1 08 020 31	1 08 020 31	1 15 020 31	1 15 020 31	1 40 020 31	1 40 020 31	1 80 020 31
14	O ripa	AISI 304	6	1 08 24 50	1 08 24 50	1 15 40 50	1 25 40 50	1 40 40 50	1 50 40 50	1 40 97 10
16	Soal for air motor housing	PTFE-PPS-	2	1 08 080 10	1 00 000 10	1 15 95 19	1 25 85 18	1 40 85 18	1 50 85 18	1 90 95 19
17	Siloncor	conducting	1	1 08 400 86	1 09 400 96	1 15 400 86	1 15 400 86	1 40 400 86	1 50 400 86	1 00 00 10
17		Metal	1	1 00 499 00	1 00 499 00	-	1 13 499 80	1 40 499 80	1 30 499 80	1 80 99 00
18	Air connection-Adapter	PP, conducting	1	1 08 46 21	1 08 46 21	1 15 46 21	1 15 46 21	1 40 46 21	1 40 46 21	1 80 46 21
19	Tank pump handle	AISI 304	1	3 08 98 50	3 10 98 50	3 15 98 50	3 25 98 50	-	-	-
22	Valve seat	PTFE conducting	4	2 08 54 24	2 10 54 24	2 15 54 24	2 25 54 24	2 40 54 24	2 50 54 24	-
24	Bottom plug	PTFE conducting	2	2 08 59 24	2 10 59 24	2 15 59 24	2 25 59 24	2 40 59 24	2 50 59 24	-
25	Top plug	PTFE conducting	2	2 08 055 24	2 10 055 24	2 15 55 24	2 25 55 24	2 40 55 24	2 50 55 24	-
26	Valve stop	PTFE conducting	2	2 08 39 24	2 10 39 24	2 15 39 24	2 25 39 24	2 40 39 24	2 50 39 24	-
27	Screw, Valve stop	PTFE conducting	2	2 08 38 24	2 10 38 24	2 15 38 24	2 25 38 24	2 40 38 24	2 50 38 24	-
28	Seal, top plug, Code RT./RV./RZ./RL.	FEP/FPM	2	2 08 78 04	2 10 78 04	2 15 78 04	2 25 78 04	2 40 78 04	2 50 78 04	2 80 78 04
	Seal, top plug, Code RE.	EPDM	2	-	2 10 78 08	2 15 78 08	2 25 78 08	2 40 78 08	2 50 78 08	2 80 78 08
	Seal, top plug, Code RN.	NBR	2	-	2 10 78 10	2 15 78 10	2 25 78 10	2 40 78 10	2 50 78 10	2 80 78 10
30	O-ring Diaphragm, piston	NBR	2	-	-	1 15 85 10	1 25 85 10	1 40 85 10	1 50 85 10	1 80 85 10
35	Air motor, complete	PE conducting	1	1 08 11 21	1 10 11 21	1 15 11 21	1 25 11 21	1 40 11 21	1 50 11 21	1 80 11 21
70	Plug, end housing	PE	8	2 08 058 20	2 10 058 20	-	-	-	-	-
			12	-	-	2 15 058 20	2 25 058 20	- 2 40 058 20	- 2 50 058 20	- 2 80 058 20
82	Grub screw Diaphragm,	AISI 304	2	-		1 15 540 50	1 25 540 50	1 40 540 50	1 50 540 50	1 80 540 50
83	piston Adapter for Silencer	PE conducting	1				-		-	1 80 299 21

A separately specified diaphragm rupture sensor (Item no. 9 15 19 00) may be installed instead of the exhaust air silencer (Pos. 17). Sensors not used in explosive atmospheres must be permanently marked as not Ex.



#### **Pulsation damper**

The Dellmeco pulsation damper represents the latest generation of active pulsation dampers. They were designed specifically for the Dellmeco double diaphragm pumps.

The intended use of a pulsation damper is to ensure that media flow will be with almost no pulsation.



Check the chemical resistance of the materials to the pumped medium.

All material designations are listed on the pulsation damper nameplate, by product code.



The instructions here are analogous to those in the sections applying to the pump.

<b>Ex</b>	Intended use compliant with Directive 2014/34/EU (ATEX) for electrostatically conducting pulsation dampers										
	Exclusively pulsation dampers of this material type are suitable for use in and near explosive atmospheres:										
	Damper housing	]									
	R	R	1								
	Z	R	]								
	Dellmeco compressed air ope designed to pump fluid media o Pump and pulsation damper are	rated double diaphragm pum f explosion subgroups up to IIC e designed category 1G equipr	ps with pulsation dampers are c or IIB to Zones 0, 1 or 2. nent inside.								
	These compressed air operat designed category 2G on the atmospheres in Zone 1 or Zone The pump with damper may be	ed double diaphragm pumps e outside. This means they of e 2. used in explosion subgroups l	with pulsation dampener are can be used in explosive gas								
	Planners/project planners will s described above.	pecify temperature classes for	pump and damper together, as								



Discharging the pulsation damper exhaust air into the fluid will cause foaming and container overflow. Such escaped volumes may cause serious injury, even death, due to their chemical properties. Do not operate pulsation dampers submerged or immersed in fluids.

#### **Technical data**

#### Pulsation damper code

Λ	40	Z	י   	Г F   	2   	
					Damper head	R - PE - electrostatically conducting P - PE
				Diaph	nragm	E - EPDM N - NBR T - TFM / PTFE V - Viton (FKM) L - PTFE electrostatically conducting
			Damp	ber hou	using	P - PE T - PTFE R - PE, electrostatically conductive Z - PTFE, electrostatically conducting
	N si	omi ize	nal			DN 40 (1 1/2")

Dellmeco compressed air operated pulsation damper, DM - range

**Restrictions:** 

The explosion-protected version only with

- Damper head Code R
- Damper housing Code R or Z



#### Dimensions - pulsation damper installed [mm]

	Α	В	С	D	Е	F	G	Н	I	ØJ	Κ	L	М	Ν	0	Р	Q
DM 08/10	70	113	193	15	G 1/4"	58	R 1/8"	107	10	15	50	86	-	-	74	R1/8"	74
DM 10/25	105	128	238	18	G 3/8"	84	R 1/8"	150	10	15	75	93	-	-	81	R1/8"	104
DM 15/55	153	177	325	40	G 1/2"	87	R 1/4"	202	18	30	112	136	65	M12	81	R1/8"	104
DM 25/125	200	232	435	50	G 1"	123	R 1/4"	272	28	40	140	170	85	M12	119	R1/8"	156
DM 40/315	270	312	581	57	G 1 1/2"	109	R 1/2"	373	30	60	190	227	110	M16	151	R1/4"	204
DM 50/565	350	385	726	52	G 2"	158	R 1/2"	478	30	60	270	282	125	M16	183	R1/4"	273
DM 80/850	480	580	800	100	G 3"	388	R 3/4"	690	40	75	395	495	160	M16	261	R1/2"	360

Dimensions may vary

#### Pulsation damper through bolt torques [Nm]

	DM 08	DM 10	DM 15	DM 25	DM 40	DM 50	DM 80
PE damper	3	6	8	13	17	22	24
PTFE damper	2	5	7	11	15	19	-
Damper - pump	Hand tightened						
Air connection - pulsation damper	3	3	4	4	6	6	6



#### **Pulsation damper fitment**

It is possible to upgrade a pump by fitting a pulsation damper. This requires a pressure manifold to fit the pulsation damper. The item number of this pressure manifold is available from the manufacturer. To replace the pressure manifold, disassemble the pump as described in the "Repair" section, replace the pressure manifold and reassemble. No valve is installed between pump and damper.

To ensure that the damper will be tight, check the pulsation damper through bolts (Pos. 42) for proper torque (see the technical data for the damper) before assembling.

Screw the damper onto the new pressure manifold for the pump, hand-tight. An appropriate seal is included with the damper.

No separate equipotential bonding of the damper is required since the damper has a direct conductive connection to the pump.



#### **Connection instructions**

Remove the blind plug at the air inlet above the damper head (Pos. 41) to fit the pulsation damper compressed air connection. The pulsation damper uses its own compressed air connection to ensure proper operation. Pump and pulsation damper must be connected to a common compressed air line. Pump and damper will be supplied with compressed air via a T-piece in the supply line.

The air used must be oil-free, dry and clean, as for the pump itself.

The connection must be via hoses or compensators, stress free.

Pressure test on the entire system

Bypass pump and damper on the fluid side when pressure testing the system.

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Pressurising damper and pump in the absence of a compressed air supply may rupture the diaphragm and cause leakages with a risk of serious injury, even death, posed by the chemical properties of the pumped medium. Do not pressurise unless in the presence of compressed air.



#### Commissioning

Check pulsation dampers for cracks or other damage before commissioning and before every start.

#### Operation

Start up empty dampers slowly, together with the pump. The damper will self-regulate to match all changes in operation.

#### Maintenance

Check pulsation dampers for leaks after the first max. 100 hours of operation, thereafter check at inspection intervals, together with the pump.

#### Cleaning

Ensure that pump and damper are empty and flushed before unmounting pump and damper from the system. Ensure that pump and damper are depressurised (medium and air). Observe the Safety instructions for the pump.

#### Repairing the pulsation damper

#### Disassembly:

DELLMECO pulsation damper frame sizes DM10 - DM80 differ in the number of their through bolts (Pos. 42).

4, 6 and 8 through bolts are used for frame sizes DM10/DM15, DM25/DM40 and DM50/DM80, respectively. These minor design differences must be taken into account in the disassembly instructions below.



Residual quantities may splash when opening connections or disassembling; avoid risks of eye or skin damage.

Before starting work, depressurise the pump using customer-side valves; collect and dispose of residual quantities compliant with local regulations. Wear personal protective equipment. This may also, depending on the pumped medium, include self-contained breathing apparatus or wearing full protection.

Unmount the pulsation damper (screwed on hand-tight) from the pump.

Use a screwdriver to pull the sealing plugs (Pos. 46) from damper housing (Pos. 36) and head (Pos. 41). Loosen the nuts with washer (Pos. 43) of the through bolts (Pos. 42). The damper head can now be separated from the damper housing. Pull the diaphragm (Pos. 40) and piston (Pos. 39) out of the damper head. Unscrew the piston from the diaphragm. Remove the piston seals (Pos. 37) and piston seal O-rings (Pos. 38) from the damper head. Do not reuse the seals. Remove the silencer (Pos. 44).

After dismantling, check all components such as seals, diaphragms etc. for damage and replace as necessary.

#### Assembly:

The individual subassemblies are assembled as described for disassembly, but in reverse order.

Insert the silencer (Pos. 44) into the damper head. To fit new piston seals (Pos. 37) and piston seal Orings (Pos. 38), use circlip pliers to carefully bend these inwards, kidney shaped, and insert into the damper head groove (Pos. 41). Then use a round object (diaphragm piston, if necessary) to press the inner bulge of the piston seals (Pos. 37) fully into the groove.

Screw the piston (Pos. 39) into the diaphragm (Pos. 40), hand tight. Insert piston and diaphragm into the damper head. Be sure to align the outer holes of the diaphragm with the holes of the damper head. Connect damper housing (Pos. 36) and damper head (Pos. 41). Insert the through bolts (Pos. 42) and screw on nuts with washers (Pos. 43). Evenly tighten the through bolt nuts crosswise, to the specified torque. Check the pulsation damper for leaks before starting up again.

### Exploded drawing for pulsation damper



### Spare parts list Pulsation damper Housing code P and T

Pos	Description	Material	Qty	DM 10	DM 15	DM 25	DM 40	DM 50	DM 80
36	Damper housing	PE	1	8 10 001 20	8 15 001 20	8 25 001 20	8 40 001 20	8 50 001 20	8 80 001 20
		PTFE	1	8 10 001 23	8 15 001 23	8 25 001 23	8 40 001 23	8 50 001 23	-
37	Piston seal	PE	3	1 08 90 22	1 08 90 22	1 15 85 22	1 25 85 22	1 40 85 22	1 80 85 22
		PTFE-PPS- conducting	3	1 08 90 18	1 08 90 18	1 15 85 18	1 25 85 18	1 40 85 18	1 80 85 18
38	O-ring, Piston seal	NBR	3	1 08 82 10	1 08 82 10	1 15 85 10	1 25 85 10	1 40 85 10	1 80 85 10
39	Piston	PET	1	8 08 40 30	8 08 40 30	8 25 40 30	-	-	-
		AISI 304	1	-	-	-	8 40 40 50	8 50 40 50	8 80 40 50
40	Diaphragm, Code .EP	EPDM	1	-	D1 10 50 08	D1 15 50 08	D1 25 50 08	D1 40 50 08	D1 50 50 08
	Diaphragm, Code .TP	TFM / PTFE	1	D1 08 50 05	D1 10 50 05	D1 15 50 05	D1 25 50 05	D1 40 50 05	D1 50 50 05
	Diaphragm, Code .NP	NBR	1	-	D1 10 50 10	D1 15 50 10	D1 25 50 10	D1 40 50 10	D1 50 50 10
	Diaphragm, Code .LP	PTFE, conducting	1	D1 08 00 24	D1 10 00 24	D1 15 00 24	D1 25 00 24	D1 40 00 24	D1 50 00 24
41	Damper head	PE	1	8 10 203 20	8 10 203 20	8 25 203 20	8 40 203 20	8 50 203 20	8 80 203 20
42	Through bolt	AISI 304	4	8 10 542 50	8 10 542 50	-	-	-	-
			6	-	-	8 25 542 50	8 40 542 50	-	-
			8	-	-	-	-	8 50 542 50	8 80 542 50
43	Nut with washer	AISI 304	4	1 10 145 50	1 10 145 50	-	-	-	-
			12	-	-	1 25 145 50	1 40 145 50	-	-
			16	-	-	-	-	1 50 145 50	1 80 145 50
44	Silencer	PE	1	8 08 99 20	8 08 99 20	8 25 99 20	8 40 99 20	8 50 99 20	8 80 99 20
45	Housing O-ring Code .TP	FEP/FPM	1	8 10 79 04	8 15 79 04	8 25 79 04	8 40 79 04	8 50 79 04	8 80 79 04
	Housing O-ring Code .EP	EPDM		8 10 79 08	8 15 79 08	8 25 79 08	8 40 79 08	8 50 79 08	8 80 79 08
	Housing O-ring Code .NP	NBR	1	8 10 79 10	8 15 79 10	8 25 79 10	8 40 79 10	8 50 79 10	8 80 79 10
46	Sealing plug	PE	4	8 10 058 20	8 10 058 20	-	-	-	-
			12	-	-	8 25 058 20	8 40 058 20	-	-
			16	-	-	-	-	8 50 058 20	8 80 058 20

Pos	Description	Material	Qty	DM 10	DM 15	DM 25	DM 40	DM 50	DM 80
36	Damper Housing	PE conducting	1	8 10 001 21	8 15 001 21	8 25 001 21	8 40 001 21	8 50 001 21	8 80 001 21
		PTFE conducting	1	8 10 001 24	8 15 001 24	8 25 001 24	8 40 001 24	8 50 001 24	-
37	Piston O-ring	PE	3	1 08 90 22	1 08 90 22	1 15 85 22	1 25 85 22	1 40 85 22	1 80 85 22
		PTFE-PPS- conducting	3	1 08 90 18	1 08 90 18	1 15 85 18	1 25 85 18	1 40 85 18	1 80 85 18
38	O-ring, Piston seal	NBR	3	1 08 82 10	1 08 82 10	1 15 85 10	1 25 85 10	1 40 85 10	1 80 85 10
39	Piston	PET	1	8 08 40 30	8 08 40 30	8 25 40 30	-	-	-
		AISI 304	1	-	-	-	8 40 40 50	8 50 40 50	8 80 40 50
40	Diaphragm, Code .ER	EPDM	1	-	D1 10 50 08	D1 15 50 08	D1 25 50 08	D1 40 50 08	D1 50 50 08
	Diaphragm, Code .TR	TFM / PTFE	1	D1 08 50 05	D1 10 50 05	D1 15 50 05	D1 25 50 05	D1 40 50 05	D1 50 50 05
	Diaphragm, Code .NR	NBR	1	-	D1 10 50 10	D1 15 50 10	D1 25 50 10	D1 40 50 10	D1 50 50 10
	Diaphragm, Code .LR	PTFE, conducting	1	D1 08 00 24	D1 10 00 24	D1 15 00 24	D1 25 00 24	D1 40 00 24	D1 50 00 24
41	Damper head	PE conducting	1	8 10 203 21	8 10 203 21	8 25 203 21	8 40 203 21	8 50 203 21	8 80 203 21
42	Through bolt	AISI 304	4	8 10 542 50	8 10 542 50	-	-	-	-
			6	-	-	8 25 542 50	8 40 542 50	-	-
			8	-	-	-	-	8 50 542 50	8 80 542 50
43	Nut with washer	AISI 304	4	1 10 145 50	1 10 145 50	-	-	-	-
			12	-	-	1 25 145 50	1 40 145 50	-	-
			16	-	-	-	-	1 50 145 50	1 80 145 50
44	Silencer	PE	1	8 08 99 20	8 08 99 20	8 25 99 20	8 40 99 20	8 50 99 20	8 80 99 20
45	Housing O-ring Code .TR	FEP/FPM	1	8 10 79 04	8 15 79 04	8 25 79 04	8 40 79 04	8 50 79 04	8 80 79 04
	Housing O-ring Code .ER	EPDM		8 10 79 08	8 15 79 08	8 25 79 08	8 40 79 08	8 50 79 08	8 80 79 08
	Housing O-ring Code .NR	NBR	1	8 10 79 10	8 15 79 10	8 25 79 10	8 40 79 10	8 50 79 10	8 80 79 10
46	Sealing plug	PE	4	8 10 058 20	8 10 058 20	-	-	-	-
			12	-	-	8 25 058 20	8 40 058 20	-	-
			16	-	-	-	-	8 50 058 20	8 80 058 20

### Spare parts list, Pulsation damper Housing code R and Z

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### Options

Apart from the pulsation damper, the options:

- Flange connection
- Diaphragm rupture monitoring

are also available as standard. The product code for these options is appended to the end of the pump code. The codes will be shorter if this option is missing.

Other options are available on request from the dealer or from Dellmeco.

#### Flange connections





This option allows flange connections according to various DIN or ANSI flange types for different pressure stages. The stainless steel threaded bushings (Code F1, F2, F3) for fastening of flanges are located in the block flange. Insert the included O-rings into the flange groove to seal the flanged connection. The flange O-rings are made of EPDM (F1), NBR (F2) and FEP/FKM (F3).

Flanges marked F3.1, F7.1, F8.1 and F9.1 are made of PTFE or electrostatically conducting PTFE. The flange material is adapted to suit the respective material of the pump housing.

Tighten the flange screws crosswise when mounting the flanges. The required torques are given in the table below. Observe the same instructions as for the pump with threaded connections.

Frame size	DM15	DM25	DM40	DM50	DM80
Flange connection torque [Nm]	4	5	12	15	19

Spare pa	arts list	- Flange connections		DM15	DM25	DM40	DM50	DM80
Code	Qty	Description	Material	Art. no.	Art. no.	Art. no.	Art. no.	Art. no.
	2	Flange, PN10, DIN 1092-1	PE	2 15 25 20	2 25 25 20	2 40 25 20	2 50 25 20	2 80 25 20
	2	Flange, PN10, DIN 1092-1	PTFE	2 15 25 23	2 25 25 23	2 40 25 23	2 50 25 23	2 80 25 23
E1	2	Flange, PN10, DIN 1092-1	PE electrostatically conducting	2 15 25 21	2 25 25 21	2 40 25 21	2 50 25 21	2 80 25 21
FI	2	Flange, PN10, DIN 1092-1	PTFE electrostatically conducting	2 15 25 24	2 25 25 24	2 40 25 24	2 50 25 24	2 80 25 24
	8	Threaded bush	Stainless steel	9 15 47 60	9 15 47 60	9 40 47 50	9 40 47 50	9 50 47 50
	2	Flange O-ring	EPDM	2 15 78 08	2 25 78 08	2 40 78 08	2 50 78 08	2 80 78 08
F2	2	Flange O-ring	NBR	2 15 78 10	2 25 78 10	2 40 78 10	2 50 78 10	2 80 78 10
F3/F3.1	2	Flange O-ring	FEP / FKM	2 15 78 04	2 25 78 04	2 40 78 04	2 50 78 04	2 80 78 04
F3	2	Flange, PN10, DIN 1092-1	PE	2 15 125 20	2 25 125 20	2 40 125 20	2 50 125 20	-
	2	Flange, PN10, DIN 1092-1	PE electrostatically conducting	2 15 125 21	2 25 125 21	2 40 125 21	2 50 125 21	-
F3.1	2	Flange, PN10, DIN 1092-1	PTFE	2 15 125 23	2 25 125 23	2 40 125 23	2 50 125 23	-
	2	Flange, PN10, DIN 1092-1	PTFE electrostatically conducting	2 15 125 24	2 25 125 24	2 40 125 24	2 50 125 24	-
F4	2	Pipe flange, PN10	PE	2 15 125 20	2 25 125 20	2 40 125 20	2 50 125 20	-
	2	Pipe flange, PN10	PTFE	2 15 125 23	2 25 125 23	2 40 125 23	2 50 125 23	-
	2	Pipe flange, PN10	PE electrostatically conducting	2 15 125 21	2 25 125 21	2 40 125 21	2 50 125 21	-
	2	Pipe flange, PN10	PTFE electrostatically conducting	2 15 125 24	2 25 125 24	2 40 125 24	2 50 125 24	-
F7	2	Flange to DIN 2576	PE	2 15 225 20	2 25 225 20	2 40 225 20	2 50 225 20	-
F7.1	2	Flange to DIN 2577	PTFE	2 15 225 23	2 25 225 23	2 40 225 23	2 50 225 23	-
F8	2	Flange to ANSI 150 RF-SO	PE	2 15 325 20	2 25 325 20	2 40 325 20	2 50 325 20	-
F8.1	2	Flange to ANSI 150 RF-SO	PTFE	2 15 325 23	2 25 325 23	2 40 325 23	2 50 325 23	-
F9	2	Flange to DIN 2277/2278, PN16	PE	2 15 425 20	2 25 425 20	2 40 425 20	2 50 425 20	-
F9.1	2	Flange to DIN 2277/2278, PN17	PTFE	2 15 425 23	2 25 425 23	2 40 425 23	2 50 425 23	-



#### **Diaphragm rupture monitoring**



In the event of a diaphragm rupture and loss of compressed air, the process medium pressure might force the pumped fluid into the pump's air motor housing and possibly escape through the silencer. This intrusion of fluid may be detected if the diaphragm is monitored for ruptures.

#### Planning

Double diaphragm pumps may be equipped with a diaphragm rupture monitoring system for added protection against leakage of pumped media. Pumped media will in cases of diaphragm rupture enter the pump's air motor housing against the pressure of supply air and escape through the outlet silencer (Pos. 17); a diaphragm rupture monitor will detect such leakage. The capacitive diaphragm rupture sensor will for this purpose be installed in the silencer, where it will register any fluid, regardless of conductivity.

#### ATTENTION

- False alarms are possible. Use only dry compressed air as specified in section "Technical data".
- Diaphragm rupture monitoring is not possible for submersible pump applications.



Diaphragm rupture monitoring is available in two variants; the relevant code will be appended to the pump code; the code will be shorter unless the option is selected:

- DM1 diaphragm sensor (Namur)
- DM2 diaphragm monitoring complete with sensor and isolator

Both versions are suitable for explosive atmospheres.



#### DANGER

Danger of electric shock. Planning only by planners familiar with electrical engineering.



Planners shall specifically define the response to the alarm and communicate this to the operator.

### Parts list

Spare	Spares for diaphragm rupture monitoring			DM08	DM10	DM15	DM25	DM40	DM50	DM80	
Code	Pos.	Qty	Description	Material	Art. no.						
DM1	63	1	Diaphragm rupture sensor NAMUR	diverse	9 15 19 00	9 15 19 00	9 15 19 00	9 15 19 00	9 15 19 00	9 15 19 00	9 15 19 00
DM2	63	1	Diaphragm rupture sensor NAMUR		9 15 19 00	9 15 19 00	9 15 19 00	9 15 19 00	9 15 19 00	9 15 19 00	9 15 19 00
Diviz	-	1	Isolator		9 15 14 00	9 15 14 00	9 15 14 00	9 15 14 00	9 15 14 00	9 15 14 00	9 15 14 00

Please refer to the data sheets supplied for technical data, wiring diagrams and other detail.

#### Assembly

Diaphragm rupture sensors screw into the silencer (Pos. 17). Install the electrical connections.



Danger of electric shock. Fitment only by specialists familiar with electrical systems.

Implementation:

<b>Ex</b>	DM1 connection to an on-site isolator as associated equipment. Observe planning specifications.
	Faulty connection and supply of diaphragm rupture sensors will lead to explosion. Fitment exclusively by persons familiar with electrical explosion protection, especially intrinsic electrical safety.
	Connect DM2 to the supplied isolator. The connection diagram and technical data are located directly on the isolator.

Install the switchgear accordingly in a suitable switchgear cabinet/enclosure as specified by the planner.

### Decommissioning



ATTENTION

Observe local conditions and regulations when disposing of the diaphragm rupture sensor and isolator as electrical devices.



#### Warranty

This product was shipped to the customer only after inspection.

Should a fault occur in normal operation, as defined in these Operating Instructions, within the warranty period, then defective parts will be either repaired free of charge or the item will be replaced.

#### Warranty period

The warranty period shall be 24 months from the date of purchase.

#### **Exclusion of warranty**

The following instances will be excluded, also during the warranty period:

- Problems caused by third-party repairs other than performed by us, our service partners or sellers or by service staff authorised by us.
- Defects caused by product modifications not undertaken by authorised qualified staff.
- Wearing parts: Worn and cracked parts needing to be replaced in the course of normal operation, such as diaphragms, valve seats, balls, seals and O-rings.
- Defects and/or damage caused by transport, relocation or dropping of the product after purchase.
- Defects and/or damages caused by fire, earthquakes, floods or force majeure.
- Defects caused by compressed air with included foreign substances, by oil-bearing air or by excessive humidity or the use of gases or liquids other than the specified compressed air.
- Defects caused by excessively abrasive fluids.
- Defect due to corrosion.



CE

### **EC declaration of conformity**

within the meaning of Machinery Directive 2006/42/EC

We,	Dellmeco GmbH Industriestraße-West 1 D-63808 Haibach
De	clare under our sole responsibility that the product produced in series
Designation:	Pneumatic double diaphragm pump Pneumatic pulsation damper
Series:	DM
Manufacturer:	Dellmeco GmbH Industriestraße-West 1 D-63808 Haibach
Serial number:	See rating plate
to which th	nis declaration refers, meets the requirements of the following guidelines (RL)
	Machine Directive 2006/42/EC
	and the following harmonised standards

#### DIN EN ISO 12100:2013-08

.

Haibach, 01/01/2022

Chills

l.T.S

Alexander Freund CEO

Christian Bathon CEO



### **EU declaration of conformity**

within the meaning of Directive 2014/34/EU for equipment for use in potentially explosive atmospheres

We,	Dellmeco GmbH, Industriestraße-West 1, D-63808 Haibach
Declare und	er our sole responsibility that the product produced in series
Designation:	Pneumatic double diaphragm pump Pneumatic pulsation damper
Series:	DM
Size (nominal width):	08 (1/4"), 10 (3/8"), 15 (1/2"), 25 (1"), 40 (1 1/2"), 50 (2"), 80 (3")
Housing material:	PE, electrically conductive, PTFE electrically conductive
Diaphragm material:	TFM (PTFE), PTFE electrically conductive, TFM/EPDM/PFA, EPDM, NBR, FKM
Valve ball:	PTFE cylinder valve, PTFE, EPDM, NBR, AISI 316, polyurethane, ceramic
Accessories:	Suction pipe (barrel pump), ball lift, flange
Electrical attachments:	all electrical attachments have their own declaration of conformity issued by the supplier.

to which this declaration refers, meets the requirements of the following guidelines (RL)

#### ATEX Directive 2014/34/EU

and the following harmonised standards

#### EN 1127-1:2019-10 EN 80079-36:2016-12 EN 80079-37:2016-12

and other standards and technical specifications used

#### DIN EN ISO 12100:2013-08

.

Marking of the equipment:



II 1/2 G Ex h IIC or IIB/IIC T4...T3 Ga/Gb PTB 18 ATEX 5008 X IECEx PTB 21.0015X

Chill **Christian Bathon** CEO

Haibach, 01/01/2022

Alexander Freund CEO



### **EU declaration of conformity**

within the meaning of Directive 2014/34/EU for equipment for use in potentially explosive atmospheres

We,	Dellmeco GmbH, Industriestraße-West 1, D-63808 Haibach
Declare und	der our sole responsibility that the product produced in series
Designation:	Pneumatic double diaphragm pump Pneumatic pulsation damper
Series:	DM
Size (nominal width):	15 (1/2"), 25 (1"), 40 (1 1/2"), 50 (2")
Housing material:	PE, electrically conductive, PTFE electrically conductive
Diaphragm material:	TFM (PTFE), PTFE electrically conductive, TFM/EPDM/PFA, EPDM, NBR, FKM
Valve ball:	PTFE cylinder valve, PTFE, EPDM, NBR, AISI 316, polyurethane, ceramic
Supplementary operating instructions:	DM plastic DE version supplement cat1/1 11 2020

to which this declaration refers, meets the requirements of the following guidelines (RL)

#### ATEX Directive 2014/34/EU

and the following harmonised standards

#### EN 1127-1:2019-10 EN 80079-36:2016-12 EN 80079-37:2016-12

and other standards and technical specifications used

DIN EN ISO 12100:2013-08

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II 1/1 G Ex h IIC or IIB/IIC T4...T3 Ga/Ga PTB 18 ATEX 5008 X

Marking of the equipment:



Chills Christian Bathon

CEO

Haibach, 01/01/2022

IECEx PTB 21.0015X

Alexander Freund CEO

	IECEx Certificate of Conformity		
INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification System for Explosive Atmospheres for rules and details of the IECEx Scheme visit www.iecex.com			
Certificate No.:	IECEX PTB 21.0015X	Page 1 of 4	Certificate history:
Status:	Current	Issue No: 0	
Date of Issue:	2021-04-30		
Applicant:	Dellmeco GmbH Industriestraße West 1 Haibach 63808 Germany		
Equipment:	Diaphragm pumps		
Optional accessory:			
Type of Protection:	Ex h		
Marking:	Ex h IIC or IIB/IIC T4T3 Ga/Gb, or		
Approved for issue on behalf of the IECEx Certification Body:		Dr. Ing. M. Thedens	
Position: Head of department "Physical-Ignition-Processes"			-Processes"
(for printed version)			
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