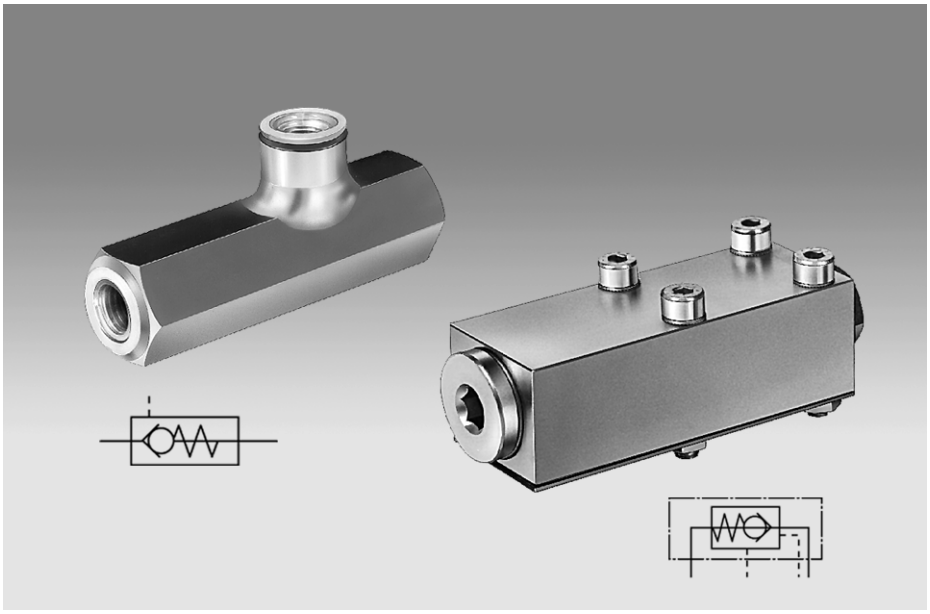
Operating Instructions

Check Valves, Pilot Operated



These operating instructions are available for pilot-operated check valves of the following types:

2951-416
2951-417
2951-421
2951-501

Target group of this document

Fitters and setters of machine tools. They have to be familiar with the handling and mounting of hydraulic components.

Provided use

Locking of leakage-free hydraulic cylinders, i. e. for maintaining the pressure and/or the position, can also be used in combination with non-leakage free directional control valves.
Pilot-operated check valves are not suitable for locking of double-acting swing clamps (pull-type cylinders). Due to the unfavourable surface ratio of these elements, the control pressure is not sufficient for unlocking and dangerous pressure intensifications occur. For such applications use type 2951-421.

Safety

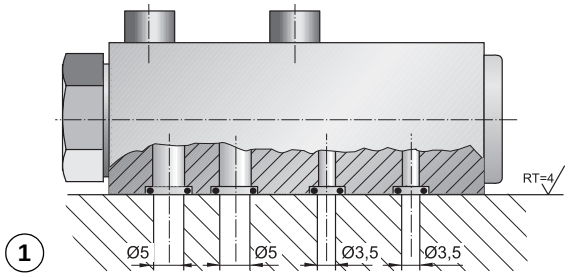
Troubles of functioning
Protect against swarf, otherwise check valves might not seal.

Instructions for safe operation

- Swarf or contamination in the hydraulic oil lead to increased wear or damage at the guides, running surfaces and seals.
- The maximum operating pressure and the admissible flow rate of the valve must not be exceeded.
- Use hydraulic oil as per Roemheld data sheet A 0.100.

Function

Check valves are spring-loaded ball-type poppet valves (leakage free).
The flow B → A is free. The flow from A → B is locked, but it can be hydraulically unlocked by pressurising control port Z.



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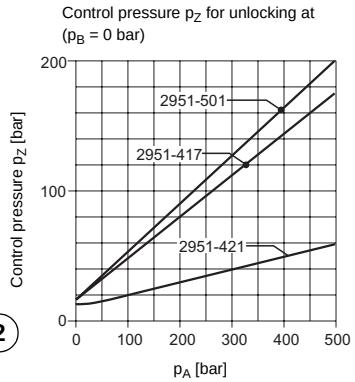

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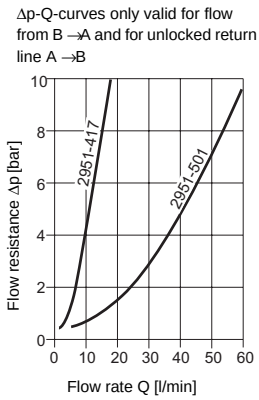


All figures are schematic figures.

Installation

Any mounting position of the check valves is possible.

- Return the leakage return port L depressurised at the reservoir.

Type 2951-416 (for manifold-mounting)

- Drill holes for hydraulic oil supply and return in the fixture.
- Grind flange surface.
- Clean the support surfaces.
- Fasten the valve with O-rings on the fixture.

Hydraulic connection

- Connect hydraulic lines to qualifying standards, pay attention to scrupulous cleanness! See also Römheld data sheets A0.100, F9.300, F9.310 and F9.360.
- Use only fittings "screwed plug B" as per DIN 3852 (ISO 1179).
- Do not use sealing tape, copper rings or coned fittings.
- Check sealing of the hydraulic connections!

Maintenance

Check if the hydraulic ports are tight (visual control). The valve itself is maintenance free.

Data sheets

Types	Corresponding data sheets
2951-417, 2951-501	C2.9511
2951-416	C2.9512
2951-421	D8.755

General characteristics

Part-no.		2951-416	2951-417	2951-421	2951-501
Port A, B		Ø 5	G1/4	G1/2	G1/2
Control port Z		Ø 3.5	G1/4	G1/4	G1/4
Control pressure $p_Z \geq$	bar	0.3 p_A + 12	0.32 p_A + 12	0.12 p_A +7	0.38 p_A + 12
Max. operating pressure	bar	500	500	500	500
Max. flow rate	l/min	20	15	55	55

Operating Instructions

Hydraulic Intensifier

Hydraulic Intensifier

- **continuously acting**
- **with hydraulic port and tubes or with hydraulic manifold mounting port and plug-type connectors**

These operating instructions are available for the following types:

8755-015	**8755-132**
8755-020	**8755-140**
8755-032	**8755-148**
8755-040	**8755-162**
8755-050	**8755-175**

Target group of this document

Fitters and setters of machine tools. They have to be familiar with the handling of hydraulic components.

Provided use

The hydraulic intensifer has been designed for the use in clamping fixtures to increase the hydraulic pressure. Pressure intensification is effected in intensification ratio i.

⚠ ***Material damage***
With hydraulic pressure very high forces are generated. The fixture or machine must be in the position to compensate these forces.

Instructions for safe operation

- Swarf or contamination in the hydraulic oil lead to damage of the intensifier.
- Insert filter 10µ for continuous functioning.
- Use hydraulic oil as per data sheet A0.100.
- If the intensifier will be used on uncoupled systems (no connection to the pressure generator), a pilot-controlled check valve should be mounted at the high-pressure side to guarantee a safe holding of the load (data sheet C 2.9511).

⚠ ***Material damage***
Do not exceed maximum operating pressure and maximum flow rate! Pressure spikes have to be avoided.

Function

The hydraulic intensifer increases the pressure at the input side to a higher pressure in the indicated intensification ratio i (see chart page 2).
The intensifer allows a high flow rate at low pressure and switches automatically to pressure intensification in case of increasing counter pressure.

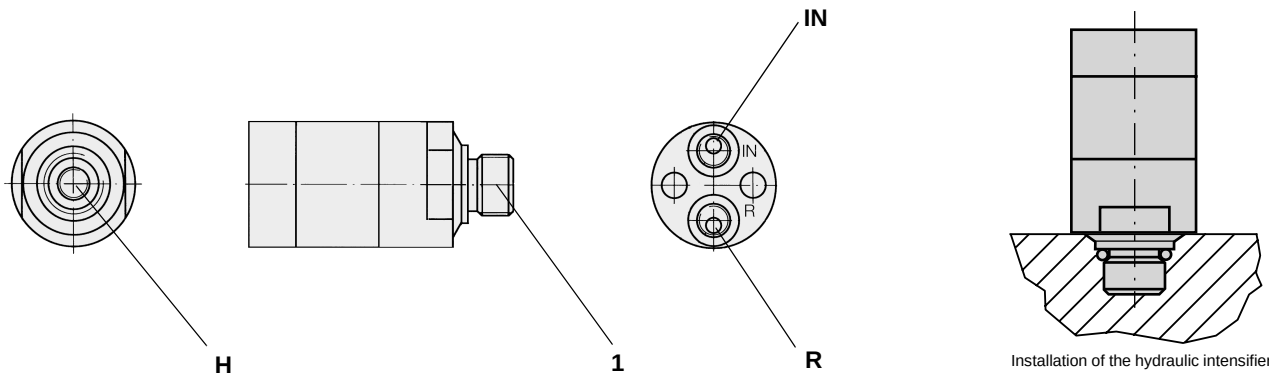
⚠ ***Troubles of functioning***
During operation there is a leakage; therefore use in cycling mode is not possible.

Instructions for operation

- Hydraulic connection.
- For pressure built-up line **R** to the reservoir has to be discharged.
- Pressurise port **IN** (pressure will be built up in line **H**).
- Pressure intensification will be automatically activated.
- To retract the cylinder line **R** has to be pressurised and line **IN** to the reservoir discharged.

Hydraulic connection

- Connect hydraulic lines to qualifying standards, pay attention to scrupulous cleanness! See also Roemheld data sheets A0.100, F9.300, F9.310 and F9.360.
- Use only fittings "screwed plug B" as per DIN 3852 (ISO 1179).
- Do not use sealing tape, copper rings or coned fittings.
- Check sealing of the hydraulic connections!
- Connection at mounting thread (**1**) (see drawing page 2).
- The hydraulic intensifier can be directly screwed into the fixture.



Installation of the hydraulic intensifier

All figures are schematic figures.

Hydraulic bleeding

Bleed the hydraulic lines during start-up of the system, otherwise clamping times can be considerably prolonged and function problems can be caused.

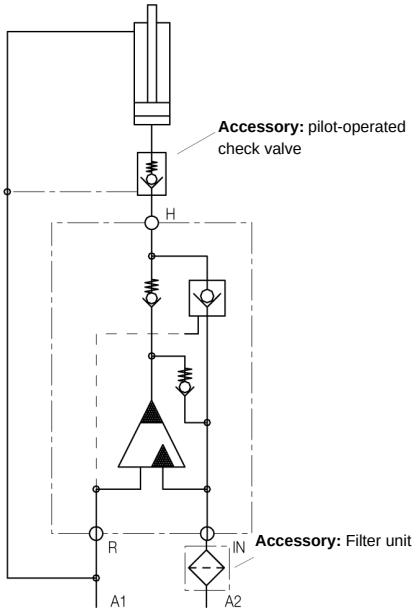
Maintenance

The filters in the hydraulic system have to be cleaned regularly and exchanged in case of strong contamination. Check if the hydraulic ports are tight (visual control).
The hydraulic intensifier itself is maintenance free.

Port	Function
IN	Input (clamping)
R	Discharge line (unclamping)
H	High-pressure output

Intensification

Type	Intensification i	Max. flow rate low-pressure side Q_{IN} [l/min]	Max. flow rate high-pressure side Q_H [l/min]	Max. operating pressure low-pressure side P_{IN} in [bar]	Max. operating pressure high-pressure side P_H in [bar]
8755-015	1,5	8	1,0	200	300
8755-020	2,0	8	0,8	200	400
8755-032	3,2	15	2,5	155	500
8755-040	4,0	14	2,0	125	500
8755-050	5,0	14	1,6	100	500
8755-132	3,3	8	0,5	151	500
8755-140	4,0	8	0,4	125	500
8755-148	4,8	8	0,4	104	500
8755-162	6,2	8	0,3	80	500
8755-175	7,5	8	0,3	66	500



Trouble shooting

Trouble	Cause / Remedy
System reduces pressure	Check valve is leaky - Exchange hydraulic intensifier or external check valve
No pressure built-up	pressure in R line not reduced - Reduce pressure in R line Filter contaminated - Exchange filter

Data sheets

Types	Corresponding data sheets
8755-015 **8755-020** **8755-032** **8755-040** **8755-050** **8755-132** **8755-140** **8755-148** **8755-162** **8755-175**	D8.755

Subject to changes without notice.