

# ARS



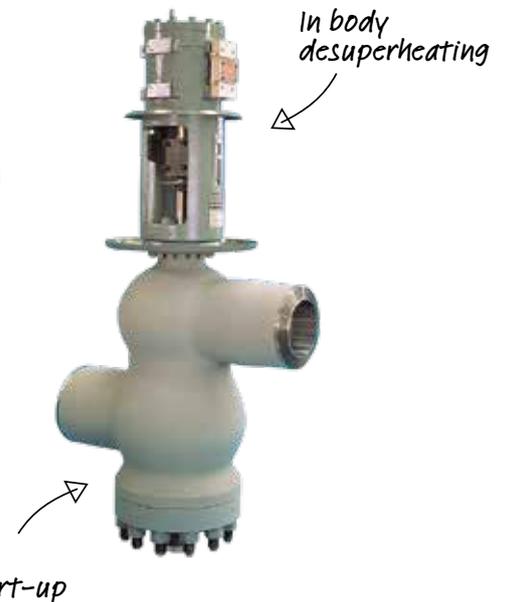
  
Engineering  
**GREAT** Solutions

**High Pressure (HP)  
Bypass Valves**

# ARS - HP Bypass Valve

The HP-Bypass Valve Type ARS is a steam conditioning valve. It is used for steam throttling with very high pressure drop combined with in-body desuperheating through spraywater injection.

Its prime area of application is high pressure bypass systems for fossil-fired power plants with subcritical as well as supercritical steam conditions. With the range of body materials available, the ARS valve can be applied for main steam pressures and temperatures of today's most advanced thermal power plants. The valve is specially designed for the cyclic operation of bypass systems. Equipped with a hydraulic actuator and the necessary safety control devices the valve can be used as a combined HP-Bypass and superheater safety valve in accordance with EN4126-5 (TRD 421). The complete system has a type approval for this application.



## Key features

- > Compact, robust design
- > Bonnet and bolting on low pressure side
- > Optimized body shape for minimal thermal stress
- > Multi-function contoured cage eliminates thermal shocks
- > Few components
- > Easy to maintain
- > Wing type stem
- > Tight shut-off (EN 12266-1 Cl. B or MSS-SP61 or ANSI/FCI 70.2 Cl. V)
- > Wide installed base
- > Integral desuperheating; water injection in area of highest turbulence ensures:
  - Optimal mixing of steam and water
  - Very short necessary straight pipe length after the valve (approx. 1m)

## Benefits

- > Integrated desuperheating for shortest evaporation length
- > Designed for frequent start-up
- > Wide installed base
- > Removable stem without dismantling the actuator
- > Available with safety function & type approval according to EN4126-5 (TRD421)
- > Tight shut-off (EN 12266-1 Cl. B or MSS-SP61 or ANSI/FCI 70.2 Cl. V)

## Function

The valve combines the function of pressure reduction and desuperheating. For pressure reduction a so-called wing type stem is used. This design incorporates specially designed channels that divide the steam flow into discrete paths, resulting in noise level reductions of 10dBA over conventional plug designs.

The spraywater is injected into a zone of high steam velocity and turbulence. This ensures a fine atomization combined with a good mixing of the injected water with the steam, which results in a very short evaporation length and an even temperature distribution at the valve outlet. The specially designed multi-function contoured cage

breaks the steam jet into multiple small jets, ensuring noise attenuation. This cage also prevents water droplets from reaching the pressure boundary walls, thereby eliminating any risk of thermal shocks.

## Product specification

### Design code

EN 12516-2, others upon request

### Body style

Z-type; Flow-to-open  
Spherical shaped valve body

### Nozzle connection

For steam pipes: butt-welding according to customer's requirement  
For spraywater pipes: flanged connection with butt-welding according to pipe

### Steam data range

650°C / 330bar

### Seat/stem tightness

Tight shut-off (EN 12266-1 Cl. B or MSS-SP61 or ANSI/FCI 70.2 Cl. V)

### Actuation

Double-acting hydraulic actuator

### Serviceability

Replaceable stem/plug without removing the actuator  
Replaceable stellited tight seat or hard facing on body  
Replaceable multi-function cage  
Replaceable spray nozzle body  
Bolted bonnet with spray nozzle

### Options

Outlet throttling orifice  
Transition pieces for large pipe diameters and material compatibility  
Prewarming connection

### Orientation

No restriction for the valve operating position  
For serviceability and operation, actuator on bottom recommended

### Safety valve certificate

EN 4126-5 (TRD 421) – Type approval available

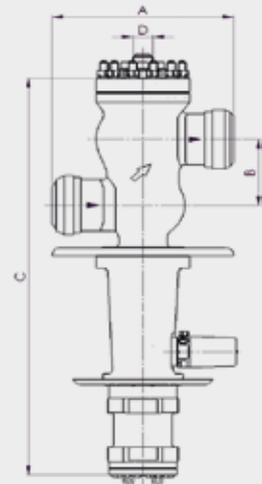
## General information

| Valve type | A (mm) | B (mm) | C (mm) | D** (mm) | Stroke (mm) | K <sub>v</sub> | C <sub>v</sub> | Weight (kg) |
|------------|--------|--------|--------|----------|-------------|----------------|----------------|-------------|
| ARS 63     | 620    | 270    | 1630   | 40       | 45          | 96             | 111            | ~500        |
| ARS 72     | 620    | 270    | 1630   | 40       | 60          | 125            | 145            | ~500        |
| ARS 80     | 620    | 270    | 810*   | 40       | 60          | 154            | 179            | ~400*       |
| ARS 90     | 700    | 300    | 2200   | 40       | 60          | 194            | 225            | ~600*       |
| ARS 100    | 780    | 340    | 900*   | 40       | 60          | 241            | 280            | ~1190*      |
| ARS 112    | 880    | 480    | 2200   | 40       | 80          | 295            | 342            | ~1000*      |
| ARS 125    | 940    | 420    | 1200*  | 45       | 80          | 374            | 434            | ~1000*      |
| ARS 140    | 1030   | 470    | 1245*  | 60       | 100         | 473            | 548            | ~1500*      |
| ARS 160    | 1180   | 627    | 2500   | 60       | 100         | 576            | 668            | ~2150       |
| ARS 180    | 1405   | 740    | 1810*  | 80       | 120         | 721            | 836            | ~2600*      |

Note: Values are for reference only. Final dimensions will be stated in the top assembly drawing. Other dimensions upon request

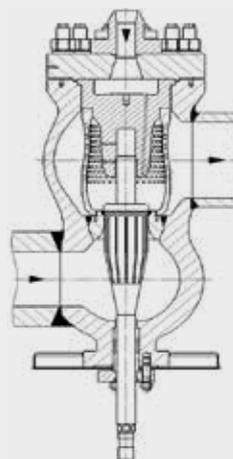
\* Values without actuator. Dimension C from bonnet until yoke connection

\*\* Flow diameter

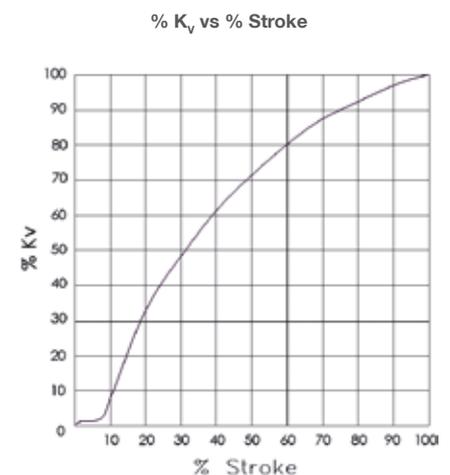


## Typical materials

|                            |   |
|----------------------------|---|
| <b>Body</b>                | A182 F22 / 10CrMo9-10<br>A182 F91 / X10CrMoVNb9-1 |
| <b>Valve seat</b>          | Like body + Stellite hard facing                  |
| <b>Stem</b>                | X19CrMoVNbN11-1                                   |
| <b>Bonnet</b>              | A182 F22 / 10CrMo9-10<br>A182 F91 / X10CrMoVNb9-1 |
| <b>Multi-function cage</b> | X20CrMoV11-1                                      |
| <b>Water flange</b>        | 16Mo3   |



Note: Other materials upon request



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