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larner-johnson® valve

presentation

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larner-johnson® valves

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History

☑ The Larner-Johnson valve was originally designed and developed in 1920's for use on hydra-electric power plants in the U.S.A., where it pioneered the application of the needle valve principal.

☑ J. Blakeborough & Son Ltd's interest in the Larner-Johnson valve consummated in 1937 when the company obtained manufacturing and selling rights of the patents.

☑ Extensive development work was carried out at this point laying down sound technical foundations, which were to prove the product time and again.

☑ Blackhall Engineering Ltd purchased the sole manufacturing and intellectual rights from Blakeborough in 1989.

☑ The Larner-Johnson valve design has been applied to almost all the principal valve duties, resulting in the series of manual, power-operated and self-acting types.

☑ Thousands of installations have been carried out, covering the widest range of sizes, duties and conditions. Providing evidence of a capacity for sustained high level performance.

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general characteristics

The Larner-Johnson valve consists of a circular body surround an internal cylinder, closed at one end and connected to the body by radial ribs, in which a pointed plunger or needle operates, making contact with a seat in the neck of the body to close the valve.

The pressure used to move the plunger is the pipe line pressure in the body of the valve itself. The flow through the valve at all positions of the plunger is smooth and free from eddies or disturbance.

The hydraulic characteristics of flow are identical with those of the needle nozzle of an impulse wheel, and these valves are equally smooth in action and as free from vibration as the impulse wheel nozzle.

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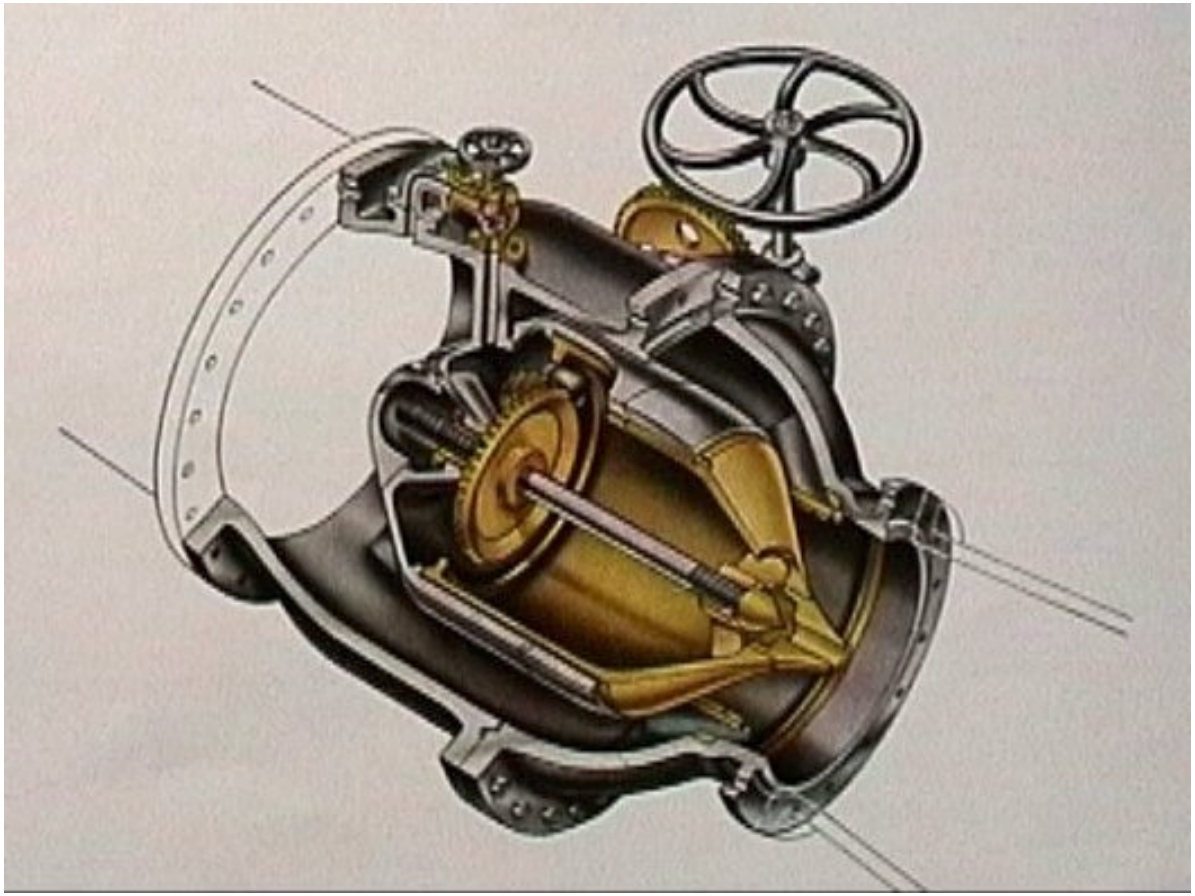

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strengths

The Larner-Johnson valve has unique features of superiority which distinguish the valve from other valves currently available on the market.

All parts of the valve are circular and hence free from distortion under high pressures. The stresses can be accurately determined, thus eliminating all empirical and experimental factors of design.

The simplicity of design and freedom from distortion make it possible to build this valve in sizes larger than could be attempted with any other type. They are in use and under construction up to 21 ft diameter (4000 mm). Some of the larger valves operate under heads up to 1000 ft (305m). Smaller valves have been tested at pressures up to 3000 ft (915m).

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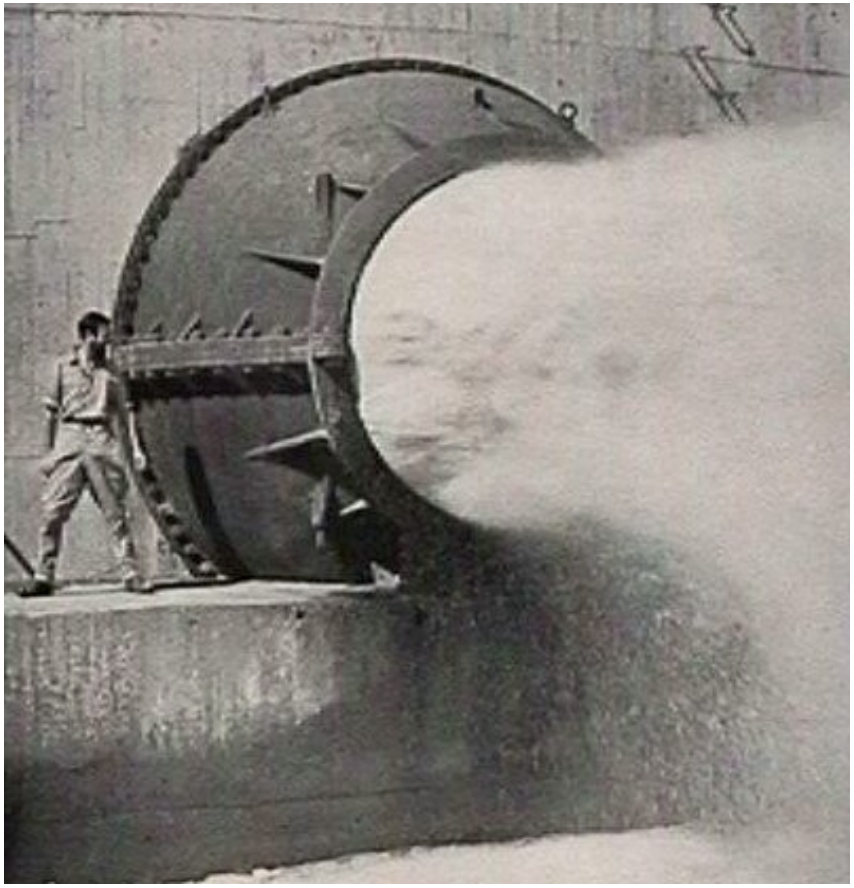

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durability

This valve is unquestionably the most durable type on the market. Historically, up to the first 25 years, the valve has never needed to be furnished with a new part of any kind to replace one worn out in service. There are no sliding contacts under pressure as in the case of other valves. The plunger in operation is unbalanced only enough to move it.

The internal cylinder in which the plunger operates is usually made of cast iron for all pressures. It is subject to compressive stress only, and cast iron finishes to a better surface than cast steel. Only small sizes and valves, which are seldom operated, are protected with a full bronze lining. Experience has shown that valves which are operated occasionally require no lining. There is no flow of water in the internal cylinder except while the plunger is moving.

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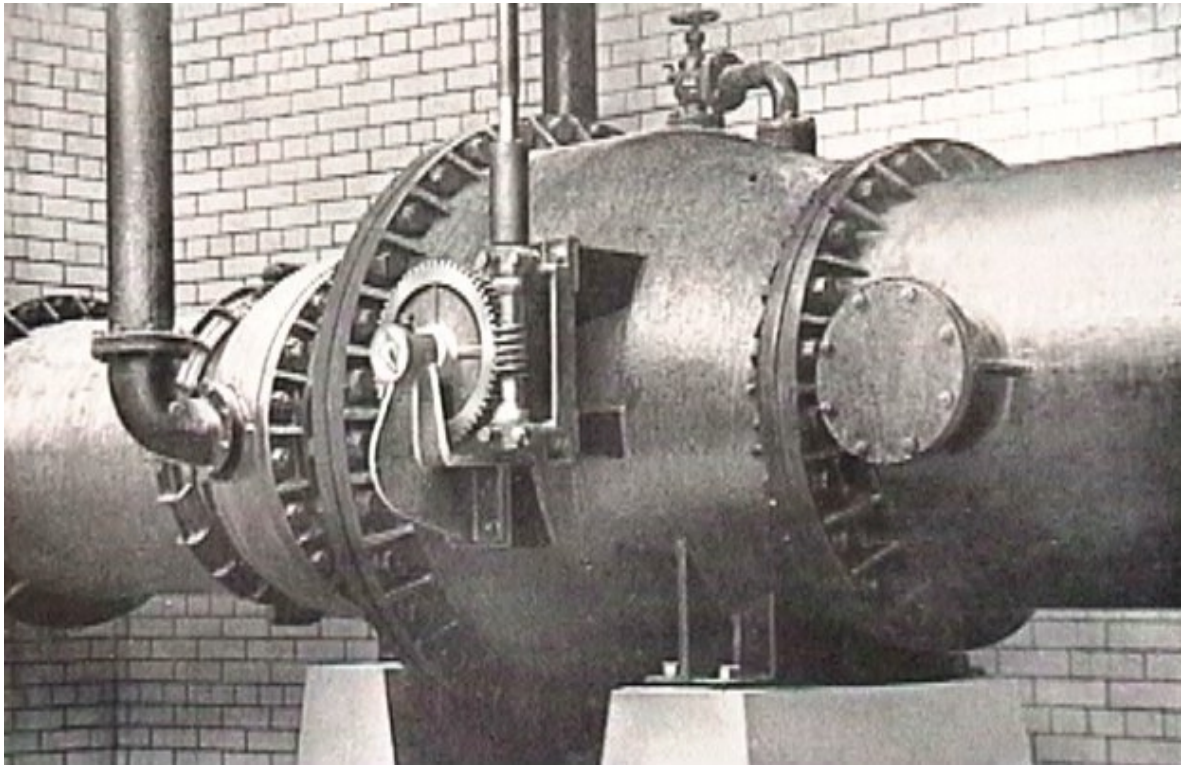

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tightness

No matter how large the size or how high the pressure, these valves are always tight when closed. The plunger has a renewable seat ring which is machined to a perfect fit against a renewable seat ring in the neck of the valve body. The higher the pressure in the valve the higher the pressure of the plunger against the seat, but there is no rubbing of one seat on the other, and hence there is no wear. Once tight, the valve is always tight.

Distortion, which is a common cause of leakage in other valves, is entirely absent from Larner-Johnson valves on account of their circular shape.

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reliability

❶ The valve requires no outside auxiliary force for operation, which is achieved by means of the pressure within the valve. (Ordinarily the force required to move the plunger is only sufficient to overcome the friction of the plunger sliding in the internal cylinder, but if the movement of the plunger is obstructed a relatively enormous force is automatically applied which is sufficient to over come almost any obstacle.)

The valve becomes a veritable hydraulic jack, capable of exerting a great force. It is practically impossible for the plunger to become wedged in any way.

❷The rate of opening and closing may be adjusted to suit the conditions of operation.

These valves do not require a by-pass. They are ready to operate instantly and will work just as easily when water is flowing through them as when conditions are static.

This is an exclusive feature of great importance.

Trouble experienced with other valves generally results from the necessity for operating them unbalanced whenever they are used to stop flowing water.

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materials of construction

The Larner-Johnson valve is manufactured from high grade materials throughout which are carefully selected for the particular service conditions.

Cast Iron - For bodies and plungers, high - duty iron by the ‘Meehanite process corresponding to B.S. 1452 Gr 220. (The superior qualities of ‘Meehanite‘ in toughness, density and consistency render it eminently suitable for pressure castings.)

Cast Steel - Alternative for bodies and plungers under special conditions. Normally a plain carbon steel to B.S. 1504 -161- Gr 480A.

Stainless Steel - The pilot valve, pilot valve stem, operating shaft, linkage pins and in special cases the seat rings. To B.S. 970 431-S29 combining high strength and hard wearing corrosion resistant properties.

Gunmetal - For bushes, liners, seat rings and the smaller valve plungers. Normally to B.S. 1400-LG2 but alloys of other compositions can be substituted according to requirements.

Aluminium Bronze - For pilot valve and stem. To B.S. 2874-CA-104. A high strength bronze with special corrosion resistance properties.

High Tensile Brass - Sundry trim components in certain sizes. To B.S. 2874-CZ-114

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operators

The Larner-Johnson valve requires minimal torque for actuation in comparison to other valve configurations, this advantage being due to its balanced design.

The valve may be operated by the following operators :

Gearbox

Electric Actuator
Basic features include - Reversing motor,precision reduction gearing, limit switches,automatic torque limiting control, local travel indication, weatherproof enclosures, provision for manual operation with safety interlock. Integral starter, additional switches for interlocking etc..

Hydraulic or pneumatic cylinder
Associated controls

Float Operated - Angle Pattern & Inline design
Optional stilling tanks with ball cock and siphon configurations

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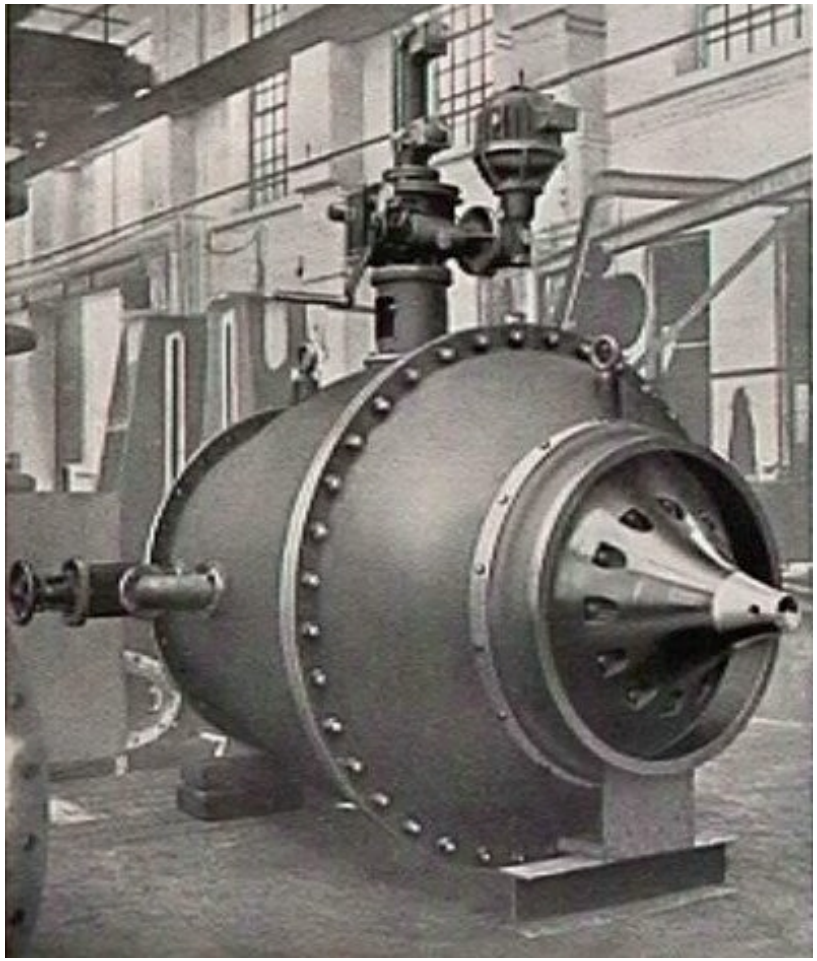

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applications

The Larner-Johnson valve is essentially for liquid service, its principle application is the control of water, however there is a demand for industrial applications.

Although available in certain sizes and adaptations on a standardised basis, the valve is obviously not an off the shelf item. The valve is employed selectively, where enhanced durability, safety and and smoothness of control are important.

Examples include :

- Pipeline stop and regulating
- Free discharge regulators
- Angle type regulator
- Solid plunger
- Pressure Reducing
- Submerged Discharge
- Tight closure against reverse pressure
- Jet disperser
- Inline Float
- Altitude valve
- Pressure Sustaining
- Fixed Cone

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target applications

The Larner-Johnson valve is competitive in the applications as described in this slide, essentially the large medium to high pressure applications are targeted.

Bore sizes 250mm plus - Pressure ratings PN 10 plus

✓ Terminal Discharge

Free discharge regulators	Type E	
Jet disperser	Type	
Submerged Discharge	Type	Fig 3200
Fixed Cone	Type	Fig 3300

✓ Inline Control

Pipeline stop and regulating	Type E	Fig 3137
Angle type regulator	Type E	Fig 3078
Inline Float	Type E	Fig 3165

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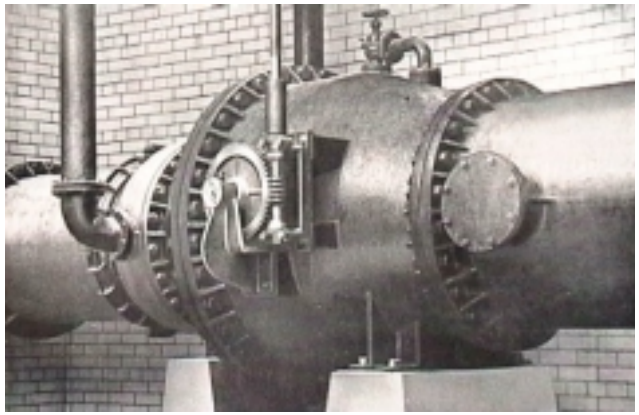
Blackhall Larner-Johnson valves are designed to meet the water industries specific needs and are specified by engineers world wide. In addition to new installations we are able to offer our customers a Valve commissioning and repair **service**

Water Supply

- **Distribution**
- **Treatment**
- **Resources**



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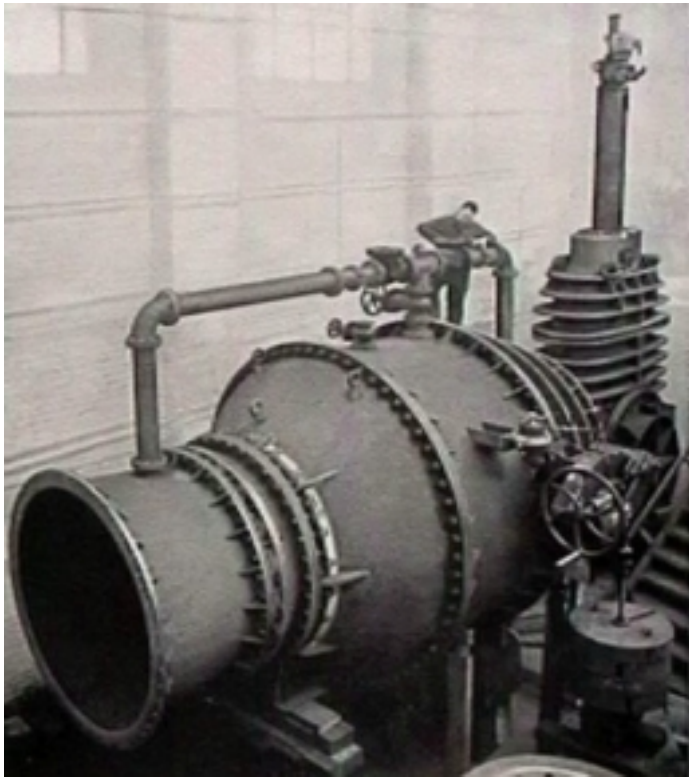
refurbishment & commissioning

Qualified confined space employees

World wide experience



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Valves which incorporate features of great advantage to the water industry