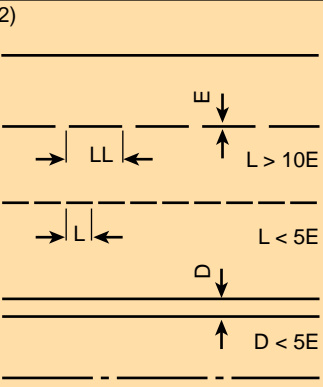



# Pooyan Hydraulics


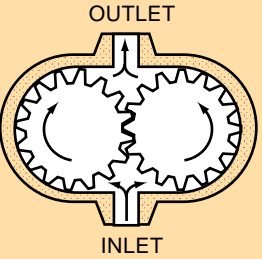

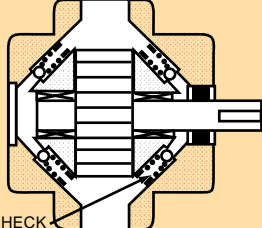

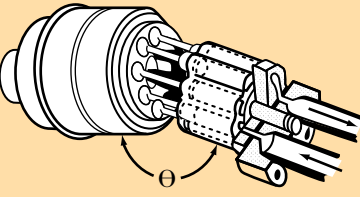

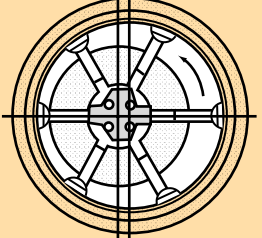
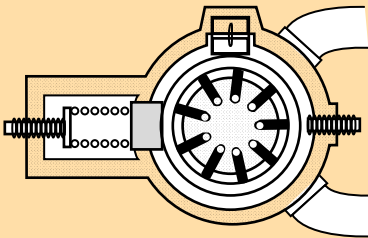

	DESCRIPTION	SYMBOL	APPLICATION
1.1	<b>BASIC SYMBOLS</b>		
1.1.1	<b>Line</b>	2)	
1.1.1.1	— continuous		
1.1.1.2	— long dashes	$L > 10E$	
1.1.1.3	— short dashes	$L < 5E$	
1.1.1.4	— double	$D < 5E$	
1.1.1.5	— long chain thin (optional use)		
1.1.2	<b>Circle, semi-circle</b>		
1.1.2.1			As a rule, energy conversion units (pump, compressor, motor)
1.1.2.2			Measuring instruments
1.1.2.3			Non-return link, roller, etc
1.1.2.4			Mechanical link, roller, etc.
1.1.2.5			Semi-rotary actuator

2) L = Length of dash, E = Thickness of line, D = Space between lines

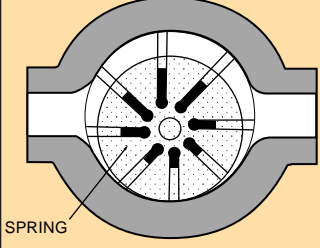


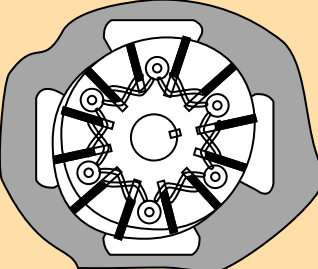








# ISO FLUID POWER GRAPHIC SYMBOLS

	DESCRIPTION	SYMBOL	APPLICATION
1.1.3	<b>Square, rectangle</b>		As a rule, control valves (valve) except for non-return valves
1.1.4	<b>Diamond</b>		Conditioning apparatus (filter, separator, lubricator, heat exchanger)
1.1.5	<b>Miscellaneous symbols</b>	3)	
1.1.5.1			Flow line connection
1.1.5.2			Spring
1.1.5.3			Restriction:
1.1.5.3.1			— affected by viscosity
1.1.5.3.2			— unaffected by viscosity
1.2	<b>FUNCTIONAL SYMBOLS</b>		
1.2.1	<b>Triangle:</b>		The direction of flow and the nature of the fluid
1.2.1.1	— solid		Hydraulic flow
1.2.1.2	— in outline only		Pneumatic flow or exhaust to atmosphere
1.2.2	<b>Arrow</b>		Indication of:
1.2.2.1			— direction
1.2.2.2			— direction of rotation
1.2.2.3			— path and direction of flow through valves.  For regulating apparatus as in 3.4 both representations, with or without a tail to the end of the arrow, are used without distinction  As a general rule the line perpendicular to the head of the arrow indicates that when the arrow moves, the interior path always remains connected to the corresponding exterior path
1.2.3	<b>Sloping arrow</b>		Indication of the possibility of a regulation or a progressive variability







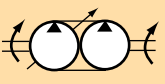
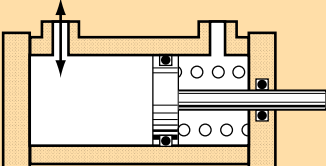
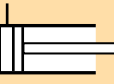
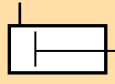
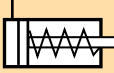
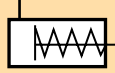
# ISO FLUID POWER GRAPHIC SYMBOLS

	DESCRIPTION	SYMBOL	USE OF THE EQUIPMENT OR EXPLANATION OF THE SYMBOL
2.1	<b>PUMPS AND COMPRESSORS</b>		To convert mechanical energy into hydraulic or pneumatic energy.
2.1.1	<b>Fixed capacity hydraulic pump:</b>		
2.1.1.1	— with one direction of flow		 OUTLET INLET
2.1.1.2	— with two directions of flow		 BALL CHECK
2.1.2	<b>Variable displacement hydraulic pump:</b>		
2.1.2.1	— with one direction of flow		
2.1.2.2	— with two directions of flow		 
2.1.3	<b>Fixed capacity compressor (always one direction of flow)</b>		

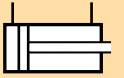
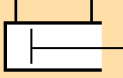
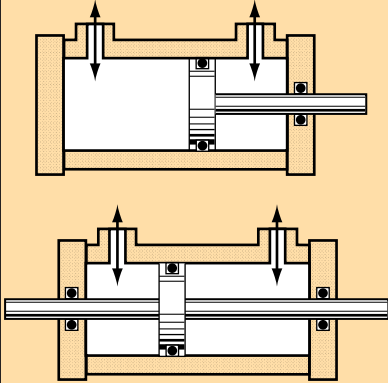
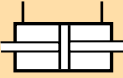
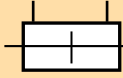

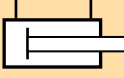
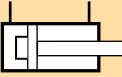
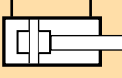
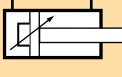
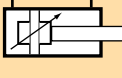
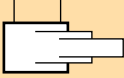

# ISO FLUID POWER GRAPHIC SYMBOLS

	DESCRIPTION	SYMBOL	USE OF THE EQUIPMENT OR EXPLANATION OF THE SYMBOL	
2.2	<b>MOTORS</b>		To convert hydraulic or pneumatic energy into rotary mechanical energy	
2.2.1	<b>Fixed capacity hydraulic motor:</b>			
2.2.1.1	— with one direction of flow			
2.2.1.2	— with two directions of flow			
2.2.2	<b>Variable displacement hydraulic motor:</b>			
2.2.2.1	— with one direction of flow		The symbol is a combination of 2.2.1.1 and 1.2.3 (sloping arrow)	
2.2.2.2	— with two directions of flow		The symbol is a combination of 2.2.1.2 and 1.2.3 (sloping arrow)	
2.2.3	<b>Fixed displacement pneumatic motor:</b>			
2.2.3.1	— with one direction of flow			
2.2.3.2	— with two directions of flow			
2.2.4	<b>Variable displacement pneumatic motor:</b>			
2.2.4.1	— with one direction of flow		The symbol is a combination of 2.2.3.1 and 1.2.3 (sloping arrow)	
2.2.4.2	— with two directions of flow		The symbol is a combination of 2.2.3.2 and 1.2.3 (sloping arrow)	
2.2.5	<b>Oscillating motor:</b>			
2.2.5.1	— hydraulic			
2.2.5.2	— pneumatic			

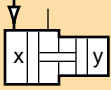
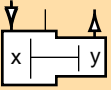
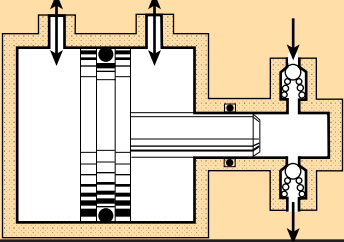
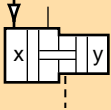
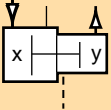
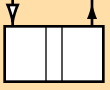

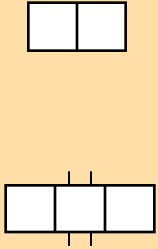
# ISO FLUID POWER GRAPHIC SYMBOLS

		DESCRIPTION	SYMBOL	USE OF THE EQUIPMENT OR EXPLANATION OF THE SYMBOL	
2.3	<b>PUMP/MOTOR UNITS</b>			Unit with two functions, either as pump or as rotary motor	
2.3.1	<b>Fixed displacement pump/motor unit:</b>				
2.3.1.1	— with reversal of the direction of flow			Functioning as pump or motor according to direction of flow	
2.3.1.2	— with one single direction of flow			Functioning as pump or motor without change of direction of flow	
2.3.1.3	— with two directions of flow			Functioning as pump or motor with either direction of flow	
2.3.2	<b>Variable displacement pump/motor unit:</b>				
2.3.2.1	— with reversal of the direction of flow			The symbol is a combination of 2.3.1.1 and 1.2.3 (sloping arrow)	
2.3.2.2	— with one single direction of flow			The symbol is a combination of 2.3.1.2 and 1.2.3 (sloping arrow)	
2.3.2.3	— with two directions of flow			The symbol is a combination of 2.3.1.3 and 1.2.3 (sloping arrow)	
2.4	<b>VARIABLE SPEED DRIVE UNITS</b>			Torque converter. Pump and/or motor are variable capacity. Remote drives, see 8.2	
2.5	<b>CYLINDERS</b>			Equipment to convert hydraulic or pneumatic energy into linear energy	
2.5.1	<b>Single acting cylinder:</b>	Detailed	Simplified	Cylinder in which the fluid pressure always acts in one and the same direction (on the extension stroke)	
2.5.1.1	— returned by an unspecified force			General symbol when the method of return is not specified	
2.5.1.2	— returned by spring			Combination of the general symbols 2.5.1.1 and 1.1.5.2 (spring)	








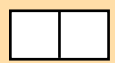



# ISO FLUID POWER GRAPHIC SYMBOLS

		DESCRIPTION		SYMBOL	USE OF THE EQUIPMENT OR EXPLANATION OF THE SYMBOL
2.5.2	<b>Double acting cylinder:</b>				Cylinder in which pressure fluid operates alternately in both directions (extend and retract strokes)
2.5.2.1	— with single piston rod				
2.5.2.2	— with double-ended piston rod				
2.5.3	<b>Differential cylinder</b>				The action is dependent on the difference between the effective areas on each side of the piston
2.5.4	<b>Cylinder with cushion:</b>				
2.5.4.1	— with single fixed cushion				Cylinder incorporating fixed cushion acting in one direction only
2.5.4.2	— with double fixed cushion				Cylinder with fixed cushion acting in both directions
2.5.4.3	— with single adjustable cushion				The symbol is a combination of 2.5.4.1 and 1.2.3 (sloping arrow)
2.5.4.4	— with double adjustable cushion				The symbol is combination of 2.5.4.2 and 1.2.3 (sloping arrow)
2.5.5	<b>Telescopic cylinder:</b>				
2.5.5.1	— single acting				The fluid pressure always acts in one and the same direction (on the extend stroke)
2.5.5.2	— double acting				The fluid pressure operates alternately in both directions (extend and retract strokes)

# ISO FLUID POWER GRAPHIC SYMBOLS

		DESCRIPTION		SYMBOL		USE OF THE EQUIPMENT OR EXPLANATION OF THE SYMBOL
2.6	<b>PRESSURE INTENSIFIERS:</b>	Detailed	Simplified	Equipment transforming a pressure x into a higher pressure y		
2.6.1	— for one type of fluid			E.g. a pneumatic pressure x is transformed into a higher pneumatic pressure y		
2.6.2	— for two types of fluid			E.g. a pneumatic pressure x is transformed into a higher hydraulic pressure y		
2.7	<b>AIR-OIL ACTUATOR</b>			Equipment transforming a pneumatic pressure into a substantially equal hydraulic pressure or vice versa		
3	<b>CONTROL VALVES</b>					
3.1	<b>METHOD OF REPRESENTATION OF VALVES (EXCEPT 7.3 AND 7.6)</b>			Made up of one or more squares 1.1.3 and arrows  In circuit diagrams hydraulic and pneumatic units are normally shown in the unoperated condition		
3.1.1	<b>One single square</b>			Indicates unit for controlling flow or pressure, having in operation and infinite number of possible positions between its end positions so as to vary the conditions of flow across one or more of its ports, thus ensuring the chosen pressure and/or flow with regard to the operating conditions of the circuit		
3.1.2	<b>Two or more squares</b>			Indicate a directional control valve having as many distinct positions as there are squares. The pipe connections are normally represented as representing the unoperated condition (see 3.1). The operating positions are deduced by imagining the boxes to be displaced so that the pipe connections correspond with the ports of the box in question		

# ISO FLUID POWER GRAPHIC SYMBOLS



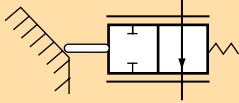
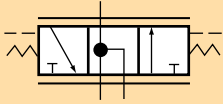
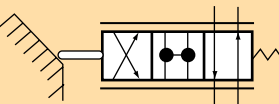
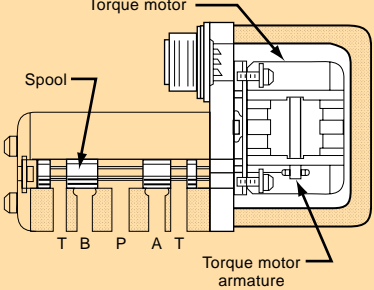
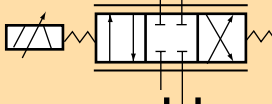
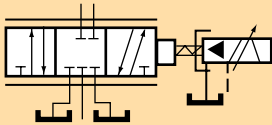
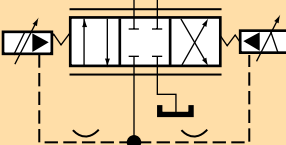
		DESCRIPTION	SYMBOL	USE OF THE EQUIPMENT OR EXPLANATION OF THE SYMBOL
3.1.3	<b>Simplified symbol for valves in cases of multiple repetition</b>		The number refers to a note on the diagram in which the symbol for the valve is given in full	
3.2	<b>DIRECTIONAL CONTROL VALVES</b>		Units providing for the opening (fully or restricted) or the closing of one or more paths (represented by several squares)	
3.2.1	<b>Flow paths:</b>		Square containing interior lines	
3.2.1.1	— one flow path			
3.2.1.2	— two closed ports			
3.2.1.3	— two flow paths			
3.2.1.4	— two flow paths and one closed port			
3.2.1.5	— two flow paths with cross connection			
3.2.1.6	— one flow path in a bypass position, two closed ports			
3.2.2	<b>Non-throttling directional control valve</b>		The unit provides distinct circuit conditions each depicted by a square	
3.2.2.1			Basic symbol for 2-position directional control valve	
3.2.2.2			Basic symbol for 3-position directional control valve	
3.2.2.3			A transitory but significant condition between two distinct positions is optionally represented by a square with dashed ends	





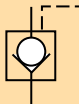
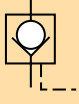
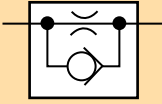
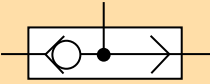
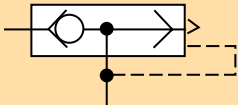


# ISO FLUID POWER GRAPHIC SYMBOLS

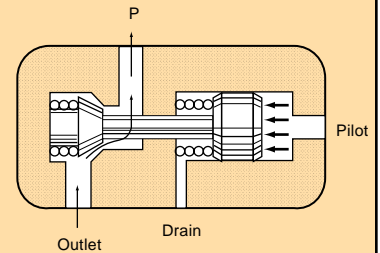
		DESCRIPTION	SYMBOL	USE OF THE EQUIPMENT OR EXPLANATION OF THE SYMBOL
3.2.2.4		<b>Designation:</b> The first figure in the designation shows the number of ports (excluding pilot ports) and the second figure the number of distinct positions		
3.2.2.5		<b>Directional control valve 2/2:</b>		Directional control valve with 2 ports and 2 distinct positions
3.2.2.5.1	—	with manual control		
3.2.2.5.2	—	controlled by pressure operating against a spring (e.g., on air unloading valve)		
3.2.2.6		<b>Directional control valve 3/2:</b>		Directional control valve with 3 ports and 2 distinct positions
3.2.2.6.1	—	controlled by pressure in both directions		
3.2.2.6.2	—	controlled by solenoid with return spring		Indicating an intermediate condition (see 3.2.2.3)
3.2.2.7		<b>Directional control valve 4/2:</b>		Directional control valve with 4 ports and 2 distinct positions
3.2.2.7.1	—	controlled by pressure in both directions by means of pilot valve (with single solenoid and spring return)		
3.2.2.8		<b>Directional control valve 5/2:</b>		Directional control valve with 5 ports and 2 distinct positions
3.2.2.8.1	—	controlled by pressure in both directions		

# ISO FLUID POWER GRAPHIC SYMBOLS

	DESCRIPTION	SYMBOL	USE OF THE EQUIPMENT OR EXPLANATION OF THE SYMBOL	
3.2.3	<b>Throttling directional control</b>		<p>The unit has 2 extreme positions and an infinite number of intermediate conditions with varying degrees of throttling</p> <p>All the symbols have parallel lines along the length of the boxes. For valves with mechanical feedback see 5.3</p>	
3.2.3.1			Showing the extreme positions	
3.2.3.2			Showing the extreme positions and a central (neutral) position	
3.2.3.3	— with 2 ports (one throttling orifice)		For example: Tracer valve plunger operated against a return spring	
3.2.3.4	— with 3 ports (two throttling orifices)		For example: Directional control valve controlled by pressure against a return spring	
3.2.3.5	— with 4 ports (four throttling orifices)		For example: Tracer valve, plunger operated against a return spring	
3.2.4	<b>Electro-hydraulic servo valve:</b> <b>Electro-pneumatic servo valve:</b>		A unit which accepts an analog electrical signal and provides a similar analog fluid power output	
3.2.4.1	— single-stage		— with direct operation	
3.2.4.2	— two-stage with mechanical feedback		— with indirect pilot operation	
3.2.4.3	— two-stage with hydraulic feedback		— with indirect pilot operation	

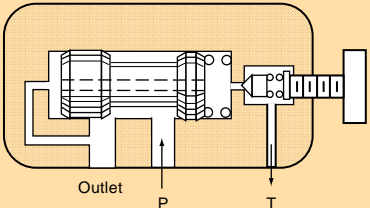
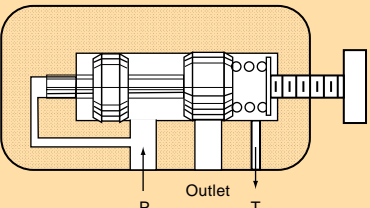
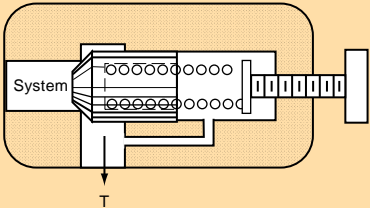
# ISO FLUID POWER GRAPHIC SYMBOLS

		DESCRIPTION	SYMBOL	USE OF THE EQUIPMENT OR EXPLANATION OF THE SYMBOL
3.3	<b>NON-RETURN VALVES, SHUTTLE VALVE, RAPID EXHAUST VALVE</b>			Valves which allow free flow in one direction only
3.3.1	<b>Non-return valve</b>			
3.3.1.1	— free			Opens if the inlet pressure is higher than the outlet pressure
3.3.1.2	— spring loaded			Opens if the inlet pressure is greater than the outlet pressure plus the spring pressure
3.3.1.3	— pilot controlled			As 3.3.1.1 but by pilot control it is possible to prevent
3.3.1.3.1	— a pilot signal closes the valve			
3.3.1.3.2	— a pilot signal opens the valve			
3.3.1.4	— with restriction			Unit allowing free flow in one direction but restricted flow in the other
3.3.2	<b>Shuttle valve</b>			The inlet port connected to the higher pressure is automatically connected to the outlet port while the other inlet port is closed
3.3.3	<b>Rapid exhaust valve</b>			When the inlet port is unloaded the outlet port is freely exhausted
3.4	<b>PRESSURE CONTROL VALVES</b>			Units ensuring the control of pressure. Represented by one single square as in 3.1.1 with one arrow (the tail to the arrow may be placed at the end of the arrow). For interior controlling conditions see 5.2.4.3
3.4.1	<b>Pressure control valve:</b>			General symbols
3.4.1.1	— 1 throttling orifice normally closed		 	

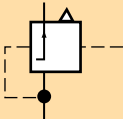
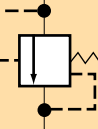
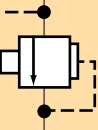

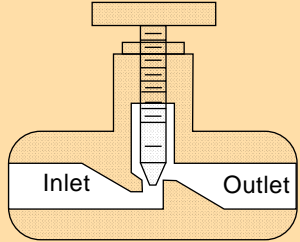
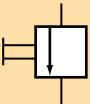
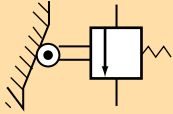
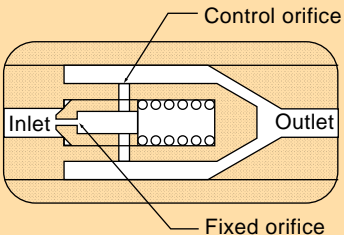
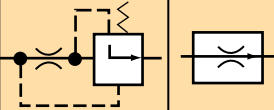
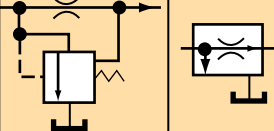


# ISO FLUID POWER GRAPHIC SYMBOLS

		DESCRIPTION	SYMBOL	USE OF THE EQUIPMENT OR EXPLANATION OF THE SYMBOL
3.4.1.2	— 1 throttling orifice normally open			
3.4.1.3	— 2 throttling orifices, normally closed			
3.4.2	<b>Pressure relief valve (safety valve):</b>			Inlet pressure is controlled by opening the exhaust port to the reservoir or to atmosphere against an opposing force (for example a spring)
3.4.2.1	— with remote pilot control			The pressure at the inlet port is limited as in 3.4.2 or to that corresponding to the setting of a pilot control
3.4.3	<b>Proportional pressure relief</b>			Inlet pressure is limited to a value proportional to the pilot pressure (see 5.2.4.1.3)
3.4.4	<b>Sequence valve</b>			When the inlet pressure overcomes the opposing force of the spring, the valve opens permitting flow from the outlet port
3.4.5	<b>Pressure regulator or reducing valve (reducer of pressure):</b>			A unit which, with a pressure variable inlet pressure, gives substantially constant output pressure provided that the inlet pressure remains higher than the required outlet pressure
3.4.5.1	— without relief port			
3.4.5.2	— without relief port with remote control			As in 3.4.5.1, but the outlet pressure is dependent on the control pressure
3.4.5.3	— with relief port			












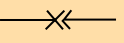
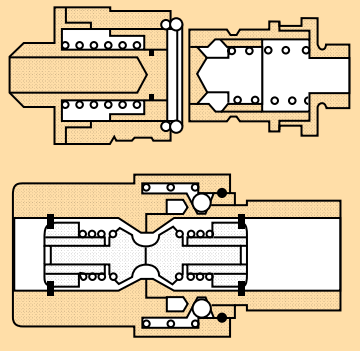
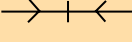
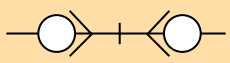


# ISO FLUID POWER GRAPHIC SYMBOLS

		DESCRIPTION	SYMBOL	USE OF THE EQUIPMENT OR EXPLANATION OF THE SYMBOL	
3.4.5.4.	— with relief port, with remote control			As in 3.4.5.3, but the outlet pressure is dependent on the control pressure	
3.4.6	<b>Differential pressure regulator</b>			The outlet pressure is reduced by a fixed amount with respect to the inlet pressure	
3.4.7	<b>Proportional pressure regulator</b>			The outlet pressure is reduced by a fixed ratio with respect to the inlet pressure (see 5.2.4.1.3)	
3.5	<b>FLOW CONTROL VALVES</b>			Units ensuring control of flow excepting 3.5.3 positions and method of representation as 3.4	
3.5.1	<b>Throttle valve:</b>			Simplified symbol (does not indicate the control method or the state of the valve)	
3.5.1.1	— with manual control			Detailed symbol (indicates the control method of the state of the valve)	
3.5.1.2	— with mechanical control against a return spring (braking valve)				
3.5.2	<b>Flow control valve:</b>		Detailed   Simplified	Variations in inlet pressure do not affect the rate of flow	
3.5.2.1	— with fixed output				
3.5.2.2	— with fixed output and relief port to reservoir			As 3.5.2.1 but with relief for excess flow	

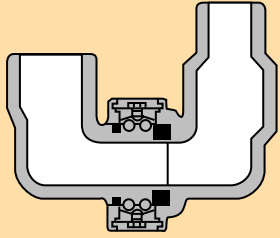
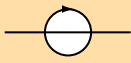
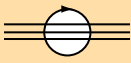
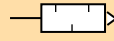






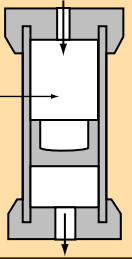
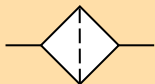
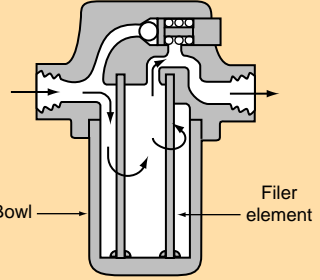
# ISO FLUID POWER GRAPHIC SYMBOLS

		USE OF THE EQUIPMENT OR EXPLANATION OF THE SYMBOL		
DESCRIPTION	SYMBOL			
3.5.2.3	— with variable output		As 3.5.2.1 but with arrow 5.2.3 added to the symbol of restriction	
3.5.2.4	— with variable output and relief port to reservoir		As 3.5.2.3 but with relief for excess flow	
3.5.3	<b>Flow dividing valve</b>		The flow is divided into two flows in a fixed ratio substantially independent of pressure variations	
3.6	<b>SHUT-OFF VALVE</b>		Simplified symbol	
4	<b>ENERGY TRANSMISSION AND CONDITIONING</b>			
4.1	<b>SOURCES OF ENERGY</b>			
4.1.1	<b>Pressure source</b>		Simplified general symbol	
4.1.1.1	<b>Hydraulic pressure source</b>		Symbols to be used when the nature of the source should be indicated	
4.1.1.2	<b>Pneumatic pressure source</b>			
4.1.2	<b>Electric motor</b>		Symbol 113 in IEC Publication 117.2	
4.1.3	<b>Heat engine</b>			
4.2	<b>FLOW LINES AND CONNECTIONS</b>			
4.2.1	<b>Flow line:</b>			
4.2.1.1	— working line, return line and feed line			
4.2.1.2	— pilot control line			

# ISO FLUID POWER GRAPHIC SYMBOLS

		USE OF THE EQUIPMENT OR EXPLANATION OF THE SYMBOL		
DESCRIPTION	SYMBOL			
4.2.1.3	— drain or bleed line			
4.2.1.4	— flexible pipe		Flexible hose, usually connecting moving parts	
4.2.1.5	— electric line			
4.2.2	<b>Pipeline junction</b>			
4.2.3	<b>Crossed Pipelines</b>		not connected	
4.2.4	<b>Air bleed</b>			
4.2.5	<b>Exhaust port:</b>			
4.2.5.1	— plain with no provision for connection			
4.2.5.2	— threaded for connection			
4.2.6	<b>Power take-off:</b>		On equipment or lines, for energy take-off or measurement	
4.2.6.1	— plugged			
4.2.6.2	— with take-off line			
4.2.7	<b>Quick-acting coupling:</b>			
4.2.7.1	— connected, without mechanically opened non-return valve			
4.2.7.2	— connected, with mechanically opened non-return valves			
4.2.7.3	— uncoupled, with open end			
4.2.7.4	— uncoupled, closed by free non-return valve (see 3.3.1.1)			

# ISO FLUID POWER GRAPHIC SYMBOLS


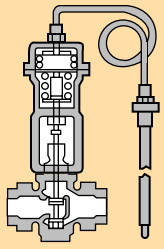

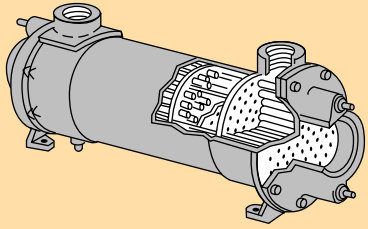
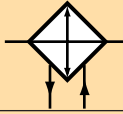

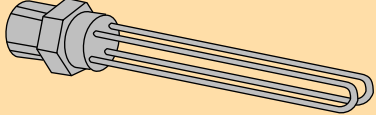
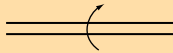

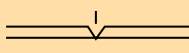
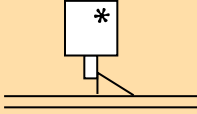


		DESCRIPTION	SYMBOL	USE OF THE EQUIPMENT OR EXPLANATION OF THE SYMBOL
4.2.8	<b>Rotary connection:</b>			
4.2.8.1	— one way		Line junction allowing angular movement in service	
4.2.8.2	— three way			
4.2.9	<b>Silencer</b>			
4.3	<b>RESERVOIRS</b>			
4.3.1	<b>Reservoir open to atmosphere:</b>			
4.3.1.1	— with inlet pipe above fluid level			
4.3.1.2	— with inlet pipe below fluid level			
4.3.1.3	— with a header line			
4.3.2	<b>Pressurized reservoir</b>			
4.4	<b>ACCUMULATORS</b>			<p>The fluid is maintained under pressure by a spring, weight or compressed gas (air, nitrogen, etc.)</p>  <p>Air or gas</p>
4.5	<b>FILTERS, WATER TRAPS, LUBRICATORS AND MISCELLANEOUS APPARATUS</b>			
4.5.1	<b>Filter or strainer</b>			 <p>Bowl</p> <p>Filter element</p>
4.5.2	<b>Water trap</b>			



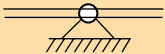
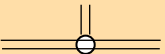
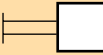

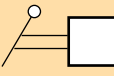
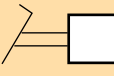



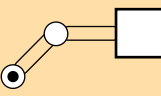



# ISO FLUID POWER GRAPHIC SYMBOLS

		DESCRIPTION	SYMBOL	USE OF THE EQUIPMENT OR EXPLANATION OF THE SYMBOL
4.5.2.1	— with manual control drain			
4.5.2.2	— automatically drained			
4.5.3	<b>Filter with water trap:</b>			
4.5.3.1	— with manual control			
4.5.3.2	— automatically drained			
4.5.4	<b>Air dryer</b>			
4.5.5	<b>Lubricator</b>			
4.5.6	<b>Conditioning unit</b>			
4.5.6.1	— Detailed symbol			
4.5.6.2	— Simplified symbol			
4.6	<b>HEAT EXCHANGERS</b>			Apparatus for heating or cooling the circulating fluid

# ISO FLUID POWER GRAPHIC SYMBOLS

		DESCRIPTION	SYMBOL	USE OF THE EQUIPMENT OR EXPLANATION OF THE SYMBOL	
4.6.1	Temperature controller			The fluid temperature is maintained between two predetermined values. The arrows indicate that heat may be either introduced or dissipated	
4.6.2	Cooler			The arrows in the diamond indicate the extraction of heat	
4.6.2.1				— without representation of the flow lines of the coolant	
4.6.2.2				— indicating the flow lines of the coolant	
4.6.3	Heater			The arrows in the diamond indicate the introduction of heat	
5.	<b>CONTROL MECHANISMS</b>				
5.1	<b>Mechanical components</b>				
5.1.1	<b>Rotating shaft:</b>			The arrow indicates rotation	
5.1.1.1	— in one direction				
5.1.1.2	— in either direction				
5.1.2	<b>Detent</b>			A device for maintaining a given position	
5.1.3	<b>Locking device</b>			* The symbol for unlocking control is inserted in the square	
5.1.4	<b>Over-center device</b>			Prevents the mechanism from stopping in a dead center position	
5.1.5	<b>Pivoting devices:</b>				
5.1.5.1	— simple				

# ISO FLUID POWER GRAPHIC SYMBOLS

	DESCRIPTION	SYMBOL	USE OF THE EQUIPMENT OR EXPLANATION OF THE SYMBOL
5.1.5.2	— with traversing lever		
5.1.5.3	— with fixed fulcrum		
5.2	<b>CONTROL METHODS</b>		The symbols representing control methods are incorporated in the symbol of the controlled apparatus, to which they should be adjacent. For apparatus with several squares the actuation of the control makes effective the square adjacent to it.
5.2.1	<b>Muscular control:</b>		General symbol (without indication of control type)
5.2.1.1	— by pushbutton		
5.2.1.2	— by lever		
5.2.1.3	— by pedal		
5.2.2	<b>Mechanical control:</b>		
5.2.2.1	— by plunger or tracer		
5.2.2.2	— by spring		
5.2.2.3	— by roller		
5.2.2.4	— by roller, operating in one direction only		
5.2.3	<b>Electrical control:</b>		
5.2.3.1	— by solenoid		
5.2.3.1.1	— with one winding		
5.2.3.1.2	— with two windings operating in opposite directions		

# ISO FLUID POWER GRAPHIC SYMBOLS

		DESCRIPTION	SYMBOL	USE OF THE EQUIPMENT OR EXPLANATION OF THE SYMBOL
5.2.3.1.3				— with two windings operating in a variable way progressively, operating in opposite direction
5.2.3.2	— by electric motor			
5.2.4	<b>Control by application or release of pressure</b>			
5.2.4.1	Direct acting control:			
5.2.4.1.1	— by application of pressure			
5.2.4.1.2	— by release of pressure			
5.2.4.1.3	— by different control areas			In the symbol the larger rectangle represents the larger control area, i.e., the priority phase
5.2.4.2	Indirect control, pilot actuated:			General symbol for pilot directional control valve
5.2.4.2.1	— by application of pressure			
5.2.4.2.2	— by release of pressure			
5.2.4.3	Interior control paths			The control paths are inside the unit
5.2.5	<b>Combined control:</b>			
5.2.5.1	— by solenoid and pilot directional valve			The pilot directional valve is actuated by the solenoid
5.2.5.2	— by solenoid or pilot directional valve			Either may actuate the control independently