ELADOS® EMP III
Diaphragm Pump type 00160 - 00540

- **Mechanical stroke adjustment**
- **Stroke frequency regulation**
- **Pulse control**
- **Pulse multiplication and division**
- **Pulse memory**
- **Standard signal control**
- **Empty signal and low level warning**
- **External metering lock**
- **Empty signal and stroke signal output**
- **Metering regulator (readjustment of metering output) in combination with an oval gear meter**

The ELADOS® EMP III series of metering pumps is constructed on the building block principle. It comprises the drive unit, the gear box unit, the metering pump head and the electronics. Different designs of drive option allow the pump to be adapted to any processing sequence for quantity or proportional metering. The scope of delivery is rounded off by practical accessories, so forming a complete range of equipment for all metering uses.

Technical Data:

Mechanical Data:

Pump capacity [l/h]:	16	25	54
Metering back-pressure* [bar]:	10	10	10
Delivery per stroke [cm^3]:	2.1	3.4	7.3
Reproductivity:	< ± 3 %		
Suction height:	2 mWs, suction height with clean, slightly wet valves		
Max. metering frequency:	122 1/min		
Pressure valve:	without spring		
Suction valve:	without spring		
Ambient temperature:	max. 40°C		

Materials:

Housing:	thermoplastic polyester
Pump head:	polypropylene **optional** PVDF, PVC or stainless steel 1.4571
Diaphragm:	PTFE - EPDM compound diaphragm
Seals:	FPM 602 (Viton B) **optional** EPDM or Kalrez
Valve balls:	ceramics **optional** PTFE or stainless steel 1.4401
Weight:	7.4 kg
Colour:	blue RAL 5007

Electrical Data:

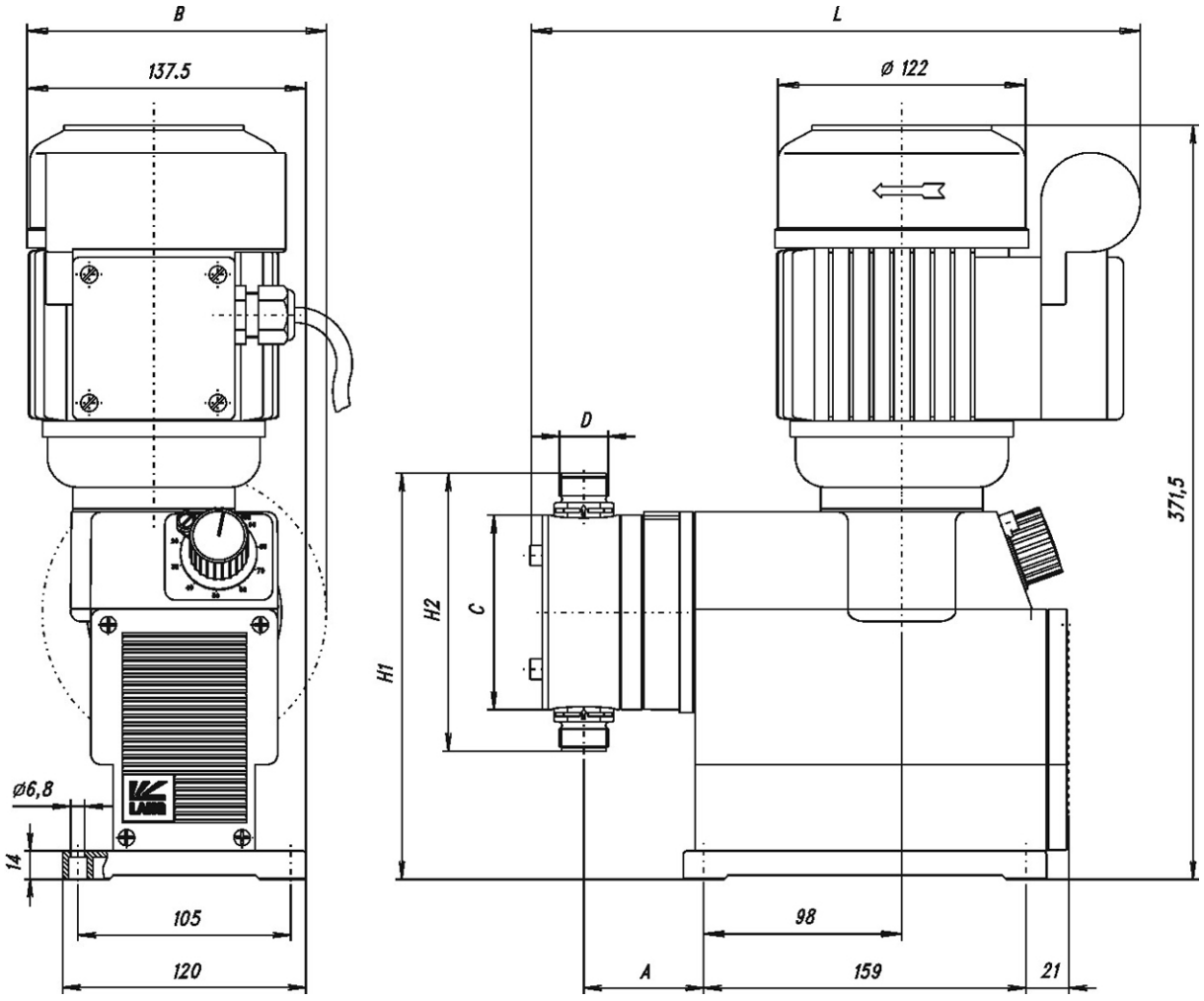
Connection:	230 V / 50/60 Hz At a mains frequency of 60 Hz, delivery capacity increases by 20%, whereas metering back-pressure decreases by 20%.
Current consumption:	950 mA (50 Hz)
Power output:	90 W (50 Hz)
Safety type:	IP 55
Insulation class:	F

All values at 50 Hz. All data refer to water temperature of 20 °C according to the instructions of the technical manual, subject to!

*For **EMP III HP (High Pressure)** version see page 25.
Other special versions on request.

Dimensions :

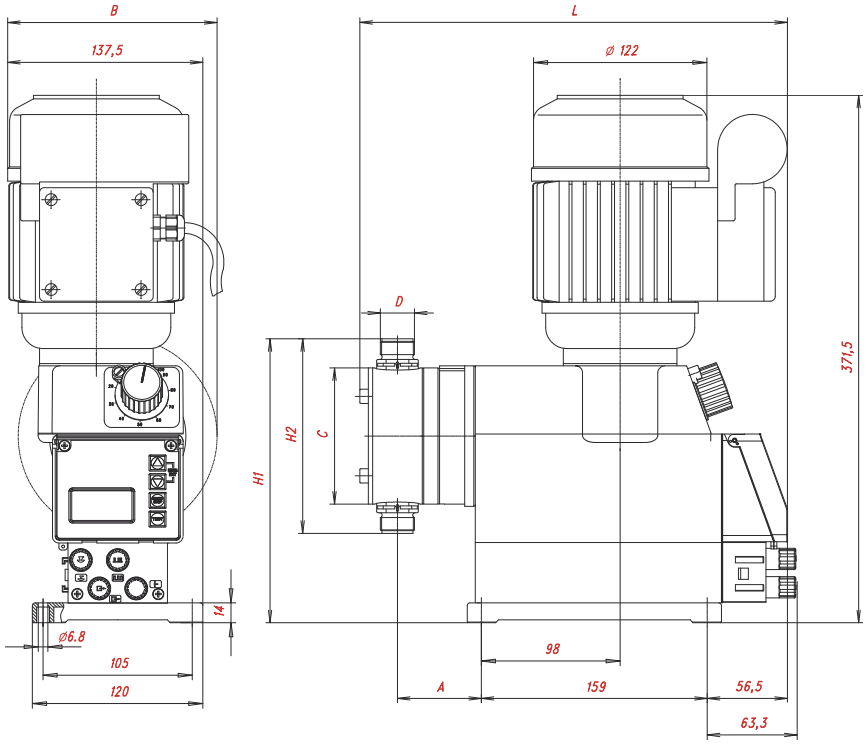
Version E00



Capacity	Dimensions [mm]					
l/h	A	C	L	H1	H2	D
16	59	∅ 96	301	200	137	5/8“
25	59	∅ 96	301	200	137	5/8“
54	63	∅ 96	303	200	137	5/8“

Dimensions:

Version E10 – E 60



Capacity	Dimensions [mm]					
l/h	A	C	L	H1	H2	D
16	59	∅ 96	301	200	137	5/8“
25	59	∅ 96	301	200	137	5/8“
54	63	∅ 96	303	200	137	5/8“

Pump code – part 1

1. Electrical version (please see legend on page 7)

E 00
E 10
E 60

2. Pump capacity 50 Hz [60 Hz]

00160	=	16 l/h	[19 l/h]
00250	=	25 l/h	[30 l/h]
00540	=	54 l/h	[64 l/h]

3. Pump material

PP	=	PP	(standard)
PV	=	PVDF	
VA	=	stainless steel	

4. Metering back pressure

10	=	10 bar	[8 bar]

5. Sealing material

EP	=	EPDM	
FP	=	Viton B	(standard)
KA	=	kalrez	

6. Valve ball material

KE	=	ceramics	(standard)
VA	=	stainless steel	
PT	=	teflon	

7. Valve material

PP	=	PP	(standard)
PV	=	PVDF	
VA	=	stainless steel	

8. Valve spring

99	=	without spring	(standard)

9. Mains supply

01	=	mains cable 2 m shock-proof plug (230 V)
02	=	mains cable 2 m end splices (115 V)
99	=	without cable

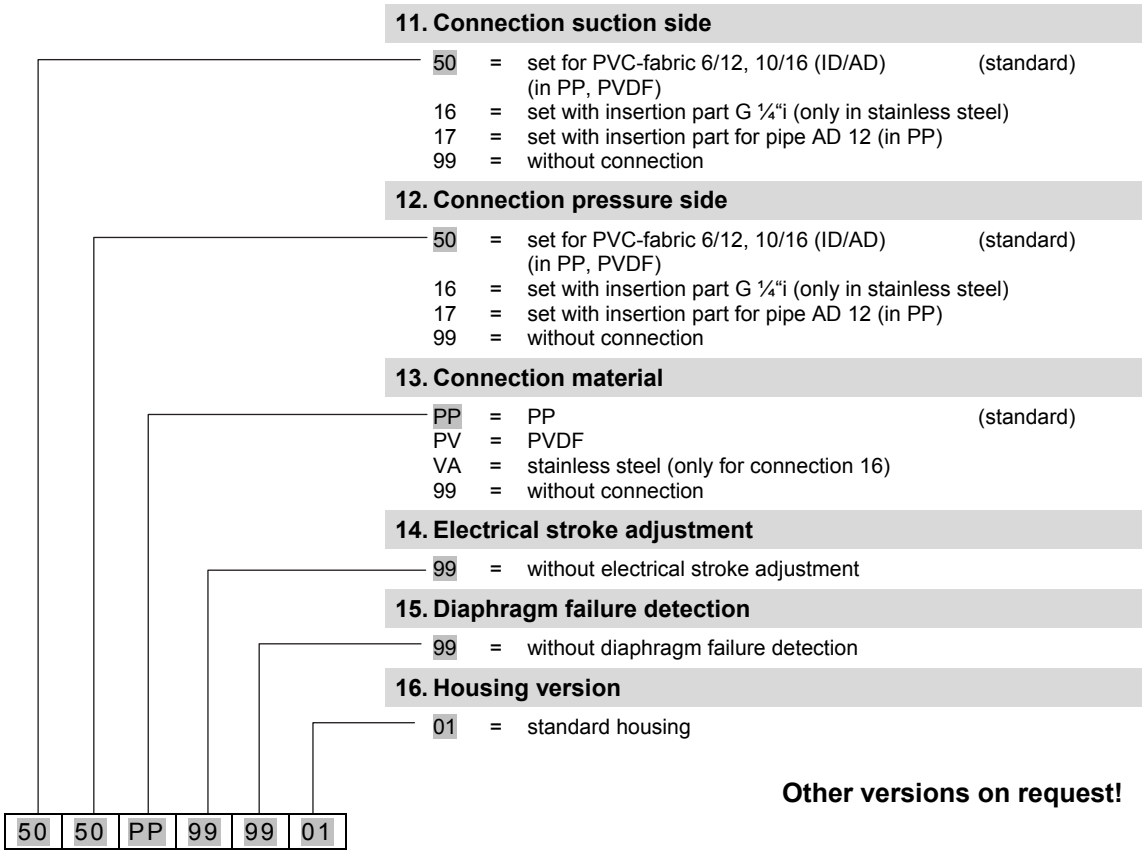
10. Power supply

08	=	230V / 50/60 Hz
09	=	115V / 50/60 Hz
10	=	3PE 400/230 V 50/60 Hz (only for version E00)

E60	00250	PP	10	FP	KE	PP	99	01	08

Other versions on request!

Pump code – part 2



Example of a complete pump code of a standard pump:

E60	00250	PP	10	FP	KE	PP	99	01	08	-	50	50	PP	99	99	01

(Pump code 1) (Pump code 2)

Electrical versions

E 00 Mechanical stroke adjustment

E 10 On / off switch, mechanical stroke adjustment

E 60
- Mechanical stroke adjustment
- Back-lit graphic display, 4 operating keys
- Single stroke control (each stroke is completely executed)
- Metering monitoring via stroke-signal output or via external metering-monitoring system (e.g. liquid level switch) possible
- Registration of operating and consumption data (calculative)
- Calibration function

Selectable operating modes:

Internal mode

Selection of metering rate/metering frequency via:
- Strokes/min
- Percent
- Liter/h (or gallon/h)

External mode
- Pulse mode (actuation via pulses)
  - Pulse multiplication (one incoming pulse = n metering strokes)
  - Pulse division (n incoming pulses = 1 metering stroke)
- Standard signal mode (actuation via external standard signal 0/4-20 mA or 20-0/4 mA)
- Charge mode (a previously selected quantity is metered, with initiation via an external initiation pulse)

Inputs:
- Level monitoring, package vessel (reserve and empty signal)
- Pulse
- Standard signal
- Enable (metering interlock)
- Metering control

Outputs:
- Level monitoring package vessel / malfunction
- Stroke signal

Ordering data – standard pumps:

Article	Pump code	Material-No.
ELADOS® EMP III	E00 00160 PP 10 FP KE PP 99 99 08 – 50 50 PP 99 99 01 E00 00250 PP 10 FP KE PP 99 99 08 – 50 50 PP 99 99 01 E00 00540 PP 10 FP KE PP 99 99 08 – 50 50 PP 99 99 01 **Extent of supply:** hose connection material 6/12 and 10/16 mm, operating instructions, **without** connection cable	149001 149101 149201
ELADOS® EMP III	E10 00160 PP 10 FP KE PP 99 01 08 – 50 50 PP 99 99 01 E10 00250 PP 10 FP KE PP 99 01 08 – 50 50 PP 99 99 01 E10 00540 PP 10 FP KE PP 99 01 08 – 50 50 PP 99 99 01 **Extent of supply:** 2.0 m connection cable with shock-proof plug, hose connection material 6/12 and 10/16 mm, operating instructions	149010 149110 149210
ELADOS® EMP III	E60 00160 PP 10 FP KE PP 99 01 08 – 50 50 PP 99 99 01 E60 00250 PP 10 FP KE PP 99 01 08 – 50 50 PP 99 99 01 E60 00540 PP 10 FP KE PP 99 01 08 – 50 50 PP 99 99 01 **Extent of supply:** 2.0 m connection cable with shock-proof plug, hose connection material 6/12 and 10/16 mm, dummy plug for empty signal input, dummy plug for pulse input, dummy cap for empty signal or stroke signal output, 5-pin connection plug for pulse or standard signal input, plug allocation plan, operating instructions	149560 149660 149760

ELADOS® EMP II E 60PLUS

With the add-on unit (Dongle Box) for connection of an OGMPLUS oval gear meter the version E 60 turns to version E 60PLUS.

Article	Material-No.
Dongle Box with the following additional functions: • Automatic readjustment of pump output in combination with an oval gear meter (for operating modes "internal" and "current" only) • Automatic calibration function via oval gear meter • Consumption data control by means of oval gear meter	248606

Accessories:

Oval gear meter
for volumetric measurement of the rate of flow

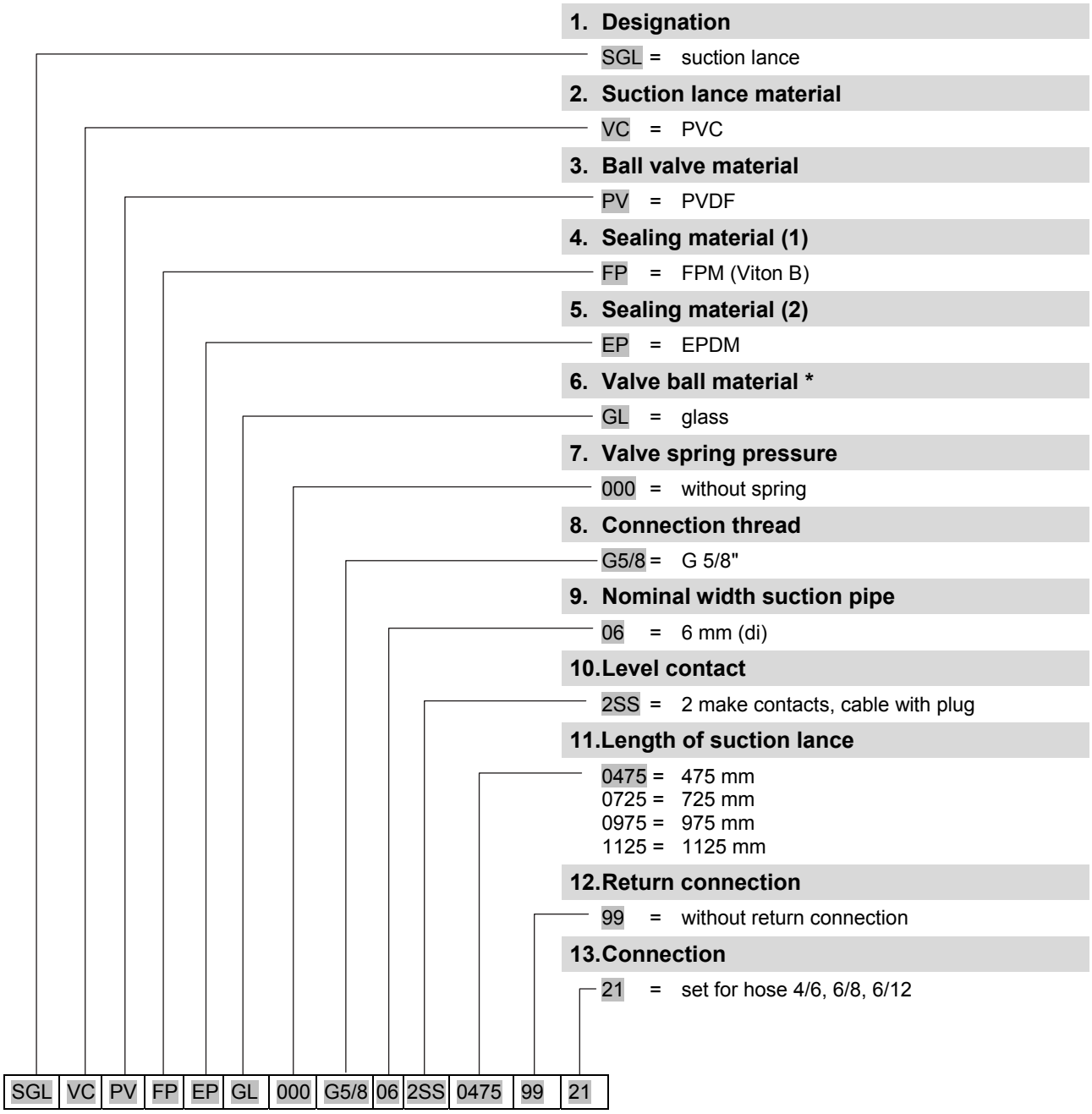
Ordering data are to be found in chapter 6 of “Measuring and Controlling”.

Accessories:

Article	Material No.
Suction lances D32 with reserve and empty signal report	
incl. of ball non-return valve, suction strainer and zero-potential empty signal contact (empty = contact interrupted), hose connection material (4/6 mm, 6/8 mm, 6/12 mm)	
Pipe diameter: 32 mm Connection cable: circular connector incl. 5 m cable Turn-on voltage: max. 50 V AC/DC Switching current: 0.5 A Rupturing capacity: 10 W / 10 VA	
SGL VCPVFPEPGL000 G5/8-06-2SS-0475-9921 (for container 20 l)	186140
SGL VCPVFPEPGL000 G5/8-06-2SS-0725-9921 (for container 30/60 l)	186141
SGL VCPVFPEPGL000 G5/8-06-2SS-0975-9921 (for container 100/200 l)	186142
SGL VCPVFPEPGL000 G5/8-06-2SS-1125-9921 (for container 200 l)	186143

Please see next page for pump code declaration.

Suction lance code



* standard valve ball material will soon be changed to ceramics

	Article	Material-No.
	**Adapter – insert cap** for suction lance Ø 32 mm PVC soft to attach on: canister 10 l and 20 l	286198
	**Adapter – screw joint** for suction lance Ø 32 mm PVC hard Thread pitch: 5 mm Threaded int. diameter: 56 mm Threaded ext. diameter: 61 mm can be screwed on: canister 30 l **or** container 60 – 200 l	286197
	**Suction lance adapter, rigid PVC/Viton B** for canister and barrel	288549
	**Suction lance adapter, rigid PVC/Viton B** for barrels (I-ring plus – barrel 220)	288547
	**Suction lance adapter, rigid PVC/Viton B** for container (ECOBULK-container with skid pallet) for screw in in screw cap with 2” Tri-Sure-Stuffing	288548

Article	Material-No.

Adapter – insert cap 288534

for suction lance Ø 32 mm
PVC – hard / Viton B
appropriate for **degassing products**

Return connection:	4/6, 6/8 or 6/12 mm (int.Ø /ext.Ø)
Vent connection:	6/12 mm (int.Ø /ext.Ø)
to attach on:	canister 30 l **or** container 60 – 200 l

Adapter – screw joint 288535

for suction lance Ø 32 mm
PVC – hard / Viton B / silicone
appropriate for **degassing products**

Return connection:	4/6, 6/8 or 6/12 mm (int.Ø /ext.Ø)
Vent connection:	6/12 mm (int.Ø /ext.Ø)
Thread pitch:	5 mm
Threaded int. diameter:	63 mm
Threaded ext. diameter:	69 mm

for barrel with internal thread (L–ring plus barrel 220 l)

Terminal box for connection cable of the suction pipe 288419

for connection cable with round plug
incl. cable union PG 7 (max. 2 x 1 m²)

Protection tubes for suction lances, D32

for prevention of mechanical damage of the suction valve and the float respectively;
suitable for all suction lances Ø 32 mm

Protection tube, PVDF, 32,5/40 (int.Ø /ext.Ø) 286191

incl. fastening screw

Protection tube, VA (1.4035), 32,5/40 (int.Ø /ext.Ø) 286153

incl. fastening screw

Bottom admission valve

1. Valve designation
BSV = bottom admission valve

2. Housing material
PV = PVDF

3. Valve body material
PV = PVDF

4. Sealing material
FP = Viton B
EP = EPDM

5. Valve ball material *
GL = glass

6. Valve spring pressure
000 = without spring

7. Thread connecting side
G 5/8

8. Connection
06 = set for PVC-fabric 6/12

BSV	PV	PV	FP	GL	000	G5/8	06

Article	Material-No.
BSV PV PV FP GL 000 G 5/8 – 06	249018
BSV PV PV EP GL 000 G 5/8 – 06	249024

* standard valve ball material will soon be changed to ceramics

Pulsation damper **Material-No.**

To reduce pressure peaks and pulsation at oscillating rotary pumps at the pressure side and to prevent cavitating at the suction side.

Stroke volume:	15 cm³/stroke
Admissible nominal pressure:	10 bar
Thread connection:	G ¾

PDS 080 D16 PP/Hypalon 415503009

Housing material:	PP
Sealing/diaphragms:	Hypalon

PDS 080 D16 PP/Viton 415503010

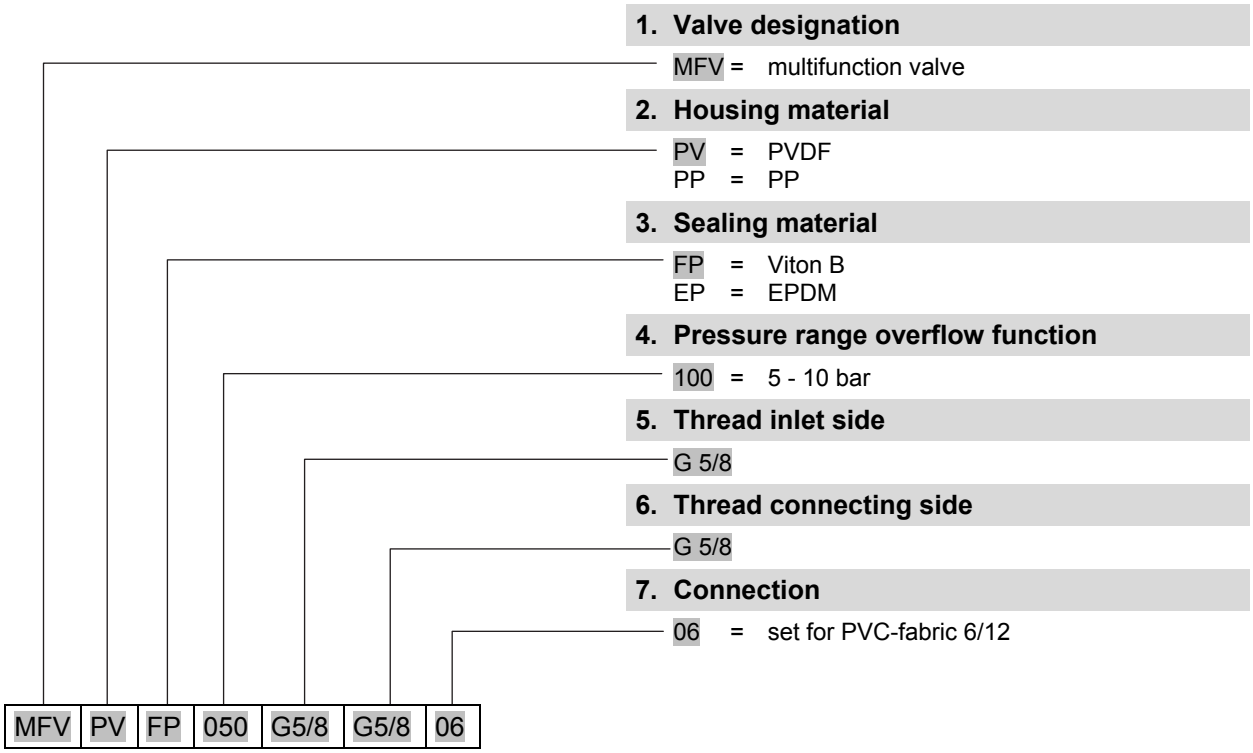
Housing material:	PP
Sealing/diaphragms:	Viton

Manometer 415502560
0-10 bar, connection G ¼

Attention:
When adjusting the initial pressure the pulsation damper has to be relieved on the metering media side.

Reduction G ½ a – G ¼ i 415202771

Multifunction valve



This safety-relevant component serves the purpose of protecting the piping system and the metering pump and permits safe and reliable commissioning and maintenance of the system.

The multiple function valve combines all of the following functions: **overflow, pressure maintenance, venting** and **drainage**

Article	Material-No.
MFV PP FP 100 G 5/8 – G 5/8 – 06	249249
MFV PP EP 100 G 5/8 – G 5/8 – 06	249269
MFV PV FP 100 G 5/8 – G 5/8 – 06	249243
MFV PV EP 100 G 5/8 – G 5/8 – 06	249263

Further material combinations on request!

Metering valves

1. Valve designation

DVM = metering valve with metering pipe
DVO = metering valve without metering pipe

2. Screw-in part material

VC = PVC
PV = PVDF
VA = stainless steel

3. Valve body material

PV = PVDF
VA = stainless steel

4. Sealing material

EP = EPDM
FP = Viton B

5. Valve ball / conical nipple material *

GL = glass

6. Valve spring pressure

002 = 0.2 bar
005 = 0.5 bar
009 = 0.9 bar

7. Thread screw-in side

G ½

8. Thread connecting side

G 5/8

9. Connection

16 = set with insertion part G1/4i
37 = set for hose 6/8, 6/12
99 = without connection

DVM	VC	PV	FP	GL	009	G1/2	G5/8	37

Article	Material-No.
DVM VC PV FP GL 009 G 1/2 – G 5/8 – 37	245037
DVM VC PV EP GL 009 G 1/2 – G 5/8 – 37	245034
DVM VA VA FP VA 009 G 1/2 – G 5/8 – 16	245039
DVM VA VA EP VA 009 G 1/2 – G 5/8 – 16	245036

* standard valve ball material will soon be changed to ceramics

Article	Material-No.
DVO VC PV FP GL 005 G 1/2 – G 5/8 – 37	249028
DVO VC PV EP GL 005 G 1/2 – G 5/8 – 37	249029
DVO PV PV FP GL 005 G 1/2 – G 5/8 – 99	249084
DVO PV PV EP GL 005 G 1/2 – G 5/8 – 99	249085
DVO VA VA FP VA 002 G 1/2 – G 5/8 – 99	249060
DVO VA VA EP VA 002 G 1/2 – G 5/8 – 99	on request

	Article		Material-No.
	Suction and pressure lines		
	available by the meter		
	(int.Ø/ext.Ø)	max. operating pressure (bar) at 20° C	
	PVC-fabric 6/12 mm	16 bar	417400123

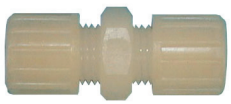
Note: We explicitly point out that PVC fabric tubes have a limited lifetime if alkaline chemicals will be used. To avoid damage for your staff and your company the tubes have to be exchanged at least every 6 months. In case of non-compliance we exclude all kinds of liability and responsibility.

	PVC hose fully transparent 6/8 mm	0.5 bar	417400015
	PVC hose fully transparent 6/10 mm	0.5 bar	417400017
	PE hose 6/8 mm	8 bar	417400310
	PTFE hose 6/8 mm	14 bar	417400224
	PE-X tube 8/12 mm, coiled bundle 50 m		417400361
	PE-X tube 8/12 mm, coiled bundle 200 m		417400363

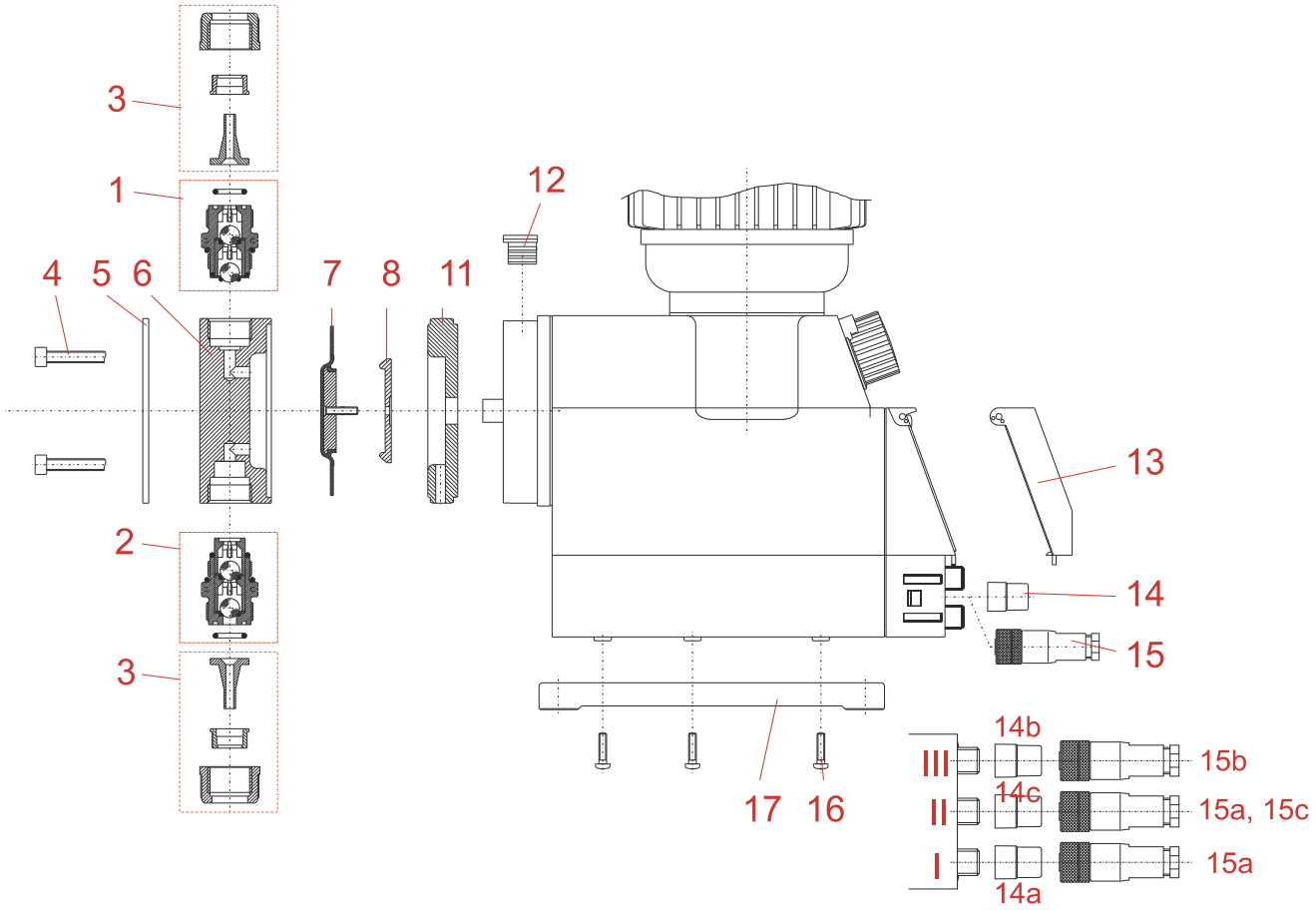
Screw connection for PE-X tube

	PP	PVDF
 Screw fitting G1/4"a - PEX 8/12	207726	207716
Screw fitting G3/8"a - PEX 8/12	207727	207717
Screw fitting G1/2"a - PEX 8/12	207722	207712

	PP	PVDF
 Screw on connection G5/8"i - PEX 8/12	207724	207714
Screw on connection G5/8"i - PEX 12/16	207728	207729

	Article	Material No.	
		PP	PVDF
	**T-Union** for PE-X tube 8/12	415102307	415102302
	**Straight union** for PE-X tube 8/12		415102065
	**Signal horn with integrated red flash light** 230 V / 50 Hz / IP 33 RO		418271053
	**Wall bracket** made of stainless steel 1.4301 incl. of attachment parts (dowels and screws)		286013
	**Connection cable, 5 m length**		
	for empty signal input with straight 4-pin plug		418439001
	for pulse or current input with straight 5-pin plug		418439007
	for empty signal or stroke signal output with straight 4-pin plug		418439022

Spare parts:

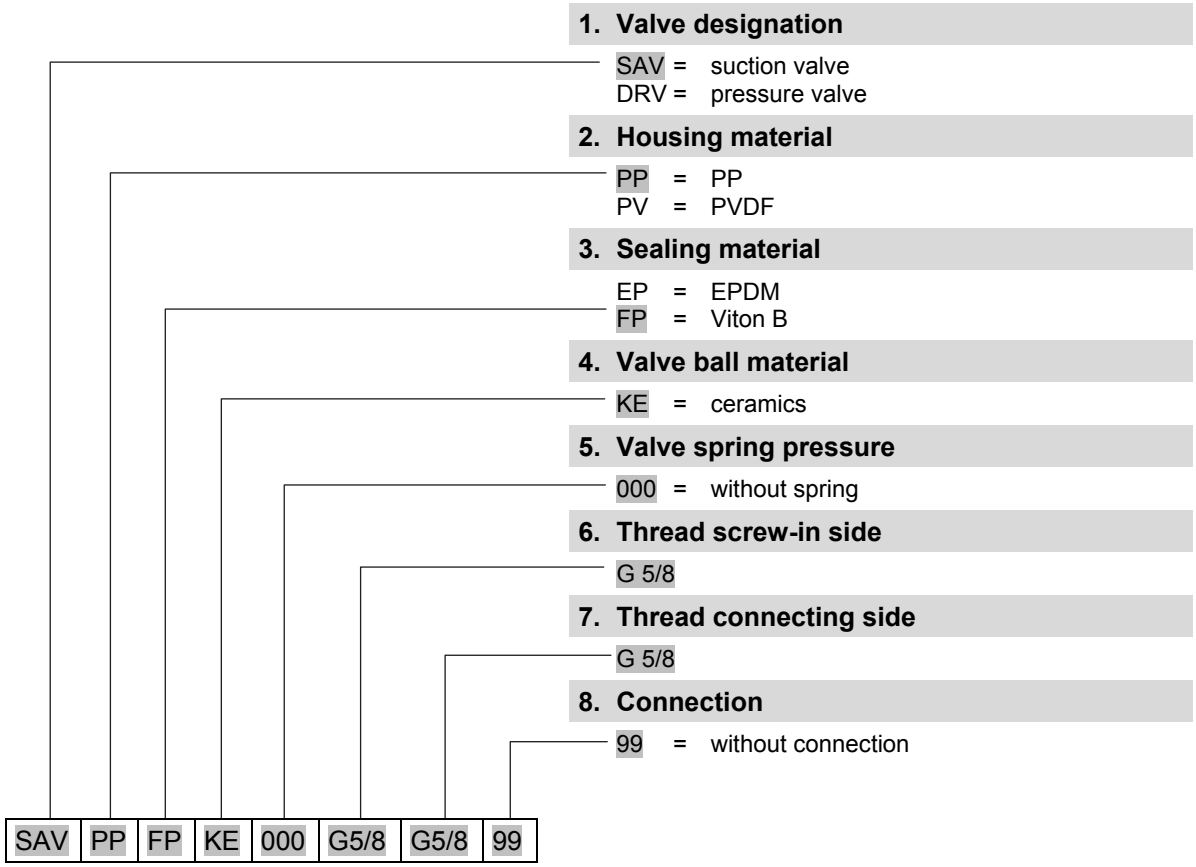

3
1
12
4
5
6
7
8
11
13
2
14
15
3
14b
III
15b
14c
II
15a, 15c
17
16
I
15a
14a

Item-No.	Article	Material-No.
1	Pressure valve DRV **PP FP** KE 000 G 5/8 – G 5/8 – 99* DRV **PP EP** KE 000 G 5/8 – G 5/8 – 99* DRV **PV FP** KE 000 G 5/8 – G 5/8 – 99* DRV **PV EP** KE 000 G 5/8 – G 5/8 – 99*	249491 249493 249494 249495
2	Suction valve SAV **PP FP** KE 000 G 5/8 – G 5/8 – 99* SAV **PP EP** KE 000 G 5/8 – G 5/8 – 99* SAV **PV FP** KE 000 G 5/8 – G 5/8 – 99* SAV **PV EP** KE 000 G 5/8 – G 5/8 – 99*	249471 249473 249474 249475
3	Connection set **PP** G 5/8 – 6/12, 10/16 mm Connection set **PVDF** G 5/8 – 6/12, 10/16 mm (consisting of union nut, clamping piece and tapered parts)	249237 249216
4	Pump head screw M6 x 90	413031048
5	Pressing plate	34900138
12	Covering stopper	34900168
13	Transparent enclosure cover	34800120
14a	Dummy plug empty signal input	248186
14b	Dummy plug control input	248187
14c	Cover cap control output	34800117
15a	4-pin plug, empty signal input	418463115
15b	4-pin plug, control output	418463117
15c	5-pin plug, control input	418463118
16	Screw KB 40 x 16	413071167
17	Mounting plate	34900120

Item-No.	Article	16 l/h	25 l/h	54 l/h
6	Pump head **PP** Pump head **PVDF**	34900102 34900175	34900103 34900176	34900104 34900177
7	Diaphragm	34900108	34900109	34900110
8	Supporting disk	34900131	34900113	34900145
11	Intermediate plate	34900132	34900115	34900133

* Please see next page for code declaration.

Valve code

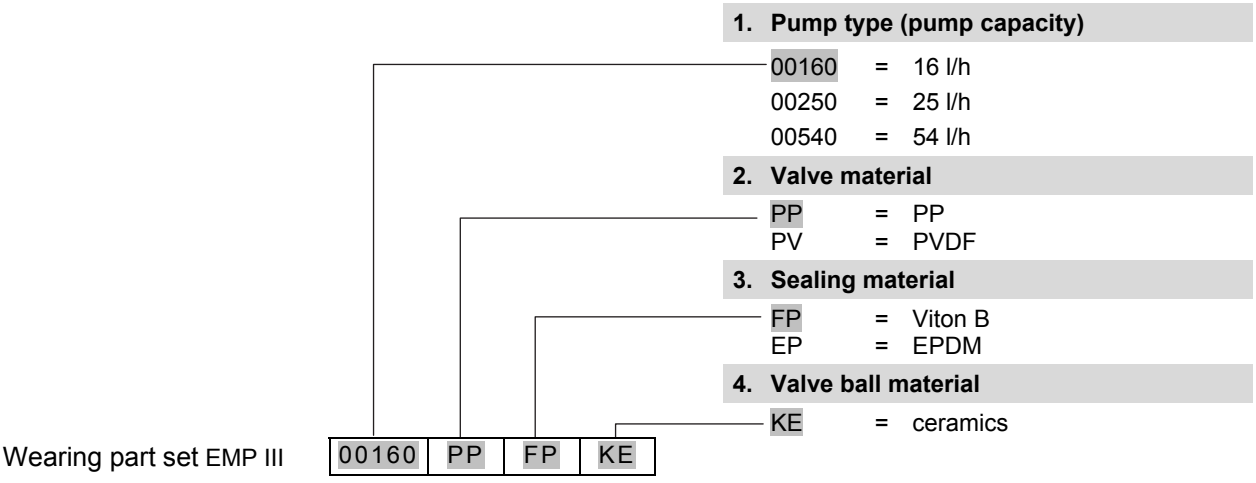

1. Valve designation
SAV = suction valve
DRV = pressure valve
2. Housing material
PP = PP
PV = PVDF
3. Sealing material
EP = EPDM
FP = Viton B
4. Valve ball material
KE = ceramics
5. Valve spring pressure
000 = without spring
6. Thread screw-in side
G 5/8
7. Thread connecting side
G 5/8
8. Connection
99 = without connection
SAV
PP
FP
KE
000
G5/8
G5/8
99

Set of wearing parts (complete)

consisting of 1 piece each:

- Suction valve with hose connection material
- Pressure valve with hose connection material
- Diaphragms
- Supporting ring

Article	Code	Material-No.
Wearing part set	EMP III 00160 PP FP KE	249106
	EMP III 00250 PP FP KE	249111
	EMP III 00540 PP FP KE	249112
	EMP III 00160 PP EP KE	249113
	EMP III 00250 PP EP KE	249114
	EMP III 00540 PP EP KE	249115
	EMP III 00160 PV FP KE	249116
	EMP III 00250 PV FP KE	249117
	EMP III 00540 PV FP KE	249118
	EMP III 00160 PV EP KE	249119
	EMP III 00250 PV EP KE	249120
	EMP III 00540 PV EP KE	249123



- **Mechanical stroke adjustment**
- **Stroke frequency regulation**
- **Pulse control**
- **Pulse multiplication and division**
- **Pulse memory**
- **Standard signal control**
- **Empty signal and low level warning**
- **External metering lock**
- **Empty signal and stroke signal output**

The ELADOS® EMP III series of metering pumps is constructed on the building block principle. It comprises the drive unit, the gear box unit, the metering pump head and the electronics. Different designs of drive option allow the pump to be adapted to any processing sequence for quantity or proportional metering. The scope of delivery is rounded off by practical accessories, so forming a complete range of equipment for all metering uses.

Note: **The pump versions EMP III HP (High Pressure) 00160 and 00250 can be operated with a higher metering back pressure.**

Technical Data:

Mechanical Data:

Pump type:	**00160**	**00250**
Pump capacity [l/h]:	**14.7**	**23.5**
Metering back-pressure [bar]:	**16**	**12**
Delivery per stroke [cm³]:	**1.98**	**3.15**
Metering accuracy:	< ± 3 %	
Suction height:	2 mWs, suction	
height	with clean, slightly	
wet	valves	
Max. metering frequency:	124 1/min	
Pressure valve:	without spring	
Suction valve:	without spring	
Ambient temperature:	max. 40° C	

Materials:

Housing:	thermoplastic polyester
Pump head:	polypropylene **optional** PVDF, PVC or stainless steel 1.4571
Diaphragm:	PTFE - EPDM compound diaphragm
Seals:	FPM 602 (Viton B) **optional** EPDM or Kalrez
Valve balls:	Duran glass **optional** PTFE or stainless steel 1.4401
Weight:	7.4 kg
Colour:	blue RAL 5007

Special versions on request

Electrical Data:

Connection:	230 V / 50/60 Hz At a mains frequency of 60 Hz, delivery capacity increases by 20 %, whereas metering back-pressure decreases by 20 %. Special voltages on request
Current consumption [mA]:	950 (50 Hz)
Power output [W]:	90 (50 Hz)
Safety type:	IP 55
Insulation class:	F

All values at 50 Hz. All data refer to water temperature of 20° C according to the instructions of the technical manual, subject to!

Pump code – part 1

1. Electrical version (please see legend on page 7)

E 00 mechanical stroke adjustment
E 10 ...
E 60 ...

2. Pump capacity 50 Hz [60 Hz]

00160	=	14.7 l/h	[17.6 l/h]
00250	=	23.5 l/h	[28.2 l/h]

3. Pump material

PP	=	PP	(standard)
PV	=	PVDF	
VA	=	stainless steel	

4. Metering back pressure (depends on pump capacity)

12	=	12 bar (für 23.5 l/h)	[9.6 bar]
16	=	16 bar (für 14.7 l/h)	[12.8 bar]

5. Sealing material

EP	=	EPDM	
FP	=	Viton B	(standard)
KA	=	kalrez	

6. Valve ball material

KE	=	ceramics	(standard)
VA	=	stainless steel	
PT	=	teflon	

7. Valve material

PP	=	PP	(standard)
PV	=	PVDF	
VA	=	stainless steel	

8. Valve spring

99	=	without spring	(standard)

9. Mains supply

01	=	mains cable 2m shock-proof plug
02	=	mains cable 3-wired 2.4 m end sleeves
03	=	mains cable 3-wired 3 m end sleeves
09	=	mains cable USA version
13	=	mains cable Italy version
99	=	without cable

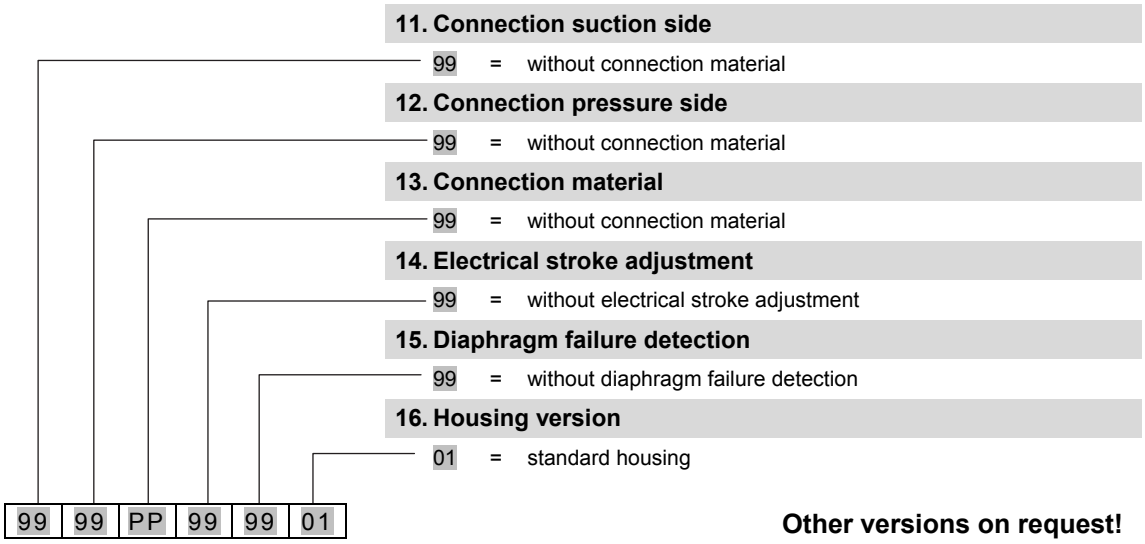
10. Power supply

01	=	115V / 50 Hz	
02	=	115V / 60 Hz	
03	=	230V / 50 Hz	(standard)
04	=	230V / 60 Hz	
10	=	3PE 400/230 V 50/60 Hz (only for version E00)	

E60	00250	PP	12	FP	KE	PP	99	01	03

Other versions on request!

Pump code – part 2



Example of a complete pump code of a EMP III HP pump:

E60	00250	PP	12	FP	KE	PP	99	01	03	-	99	99	99	99	99	01
	(Pump code 1)										(Pump code 2)					

Note: **For pump versions EMP II HP the hose connection material has to be ordered seperately (see page 29).**

Accessories:

Note: **Accessories selection should be carried out in the following way:**

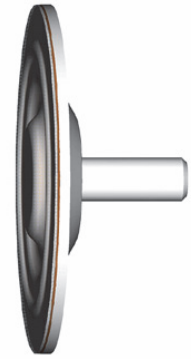
Accessories for the **suction side** can be selected from the standard versions **(see page 10 – 14)**.

General accessories can be selected from the standard versions **(see page 19/20)**

Accessories for the **pressure side** have to be equipped with hose connection material which is suitable for high pressure. **This has to be ordered separately (see page 29).**
In case of multifunction valves and pressure hoses the accessories suitable for high pressure have to be used (see below).

	Article		Material-No.
	**Connection material (pressure side)**		
	Straight screw on connection PVDF		
	Connection G5/8"i for hose 6/10		415102353
	Suction and pressure lines (available by the metre)		
	(int.Ø/ext.Ø)	max. operating pressure [bar] at 20° C	
	PTFE hose 6/10 mm	16	417400216
	HD-PE hose 6/10 mm	16	417400302

Note: **Spare parts for EMP III HP can be selected from the standard versions (see p. 21) with the exception of diaphragms.**



Diaphragme

PTFE coated

for pump type 00160	34900288
for pump type 00250	34900289