



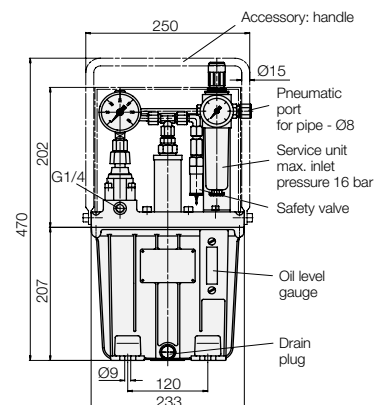
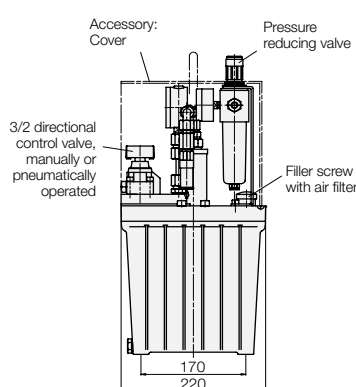
ROEMHELD
HILMA ■ STARK

Issue 2-21 E

D 8.600

Hydro-Pneumatic Pumps

max. flow rate 1.5 l/min, max. operating pressure 500 bar



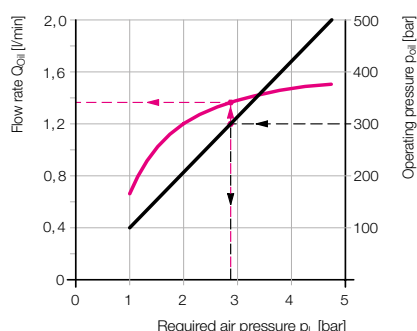
Application

The hydro-pneumatic pump is particularly suitable for small to medium-sized clamping and assembly fixtures with single or double-acting cylinders, which mainly operate in intermittent mode (pressure build up and pressure holding).

Description

The tandem plunger pump is built into the oil reservoir in a space-saving manner. It operates with oscillating movements and automatic stroke reversing control by a pilot-operated 4/2 directional control valve. The stroke frequency and thereby the flow rate depend on air pressure and hydraulic counter pressure.

Flow rate without counter pressure (idle running)



Example:

For an operating pressure of $p_{oil} = 300$ bar an air pressure of $p_L = 2.8$ bar is adjusted at the pressure reducing valve. The flow rate Q_{oil} without counter pressure is approx. 1.35 l/min.

Control variants

Manually-operated 3/2 directional control valve

This valve is equipped with a turning handle for direct operation at the power unit.

Pneumatically-operated 3/2 directional control valve

This valve is mounted on the power unit allowing for pneumatic remote control, which, however, requires an additional hand lever valve (accessory). According to the length of the pneumatic piping between both valves, there is a longer or shorter time delay for the clamping and unclamping operation.

Without valve as pressure generator

For external valve controls (P and R ports only) The pump unit maintains constant the adjusted pressure.

With attached valve control

For single and double-acting cylinders Examples see page 3 and 4

Technical data

Max. flow rate	[cm ³ /s]	25
	[l/min]	1.5
Max. operating pressure	[bar]	500
Min. operating pressure	[bar]	100
Max. air pressure	[bar]	4.7
Min. air pressure	[bar]	1.0
Intensification ratio		1:108
Max. air consumption	[l/min]	1200
Min. control pressure for pneumatic valve	[bar]	3
Max. oil charge	[l]	4.0
Usable oil volume	[l]	1.8
Viscosity range	[10 ⁻⁶ m ² /s]	10...500
Recom. viscosity class as per DIN 51519		ISO VG 22
Recom. hydraulic oil as per DIN 51524		HLP 22
Noise level	[dBA]	78
Weight, approx.	[kg]	20

Hydro-pneumatic pumps with deviating pressure or flow rate on request.

Delivery

The power units are delivered complete and ready for connection. On the pneumatic side there is a service unit with pressure reducer and filter. An additional pressure relief valve prevents increase of pressure over 4.8 bar, and thus operating pressures over 500 bar on the hydraulic side. With valve control fitted, the customer must ensure that the valves are controlled.

	Part no.
Pump with manual valve	8600110
Pump with pneumatic valve	8600111
Pump without valve as pure pressure generator	8600112
Pump as basic power unit for attachable valve control	8600113

When selecting this pump, the valves for single or double-acting cylinders must be determined additionally. Examples see page 3 and 4

Accessories for 8600110, -111 and -112

Handle	0353217
Cover	0353714

Accessories for pneumatic remote control of 8600111

Hand lever valve with catch	3812005
Sound absorber for hand lever valve	3887015
Foot valve with catch including cover	0381206
Air hose ND 6	3890059
Screw socket G1/4	3890071
Tube clamp	3890076

Example of ordering



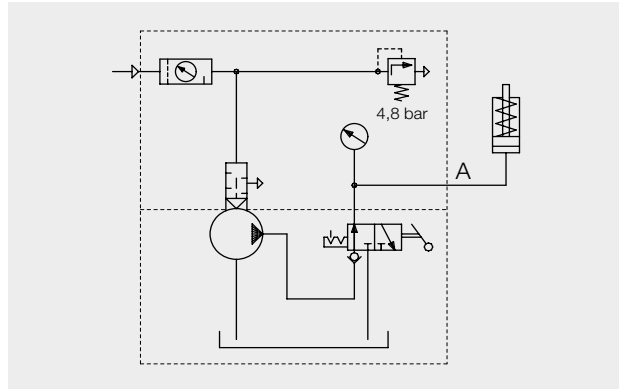
Pump with manual valve	8600110
Handle	0353217
Cover	0353714

Hydraulic circuit diagrams

Hydro-pneumatic pump with manual valve

Part no. 8600 110

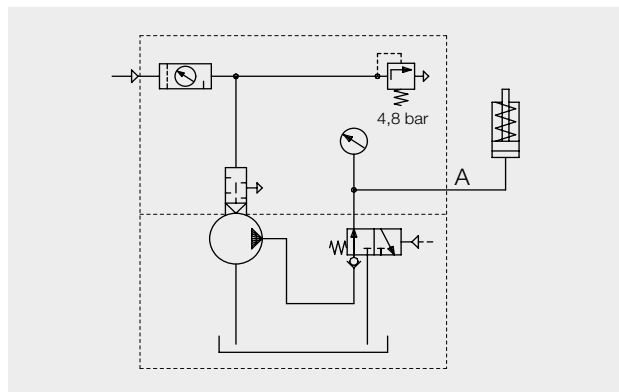
Control:
manually-operated 3/2 directional control poppet valve
for single-acting elements



Hydro-pneumatic pump with pneumatic valve

Part no. 8600 111

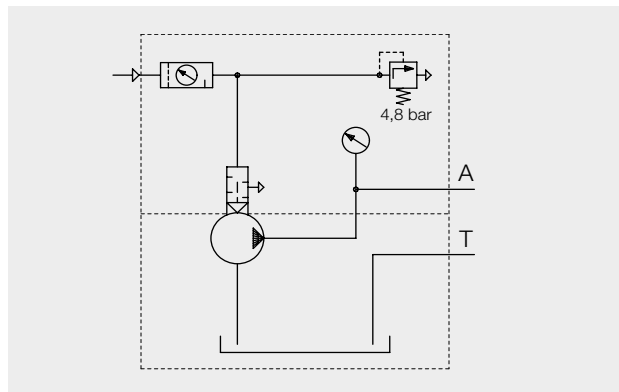
Control:
Pneumatically-operated 3/2 directional control poppet valve
for single-acting elements
Accessories for pneumatic remote control see page 1.



Hydro-pneumatic pump as pressure generator

Part no. 8600 112

Without valve for external valve control

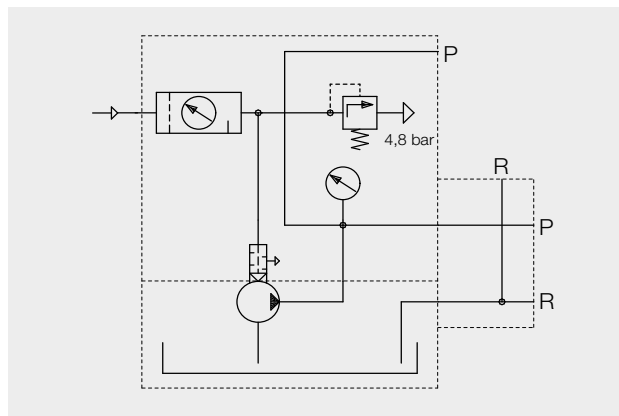


Hydro-pneumatic pump as basic power unit

Part no. 8600 113

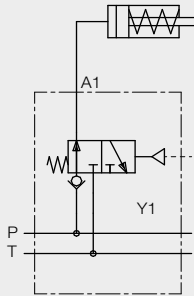
**for attachable valve control
for single or double-acting elements**

For this basic power unit, the valves for single or double-acting cylinders must be determined additionally.
For clamping pressure monitoring, electrically evaluable piston pressure switches can be selected.
The valves and pressure switches are manifold-mounted on series mounting plates.
The series mounting plates are firmly mounted to the basic power unit via tie rods.
Examples see page 3 and 4.



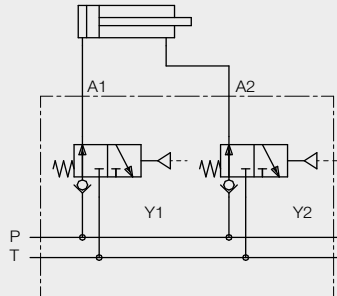
Examples for valve controls up to 500 bar

Single acting



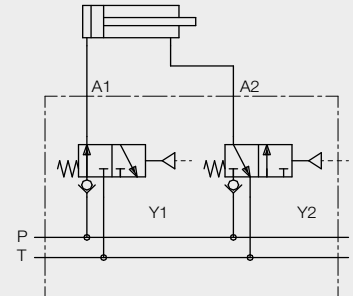
1 x 3/2 directional control poppet valve, clamped without control air

Double acting with 2 identical valve positions



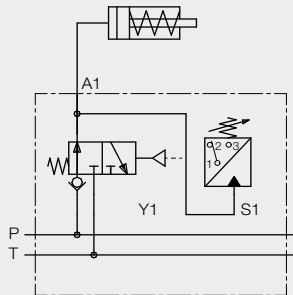
2 x identical 3/2 directional control poppet valves, alternating control air supply

Double acting with 2 different valve positions



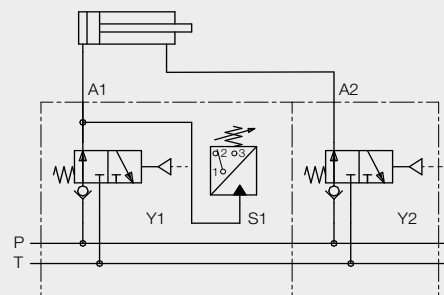
2 x inverse 3/2 directional control poppet valves, simultaneous control air supply

Single acting with machine tool interlock



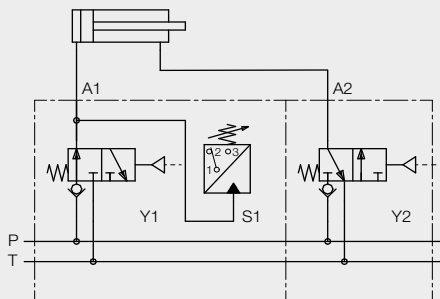
1 x 3/2 directional control poppet valve, clamped without control air, with 1 x piston pressure switch in the clamping outlet

Double acting with 2 identical valve positions with machine tool interlock



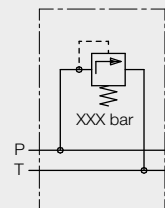
2 x identical 3/2 directional control poppet valves, alternating control air supply, with 1 x piston pressure switch in the clamping outlet

Double acting with 2 different valve positions with machine tool interlock



2 x inverse 3/2 directional control poppet valves, simultaneous control air supply, clamped without control air, with 1 x piston pressure switch in the clamping outlet

Pressure limitation in the hydraulic circuit



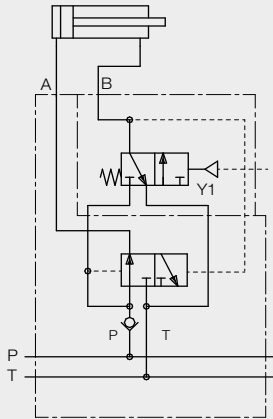
1 x adjustable pressure relief valve as additional safety valve

Note

The pressure relief valve must be set to the operating pressure + 15 % as a minimum. This prevents the hydro-pneumatic pump from being permanently switched on. Adjustment of the operating pressure see example on page 1.

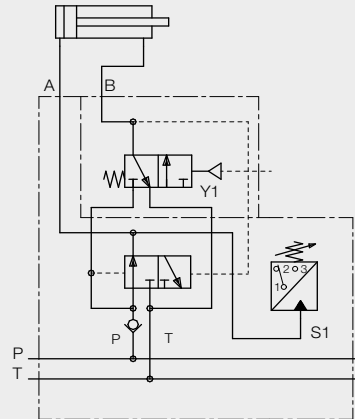
Examples for valve controls up to 500 bar

Double acting via 4/2 directional function *1)



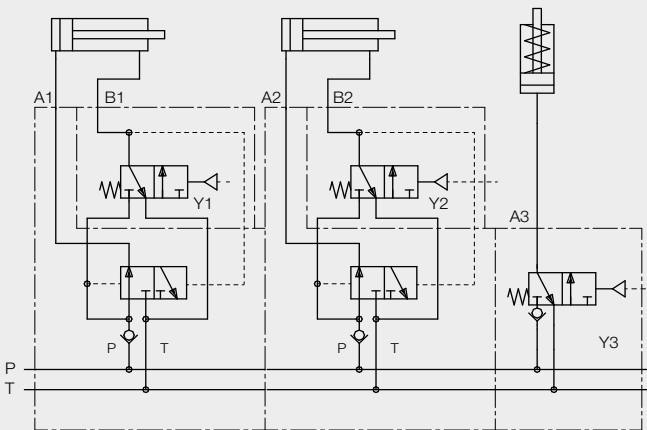
2 x 3/2 directional control poppet valve,
clamped without control air,
with hydraulically controlled intermediate plate

Double acting via 4/2 directional function *1)
with machine tool interlock

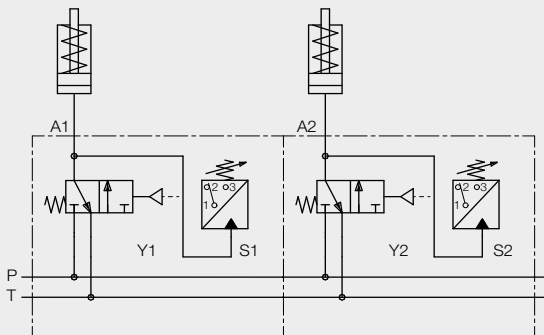


2 x 3/2 directional control poppet valve,
clamped without control air,
with hydraulically controlled intermediate plate
with 1 x piston pressure switch in the clamping outlet

2 x double acting via 4/2 directional function *1)
and 1 x single acting



2 x single acting
with machine tool interlock



*1) Note on the 4/2 directional function:
Due to the design, one of the two pressure outlets A or B
is always under pressure, therefore not suitable for
coupling purposes.

All valves shown with pneumatic control 4...15 bar.
Valves with 24 VDC solenoids as per data sheet C 2.360.
Valves manually operated as per data sheet C 2.320.
Valves with hydraulic control 16...50 bar on request.