

APPLICATIONS

FOOD, PROCESSING,
BEVERAGE, BIOTECH
AND PHARMACEUTICAL



CHEMICAL AND
PETROCHEMICAL



PAINTS, RESINS
INKS AND COATINGS



OIL, GAS AND
AUTOMOTIVE



SURFACE
TREATMENT



CERAMIC
SLIP/GLAZE



SEWAGE
TREATMENT



DRY POWDER
HANDLING



MINING AND
CONSTRUCTION



PAPER
INDUSTRY



PUMP FEATURES

- ▶ Compact, solid design - minimum space required
- ▶ Excellent for abrasive and shear-sensitive materials - low internal velocities mean abrasive liquids do not damage the pump and low shear for fragile applications like chemicals
- ▶ Can be used to pump water, viscous liquids with solids and even powders
- ▶ Sealless - no seals or packing to leak
- ▶ Safe in hazardous areas - air driven and non-sparking
- ▶ Can run dry without damage
- ▶ Self-priming to over 8 meters
- ▶ Variable flow - simply regulate the inlet air supply to adjust from zero to maximum flow
- ▶ Pump virtually stalls if discharge is closed and restarts when discharge is opened (no heat build-up or wear)
- ▶ Expensive systems for pressure relief are not required
- ▶ Composite, long life diaphragms (no discs) are smooth and not interrupted by seals
- ▶ Operates without lubrication
- ▶ Fully groundable
- ▶ Easy maintenance
- ▶ Internationally recognised certification



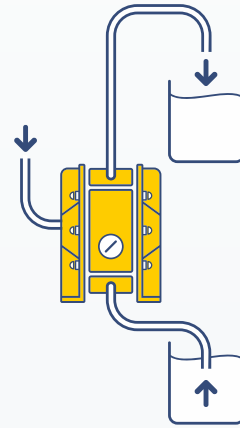
Management
System
ISO 9001:2008

www.tuv.com
ID 9105038609

HOW TO INSTALL DELLMECO PUMPS

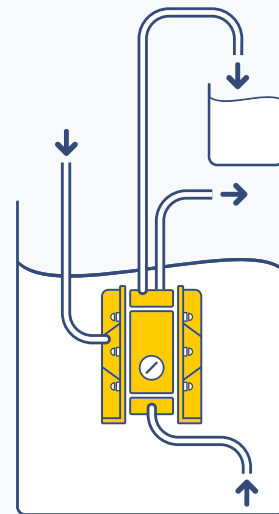
SELF-PRIMING APPLICATION

The suction lift range is up to 8 meters. This will vary according to construction materials and application parameters. All data are based upon pumping water at 20°C.



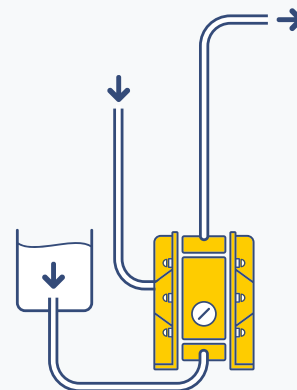
SUBMERGED OPERATION

Our pumps can operate under full submersion. The construction materials must be suitable for the surrounding liquid and the outlet must be positioned above the liquid level.



POSITIVE SUCTION HEAD

As a method for completely emptying holding tanks, clarifiers or similar containers. Optimum inlet pressure should be kept at 0.2-0.3 bar.



PUMP CODE

e.g. DM 15/55 PTS-DM1

<p>DM - Dellmeco Pump 15 - Port dimension, DN 55 - Max capacity l/min at 8 bar</p>	<p>DM 1 - Optional equipment</p> <p>BC1 - Barrier Chamber with sensors (Namura) Bc2 - Barrier Chamber as BC1 with controllers BC3 - Barrier Chamber as Bc2 + ATEX DM1 - Diaphragm Monitoring, Namur – ATEX DM2 - Diaphragm Monitoring with controller F1 - Flange Connection PN 10 with EPDM O-ring F2 - Flange Connection PN 10 with NBR O-ring F3 - Flange Connection PN 10 with FEP/FPM O-ring F4 - Flange Connection JIS B2220 F7 - Flange Connection DIN 2576 PN10 F8 - Flange Connection ANSI 150 RF-SO F9 - Flange Connection PN10/16 DIN 2277/2278 NPT - NPT Thread Connection SC1 - Stroke sensor, ATEX SC2 - SC1 plus stroke counter SC3 - SC1 plus stroke counter - ATEX SC5 - Stroke counting pneumatical with pressure transmitter SC6 - SC5 plus stroke counter BF1 - Back flushing system, hand operated, EPDM seals BF2 - Back flushing system, hand operated, PTFE seals BF3 - Back flushing system, hand operated, FPM seals BF4 - Back flushing system, pneumatical, EPDM seals BF5 - Back flushing system, pneumatical, PTFE seals AF1, AF2 - Air filter, regulator, valve, nipple, connector D - Drum pump HJ - Heating/Cooling Jacket HP - High Pressure MV - pump with solenoid valve P - Powder pump Ra - Additional polishing to Ra= 0,5 µm (Hygienic series only) S - Sleeve with split connections T - Trolley CLEAN - Class 100 Clean-Room assembly for special pump applications (to meet added purity requirements)</p>
<p>P - Housing material:</p> <p>A - Aluminium B - Aluminium coated with PTFE C - Cast Iron H - AISI 316L Hygienic P - PE (Polyethylene) R - PE conductive S - AISI 316 Industrial T - PTFE (Polytetrafluoroethylene) Z - PTFE conductive</p>	
<p>T - Diaphragm material (all conductive):</p> <p>E - EPDM F - TFM/PFA N - NBR T - TFM/PTFE</p>	
<p>S - Material and type of valve:</p> <p>C - Ceramic, ball valve E - EPDM, ball valve F - PTFE, cylinder valve N - NBR, ball valve P - PE, cylinder valve S - AISI 316, ball valve T - PTFE, ball valve U - Polyurethane, ball valve</p>	

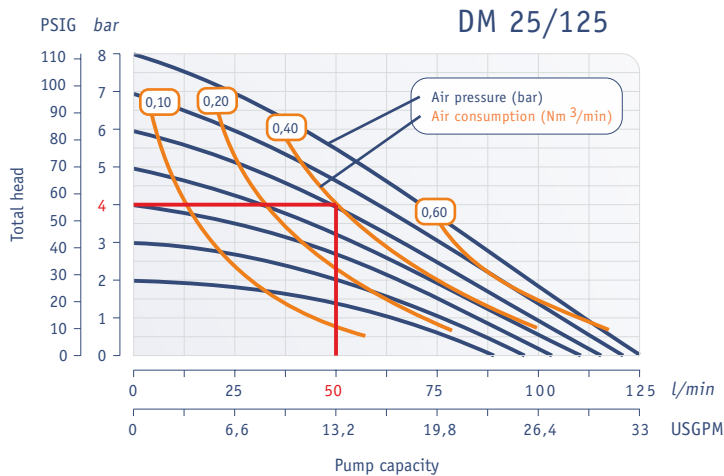
MATERIALS PROFILE

DIAPHRAGMS	OPERATING TEMPERATURES MIN MAX	WETTED PARTS
<p>NBR General purpose, shows good solvent, oil, water, and hydraulic fluid resistance. Should not be used with highly polar solvents like acetone and ketone (MEK), ozone, chlorinated hydrocarbons or nitro-hydrocarbons</p> <p>EPDM Shows very good water and chemical resistance. However, poor resistance to oil and solvents and medium resistance to ketones and alcohols.</p> <p>Virgin PTFE. Chemically inert, virtually impervious. Very few chemicals are known to react with PTFE e.g. molten alkali metals, gaseous fluorine and some fluoro-chemicals readily liberate free fluorine at elevated temperatures.</p>	<p>-30°C +90°C</p> <p>-40°C +120°C</p> <p>-37°C +120°C</p>	<p>PE (polyethylene) is very tough and resistant to wear, its water absorption capacity is low and it displays good general resistance to chemicals. Only such strong oxidants such as nitric acid, oleum and halogens can damage PE.</p> <p>PE competes with PP (polypropylene) and both are used in manufacturing pumps. They are thermally and chemically similar. However, the mechanical properties are different. Trials show that the abrasive resistance of PE is 7 times higher than that of PP and even 1.6 times higher than that of steel. It is also more resistant than, for example, cast iron or aluminum. This high resistance to abrasion plays a vital role in many applications (e.g. pickling baths in the electroplating industry, printing inks, lime slurry for wet desulphurisation, ceramics and glazing).</p> <p>PTFE (polytetrafluoroethylene) is a thermoplastic polymer. It has a smooth surface, very low friction coefficient and can be used over a wide range of temperatures. It also displays virtually universal resistance to chemicals. However, pure PTFE has a low resistance to abrasives and tends to 'cold-flow'.</p>

The temperature ranges given above are the limits for which these materials can be safely used. Both temperature and working pressure affects the longevity of AODD components. 'Preventive maintenance planning' (PMP) will increase the working lifespan at the extreme limits.

HOW TO SELECT THE PUMP SIZE

- 1) Enter Flow (l/min) and Head
(example: 50 l/min at 4bar)
- 2) Read off the approximate energy requirements in Volume and Pressure
(example: 0.40 Nm³/min at 6bar)

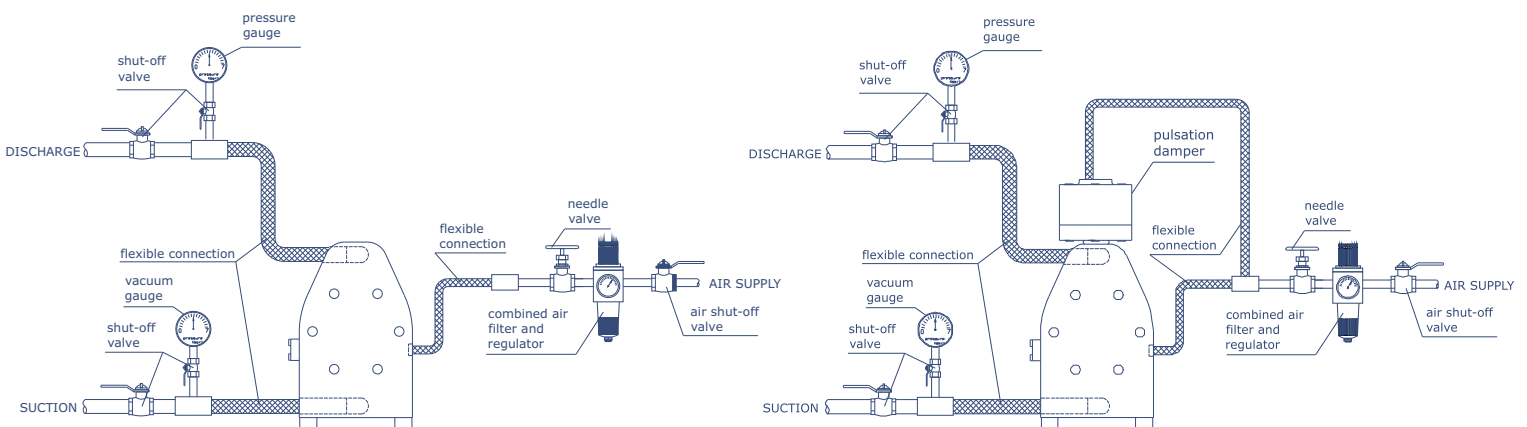


1" Pump - Performance Curve
Performance based on water at 20°C

RECOMMENDED INSTALLATION GUIDELINES

To reduce piping and pump connection stresses, we recommend flexible connections on both the inlet and outlet pipes and air inlet connections.

For best results DELLMECO recommends installing the pulsation dampener on the discharge side of the pump.



More detailed installation information is available upon request by our DELLMECO Technical Team

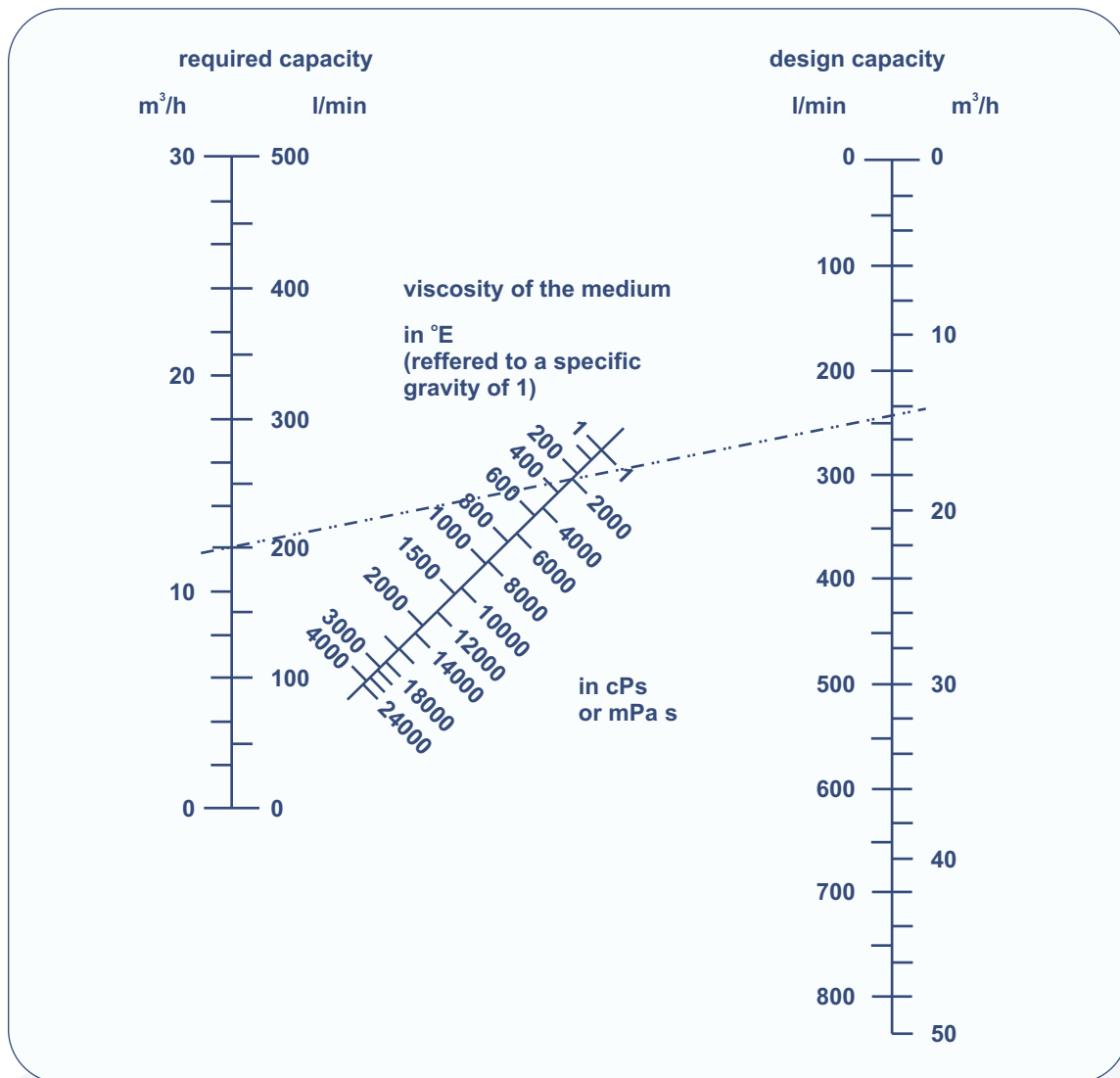
REDUCTION OF FLOW RATE

The viscosity of the media affects pump capacity.

The capacities specified in the pump performance charts generally refer to water (1cPs).

The volume must be reduced accordingly when pumping media with higher viscosities. The design capacity can be read directly from the graph below and the corresponding pump size selected.

The example shown here is based upon a required capacity of 200 l/min with a product viscosity of 2000 cPs. The dotted line intersects the design capacity at 248 l/min.

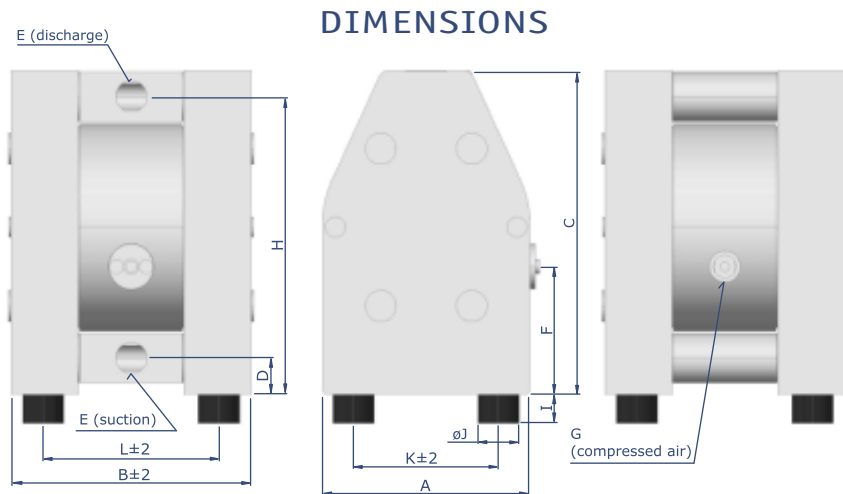


POLYETHYLENE AND PTFE PUMPS



1. Designed to succeed
 - temperatures up to 120°C
 - pressure up to 14bar
 - lubrication-free operation
 - low air consumption
 - abrasion resistance (PE, PE conductive)
2. Flexible installation
 - BSP as standard
 - PN10, PN16, ANSI, NPT, JIS, RJT, split manifold configurations available
 - connections may rotate 180°
3. Solid, compact and strong
 - housing machined from solid PE, PTFE as well as conductive PE and PTFE
 - withstands aggressive chemicals
 - gentle pumping action
 - viscous media transfer
4. Perfect diaphragm
 - completely smooth liquid-side surface (no holes)
 - no metal in contact with the media
 - materials match the application

POLYETHYLENE AND PTFE MATERIALS



DIMENSIONS	A	B	C	D	E	F	G	H	I	øJ	K	L
DM 08/10	70	113	120	15	G 1/4"	58	R 1/8"	107	10	15	50	86
DM 10/25	105	128	164	18	G 3/8"	84	R 1/8"	150	10	15	75	93
DM 15/55	153	177	235	25	G 1/2"	87	R 1/4"	217	18	30	112	136
DM 25/125	200	232	312	35	G 1"	123	R 1/4"	287	28	40	140	170
DM 40/315	270	312	426	42	G 1 1/2"	109	R 1/2"	388	30	60	190	227
DM 50/565	350	385	540	45	G 2"	158	R 1/2"	485	30	60	280	282
DM 80/850	480	580	800	100	G 3"	388	R 3/4"	690	40	75	395	495

TECHNICAL DATA

	08/10	10/25	15/55	25/125	40/315	50/565	80/850
Max capacity (l/min)	10	25	55	125	315	565	850
Max pressure (bar)	8,0						
Nominal port size	1/4"	3/8"	1/2"	1"	1 1/2"	2"	3"
Air connection	R 1/8"	R 1/8"	R 1/4"	R 1/4"	R 1/2"	R 1/2"	R 3/4"
Suction lift dry (mWC)	0.5 / 1.5*	2.0	3.0	4.0	4.0	5.0	5.0
Suction lift wet (mWC)	8.0						
Max diameter solids (mm)	2	3	4	7	10	12	15
Temperature limits - PE (°C)	70	70	70	70	70	70	70
Temperature limits - PTFE (°C)	110	110	120	120	120	120	-
Weight - PE (kg)	0.9	1.4	5	9	23	42	170
Weight - PTFE (kg)	1.4	2.4	7	16	43	87	-
Material of pump housing	PE, PTFE						PE
Diaphragm options	TFM/PTFE	NBR, EPDM or TFM/PTFE					
Valve balls	PTFE, AISI 316	NBR, EPDM, PTFE, AISI 316, PU					NBR, EPDM, PTFE
Rod valves	PTFE		PE or PTFE				-
O-rings	NBR, EPDM, FEP/FPM, PTFE+EPDM or PTFE+FPM						

* 0.5m for ball valves, 1.5m for cylinder valves

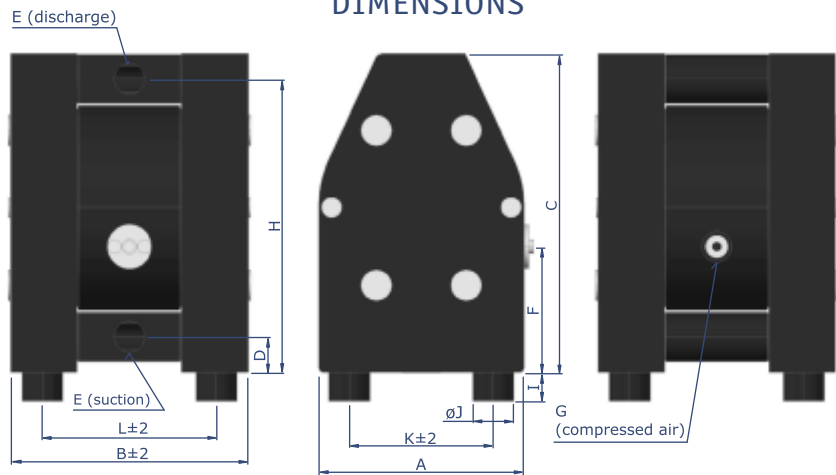
WHERE ATEX IS REQUIRED



The plastic pumps can be manufactured from conductive PE and/or PTFE to enable electrical grounding. This eliminates the build-up of static electricity and allows the safe transfer of solvents, alcohols and other volatile liquids. ATEX is also available for aluminium, cast iron and AISI 316 pumps.

ATEX **CE** **Ex** **II 2GD TX**

DIMENSIONS



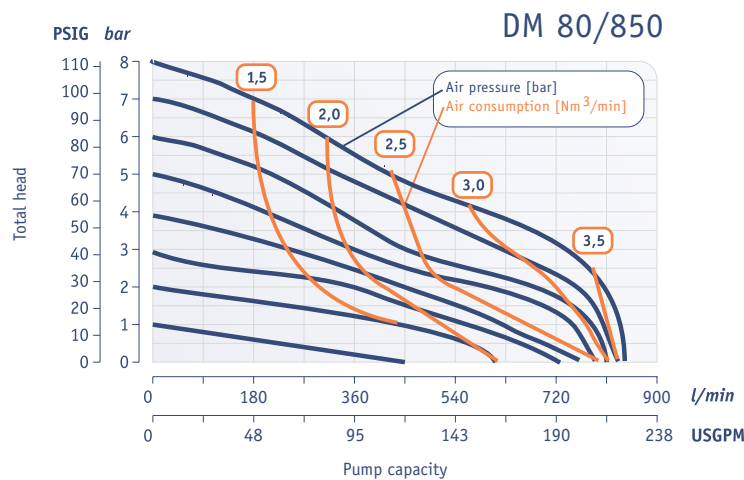
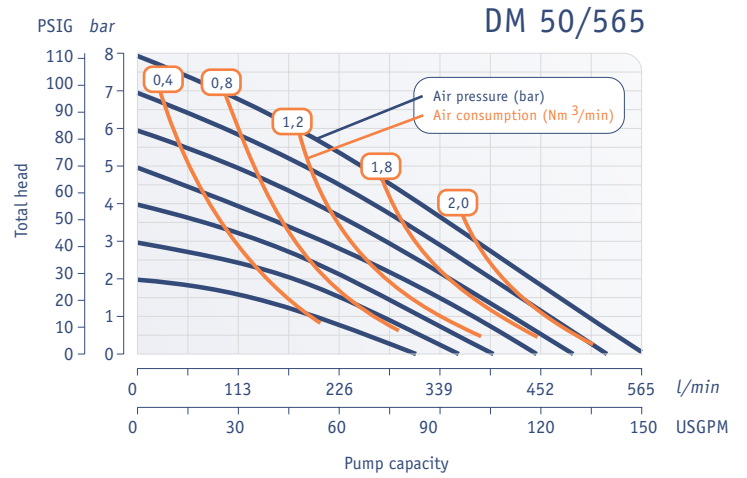
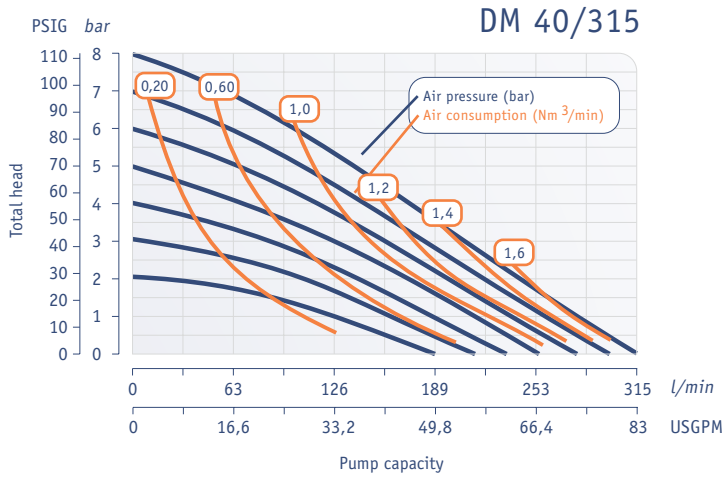
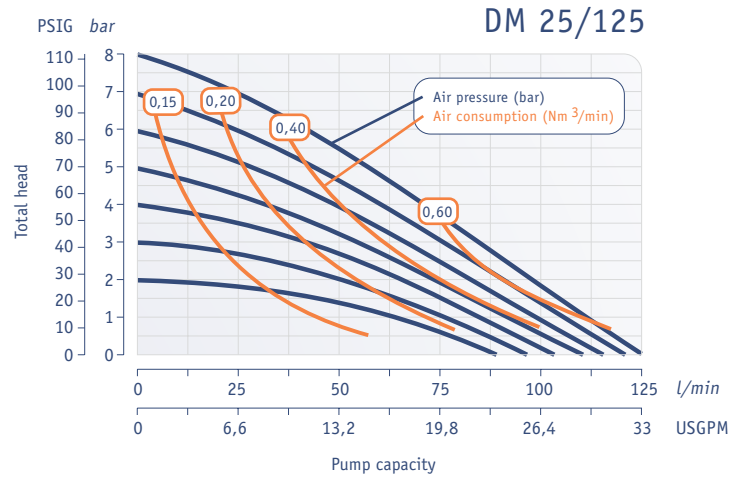
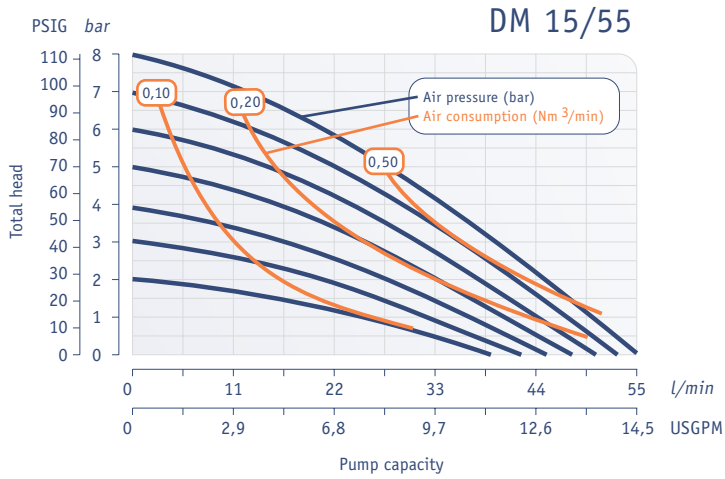
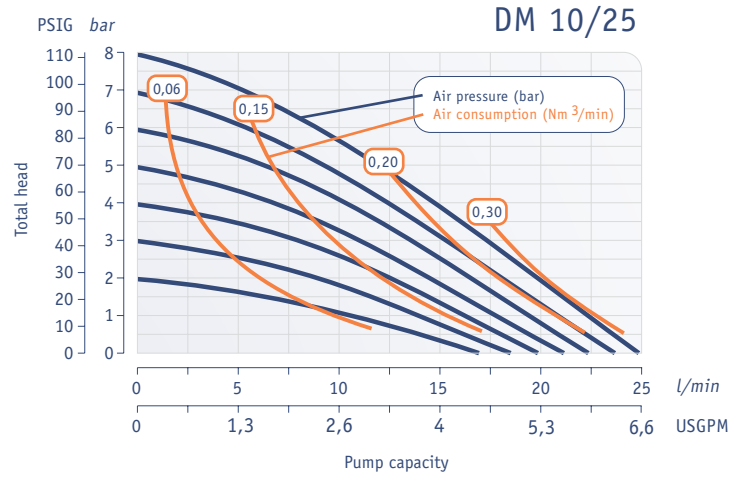
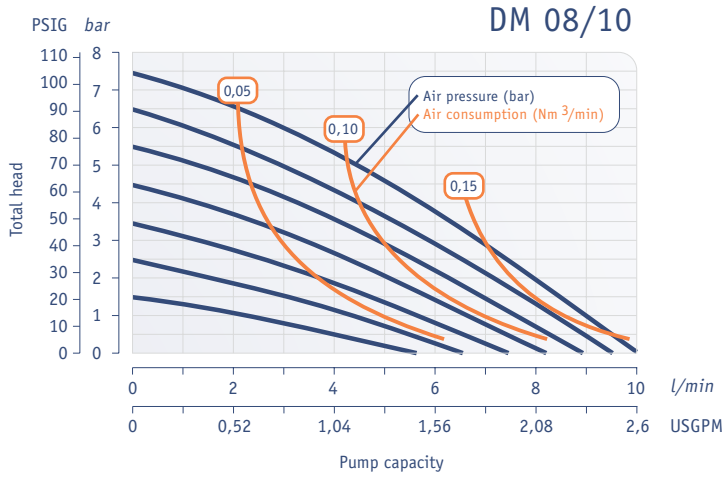
DIMENSIONS	A	B	C	D	E	F	G	H	I	øJ	K	L
DM 08/10	70	113	120	15	G 1/4"	58	R 1/8"	107	10	15	50	86
DM 10/25	105	128	164	18	G 3/8"	84	R 1/8"	150	10	15	75	93
DM 15/55	153	177	235	25	G 1/2"	87	R 1/4"	217	18	30	112	136
DM 25/125	200	232	312	35	G 1"	123	R 1/4"	287	28	40	140	170
DM 40/315	270	312	426	42	G 1 1/2"	109	R 1/2"	388	30	60	190	227
DM 50/565	350	385	540	45	G 2"	158	R 1/2"	485	30	60	280	282
DM 80/850	480	580	800	100	G 3"	388	R 3/4"	690	40	75	395	495

ATEX pumps are designed to comply with the regulations for pneumatic diaphragm pumps handling flammable liquids. All construction materials are with approved NBR, EPDM or PTFE/TFM

TECHNICAL DATA

	08/10	10/25	15/55	25/125	40/315	50/565	80/850
Max capacity (l/min)	10	25	55	125	315	565	850
Max pressure (bar)	8,0						
Nominal port size	1/4"	3/8"	1/2"	1"	1 1/2"	2"	3"
Air connection	R 1/8"	R 1/8"	R 1/4"	R 1/4"	R 1/2"	R 1/2"	R 3/4"
Suction lift dry (mWC)	0.5 / 1.5*	2.0	3.0	4.0	4.0	5.0	5.0
Suction lift wet (mWC)	8.0						
Max diameter solids (mm)	2	3	4	7	10	12	15
Temperature limits - PE (°C)	70	70	70	70	70	70	70
Temperature limits - PTFE (°C)	110	110	120	120	120	120	-
Weight- PE (kg)	0.9	1.4	5	9	23	42	170
Weight - PTFE (kg)	1.4	2.4	7	16	43	87	-
Material of pump housing	PE conductive, PTFE conductive						PE conductive
Diaphragm options	TFM/PTFE	NBR, EPDM or TFM/PTFE					
Valve balls	PTFE, AISI 316	NBR, EPDM, PTFE, AISI 316, PU					NBR, EPDM, PTFE
Rod valves	PTFE		PE or PTFE				-
O-rings	NBR, EPDM, FEP/FPM, PTFE conductive +EPDM or PTFE conductive +FPM						

* 0.5m for ball valves, 1.5m for cylinder valves



PULSATION DAMPENERS

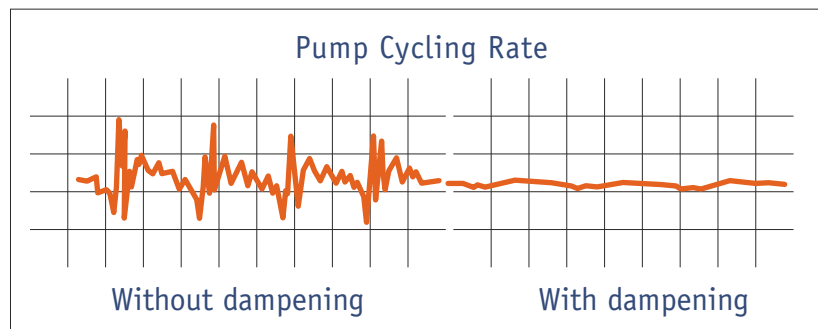
In general, a pulsation dampener is used when one or more of the following criteria are required:

- to prevent potential pipe vibration;
- to reduce the load on the pump;
- to minimise or eliminate pulsations for the benefit of downstream instrumentation;
- to minimise or eliminate pulsations which may interfere with the pumping process.

It works by means of an air cushion created by the pressure of the media pushing the diaphragm upward. This allows air to enter the chamber keeping the diaphragm center at mid-stroke.

During operations the diaphragm flexes thus absorbing and equalising the pressure surge.

Properly sized and installed these dampeners provide virtually surge-free discharge flow.



- Simple installation
- Virtually surge-free flows
- Less vibration and noise
- Stable pressures
- Automatically self-charging and self-venting
- Available in a variety of sizes and materials

PULSATION DAMPENER CODE

DM 15 PTP DM - Dellmeco Pulsation Dampener 15 - Size, nominal connection size	DM 15 PTP P - Dampener housing material	DM 15 PTP T - Diaphragm material (all conductive)	DM 15 PTP P - Dampener head material
08 - 3/8"; 10, 15 - 1/2" 20 - 3/4"; 25 - 1"; 40 - 1 1/2"; 50 - 2"; 65 - 2 1/2"; 80 - 3"	A - Aluminium H - AISI 316L Hygienic P - PE R - PE conductive S - AISI 316 Industrial T - PTFE Z - PTFE conductive	E - EPDM F - TFM/PFA N - NBR T - TFM/PTFE	P - PE R - PE conductive
Air supply connection:		DM 08, DM 10: R 1/8" DM 15, DM 20, DM 25: R 1/8" DM 40, DM 50, DM 65: R 1/4" DM 80: R 1/2"	
Max. operating pressure:		8bar (higher on demand)	
Max. operating temperature:		PE dampener housing 70 °C PTFE dampener housing 120 °C Metal dampener housing 120 °C	

Plastic dampeners

For inflammable liquids as well as applications in explosion protected zones, only dampeners made from conductive polymer materials (code Z and R) may be used. It is not necessary to electrically ground the dampener separately as it is conductive and the pump itself will be grounded.

In general, the pump and dampener are delivered already mounted. However, if the customer wishes they can be separately packed. The dampener then has to be screwed into the thread at the top of the pump discharge port.

Metal dampeners

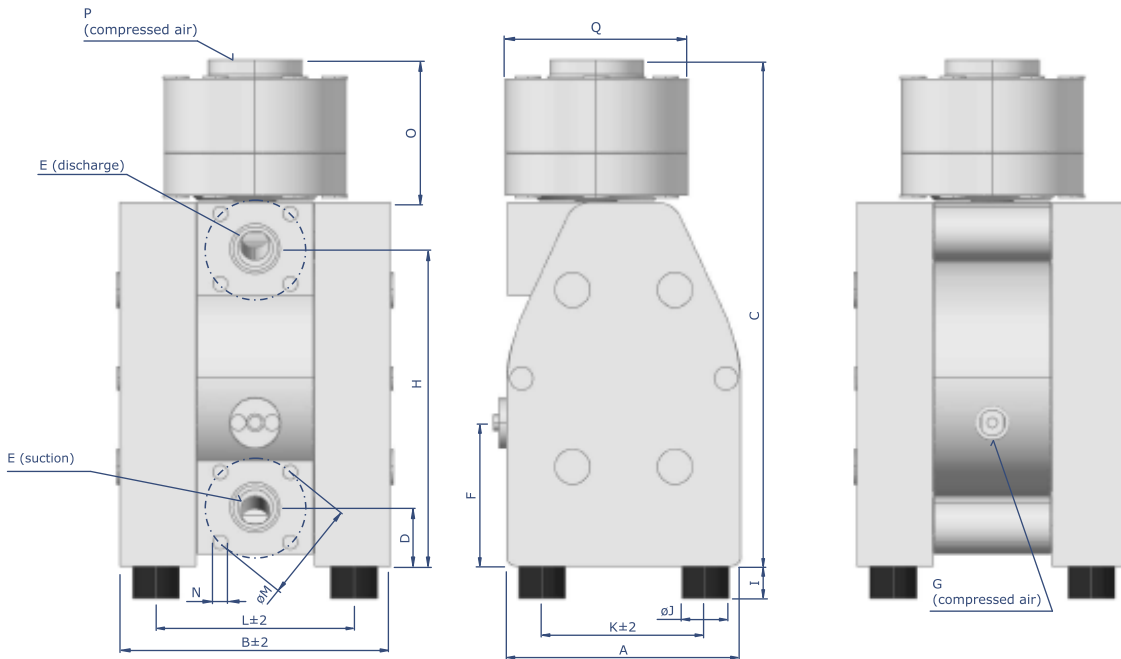
Also for inflammable liquids as well as applications in explosion protected zones but where only dampeners made from PE conductive (code R) may be used.

In general, both the pump and dampener are delivered separately. It is then necessary to electrically ground the dampener as in this case it is not connected to the pump.

PLASTIC DAMPENERS INTEGRATED WITH THE PUMP



DIMENSIONS



DIMENSIONS	A	B	C	D	E	F	G	H	I	ØJ	K	L	M	N	O	P	Q
DM 08/10	70	111	195	15	G 1/4"	58	R 1/8"	107	10	15	50	86	-	-	75	R 1/8"	76
DM 10/25	105	128	249	18	G 3/8"	84	R 1/8"	150	10	15	75	93	-	-	85	R 1/8"	110
DM 15/55	153	177	320	40	G 1/2"	87	R 1/4"	202	18	30	112	136	65	M12	85	R 1/8"	110
DM 25/125	200	232	432	50	G 1"	123	R 1/4"	272	28	40	140	170	85	M12	120	R 1/8"	156
DM 40/315	270	312	579	57	G 1 1/2"	109	R 1/2"	373	30	60	190	227	110	M16	153	R 1/4"	204
DM 50/565	350	385	726	52	G 2"	158	R 1/2"	478	30	60	280	282	125	M16	186	R 1/4"	273
DM 80/850	480	580	1061	100	G 3"	388	R 3/4"	690	40	75	395	495	160	M16	250	R 1/2"	365

CONNECTION TYPES - PLASTIC SERIES



STANDARD BSP

This is the standard connection for all plastic and metal pumps.



S - SPLIT CONNECTIONS

All pump models can be fitted with split connections (code S). The pump can be converted from a standard double-action air-driven diaphragm pump into a unit with two single chambers. The suction and discharge connections are replaced by a split sleeve with a separate suction and discharge for both chambers. Both chambers are independent and by having them with the same drive it means there can be two media streams in a 1:1 ratio.



FLANGE CONNECTIONS PN10

This option offers the possibility to use flange connectors according to DIN/PN 10. The inlet/outlet flange connections are by thread bushings made of stainless steel. The attached O-rings have to be inserted into the grooves of the manifolds to improve sealing before connecting the pump.

- F1 - Flange connection PN 10 EPDM
- F2 - Flange connection PN 10 NBR
- F3 - Flange connection PN 10 FEP/FPM



OTHER TYPES OF FLANGE CONNECTIONS

- F4 - JIS B2220
- F7 - PN10 DIN 2576
- F8 - ANSI 150 RF-SO
- F9 - PN10/16 DIN 2277/2278

Additional connection types are available upon request

DIAPHRAGM MONITORS



Although DELLMECO diaphragms are designed for optimum service and maximum lifespan, regular maintenance must be included as part of the service programme. This is called 'preventive maintenance planning' (PMP). However, for increased security in sensitive applications, any pump failure from, for example, the media leaking into the pump central housing can be simply and effectively prevented by installing a DELLMECO diaphragm monitoring system.

A capacitive diaphragm sensor is mounted in the pump muffler which monitors any media in proximity to the sensor, no matter whether this media is conductive or not. Thus, immediate remedial actions can be taken.

The diaphragm monitoring system is available in two options:

DM1: Diaphragm sensor (NAMUR type) also for explosion-proof zones

Dm2 : Diaphragm monitoring system complete with sensor and controller(s)

BACK-FLUSHING

OPTIONS BF1, BF2, BF3, BF4, BF5



The DELLMECO pump can be completely emptied (flushed) either manually or pneumatically without dismantling or moving the unit. It consists of a bypass in the pump side housing which can be activated manually (code BF1, BF2, BF3) or pneumatically (code BF4, BF5). In the manual system the pump should be kept in operation and the valves opened (BF1, BF2) by approx. 10 mm. Attention is needed to ensure the valves are not blocked. The pump is then slowed down by decreasing the air inlet pressure and finally stopped. The side housing O-rings can be made of EPDM (BF1, BF4), PTFE (BF2, BF5) or FPM (BF3).



The pneumatic back-flushing system (code BF4 and BF5) requires a minimum air pressure of 3bar. By attaching a 4-2-way valve (available as an additional option), the back-flushing can be activated automatically when the media flow is stopped.



A metal pump with ball lift system (BF2 option) is when the valves are opened manually by turning the steel blocking pins situated on both side housings of the pump. The pump can then be completely drained on the suction side.

PNEUMIXERS

How it functions

The Pneumixer works both as a pump and as a mixer. It uses the container to both mix and transfer the media and it fits securely yet simply into the hole used for filling. With this ingenious system there is no need for rolling, shaking or pumping to mix the media. Valuable time and costs are thus saved whilst waste and mess are avoided.

Available in stainless steel AISI 316L.

Mixing mode

The discharge valve is closed and the re-circulation valve opened to allow the media to mix in the container.

Transfer mode

To both mix and pump the media out of the container the discharge valve is opened and the re-circulation valve partially opened.

The length of pipe can be ordered to fit any container size



DRUM PUMPS

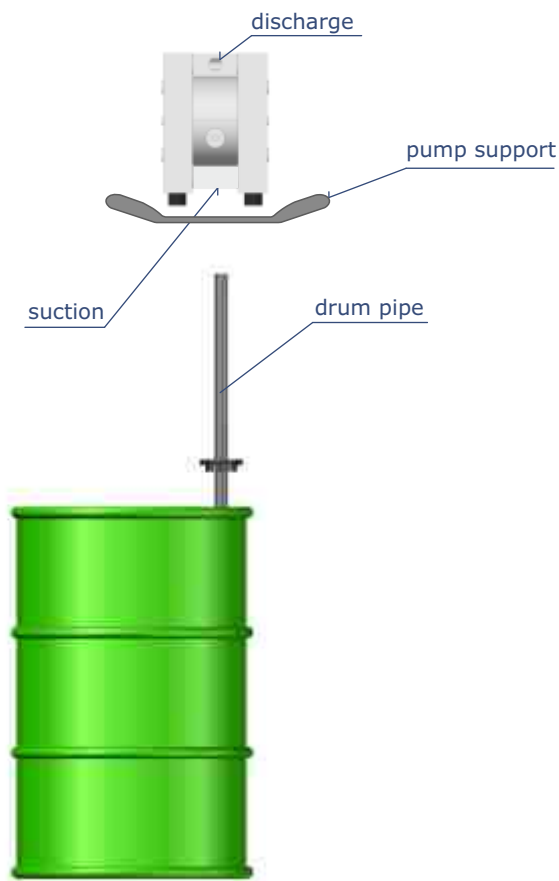


DELLMECO drum pumps are available in both standard and conductive PE, PTFE, aluminium and AISI 316L for optimum media compatibility. The sizes range up to 1" and they can work with media of different viscosities.

Converting 3/8", 1/2", 3/4" or 1" plastic or metal pumps to a drum or rail application is easy. The adaptor kits are constructed of chemically resistant materials to handle any job. And the drum pipe assembly also comes complete with all the hardware needed. Simply attach the adaptor to the drum and then fix the pump with the pipe connected into the drum.

The standard length of drum pipe is 1.0m or 1.2m but orders can be made to fit any container size.

INSTALLATION



Drum pipe material:

- Polypropylene
- Aluminium
- AISI 316

PUMP WITH SOLENOID VALVE - MV OPTION



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

The pump is fitted to a 2-position, 4-way solenoid valve. When the solenoid is unpowered, one chamber within the pump is pressurised with air, whilst the opposite chamber is discharged. When electric power is applied, the solenoid re-pressurises the discharged chamber and the opposite chamber is then discharged.

By alternatively turned on and off, the solenoid enables the unit to run like a standard DELLMECO pump and no lubrication is needed.

This option requires 24 V DC to operate.

Pumps with the MV option are non-submersible.

DMF SERIES DIAPHRAGM PUMP



The DMF series are pneumatic diaphragm pumps with integrated pulsation dampener and two separate delivery chambers.

The media is pumped via an active pulsation dampener to the 1st delivery chamber. The dampener needs a minimum back pressure of 1bar and becomes more efficient as the back pressure increases.

The second delivery chamber can be used, if need be, to discharge surplus media back to the supply container. This re-circulation enables the complete blending of the media constituents and also avoids sedimentation.

The DMF pump series with PE conductive housing material may be used for inflammable liquids as well as for applications in explosion-proof zones. This is important for example in the ink and glue industries.

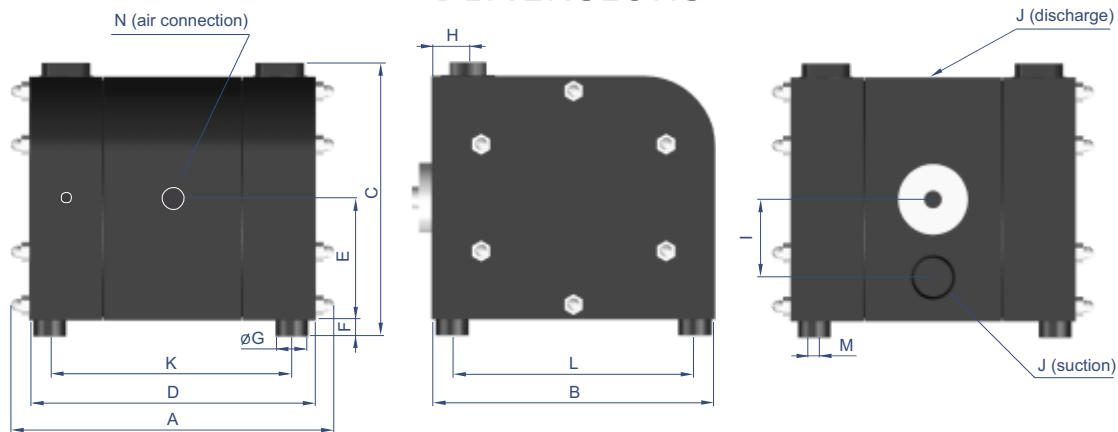
DMCX SERIES DIAPHRAGM PUMPS



FEATURES

- pneumatic diaphragm pumps for pumping small to medium volumes of media
- machined from solid material on highly advanced Computer Numerical Control (CNC) Machining and Turning Centers
- driven by compressed air (no need for electric motors or electrical connections)
- 4 pump sizes with media capacities from 10 -130 l/min (water at 20°C)
- air control system without lubrication or 'dead' spot
- diaphragms made of EPDM, NBR or PTFE/EPDM composite
- ball or cylinder valves available
- self-priming and protection from running dry
- easy preventive maintenance
- made of conductive PE (with ATEX conformity)

DIMENSIONS



mm	A	B	C	D	E	F	ØG	H	I	J	K	L	M	N
DMCX 10	137	86	96	113	41	8	15	15	27	NPT 3/8"	93	66	M4	R 1/4"
DMCX 20	155	124	123	131	53	10	20	19	34	NPT 1/2"	105	115	M6	R 1/4"
DMCX 50	205	175	168	175	75	10	20	22	48	NPT 3/4"	150	165	M6	R 1/4"
DMCX 130	269	240	225	225	100	10	20	33	63	NPT 1 1/4"	205	215	M6	R 1/4"

DMCX PUMP CODE

DMCX 20 RTP DMCX - Dellmecc AODD Pump, CX Series 20 - Size, nominal connection (NPT):	DMCX 20 RTP R - Housing material:	DMCX 20 RTP T - Diaphragm material:	DMCX 20 RTP P - Material and type of valves:
10 - 3/8" 20 - 1/2" 50 - 3/4" 130 - 1 1/4";	R - PE conductive	E - EPDM N - NBR T - TFM/PTFE	E - ball valve, EPDM F - cylinder valve, PTFE N - ball valve, NBR P - cylinder valve, PE S - ball valve, AISI 316 T - ball valve, PTFE