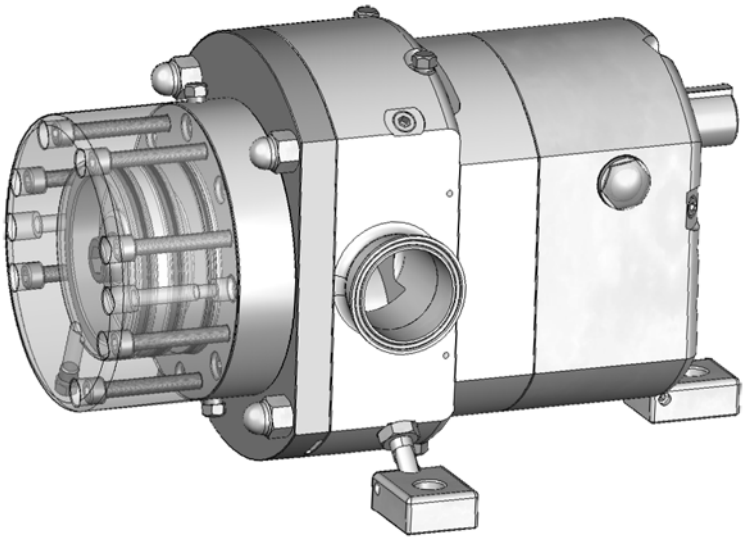

GEA Hilge

Pressure Relief Valve for NOVAlobe

Installation and operating instructions English

Translation of the original operating manual

BA.280.YYY.002.10.07.GB

1. Introduction

Abstract

This section describes the target group of this manual and the requirements which are important for reading and understanding this manual.

1.1 Application and target group

The operating manual contains important information required for operation of the pressure relief valve PRV - NOVA for NOVAlobe pumps. Read this document attentively and follow the described instructions and notes.

This operating manual is intended for:

- the operators of the pump and
- maintenance and repair personnel.

It is assumed that all such personnel will have the basic technical background required for the start-up, maintenance, and repair of pump systems.

Sections which are intended only for specially authorised personnel are indicated by a preceding notation to this effect.

1.2 References to the document

Further applicable documents

This additional instruction manual applies to the respective NOVAlobe pump operating manual.

Copyright

Technical changes

Design variants, technical data, and spare part numbers are subject to technical change.

The right to make changes for the sake of further technical development is reserved.

2. Safety

Abstract

This section describes what you have to consider for your own safety. Read this important section attentively!

2.1 Instructions for the operator

Observe the instructions given in the NOVAlobe pump operating manual. There you get general instructions concerning operation and maintenance as well as information how to classify the different safety instructions.

2.2 Identification of instructions in the operating manual

Symbol

The safety instructions presented in this operating manual are identified as shown below.

Fig. 1 Symbol for safety instructions

Signal words

In order to classify the safety labels they are distinguished by the following signal words:

- **DANGER**
  Characterises an imminent hazard with a high risk which can cause death or grievous bodily harm.
- **WARNING**
  Characterises a possible hazard with medium risk which can cause death or bodily harm if it is not avoided.
- **CAUTION**
  Characterises a hazard with minor risk which can causes minor or medium bodily harm if it is not avoided.

Don't remove instructions from machine

Instructions attached directly to the machine, such as Rotational direction arrow must be noted and kept in completely legible condition.

Damaged or illegible instructions must be replaced.

2.3 Cleaning

CIP and SIP methods must be in accordance with the latest current guidelines of the EC.

When special cleaning agents and methods are used, the supplier must confirm that they are safe for the materials involved.

Warning

Danger from pressure surge! Liquids under high pressure can be forcibly ejected from the pump.

Pressure surge can cause bodily injury or damage to the plant and pump.

- Before sterilisation always evacuate the system completely!

2.3.1 CIP cleaning process

Warning

Danger from hazardous substances such as cleaning agents!

Hazardous substances can cause death, bodily injury or damage to the plant and pump.

- Read product information of cleaning agent and follow the given safety instructions absolutely.
- In order to make the pump / pressure relief valve residue free: Rinse well with clean water after using a cleaning agent.

The following table shows a typical CIP cleaning process.

Step	Description	PRV position	Duration
1	Flush through with cold water ~ 5C	Closed	5 minutes
2	Flush through with cold water ~ 5C	Open	5 minutes
3	Flush hot caustic soda (70 -80 C) at 2.5% concentration	Closed	5 minutes
4	Flush hot caustic soda (70 -80 C) at 2.5% concentration	Open	5 minutes
5	Flush hot caustic soda (70 -80 C) at 2.5% concentration	Closed	5 minutes
6	Flush hot caustic soda (70 -80 C) at 2.5% concentration	Open	5 minutes
7	Flush hot caustic soda (70 -80 C) at 2.5% concentration	Closed	10 minutes
8	Flush through with cold water ~ 5C	Open	5 minutes
9	Flush through with cold water ~ 5C	Closed	5 minutes
10	Flush through with cold water ~ 5C	Open	5 minutes
11	Flush through with cold water ~ 5C	Closed	10 minutes

Tab. 1 CIP cleaning process

2.3.1.1 Cleaning flow

The following table shows the cleaning flow through the pressure relief valve and the pump.

Pump model	Cleaning flow through the PRV [l/min]	Cleaning flow through the pump [l/min]
NL 10/0.06	2	44
NL 20/0.12	2.5	113
NL 30/0.22	3	177
NL 50/0.1.29	4	452
NL 40/0.65	3.5	299

Table 2 Cleaning flow

3. Product Description

Abstract

This section describes the pressure relief valve as well as its design and application.The section „Technical Data“ describes limits for application. You must know and observe these limits.

3.1 Overview

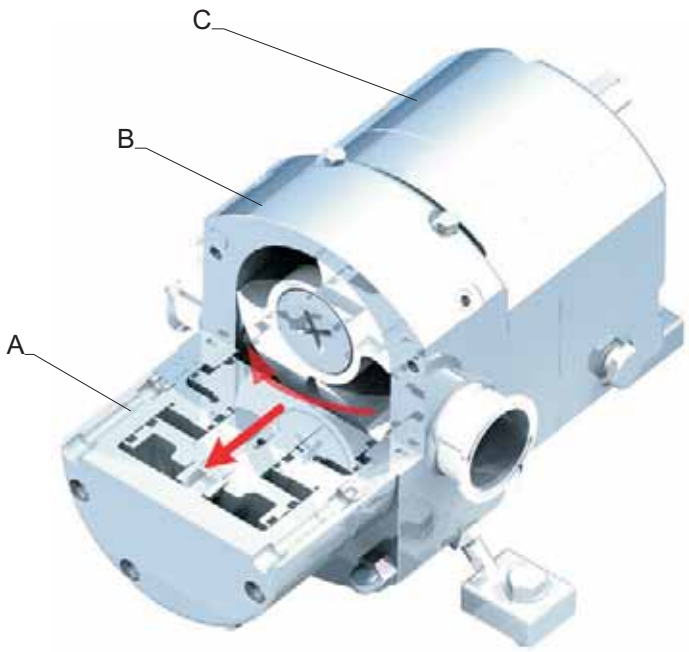

Fig. 2 Product overview

- A - pressure relief valve
- B - NOVAlobe pump
- C - gear box

3.2 Description

Rotary lobe pumps will generate a rising pressure when operating against a closed outlet. This increasing pressure will continue until pump failure or system failure occurs.)

Safe guards such as motor power cut out equipment or pressure relief valves with bypass can help prevent catastrophic failure.

The pressure relief valve is available to provide a short term safe guard against pump damage.

If the pressure relief valve is fitted with sensors it is able to provide status information[1].

1. option

3.2.1 Working principle

The NOVAlobe pressure relief valve has a large diameter piston that is allowed to lift at a set pressure and so bypass high pressure liquid back to the low pressure side of the pump.

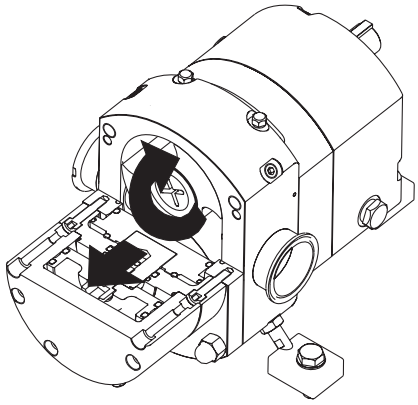

Fig. 3 Working principle of pressure relief valve

3.3 Proper usage

Warning

Improper usage is dangerous.

Operating the pump in a manner that differs from the information provided in the order may result in death, severe bodily injury, or damage to property.

- Pump only media that are specified in the order. The pump has been specially designed for that purpose!
- Operate the pump only in the electrical network specified in the order!

3.3.1 Air supply

The air must be clean and dry.

3.3.2 Maximum pressures

Position	Max. pressure [bar]
Air load	4
Air lift	1
CIP inlet	3

Table 3 Maximum pressures

4. Mounting, installation and connection

Abstract

In this section you will learn how to mount, adjust and install the pressure relief valve.

4.1 Valve connection

The pressure relief valve is equipped with four connection points.

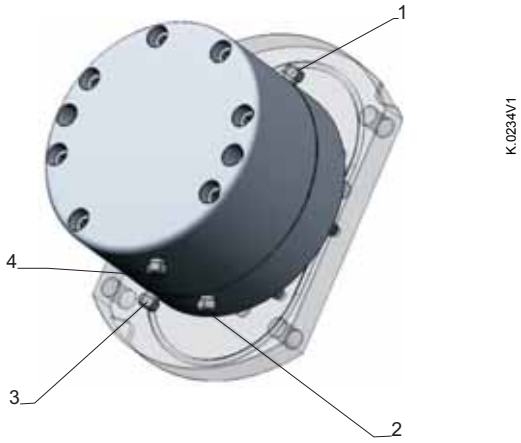

Fig. 4 Connections

- 1 - cleaning fluid inlet
- 2 - air lift connection point
- 3 - cleaning fluid outlet
- 4 - air load connection point

Connect the pressure relief valve in this way:

1. Connect the inlet of cleaning fluid.
2. Connect the air lift.
3. Connect the outlet of cleaning fluid.
4. Connect the air load.
5. Check tightness of connection

4.2 Valve settings

The pressure relief valves are supplied with the following operational options:

- Air load only
- Air load and air lift
- Air load and air lift and CIP

The air actuated pressure relief valve can be operated remotely and interfaced with control systems of other components operating within the process.

The setting of the control pressure is influenced by the viscosity of the pumped media, the speed of the pump and the design and layout of the system into which the pump unit is installed.

The setting of the control pressure for valve loading should be carried out on site under the operating conditions for which the pump unit has been selected.

To adjust the air pressure setting of the pressure control system the pump must be installed with a pressure gauge in the

discharge line adjacent to the pump unit discharge port.

Set the valve in this way:

1. Install the pump as recommended in the installation manual.
2. The pump must be installed with a pressure gauge on the discharge line next to the discharge port.
3. An air supply regulated by a pressure control valve is required.
4. The pressure regulated air supply should be adjusted to zero bar.
5. Connect a regulated air supply to the Air Load connection point.
6. Start the pump following recommended start up procedures.
7. Using the pressure regulating control valve, adjust the air pressure until the required pressure relief setting is reached as indicated by the pressure gauge on the discharge line next to the pump discharge port.

NOTE: The air pressure must not exceed 4 bar (see section 3.3.2*).*

To use the air lift system:

1. A 1 bar regulated air supply is required.
2. A change over valve is required to change the air supply pressure from the air load supply point to the air lift supply point.
3. The control system must allow the depressurization of the air load system or the air lift system when not in use.
4. Operation of the change over valve allows the valve to be opened or closed as required.

Caution

Danger of over pressurisation!

Over pressurisation can cause damages to the pump or plant.

- Regular inspection of the air pressure setting must be carried out to ensure that the systems are not over pressurised.
- Suitable air pressure relief systems must be employed.
- The pressure relief valve must be serviced every 12 months.

4.2.1 Setting the closing pressure

The closing pressure must be set on site on the liquid being handled.

Pump model	Approximate ratio
NL 10/0.06	0.24
NL 20/0.12	0.21
NL30/0.22	0.24
NL40/0.65	0.24
NL50/1.29	0.24

Table 4 Closing pressure

Air pressure $_{required}$ = approx. ratio x pump differential pressure

4.3 Sensor data

You can fit your own preferred sensor. A sensor is not supplied as standard. The sensor fitting dimensions is similar on all trip pressure relief valves.

For dimensions please contact HILGE or Grundfos.

5. Maintenance / servicing

Abstract

This section gives important information concerning maintenance and servicing of the pump. Read this section before you carry out maintenance work or troubleshooting measures!

5.1 Safety instructions for maintenance, inspection and installation work

Warning

Danger of unprofessional work!

Unprofessional work can cause bodily injury or damage to the plant and pump!

- The operator must ensure that all maintenance, inspection, and installation work is carried out by authorised and qualified technical personnel, who have acquired the required knowledge through study of the operating instructions.

Warning

Danger of electrical shock if electrical parts are touched.

Electrical shock can cause death, bodily injury.

- Always turn off the electrical supply at the pump before eliminating any breakdown!

Warning

Danger of pressurized spray.

Pressurized components can cause death, bodily injury or damage to the plant and pump.

Warning

Danger of hot components.

Hot components can cause death, bodily injury or damage to the plant and pump.

- Always allow to cool down before eliminating any breakdown!

Warning

Danger of unintentioned switching of the pump!

Unintentioned switching of the pump can cause death, bodily injury or damage to the plant and pump.

- Take appropriate measures to ensure that the machine cannot be unintentionally turned on again.

Warning

Danger of contact or inhaling of hazardous substances!

Contact or inhaling of hazardous substances can cause death, bodily injury or damage to the plant and pump!

- Pumps or systems which convey hazardous media must be decontaminated!

Warning

Danger of missing protection and safety equipment.

Missing protection and safety equipment can cause death, bodily injury or damage to the plant and pump.

- Immediately after completing the work install the protection and safety equipment and make sure it functions!

Caution

Danger of improper tools!

Improper tools can cause damage to the pump and plant.

- In accordance with the design standard (3A0.01 to 3A3.37), all tools, possible support surfaces, and other auxiliary materials must ensure that all parts of the pump can be assembled without damage (e.g.scratches).

Caution

Danger of frost!

Frost causes damage to the plant and pump.

- When there is danger of frost drain the pump completely.

5.2 Maintenance of the valve

Service interval: 12 months

- Replace all O-rings (Viton)
- Replace all screws (A4)
- Replace all worn parts.

5.3 Assembly

5.3.1 Parts overview

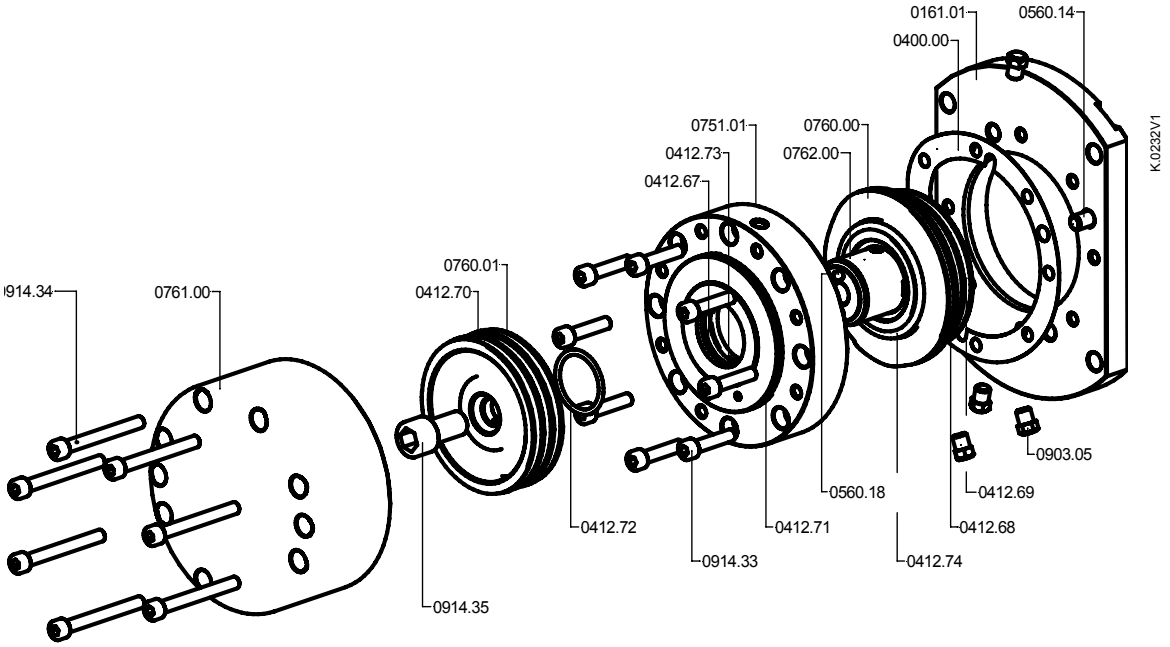

Fig. *5* Parts overview

Qty.	Part-No.	Description
1	0161.00	front cover
1	0400.00	gasket, CIP
1	0412.67	O-ring
1	0412.68	O-ring
1	0412.69	O-ring
2	0412.70	O-ring
1	0412.71	O-ring
1	0412.72	O-ring
1	0412.73	O-ring
1	0412.74	O-ring
2	0560.17	fasteners dowel

Qty.	Part-No.	Description
2	0560.18	pin
1	0751.00	main cylinder
1	0760.00	piston, product side
1	0760.01	gas piston
1	0761.00	cylinder cap-air
1	0762.00	piston spacer, air
4	0903.05	drain plug
8	0914.33	socket head cap screw
7	0914.34	socket head cap screw
1	0914.35	socket head cap screw

Tab. *5* Parts list

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GEA Hilge

Hilge GmbH & Co. KG

Hilgestraße 37-47, 55294 Bodenheim, Germany
Phone: +49 6135 75-0, Fax: +49 6135 754955
gea.com