EL-IP/M 0001-GB-03.02/GP

ELRO

Peristaltic Pumps
Series IP and M300

CRANE®

ELRO Peristaltic Pumps

Innovative Technology with Tradition

For over 15 years ELRO Peristaltic Pumps in form of mobile and stationary units have established themselves in the positive displacement pump market as indispensable products for industry.

Day in and day out these pumps demonstrate their reliability and efficiency under the most demanding operational conditions.

Over decades the range of peristaltic pumps has been completed by intensive research, development and the use of new materials. The product range includes the widest material selection for pumping hoses offered by any manufacturer of peristaltic pumps.

The quality demands of customers as well as ease of operation and maintenance are uppermost in the manufacture of these products.

The latest production methods, inspection and testing systems for quality assurance and documented production sequences in compliance with DIN EN ISO 9001 are the basis for constantly outstanding quality of the peristaltic pumps.

With this wide product range ELRO pumps are able to meet most customer requirements, even in extremely difficult pumping processes.

Traditional values in combination with long experience and the available pump/application know-how enables customer and market specific solutions in agreed timescales.

By using the latest technologies, modern manufacturing methods and reliable service the range of ELRO Peristaltic Pumps will continue to maintain its first class position with the users in the future.

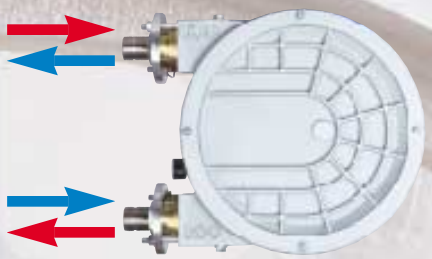
Benefits at a glance:

- ideal for abrasive, viscose and shear sensitive media
- gentle pumping of liquid or viscous products
- constant volume capacity due to vacuum support
- dry running resistant
- integrated early warning system
- pumping of media with entrained solids
- unobstructed fluid flow – easy cleaning
- free of dynamic and pressure loaded seals
- portable units Series M300
- infinite regulation of capacity
- high pumping pressures of max. 13 bar for Series IP
- dry self-priming up to max. 9.5 m lift
- easy operation and servicing, only one wear item
- also suitable for explosive environments (Ex-version)

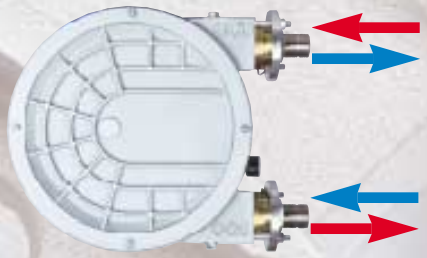
Possible installations

ELRO peristaltic pumps with accessories can be used for many applications and are not restricted to a specific installation location. Fixed installation directly into the process flow is possible, as is the use as mobile or portable unit that can be transported to different applications. The standard version of the pump set-up is the combination: ports on left-hand side (suction side top – pressure side bottom, red).

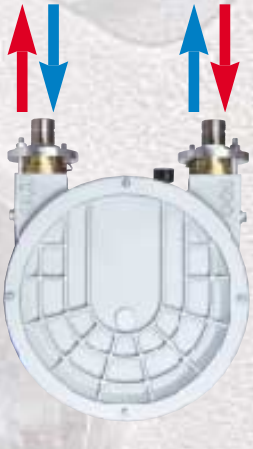
Of course, the IP series peristaltic pumps may be adapted to existing installations by modification of the port configuration. This only requires the relocation of the stainless steel pipe connections on the suction and discharge side of the vacuum system to suit the desired condition. This can be done without additional machining.



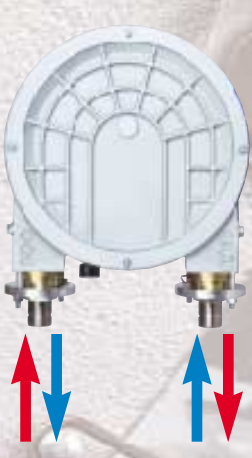
Ports left hand side



Ports right hand side

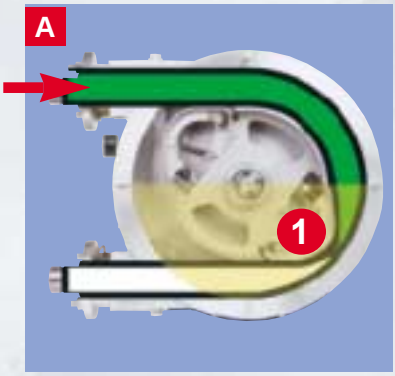


Ports on top

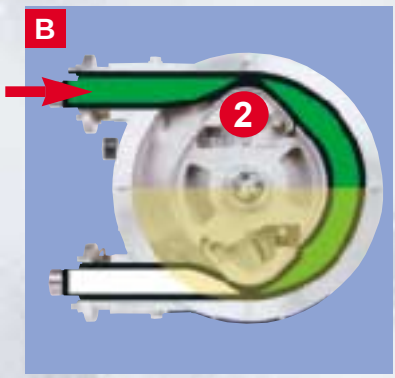


Ports on bottom

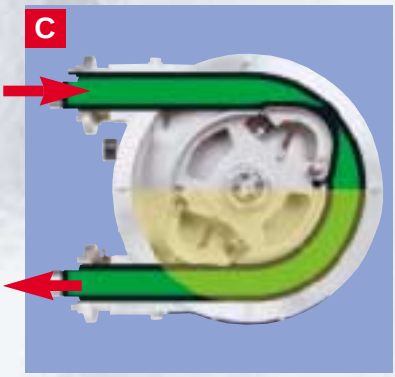
Operation of Series IP



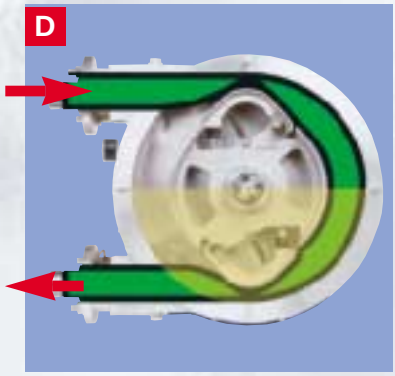
A The rotor rotates within the pump housing filled with lubricant and compresses the pumping hose with the sliding shoe (1). This process generates a hermetic separation between suction and discharge side.



B Once the second sliding shoe (2) compresses the hose, a completely enclosed pumping chamber is formed. This volume corresponds exactly to half the pump capacity per rotation. A vacuum is also generated inside the pump housing, supporting the elasticity of the hose allowing restoration to its original full cross-section.



C The rotation of the rotor forces the pumped medium inside the hose towards the outlet port on the discharge side. During each opening of the hose a vacuum is created on the suction side ensuring constant suction. It also takes place when the hose is empty giving high suction conditions.



D With each rotation the pumping chamber is reformed and the suction capability is renewed.

Flexible, Modular S

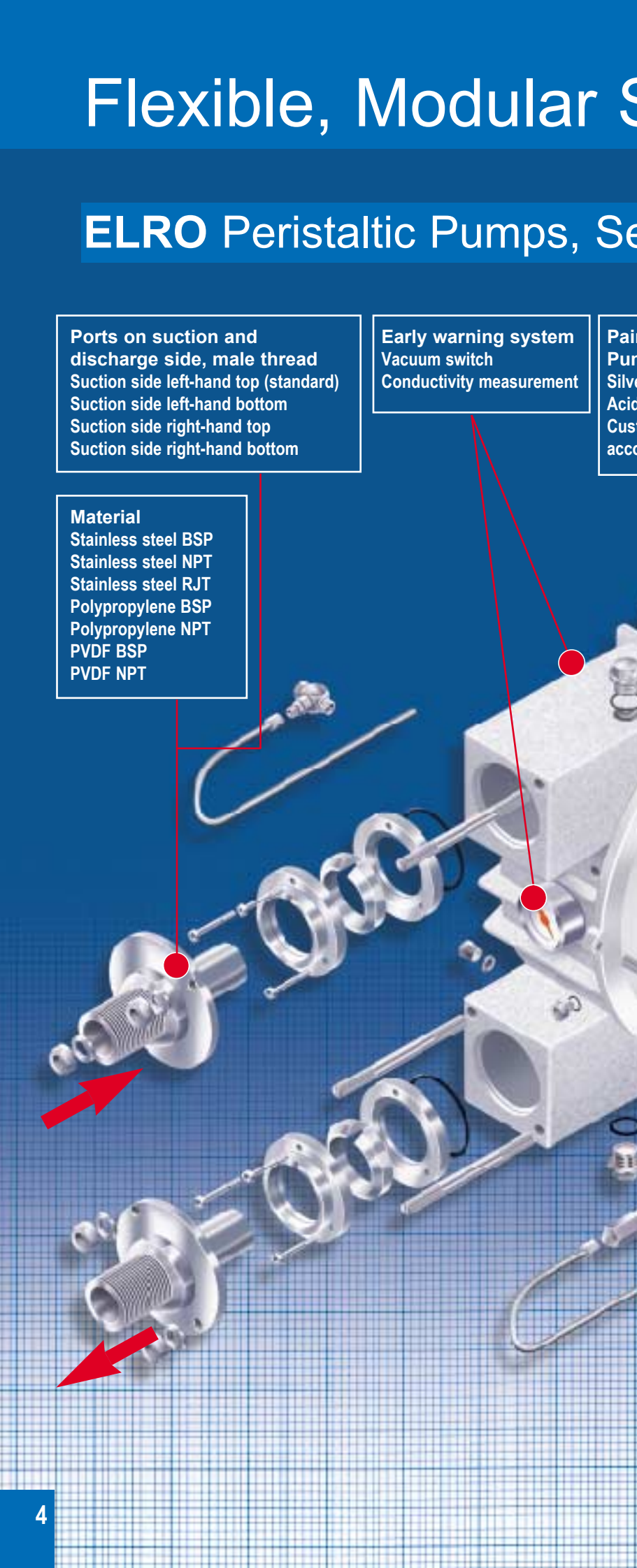
ELRO Peristaltic Pumps, Se

Ports on suction and discharge side, male thread
Suction side left-hand top (standard)
Suction side left-hand bottom
Suction side right-hand top
Suction side right-hand bottom

Early warning system
Vacuum switch
Conductivity measurement

Pai
Pur
Silv
Acid
Cus
acc

Material
Stainless steel BSP
Stainless steel NPT
Stainless steel RJT
Polypropylene BSP
Polypropylene NPT
PVDF BSP
PVDF NPT



System

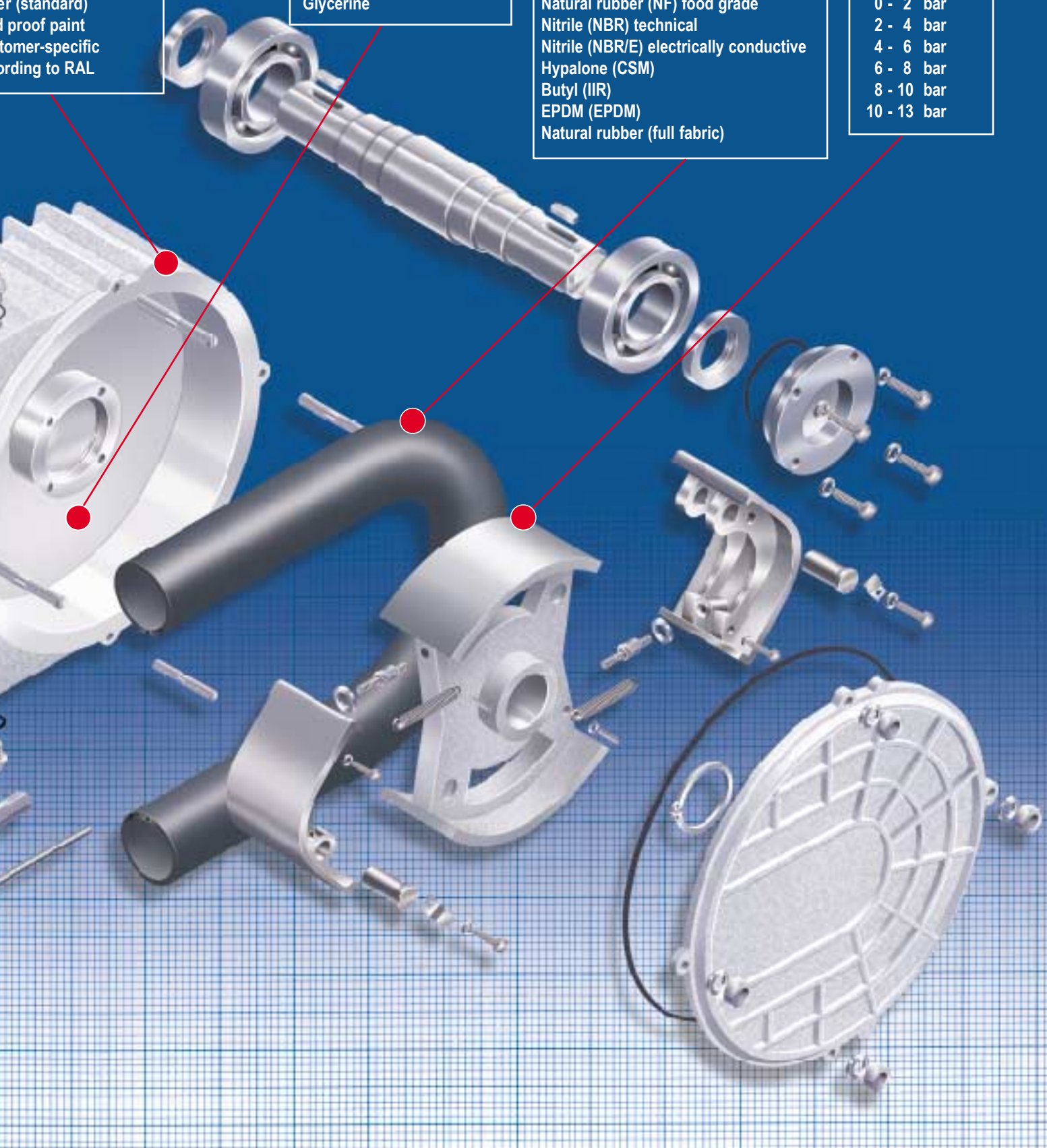
eries IP

nt finish
mp housing
er (standard)
d proof paint
tomer-specific
ording to RAL

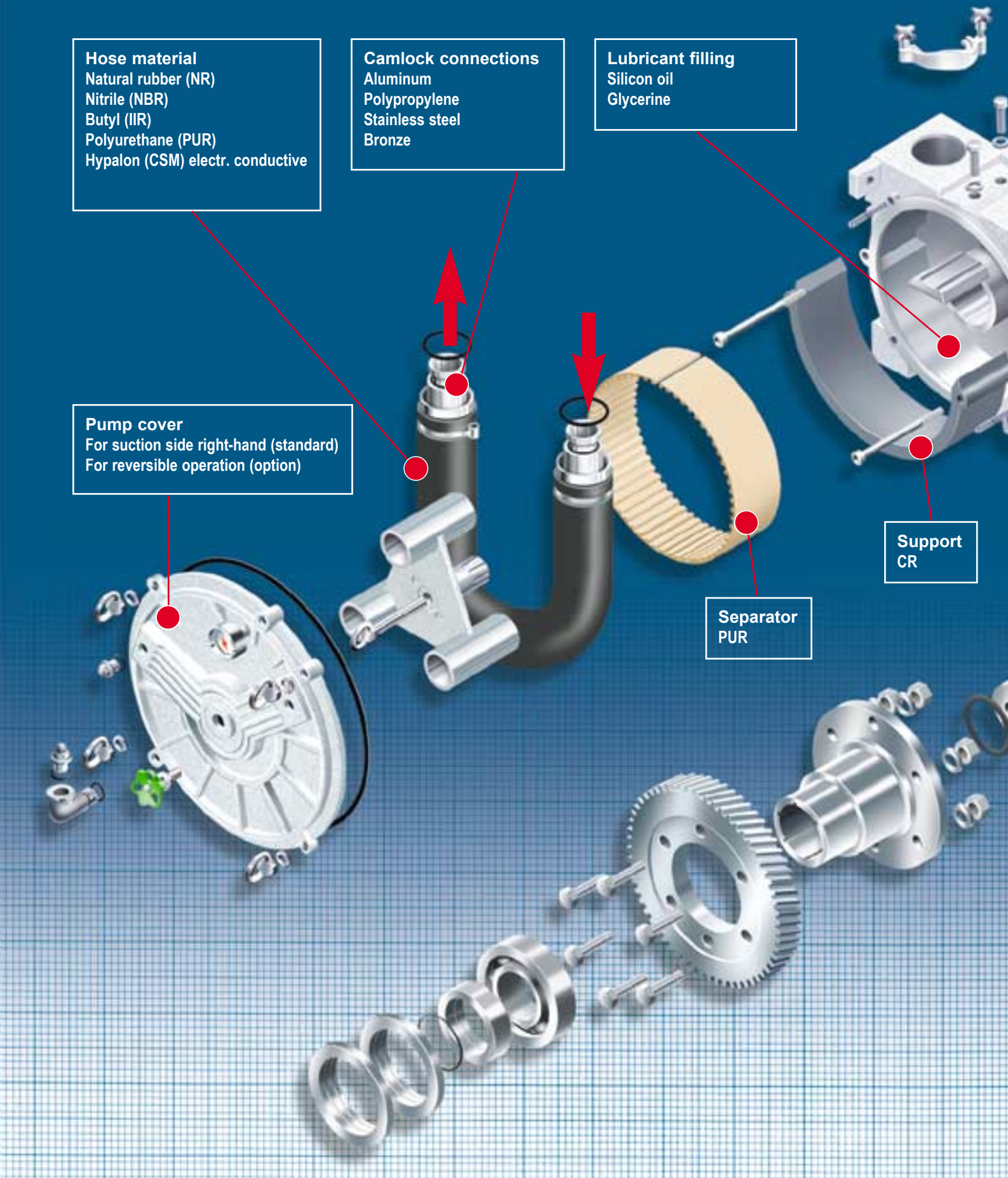
Lubricant filling
Silicon oil
Glycerine

Hose materials
Natural rubber (NR) technical
Natural rubber (NF) food grade
Nitrile (NBR) technical
Nitrile (NBR/E) electrically conductive
Hypalone (CSM)
Butyl (IIR)
EPDM (EPDM)
Natural rubber (full fabric)

Pressure ratings / rotor
0 - 2 bar
2 - 4 bar
4 - 6 bar
6 - 8 bar
8 - 10 bar
10 - 13 bar



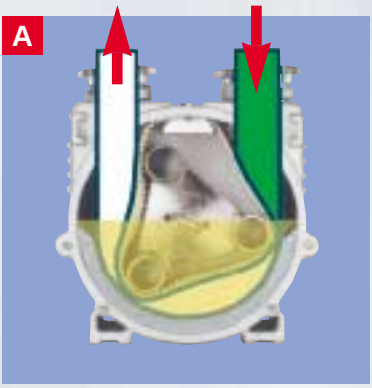
ELRO Peristaltic Pumps Series M300



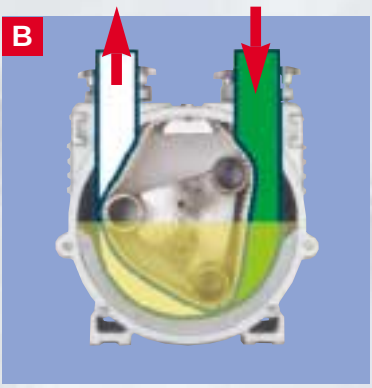
Paint finish pump housing
Silver (standard)
Acid-proof paint
Customer specific according to RAL

Available drives
Electric motor 400 V AC
Electric motor 230 V AC
Electric motor Ex-version
Petrol engine
Diesel engine
Hydraulic motor
Pneumatic motor
Water turbine

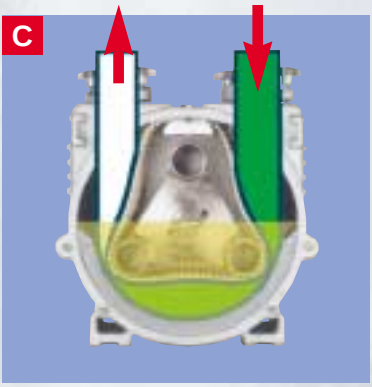
Operation of Series M300



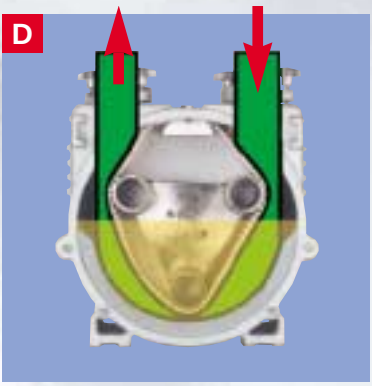
A The rotor turns inside the tightly fixed separator. Which is held in the pump housing filled with lubricant. The separator divides the housing into two completely enclosed areas. This means during compression of the pumping hose the suction and discharge sides are hermetically separated.



B Air from the suction side is pumped over the separator by the turning of the rotor and exhausted outside the pump. This forms a vacuum inside the pump chamber relative to the suction lift, which supports the elasticity of the hose during restoration to its original full cross-section.



C Once the second sliding shoe compresses the hose, a pumping chamber is formed. This volume corresponds exactly to one-third of the pump capacity per rotation. The rotation of the rotor presses the medium inside the hose towards the outlet on the discharge side. During each opening of the hose a vacuum is created on the suction side ensuring constant suction.
It also takes place when the hose is empty giving high suction lift conditions.



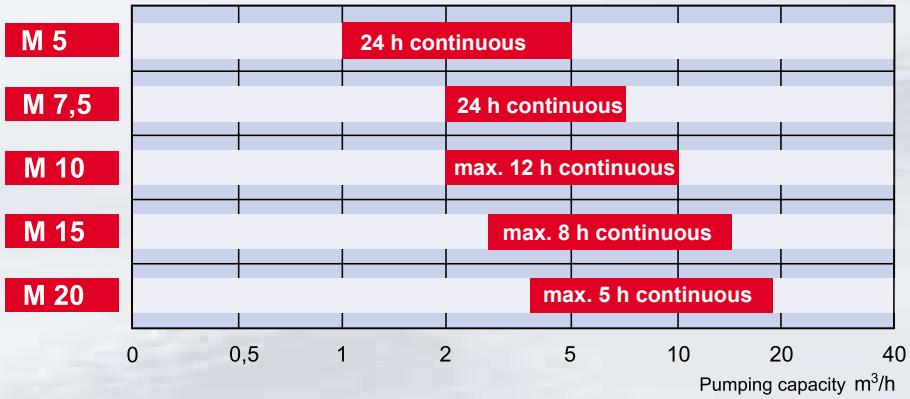
D With each rotation the pumping chamber is reformed and the suction capability is renewed.

ELRO Peristaltic Pumps

Selection, Pump Capacity

For the selection of the mobile ELRO Peristaltic pumps series M300, the following factors are to be considered:

- pumping medium
- pumping capacity
- suction and discharge conditions
- operation time per day
- location of use
- accessories with suitable couplings



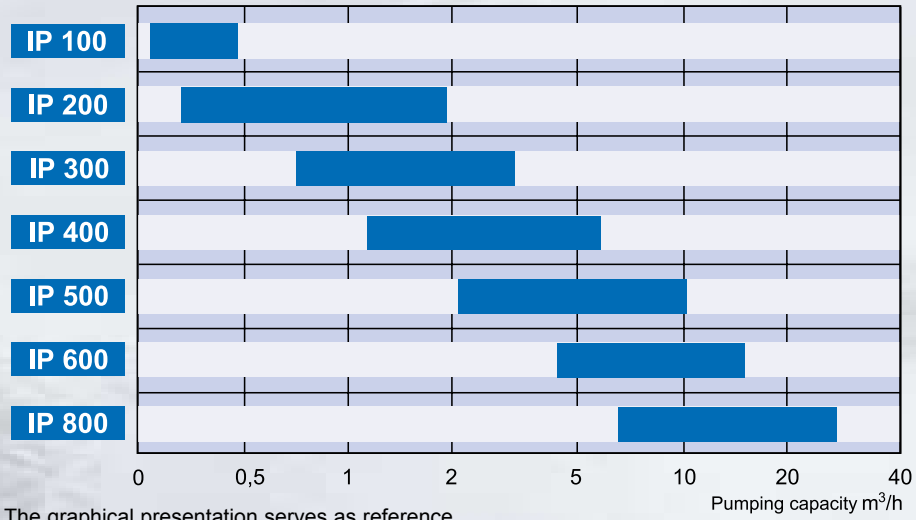
The essential items for a low-wear operation of the peristaltic pumps are dependant on:

pumping media <=> speed

media temp. <=> hose compression

discharge pressure <=> Consider larger diameter discharge lines

operation time per day <=> continuous intermittent short time

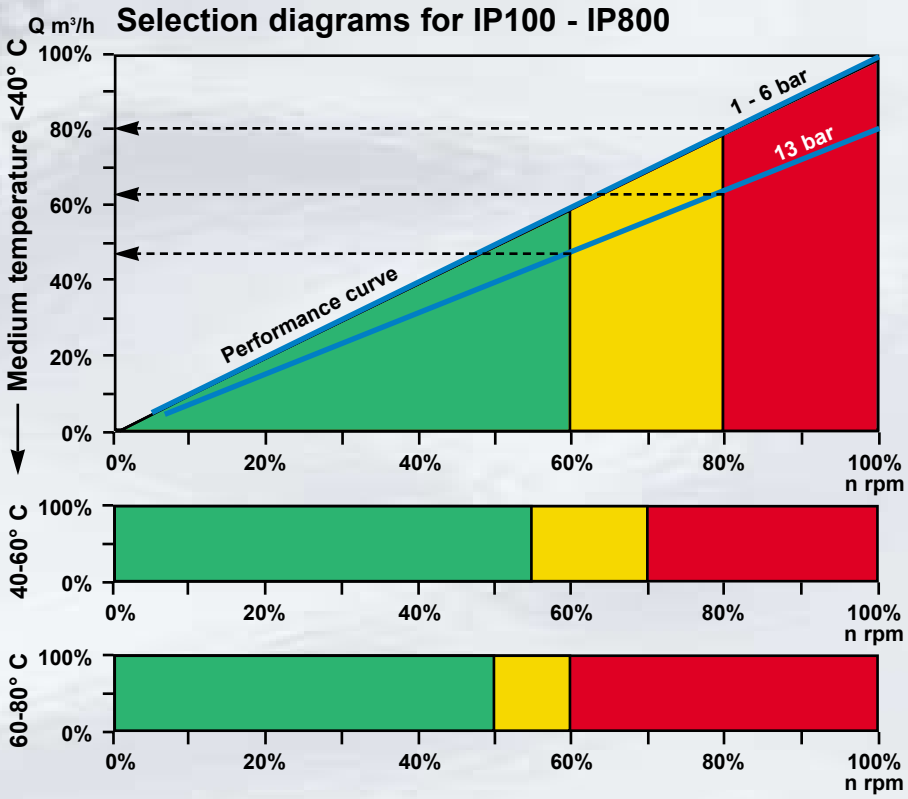


The graphical presentation serves as reference.
Exact details can be obtained from the respective data sheets.

After fixing the operation point, depending on the above parameters, an exact specification of the pump can be made using the individual data sheets. Using the selection diagram, adjustments may be necessary after consideration of the factors “Operation time/day and media temperature”.

At a media temperature >40°C, hose life is shortened and a speed reduction should be considered.

- Short-time operation (max. 4 hours)
- Intermittent operation (max. 12 hours)
- Continuous operation (24 hours)



Elastomers

Natural rubber (NR) technical and approved for food applications to FDA
Composition: natural substance, high-polymer isoprenes
Properties: tension-resistant, elastic, cold-resistant, approved for food applications
Operative range: for abrasive media, diluted acids and alkalis
Temperature range: -20ºC - + 80ºC

Nitrile rubber (NBR)
Composition: mixed polymeride from butadiene and acryl nitrile
Properties: wear-resistant, grease and oil resistant
Operative range: for oily and greasy media, alcohols
Temperature range: -10ºC - + 80ºC

Butyl rubber (IIR)
Composition: mixed polymeride from isobutadiene and isoprenes
Properties : heat resistant and non-aging, gas-tight
Operative range: for organic and inorganic acids and alkalis, ketones and hot water
Temperature range: -25ºC - + 80ºC

Hypalon (CSM)
Composition: elastomer formed through polymerisation of chlorosulfonated ethyls
Properties : chemical resistant, wear resistant and electric conductive (only M300)
Operative range: for acids and alkalis, colours
Temperature range: -20ºC - + 80ºC

EPDM (EPDM) only IP range
Composition: EPDM rubber through co-polymerisation of ethyl, propylene and diene
Properties : chemical resistant, good insulating properties and outside applications
Operative range: for acids and alkalis, hot water
Temperature range: -30ºC - + 80ºC

Polyurethane (PUR) only M300 range
Composition: elastomer formed through polyaddition of isocyanate and alcohol
Properties : hard wear and abrasion proof, oil resistant
Operative range: for abrasive and oily media
Temperature range: -20ºC - + 80ºC

For further details see our separate compatability guide

For special applications, special full fabric hoses are available for the series IP.

ELRO peristaltic pumps can be equipped with a suitable pumping hose for almost any application.
The great variety of different hose materials results from intensive research and long-term tests.

All ELRO pumping hoses are precision ground after the production process. This additional process ensures an uniform surface and a constant outside diameter compared with conventional hoses.
It prolongs hose life and in addition, a consistent pump capacity is achieved for all pumps.

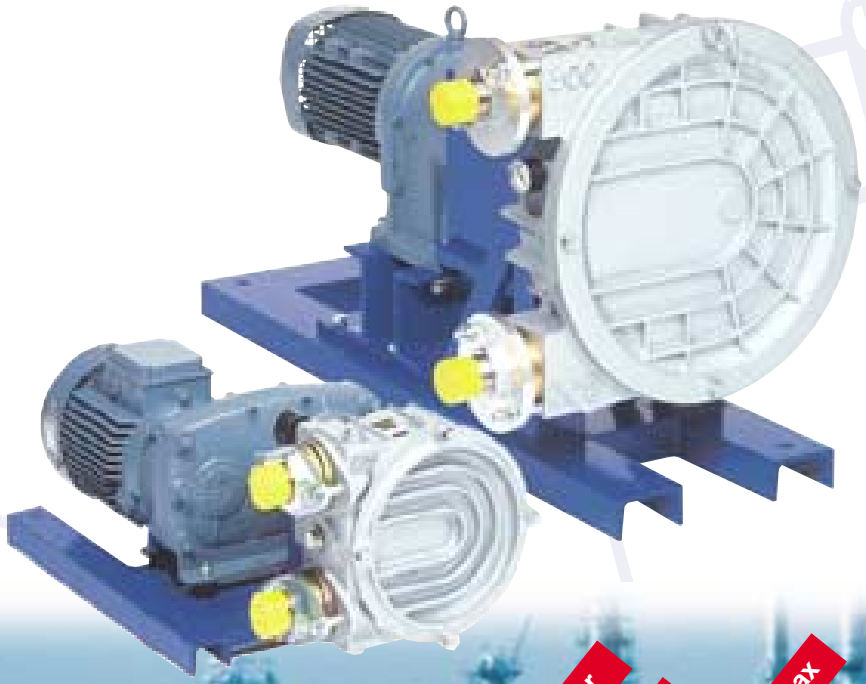
Housing material

The pump housings of the ELRO peristaltic pumps are cast from aluminium. This process which is more complicated than steel casting or welded designs is used for the following reasons:

- better heat dissipation
- integration of cooling ribs
- air tight housing
- reduction of wall thickness
- compact construction
- wear resistant
- low weight

ELRO Peristaltic Pumps

Series IP

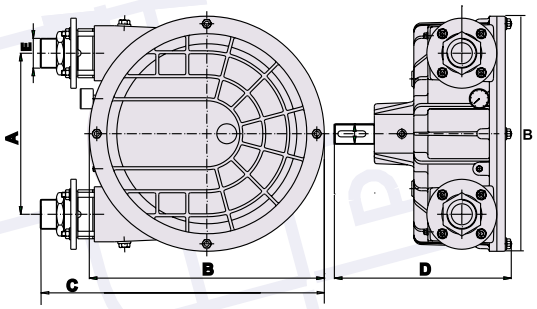


The IP series of ELRO peristaltic pumps distinguish themselves through a gentle transport of liquid or viscous media. Also capable of handling abrasive, shear-sensitive products with long fibres and solids.
Over the years they have become an integral part in the pump pool of many operators.

The 13 bar pump pressures of the standard versions make ELRO peristaltic pumps suitable for replacing other pump technologies. The seven pump sizes, various hose materials including food approved versions and the different port options allow individual adaptation to each application. This variety is further expanded by the frame and motor variants.

Type	Pump capacity l/rev	Inner hose diameter mm	Max. speed [rpm] rpm	Drive output min/max kW	Weight without drive kg
IP 100 (1")	0,07	15	142	0,37 – 1,1	12
IP 200 (1 ¼")	0,22	30	142	0,55 – 1,5	16
IP 300 (1 ½")	0,85	35	70	1,1 – 4,0	48
IP 400 (2")	1,65	50	60	1,5 – 5,5	51
IP 500 (2")	2,9	52	60	2,2 – 7,5	110
IP 600 (2 ½")	4,45	60	60	3,0 – 11	123
IP 800 (3")	7,8	70	60	5,5 –18,5	248

Dimensions (mm)



Type	IP 100	IP 200	IP 300	IP 400	IP 500	IP600	IP 800
E	(1")	(1 1/4")	(1 1/2")	(2")	(2")	(2 1/2")	(3")
A	152	140	336	320	516	510	692
B	242	242	470	470	680	680	890
C	316	316	585	570	840	800	1020
D	290	290	380	355	480	500	680

ELRO peristaltic pumps are equipped as a standard with a patented vacuum system. It leads to many economic and technical advantages such as:

- very good suction properties up to 9.5 m lift (no additional suction equipment required)
- constant pump capacity during the entire hose life
- enables the hose to reform to its full cross section
- low reduction in capacity when handling very viscous media
- use as early warning system for a just in time hose exchange

Applications

Main application:

- Chemical industry
- Ceramic and porcelain industry
- Building industry
- Food and beverage industry
- Breweries
- Cosmetic and pharmaceutical industry
- Power stations
- Colour and painting industry
- Waste and disposal industry

The patented early warning system (see illustration right 2, 3) works as follows: Each hose is provided with a small additional channel through which the air in the upper section of the pumping chamber is evaquated from the pump housing. Therefore, a vacuum is formed in the sealed aluminium housing. In the case of damage or normal wear of the hose, the vacuum will drop.

The early warning can be seen through the installed vacuum gauge. An acoustic or optical signal can be activated by using the vacuum switch 1.

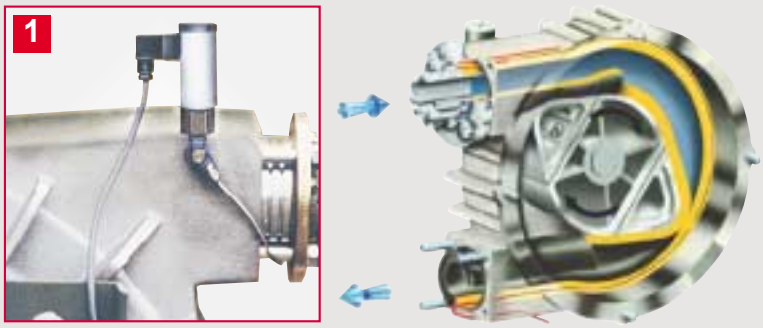
By this, the hose condition is monitored for optimum service planning.

Downtimes through normal wear can be predicted.

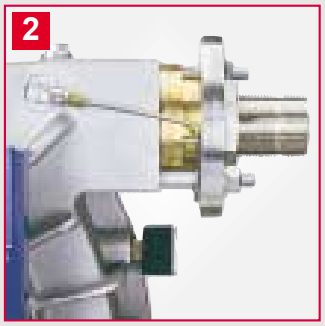
Waste disposal industry

Breweries

Chemical industry



Early warning system switch



Early warning system suction side

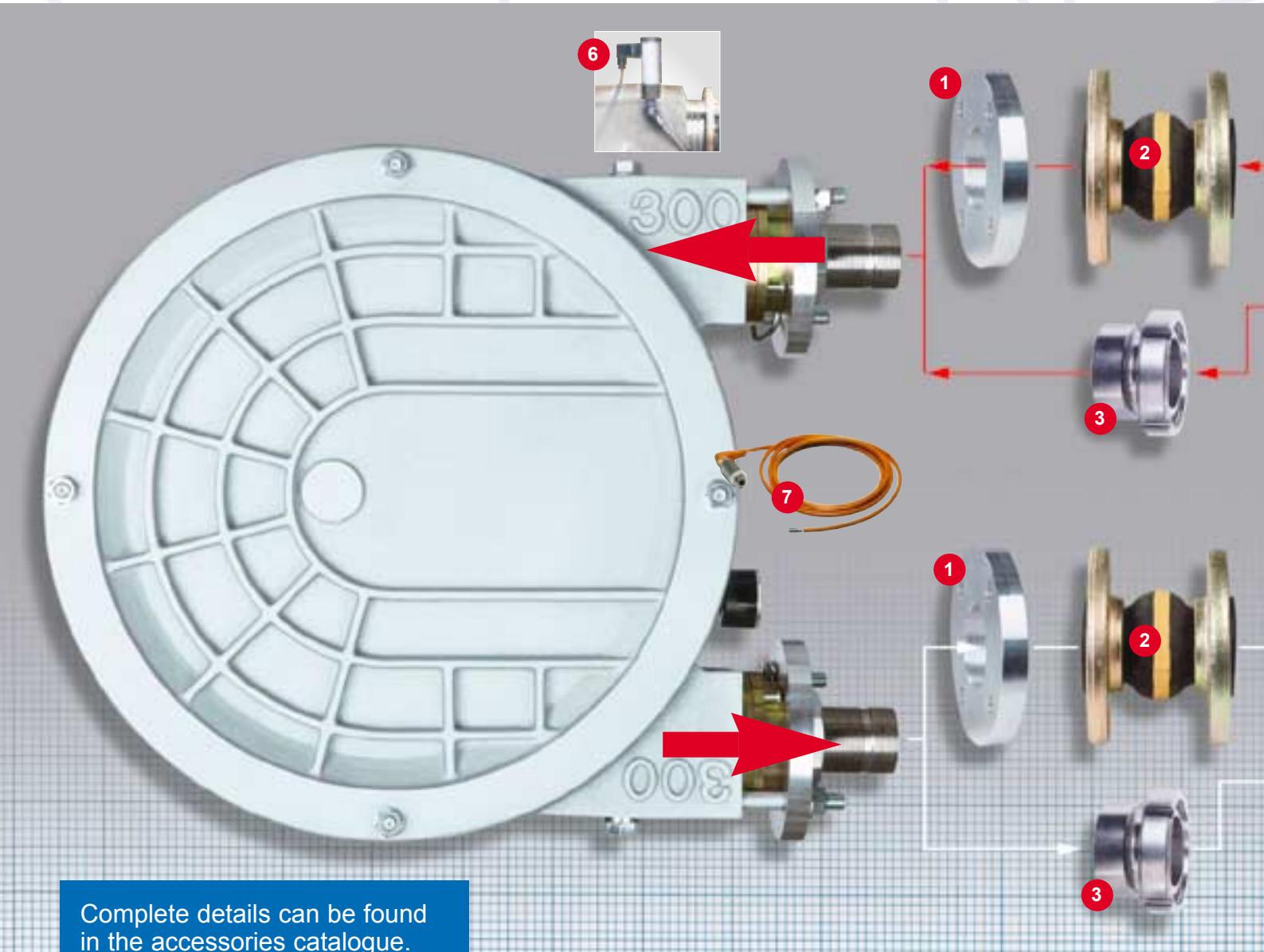
Early warning system discharge side

ELRO Peristaltic Pumps

Series IP

The IP series of ELRO peristaltic pumps are available with a variety of accessories for each application.

1. Flanges in steel, stainless steel and plastic according to different standards
2. Compensators in steel, stainless steel with matched elastomer materials
3. Quick action couplings and fittings, e.g. coupling in stainless steel, brass and aluminium, DIN and triclamps
4. Suction/discharge hoses are available with nominal sizes between 1” and 4” and equipped with suitable coupling systems, completely pressure-tested. Standard spiral hoses with plastic and steel reinforcement, chemical hoses or suction/discharge hoses approved for food applications.
5. Pulsation dampers made of different housing materials: lacquered steel, polypropylene or stainless steel. Depending on the type of design and size with an inner membrane complete with fittings and pressure gauge.
6. Vacuum switch for checking the vacuum in the pump housing. Pressure drop = Alarm.
7. Conductivity sensors for the conductivity measurement. If conductivity fluid is mixed with the medium = Alarm.



Complete details can be found in the accessories catalogue.

Pump coding

I	10	E	A	A	–	–	B	A	□	□	□

Motor and gear-box choice

Type

I

Size

10	IP100
20	IP200
30	IP300
40	IP400
50	IP500
60	IP600
80	IP800

Connections

E	Stainless steel NPT
R	Stainless steel RJT
S	Stainless steel BSP
K	Polypropylene BSP
T	Polypropylene NPT

Hose / lubricant

A	NBR electric conductive + silicon
B	NBR + silicon
C	CSM + silicon
D	NBR + glycerine
E	EPDM + silicon
F	EPDM + glycerine
G	NR + glycerine
H	CSM + silicon
J	IIR + silicon
K	IIR + silicon
N	NR + silicon
W	NR full fabric + silicon
Y	NR full fabric + glycerine

Pump pressure

A	0 - 2 bar
B	2 - 4 bar
C	4 - 6 bar
D	6 - 8 bar
E	8 -10 bar
F	10 -13 bar

Paint finish

A	Silver
B	Acid-proof paint
C	Customer-specific

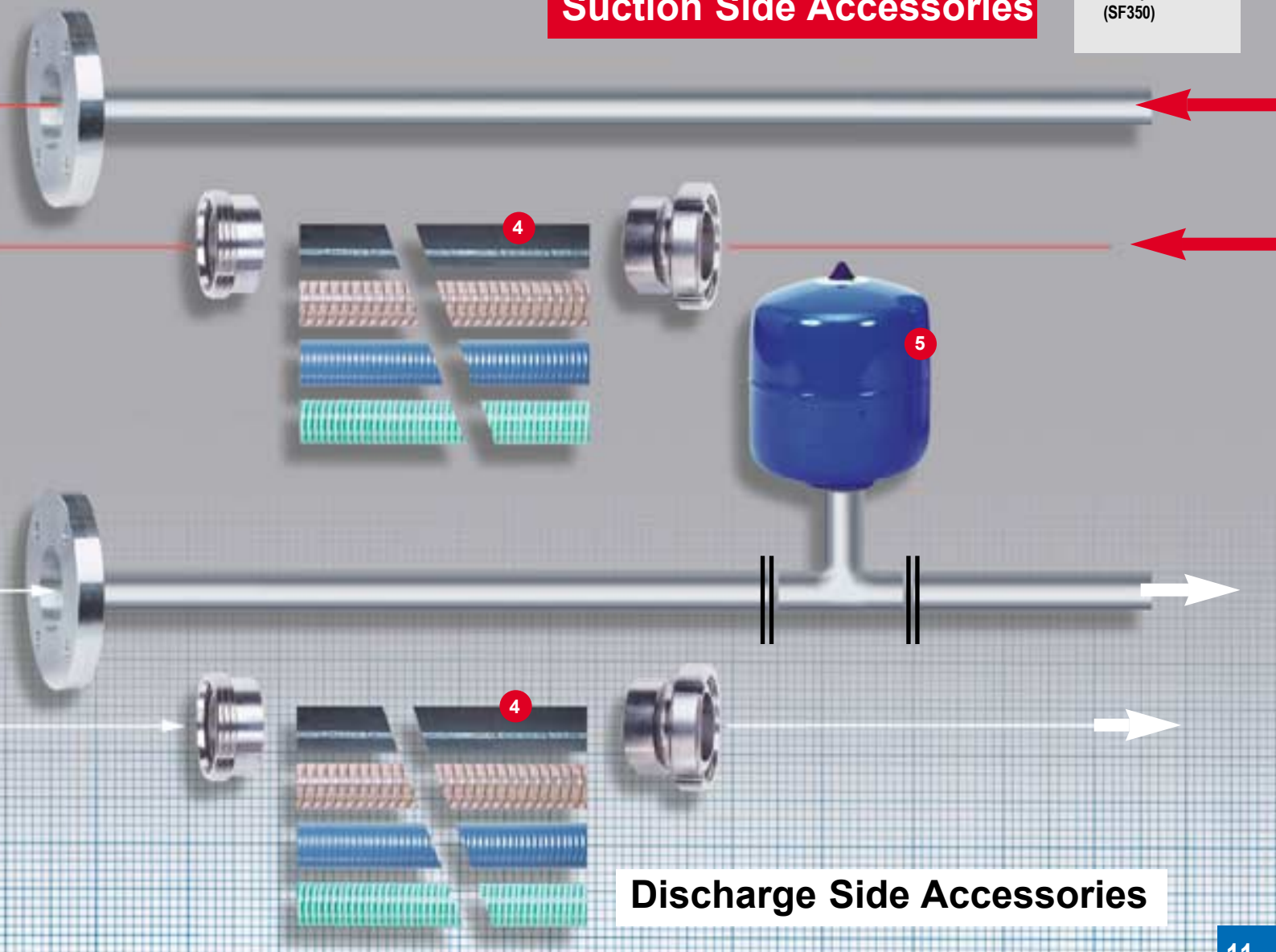
Connecting position with regard to suction side viewed from front

–	left/top (standard)
A	left/bottom
B	right/top
C	right/bottom
D	top/left
E	top/right
X	left/full fabric coating
Y	right/full fabric coating
Z	top/full fabric coating

Base frame

A	steel painted (150-180)
B	steel painted (110-140)
C	Stainless steel
D	Steel painted movable
E	Stainless steel movable
F	Stainless steel specified
G	Stainless steel painted
H	steel painted (150-180)
J	steel painted (SF350)

Suction Side Accessories



Discharge Side Accessories

ELRO Peristaltic Pumps

Series M300

ELRO M300 series Peristaltic Pumps were designed for safe, quick and mobile applications in the most varied industrial operating conditions. Over many years this unique, patented pump system has been and is successfully used world-wide for more and more new applications.

The basic idea during the development of the mobile peristaltic pumps was to integrate the advantages of standard peristaltic pumps and to achieve a compact, portable and flexible design. This idea was realised through a special, patented concept in the pump housing design.

Type / drive		Weight
M 5 E(X) – M 20 E(X)	Electric motor 230 - 400 V + EX	55-65 kg
M 15 / 7,5 E(X) – M 20 / 10 E(X)	Two-stage electric motor 400 V + EX	62-65 kg
M 20 B	Petrol engine 4,0 kW / 4000 rpm	52 kg
M 20 D	Diesel engine 4,15 kW / 3600 rpm	75 kg
M 20 H	Hydraulic drive	55 kg
M 20 L	Pneumatic motor	58 kg
M 20 WT	Water turbine →	56 kg
M 20 FU	Electric motor with integrated frequency converter	66 kg

It enables the use of thin-walled pumping hoses which are continuously expanded to their full cross-section by the permanent vacuum. Pumping capacities between 4 m^3/h and 22 m^3/h can be achieved.

Examples of application: Emergency pump on ships, sanitary disposal unit for fast trains, loading pump for road tankers, at power stations and sewage plants for sampling and for cleaning tanks and basins, in the chemical industry, for fluid transfer duties.

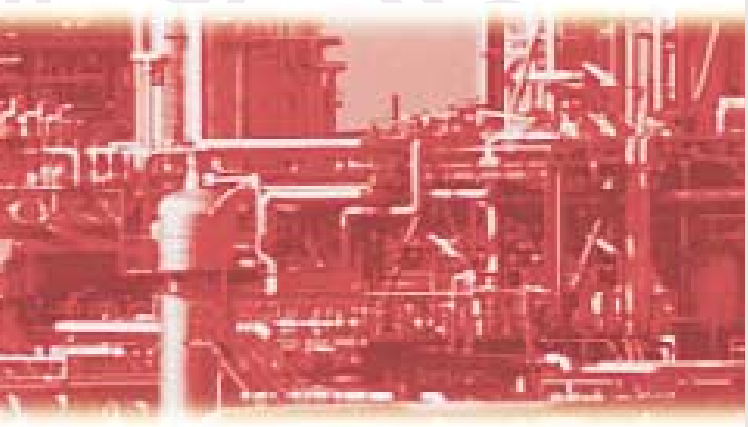
These pumps prefer a long suction line up to the absolute vacuum whereby suction lengths of more than 50 m are frequently used.

The discharge pressure should not exceed 2 bar.

Applications

Main Application:

- Environmental technology
- Tank cleaning
- Building industry
- Chemical industry
- Forwarders
- Power stations, disposal technology
- Ships, port facilities and skimmer



The peristaltic pumps can be equipped with different hose materials depending on applications as well as with couplings on the suction and discharge side in different materials and designs.

The M300 series can be selected with a variety of different motors.

For special applications, the pump is also available in a reversible design. Therefore it is possible to pump in the opposite direction with the same performance features - a decisive criterion when pumping out and pumping over media which are harmful to the environment.

The design of all pumps enables changing of pumping hose and all components within shortest period of time without any additional special tools.

Forwarders

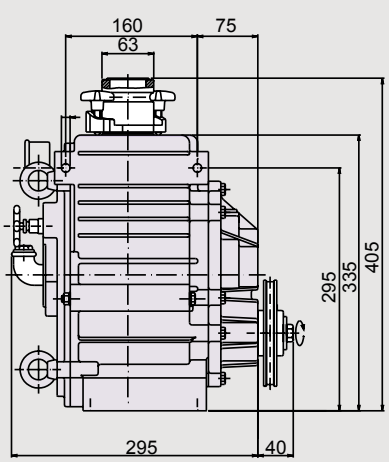
Environmental technology

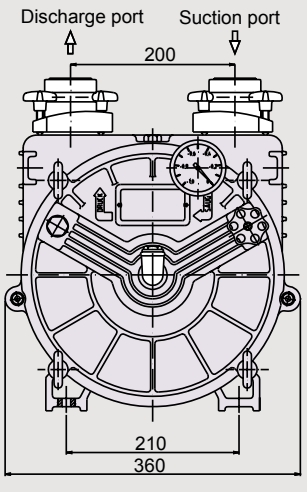
Disposal technology

Galvanic station

Disposal fast trains

Dimensions (mm)





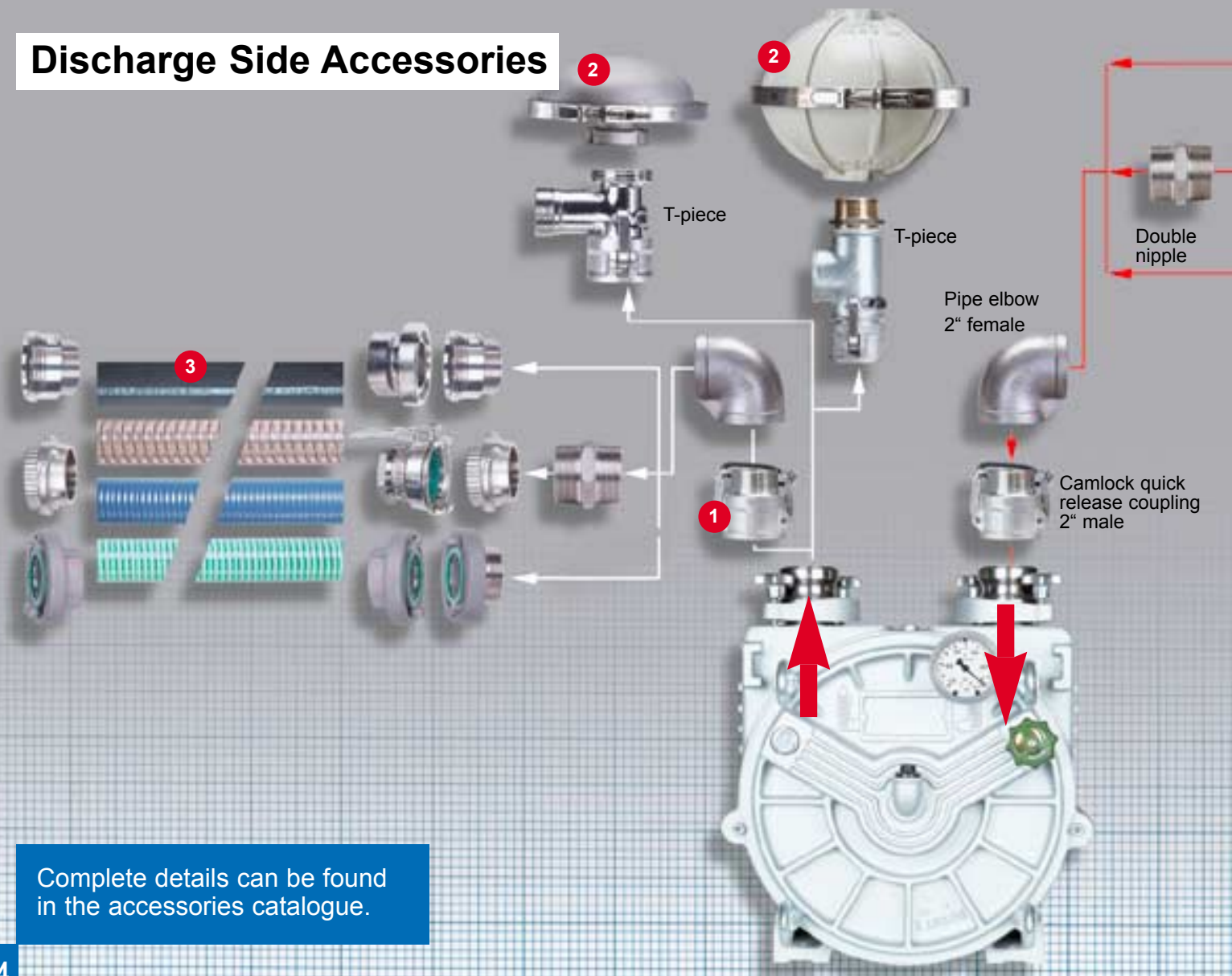
ELRO Peristaltic Pumps

Series M300

ELRO Peristaltic Pumps are available with a variety of accessories suitable for each specific application.

1. KL quick release couplings, pipe elbows, Storz couplings made of aluminium, brass or stainless steel, plastic, DIN, tank vehicle couplings made of brass or stainless steel.
2. Pulsation dampers made of aluminium and stainless steel with suitable T-piece.
3. Suction/discharge hoses are available with nominal size between 1” and 4” and equipped with suitable coupling systems completely pressure-tested. Standard spiral hoses with plastic and steel reinforcement, hoses for chemical applications as well as suction/discharge hoses approved for the food industry.
4. 70 litre pre-filter vessel made of steel and stainless steel with filling equipment
5. 180 litre transport drum made of stainless steel with filling equipment
6. Hose cleaning device and balls in different designs.
7. Suction baskets, flat vacuum pick-ups, special suction pipes and residue suction nozzles made of different materials.

Discharge Side Accessories



Complete details can be found in the accessories catalogue.

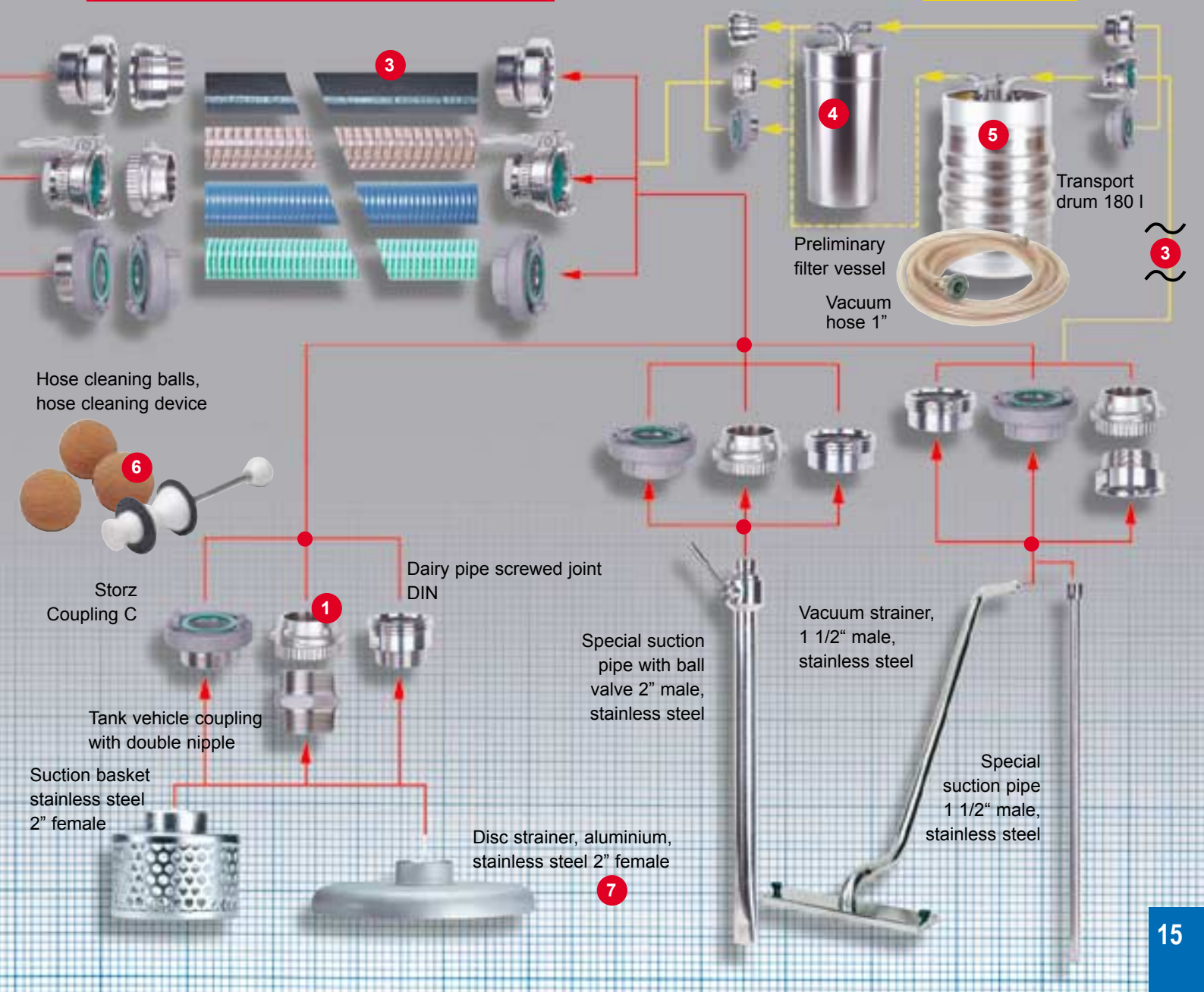
Pump coding

M	05	A	B	–	E	B	–

Model	Type	Connections	Hose / lubricant	Paint finish	Base frame	Motor type	Motor
M	05 5m³/h 07 7m³/h 10 10m³/h 11 10/5m³/h 15 15m³/h 17 15/7m³/h 20 20m³/h 21 20/10m³/h OM Without Motor	A Aluminium K Polypropylene R Brass S Stainless steel	B NBR+silicon C CSM + silicon D NBR + glycerine G NR + glycerine H CSM + glycerine J IIR + silicon K IIR + glycerine N NR + silicon P PUR + silicon R PUR + glycerine	- Silver H Acidproof paint Z Customer-specific	E Fire brigade carrying frame stainless steel F Fire brigade carrying frame galvanised steel T Aluminium (Standard) M Vehicle stainless steel	B Petrol D Diesel E Electric H hydraulic L Pneumatic motor W Water turbine	- without D EEx d T4 E EEx e T3 F Faryman H Honda R Reversible Y Yanmar Z Hatz

Suction Side Accessories

Option



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