Operation Installation and Maintenance Instructions

Pressure regulating valve with modulating kit, type DRV

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1 General Safety Notes

⚠ CAUTION	Indicates a potentially dangerous situation. If this is not avoided, small or light injury may result.
NOTICE	Indicates general information on a danger of property damage. Indicates general information on a danger of personal injury.

The notes for installation and maintenance are intended for a specialist!

The operator shall responsible for complying with general accident prevention, safety and operating provisions.

2 General Information

The hp–Pressure regulating valves DRV are designed to control system pressure and flow.
The pressure range can be changed to 2 alternative levels by exchanging the regulating spring (see chapter 4).
The housing is designed in GGG40 cast iron.

The following information is engraved into the valve housing:

Nr. 18 -> connection G 3/8“, fuel oil Flow rate 300 - 600 l/h
Nr. 19 -> connection G 3/4“, fuel oil Flow rate 1000 - 2000 l/h
Nr. 20 -> connection G 3/8“, heavy fuel oil Flow rate 300 - 600 l/h
Nr. 21 -> connection G 3/4“, heavy fuel oil Flow rate 1000 - 2000 l/h

The following information is engraved into the sealing nut of the valve:

- Serial number -> V NNNNN
- Pressure stage -> PS X
- Date of manufacture -> MM/YY

2.1 Operational limits

Flow	max. 2000 l/h
Max. pressure	25 bar
Temperature	up to 150 °C
Max. viscosity	450 mm²/s
Ambient temperature	-10 to +90 °C
Storage temperature	-10 to +60 °C

2.2 Operating principle

The pressure and flow regulating valve is pressure limiting, spring-loading piston valve.
A suitable drive (e.g. cam disk, not included in scope of delivery) realize an axially moving of the actuator. This leads to a change of the spring pressure. Thereby the return pressure and the return oil volume by an oil burner nozzle can be changed and the required nozzle/burner output can be adjusted. Any excess fluid is fed off into the return line “T”. By turning of the adjusting screw are changes of the pressure range possible (see Chapter 4).

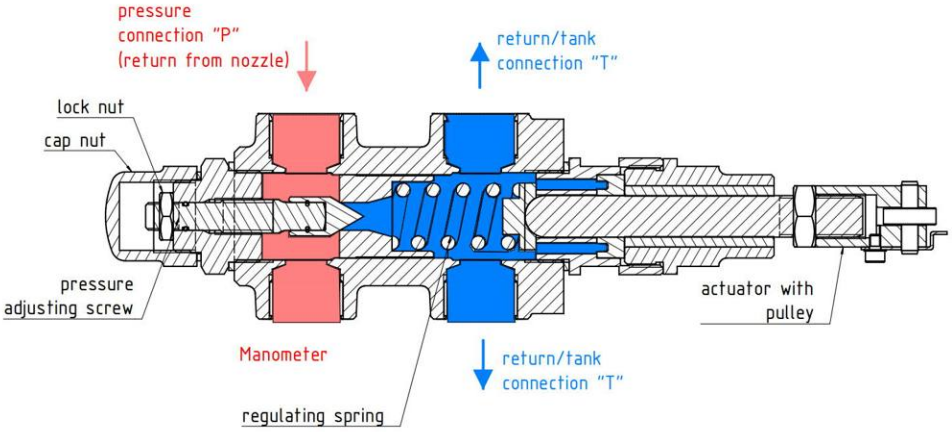

Fig.1 Operating principle

3 Installation

- Screw tight the valve over the drill holes in the flange.
- Before connecting the lines, all plastic caps must be removed.
- All connections and lines must be installed free of tension and tight. We recommend only using sealing rings made of copper, aluminium or plastics. Never use hemp or similar materials. The pipes must be cleaned from any dirt and metal particles before the valve is connected.
- Unused connections must be covered with plug screws and sealing rings.
- Should there be no manometer attached, please remove the plug screw and fit one to the unused pressure connection "P" (Fig. 1).

NOTICE

Never use water as purging liquid!
Danger of corrosion!

- The pressure line from the burner nozzle which fluid pressure is to be regulated by the valve, shall be connected to the pressure connection "P".
- Please connect the return flow line which has to lead back the controlled fluid from the regulating piston to the tank, to the return-flow / tank connection "T".

4 Initial Start-up and pressure adjustment

- The pressure and flow regulating valve cannot work without a suitable drive (e.g. cam disk, not included in scope of delivery). The main application of these valves is the pressure regulation of the return pressure of oil burners and so the burner output can be mechanically modulated.
- hp-regulating valves have been with relaxed actuator and factory-set to the lowest possible pressure level of the respective pressure stage. In order to set the desired operating pressure, firs remove the hut nut and the seal ring (see Fig.1) to reveal the adjusting screw beneath – screw off the lock nut.
- Now switch on the unit's pump and turn the adjusting screw to the right to adjust the operating pressure to the desired setting (turn the setting screw to the right – clockwise -> to increase the pressure, turn the setting screw to the left – counterclockwise -> to decrease the pressure. For a reading of the set value, Section 4.13 of DIN EN 12514-2, Issue 2000 calls for a manometer to be attached to the unit. Should there be no manometer attached, please remove the plug screw 2 (see Fig.1) and fit one to the manometer connection.
- After adjusting the pressure setting to the desired level, screw on the lock nut and replace and retighten the cap nut + the seal ring (see Fig.1).
- The complete pressure operating range of the valve is covered by the actuator with pulley. There is adjustment distance 6 ±0,2 mm available.

5 Application range and operation

When setting the desired operating pressure assure that a setting is chosen which is within the pressure range of the built-in pressure spring. The pressure spring code is engraved into the sealing nut of the valve (pressure stage 2 and 3).

Pressure range and pressure stage

pressure stage	Pressure range
2	from 2 - 18 bar
3	from 6 - 25 bar

NOTICE

Setting a higher operating pressure (one that exceeds the designated pressure range) will result in the pressure spring blocking.

6 Liquid fuels

Liquid fuels, mainly fuel oils derived from crude oil distillation, qualities according to DIN 51603 Part 1 – 5
FAME – mix with fuel oil according to DIN 51603 Part 6 (FAME = Fatty Acid Methyl Ester)
FAME 100% DIN EN 14214 respectively EN 14213
Marine fuel ISO 8217 (HFO, MDF Kategorie ISO-F-DMX, DMA, DMB)
Cold-pressed bio fuel according to DIN V 51605

Characteristics for different fuels (reference value)

Fuel	Density (at 20 °C)	Kin. viscosity (at 40°C)	Max. temperature at spraying viscosity *)
Unit	[kg/m³]	[mm²/s]	[°C]
Fuel oil (DIN 51603-1)	max. 856	max. 3,6	15
HFO (DIN 51603-3)		max. 1150	160
Re – raffinate (DIN 51603-4)		<45	90
Fuel oil (DIN 51603-6)	max. 860	max. 3,6	15
Marine Fuels (ISO 8217)	890 (15°C)	min: 1,4; max. 11	80
RME (DIN EN 14213)	856,6-896,6	3,5 – 5,0	28
Rape oil (DIN V 51605)	896,6-926,6	max. 36,0	85

*) temperature values are approximate

Chemical resistance of all parts for specified types of fuel. Non-standard fuels are excluded from the warranty.

7 Inspection and Maintenance

hp-Pressure regulating valves are maintenance free.

Regular checks of the tightness and the reached pressures during operation are to be carried out weekly.
Use a suitable filter/strainer to protect the valves from dirt. (Please refer to the Operating Instructions for the pump in question.)

NOTICE

These mounting, maintenance and operating instructions are intended solely for the use of a trained specialist.

8 Dimensions

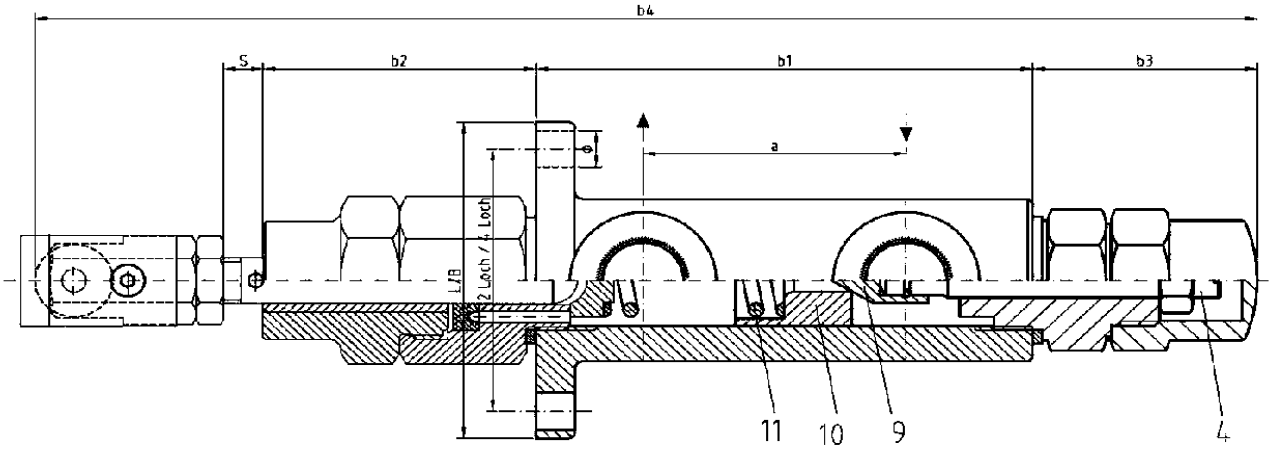

Fig.2 Dimensions

						Adjustment distance	Flange connection measurement				
Size chart	a	b1	b2	b3	b4	[mm]	L	B	Hole pattern [mm x mm]		Ø
DRV 18 EL + 21 S	54	102	56	46	250	6 ±0,2	70	48	58	2-hole	8
DRV 19 EL + 22 S	63	119	76	46	300	6 ±0,2	70	70	54 x 54	4-hole	8