

**Operating and Maintenance Instructions
with Disassembly and Assembly Instructions**

**Peristaltic Pumps
ASH Series**

Design ID

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**Retain
for future
use!**

Operating data of the pump acc. to the order data sheet

Order No.:

Pump Ident No.:

Machine No.:

Pump Type:

Operating data, dimensions and other additional information can be found in the order-specific part of the documentation.



These Operating and Maintenance Instructions contain information from the pump manufacturer. They may need to be supplemented by instructions of the operator company for its personnel. These instructions do not take account of specific information relating to operation and maintenance of the process plant into which the pump is integrated. Such information can only be given by the persons responsible for construction and planning of the plant (plant manufacturer).

Such specific instructions relating to operation and maintenance of the process plant into which the pump is integrated have priority over the instructions of the pump manufacturer. The plant manufacturer must on principle observe the limits of use!

Refer to the operating instructions of the plant manufacturer!

Contents

- 1. General**
- 2. Safety**
- 3. Transportation and Intermediate Storage**
- 4. Description**
- 5. Installation/Mounting**
- 6. Start-up/Shutdown**
- 7. Maintenance/Repair**
- 8. Operating Faults, Causes and Remedial Action**

Important note:

This operating manual is to be supplemented by the order-related information.

Table of Content

1. General

- 1.1 Application and range of utilization
- 1.2 Performance data
- 1.3 Abbreviation
- 1.4 Warranty
- 1.5 Testing
- 1.6 Availability

2. Safety

- 2.1 Marking of hints in the operating instructions
- 2.2 Personnel qualification and personnel training
- 2.3 Dangers in case of non-compliance with the safety hints
- 2.4 Responsible working
- 2.5 Safety hints for the customer/operator
- 2.6 Safety hints for maintenance, inspection and mounting operations
- 2.7 Arbitrary reconstruction and spare parts
- 2.8 Inadmissible modes of operation
- 2.9 Dismounting individual aggregate components

3. Transportation and intermediate storage

- 3.1 Packing
- 3.2 Transportation
- 3.3 Intermediate storage

4. Description

- 4.1 Structural design
 - 4.1.1 Pump casing
 - 4.1.2 Pump branch position, design
 - 4.1.3 Rotor with sliding pads
 - 4.1.4 Bearing and lubrication of the rotor
 - 4.1.5 Lubrication/cooling
 - 4.1.6 Tightening torques for screws
- 4.2 Mode of Operation
- 4.3 Aggregate construction
 - 4.3.1 Drive
 - 4.3.2 coupling and protection against accidental contact
 - 4.3.3 Base plate

5. Installation/mounting

- 5.1 Installation
- 5.2 Foundation
- 5.3 Baseplate
- 5.4 Checking the coupling alignment
- 5.5 Assembly of pump and drive
- 5.6 Space required for maintenance and servicing
- 5.7 Laying of hoses or pipelines
 - 5.7.1 Cleaning and checking of hoses and pipelines prior to installation
 - 5.7.2 Connection of the hoses or pipes to the suction and discharge branch of the pump
 - 5.7.3 Nominal diameters
 - 5.7.4 Change of cross sections and directions
 - 5.7.5 Suction head and suction side supply
- 5.8 Safety and control devices
 - 5.8.1 Manometers and vacuummeters
 - 5.8.2 Safety element in the discharge line
 - 5.8.3 Non-return valve/stop valve
 - 5.8.4 Hose fracture/overflow
 - 5.8.5 Hose fracture detector
- 5.9 Electrical connections

6. Starting/Stopping

- 6.1 Preparation for starting
 - 6.1.1 Pre-assembled pumps
 - 6.1.1.1 Lubricant/coolant filling in the pump casing
 - 6.1.2 Venting of the pump casing
 - 6.1.3 Break-away of the pump
 - 6.1.4 Quality and properties of the flushing liquid
 - 6.1.5 Control of the sense of rotation
- 6.2 Starting
 - 6.2.1 Start-up
 - 6.2.2 Drive
 - 6.2.3 Checking the delivery values
- 6.3 Stopping
 - 6.3.1 Shut-down
 - 6.3.2 Discharge line/pressure hose
 - 6.3.3 Measures in case of a prolonged shut-down period

7. Maintenance/Service

- 7.1 Maintenance
 - 7.1.1 General control
 - 7.1.2 Maintenance of components
 - 7.1.2.1 Pump hose
 - 7.1.2.2 Bearing of the rotor and lubrication of the bearing
 - 7.1.2.3 Replenishing the lubricant/coolant in the pump
 - 7.1.2.4 Geared and variable geared motors
- 7.2 Servicing (dismounting and mounting instructions)
 - 7.2.1 Dismounting the peristaltic pump
 - 7.2.1.1 Dismounting the pump hose and cleaning the internal parts
 - 7.2.1.2 Dismounting the cylindrical roller and grooved ball bearing and the lip seals
 - 7.2.2 Mounting the peristaltic pump
 - 7.2.2.1 Mounting the cylindrical roller and grooved ball bearing and the lip seal
 - 7.2.2.2 Mounting the pump hose
- 7.3 Readjustment of the sliding pads
 - 7.3.1 Optimization of the contact pressure
 - 7.3.2 Following the mounting of the peristaltic pump, the following operations must be performed:
- 7.4 Spare parts/replacement parts

8. Troubles, Causes and Remedial Action

- 8.1 Troubles with reference numbers for cause and remedial action
- 8.2 Cause and remedial action

1. General

1.1 Application and range of utilization

The peristaltic pumps are rotary positive-displacement pumps which are self-priming dry and safe to run dry for handling and dosing liquid to highly viscous and pasty, clean, neutral, aggressive or abrasive, gaseous liquids or liquids which tend to froth, even with solids contents. If at any later date the operating conditions happen to change (e.g. different liquid pumped, speed, viscosity, temperature or pressure conditions), it must be checked by us from case to case and confirmed, if necessary, whether the pump is suited for these purposes. In case no special agreements were made, pumps supplied by us may, during the warranty period, be opened or varied only by us or our authorized contractual service stations, otherwise, our liability for any defects will be void.

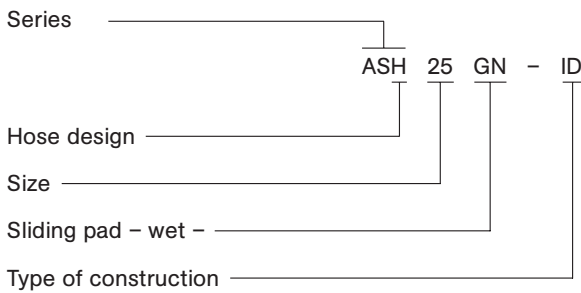
1.2 Performance data

The exact performance data applying to the pump are to be taken from the order data sheet.

1.3 Abbreviation

The abbreviation of the peristaltic pump is set up according to the following scheme.

Example:



This abbreviation is engraved on the name plate.

1.4 Warranty

Our liability for shortcomings in the supply is laid down in our delivery conditions. No liability will be undertaken for any damages caused by non-compliance with the operating instructions and service conditions.

1.5 Testing

On request, all pump aggregates, prior to leaving our factory, are subjected to a thorough trial run and performance test on the test bench. Only properly operating pumps leave the factory achieving the Performances warranted by us. Thus, compliance with the following operating instructions ensures proper operation and full delivery.

1.6 Availability

We generally recommend the precautionary purchase and stocking of spare pumps and/or spare parts if the pumps supplied are important for maintaining a production or delivery process. Thus downtimes can be avoided or reduced to a minimum.

2. Safety

These operating instructions contain basic hints to be observed during installation, operation and maintenance. Therefore, prior to mounting and commissioning, these operating instructions must by all means be read by the

fitter as well as the pertinent expert personnel/customer and must always be available at the place of installation of the machine/plant.

In addition to the general safety information listed in this safety section the special safety hints, such as for private use, which are specified in other sections, must be observed as well.

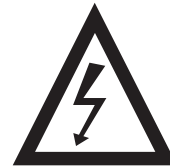
2.1 Marking of hints in the operating instructions

The safety hints contained in these operating instructions which, in case of non-compliance, may cause danger to the personnel, are particularly marked with the general danger symbol



Safety sign according DIN 4844-W9

in case of warning against electric voltage with



Safety sign according DIN 4844-W8

For safety hints, non-compliance with which may cause dangers to the machine and its functions, the word

ATTENTION

is added.

Hints directly attached to the machine such as

- Directional marker
- Sign for fluid connections

must by all means be observed and maintained in completely legible condition.

2.2 Personnel qualification and personnel training

The personnel for operation, maintenance, inspection and mounting must have the corresponding qualification for these operations. Range of liability, competence and the supervision of the personnel must be exactly controlled by the customer. If the personnel do not have the required knowledge, same must be trained and instructed. If required, this may be effected by the manufacturer/supplier on behalf of the machine owner. In addition, it must be ensured by the customer that the contents of the operating instructions are fully understood by the personnel.

2.3 Dangers in case of non-compliance with the safety hints

Non-compliance with the safety hints may result in both, danger to persons as well as environment and machine. Non-compliance with the safety hints may lead to the loss of any claims for damages.

In detail, non-compliance may, **for example**, entail the following dangers:

- Failure of important functions of the machine/plant
- Failure of specified methods for maintenance and servicing
- Danger to persons by electrical, mechanical and chemical influences
- Danger to the environment by leakage of dangerous substances

2.4 Responsible working

The safety hints mentioned in these operating instructions, the current national rules for the prevention of accidents as well as any internal working, operating and safety regulations of the customer must be observed.

2.5 Safety hints for the customer/operator

- If hot or cold machine parts lead to dangers, these parts must be protected against accidental contact at the site.
- Protection against accidental contact for moving parts (e.g. coupling) must not be removed when the machine is in operation.
- Leakages (e.g. of the shaft seal) of dangerous materials to be handled (e.g. explosive, toxic, hot) must be discharged so as not to result in danger to persons and the environment. Legal stipulations are to be observed.
- Dangers by electrical energy are to be excluded (for details with regard hereto, please refer e.g. to the regulations of the VDE and the local energy supply associations).

2.6 Safety hints for maintenance, inspection and mounting operations

The owner shall see to it that all maintenance, inspection and mounting operations are performed by authorized and qualified expert personnel who have sufficiently informed themselves by thoroughly studying the operating instructions.

Basically, operations at the machine may be performed during standstill only. The mode of operation for stopping the machine described in the operating instructions must by all means be observed.

Pumps or aggregates handling noxious liquids must be decontaminated.

Immediately upon completion of the operations, all safety and protective devices must be mounted and/or made operational again.

Prior to restarting, the items listed in Section "6.1 Preparation for Starting" must be observed.

2.7 Arbitrary reconstruction and spare parts

Production Reconstruction of or changes to the machine are only admissible after consultation with the manufacturer. Original spare parts and accessories authorized by the manufacturer serve safety purposes. The use of other parts may cancel the liability for the consequences resulting therefrom.

2.8 Inadmissible modes of operation

The operating safety of the machine supplied is only ensured with due application according to Section 1 – General – of the operating instructions. The limit values given in the data sheet must by no means be exceeded.

2.9 Dismounting individual aggregate components

When dismantling individual aggregate components, the aggregate must be secured so that the stability will not be reduced as a result of changes in the location of the center of gravity.

3. Transportation and Intermediate Storage

Nominal pump branch diameters

3.1 Packing

The graphical Symbols provided on the packing must be observed.

During transportation and Storage, the suction and discharge side of the pump must be closed with plugs. For installation of the pump aggregate, the plugs must be removed.

3.2 Transportation

Due to their weight, peristaltic pumps of series ASH are transported to the place of installation by means of a lifting appliance.

When transporting the pumps by means of a crane, the sling ropes must be safely fixed to the Suspension eyes.



Crane installation and the sling ropes must be sufficiently sized. The sling ropes must not be fixed to the suspension eyes of the motor.

3.3 Intermediate storage

In case of more than 4 weeks from delivery until initial operation or an intermediate stopping, one of the sliding pads must be dismounted. Thereafter, the rotor must be turned so that the sliding pad still mounted is no more engaged with the pump hose.

4. Description

4.1 Structural design

Self-priming sealless peristaltic pump.

Materials

Denomination	Material design
Pump casing	EN-GJL-250 / EN-GJS-400-15 ①
Pump cover	1.0573 (QSt 52-3)
Rotor	EN-GJS-600-3
Sliding pad	Aluminium alloy / EN-GJS-400-15 ②
Pump hose	Various elastomers, Reinforced by fabric
Pump branch	1.4571 / PE

① Only for size ASH-100

② Optional

4.1.1 Pump casing

Pump casing of the compact type of construction with pushed-in pump hose and lubricant/coolant filling. Pump cover with feedpipe and venting unit.

4.1.2 Pump branch position, design

Pump branch position

Suction and discharge branch, as seen from the drive, horizontally to the right or left on top of one another or vertically upwards or downwards one beside the other.

Pump branch design

D = Lapped joint flange connecting dimensions	DIN 2642-PN 10 DIN 2501-PN 16
C = Flange, sealing strip, form C	DIN 2633-PN 16
R = External pipe thread	DIN 2999
K = Headed bush (plastic) with lapped joint flange (steel) Connecting dimensions	DIN 16963/ 8063-PN 10 DIN 2501-PN 16
T = nozzle	
A = Lapped joint flange, Connecting dimensions	ANSI B 16.5- Class 150

Pump branch nominal widths

Pump size	DN	
	[mm]	[inches]
ASH 25	25	1
ASH 32	32	1 ¹ / ₄
ASH 40	40	1 ¹ / ₂
ASH 50	50	2
ASH 65	65	2 ¹ / ₂
ASH 80	80	3
ASH 100	100	4

For further dimensions for branch designs, please refer to our dimension sheets.

4.1.3 Rotor with sliding pads

Solid rotor, with shaft and two sliding pads of optimum shape set off by 180°. A change of the preliminary hose stress is effected by means of adding or removing of adjusting plates between rotor and sliding pads.

4.1.4 Bearing and lubrication of the rotor

The bearing of the solid rotor within the area of the shaft is by a grease-lubricated cylindrical roller and a grooved ball bearing.

Both bearings are lubricated for life. Sealing of the bearing chamber at the drive end by a sealing washer and flinger ring, and the pump end by a double-acting sealing ring.

4.1.5 Lubrication/cooling

In the pump casing, the pump hose and sliding pads are lubricated by a special liquid and cooled. Sealing of the pump casing to the bearing chamber by a lip seal.

Filling quantities

Pump size	quantity of coolant/lubricant [l]
ASH 25	1,6
ASH 32	2,7
ASH 40	5,5
ASH 50	10
ASH 65	17
ASH 80	36
ASH 100	58

4.1.6 Tightening torques for screws

Pump size	Screw tightening torque M [Nm]		
	Part 304 screw for sliding pad	Part 607 screw for pump cover	Part 610 screw for ring nut
ASH 25	23	24	17
ASH 32	43	47	30
ASH 40	103	47	30
ASH 50	203	47	74
ASH 65	203	47	74
ASH 80	351	81	144
ASH 100	683	81	249

4.2 Mode of operation

Two sliding pads arranged on a rotor alternately compress a thick-walled pump hose thus pushing, because of the rotor rotation, the hose contents (the liquid pumped) from the suction to the discharge side. Due to the subsequent opening of the pump hose, an underpressure is generated on the suction side, thus causing constant suction.

The liquid pumped passes the pump hose without touching any mechanical parts. The smooth flow is conducive to gentle handling. No emulsification or turbulences are brought about. The pump is safe to run dry and self-priming dry. The Sense of rotation and thus direction of pump delivery is reversible.

4.3 Aggregate construction

4.3.1 Drive

By non-explosion-proof or explosion-proof geared motors, via infinitely variable geared motors or via a gear with electric motor. Other drive variants are possible.

4.3.2 Coupling and protection against accidental contact

A protection against accidental contact according to DIN EN 809 is attached as soon as the scope of supply comprises pump, baseplate, shaft coupling and drive. **According to the rules for the prevention of accidents, the pump may only be started with a protection against accidental contact according to DIN EN 809.**



If a protection against accidental contact is not supplied, same must be installed by the customer.

4.3.3 Base plate

Base plate of steel design. For material and size, please refer to our dimension sheets.

5. Installation/Mounting

5.1 Installation

Installation of the pumps is horizontal.

5.2 Foundation

The foundation design depends on the size of the pump and/or the pump aggregate and the local mounting conditions.

For exact data on pump and aggregate dimensions, please refer to our dimension sheets.

The foundation may be designed as a concrete foundation or load-bearing foundation frame, for example, of the steel type.

A condition of all foundation types is: The foundation must be designed so that it can take the weight of the pump aggregate on the entire surface.

5.3 Base plate

The baseplate must be fixed on the foundation, stress-free.

5.4 Checking the coupling alignment

A pump aggregate supplied complete was carefully assembled at the factory. Due to the fact that the pump and the drive are fixed on the baseplate a readjustment of the coupling is not necessary.

5.5 Assembly of pump and drive

The aggregate being completed at the place of service only, mounting of the coupling must be effected as follows:

1. Cover pump and drive shaft end with a filmy coat of molybdenum disulfite (e.g. Molykote), and insert keys.
2. By means of a fitting tool, push pump and motor-side coupling halves on until the keys are flush with the coupling hubs.
If no fitting tool is available, heating of the coupling halves to approx. 100°C (without ring gear) facilitates mounting.
3. Fix coupling halves axially with a grub screw according to DIN 916.
4. When assembling pump and drive see to it that the coupling halves are exactly aligned.
5. Mount protection against accidental contact according to DIN EN 809.



5.6 Space required for maintenance and servicing

ATTENTION The pump must be accessible from all sides for necessary visual inspections to be performed.

For maintenance and service operations, sufficient space must be provided, especially for dismounting the pump or replacing the pump hose. In addition, see to it that all hoses and pipelines can be easily mounted and dismounted.

5.7 Laying of hoses or pipelines

5.7.1 Cleaning and checking the hoses and pipelines prior to installation

Before installing the pump it is absolutely necessary to flush and clean the pipelines, hoses, slide valves and valves at suction and pressure end and to check them for free passage.

Hose kinks must be removed. Flange packings must not protrude to the inside. Any remainders of assembly like bolts, nuts, burrs and welding beads steel pieces etc. destroy the inside parts of the pump. Any warranty claim will be null and void as soon as damages are caused by such items.

5.7.2 Connection of hoses or pipelines to the suction and discharge branch of the pump

In case of pumps with hose connections

the hose to be connected to the suction branch must be of a reinforced design so that a contraction due to the generated underpressure is avoided.

In case of pumps with flange connections

we recommend to install suitable (pulsation) dampers in the pipelines immediately behind the pump on the suction and discharge side (contact factory, if necessary).

5.7.3 Nominal diameters

The nominal diameters of the suction and discharge hoses and/or pipelines should be rated according to the nominal pump branch diameters. In case of rough deviations, especially on the suction side, please contact the manufacturer.

5.7.4 Change of cross sections and directions

Sudden changes of cross sections and directions as well as hairpin bends must be avoided. Pipe bends or branches, if any, must be installed as far away from the pump as possible.

5.7.5 Suction head and suction-side supply

When handling very hot, greasy and viscous liquids, the suction head must by all means be reduced to a minimum to avoid handling losses.

We recommend to operate the pump at minimum speed.

ATTENTION In case of hardly flowable liquids pumped the pump must be operated with suction-side supply and minimum speed.

5.8 Safety and control devices

5.8.1 Manometers and vacuummeters

A manometer and a vacuummeter are to be installed at the discharge and the suction line.

5.8.2 Safety element in the discharge line

As soon as there is a stopping element in the discharge line or if there is a possibility of the pressure line being clogged a safety element has to be provided, for example a by-pass line with high-pressure relief valve, bursting diaphragm, motor protection etc.



Peristaltic pumps are positive-displacement pumps being capable of producing an extremely high pressure. With the discharge line being closed because of clogging for example or due to an accidental dropping of a valve, the pressure produced by the pump may exceed the admissible pressure of the plant by a multiple. This may cause bursting of lines which must be avoided by all means especially when pumping dangerous liquids. For this reason safety devices have to be installed in the plant (e. g. pressure switches).

5.8.3 Non-return valve/stop valve

A non-return valve or stop valve must be installed in both, the discharge and the suction line. The safety devices are required so that in case of a hose fracture, the system pressure does not get into the pump casing and/or the pump is not drained towards the suction side. The stop valves must be provided as close as possible to the pump branches.

5.8.4 Hose fracture/overflow

A hose fracture results in the liquid pumped and lubricant/coolant being mixed and afterwards the pump liquid gets out of the ventilating system.



Hazardous liquids to be pumped (like explosive, toxic, hot substances) must be led off in a way avoiding any risk for persons and environment. Legal requirements must be met.

5.8.5 Hose fracture detector

A hose fracture detector may be installed in order to stop the drive of the pump or to start a safety element in the suction or discharge line respectively, if a hose fracture occurred (please see technical data and operating instructions "Hose Fracture Detector ASM", VM 810 0007).

5.9 Electrical connections



Connection of the power supply cables of the coupled geared motor must be effected by an electrical expert according to the circuit diagram of the motor manufacturer. In doing so, the current VDE regulations and the regulations of the local power supply association must be observed.

Danger by electrical energy must be excluded.

6. Starting/Stopping

6.1 Preparation for starting

6.1.1 Pre-assembled pumps

In case of pumps which are delivered with but one or without mounted sliding pad (Item 402), missing sliding pads must be mounted (please refer to 7.2.2.2 below) prior to filling the pump with lubricant/coolant.

Prior to mounting the sliding pads (402), the surface of the rotor (301) is to be amply coated with glycerol. Prior to mounting the first sliding pad (402), crank the lubricated rotor (301) several times. Mount the first sliding pad (402) with the corresponding number of adjusting plates (302), with regard hereto, please refer to Section 7.3.1 below. The number of plates is indicated in the chart on page 13. For the installation of the pump hose, please refer to section 7.2.2.2 below.

Sliding pads not mounted and the lubricant/coolant filling are part of our delivery.

6.1.1.1 Lubricant/coolant filling in the pump casing

ATTENTION Prior to commissioning, the pump casing must be filled with lubricant/coolant.

Filling quantity please refer to the chart under section 4.1.5.

In case of pumps which were delivered by the factory without a lubricant/coolant filling, a sufficient quantity in a packing drum is supplied for initial filling.

The lubricant/coolant consists of highly concentrated glycerol and can be purchased from us under the designation "ALLWEILER Special Lubricant/Coolant for Peristaltic Pumps".

Filling is done through the cover fittings provided at the pump cover.

6.1.2 Venting the pump casing

During pump operation, the vent unit (611) must always be kept open.

Constant ventilation of the pump casing (501) must be assured. This does not apply to pumps with vacuum support.

6.1.3 Break-away of the pump

In case of a re-start or after a prolonged standstill please make sure that the pump is rotated easily by the drive unit. If this is not possible, e. g. because of the high adhesion between the sliding pad and the hose, it is possible to assist with an appropriate tool in the area between the key and the drive shaft.

ATTENTION During this process the drive shaft must not be damaged.

6.1.4 Control of the sense of rotation

Due to its system the peristaltic pump is operable in both directions while merely suction and discharge side have to be changed. With a view to the installations the sense of rotation of the drive has to be checked by a temporary starting before putting the pump into operation.

During this process the shut off elements are to be opened and the non-return valves are to be put out of function.

6.2 Start-up

6.2.1 Starting

Prior to starting the pump, any stop valves provided in the suction and discharge line must be completely opened and the correct function (mounting position) of the non-return valves checked.

6.2.2 Drive

Switch on the motor

ATTENTION Pay attention to the special characteristics of the drive.

Refer to the operating instructions of the drive manufacturer.

6.2.3 Checking the delivery values

After the drive has reached its operating speed, inlet pressure and pump discharge pressure must be checked via a mano-vacuummeter and pressure gauge. The motor must not be overloaded. The power consumption can be checked by means of an ammeter. In this connection, temperature and viscosity of the liquid to be pumped must be controlled. The values read must be checked against the order data sheet and/or acceptance report.

6.3 Stopping

6.3.1 Shut-down

Switch off drive motor.

6.3.2 Discharge line/pressure hose

If a non-return valve is installed in the discharge line and same closes safely, the shut-off valve, if any, may remain open.

If a non-return valve was not provided, the shut-off valve must be closed.

6.3.3 Measures in case of a prolonged shut-down period

If a shut-down period of more than four weeks is projected, the pump must be drained, thereafter, proceed according to 3.3 above.

7. Maintenance/Serviceing

7.1 Maintenance

– For maintenance and Service operations, the data listed under Section 2. Safety must be observed.

– Regular control and maintenance of the pump and the drive will extend the service life.

7.1.1 General control

1. The drive motor must not be overloaded.
2. Check suction and pressure hose and/or lines for tightness.
3. Check lubricant/coolant level in the pump casing through an inspection glass in the pump cover.
4. Pressure and temperature monitoring instruments must be observed.

7.1.2 Maintenance of components

7.1.2.1 Pump hose

In case of hose fracture, the pump hose must be replaced (please refer to Section 7.2 Servicing).

7.1.2.2 Bearing of the rotor and lubrication of the bearing

Bearing of the solid rotor within the area of the drive shaft is effected by a grease-lubricated cylindrical roller and a grooved ball bearing. Both bearings are lubricated for life and thus maintenance-free.

Under normal operating conditions, the Service life of the bearings may be assumed to be approx. 40,000 operating hours. Due to intermittent operation, high temperature or the like, the actual service life may be shorter. We therefore recommend to control the running noises and temperature in the bearing area at regular intervals. If compared with the normal rolling noises, scratchy or rattling noises or excessive temperature rises are detected, this indicates a bearing damage, and the bearings should be replaced as soon as possible (please refer to Section 7.2 Servicing).

Bearing and roller bearing grease

For the lubrication of the cylindrical roller bearings and the groove ball bearings it is recommended to use the bearing and roller bearing grease stated below or another the quality of which can be proved to be the same. The order of manufacturers is not an order of quality ranks.

Manufacturer	Brand name
ARAL	HL 3
BP	BP ENERGREASE LS 3
CALTEX	CALTEX MULTIFAX 2
ESSO	BEACON 3
GULF	GULFCROWN GREASE No. 2 GULFCROWN GREASE No. 3
MOBIL-OIL	MOBILUX GREASE FETT 3
SHELL	SHELL ALVANIA FETT 3
SKF	ALFALUB LGMT 3
VALVOLINE	VALVOLINE LB 2

In case the stated bearing and roller bearing grease qualities are not available we recommend a multipurpose grease on lithium base.

Mixing of grease qualities of different base oils and thickeners is to be avoided as it will lead to a reduction of the lubricating properties

7.1.2.3 Replenishing the lubricant/coolant in the pump casing

When replacing the pump hose, it may be necessary to fill up the lubricant/coolant. See to it that the quantity stated under Item 4.1.5 above is not exceeded or fallen below.

In case of a preceding hose fracture, a new lubricant/coolant must in principle be used.

7.1.2.4 Geared and variable geared motors

Please refer to the operating and maintenance instructions of the manufacturer.

7.2 Servicing (dismounting and mounting Instructions) General



On request, trained service engineers will be at your disposal for mountings and repairs.

In case of repairs performed by the customer's own personnel or our trained mechanics, it must be ensured that the pump is completely empty and clean.

This applies in particular to pumps which, in case of repair, are sent to our factory or to one of our contractual repair shops.

In protection of our staff and for reasons of environmental protection, we have to refuse to accept for repair any pumps filled with pumped liquid. Otherwise, we will have to charge the customer/operator with the costs for an ecologically acceptable waste disposal.

In case of repair of pumps operated with dangerous materials O and/or liquids harmful to the environment, the customer/operator must advise hereof his own and/or our local mounting personnel or, in case of return, our factory and/or our contractual service shop of his own accord. In such a case, evidence of the pumped liquid, e.g. in the form of a DIN safety data sheet will have to be presented to us when requesting a service engineer.

As an alternative, kindly apply to our service department for a non-objection certificate under Form No. 448/191 which you are requested to fill in truly, correctly and completely. Kindly send the completed form to the division charged with the repair of the pump or present it to our requested contractual service mechanic.

① **Dangerous substances are:**

- Toxic substances
- Substances detrimental to health
- Caustic substances
- Irritants
- Explosive materials
- Fire-promoting materials
- Highly, easily and normally inflammable materials
- Carcinogenic substances
- Foetopathic substances
- Genes-changing substances
- Substances which are dangerous to human beings in any other way

When working locally, the customer's own and/or our mounting personnel must be referred to dangers which may be caused in connection with repairs.

The most important dismounting and mounting operations are described in these instructions. The mounting steps described in the individual sections must be consistently observed.

7.2.1 Dismounting the peristaltic pump

Prior to commencing the dismounting, the following operations must be performed:

- Disconnect power supply cable from the motor. It must not be possible to start the motor.
- All stop valves in the supply/suction and discharge lines must be closed.
- Dismount supply/suction and discharge lines from the pump.

- Leave the peristaltic pump to cool down to ambient temperature
- Discharge the pumped liquid still being in the pump hose by briefly switching on the pump

ATTENTION Use collecting tank



- Dangerous substances and/or ecologically harmful pumped liquids must be drained and collected so that there will be no danger to life and limb of persons. An ecologically acceptable disposal must be ensured.

7.2.1.1 Dismounting the pump hose and cleaning the internal parts

- Screw screw plug (504) out of the ball cock (618) and drain the lubricant/coolant by opening the ball cock (618).

Note: Collect lubricant/coolant in a clean tank for reuse after the hose has been replaced.



In case of hose fracture, the lubricant/coolant mixture must be drained and collected so that there will be no danger to life and limb of persons. An ecologically acceptable disposal must be ensured.

- Loosen and remove hexagon screws (205 at the suction and discharge size pump branch (508),
- Withdraw the two pump branches (508) with the glands (203) from the pump casing (501).
- The geared and variable geared motor being disconnected, set the rotor (301) rotating by turning the fan wheel at the electric motor, and push the pump hose (401) out on the discharge side.

ATTENTION When pushing out the pump hose, sufficient dismounting space must be provided.

Pushing-out must not be impeded by scattered parts or stationary objects. Danger of injury by pushing out the pump hose must be excluded.



- During the cleaning and disassembly operations described below it must not be possible to start the motor. Danger of injury!
- Remove the discharge-side packing ring (202) which was also pushed out, and the junk ring (201) from the pump hose (401).
- Remove the second packing ring (202) and the junk ring (201) from the pump casing (501).
- Turn hexagon screws (607) with washers (606) out of the pump casing (501) and pump cover (503).
- Remove pump cover (503)
- Remove sliding pad (402).
- Remove gasket (502) from the pump casing (501)
- Clean the whole internal pump chamber.
- Check sliding surfaces of the sliding pads (402) for damages. replace damaged sliding pads.

ATTENTION If the pump hose (401) cannot be dismantled as described above due to heavy wear, proceed as follows:

- Observe the first three steps as above.
- During the operations described hereafter it must not be possible to start the motor. Danger of injury!
- Turn hexagon bolt (607) with washers (606) out of pump casing (501) and pump cover (503).
- Remove pump cover (503).
- Pull pump hose (401) laterally out of the pump casing (501). After this pull pump hose (401) inwards out of the two pump branches .

- Remove packing rings (202) from the pump casing (501).
- Take bottom rings (201) out of the pump casing (501).
- Disassemble sliding pads (402).
- Remove Sealing (502) from the pump casing (501).
- Thoroughly clean the entire pump interior.
- Check sliding surfaces of the sliding pads (402) for damages. Replace damaged sliding pads.

7.2.1.2 Dismounting the cylindrical roller and grooved ball bearing and the lip seals

Note: Dismounting of the cylindrical roller and grooved ball bearing can only be performed following the dismounting of the pump hose.

- Following the dismounting of the pump hose (401), remove key (111) from the drive shaft of the rotor (301).
- By means of an auxiliary tool, dismount flinger ring (110) from the pump casing (501).
- Remove circlip (109) and shim (108) from the drive shaft of the rotor (301).
- Press rotor (301) with inner ring of the roller bearing out of the bearing in the pump casing (501), and dismount.
- Dismount circlip (101) before the grooved ball bearing (102) from the pump casing (501).
- Remove spacer sleeve (103) from the pump casing (501).
- By means of a suitable tool push grooved ball bearing (102) out of the pump casing (501).
- Dismount circlip (101) behind the dismantled grooved ball bearing (102) from the pump casing (501).
- Dismount circlip (104) before the cylindrical roller bearing (105) from the pump casing (501).
- By means of a suitable tool, lever lip seal (106) out of the pump casing (501).
- Dismount circlip (104) behind the dismantled lip seal (106) from the pump casing (501).
- By means of a suitable tool push cylindrical roller bearing (105) out of the pump casing (501).
- Clean bearing chamber in the pump casing (501).

7.2.2 Mounting the peristaltic pump

ATTENTION Prior to remounting, check sliding pads, rotor, cylindrical roller and grooved ball bearing for wear. If required, replace parts by **original spare parts**. Prior to mounting, clean all parts. In principle, install new lip seal (106).

7.2.2.1 Mounting the cylindrical roller and grooved ball bearing and the lip seal

Note: If required, carefully clean cylindrical roller and grooved ball bearing with Diesel fuel. The contact surfaces being bright and undamaged, the bearings may be re-used. If this is not the case, the bearings must be replaced.

- Slightly oil bearing points in the pump casing (501).
- Insert circlip (101) in the pump casing (501).
- By means of a pipe length, press grooved ball bearing (102) from the drive side over the outer bearing ring against the installed circlip (101) into the pump casing (501).

ATTENTION The grooved ball bearing has a sealing washer on one side.

Mounting of the grooved ball bearing must be effected so that the sealing washer points to the drive side to be sealed.

- Insert circlip (101) before the grooved ball bearing (102) in the pump casing (501).
- Insert circlip (104) before the cylindrical roller bearing (105) in the pump casing (501).
- By means of an appropriate pipe length, press cylindrical roller bearing (105) without inner bearing ring from the rotor side over the outer bearing ring against the installed circlip (104) into the pump casing (501).
- Insert circlip (104) behind the cylindrical roller bearing (105) in the pump casing (501).
- Press new lip seal (106) from the rotor side toward the circlip into the pump casing (501). In doing so see to the correct mounting position of the lip seal (106) (please refer to sectional drawing).

ATTENTION With the sizes 25 up to 65 the metallic retaining ring of the double-acting lip seal (106) must face the rotor. Pressing-in is effected by means of a suitable pressing stamp. See to it that the pressing force is applied at the outer ring of the lip seal.

For the sizes 80 and 100 two single-acting lip seals (106) are used. The position of installation is shown on the sectional drawing.

- Fill deep groove ball bearing (102) and cylindrical roller bearing with rolling bearing grease. Grease filling is done as follows:
 1. Fill hollow spaces between the rolling bodies with grease.
 2. Scrape off excess grease (most suitably with your fingers, do not use any metallic object). Kind of grease recommended by us please see under 7.1.2.2.
 - Mount spacer sleeve (103) from rotor side into the bearing chamber
 - By means of a pipe length press inner bearing ring of the cylindrical roller bearing (105) onto the shaft of the rotor (301).
 - Push rotor with inner bearing ring of the cylindrical roller bearing into the installed cylindrical roller bearing (105) and into the grooved ball bearing (102).
- ATTENTION** In doing so, the sealing lip of the lip seal must not be damaged. Before pushing the rotor in, the sealing lip is to be radially bent up, e.g. by means of a hammer handle or the like.
- Mount shim ring (108) over the shaft of the rotor (301) in front of the grooved ball bearing (102).
 - Fix circlip (109) in front of the grooved ball bearing (102) and the shaft of the rotor (301).
 - Place flinger ring (110) on the shaft of the rotor (301) flush with the pump casing.
 - Insert key (111) in the shaft of the rotor (301) and lock by two punch marks right and left on the front side.

7.2.2.2 Mounting the pump hose

ATTENTION During the mounting of the pump hose, the drive must not be capable of being started.

- Cover the pump hose (401) and casing contact surface (501) with lubricant/coolant (Figure 1 below).
- Push the pump hose (401) in turning the rotor (301) at the same time. The contact surface of the rotor (301) must be dry.
In case of an attached gear, the rotor (301) can be turned by means of a lever or the fan wheel of the motor. At the suction and discharge branches the pump hose (401) must have the same projection (Figure 2 below)
- Push the stuffing box junk rings (201) at the suction and discharge branches over the pump hose ends (401) into the pump casing (501). Cover the packing rings (202) on the outside with glycerol, and insert. Push the gland (203) with the pump branches (508) into the pump hose (401) and fix to the pump casing (501) with the hexagon screws (205). The hexagon screws (205) are to be tightened in accordance with the specified tightening torques (refer to chapter 4.1.6). See to the centering of the gland (203) on the pump hose (401) (Figure 3 below).

ATTENTION The pump branches (508) and the pump hose ends (401) must be clean and dry.

- Cover the contact surface of the rotor (301) with lubricant/coolant (Figure 4) while turning simultaneously.
- Fix one sliding pad (402) with a hexagon screw (304) and, if necessary, place adjusting plates (302) underneath.
The number of adjusting plates (302) required for the respective operating condition is indicated in the diagram on page 13. Firmly tighten the sliding pad (402) with a hexagon screw by observing the specified tightening torques (refer to chapter 4.1.6). Firmly tighten the sliding pad (402) with a hexagon screw. Cover the sliding pad (402) with lubricant/coolant (Figure 5 below).
- Turn the rotor (301) through 180°, and mount the second sliding pad (402) with the same number of adjusting plates as described above (Figure 6).
- Check the mounting position of the pump hose (401) in the pump casing (501) and at the rotor (301) by a visual inspection. The pump hose (401) must not be installed, twisted around its own axis.
In case of vertical rotor position the rotor (301) has to be turned through 15° ... 90°.
- By means of the hexagon screws and hexagon nuts (607) the pump cover (503) must be fixed to the pump casing (Figure 7).
After this tighten hexagon screws and hexagon nuts respectively in accordance with the given tightening torques (refer to chapter 4.1.6). For this purpose torque wrenches or type tested screw drivers or similar instruments may be used.
Check vent valve or unit (611) for function.
- Screw in screw plug (504) and fill lubricant/coolant in through the threaded opening of the vent valve or unit (611) in the cover fittings (please refer to section 6.1.1 above). In case of vertical branch position, the rotor (301) must be turned through 15° ... 90° prior to filling.
- Screw in vent valve or unit (611).

7.3 Readjustment of the sliding pads

7.3.1 Optimization of the contact pressure

- The contact pressure of the sliding pads (402) onto the pump hose (401) must be set.

ATTENTION In case of a change of the operating data, readjustment of the contact pressure is required.



Figure 1

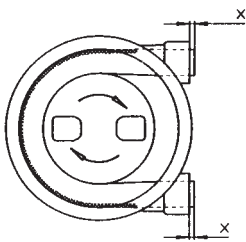


Figure 2

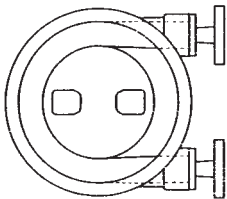


Figure 3

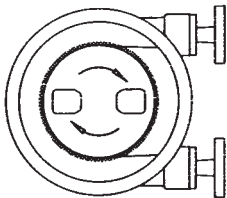


Figure 4

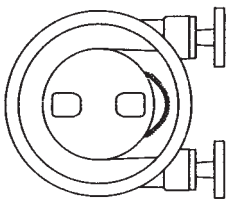


Figure 5

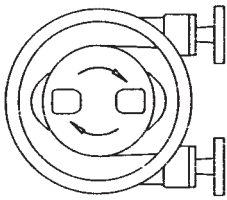


Figure 6

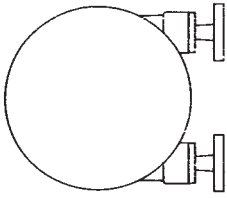


Figure 7

- For the number of adjusting plates (302) required for the respective operating condition, please refer to the diagram on page 13.
- Bring the rotor (301) into position so that only one sliding pad (402) is in engagement. Loosen the hexagon screw (304) at the sliding pad (402), and insert and/or remove the required number of adjusting plates (302). Thereafter tighten the hexagon screw (304) again.
- Turn the rotor (301) through 180° and repeat the procedure at the other sliding pad (402).
Note: See to it that the same number of adjusting plates (302) are placed under the sliding pads (402).
- Check the mounting position of the pump hose (401) by visual inspection.
Note: If the pump hose (401) slips out of its guide, it can be brought into guiding position again by means of a rubber hammer.

ATTENTION Danger of injury with the motor running and rotor turning open!

7.3.2 Following the mounting of the peristaltic pump, the following operations must be performed:

- Attach suction and discharge lines/hoses.
- Open shut-off valves.
- Check flow direction of the pump
- Control suction and pressure behaviour via manovacuometer and pressure gauge.

7.4 Spare parts/replacement parts

Parts marked with footnotes r, R in the parts list may be provided as spare parts/replacement parts. For reasons of operating safety, only **original spare parts** supplied by us should be kept on stock and installed. In this connection, we refer to the statements made under Section 2.7 above.



For replacement and spare parts orders, the following must be quoted: **Machine number, abbreviation of pump, part number, denomination and part quantity or Ident No. and quantity**

Note: The machine number and the abbreviation of the pump are engraved on the name plate. The Ident No. and quantity can also be taken from the attached separate spare parts list.

8. Troubles, Causes and Remedial Action

8.1 Troubles with reference numbers for cause and remedial action

The table below should be regarded as a guide to troubles, if any, at the peristaltic pump. In case of troubles not listed herein or if they cannot be traced back to the causes listed, we recommend to check with the factory or our sales agencies.



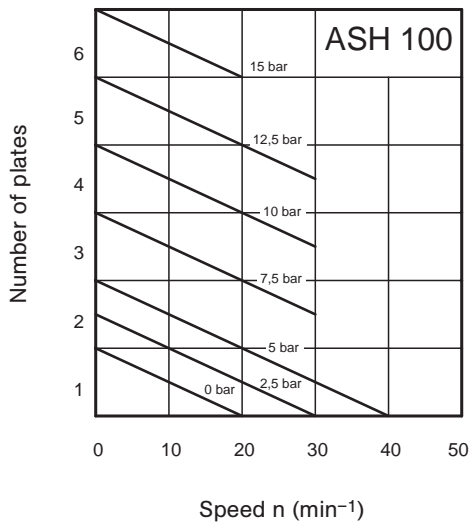
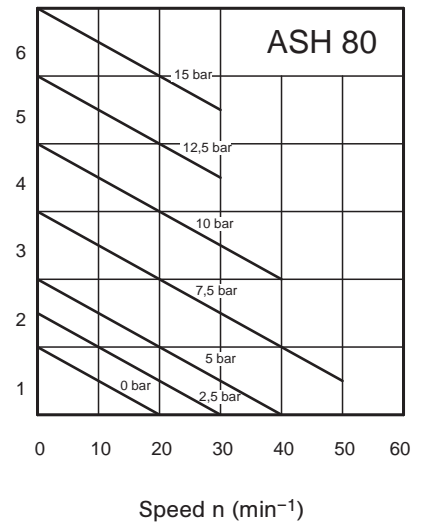
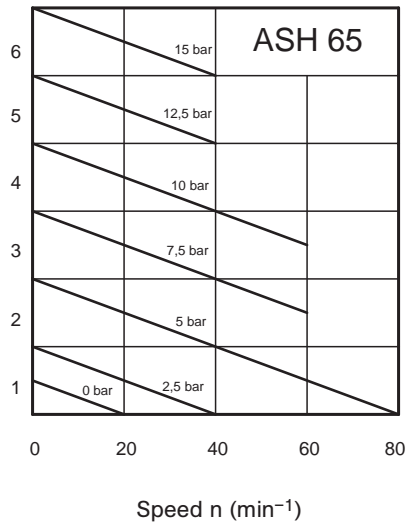
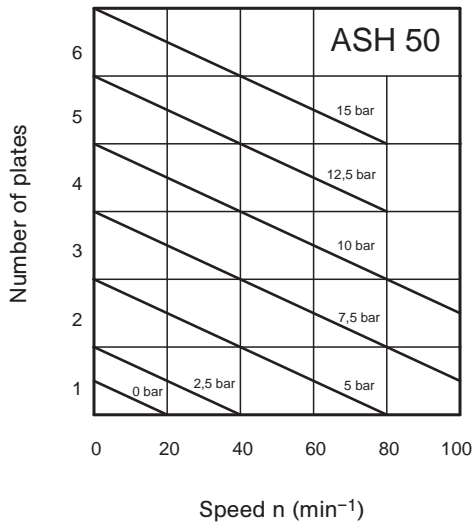
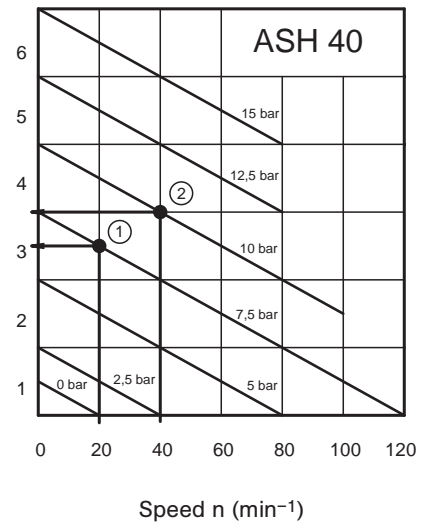
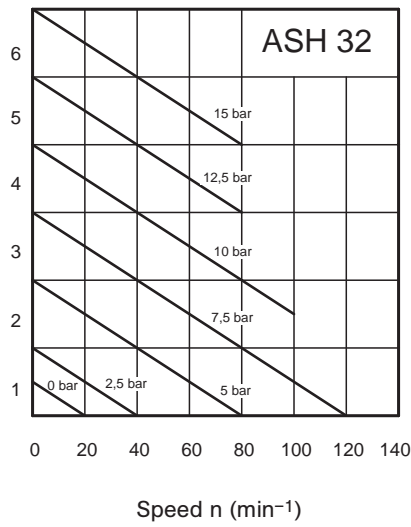
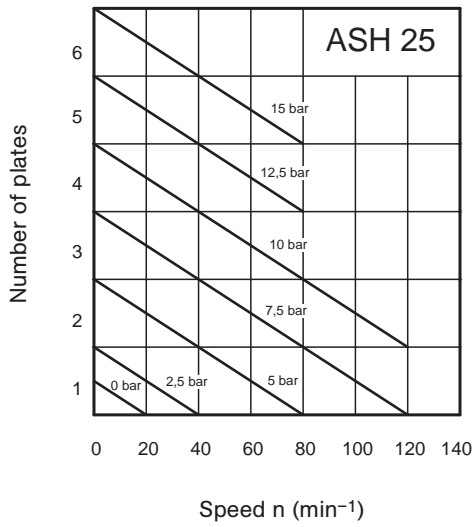
When removing troubles, the pump must be depressurized and empty.

Operational troubles at the peristaltic pump	Reference numbers for cause and remedial action
Pump does not achieve the required pressure	1, 2
Pump does not prime	3, 5, 6, 7, 8, 9, 12
Pump does not start	10, 12, 13, 14
Pump does not achieve the stated flow rate	1, 2, 3, 4, 5, 6, 7, 8, 10, 12, 13
Pump achieves excessive machine temperature	1, 10, 11
Pump does not prime any more	3, 4, 5, 7, 12, 13, 14

8.2 Cause and remedial action

Ref. No.	Cause	Remedial action
1	Wrong sliding pad adjustment.	Readjust sliding pads. (Number of plates refer to page 13)
2	Hose has not yet reached the required operating temperature.	Let pump continue to pump until the operating temperature is reached.
3	Suction hose and/or line clogged.	Clean suction hose and/or line.
4	Pressure hose and/or line clogged.	Clean pressure hose and/or line.
5	Suction hose and/or line leaky.	Seal suction hose and/or line.
6	Gate valve in the suction and/or discharge line not completely open.	Open gate valve.
7	Suction and/or pressure head too high.	Check suction and/or pressure head.
8	Viscosity of the medium too high/too low.	Check viscosity and reduce speed, if necessary.
9	Wrong direction of rotation of the pump.	Reverse any two motor leads.
10	Wrong pump speed, drive overloaded.	Check pump speed, power consumption, voltage, frequency.
11	Temperature of medium pumped too high.	Lower temperature of medium pumped, if possible, readjust sliding pads.
12	Foreign bodies in the pump	Remove foreign bodies, replace defective parts.
13	Solids content too high, particle size too large.	Reduce speed, install screen with mesh size = admissible particle size in front of the suction branch.
14	Solids settle during standstill	Flush pump and dismount and clean, if necessary.

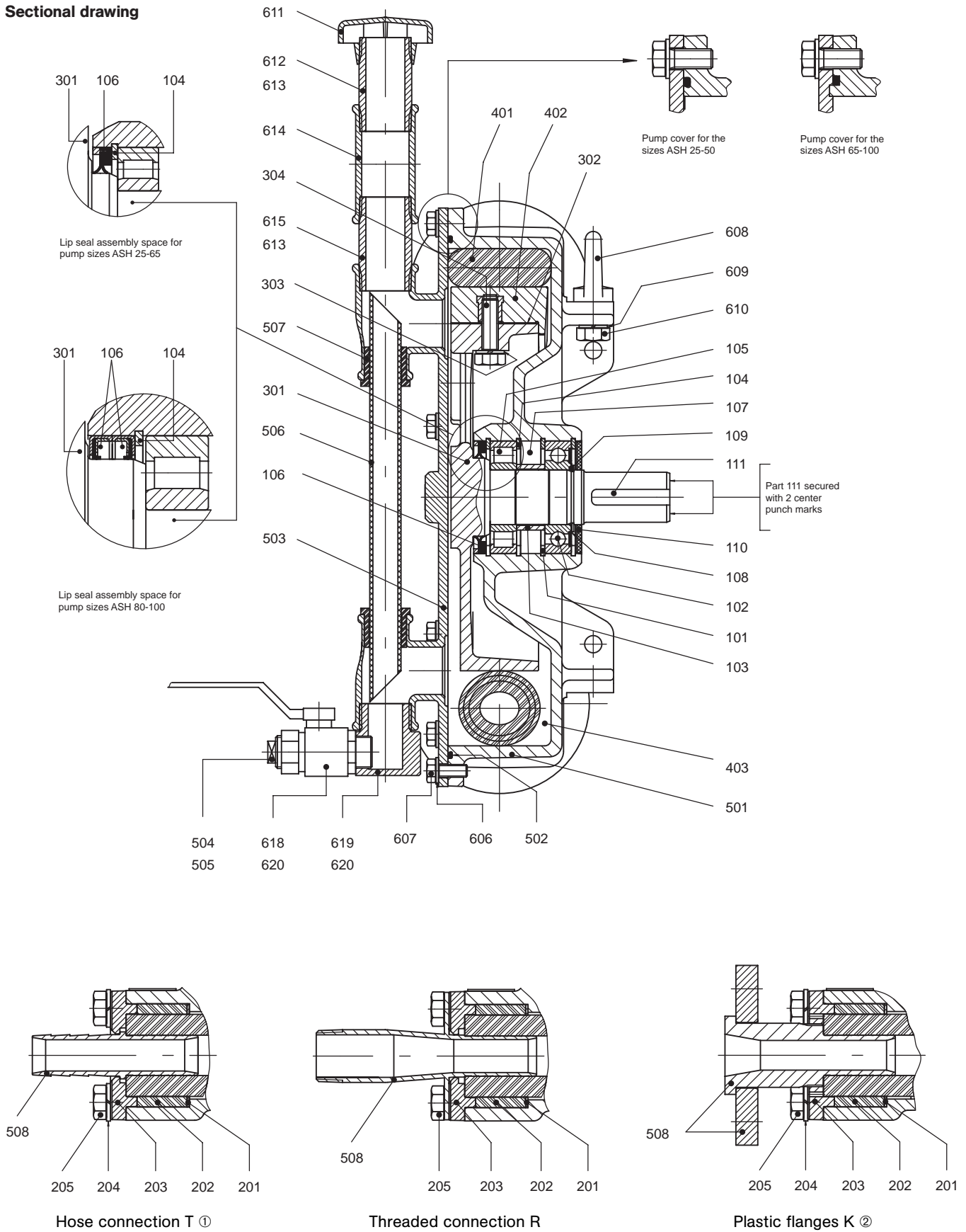
Number of plates



The number of plates is to be rounded up to a full digit.
 In case of temperatures of the pumped liquid exceeding 60°C, the plate number is to be reduced by 1 piece.

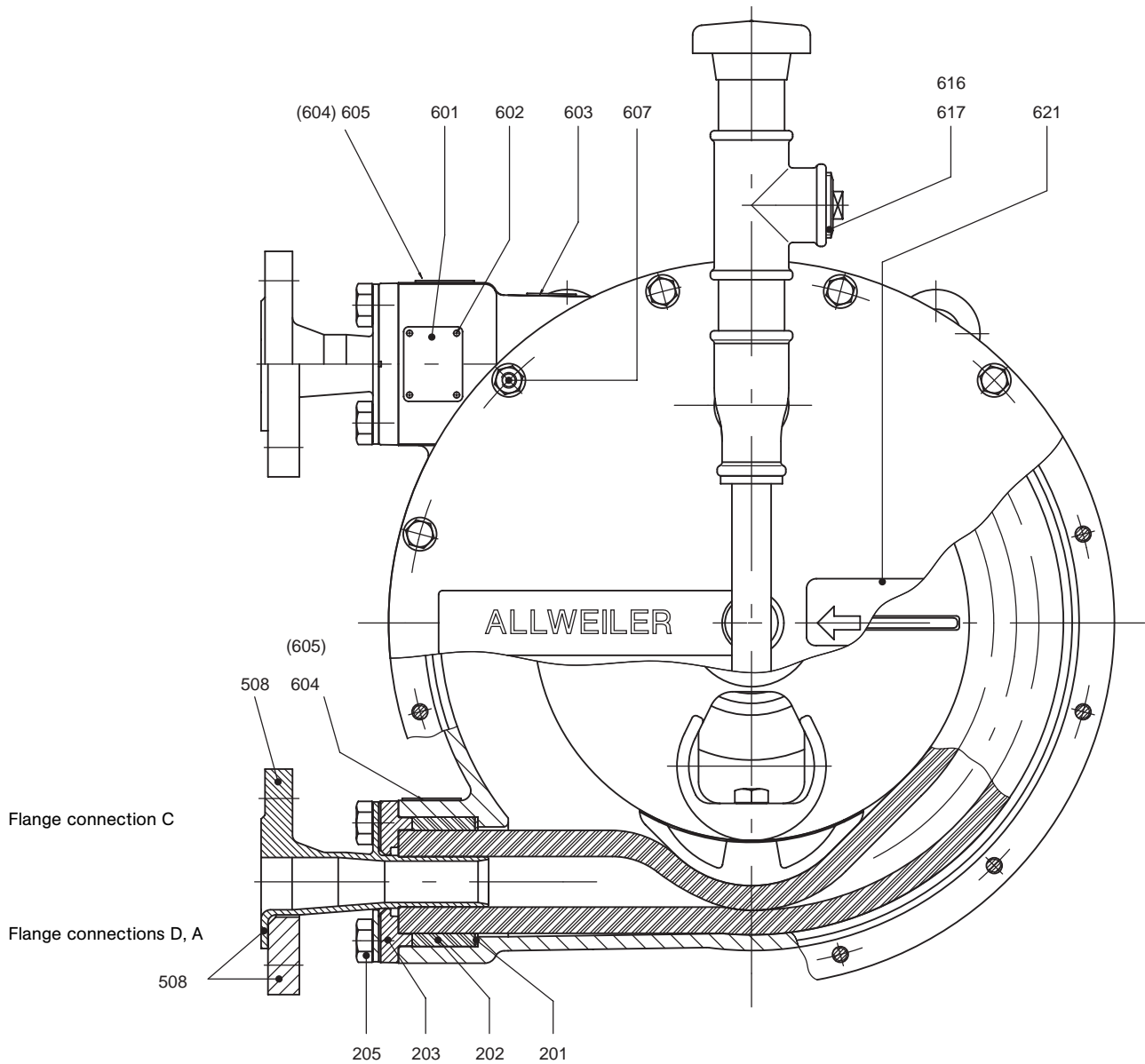
Example ASH 40: ① n = 20 min⁻¹; p = 7,5 bar; 3 plates
 ② n = 40 min⁻¹; p = 10 bar; 4 plates

Sectional drawing



Recommended spare parts:
 r = small repair set
 R = great repair set

① only for pump sizes ASH 25-40
 ② only for pump sizes ASH 25-65



Part-No.	Denomination	Part-No.	Denomination	Part-No.	Denomination
101	Retaining circlip	303	Spring washer	606	Spring washer
102 R	Deep groove ball bearing	304	Hexagon screw	607	Hexagon screw
103	Spacer sleeve	401 r, R	Hose	607	Stud
104	Retaining circlip	402	Sliding shoe	607	Hexagon screw
105 R	Cylindric roller bearing	403 r, R	Glycerin filling	608	Lifting eye nuts
106 R	Lip seal	501	Pump casing	609	Spring washer
107	Bearing grease	502 r, R	Pump cover seal	610	Hexagon screw
108	Shim ring	503	Pump cover	611	Vent valve/unit
109	Retaining ring	504	Screw plug	612	Pipe nipple
110	Flinger ring	505	Teflon tape	613	Teflon tape
111	Key	506	Pipe	614	Tee
201	Stuffing box base ring	507	Bushing	615	Barrel nipples
202 R	Stuffing box packing	508	Connection piece	616	Screw plug
203	Packing gland	601	Name plate	617	Teflon tape
204	Spring washer	602	Dome headed grooved pin	618	Plug valve
205	Hexagon screw	603	Instruction label	619	Angle
301	Rotor	604	Suction label	620	Teflon label
302	Adjusting sheet	605	Discharge label	621	Adhesive label "Minimum fill level"

Subject to technical alterations.

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