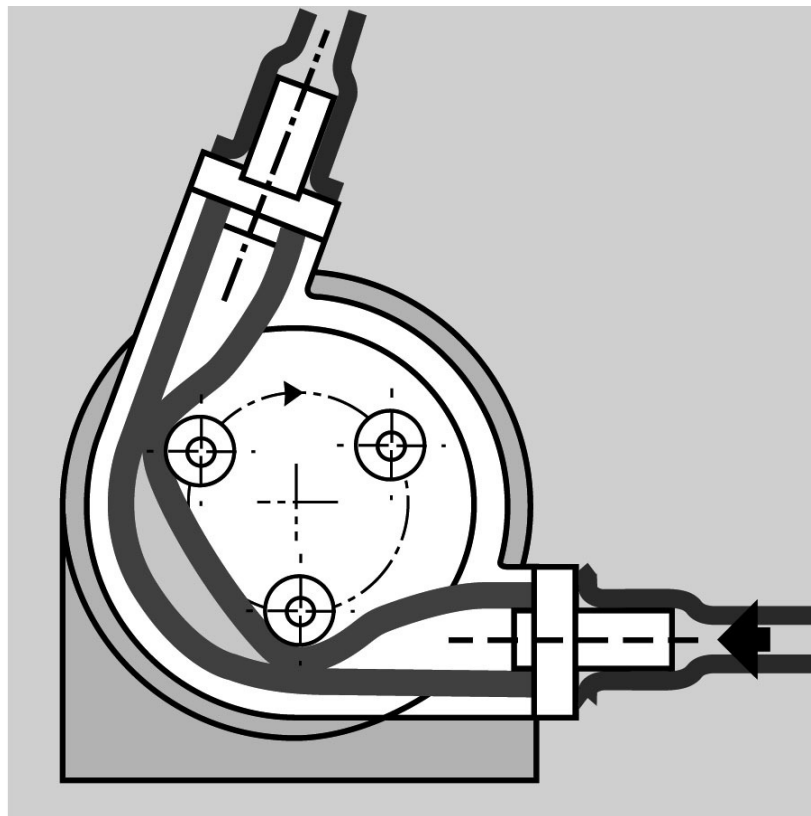


Ponndorf

Hose Pump
Type *P_classic*
15 - 50



Operation Manual

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2. General

2.1 Pump data sheet

Type: P_classic 15 0 -
Serial no.: 25426
Year of manufacture: 2014

Customer/Customer no.: Korea P & S; Daejeon
Customer's order no.: PS1312-575
PONNDORF reference no.: 331053

Pumping media

Description:
Dynamic viscosity:
Density:
Temperature:
Solids content:

Pump

Make: PONNDORF
Type (model/size) P_classic 15-0
Pump no.: 25426
Hose materials: Natural Rubber
Connections: Stainless Steel
Flow rate ¹⁾: Up to 500 l/h water at 0 bar counter pressure
Max. discharge pressure: 2 bar
Max. suction lift: 7 m H₂O
Casing material: Aluminum alloy
Paint: RAL 5003
Explosion protection: see page 3 – topic 1.)

Included in delivery: 1 pump hose, 2 connection sockets (execution see above) 250 g Ponndorf Special Grease

¹⁾ The above mentioned flow rate is based on pumping water at 0 bar discharge pressure and supply on the suction side.

Drive

Design

Type:

Make:

Serial no. gear unit:

Mounting position:

Output speed n_2 :

Motor power:

Serial no. motor:

Voltage / frequency:

IP rating:

Paint:

Explosion protection: see page 3 – topic 2.)

Hose monitoring

Type:

Make:

Explosion protection: see page 3 – topic 3.)

Switch cabinet

Serial no.

Make:

Explosion protection: see page 3 – topic 4.)

Coupling

Type:

Make:

Explosion protection: see page 3 – topic 5.)

Application in area exposed to explosion hazards

The hose pump delivered type **P_classic xx xxxx**
complies to the explosion classification **xxxxx**

and consists of the following single components:

- | | | |
|-----|------------------|--------------|
| 1.) | Pump: | xxxxx |
| 2.) | Drive: | xxxxx |
| 3.) | Hose monitoring: | xxxxx |
| 4.) | Switch cabinet: | xxxxx |
| 5.) | Coupling: | xxxxx |

2.2 Service address

PONNDORF GERÄTETECHNIK GmbH
Leipziger Strasse 374
D - 34123 Kassel
Tel. +49 561 51139 - 0
Fax: +49 561 51139 - 88
E-Mail: info@ponndorf.de

2.3 General information

Ponndorf Hose Pumps are a self-priming positive displacement pumps without any glands or valves. The pumping medium only comes in contact the inner surface of the pump hose, but not with the moving parts of the pump. Therefore the pumps are particularly suitable for pumping aggressive, abrasive and viscous liquids, but as well for pumping liquids containing coarse-grained solids and sensitive materials which require to be pumped gently.



Priming and pumping of combustible gases or fumes is prohibited. Start up and close down operations which require this should only be rarely and kept as short as possible. A dry run of the pump has to be avoided generally. Appropriate measures have to be taken by operator.



Hose pumps are only intended to pump free-flowing liquids but not to pump gaseous pumping media.



To guarantee the tightness and chemical compatibility of the pump hoses, the manufacturer of the hose pump must be consulted in case of possible changes of the pumping media unless this information does not appear from available documents.

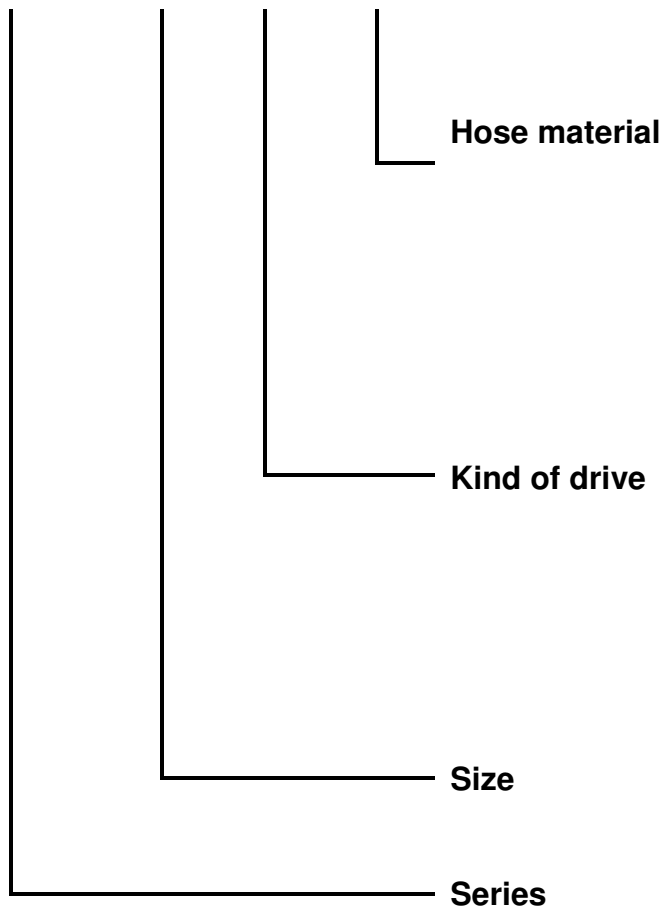


To avoid blockages of the pumps and/or any other damages of pumps or pump hoses, the operator must guarantee that no hose damaging objects can invade the hoses (e.g. sharp-edged or too big and not pumpable objects). A suitable strainer may be used as protection.

2.4 Key to model no.

Example:

P_classic 15 - GM - NR



NR	= natural rubber
N	= neoprene
NKF	= natural rubber according to 21 CFR of FDA

0	= without drive, coupling and base plate (bare shaft end)
GM	= with gear motor
GM/FU	= with gear motor incl. 3 thermistors for frequency converter use
GM/FU/FL	= like GM/FU, but with additional separate fan
GM/FUC	= with gear motor with integrated frequency converter
RST	= with variable speed drive

= Inside diameter (ID) of pump hose

The pump series and size as well as the pump no. are noted on the nameplate.
The pump no. can also be found at the bottom of the pump casing.

2.5 Guarantee

The guarantee for defects of any goods delivered by us is stated in our Terms and Conditions of Sale.

We do not assume any liability for defects and damages which are caused by non-observance of the instructions of the operation manual.

Furthermore we assume no liability for defects or damages which are caused by changing the operating conditions (use not in accordance with the intended use), e.g. use of a different pumping medium for which the pump hose is not suitable for, higher temperature which exceed the maximum permissible or line losses caused by media with a too high viscosity.

2.6 Technical data

		P_classic 15	P_classic 27	P_classic 35	P_classic 50
Max. flow rate:	[l/h H ₂ O]	500	2.000	5.700	12.000
Max. pressure:	[bar]	2			
Max. suction height:	[m H ₂ O]	7			
Max. viscosity of pumping media:	[mPas]	35.000			
Max. motor power:	[kW]	0,37	0,37	1,5	2,2
Weight: construction 0 construction GM construction RST	[kg]	7,0 35,5 40,5	14,0 43,5 48,5	26,0 max. 93,7 max. 90,7	42,0 max. 115,7 123,7
Hose material		Natural rubber, neoprene, natural rubber according to 21 CFR of FDA			

3. Safety

These instructions contain basic recommendations that should be followed during installation, operation and maintenance. Therefore the operation manual has to be read by the fitter and qualified personnel/operator before installation and operation and must always be available at the location of the machine/facility.

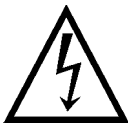
Not only the general instructions of safety mentioned in chapter - Safety - have to be observed. The more specific safety instructions mentioned in other chapters must be observed, too.

3.1 Marking of details in the operation manual

Non-observance of the safety instructions of this operation manual can endanger people. Those instructions are particularly marked with the following general danger signs:



Safety sign according to DIN 4844 - W 9



Safety sign according to DIN 4844 - W 8
when warning of electrical hazards



This sign is used to mark instructions of the manual which are safety relevant when operating the pumps in hazardous locations.

CAUTION

In case of safety instructions which can cause dangers for the machine or its performance the term **CAUTION** is interpolated.

Signs directly fixed to the machine, e.g.

- arrows which indicate the flow rotation
- signs for fluid connections

have to be observed and must be kept in a readable condition.

3.2 Safety instructions for hose pumps in hazardous locations



- Explosive gas mixture or dust concentration can cause serious or even fatal injuries in conjunction with hot, voltage, pressurized and moved parts of the pump
- Only qualified technical personnel is authorized to effect installation, connection, operation as well as maintenance and repair works in consideration of
 - provided instructions
 - danger signs and/or decal information
 - every other provided instructions for the user
 - the system-dependent regulations and requirements
 - the currently valid regulations concerning explosion protection and safety as well as rules for accident prevention
- **The pump in connection with the mobile base plate only fulfils the ATEX directive (EC Directive 94/9/EC) in a stationary condition.**

In case of moving the pump the operator has to make sure that no explosive environment exists!

3.3 Intended use



- Ponndorf Hose Pumps are intended for use in commercial facilities and are only permitted for use in accordance to the information of the technical documentation and of the nameplate. They comply to the currently valid standards and regulations and meet the requirements of the European directive 94/9/EC.
- If a pump is coupled to a drive unit, the operating manual of the drive and other provided components must be observed, too.

Before placing the pump into operation the operator must make sure that

- the pump and all other components were not damaged during the carriage.



- the information on the nameplate concerning equipment group and category, zone, temperature class and explosion group accords with the permissible use in the particular hazardous location.

- the air temperature of the ambience of the pump is observed.

- the maximum temperature of the pumping media is not exceeded.



- there is a sensor of the leakage detector assembled which meets the ATEX requirements.

- pump hose, clamping rings and connecting sockets are mounted properly and the pump hose is greased sufficiently with Ponndorf special grease (as described in chapter 6.4).

In case of any discrepancies the pump must not be placed into operation!

While placing the pump into operation the characteristics (pump speed, pressure) which are prescribed in the manual and on the nameplate must not be exceeded.

3.4 Qualification and training of personnel

The technical personnel responsible for operation, maintenance, inspection and installation must be qualified for this work. Fields of responsibility, competencies and the supervision of the personnel have to be exactly regulated by the operator. If the personnel is inadequately skilled it must be trained and instructed. If necessary, this may be effected by order of the operator by the manufacturer/supplier.

Furthermore the operator has to make sure that the personnel did absolutely catch the contents of the operation manual.

3.5 Dangers in case of non-observance of the safety instructions

Non-observance of the safety instructions can endanger people, environment and equipment and can result in losing any claim for damages.

In detail non-observance can **for instance** result in the following dangers:

- failure of important functions of the machine/facility
- failure of methods prescribed for maintenance
- threat to people because of electrical, mechanical and chemical effects
- danger to the environment because of leakage of hazardous substances

3.6 Safety-conscious working

The safety instructions of this manual, the existing national rules for accident prevention as well as potential instructions of the operator for work, operation and safety have to be observed.

3.7 Safety instructions for the operator/user

- If hot or cold machine parts cause dangers, the operator is responsible for a protection against contact.
- The protection against contact of moving parts of machines in operation (e.g. coupling) must not be removed.
- Leakages of hazardous pumping media (e.g. explosive, toxic, hot) have to be discharged in a way which guarantees that no dangers to people and environment arise. Legal regulations have to be observed.
- Dangers caused by electrical power have to be eliminated.
(Please see also regulations e.g. of the VDE (in Germany) or of the local power supply companies.)



3.8 Safety instructions for maintenance / inspection / assembly

The operator has to make sure that all maintenance, inspection and installation works will be effected by authorized and qualified technical personnel, which is familiar with the contents of the operating manual.

Basically all works may only effected during shutdown periods. The proceeding to shutdown the machine described in the operating manual must be strictly observed.

Pumps or aggregates which convey harmful media have to be cleaned.

When works are finished all safety installations and protectors must immediately be refitted or be put into operation.

The articles of chapter 6 (Installation / Connection / Operation) have to be observed before reconnection.

3.9 Unauthorized modifications or use of unoriginal parts

Modifications of the machine are only permissible after prior consultation of the manufacturer. Original spare parts and accessories authorized by the manufacturer serve the safety. Use of other parts can repeal the liability for any consequences.

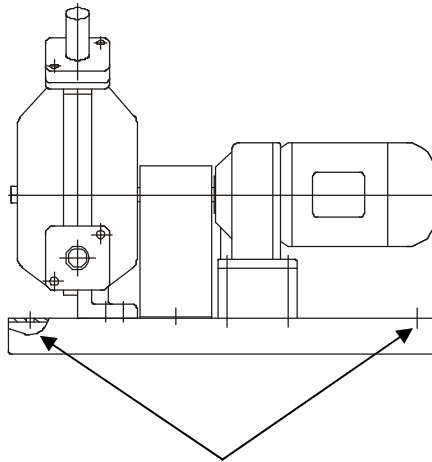
3.10 Unauthorized operating methods

The reliability of the supplied machine is only guaranteed in case of intended use in accordance to chapter 2 - General - of the operating manual.
The limit values stated in the data sheet must not be exceeded in any way.

4. Transport and storage



- When choosing lifting tools and separate lifting accessories the weight of the pump must be taken into consideration. The corresponding accident prevention regulations have to be observed.
(In Germany: UVV "Lastaufnahmeeinrichtungen im Hebezeugbetrieb", BG 9a)



Holes for lifting the pump
(resp. to fix the base plate of stationary pumps)

Storage

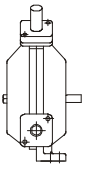
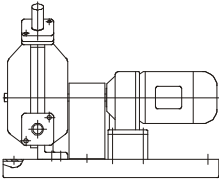
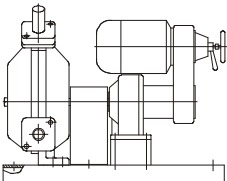
The pump has to be protected against humidity when stored.

CAUTION

In case of longer standstill before placing the pump into operation do not assemble the pump hose, during longer shutdown periods remove the hose from the pump. Otherwise the hose could be warped by the constant compression of the rollers!

5. Description of pump and accessories

The pump head is connected with the drive by a coupling. Pump head and drive are completely mounted on a base plate. Construction "0" means that the pump head is supplied with bare shaft extension.

	Construction	Description
	- 0	- pump head with bare shaft extension, without drive
	- GM - GM / FU - GM / FUC	- pump with gear motor - pump with gear motor incl. thermistors for frequency converter use - pump with gear motor with integrated frequency converter
	-RST	- pump with variable speed drive

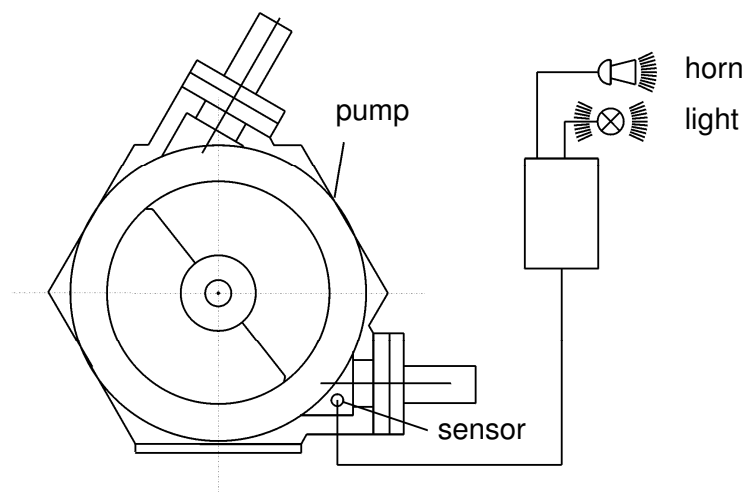
	P_classic 15	P_classic 27	P_classic 35	P_classic 50
Material of pump casing:	Aluminium alloy			
Material of base plate:	Steel (standard)			
Paint of the complete pump:	RAL 5003 (standard)			
Diameter of shaft:	15 mm	15 mm	25 mm	25 mm
Fit:	H7/k6	H7/k6	H7/f7	H7/k6

5.1 Detector for hose leakages

The hose leakage detector is for a continuous monitoring in order to avoid unnoticed hose leakages.

Functional description

In case of a hose leakage the pump can be switched off and an alarm (horn/signal lamp) can be activated. This is only possible when using a motor contactor.



The following mentioned detectors for hose leakages are available:

art.-no. 93-000-001

Detector for hose leakages for operating the pumps in non-hazardous locations and for electrically conductive media.

art.-no. 93-000-009

Detector for hose leakages for operating the pumps in hazardous locations and for electrically non-conductive media.

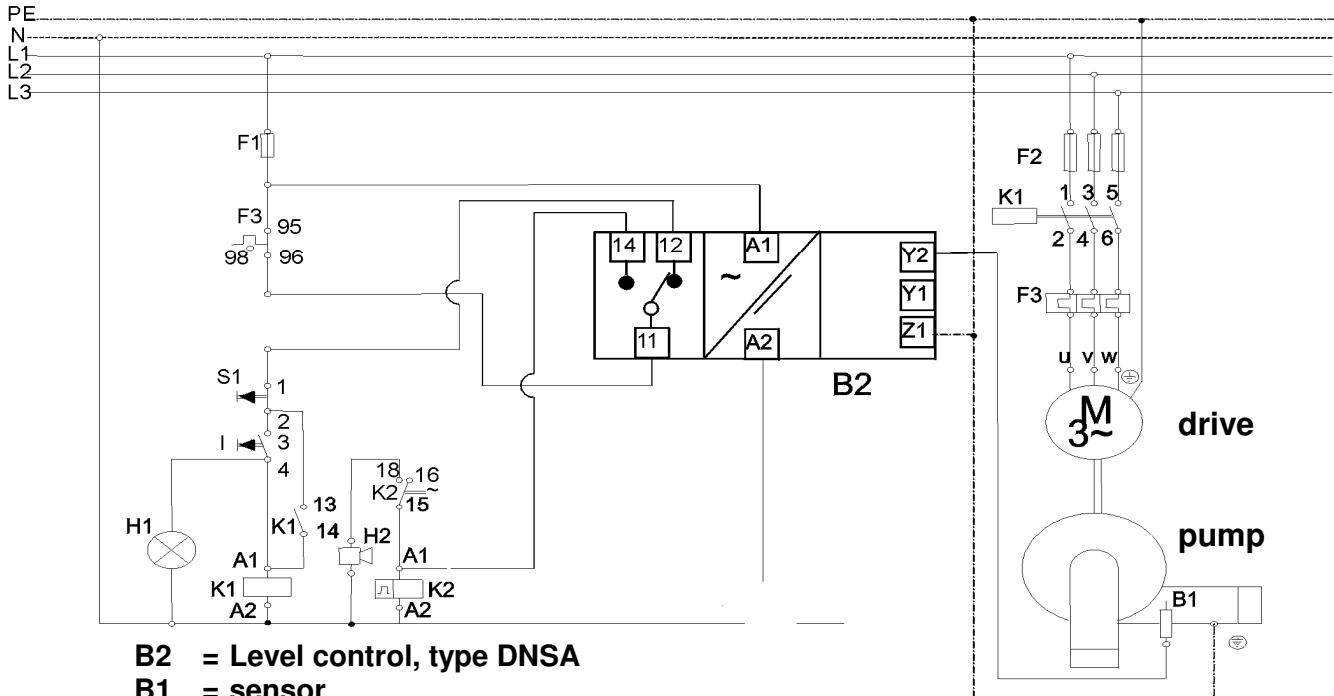
art.-no. 93-000-007

Detector for hose leakages with SPC sensor for operating the pumps in non-hazardous locations.

5.2 Diagram of the leakage detector for operating the pumps in non-hazardous locations (art.-no. 93-000-001)

The following diagram is only valid for the leakage detector consisting of:

- sensor for leakage detector (make Ponndorf, standard)
- switch amplifier (make: Disibeint, type DNSA)



- B2 = Level control, type DNSA**
- B1 = sensor**
- F1 = fuse**
- F2 = motor fuse**
- F3 = motor overloads**
- H1 = run light**
- H2 = signal horn, signal lamp**
- K1 = motor contactor**
- K2 = flasher (0,5 sec.)**
- M = motor (pump drive)**
- S1 = push button**



The connections must only be made by qualified and authorized personnel!



The standard detector for hose leakages is not suitable for use in hazardous locations and non-conductive media.

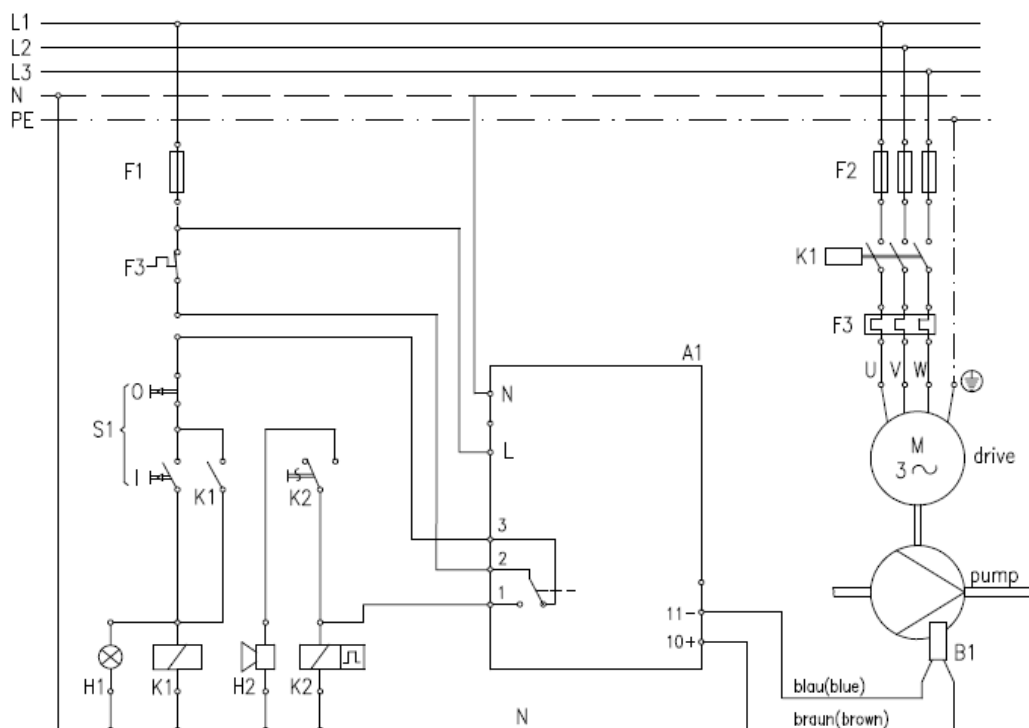
5.3 Diagram of the leakage detector for operating the pumps in non-hazardous locations (art.-no. 93-000-009)

The following diagram is only valid for the leakage detector consisting of:

- capacitive proximity switch (make: Rechner, Typ KAS-40-14-N-M12)
- switch amplifier (make: Rechner, Typ N-132/1-01)



The switch amplifier must not be used in hazardous locations. It has to be strictly installed outside of these areas.



A1 – switch amplifier type N-132/1-01
 B1 – capacitive sensor (2-wire NAMUR)
 F1 – control fuse
 F2 – motor fuse
 F3 – motor protection relais
 H1 – control lamp-operation

H2 – signal horn, signal lamp
 K1 – motor contactor
 K2 – flasher relais 0,5 sec.
 M – motor – pump drive
 S 1 – double push button



The connections must only be made by qualified and authorized personnel!

6. Installation / Connection / Operation

Installation

The installation of the pump depends on the pump type and can be made stationary or movable (on wheels).

6.1 Installation of pumps in hazardous locations



- When pumps have to be installed in hazardous locations the instructions in chapter 3.2 must be strictly observed.
- Ponndorf Hose Pumps of series P_classic for hazardous location use (optional!) meet the construction requirements of equipment group II, category 2G. They are intended for use in zone 1.
- Hose pumps for hazardous location use in construction “0” (see chapter 5 - Description of pump and accessories -)¹⁾
 - are in accordance with temperature class T4.
 - are intended for use at an ambient temperature between +2 °C and +40 °C (permissible temperature of place of installation).
 - are suitable for pumping media with a maximum temperature of:
 - +60 °C in continuous operation
 - +80 °C in short-time operation
 - fulfill the requirements for non-electrical devices of the type of protection C - protection by constructional safety - according to EN 13463-1 and EN 13463-5.
 - are allowed for the explosion group IIB.

¹⁾ **The explosion protection for complete aggregates can diverge!** The details of the enclosed declaration of conformity are relevant!

6.2 Electrical connection



The connections must only be made by qualified and authorized personnel!

The connections must be made according to the wiring diagram in the terminal box.

For instructions to effect the electrical connection please see the attached manual of the pump drive!



The pump must be protected by fuses and a protective motor switch according to the nominal current of the motor.



The pumps must be integrated in the equipotential bonding of the whole plant. For example this can be made by grounding the base frame by using the grounding terminal in the terminal box of the motor.

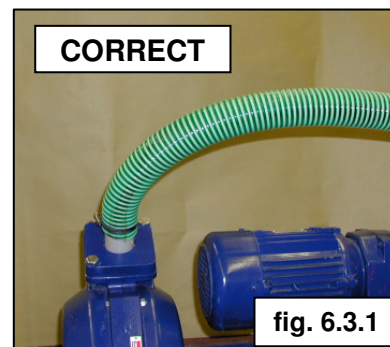
6.3 Mechanical connection

The nominal width of the tubing at the suction and the discharge side should be approx. 25 % bigger than the nominal width of the pump hose.

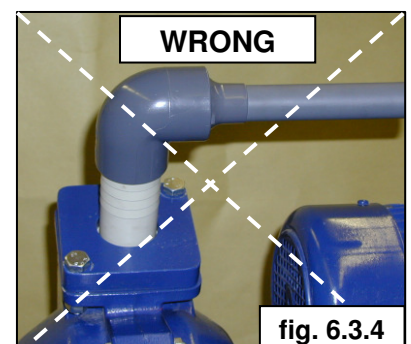
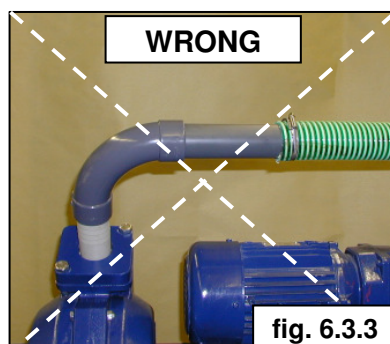
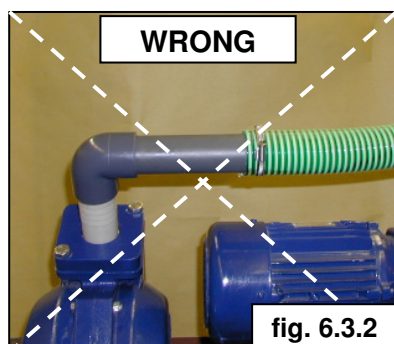
The size of the hose pump is concurrent to the width of the pump hose.

The tubing on the suction side must be vacuum proof (reinforced) and the tubing on the discharge side must withstand the maximum pressure of the pump. By using a pole changing switch the tubing on suction and discharge side must withstand the maximum pressure of the pump.

Always use flexible tubing to connect the pump with the pipework of your application. The length of the tubing should be at least 1 m. (see fig. 6.3.1).



The standard way of connection is flexible tubing (fitting the connecting sockets of the pump), fixed with hose band clamps. Other options (e.g. threaded connections, Kamlok couplings, standard flanges) are available on request.



In order to avoid pressure peaks, which can cause damages of the pump hose, there should no pipe bends or 90° elbows be installed directly after the pump on the discharge side (please see fig. 6.3.2 and 6.3.3).

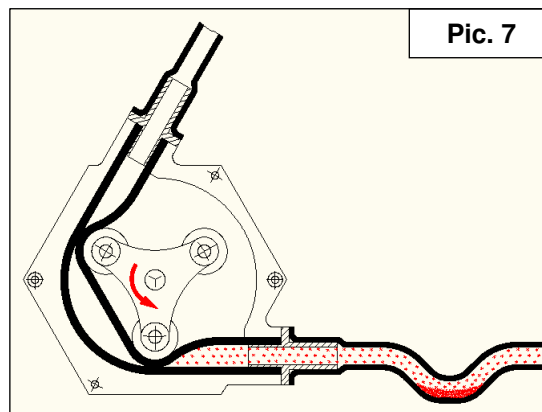
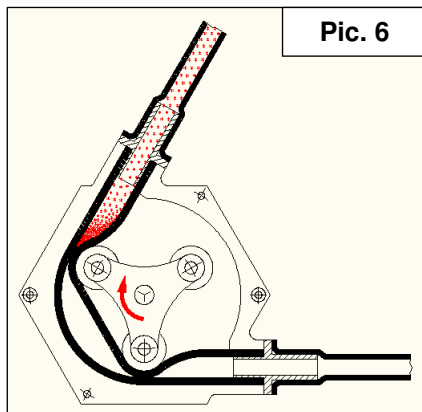
Furthermore the cross section of the pipework on the discharge side should not be reduced (please see fig. 6.3.4).

Important notice for the conveyance of media containing solids

There is a risk of sedimentation of solids which can settle in the pump while the pump is stopped. Hereby a lump of solids can be formed in the upper section of the hose. If the upper connecting socket of the pump is the outlet (discharge side), the lump blocks the pump when it is restarted (please see pic. 6). This may cause damages to the pump.

To avoid any damages we recommend to reverse the direction of rotation of the pump and to connect the discharge line to the lower, horizontal connecting socket.

To get a further advantage a flexible hose should be used to connect the pump and a kind of trap should be created in which the solids settle out (please see pic. 7).



In case of longer downtimes it is also recommended to flush the complete piping including the pump sufficiently.



Hose pumps are positive displacement pumps which must not convey against closed fittings (e.g. valves). In case of exceeding the maximum permissible pressure, the pumps or other parts of the facility can be damaged. Therefore a protection against pressure exceedance must be integrated in the pipework on the discharge side (e.g. an overflow valve or a burst disk).



When using overflow valves or burst disks it must be observed that the overpressure always will be discharged in a safe direction. I.e., neither people nor tangible assets may be endangered because of emissions of the pumping medium.

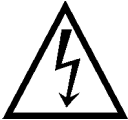


If flammable liquids or gases may leak, the affected area of emission must be free of ignition sources !

6.4 Installing the pump hose

CAUTION

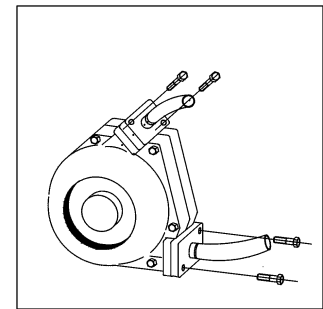
The outer surface of the pump hose must be lubricated sufficiently with Ponndorf Special Grease before assembling it.



Remove power from the pump by removing the main fuses before doing any cleaning / maintenance / assembly operations.

Fig. 6.4.1

Unscrew the flanges on the suction and discharge side of the pump.
Lubricate the pump hose with Ponndorf Special Grease.



Do not wear gloves during these operations because they may be pulled in!

Fig. 6.4.2

Switch on the drive. The rotating pump pulls in the pump hose. When the hose appears on the other discharge side of the casing switch the drive off again and interrupt the power from supply.

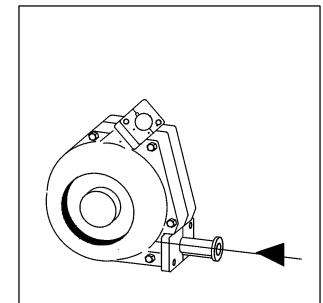


Fig. 6.4.3

Put the clamping ring onto the end of the hose and put the connecting socket into the end of the hose at suction and discharge side.

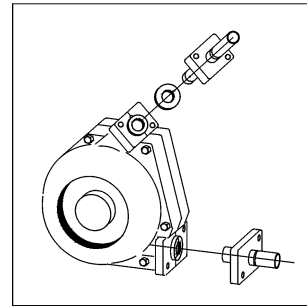
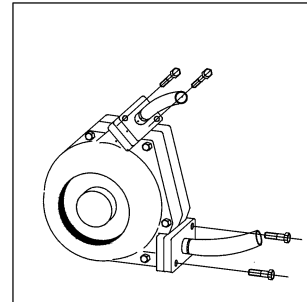


Fig. 6.4.4

Screw the flanges on suction and discharge side.



Pump is now ready for operation!

CAUTION

Before starting the pump it must be secured that any valves assembled in the pipework (on suction and discharge side) are opened. Otherwise the pump or parts of the pipework could be damaged by too high increase of pressure.



The casing cover may only be removed when the drive is switched off and the power supply is interrupted (remove fuses).

CAUTION

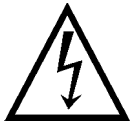
If the pump is equipped with a hose leakage detector it must be secured that the sensor is unpoluted because deposits on the sensor could cause malfunctions of the detector.

7. Maintenance / Service

There are no sophisticated procedures of maintenance necessary for Ponndorf Hose Pumps.

Nevertheless there have to be made regular inspections in order to avoid any decrease of capabilities of the pump (e.g. suction capacity / discharge head / flow rate).

7.1 Changing the pump hose



Remove power from the pump by removing the main fuses before doing any cleaning / maintenance / assembly operations !

Fig. 7.1.1

Unscrew the flanges on suction and discharge side.

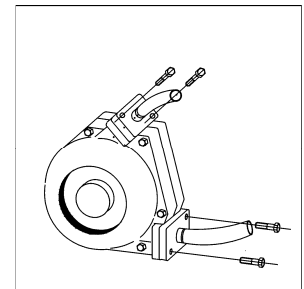
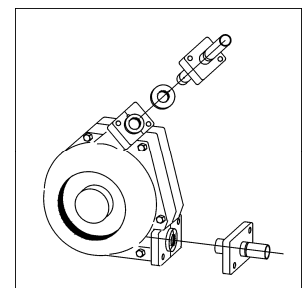


Fig. 7.1.2

Pull connecting sockets out of the end of the hose on suction and discharge side.

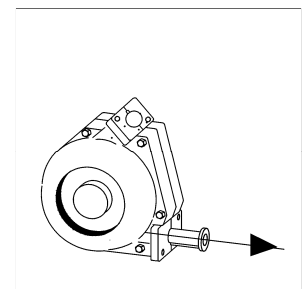
Remove clamping ring from the end of the hose.



Do not wear gloves during these operations because they may be pulled in!

Fig. 7.1.3

Pull out the defect hose. The extraction of the hose will be eased by changing the direction of the drive (pole changing switch) and starting of the motor.



For installation of the new pump hose please consider chapter 6.4



It must be secured that there are no remains of the pumping medium left in the pump hose (medium could run out or spray). Especially in case of aggressive and caustic media there is danger of injuries !

7.2 Maintenance / Service

To guarantee a constant elasticity of the pump hose it must be lubricated with Ponndorf Special Grease every 300 hours of operation. To do this remove the casing cover and put some grease through the opening onto the running surface of the pump hose (e.g. by using a screw driver).

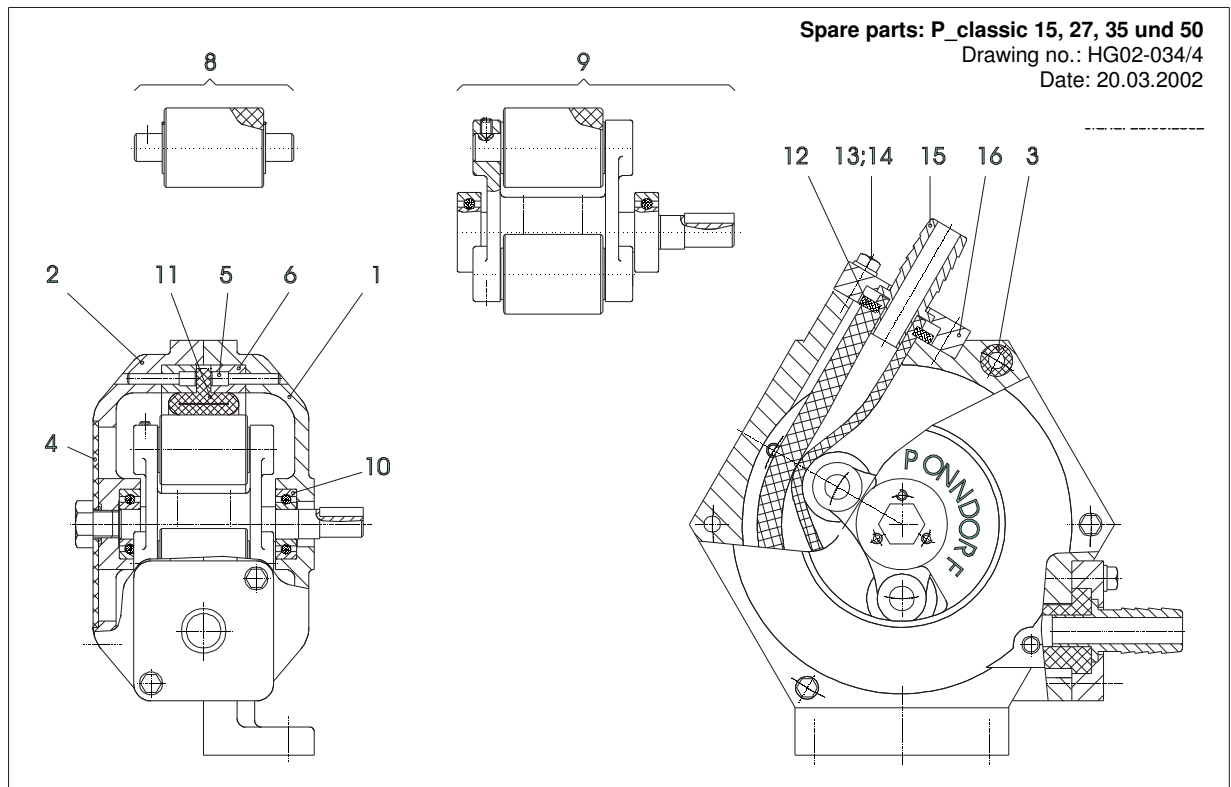
Outer surface of the pump hose	Rotor bearings	Teflon rollers
<ul style="list-style-type: none">• check on the grease film (enough grease on the running surface of the hose?)• <u>Interval:</u> every 300 hours of operation	<ul style="list-style-type: none">• check on proper seat of bearings (no radial play!)• <u>Interval:</u> every time when changing the pump hose	<ul style="list-style-type: none">• check on proper seat (no seized, not worn out)• <u>Interval:</u> every 500 hours of operation

7.3 Cleaning

After pumping media which tend to deposit, the pump hose must be rinsed out when pumping is finished.

When changing the pump hose the inside of the pump casing should be cleaned properly.

7.4 Drawing of spare parts



7.5 List of spare parts

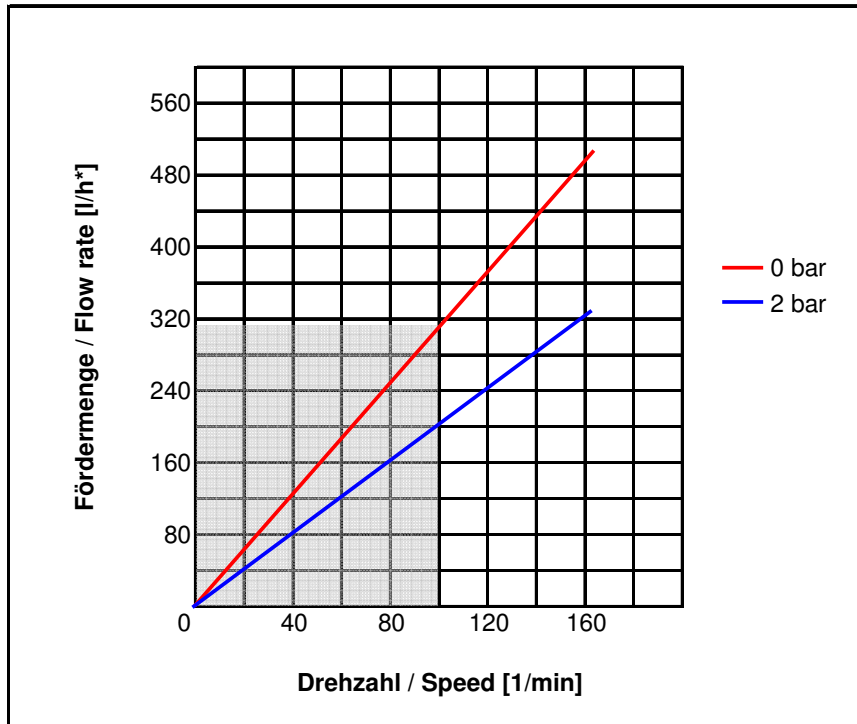
Dash No.	Description	Qty./ pump	Part Numbers for orders			
			P_classic 15	P_classic 27	P_classic 35	P_classic 50
1	Casing part 1	1	10-015-002	10-027-002	10-035-002	10-050-002
2	Casing part 2	1	10-015-004	10-027-004	10-035-004	10-050-004
3	Centering piece	2	10-015-008	10-015-008	10-015-008	10-015-008
4	Casing cover, complete material: plexiglass	1	10-015-007	10-027-007	10-035-007	10-050-007
	1.4301 / V2A (meets ATEX)		94-080-016	94-080-028	94-080-036	94-080-051
5	Pin	6/10/10/14	10-015-013	10-027-013	10-035-013	10-050-013
6	Teflon inserts complete (set of 2 pieces)	1	10-015-112	10-027-112	10-035-112	10-050-112
8	Rollers complete, Teflon (set of 3 pieces)	1	10-015-117	10-027-117	10-035-117	10-050-117
9	Rotor complete	1	10-015-022	10-027-022	10-035-022	10-050-022
10	Ball bearing	2	10-015-020	10-027-020	10-035-020	10-050-020
11	Pump hose	1				
	material: natural rubber		10-015-060	10-027-060	10-035-060	10-050-060
	natural rubber accord. FDA		10-015-066	10-027-066	10-035-066	10-050-066
	neoprene		10-015-062	10-027-062	10-035-062	10-050-062
12	Snap closure	1	10-015-026	10-027-026	10-035-026	10-050-026
13/14	Screw complete	4	10-015-099	10-027-099	10-035-099	10-050-099
15	Connecting socket	2				
	material: PP (polypropylene)		10-015-027	10-027-027	10-035-027	10-050-027
	1.4571 / V4A (meets ATEX)		10-015-029	10-027-029	10-035-029	10-050-029
16	Counter flange	2	10-015-024	10-027-024	10-035-024	10-050-024



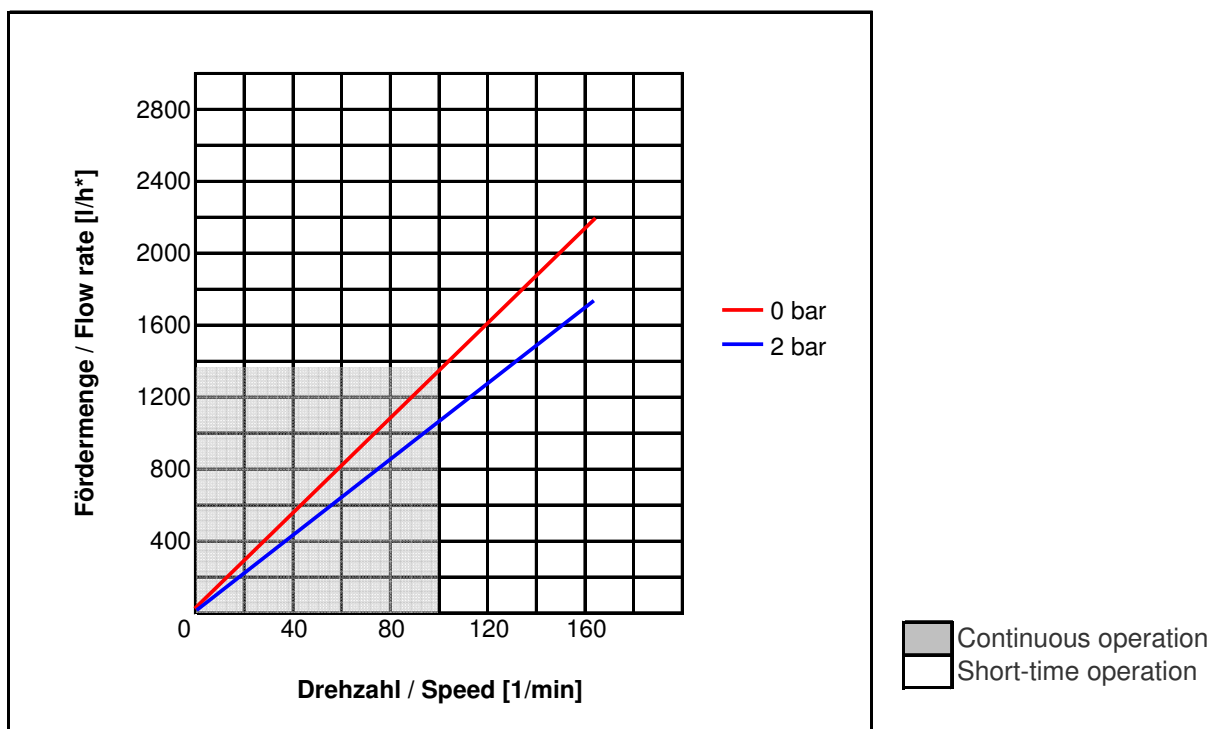
In case of operation of Ponndorf Hose pumps in hazardous locations (according to ATEX) the operator must make sure that solely a casing cover as well as connecting sockets made of stainless steel will be used. Parts made of plexiglass resp. PP (polypropylene) are not approved for this purpose.

8. Characteristic curves

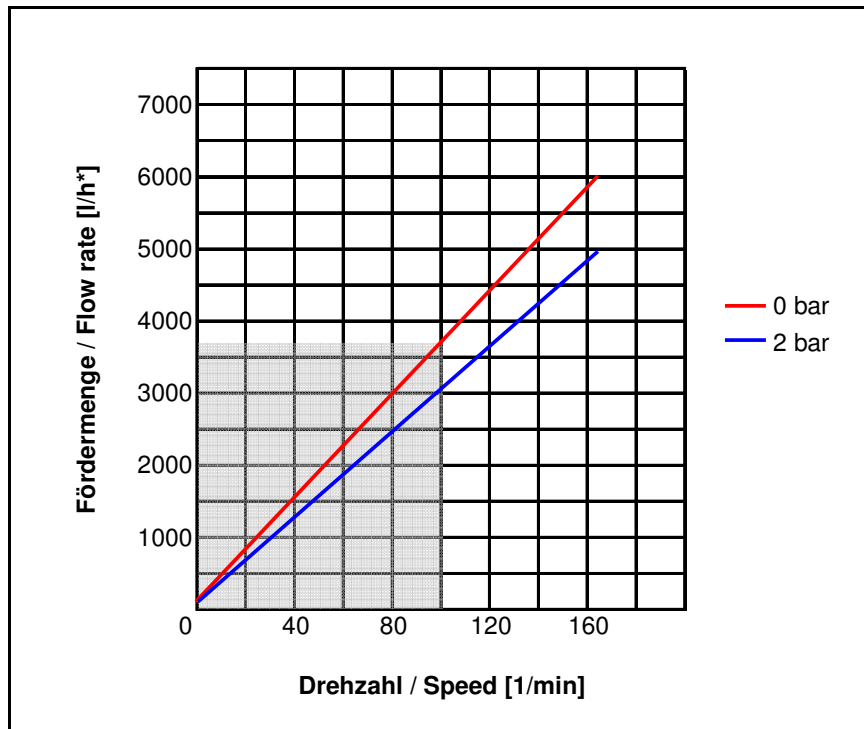
P_classic 15



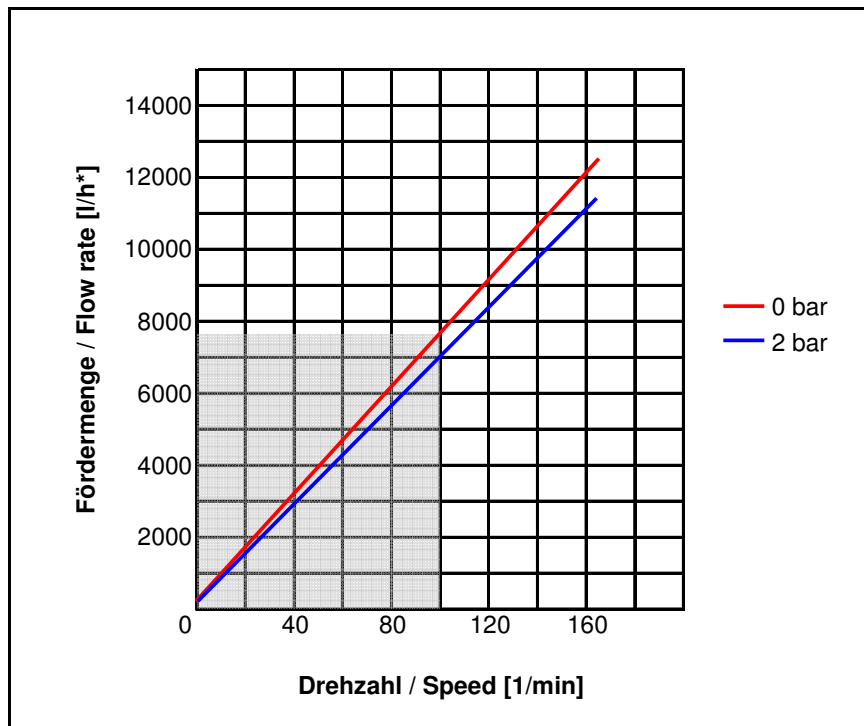
P_classic 27



P_classic 35



P_classic 50



Continuous operation
Short-time operation

Important:

The characteristic curves are based on pumping water.

So the actual flow rate of the pump can be different in case of pumping media with a higher viscosity.

9. Accompanying documents

Accompanying documents are enclosed (corresponding to the extent of delivery).