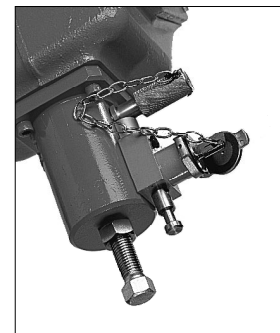


NELES CONTROLS ENSURES THAT YOUR ESD-VALVES WORK WHEN NEEDED



PEmergency Shut-Down valves (ESD) are critical in protection of plant and personnel. These must operate in the event of plant malfunction or fire.

The most important requirement for an ESD-valve is its reliability of operation (open or close) in an emergency.

By its very nature, it is difficult to test that an ESD-valve is "available" without causing a plant upset. The plant is at risk however unless it can be shown that the valve is functioning properly. How can this be done ?

Neles Controls has developed a unique system for testing on-line ESD-valves which uses a Jammer device. This can be offered for local manual use or automatic operation from a control room.

On-line testing without process shutdown

The Jammer device, when actuated, limits the valve movement to partial closure (10 - 20%). The valve system can be tested at regular intervals without disturbing normal plant operation.

The system which is built into the Neles Controls system has been subject to a Failure Mode, Effect and Criticality Analysis (FMECA) carried out by an independent specialized organization. These results have been accepted by major oil companies.

Neles Controls solutions for ESD applications

Neles Controls rotary valves for ESD service are tested to the relevant BS or API standards, which is a normal requirement for valves in services with a potential fire hazard.

The fire-safety of the actuator is at least as important as that of the valve. The Neles Controls "spring-to-close" and "spring-to-open" actuators have been successfully tested in a firing chamber.

Valves have also been in real fires at oil refineries. Experience shows that the actuator mechanism reliably closes or opens the valve before other damage in the actuator or in the valve can occur.

Stem-Ball valves for the critical services

For the critical services, including LPG, NGL and LNG at $-160^{\circ}\text{C}/320^{\circ}\text{F}$, leading oil companies have chosen the Neles Controls fully metal-seated Stem-Ball[®] valve for ESD functions.

The advantage with rotary valves is that during quick operation they involve smaller inertial forces than gate or globe valves. This advantage is greater the larger the nominal size and the higher the pressure class of the valve. Neles Controls rotary valves and spring-return actuators permit a very short closing time to be achieved.

High temperature and other severe duty valves such as those found on refinery duties, can easily be handled by the Neles Controls trunnion-mounted valve series which can be offered without use of rubber or plastic parts by use of metal seats and bearings.

Neles Controls ESD-valve design features.

- The ball and stem are made in one piece. Elimination of joints means a stronger and more reliable construction.
- The stem is connected directly into the actuator drive hub. No intermediate drive centres are used which can fail.
- The remote limit switch valve position is measured directly because of the one piece ball and stem. This means true indication signals are not "inferred" as is the case where a drive chain is used which is true with most makes.
- Metal seating gives a very consistent operating torque, unlike soft seats which increase torque with "standing" and plant contamination on the seats. This means confident actuator selection and valve operation.

OPERATION PRINCIPLES

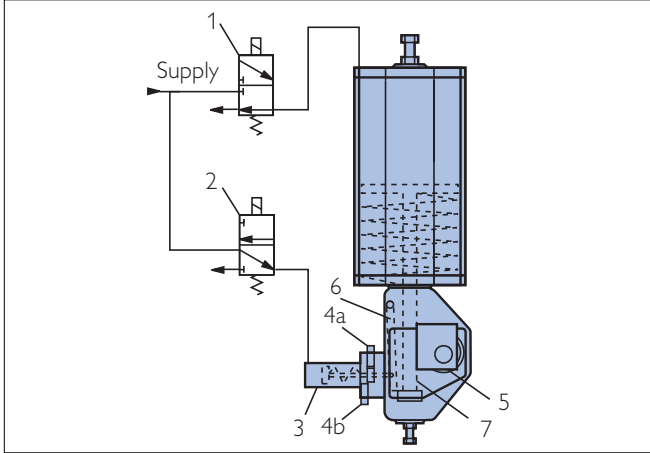


Figure 1. Automated jammer, "spring-to-close" actuator
The jammer prevents the ESD-valve from shutting completely, when the solenoid valve (2) is energized and the pneumatic actuator cylinder (3) pressurized. The valve can be rotated 10-20° against the lever (6) end. The limit switches 4a and 4b indicate the jammed and unjammed positions.
Type code example: B1J_P20/55.

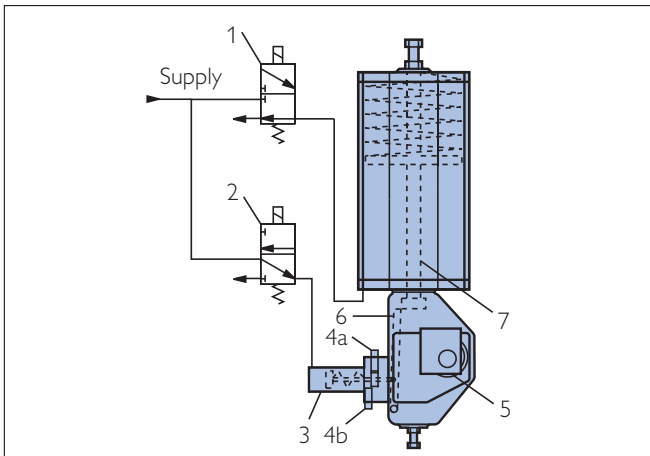


Figure 2. Automated jammer, "spring-to-open" actuator
When in closed position, it is important that the valve does not open too much during testing. An advantage with the Stem-Ball valve is its wide metal seats, which give a dead angle of 5-10 degrees before the ball is separated from the seat. When in closed position, the ball can thus be rotated against the jammer (6) without any fear of opening the valve. Such testing is impossible with gate and globe type valves.
Type code example: B1JA_P20/55.

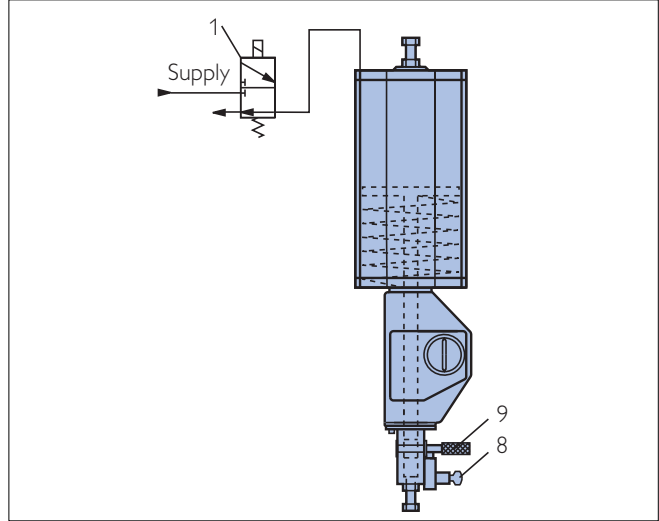


Figure 3. Manual jammer, "spring-to-close" actuator
In normal operation, the jammer is drawn out, the hole where it is to be inserted is covered and locked. Using a key (8), the cover can be removed and the jammer (9) inserted. The actuator can then rotate the valve 10-20 degrees. With the jammer inserted, the function of the valve can be tested by de-energizing the solenoid valve (1).
Type code example: B1J_T20/55.

All functions are shown in jammed positions.

Parts list

| Item | Description |
|--------|--|
| 1, 2 | Solenoid valve 3/2-way (does not belong to the delivery) |
| 3 | Jammer cylinder |
| 4a, 4b | Limit switches (jammer) |
| 5 | Limit switch (main valve) |
| 6 | Jammer (lever) |
| 7 | Piston rod |
| 8 | Key (keys) |
| 9 | Jammer (bar) |

Type coding

See complete type coding from bulletin 6B20.

Subject to change without prior notice.

INTERNATIONAL MANUFACTURING AND SALES LOCATIONS

UNITED STATES: Shrewsbury, Massachusetts. MEXICO: Chihuahua. BRAZIL: São José dos Campos.
FINLAND: Helsinki. FRANCE: Wittenheim. PEOPLE'S REPUBLIC OF CHINA: Shanghai.

Our products are available through Neles Controls sales offices in Australia, Austria, Belgium, Canada, Chile, Denmark, England, Germany, Indonesia, Italy, Japan, The Netherlands, Norway, Portugal, Russia, Saudi Arabia, Singapore, South Africa, South Korea, Spain, Sweden, Switzerland, Thailand, United Arab Emirates, Venezuela, as well as through a world-wide network of representatives.

