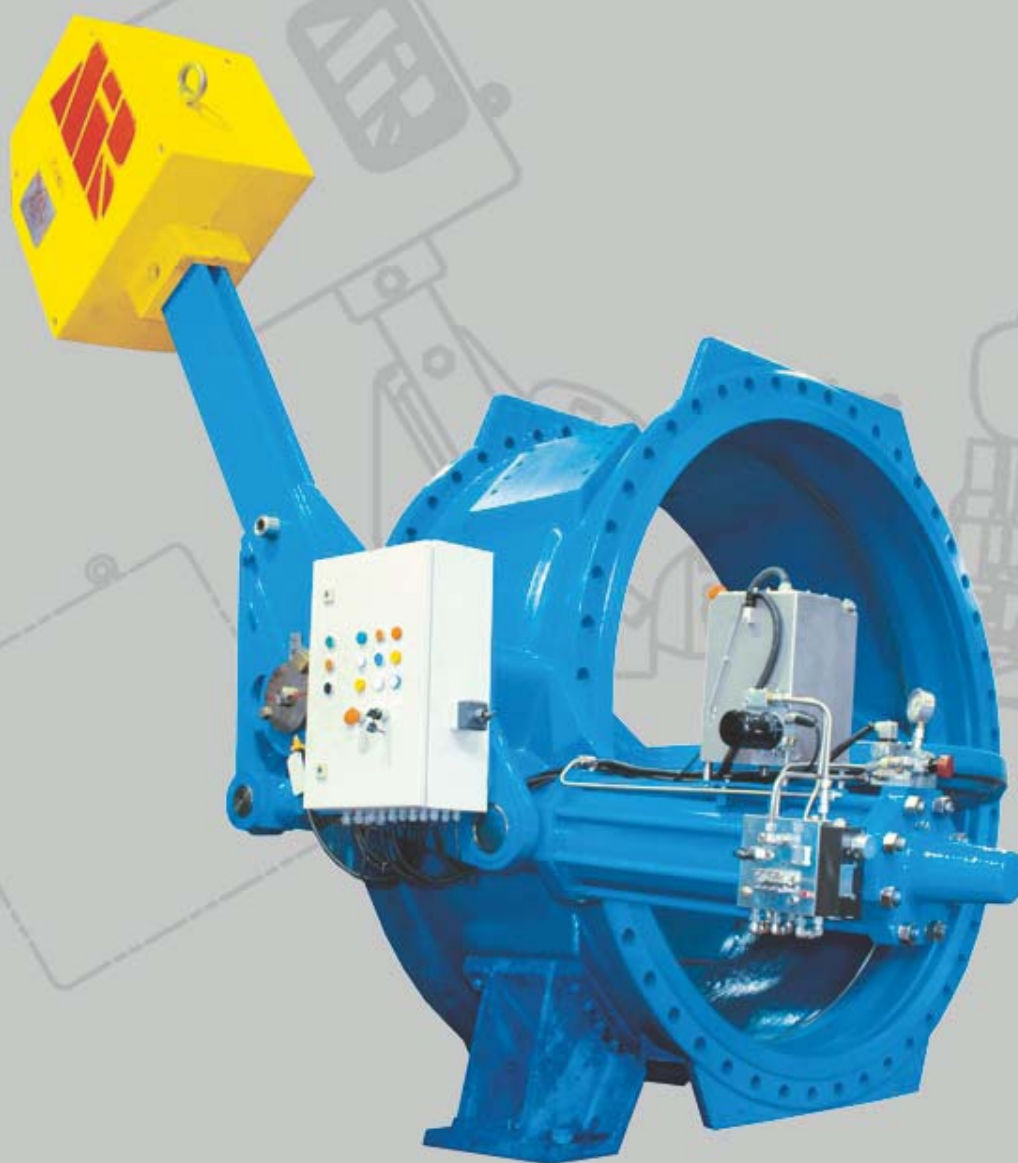




AB VALVES GmbH

Manufacturer of Industrial Valves
and Relevant Equipments

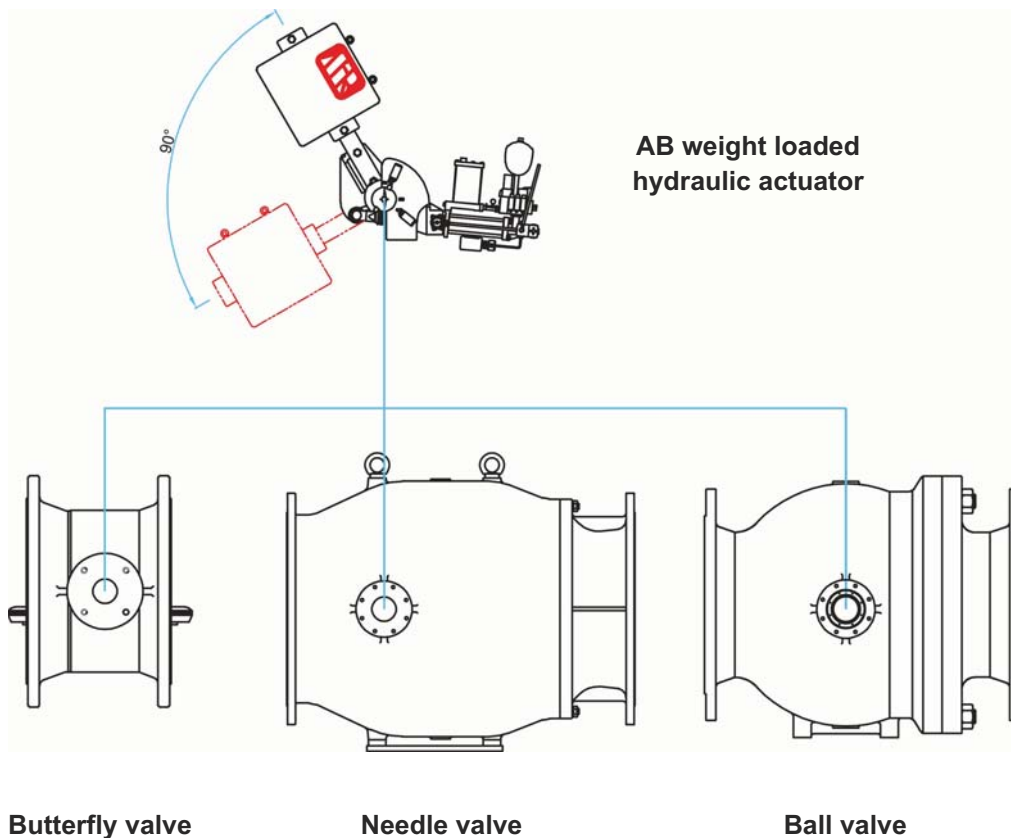
**Weight Loaded Hydraulic Actuator
Butterfly Valve (WHBV)**



Weight loaded with Hydraulic actuator

Valve specification:

AB-VALVES Weight loaded Hydraulic Actuators are used where ever valves installed at critical points of pipe networks have to closed or open in a secure and reliable manner even if failure of external operating energy. they have to meet the most stringent requirements in terms of functional safety. Weight loaded actuator can be used in emergency valves for closing or opening the valve in emergency conditions independent of electrical power.



The weight loaded provides the energy required for a single closing or opening operating of the valve. **AB** compact type weight loaded Hydraulic Actuator is used for operating valves with a drive shaft rotating by max. 90° ,maybe incorporated in ball valves, Butterfly valves or needle valves. Range of size and standard interfaces combined with a perfect modular concept enable to supply the best solution for valves of all sizes and pressure ratings.

Description of performance

Hydraulic pump produce a pressure on the piston side of the cylinder which raises the weight-loaded lever. Falling weight can be done in the following sequences:

- By means of manual hydraulic valve on control block
- By hydraulic or electrical command signal from speed sensor (or other sensors).
- By energizing or de energizing hydraulic solenoid valve from remote or local system.

To prevent of creating water Hammer and impact to Hydraulic system, weight falling at the beginning, is rapid and in the near end of its travel course fairly slowly. Each falling step times of weight movement is adjustable.

**Applications:**

Applications of AB weight loaded - Hydraulic actuator valves can be classified as follows:

Please note that mentioned application are most important usage of valve and this valve can be used for other applications according to designer opinion.

1- Combined pump discharge control & non return valve

Combined function in one valve Starting pumps in a controlled manner and non-return function the actuator helps to start the pump smoothly. Closing slams of the disk are prevented by means of 2 phase closing characteristics. Also the valve can be used as an emergency shut off valve for preventing returning water to pump station when pipe burst has occurred.

2- Over flow control valve

In this case of application, this valve can install at inlet of reservoir and can close inlet water pipe for controlling water level , also it can prevent water returning in case of inlet pipe burst occurred.

3- Turbine inlet safety valve

Safety valve directly installed at the turbine inlet. It is used as a safety valve for quick closing in case of sudden load rejection, avoiding inadmissibly high speed (runaway speed) of the turbine and water hammer phenomena which might be created there. In a lot of plants, Weight loaded hydraulic actuators are also used in the bypass acting quick- opening devise in order to open synchronously to the closing of the inlet valve in a neutral manner as for as flow rate in concerned

4- Burst control valve

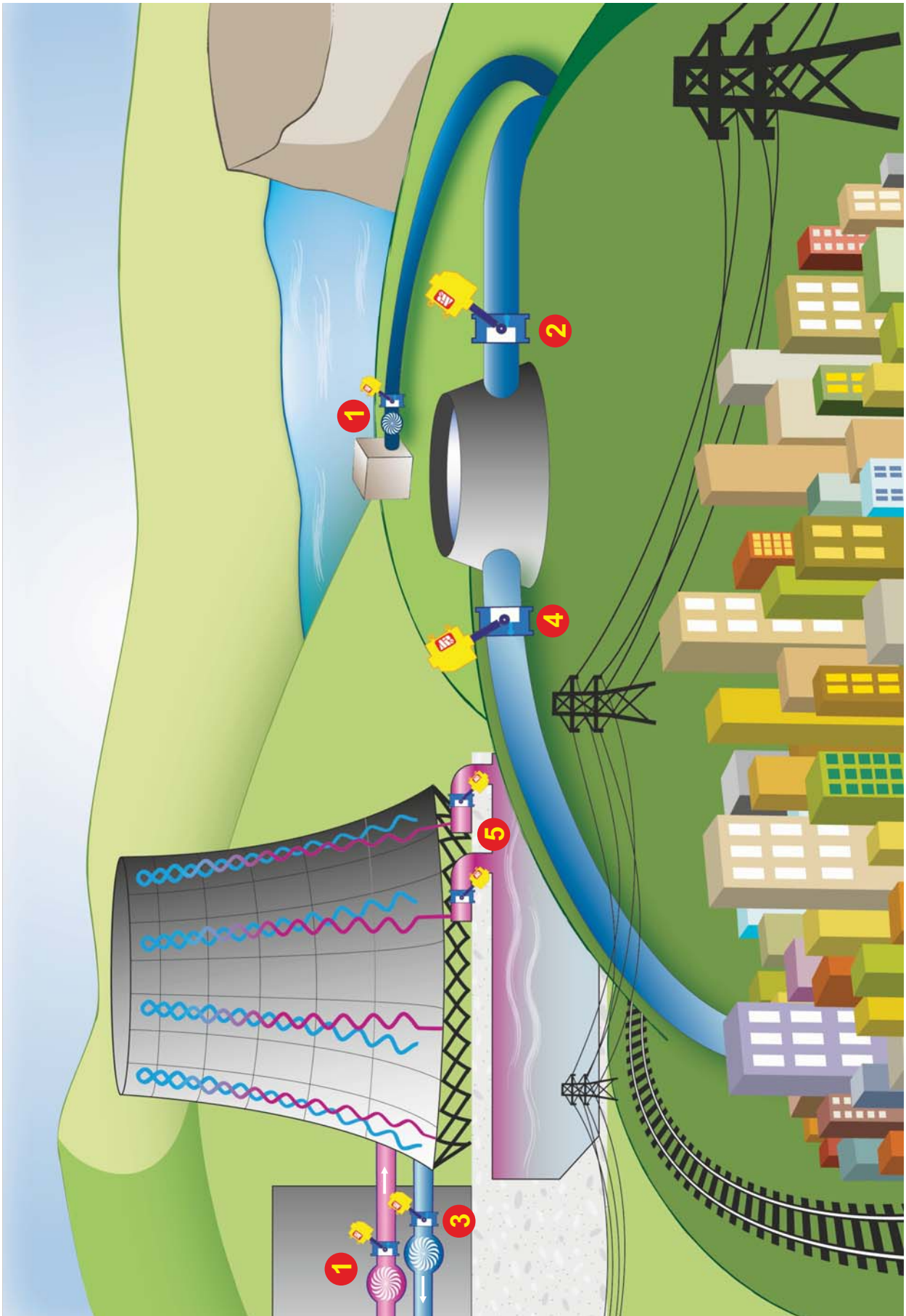
In water piping systems, pipe burst can happen due to natural disasters or other reasons like fire, explosion etc. emergency hydraulic valve can be used in system for closing water flow and to protect buildings, traffic routes, pumping stations etc.

5- Emergency drain valve (Quick opening valve)

Some time water drainage is necessary for protection of systems for instance in a power plant for any reason cooling tower should be drained (to avoid of freezing in winter time) in this situation emergency valve will open and would let to drain all the water.

For applications item 1, 2, 3 & 4 the valve is normally open (when the Weight is up valve is in open situation) In application item 5 (emergency opening) the valve is normally closed (when the Weight is up, valve is closed)

For more data contact technical office of AB-VALVES.





Technical specification:

Hydraulic system:

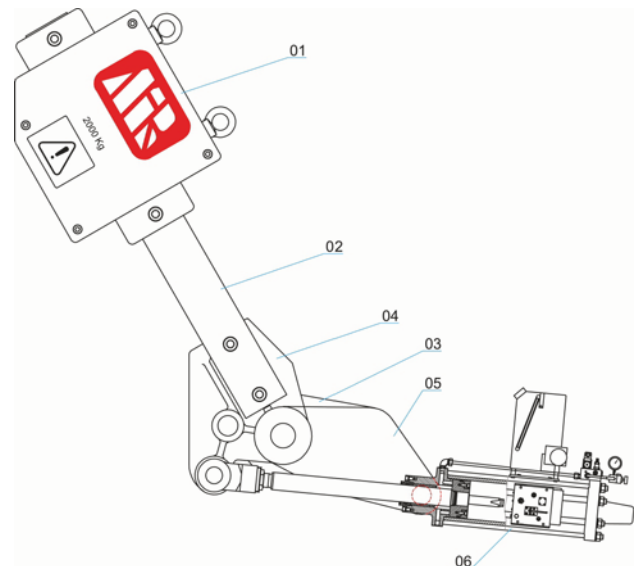
Hydraulic system in mirab weight loaded with hydraulic actuator has duty of raising the weight and also damping speed of weight falling process to prevent system shock. Hydraulic system consists of:

- Control block
- Hydraulic actuator
- Piping and connections
- Power pack (consist of motor pump and reservoir and protection elements)

Hydraulic standard parts are provided by great well known European companies .all hydraulic system also will betested after installation on valves.

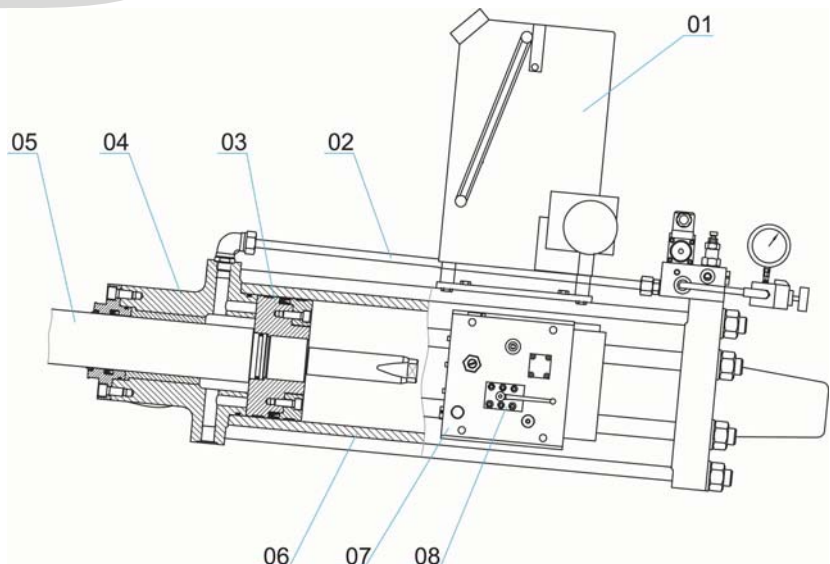
Weight loaded hydraulic actuator parts

No.	Part name
01	weight
02	Weight arm
03	Main plate
04	Joint plate
05	External plate
06	actuator



Hydraulic system

No.	Part name
01	Power pack
02	Pipe
03	Piston
04	Joint
05	Shaft
06	Cylinder
07	Block
08	3 way hand valve
09	Hand pump



**Weight loaded - Hydraulic actuator:**

Material	Actuator bracket	Steel
	Weight lever	Steel
	Weight	Cast iron
	Piston rod	Steel with hard-chrome plating
	Hydraulic cylinder	Steel with inner roller burnishing
	Cylinder Front & end	Ductile cast iron
	Sealing	High quality NBR packing.
	Pipe fittings	Zinc-coated steel
	Bearing	AL-BZ
Operation	Valve opening	By means of electric pump & manual pump
	Valve closing	By means of :Solenoid valve , Remote command from flow sensor or central control room or by manual hand valve
	Valve blocking	By means of Solenoid valve or Hand valve
	Weight raising time	Min. opening time is about 60 Sec. and would be increase by mean of the flow control.
	2-step adjustable weight falling	1st step (%70) is adjustable with flow control on the main block.
		2nd step(%30) is adjustable with flow control on the main block.
Electrical system	Total closing time	~20 Sec. and more
	Solenoid valve	Zero leakage (Seated cone type) ED %100
	Voltage of Solenoid	24 VDC (other on request).
	Limit switches	3 high corrosion resistant limit switches for open, close & %90 open (signal for compensation of unexpected internal oil leakage).
Protection Class IEC 529	Control panel	The Control Panel is installed on the valve or wall and all electric devices connected to it and operates by means of the PLC.
	Control Panel	IP 54
	Junction Box	IP 54 (if necessary)
	Limit switches	IP 67
	power pack	IP 54
Power pack unit	Solenoid valve	IP 65
	Type:	Compact power pack unit
	Electrical motor	400 VAC–3 phases 50 Hz or 230V-1phase 50Hz
Safety guards	Hydraulic pump	Gear type
		Effective protective guards have to be installed around moving parts, by costumer.
Coating		Body and disc are coated with blue electrostatic powder epoxy coating (250μ).



Butterfly valve

Technical data for weight loaded with hydraulic actuator valves are listed in this section:

Standards	Butterfly Valve	DIN EN 593 (DIN 3354)
	Face to face	DIN EN 558-1 series 14 / ISO 5752-14 (DIN 3202-F4)
	Flanges	DIN EN 1092-2 (DIN 2501)
Material	Body , Disc , Clamping ring	EN-GJS-400-15 DIN EN 1563 = GGG 40 (DIN 1693)
	Solid body seat	1.4301
	Profile sealing ring	NBR or EPDM (Germany)
	Shaft , driven & free end	1.4021
	O-ring	NBR with Certificate KTW (Germany)
	Bearing bushes	Al- Bz DIN 1714
	Screws	A2 DIN 931
Disc swing	Eccentric or double eccentric	
Coating	Body and disc are coated with blue electrostatic powder epoxy coating	
Flange Drilling	DIN EN 1092-2 (DIN 2501)	

Electrical control system

AB-valves control system of weight loaded – hydraulic actuators receives inputs signal from control panel (local / remote) , switches or sensors and sends proper control signals after processing . Control system can control valve operation by following methods :

- Command from local control panel
- Command from remote control center
- Command from electrical sensors (speed or flow sensors , level sensors , vibration sensor or ...)

Note: **AB-Valves** can provide some types of sensors, according to customer order.

Main electrical control system consists of:

- Connection cables
- Electrical motor (hydraulic system)
- Limit switches or/and pressure switch
- local control panel (include contractors, safety parts, relays, timers, terminals and ...)

Weight falling command signal for valve opening or closing in emergencies can be provide as mentioned in following table:

Electrical situation	Description	Command signal source
Electrical power is available	Valve can be operated by electrical control system.	cut off main electrical-power. Speed or flow meter- Flow switch fig.1-
Electrical power is not available	Weight will fall when the hydraulic system gets signal from mechanical flow speed sensor .	Mechanical paddle fig.2-
	Weight will fall when the hydraulic system gets signal from pressure differential sensor (venture).	-Venture pipe fig. 3

Schematic sketch for bursting pipe valve:

Fig1) installation with flow switch

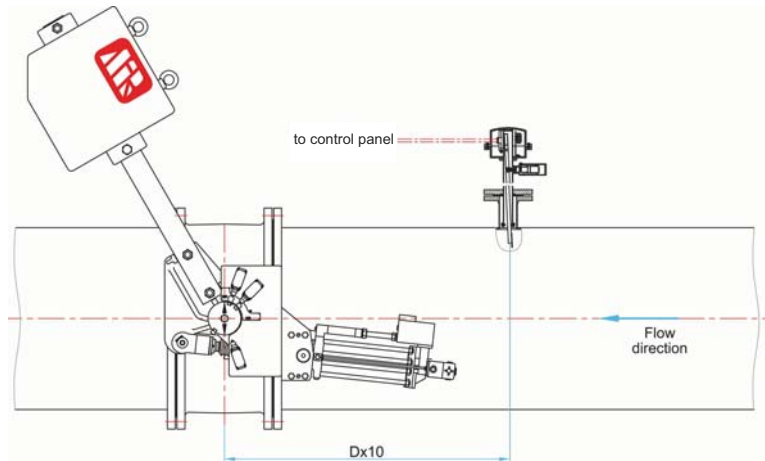
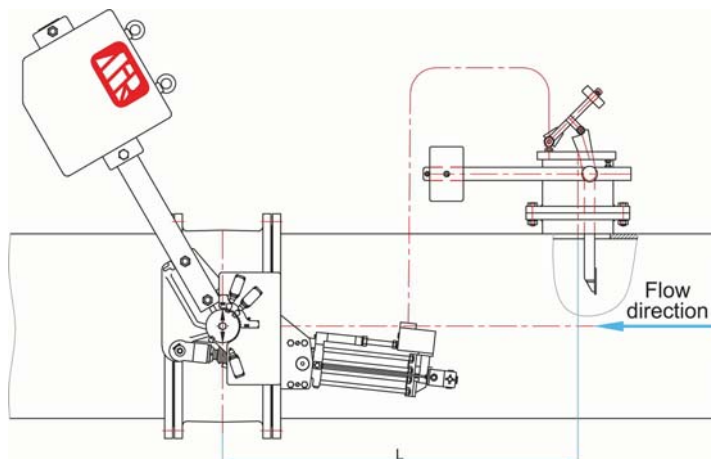


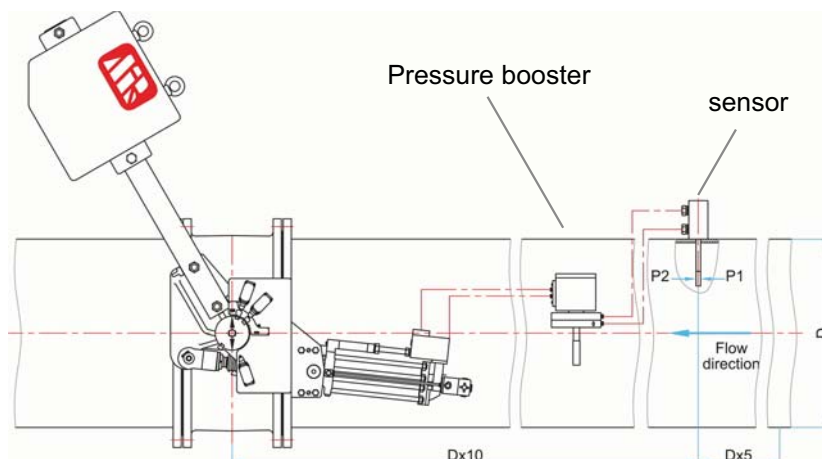
Fig2) installation with mechanical speed sensor

(paddle type tripping Device)



DN	L
300	1300
400	1300
500	1350
600	1400
700	1450
800	1450
900	1500
1000	1550
1200	1550
1400	1600
1600	1700
1800	1800
2000	2000
2200	2200

Fig3) with Differential pressure sensor





Required information for product ordering:

Some important data and technical specifications are required for valve design and production process, so customer should provide this information according to project and design, this information will be considered as valve manufacturing base data, so they should be prepared correctly to prevent further problems.

- Hydraulic solenoid voltage.
- Hydraulic electro motor voltage.
- Valve main application in system.
- Opening and closing time of valve.
- Control panel specific required data.
- Main valve type (butterfly, needle, ball valve).
- Weight falling command generator or/and sensor type.
- Nominal size, nominal pressure and working pressure.
- Flow rate and flow speed in normal and emergency conditions.
- Valve installation position in pipe line and related simple drawings.
- Other specific information for valve or project according to design data.
- Normal valve situation in operation duration (valve is normal open or close).
- Pressure side when valve is closed (pressure is at upstream or downstream).



Important operation instructions:

- 1-Butterfly valves are designed for full opening or full closing operation so they should not be used for controlling flow rate it will cause cavitation and valve will be damaged.
- 2-For better sealing function and easy maintenance and adjustment works , it is recommended to select and install valve position as pressure side locate at disc shaft side in closed situation.
- 3-Opening the valve under unbalanced pressure conditions - both sides of the valve have not same pressure
■ will apply extra stress to the shafts and other parts , so it is strongly recommended to balance pressure in both side of the disc before opening the valve.
- 4-If it is possible to keeping the valve a long time in warehouse , it is recommended to open disk 5 degree for preventing any possible seal damage . valve should be covered properly to prevent direct sunlight or dust .
- 5-Avoid any impact to valve specially hydraulic system and electrical control panel and take care while transporting and installation process .
- 6-It is necessary to clean pipe line carefully before installation and operation of valve , any external particle like metals , welding electrodes , wooden parts , eta, can make damage on sealing parts.
- 7-Be sure of compatibility of fluid physical and chemical properties and valve parts specially sealing rubber.
- 8-Valve installation place should be design such way that valve installation and maintenance process can be performed easily.

Installation, operation and maintenance instruction manual will be sent for customer in time of valve delivery.

Accessory Equipments

1-Bypass electrical valve

For balancing fluid pressure both side of the butterfly valve disc before opening process it is recommended to use by pass line with an electrical valve that is connected to the main emergency valve control system.

2- Differential pressure switch

To ensure equal pressure both side of the butterfly valve before opening it, installation of differential pressure switch is recommended. After opening bypass valve , It will send equal pressure confirmation signal to the control system of the main valve.



3-Econo plug for hydraulic solenoids

In case of using fail safe control systems , the coil of hydraulic solenoid valve will be energized for a long time, it is a electrical component and it's life time will be over finally , when the solenoid coil fails , it may cause fault in system and sometimes it is a serious trouble for systems. AB valves find a solution to reduce probability of this fail and postpone this trouble as late as possible. Econo plugs are used in hydraulic solenoid electrical system and make following advantages:

- Power of the coil.
- Increase life time of the coil .
- Reducing produced heat in the solenoid coil.
- Reducing continual voltage and consuming electrical





4-Accumulator

In weight loaded hydraulic actuator systems because of unavoidable little oil leakage during a long time , weight will move down a little after starting operation and it cause shaft and disk rotation 5-10 degree (it is beneficial for preventing shaft locking if preventive maintenance had not been performed on valve) In some cases when electrical power is not available or little disk and weight movement is not allowable according to valve function , a hydraulic accumulator can be installed on actuator for decrease effect of hydraulic leakage during time.



5-Accumulator testing and charging kit

for testing and charging of accumulators during operation and maintenance activities charging kit is available.



Needed information for ordering charging kit:

Producer name and code of accumulator - accumulator volume – accumulator and gas tank port size and type.

**AB-valve Weight loaded hydraulic actuator technical Questioner form** (Date:.....)

Company name:

Phone No.:

e-mail:

Engineer in charge:

Mobile No.:

e-mail:

1-Valve type : ☐ Butterfly valve ☐ Needle valve ☐ Ball valve quantity : set

2- Valve Size: DN mm

3- Nominal pressure: PN bar - Working pressure: bar - Flange drilling PN

4-Application:

☐ Non-return, Isolating and Pump control valve ☐ Over flow Control valve for Reservoir☐ Safety Valve for Turbine Inlet ☐ Pipe burst control valve ☐ Quick opening vale☐ Other Applications (please describe):

5-Flow rate and velocity: Normal operation condition : Tripping condition:

6-Pressure conditions when valve is closed : ☐ upstream ☐ downstream7-Valve normal situation: ☐ Normal Open (Opening with the weight rise and will be closed with weight fall)☐ Normal Close (Closing with the weight rise and will be opened with weight fall)

8- Weight falling time: step1(70% of falling travel) sec step2(30% of falling travel) sec

9- Weight Falling command is by :

☐ Velocity or flow switch (electrical) ☐ Paddle tripping device (mechanical) ☐ Lack of electricity☐ Differential pressure tripping device ☐ reservoir level sensor10- Weight rise by: ☐ Manual hydraulic pump ☐ Manual and Electrical hydraulic pump (recommended)11-Voltage of solenoid valve: V ☐ AC ☐ DC (recommendation: 24VDC)

12-voltage of electrical pump: Vphase

13-Limit switches : ☐ Open ☐ 95%Open ☐ Close ☐ Tripped ☐ Others:14-Local control panel: ☐ Mounted on valve ☐ Wall mounted

15-solenoid electrical normal situation :

Always energized (weight will start falling with solenoid de energizing)

Always de energized (weight will start falling with solenoid energizing)

16-avalable emergency electrical supply :V ☐ AC ☐ DC (from ups or generator)17-system for checking pressure in both side of valve : ☐ DPS ☐ ordinary manometer ☐ other:....

18-valve and actuator installation position and orientation: (Please selectPos.1 to Pos.8)

19-installation drawing should be send for AB-valves for more accuracy in valve specifications.

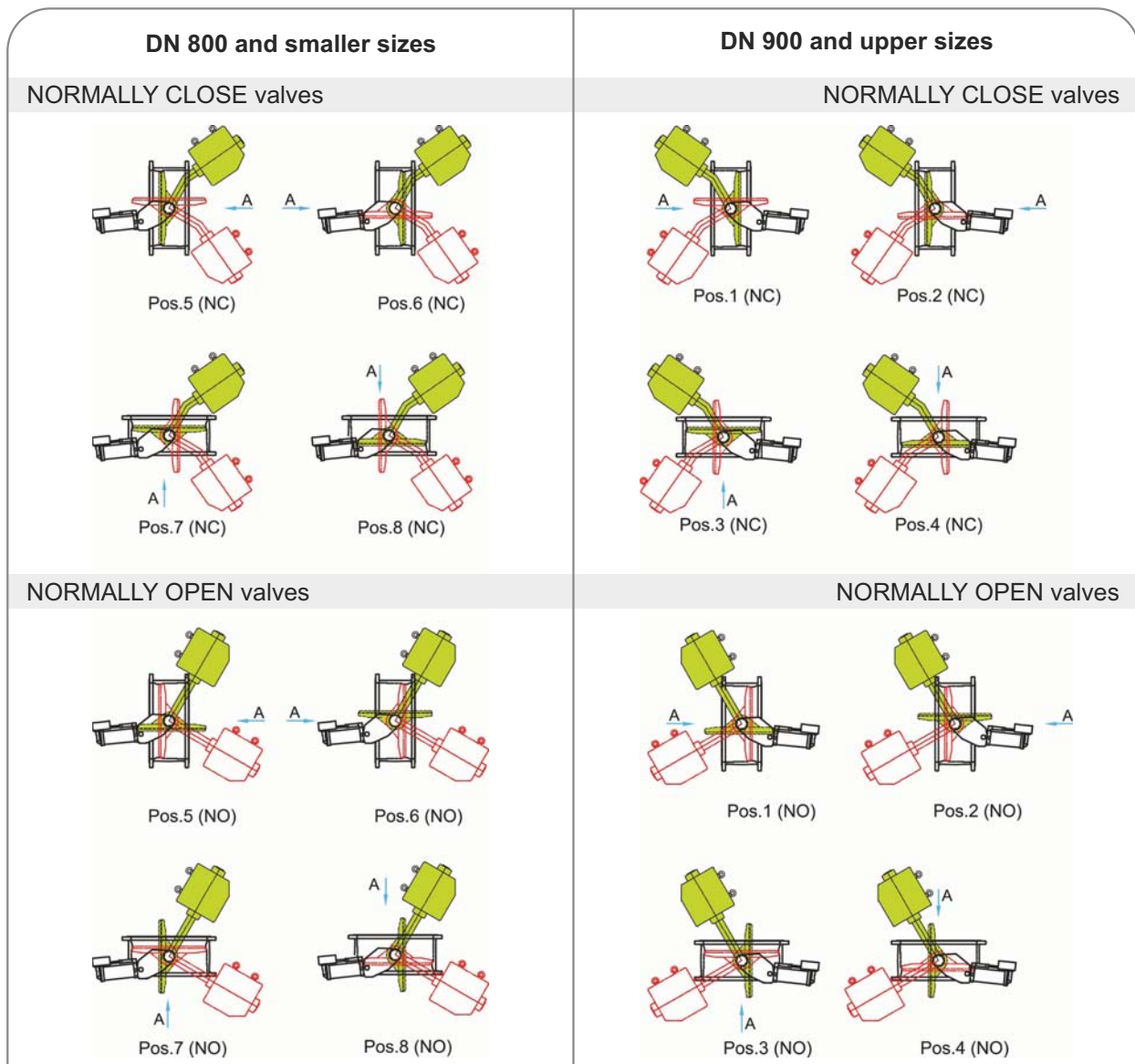
20- Other special specifications :
.....

Hydraulic actuator installation positions

For selection of actuator installation position consider following notes:

- Angle of installation (horizontal or vertical situation)
- Weight direction according to pipe line and valve high pressure side
- Normal valve working situation during operation (it is normal close or normal open type)
- Valve size (for DN 800 and smaller use left column and for DN900 and upper sizes use right column)

Important note: butterfly valve can be installed independent of pressure side or flow direction , but **AB-Valves** strongly recommend that valve high pressure side (A) and disk shaft side be same specially for PN16 & 25 .It ensure better sealing and allow adjusting profile ring during operation time.



■ Normal operation

□ Emergency conditions

A : high pressure side

AB VALVES' PRODUCTS

Butterfly Valves Flange Type (BVF)
Butterfly Valves Wafer Type (BVW)
Butterfly Valves Wafer Type for Sea Water (BVS)
Gate Valves (GV)
Valves for Special Applications
Air Valves (AV)
Hydrants (HT)
Automatic Control Valves (RV)
Non-Return Valves (NV)
Strainers (STR)
Accessories
Actuators



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