BVT
SWEDEN
VALVE SOLUTIONS

BVT-PB

Process bypass valve

B-004

BVT-PB
Process bypass valve

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 Säffle, 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.

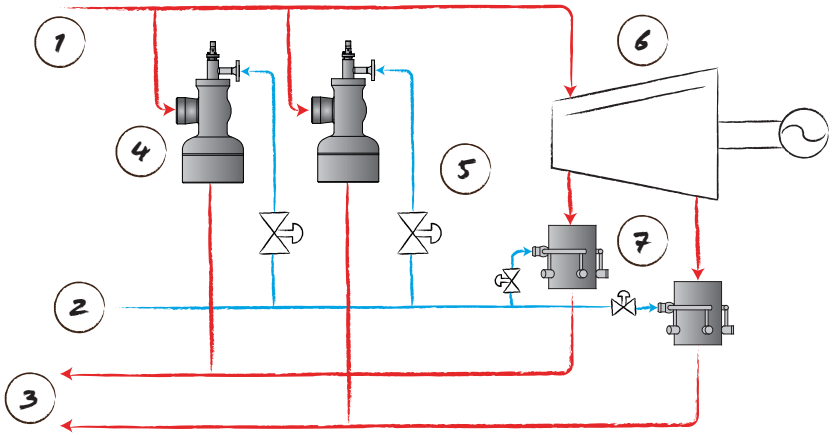
BVT-PB process bypass valve

The BVT-PB is a steam conditioning valve optimized for auxiliary and process steam. The application for process steam may range from petrochemical plants to pulp and paper, where the valve is typically installed in parallel to a steam turbine and controls the downstream pressure and temperature. Pressure reduction takes place in the valve trim as well as the outlet, where several pressure-reducing pipes are installed.

Application example

In this example, two BVT-PB valves (**4**) are installed in parallel to a turbine (**6**) and two BVT-DLP desuperheaters (**7**). Steam is desuperheated by both valves and desuperheaters and output to process. Water is controlled by external spray water control valves (**5**).

1. INPUT SUPERHEATED STEAM
2. SPRAY WATER / CONDENSATE
3. OUTPUT PROCESS STEAM
4. BVT-PB STEAM CONDITIONING VALVE
5. WATER CONTROL / STOP VALVE
6. STEAM TURBINE
7. BVT-DLP MULTI NOZZLE DESUPERHEATER



BVT-PB AND BVT-DLP IN BYPASS TO PROCESS APPLICATION

BVT-PB

Process bypass valve

Key features

- ✓ Excellent rangeability of at least 50 to 1
- ✓ Fully customizable inlet, outlet connections
- ✓ Complies with the following standards: ASME, EN, PED
- ✓ Forged valve body with uniform thickness and trim design optimized to withstand thermal cycling
- ✓ Pressure reduction stages optimized for operating conditions, and for reduced noise
- ✓ Balanced plug design requires smaller actuating forces
- ✓ Pressure seal bonnet for simpler and quicker maintenance. No special tools necessary
- ✓ Compatible with pneumatic, hydraulic and electrical actuation
- ✓ Optimized packing design
- ✓ Long cage design reduces wear on trim internals caused by wet steam or particles

Specifications

Valve sizes
Up to 225 mm seat diameter
Larger seat sizes upon request

Pressure class
Up to ANSI 1500 (higher rating on request)

Design temperature
575 ºC as standard (620 ºC on request)

Leakage class
ANSI Class III

Regulatory requirements
ASME, EN, PED, IBR, CRN

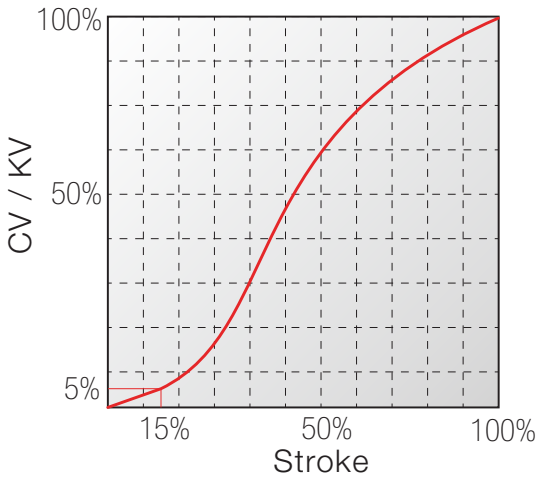
Materials
Forged material adapted to connecting pipe material

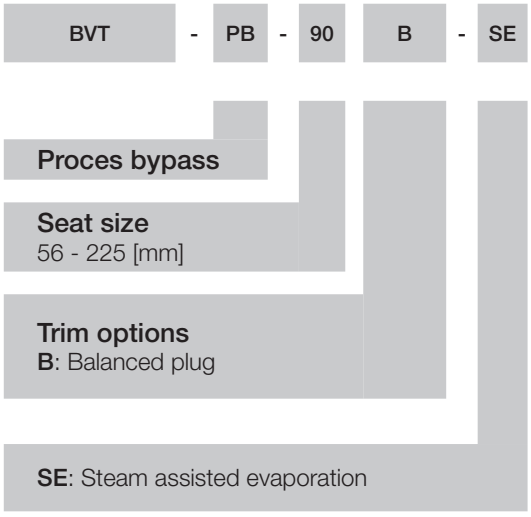
Actuation
Pneumatic, hydraulic or electrical

Options
Live load
BT-design

Modified linear characteristics

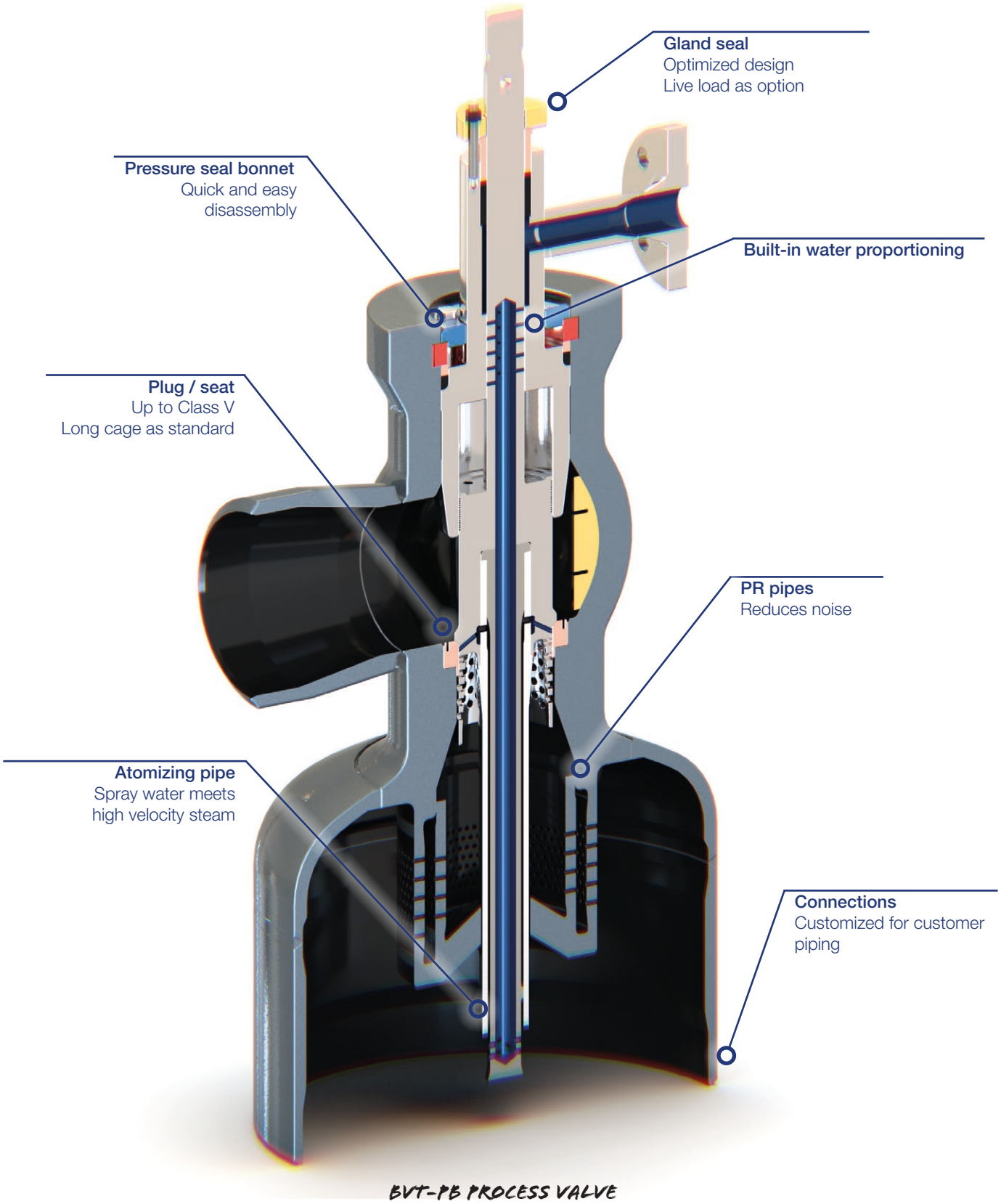
Allows for greater rangeability and flow control at lower flow rates. The graph shows how at the first ~15% of the stroke, the change in flow coefficient increases by only 5%.





BVT-PB PRODUCT CODE

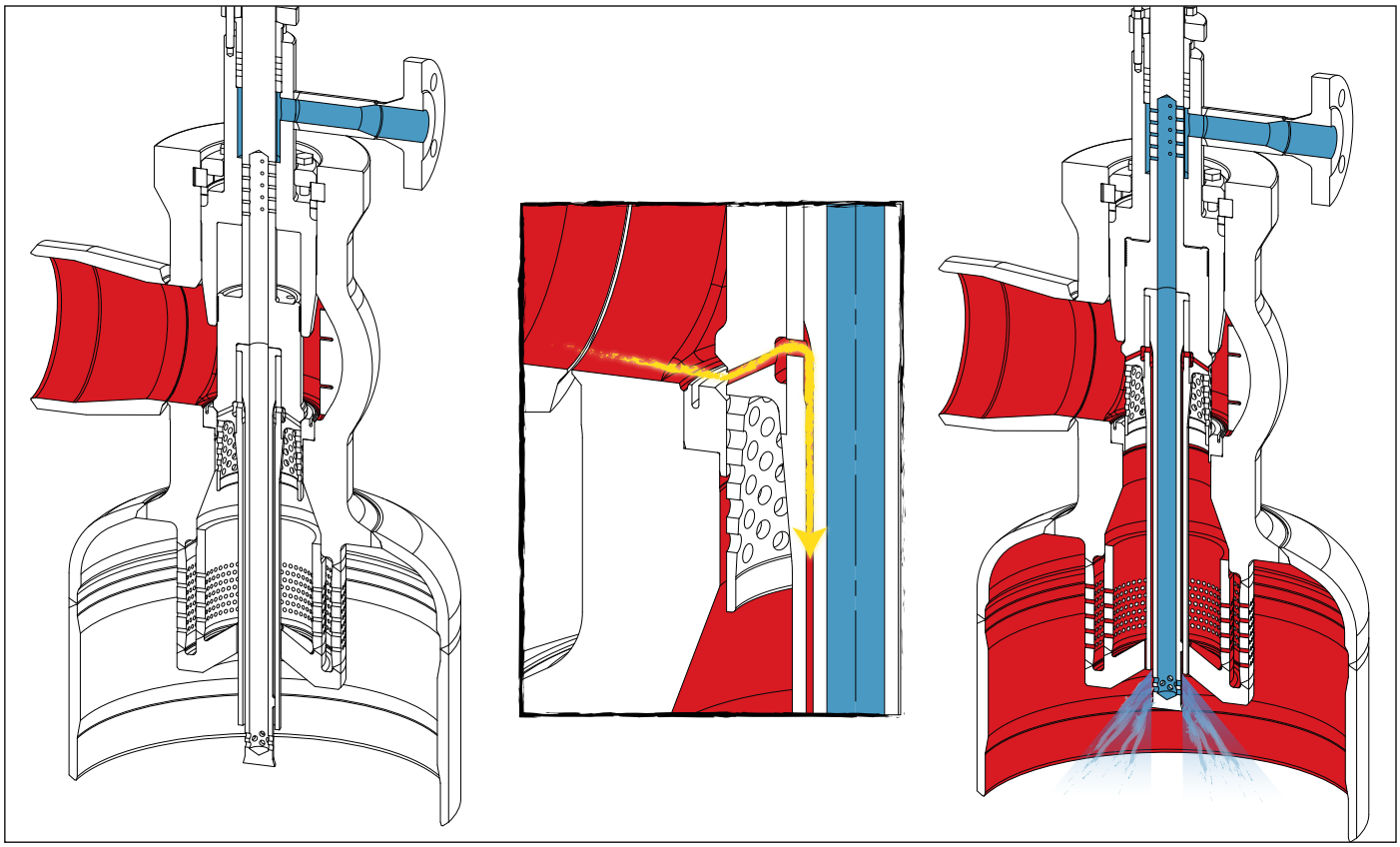
Overview



BVT-PB PROCESS VALVE

Temperature control

Spray water is introduced in the plug, and carried together with the superheated steam through the spray water atomization pipe. The increased velocity, reduced pressure and increased turbulence of the fluid in this pipe hastens the evaporation of the spray water droplets and improves the valves desuperheating performance. This design is not dependent on high steam velocity in the outlet, which is what gives the valve its high rangeability. Water proportioning is handled at the top of the hollow stem.



0% - 15% - 100% OPENING

Pneumatic actuation

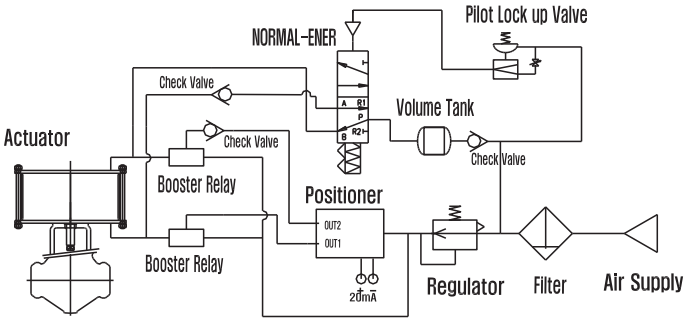
BVT valves can be equipped with pneumatic piston actuators. The cylinders are chosen to overcome the forces created by steam flow, and the accessories are chosen to handle the required stroke speeds and functionality.

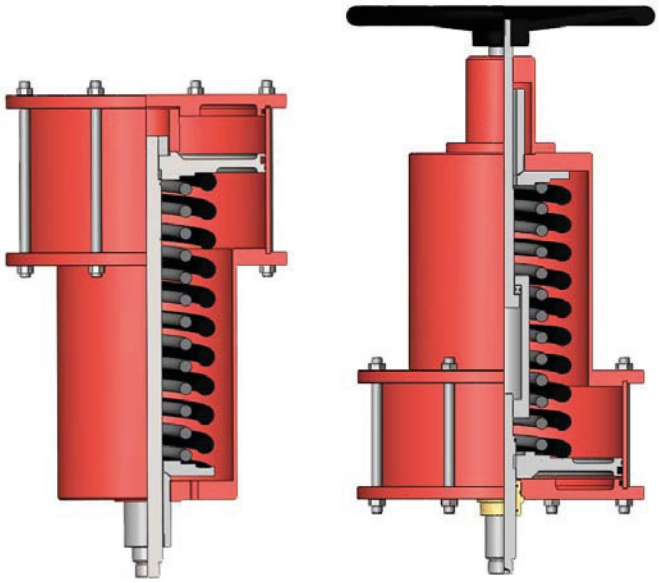
Features and options

Cylinder types
- **Double Acting, Single Acting**
- **Spring Open, Spring Close**
- **Top mounted hand wheel, side mounted hand wheel**

Air supply
4 - 10 bar

Accessories and options
- **Air filter regulator as standard**
- **3-way valves (quick open/close)**
- **Limit switches (open/close position)**
- **Position transmitters, air locks, boosters as option**





TOP: DIFFERENT CYLINDER SOLUTIONS AVAILABLE
LEFT: PNEUMATIC SCHEMATIC OF MODULATING ACTUATOR WITH AIR LOCK AND BOOSTERS

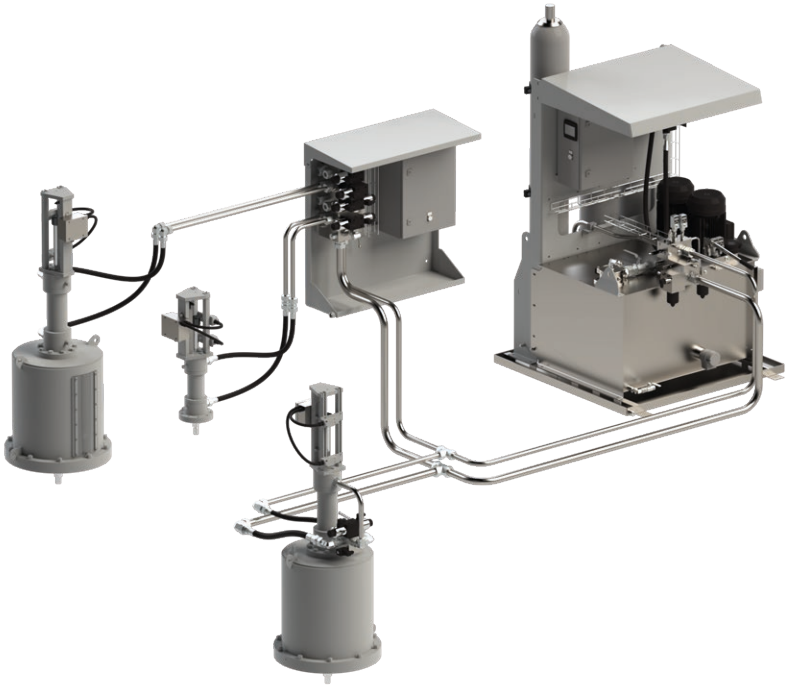
BVT-PB

Process bypass valve

Hydraulics

As an alternative to pneumatic actuation, BVT can also provide our valves with electro-hydraulic actuators. To power and control these actuators, BVT also supply Hydraulic Control Panel (HCP) and Hydraulic Power Generator (HPG). Pump control in the HPG is by default handled by the Intelligent Power Manager (IPM). The IPM monitors oil level, temperature and pressures and warns the DCS of any issues. Positioning is by default is handled by the Intelligent Actuator Control (IAC), which can control two modulating and two on/off actuators.

Commissioning tools and hydraulic pipes, fittings and hoses are also available.



HPG, HCP AND THREE HYDRAULIC CYLINDERS

Features

Hydraulic Linear Actuator

- **C4 RAL7003 painting as standard, C5M as option**
- **Double rod seals & metal scrapers**
- **Precise movement and positioning**
- **No programming of transmitter required**
- **2x Limit switches DPDT**
- **Spring and cylinder mounted valve block (HCB) as option**

Hydraulic Control Panel

- **Dual gain proportional valve for quick open/close**
- **Roof and floor stand as option**
- **Local accumulator as option**
- **Intelligent Actuator Control positioner as standard**

Hydraulic Power Generator

- **Intelligent Power Manager pump controller as standard**
- **Dual pumps, accumulators, spill tray**
- **Analog pressure, temperature and level transmitters as standard**

Intelligent Actuator Control

- **2x modulating + 2x on/off control**
- **Smooth movement and accurate positioning**
- **One-click calibration of transmitters**
- **IP66, -20º to +55ºC ambient temperature**
- **PC based service tool for setup**
- **S shaped ramps for smooth movement**

Intelligent Power Manager

- **HMI display as standard**
- **IP66, -20º to +55ºC ambient temperature**
- **Automated pipe flushing function**
- **Local / remote control**
- **Redundancy as option**
- **Different bus protocols as option**

Lloyd's Register

Certificate No. / Zertifikat Nr.: 50329/1

CERTIFICATE
in accordance with the requirements of the Pressure Equipment Directive 2014/68/EU

ZERTIFIKAT
in Übereinstimmung mit den Anforderungen der Druckgeräterichtlinie 2014/68/EU

This is to certify that the quality assurance system of
Hiermit wird bescheinigt, dass das Qualitätssicherungssystem des Unternehmens

BVT Sweden AB
SE-653 46 Karlstad
Sweden / Schweden

has been assessed by LR Deutschland GmbH in accordance with the requirements of Annex III
durch die LR Deutschland GmbH entsprechend den Forderungen des Anhangs III

Module H

to the Pressure Equipment Directive 2014/68/EU and
conforms to the requirements for the products shown below:
der Druckgeräterichtlinie 2014/68/EU geprüft und bewertet wurde und für die folgenden Produkte die Anforderungen erfüllt:

Valves and accessories for power and process applications,
for details see Annex 1 to this certificate.
Ventile und Ausrüstungsteile für Anwendungen in der Wärme- und Verfahrenstechnik,
Einzelheiten siehe Anhang 1 dieses Zertifikates.

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

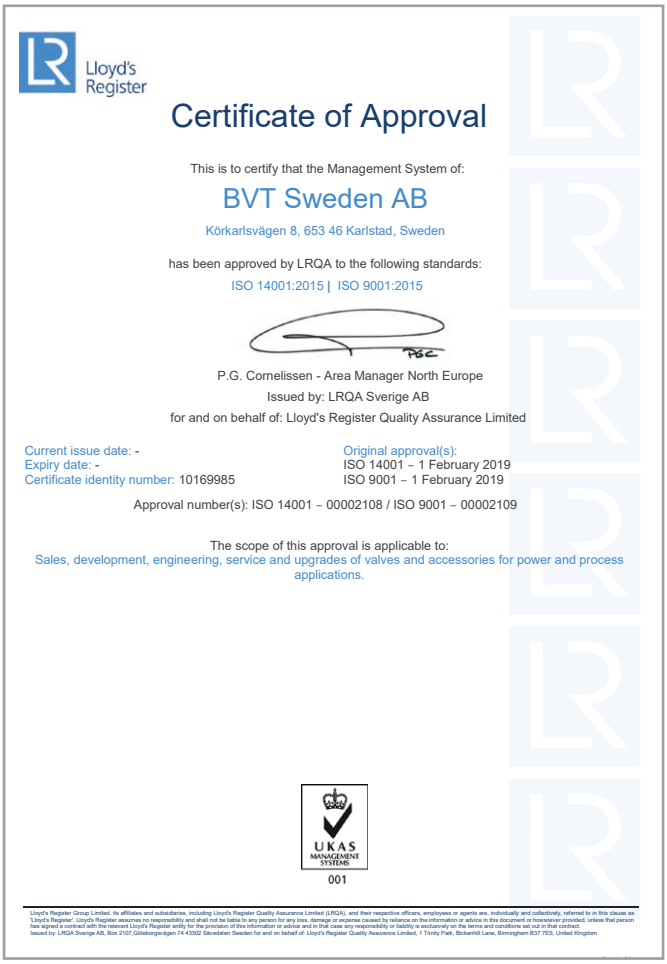
Authorisation is hereby given to use the below-mentioned Notified Body Identification Number
of LR Deutschland GmbH in accordance with the requirements of the specified directive
in relation to the products as named above:
Hiermit wird die Genehmigung erteilt, folgende Kennnummer der LR Deutschland GmbH als Notifizierte Stelle
in Übereinstimmung mit der angegebenen Richtlinie in Bezug auf die oben genannten Produkte zu verwenden:

CE 0525

Certificate expiry date / Zertifikatsgültigkeit bis: **31.01.2022**

Hamburg, 01.11.2019
Place and Date
Ort und Datum

K. Wolf
Name, Signature, Certifier
Name, Unterschrift, Zertifizierer



Lloyd's Register

Certificate of Approval

This is to certify that the Management System of:

BVT Sweden AB

Körkarlsvägen 8, 653 46 Karlstad, Sweden

has been approved by LRQA to the following standards:

ISO 14001:2015 | ISO 9001:2015

P.G. Cornelissen - Area Manager North Europe
Issued by: LRQA Sverige AB
for and on behalf of: Lloyd's Register Quality Assurance Limited

Current issue date: -
Expiry date: -
Certificate identity number: 10169985

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

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.

UKAS MANAGEMENT SYSTEMS
001

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SWEDEN

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