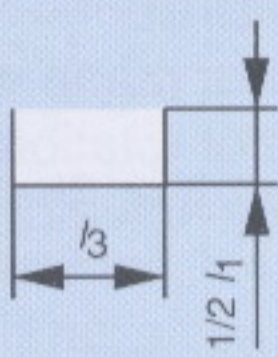
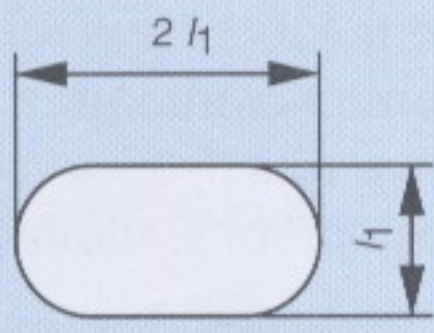


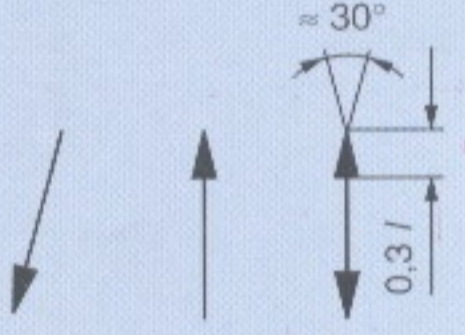
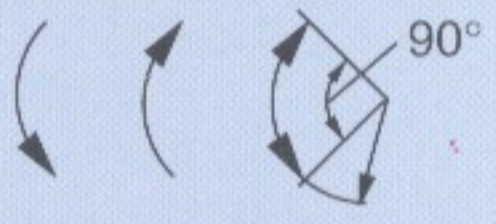







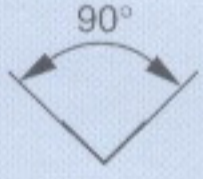




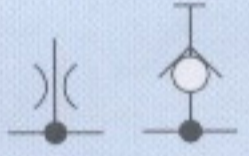
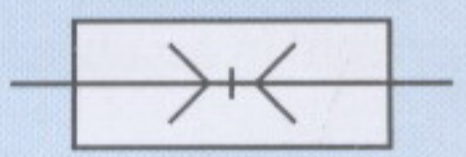
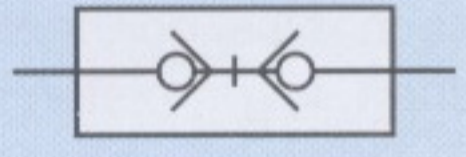

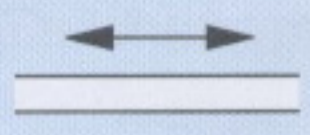
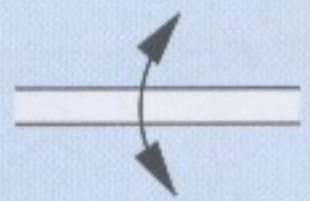



Name/ description, examples	Symbol
Open rectangle Tank	
Oval Pressure tank Accumulator Gas bottle	
<b>Function symbols</b>	
Triangle Shows direction of flow and operating medium	
Filled, hydraulic	
Open, pneumatic	
<b>Arrows</b>	
Straight Linear movement, path and direction of flow through a valve, direction of heat flow	
Curved Rotational movement, direction of rotation viewed on shaft end	
Diagonal arrow Adjustability in pumps, motors, springs, solenoids	
Electrical	
Closed path or connection	
Linear electrical positioning elements acting in opposition	



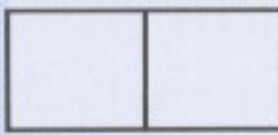

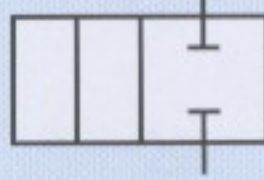
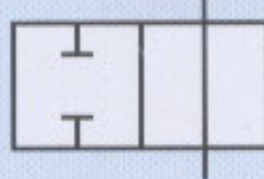
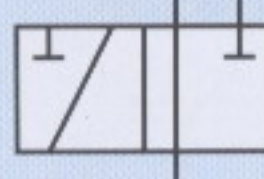
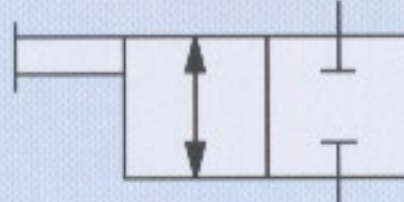
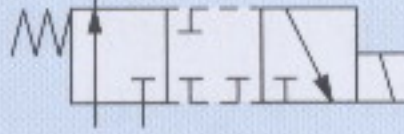
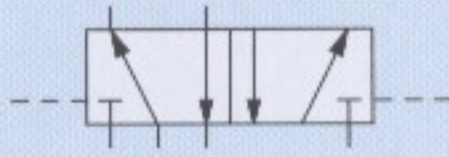
Name/ description, examples	Symbol
Temperature display or control	
Drive unit	<b>M</b>
Spring	
Throttle	
Seat of check valve	
Flow lines	
Connection	
Cross-over	
Flexible line	
<b>Connections</b>	
Breather connection (continuous)	
Limited with respect to time Open / closed	
Quick release coupling without mechanically opening check valves	
With mechanically opening check valves	
Rotary coupling with 1 through channel	
Rod, linear movement	
Shaft, rotational movement	
Detent, maintains specified position	

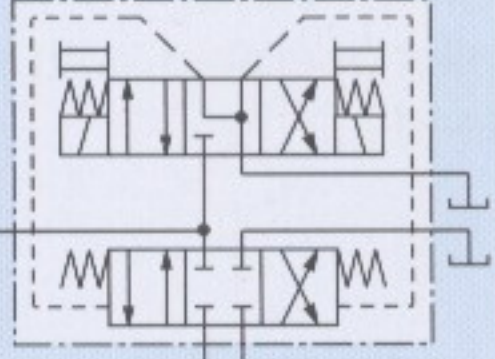
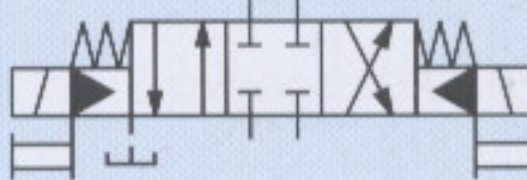
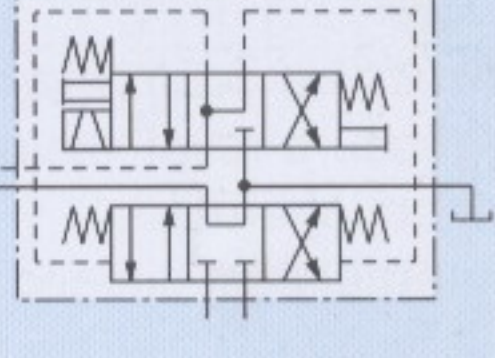
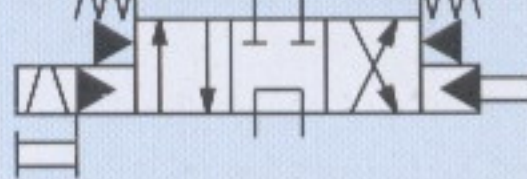


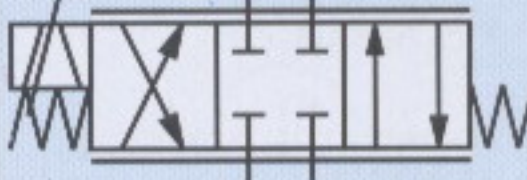


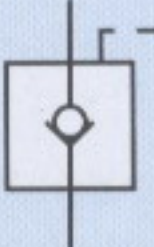
Name/ description, examples	Symbol
<b>Operational modes</b> General symbol	
Push button	
Pull-out knob	
Push button/pull-out knob	
Lever	
Pedal, 1 direction of operation	
Pedal, 2 directions of operation	
Push rod	
Push rod with stroke limitation	
Spring	
Roller shaft	
Roller lever	
Electrical, 1 winding	
Electrical, 2 windings which act in opposition to each other	
Electrical, 2 windings which act in opposition to each other and which may be steplessly adjusted	
2 parallel acting operators	

Name/ description, examples	Symbol
Operation by means of pressurisation or pressure relief Directly acts on positioning element	
By means of opposed control areas of different sizes	
Internal control channel	
External control channel	
Pneumatic/hydraulic operation	
2 stage hydraulic operation	
2 stage electro-hydraulic operation, external pilot oil supply	
2 stage pneumatic-hydraulic operation, external pilot oil return	
2 stage electro-hydraulic operation, spring centering of mid-position, external pilot oil feed and return	
2 stage electro-hydraulic operation, pressure centering of mid-position, external pilot oil feed and return	
External feedback of actual position of positioning element	
Internal feedback of actual position of positioning element	

Name/ description, examples	Symbol
Energy sources Hydraulic	
Pneumatic	
Electrical motor	
Drive unit, except for electrical motor	
<b>Energy transfer and storage</b> <i>Hydraulic pumps and motors</i>	
Fixed displacement pump, general	
Fixed displacement pump, 1 direction of flow, 1 direction of rotation	
Variable displacement pump, 2 directions of flow, 1 direction of rotation, Case drain port	
Fixed displacement motor, 2 directions of flow, 2 directions of rotation	
Fixed displacement pump/motor, 1 direction of flow, 1 direction of rotation	
Variable displacement pump/motor, manual adjustment 2 directions of flow, 2 directions of rotation, Case drain port	
Hydraulic rotary actuator	

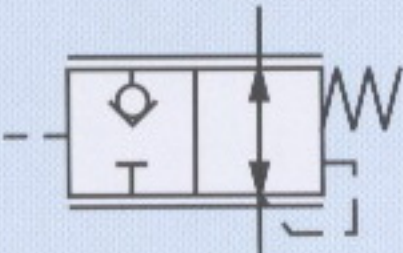
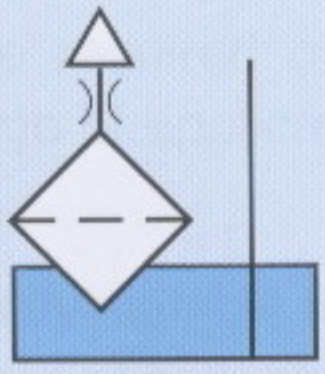
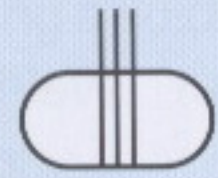
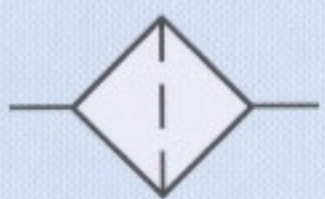
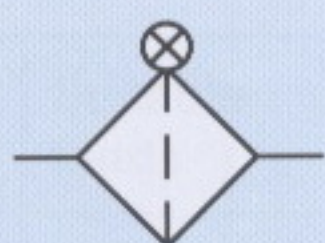

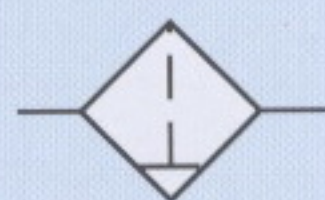
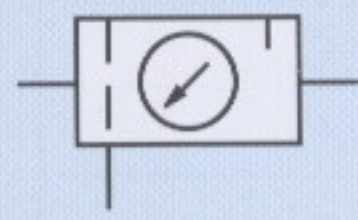
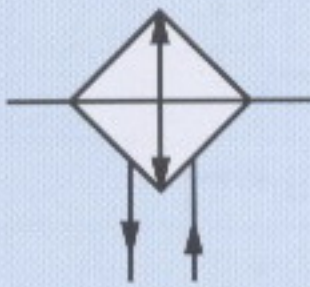
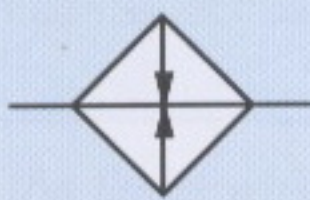
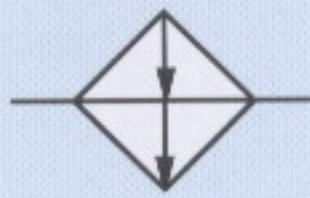
Name/ description, examples	Symbol
Hydraulic compact drive	
Variable displacement pump with pressure compensator, 1 direction of flow, 1 direction of rotation, Case drain port	
Variable displacement pump/motor with pressure compensator, 2 directions of flow, 2 directions of rotation, Case drain port	
<i>Hydraulic cylinders</i> Single acting hydraulic cylinder, return stroke via pressurisation, full bore connected to tank	
Double acting single rod hydraulic cylinder, adjustable damping at both ends of stroke	
Telescopic hydraulic cylinder, single acting	
Telescopic hydraulic cylinder, double acting	
<i>Accumulators</i> Without initial pressure	
With initial gas pressure	









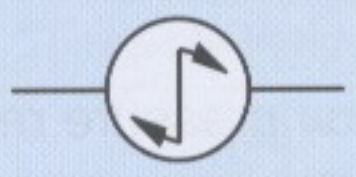
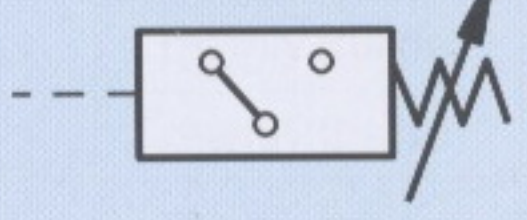
Name/ description, examples	Symbol
Gas bottle in upright position only	
<b>Open and closed loop control of energy</b> <i>Directional valves</i> Two position valve with 1 cross-over point	
Two position valve with stepless control of spool position	
Three position valve with stepless control of spool position	
Two position valve, 2 ports, normally closed, 2 directions of flow	
Two position valve, 2 ports, normally open, 2 directions of flow	
Two position valve, 3 ports, normally open, 2 directions of flow	
2/2 way directional valve, 2 ports, 2 spool positions	
3/2 way directional valve, 3 ports, 2 spool positions, 1 cross-over point, solenoid operation, spring offset	
5/2 way directional valve, 5 ports, 2 spool positions, pressure operated in both directions	

Name/ description, examples	Symbol
4/3 way directional valve, (detailed diagram) electro-hydraulically operated, 4 ports, 3 spool positions, spring centered mid-position, emergency stop operation, external pilot oil return	
(simplified diagram)	
4/3 way directional valve, (detailed diagram) electro-hydraulically operated, 4 ports, 3 spool positions, pressure centered mid-position, emergency stop operation, external pilot oil return	
(simplified diagram)	
<i>Continuously variable (modulating valves)</i> Modulating valve, negative overlap	
Modulating valve, positive overlap	
4/3 way servo valve (typical example)	
<i>Check valves/ isolating valves</i> Check valve, without spring loading	
Check valve, spring loaded	
Check valve, pilot operated, without spring pre-load	

Name/ description, examples	Symbol
Check valve, pilot operated, with spring pre-load	
Shuttle valve	
Air bleed valve	
<i>Pressure control valves</i> Pressure relief valve, direct operated, internal pilot oil feed	
Pressure relief valve, direct operated, external pilot oil feed	
Pressure relief valve, pilot operated, internal pilot oil feed and return	
Pressure relief valve, pilot operated, electrically operated relief, internal pilot oil feed, external pilot oil return	
2 way pressure reducing valve, direct operated, internal pilot oil feed	
2 way pressure reducing valve, pilot operated, internal pilot oil feed, external pilot oil return	
3 way pressure reducing valve, direct operated, internal pilot oil feed	

Name/ description, examples	Symbol
<i>Flow control valves</i> Throttle valve, adjustable	
Shut-off valve	
Deceleration valve	
Throttle/check valve	
2 way flow control valve, pressure compensated	
2 way flow control valve, pressure and temperature compensated	
3 way flow control valve, pressure and temperature compensated	
Flow divider	
<i>2 way cartridge valves (logic elements)</i> Directional valve, leakage free, differing effective areas	
Flow control valve	

Name/ description, examples	Symbol
Directional valve, leakage free in one direction, identical effective areas	
<b>Fluid storage and preparation</b> Ventilated tank	
Pressure tank	
Filter	
Filter with clogging indicator	
Separator	
Filter with separator	
Preparation unit comprising: filter, separator, pressure reducing valve, pressure gauge and lubricator	
Cooler	
Heater	
Temperature control	

Name/ description, examples	Symbol
<b>Measuring devices and indicators</b> Pressure indicator, general	
Pressure gauge	
Differential pressure gauge	
Fluid level measuring device	
Thermometer	
Flow indicator	
Flowmeter	
Tachometer	
Torque meter	
Hydro-electric pressure switch	
Limit switch	