

Membrane Pumps  
Solids Handling Pumps  
High Pressure Pumps  
Marine Pumps

# ABEL EM

Electromechanical Membrane Pumps  
Energy Saving PD Performance  
for Process and Transfer



**Versatility, Efficiency, and Dependability**

**ABEL**<sup>®</sup>  
Pump Technology

## ABEL EM

Capacity ranges up to 120 m<sup>3</sup>/h, up to 0.8 MPa

### Specialisation creates Know-How

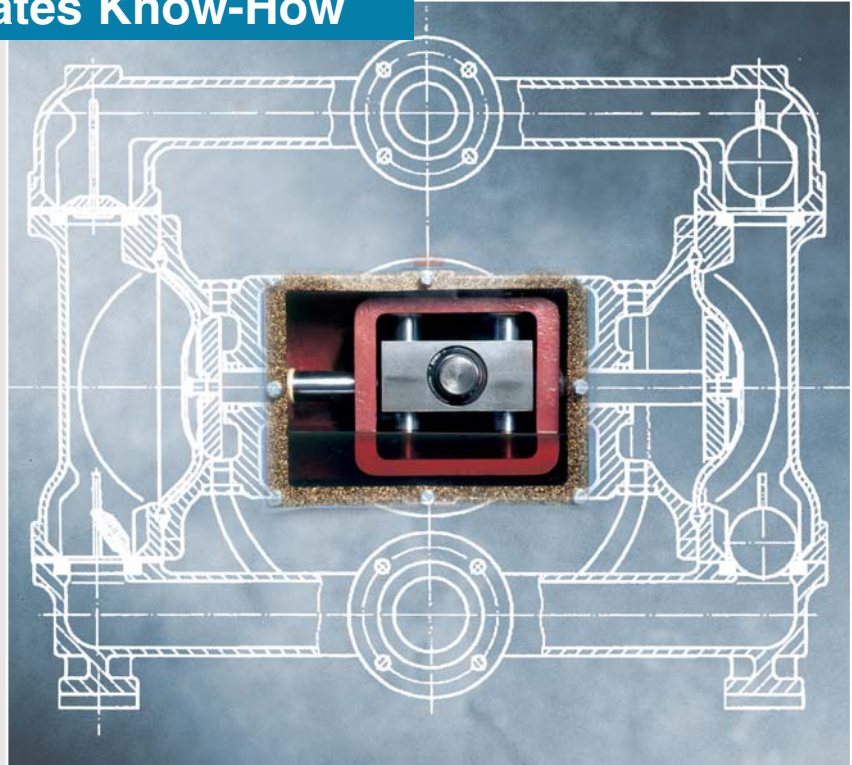
The EM Series pump technology of ABEL is unique. It is a field proven replacement, and first choice alternative serving a diverse range of critical customer needs in process and transfer applications.

The EM Series pumps incorporate the sealless, dry-running, low shear, versatile fluid handling capability of traditional diaphragm pump design with added value including:

- ▲ Highly efficient electric drive
- ▲ Constant flow rates against variable pressure and viscosity
- ▲ Slower stroke rates for comparable volume yield lower operating costs
- ▲ Up to 6" Port size for maximum flow rate
- ▲ Fully enclosed membranes - with no material exposure
- ▲ Optional VFD flow control for true process performance
- ▲ Optional pulsation dampeners and other accessories



**Pumps of EM series are available with ATEX allowance.**



The EM Series is also a viable alternative for expensive, sometimes space-consuming pump technologies for which the continuing cycle of maintenance costs can far exceed the original cost of the pump.

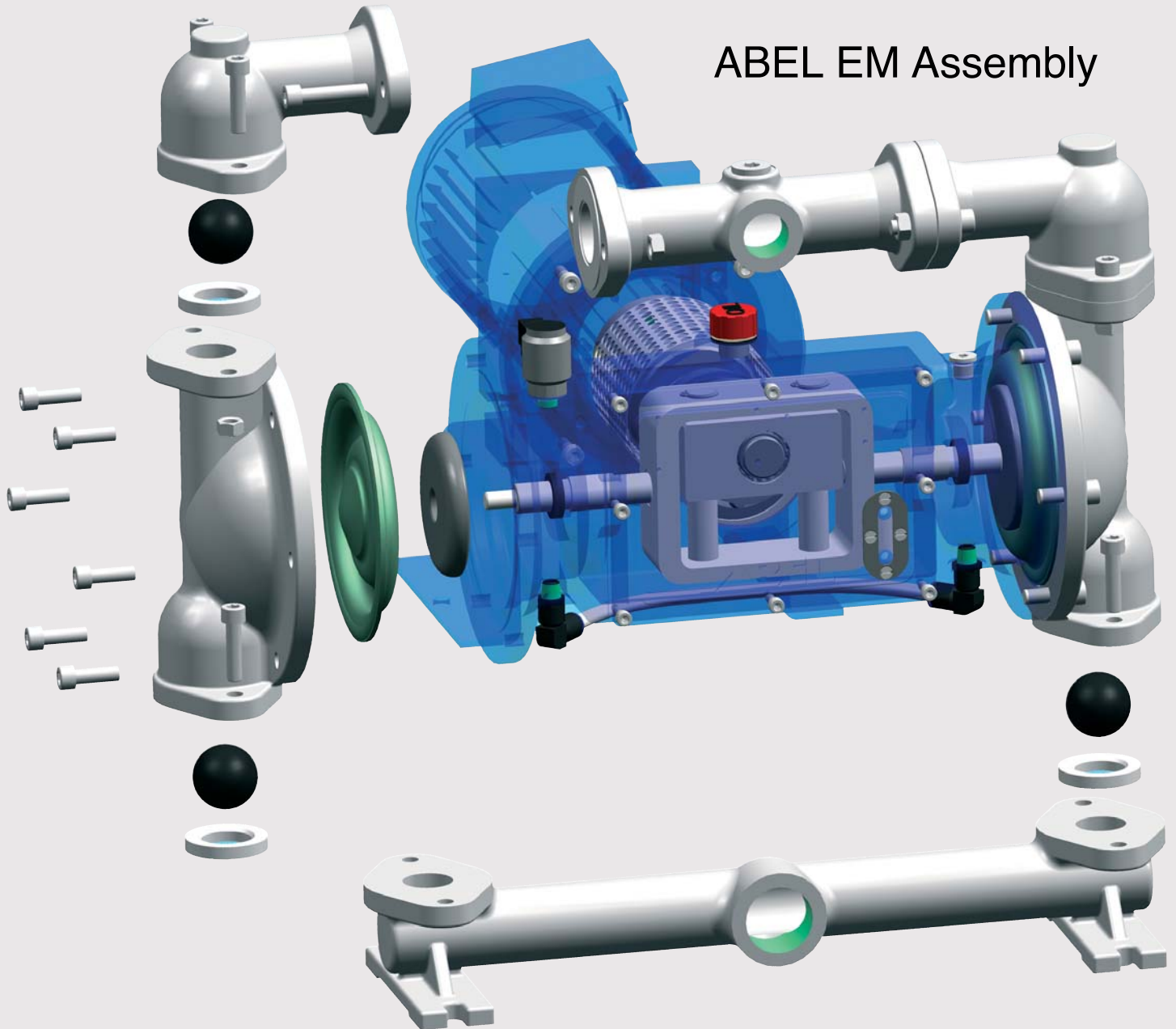
Viscous, solids-containing, aggressive, and/or corrosive fluids have been less a source of concern for those who commonly return to ABEL for their challenging applications. One reason is ABEL's "Know-How" as much as product reliability.

Powder transfer with the EM Series is also available to simplify transfer of powders that "fluidize."

#### The advantages of ABEL EM

- Smooth product transfer
- Low operating costs through high efficiency
- Almost constant flow rate across the whole pressure range; i.e. maximum capacity even with changing viscosities
- Comfortable operation, because self-priming
- Variable flow rate from 0 to 100%
- Long life through robust design
- Flexible application through variable materials
- High reliability because safe against dry running

## ABEL EM Assembly



### Design

The EM pump series are all electromechanical double-acting membrane (diaphragm) pumps of robust process construction. The integral metal core of each membrane is completely covered by the membrane material on its fluid pumping side, minimizing the possibility of fluid contamination.

The smooth mechanically controlled linear drive of the membranes ensures low shear, seal-less,

positive displacement performance with controlled transfer rates through variable viscosity and system pressure changes.

Variable flow control is realized through a variable frequency drive (VFD) as a stand-alone device or controlled by customer system controls. Alternatively mechanical speed devices can provide for a range of variable flow.

Maximum discharge pressure can be limited by an external electrical

control device, such as, a pressure switch or contact making pressure gauge when required for additional protection.

Optional discharge dampeners and suction stabilizers are available to minimize flow pulsations under variable or demanding system conditions that would otherwise decrease performance and/or operating life of the equipment.

This dampeners are also available in self-adjusting "intelligent" executive.

## ABEL EM - Two Versions. One idea.

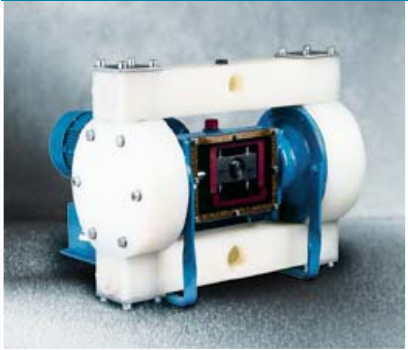
### How used?

- As process and transfer pumps for:
  - sludge
  - slurries
  - corrosives
  - powders
- For feeding applications of
  - filter press
  - centrifuge
- Metering
- Oil-water separation.

### ABEL EM Metal



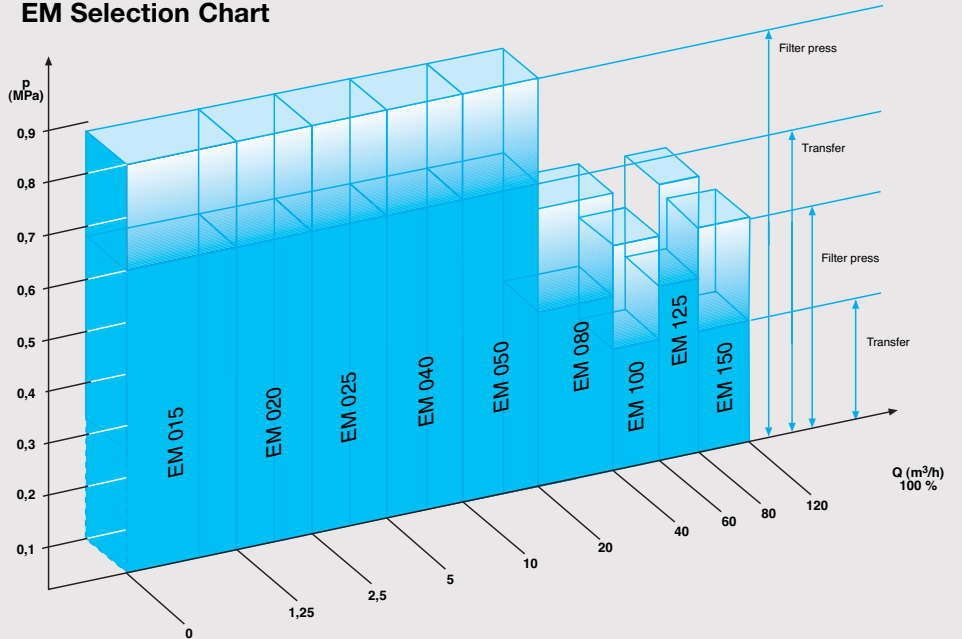
### ABEL EM Plastic



### Where used?

- Wastewater & sewage Treatment
- Chemical
- Ceramic Manufacturing
- Mining
- Power Plants
- Paint and Coatings
- Marine and offshore
- Pulp & Paper
- Pharmaceutical
- Refineries
- Breweries
- Food Processing

### EM Selection Chart



### Reduced Life Cycle Cost

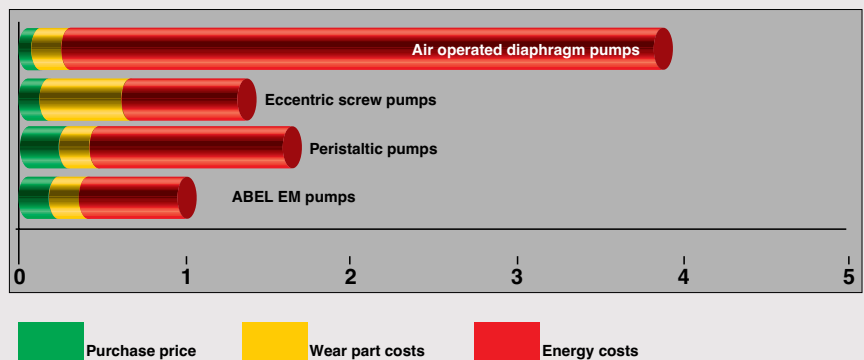
The patented Electromechanical Membrane Pump, ABEL EM is recognized as the world market leader\* in its class.

The use of conventional pumps in a range up to 115 PSI often incurs high running costs.

Running cost is only a fraction of the total life cycle cost of a pump. See the graph illustration.

\* Hydraulic Institute 1999

### “Life-time” cost consideration (5 years or 40,000 hours)



# ABEL EM Metal

Capacity ranges up to 120 m<sup>3</sup>/h, up to 0.8 MPa

## Long life through robust design

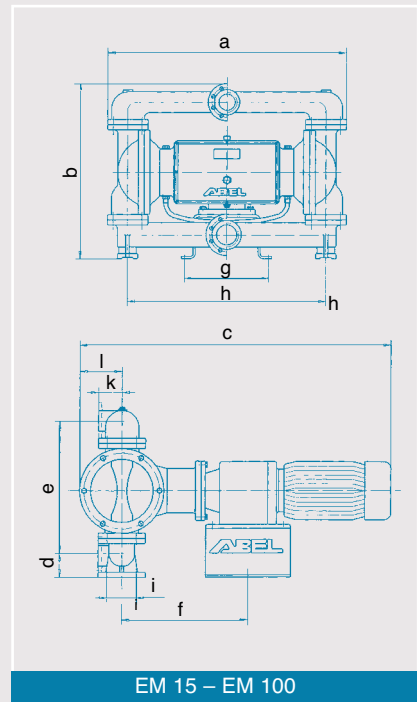
### Robust Housing Construction:

- Ductile Iron (SG)
- Stainless Steel (ED)
- Aluminum (AL) (Contact ABEL)
- Food Grade Stainless (EF) (Contact ABEL)

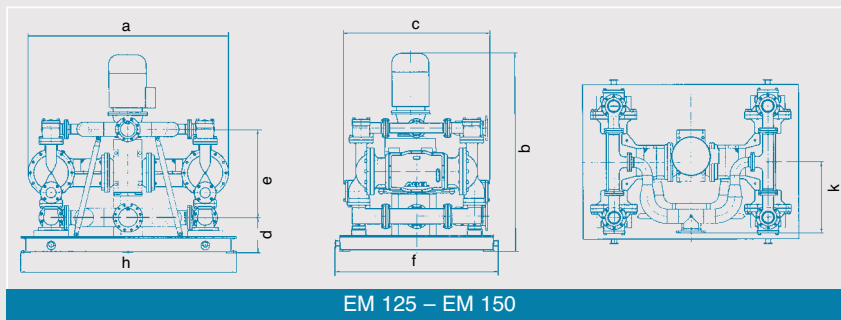


### Membrane/Ball/Seat Options:

- Nitrile/NBR
- EPDM
- Polyurethane (only balls and seats)
- FPM (Viton®)
- PTFE
- Flap valves to handle larger solids



EM 15 – EM 100



EM 125 – EM 150

ABEL-EM	Size	15	20	25	40	50	80	100	125	150	
<b>Number of pump chambers</b>		2	2	2	2	2	2	2	4	4	
<b>Flow rate max. [m<sup>3</sup>/h]</b>		1,25 *)	2,5	5 *)	10 *)	20 *)	40	60	80	120	
<b>Number of strokes max. [1/min]</b>		150	135	120	110	100	91	84	91	84	
<b>max. drive output with 0.6 MPa [kW]</b>		0,37	0,75	1,5	3	5,5	11	18,5	22	37	
<b>Nominal width suction connection</b>		G 3/4"	G 1"	G 1 1/2"	G 2"	DN 80	DN 100	DN 125	DN 150	DN 200	
<b>Nominal width pressure connection</b>		G 1/2"	G 3/4"	G 1"	G 1 1/2"	DN 50	DN 80	DN 100	DN 125	DN 150	
<b>Grain size max. [mm]</b>		3	4	6	8**)	10**)	12**)	15**)	12**)	15**)	
<b>Weight approx. [kg]</b>		33	62	120	165	340	895	1750	2520	4160	
<b>Dimensions</b>											
<b>a</b>		346	450	535	611	795	1195	1706	1925	2350	<b>a</b>
<b>b</b>		256	320	402	507	772	965	1295	1869	2310	<b>b</b>
<b>c</b>		585	720	840	1010	1165	1710	2085	1250	1710	<b>c</b>
<b>d</b>		24	30	43	70	115	120	152	318	410	<b>d</b>
<b>e</b>		210	263	317	402	581	745	1023	745	1023	<b>e</b>
<b>f</b>		290	365	439	449	570	750	935	1350	1910	<b>f</b>
<b>g</b>		175	205	280	280	330	490	580	---	---	<b>g</b>
<b>h</b>		300	378	450	511	645	985	1365	---	---	<b>h</b>
<b>i</b>		80	100	135	165	260	210	250	---	---	<b>i</b>
<b>k</b>		30	30	40	56	100	125	180	755	830	<b>k</b>
<b>l</b>		68	88	108	133	168	220	270	---	---	<b>l</b>

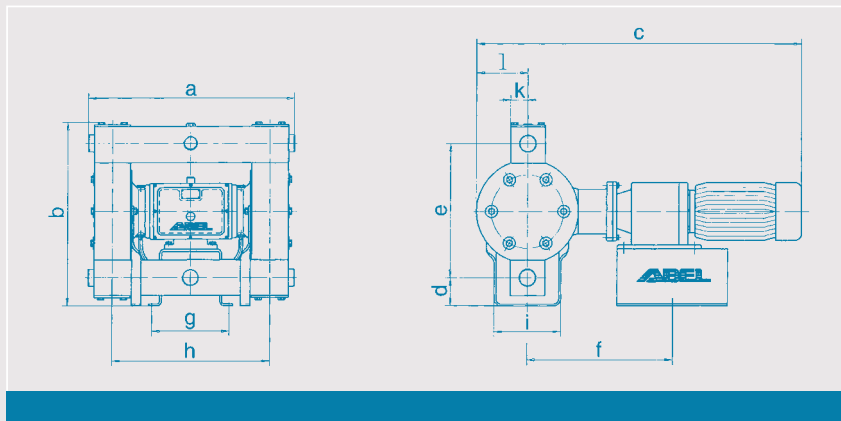
\*) about 50% of the flow rate with the use of PTFE membranes  
 \*\*) about double grain size possible if flap valves are used

# ABEL EM Plastic

Capacity ranges up to 20 m<sup>3</sup>/h, up to 0.8 MPa

## For aggressive media

In the chemical industry and in other areas of process technology aggressive media require the use of high-quality plastics such as polypropylene (PP) or PVDF (PV) as well as explosion proof motors. ABEL delivers suitable pumps for these applications with flow rates up to max. 20 m<sup>3</sup>/h.



As supplement to the EM Program, a food compliant stainless steel design (EF) is available. The flow-optimised design of the ABEL EM food comes without dead spaces and enables easy rinsing and cleaning according to the methods [CIP] and [SIP]. All product-contacting materials such as membranes, balls and seats are available in FDA approved materials. Please contact ABEL for further Information.

ABEL-EM	Size	15	20	25	40	50	
Capacity up to [m <sup>3</sup> /h]		1,25 *)	2,5	5 *)	10 *)	20 *)	
Maximum strokes [1/min]		150	135	120	110	100	
Power required at 0.6 MPa [kW]		0,37	0,75	1,5	3	5,5	
Nom. diam. of suction connection		G 3/4"	G 1"	G 1 1/2"	G 2"	DN 80	
Nom. diam. of discharge connection		G 1/2"	G 3/4"	G 1"	G 1 1/2"	DN 50	
Maximum particle size [mm]		3	4	6	8	10	
Approx. weight [kg]		30	60	80	125	270	
<b>Dimensions</b>							
a		405	510	605	680	845	a
b		265	310	380	485	740	b
c		585	730	852	1023	1207	c
d		36	30	40	53	115	d
e		200	250	305	385	560	e
f		290	335	439	449	570	f
g		175	205	280	280	330	g
h		300	380	460	520	645	h
i		60	80	190	243	300	i
k		30	38	48	55	73	k
l		80	98	120	146	210	l

\*) approx. 50% of the flow rate if PTFE membranes are used

# ABEL EM Accessories – Reasonable options for measurement, control and regulation

## Optimum process adaptation

The EM Accessories Range. Matching the needs.

The ABEL accessories allows the individual application of Electromechanical Membrane Pumps EM in your production facilities.



## ABEL-Pumps + ATEX-Directive 94/9/EC

Pumps by Abel transport difficult media in a gentle and secure manner. They are as suitable for aggressive, abrasive, and highly inflammable fluids as for media of high viscosity. Both the Electromechanical Membrane Pumps of the EM series (Z version) as well as the Piston

Membrane Pumps of the CM series, HP series and HM series are now available with ATEX certification for the equipment group II, categories 2 and 3.

We have paid particular attention to the potentially different zones on the inside and on the outside of the pump. Depending on the application and the place of installation, it is possible that the inside of the pump exhibits an Ex zone that differs from the requirement the operator has determined for the respective place of installation.

The application of ATEX requires the existence of atmospheric conditions. As a result, the

assumed continuous existence of a pressure above the atmospheric pressure within the pump would counter the specific safety requirements of ATEX.

The definitions show that only the operator (inspector, customer) can determine as to whether an area to be the place of installation for our pumps constitutes a potentially explosive atmosphere and/or as to whether a potentially explosive mixture can form. However, in many cases, this evaluation is extremely difficult even for the operator.

For that reason, we aim to provide our customers with support with regard to all questions related to ATEX.



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ABEL GmbH & Co. KG  
Abel-Twiete 1  
D-21514 Buechen, Germany  
Phone +49 4155 818 - 0  
Fax +49 4155 818 - 499  
mail@abel.de · www.abel.de