Intensifier 1.0 – 2.6 l/min

Intensification ratio 1.5 – 5.0 max. operating pressure up to 500 bar, double acting, with pilot-operated check valve

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1 Description of the product

An oscillating pump piston, that will be automatically reversed in the end positions by a hydraulically-operated valve, is installed in the intensifier. The ratio of the piston areas corresponds to the intensification ratio. For unhindered flow in the low-pressure range, the pump piston will be bypassed by means of a bypass-line. A pilot-controlled check valve shuts off the high pressure.

2 Validity of the documentation

Hydraulic intensifiers as per data sheet D 8.757. The following types or part numbers are concerned:

- 8755 715,
- 8755 720
- 8755 732,
- 8755 740,
- 8755 750

3 Target group of this document

- Specialists, fitters and set-up men of machines and installations with hydraulic expert knowledge.

Qualification of the personnel

Expert knowledge means that the personnel must

- be in the position to read and completely understand technical specifications such as circuit diagrams and product-specific drawing documents,
- have expert knowledge (electric, hydraulic, pneumatic knowledge, etc.) of function and design of the corresponding components.

An **expert** is somebody who has due to its professional education and experiences sufficient knowledge and is familiar with the relevant regulations so that he

- can judge the entrusted works,
- can recognize the possible dangers,
- can take the required measures to eliminate dangers,
- knows the acknowledged standards, rules and guidelines of the technology.
- has the required knowledge for repair and mounting.

4 Symbols and signal words

⚠ WARNING

Person damage

Stands for a possibly dangerous situation.
If it is not avoided, death or very severe injuries will result.

⚠ CAUTION

Easy injuries / property damage

Stands for a possibly dangerous situation.
If it is not avoided, minor injuries or material damages will result.

Hazardous to the environment

The symbol stands for important information for the proper handling with materials that are hazardous to the environment.
Ignoring these notes can lead to heavy damages to the environment.

Mandatory sign!

The symbol stands for important information, necessary protection equipment, etc.

NOTE

- This symbol stands for tips for users or especially useful information. This is no signal word for a dangerous or harmful situation.

5 For your safety

5.1 Basic information

The operating instructions serve to information and avoidance of dangers for transport, operation and maintenance.
Only in strict compliance with these operating instructions, accidents and property damages can be avoided as well as trouble-free operation of the product can be guaranteed.
Furthermore, the consideration of the operating instructions will result in:

- avoid injuries
- reduced down times and repair costs,
- increased service life of the products.

5.2 Safety instructions

⚠ WARNING

Injuries caused by missing safety devices!

- To avoid injuries appropriate safety devices must be provided by the customer.

Injuries due to non-compliance of the operating instructions!

- The product may only be operated, if the operating instructions - especially the chapter "Safety instructions" have been read and understood.

Injuries due to misuse, incorrect operation or abuse!

Injuries can occur if the product is not used within the intended use and the technical performance data.

- Before start up, read the operating instructions!

⚠ WARNING

Poisoning due to contact with hydraulic oil!

- For handling with hydraulic oil consider the material safety data sheet.
- Wear protection equipment.

Injury by high-pressure injection (squirting out of hydraulic oil under high pressure)!

- Improper connection can lead to escapes of oil under high pressure at the connections.
- Mounting or dismounting of the element must only be made in depressurised mode of the hydraulic system.
- Connection of the hydraulic line as per DIN 3852/ISO 1179.
- Unused connections have to be locked professionally.
- Use all mounting holes.

Burning due to hot oil!

- In operating conditions oil temperatures up to 70 °C can appear due to environment influences.
- All works must only be made in cool mode!

Burning due to hot surface!

- In operating conditions, surface temperatures of more than 70 °C can appear at the product.
- All maintenance and repair works must only be effected in cooled mode or with safety gloves.

Injury / burning due to contact with energized parts!

- Before working on electric equipment, the energized parts must be de-energized and secured.
- Do not open protection covers at electric parts.
- All electrical works must only be realised by electricians.

⚠ CAUTION

Work by qualified personnel

- Works only to be effected by authorised personnel.

Performance of the product!

The admissible performance data of the product, see chapter "Technical characteristics", may not be exceeded.

NOTE

Qualification of personnel

All works may only be effected by qualified personnel familiar with the handling of hydraulic components.

5.3 Personal protective equipment

For works at and with the product, wear safety goggles!

For works at and with the product, wear protective gloves!

For works at and with the product, wear safety shoes!

For all works at the product, the operator has to make sure that the necessary protection equipment will be worn.

6 Application

6.1 Intended use

The products are used to generate hydraulic pressure in industrial applications for bending or clamping of workpieces and / or to operate fixtures alternatively hydraulic actuators within closed, low in dust rooms.

Furthermore the following belongs to possible uses:

- Use within the capacity indicated in the technical characteristics (see data sheet).
- Use as per operating instructions.
- Compliance with service intervals.
- Qualified and trained personnel for the corresponding activities.
- Mounting of spare parts only with the same specifications as the original part.

6.2 Misapplication

⚠ WARNING

Injuries, material damages or malfunctions!

- Do not modify the product!

The use of these products is not admitted:

- For domestic use.
- On pallets or machine tool tables in primary shaping and metal forming machine tools.
- If due to physical / chemical effects (vibrations, welding currents or others) damages of the products or seals can be caused.
- In machines, on pallets or machine tool tables that are used to change the characteristics of the material (magnetise, radiation, photochemical procedures, etc.).
- In areas for which special guidelines apply, especially installations and machines:
  - For the use on fun fairs and in leisure parks.
  - In food processing or in areas with special hygiene regulations.
  - For military purposes.
  - In mines.
  - In explosive and aggressive environments (e.g. ATEX).
  - In medical engineering.
  - In the aerospace industry.
  - For passenger transport.
- For other operating and environmental conditions e.g.:
  - Higher operating pressures than indicated on the data sheet or installation drawing.
  - With hydraulic fluids that do not correspond to the specifications.

7 Installation

⚠ WARNING

Injury by high-pressure injection (squirting out of hydraulic oil under high pressure)!

- Improper connection can lead to escapes of oil under high pressure at the connections.
- Mounting or dismounting of the element must only be made in depressurised mode of the hydraulic system.
- Connection of the hydraulic line as per DIN 3852/ISO 1179.
- Unused connections have to be locked professionally.
- Use all mounting holes.

For works at and with the product, wear suitable protection equipment!

NOTE

Monitor operating pressure

The operating pressure of the high-pressure circuit has to be monitored to avoid too high pressures.

For example, using a pressure gauge or a pressure switch.

7.1 Overview of components

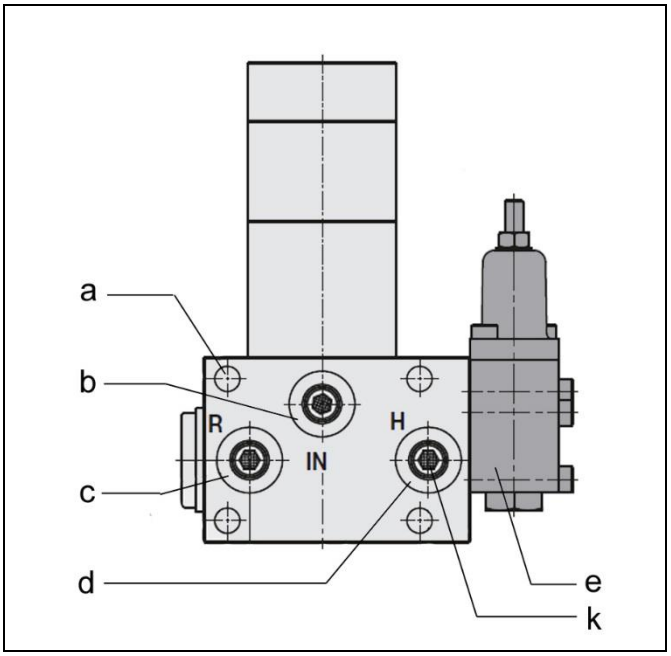

Figure 1: Design pipe thread version

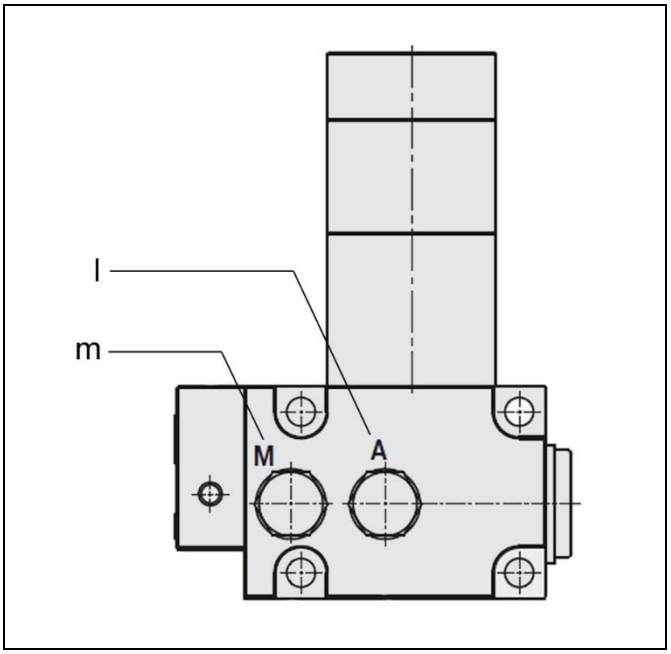

Figure 2: Design pipe thread version

a	Mounting holes	k	3 set screws (G1/4 to hold the screen disks)
b	Port IN	l	Port for high pressure (accessory)
c	Port R	m	Port for high pressure (accessory)
d	Port H		
e	Sequence valve (accessory) or deflector plate		

8 Installation

⚠ CAUTION

Malfunctions!

Chips, coolants and cutting fluids can cause malfunctions.

- Protect the power units against penetration of chips, coolants and cutting fluids!

NOTE

Extremely high hydraulic pressures

The intensifier can produce extremely high hydraulic pressures. The manufacturer of the system must provide effective safety valves for protection against excessive pressures.

Connect double acting

The intensifier must always be connected for double acting use, also if only a single acting cylinder will be operated. For oil supply, port R must be depressurised, so that the pump and the pilot-operated check valves can work without failure.

Leakage

As long as pressure is available at IN, the intensifier has an internal leakage between the ports IN and R.

8.1 Connection of the hydraulic equipment

1. Connect hydraulic lines to qualifying standards and pay attention to scrupulous cleanness!

NOTE

More details

- See ROEMHELD data sheets A 0.100, F 9.300, F 9.310 and F 9.360.

Screwed Plug

- Use only fittings "screwed plug B and E" as per DIN 3852 (ISO 1179).

hydraulic connection

- Do not use sealing tape, copper rings or coned fittings.

Pressure fluids

- Use hydraulic oil as per ROEMHELD data sheet A 0.100.

Hydraulic oil

The hydraulic oil must be perfectly filtered with particles not larger than nominally 10 µm. This is the reason why we offer a filter unit (part-no. 3887-060), which
can be directly integrated in the tubing of the low-pressure side (see page 2).

Completely bleeded

After completion of all assembly and installation works, the hydraulic system must be completely bleeded.

8.1.1 Pipe thread

For pipe thread connection 3 set screws must be unscrewed from the ports. The set screws prevent the 3 screen disks against falling out. This function is then taken over by the tube male stud couplings or swivel banjo couplings. The ports A and M are internally connected with the high-pressure port H and allow the connection of accessories, e.g. hydraulic accumulator, pressure gauge or Minimess couplings.

NOTE

Do not use the ports **A** and **M** as cylinder ports, because there are no screen disks installed.

8.1.2 Manifold-mounting connection

Required: 4 screws M8-10.9, tightening torque 36 Nm.

NOTE

The intensifier is delivered ready for installation for manifold-mounting connection, i.e. with 3 Kantseal sealing rings for sealing of the drilled channels.

8.2 Operation

8.2.1 Functional principle

The flow rate is supplied without pressure through input IN via the check valves RV3, DV2 to the output H and thereby to the hydraulic cylinders. At the same time, the oscillating pump OP starts working. The flow rate at output H is getting smaller and smaller and is nearly zero when reaching the maximum operating pressure. The pump holds constant the pressure at H as long as low-pressure is available at IN. Between the ports IN and R there will be a leakage of approx. 50 cm³/min, since due to functional reasons the pump elements cannot be sealed without leakage. If the input IN is depressurised, the check valve DV2 prevents a pressure drop at port H. To retract the cylinders, port IN will be depressurised and port R pressurised. The check valves DV1 and DV2 will be unlocked and allow free return.

8.2.2 Application

Hydraulic intensifiers convert a low input pressure into a higher output pressure according to the intensification ratio. In principle, smaller clamping elements can be used with higher pressure and thus more workpieces can be machined on one fixture. A single hydraulic cylinder, a complete group of cylinders or a complete hydraulic clamping fixture can be connected to the hydraulic intensifier. The integrated pilot-controlled check valve prevents a pressure drop in the high-pressure range on uncoupled pallets. Prerequisite is the use of leakage-free clamping elements.

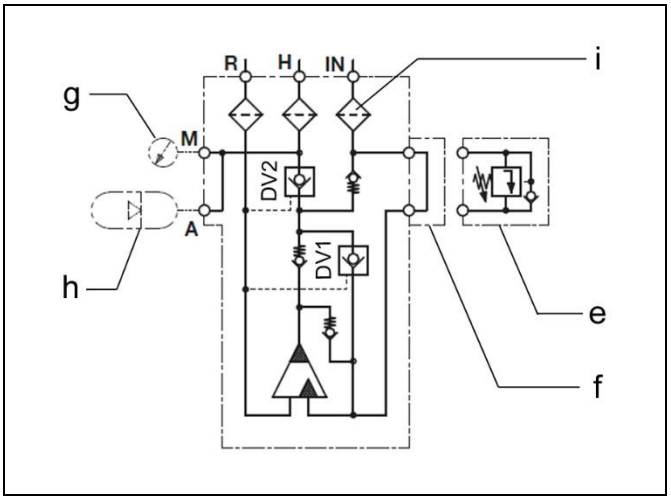

Figure 3: Connecting scheme of pipe thread version

e Sequence valve (accessory) f Deflector plate g Pressure gauge (accessory)	h Hydraulic accumulator (accessory) i Screen disk

9 Maintenance

⚠ WARNING

Burning due to hot surface!

- In operating conditions, surface temperatures of more than 70 °C can appear at the product.
- All maintenance and repair works must only be effected in cooled mode or with safety gloves.

For works at and with the product, wear suitable protection equipment!

9.1 Plan for maintenance

Maintenance works	Interval	Realisation
Cleaning	As required	Operator
Check	daily	Operator
Checking of hydraulic system and components	yearly	Qualified personnel
Check the hydraulic fluid	after 1250 operating hours or 6 months	Qualified personnel
Exchange of hydraulic fluids	in case of damages	Qualified personnel
Repair		ROEMHELD service staff

9.1.1 Regular checks

Checks by the operator have to be effected as follows:

9.1.2 Daily checks

- Check all fixing screws, retighten if required.
- Check if hydraulic hoses, pipes and cables are damaged, or have chafe marks, etc.).
- Check hydraulic components for external leakage - retighten fittings, if required.
- Hydraulic hoses must not get in contact with substances which can cause a damage (acids, lys, solvents, ...).

9.1.3 Cleaning

⚠ WARNING

Injury by flying out components or oil!

- For cleaning works always wear safety goggles, protective shoes and safety gloves.

⚠ CAUTION

Aggressive cleaning agents

The product must not be cleaned with:

- Corrosive or corroding components or
- Organic solvents as halogen or aromatic hydrocarbons and ketones (cellulose thinner, acetone, etc.),

because this can destroy the seals.

10 Trouble shooting

Trouble: Caused by intensifier:	Possible cause	Possible system solution
High pressure will not be built up	Swarf in DV1 valve (oil is contaminated with swarf)	1. Check for leaks on the high pressure side 2. Flush the intensifier to loosen swarf/dirt
	Air in the hydraulic system	Bleeding
	Internal seal damaged.	⚠ **Caution!** Repair only by ROEMHELD service personnel. Return for repair.
Intensifier cycles continuously (even if the max. clamping pressure is reached.)	Leakage between IN and R. Pump elements are for functional reasons not leakage-free.	Depressurise port IN
High pressure will be reduced immediately.	Swarf in DV2 valve (oil is contaminated with swarf) Swarf in DV valve (if available)	1. Flush the intensifier to loosen swarf/dirt 2. Check reservoir pressure
The valve DV can not release the high pressure.	Input pressure too low. (see data sheet)	1. Check the available pressure for release and the available high pressure during release.
Trouble: In the hydraulic circuit	**Possible cause**	**Possible system solution**
Intensifier shows no response	Input pressure too low. (min. 20 bar) Input volume too low. (min. 2 l/min)	Increase the input pressure to min. 20 bar. Increase the input pressure to min. 2 l/min.
High pressure is not stable	Pressure fluctuations on the input side The hysteresis varies depending on the intensification ratio between -5 to -10 bar	

11 Technical characteristics

Characteristics of type 8755 7XX

Type	Intensification i	Max. flow rate IN [l/min]	Max. flow rate H* [l/min]	Max. operating pressure - low-pressure side IN [bar]	Max. operating pressure - high-pressure side H [bar]	Min. operating pressure [bar]
8755-712	1.5	8	2.6	200	300	20
8755-720	2.0	12	2.4	200	400	20
8755-732	3.2	15	1.6	156	500	20
8755-740	4.0	14	1.3	125	500	20
8755-750	5.0	14	1.0	100	500	20

*) in case of a counter pressure of 300 bar. With increasing counter pressure the flow rate tends to zero.

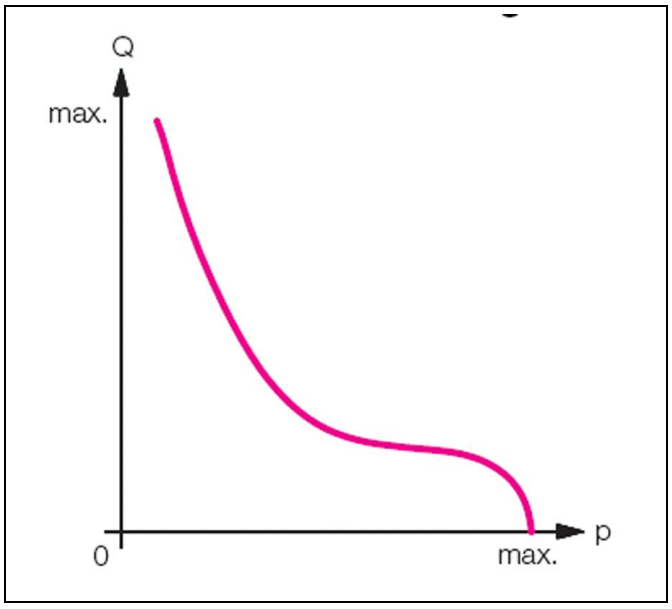

Figure 4: Pressure - flow rate diagram

Hydraulic fluids

NOTE

Pressure fluids

- Use hydraulic oil as per ROEMHELD data sheet A 0.100.

12 Disposal

Hazardous to the environment

Due to possible environmental pollution, the individual components must be disposed only by an authorised expert company.

The individual materials have to be disposed as per the existing regulations and directives as well as the environmental conditions.

Special attention has to be drawn to the disposal of components with residual portions of hydraulic fluids. The instructions for the disposal at the material safety data sheet have to be considered.

For the disposal of electrical and electronic components (e.g. stroke measuring systems, proximity switches, etc.) country-specific legal regulations and specifications have to be kept.

13 Declaration of manufacture

Manufacturer

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Declaration of manufacture of the products

Hydraulic intensifiers as per data sheet D 8.757. The following types or part numbers are concerned:

- 8755 715,
- 8755 720
- 8755 732,
- 8755 740,
- 8755 750

They are designed and manufactured in line with the relevant versions of the directives **2006/42/EC** (EC MSRL) and in compliance with the valid technical rules and standards.
In accordance with EC-MSRL and EN 982, these products are components that are not yet ready for use and are exclusively designed for the installation in a machine, a fixture or a plant.

According to the pressure equipment directives the products are not to be classified as pressure reservoirs but as hydraulic placing devices, since pressure is not the essential factor for the design, but the strength, the inherent stability and solidity with regard to static or dynamic operating stress.

The products may only be put into operation after it was assessed that the incomplete machine/machine, in which the product shall be installed, corresponds to the machinery directives (2006/42/EC).

The manufacturer commits to transmit the special documents of the products to state authorities on request.
The technical documentation as per appendix VII part B was prepared for the products.

Responsible person for the documentation:
Dipl.-Ing. (FH) Jürgen Niesner, Tel.: +49(0)6405 89-0.

Römheld GmbH
Friedrichshütte

Laubach, 10.02.2016