

# BVT-MSA

## Diaphragm actuator

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## About us

BVT Sweden was started with the ambition of becoming world leading in critical applications in process steam and thermal power plant turbine bypass. Based in Säfte, BVT Sweden employs experts with over 30 years experience in turbine bypass, steam conditioning, temperature control, design and manufacturing processes. We design turbine bypass valves, select actuation to fit our customer's requirements. Our products are optimized on a per-order basis, and we have the experience necessary to design special solutions. These products cover steam conditioning valves, pressure reduction valves, stop valves, desuperheaters and spray water control valves.

## BVT-MSA

BVT's pneumatic diaphragm actuators are designed for use in power and oil & gas industries, or in any application where steam / water valves are involved.

The actuator is installed on top of a control valve, an isolation valve or a desuperheater with a coupling connecting the actuator piston to the valve stem. It is included as standard on many probe-style desuperheater models, and is also sold as an upgrade for existing valves / desuperheaters.

## Operating principle

The actuator has a series of springs installed in its upper chamber for fail close action. At loss of air pressure, the springs close the actuator. This function is called fail close.

As an option, the actuator can also be fitted with a solenoid valve (EV). The solenoid valve is connected to the pilot port of a snap-acting-relay (D). When the solenoid is energized, the air flow to / from the lower actuator chamber is controlled by the

positioner. If it is de-energized, the snap-acting-relay exhausts the lower chamber air through a silencer, allowing the springs to close the actuator. At a loss of air pressure, the snap-acting-relay also exhausts the lower chamber air.

Air is connected to an air filter regulator, which removes condensate / debris from the incoming air and reduces the pressure in order to protect the cylinder.

## Specifications

Maximum air pressure  
**5.5 bar(g)**

Standard operating temperature  
**-20°C to 80°C**

Size  
**500 mm**

Component ingress protection  
**IP65/IP67**

Cylinder corrosion protection  
**ISO 12944 C4 or  
ISO 12944 C5M**

Regulatory requirements  
**PED, ISO 9001/14001 as standard**

Tubes and fittings  
**ANSI 316**

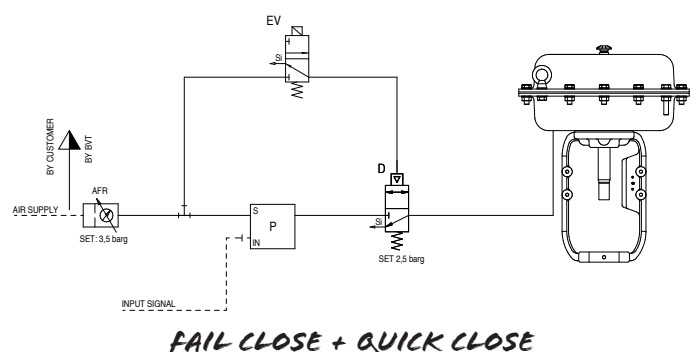
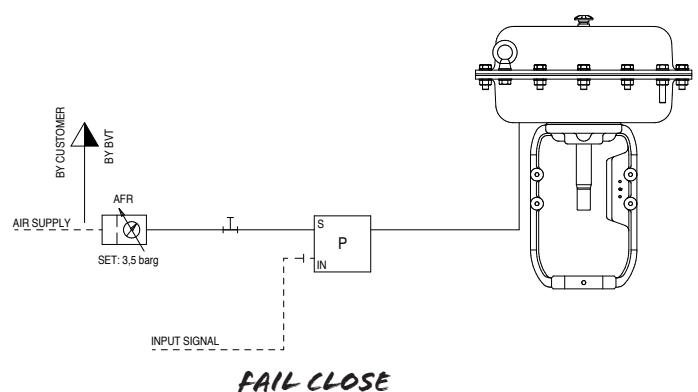
Types  
**Single acting  
Modulating or ON/OFF**

Default functions  
**Fail close at low pressure  
Air filter regulator**

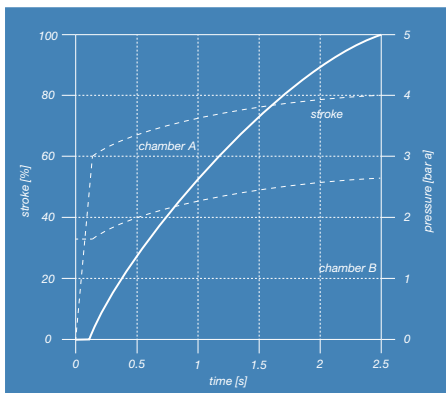
Options  
**Quick close  
Limit switches  
Position transmitter**

## Key features

- ✓ Selected to suit desuperheater or valve stroke / force requirements
- ✓ Components calibrated and tested before shipping
- ✓ High linearity and small dead-band

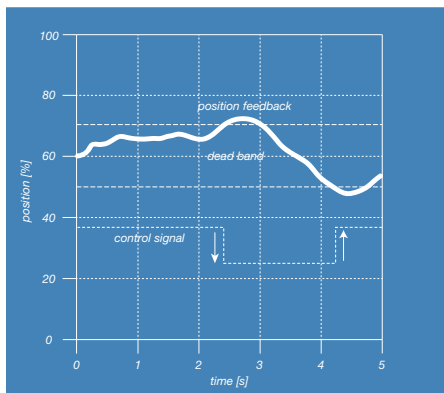


## Control logic



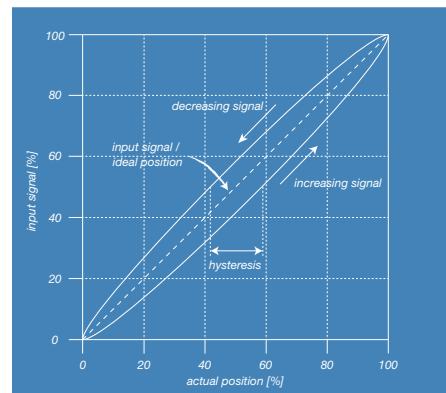
### STROKE TIME

Stroke time is confirmed by testing before delivery.



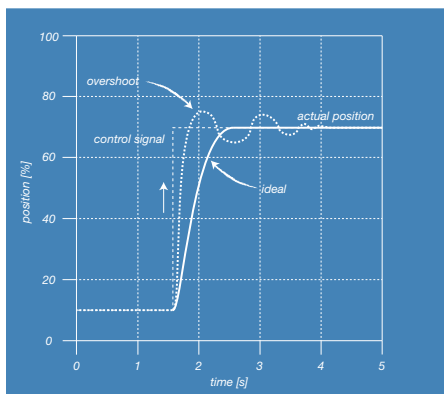
### DEAD BAND

Control actuators are tested so that the hysteresis + dead band is smaller than 4%. Linearity is kept within  $\pm 5\%$ .



### HYSTERESIS

The hysteresis is tested by step-wise opening and closing the actuator, and comparing the actual position.



### STABILITY

Volume boosters are tuned to result in a required stroke time while avoiding overshoots (which can result in instability).

Certificates

Zertifikat Nr. 0525-PED-DE-50329/1-Mod-H-1  
Issue: 1

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**ZERTIFIKAT**  
In Übereinstimmung mit den Anforderungen der Druckgeräte Richtlinie 2014/68/EU  
Certificate in accordance with the requirements of the Pressure Equipment Directive 2014/68/EU

Hiermit wird bescheinigt, dass das Qualitätsmanagement des Unternehmens  
This is to certify that the Quality Assurance System of

**Name des Herstellers/Antragstellers:** **BVT Sweden AB**  
Name of Manufacturer/Applicant

**Anschrift:** **Körkarlvägen 8, SE-653 46 Karlstad**  
Address

entsprechend den Forderungen des Anhangs III, Modul H der Druckgeräte Richtlinie 2014/68/EU durch die LRQA Deutschland GmbH geprüft und bewertet wurde und in Übereinstimmung mit den Anforderungen für die folgenden Produkte ist:  
has been assessed by LRQA Deutschland GmbH against the requirements of Annex III, Module H of the Pressure Equipment Directive 2014/68/EC and conforms to the requirements for the products shown below:

**Art des Druckgerätes/der Baugruppe:** **Druckbehälter, druckhaltende Ausrüstungsstelle**  
Type of Pressure Equipment/Assembly

**Produktbeschreibung:** **Ventile, Dampfkühler und Latzen-Einspritzkühler für den Bereich Erzeugerzeugung und Verfahrenstechnik**  
Product description  
Valves, steam steamtraps and probe-style desuperheaters for power and process applications.

**Typ:** **BVT-TB, BVT-PB, BVT-DH, BVT-SV, BVT-HB, BVT-DL, BVT-DR**  
Type

Einzelheiten siehe Anhang I.  
For details see Annex I.

Die Zulassung gilt unter der Voraussetzung, dass das Qualitätssystem fortlaufend aufrechterhalten wird und die Forderungen obiger Richtlinie erfüllt.  
Approval is subject to the continued maintenance of the quality system in accordance with the requirements of the above-mentioned Directive.

Weiterhin wird die Genehmigung erteilt, folgende Kennnummer von LRQA Deutschland GmbH als notifizierte Stelle in Übereinstimmung mit der obigen Richtlinie und den Vorschriften in Bezug auf die Produkte zu verwenden:  
Authorization is hereby given to use the under noted LRQA Deutschland GmbH Notified Body Identification Number in accordance with the requirements of the specified Directive in relation to the products as identified above.

CE 0525

**Erstmalige Zulassung:** 01.11.2019 **Zertifikatsgültigkeit bis:** 31.10.2025  
Initial Approval: valid approval: certificate expiry date

**LRQA Deutschland GmbH Kenn-Nr. 0525**  
LRQA Deutschland GmbH Ident.No. 0525

Hamburg, 27.10.2023  
Ort und Datum  
Place and Date

E. Wolf  
Name und Unterschrift  
Name and Signature

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BM503-04-89 (Mod-H, 03\_23) LRQA Deutschland GmbH, Curienstraße 1, D-20095 Hamburg, Deutschland E-Mail: eu-directives@lrqa.com Seite 1 von 2

**PED CERTIFICATE**

Current issue date: 1 February 2022  
Expiry date: 31 January 2025  
Certificate identity number: 10421710

Original approval(s):  
ISO 14001 - 1 February 2019  
ISO 9001 - 1 February 2019

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**Certificate of Approval**

This is to certify that the Management System of:

**BVT Sweden AB**

Körkarlvägen 8, 653 46 Karlstad, Sweden

has been approved by LRQA to the following standards:

**ISO 14001:2015, ISO 9001:2015**

Approval number(s): ISO 14001 – 00002108, ISO 9001 – 00002109

The scope of this approval is applicable to:

Sales, development, engineering, service and upgrades of valves and accessories for power and process applications.

Paul Graaf

Area Operations Manager, Europe  
Issued by: LRQA Sverige AB  
for and on behalf of: LRQA Limited

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**ISO 14001 AND ISO 9001**