

Gas-over-oil actuating devices for ball valves 6"...48", PN 8,0 (80)...16,0 (160) MPa (bar)

APPLICATION

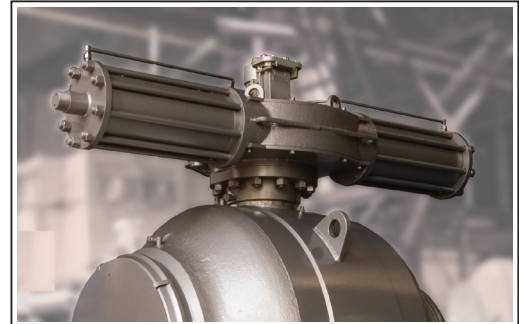
Gas-over-oil actuating devices (hereinafter referred to as Actuator) are used for actuation of ball valves 6"...48", PN 8,0...16,0MPa for pipelines transporting natural gas.

SPECIFICATION

CLIMATIC SERVICE CONDITIONS

Ambient temperature range:

- temperate climate: from -45°C to $+50^{\circ}\text{C}$ (climatic version T1);
- cold climate: from -60 to $+40^{\circ}\text{C}$ (climatic version C1).



OPERATING MEDIUM PROPERTIES

The actuators may be operated by an autonomous gas source or by line medium – non-aggressive natural gas, containing liquid hydrocarbon, ethylene glycol, methanol, turbine oils, water and mechanical impurities not exceeding certain quantities:

- humidity and condensate – up to 1500 mg/m^3 ;
- mechanical impurities – up to 10 mg/m^3 with particle size up to 1 mm.

Corrosive elements:

- hydrogen sulphide (H_2S) – no more than 20 mg/m^3 ;
- sodium + potassium – no more than 3 mg/m^3 .

Filter Processed Gas Properties Required for Safe Operation:

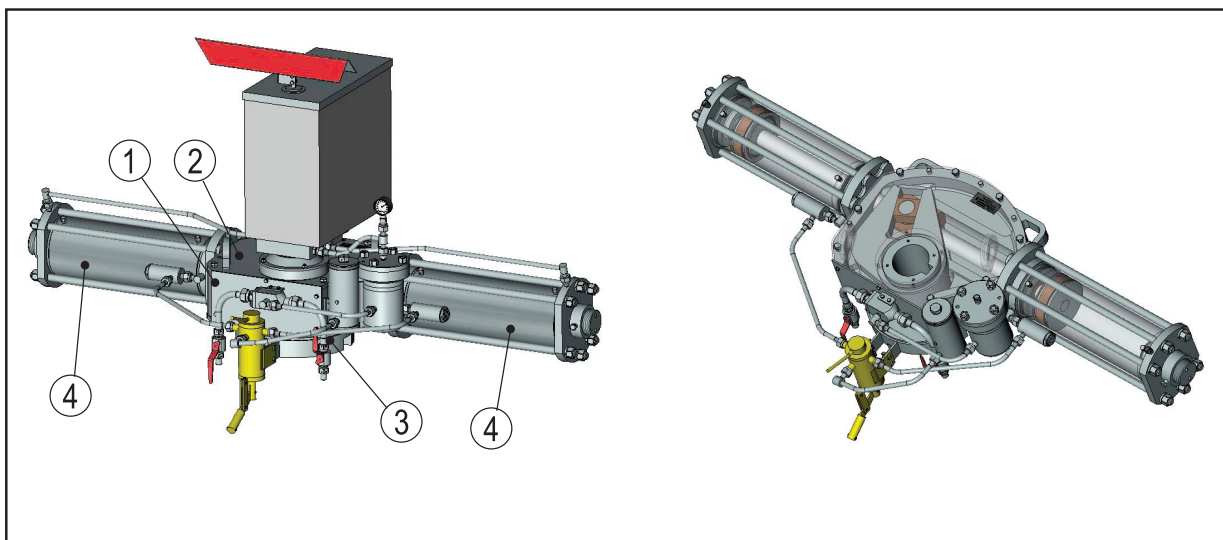
- H_2S - not more than 1 mg/m^3 ,
- solid impurities - not more than 5 mg/m^3 ,
- particle size of solid impurities - not more than 0,07 mm.

Water dew point of the gas - 5,5MPa:

- winter – minus 5°C ;
- summer – 0°C ;

Operating medium temperature range from -15°C to $+80^{\circ}\text{C}$. (upon customer request upto $+160^{\circ}\text{C}$).

ASSEMBLY



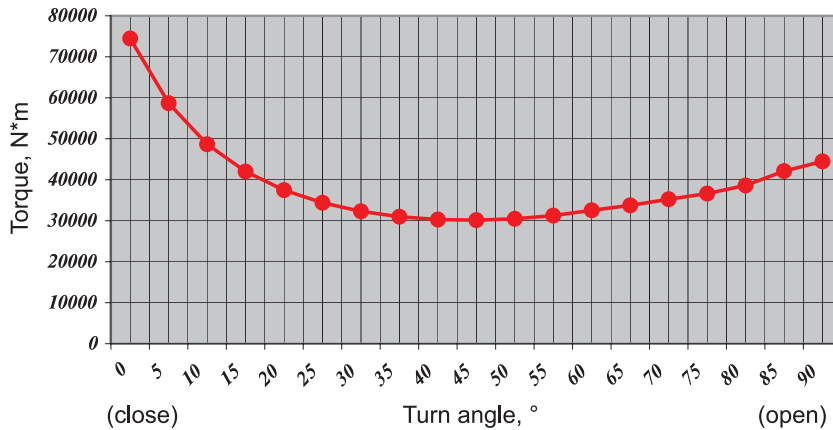
- body (1); - cover (2-top, 3-lower); - drums (4);

OPERATION

Actuators provide torque allowing full opening or closing of the valve in the range of 0 bar to PN at full differential pressure. Actuators also enable closing and opening of ball valves with both seats pressurized with PN.

Torque output

(for PT39153-400AA, PN 12,5MPa)



Gas-over-oil actuator utilize the pressure energy of the transported gas (for underground installation) or the pressure energy of the gas or air from an autonomous system (for overground installation) in the range from 1,5MPa to PN. The actuators can produce enough torque to operate fully pressurized ball valves with the operating gas pressure starting from 2,5MPa and above, for ball valves PN 125 from 3,5MPa and above.

Operating gas is led through the inlet port of the ball valve through the pipe of impulse gas feeder, bypass valve and the filter or directly into the filter from the centralized system (for overground valves only).

If necessary, the actuation of the ball valve with gas-over-oil actuator can be achieved using the build-in pump (manual override). The force on the pump handle is 150N.

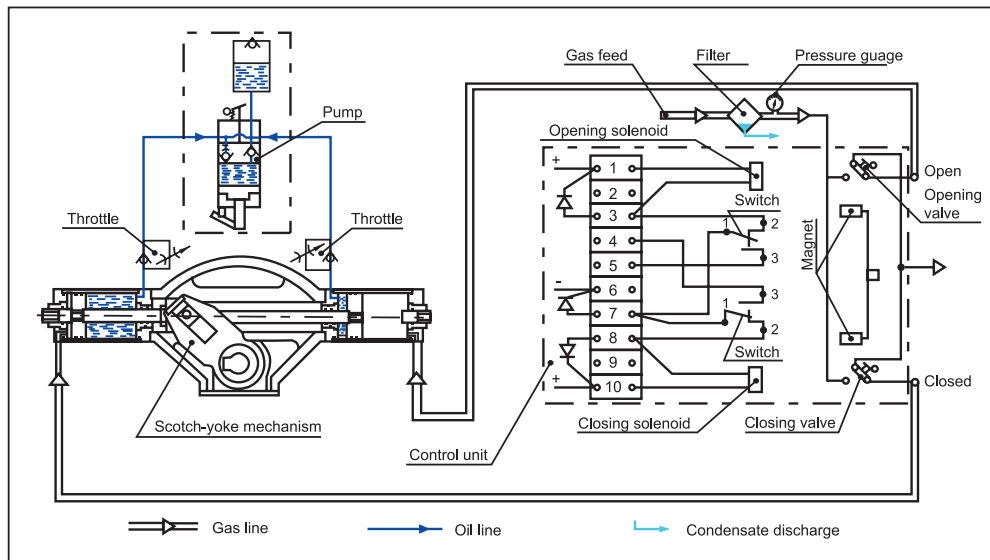
In "closed" and "open" positions the force may increase up to 400N.

Operation Principle

The linear input movement of the hydraulic cylinder is converted into the required 90° pivoting movement by means of the sliding blocks and guide track, in accordance with the scotch yoke principle. The linear movement of the attachments is transferred on the lever arm of the yoke via the carrier, the retaining bolts and the sliding blocks.

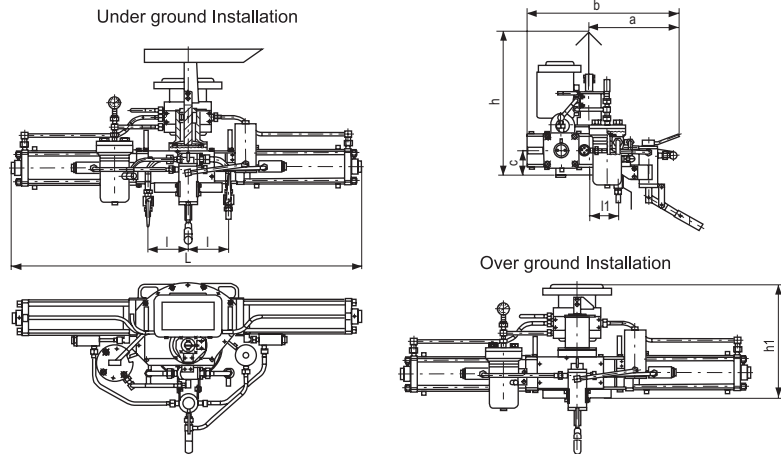
Hydraulic fluid filled in the piston cavity acts as a damper and flows from one cylinder the other.

Electropneumohydraulic scheme

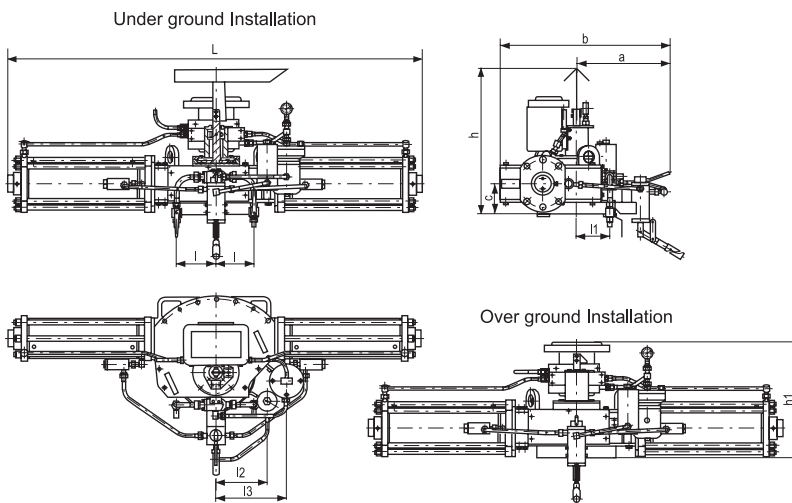


Gas-over-oil actuating devices for ball valves

DIMENSIONS AND DRAWING



Designation	L, mm/in	L, mm/in	l1, mm/in	l2, mm/in	l3, mm/in	a, mm/in	b, mm/in	c, mm/in	h, mm/in	h1, mm/in	Max weight, kg/lb
PT39180-150AA	1150/45.3	164/6.5	110/4.3	205/8.1	268/10.6	342/13.5	552/21.7	75/3	600/23.6	495/19.5	170/374
PT39180-300AA	1470/57.9	170/6.7	121/4.7	243/9.6	312/12.3	379/14.9	644/25.4	105/4.1	605/23.8	482/19	240/527



Designation	L, mm/in	l, mm/in	l1, mm/in	l2, mm/in	l3, mm/in	a, mm/in	b, mm/in	c, mm/in	h, mm/in	h1, mm/in	Max weight, kg/lb,
PT39150-300AA	1825/ 71.9	169/6.7	146/5.7	227/8.9	312/12.3	410/16.1	750/29.5	146/5.8	642/25.3	516/20.3	405/892
PT39153-400AA	1825/ 71.9	169/6.7	146/5.7	227/8.9	312/12.3	410/16.1	750/29.5	146/5.8	642/25.3	516/20.3	420/925
PT39183-700AA	2175/85.6	190/7.5	186/7.3	227/8.9	312/12.3	475/18.7	890/35	155/6.1	680/26.8	806/31.7	600/1322
PT39183-1000AA	2500/98.4	204/8	217/8.5	278/10.9	364/14.3	517/20.4	1007/39.6	165/6.5	707/27.8	833/32.8	1000/2203
PT39183-1200AA	2900/114.2	274/10.8	246/9.7	323/12.7	389/15.3	582/22.9	1126/44.3	165/6.5	735/29	861/33.9	1800/3965

MAX TORQUE

Designation	PN, MPa	2,5	6,5	8	10,0	12,5	16,0
PT39180-150AA	10,0	2183,62	5677,41	6987,59	8734,48		
PT39180-300AA	10,0	7810,91	20308,4	24994,9	31243,7		
PT39150-300AA	16,0	13290,5	33225,9	42530,3	52671,3	66454,7	85062,8
PT39153-400AA	12,5	14891,5	38717,9	47652,8	59566	74457,5	
PT39183-700AA	12,5	30293,8	78763,9	96940,2	121175	145410	
PT39183-1000AA	12,5	69854,1	181621	223533	279416	335300	
PT39183-1200AA	12,5	112552	310893	413950	517437	620327	