

**По вопросам продаж и поддержки обращайтесь:**

Архангельск (8182)63-90-72	Краснодар (861)203-40-90	Санкт-Петербург (812)309-46-40
Астана (7172)727-132	Красноярск (391)204-63-61	Саратов (845)249-38-78
Астрахань (8512)99-46-04	Курск (4712)77-13-04	Севастополь (8692)22-31-93
Барнаул (3852)73-04-60	Липецк (4742)52-20-81	Симферополь (3652)67-13-56
Белгород (4722)40-23-64	Магнитогорск (3519)55-03-13	Смоленск (4812)29-41-54
Брянск (4832)59-03-52	Москва (495)268-04-70	Сочи (862)225-72-31
Владивосток (423)249-28-31	Мурманск (8152)59-64-93	Ставрополь (8652)20-65-13
Волгоград (844)278-03-48	Набережные Челны (8552)20-53-41	Сургут (3462)77-98-35
Вологда (8172)26-41-59	Нижний Новгород (831)429-08-12	Тверь (4822)63-31-35
Воронеж (473)204-51-73	Новокузнецк (3843)20-46-81	Томск (3822)98-41-53
Екатеринбург (343)384-55-89	Новосибирск (383)227-86-73	Тула (4872)74-02-29
Иваново (4932)77-34-06	Омск (3812)21-46-40	Тюмень (3452)66-21-18
Ижевск (3412)26-03-58	Орел (4862)44-53-42	Ульяновск (8422)24-23-59
Казань (843)206-01-48	Оренбург (3532)37-68-04	Уфа (347)229-48-12
Калининград (4012)72-03-81	Пенза (8412)22-31-16	Хабаровск (4212)92-98-04
Калуга (4842)92-23-67	Пермь (342)205-81-47	Челябинск (351)202-03-61
Кемерово (3842)65-04-62	Ростов-на-Дону (863)308-18-15	Череповец (8202)49-02-64
Киров (8332)68-02-04	Рязань (4912)46-61-64	Ярославль (4852)69-52-93
	Самара (846)206-03-16	

**Единый адрес:** [kbs@nt-rt.ru](mailto:kbs@nt-rt.ru) **Веб-сайт:** [www.ksb.nt-rt.ru](http://www.ksb.nt-rt.ru)

## Регулирующие и измерительные клапаны KSB. Техническое описание

Control Valve

## BOA-CVE C/CS/W/IMS/EKB

PN 6/10/16

DN 15-200

For Automation of

BOA-SuperCompact, BOA-Compact,

BOA-W, BOA-Compact EKB and

BOA-Control IMS

## Type Series Booklet



**Contents**

**Control Valves / Measurement Valves ..... 4**

- Control Valves to DIN/EN ..... 4
- BOA-CVE C/CS/W/IMS/EKB ..... 4
  - Main applications ..... 4
  - Fluids handled ..... 4
  - Operating data ..... 4
  - Design details ..... 4
  - Body materials ..... 5
  - Product benefits ..... 5
  - Related documents ..... 5
  - Pressure/temperature ratings ..... 5
  - Valve characteristics ..... 6
  - Maximum permissible closing pressures ..... 6
  - Flow characteristics ..... 10
  - Technical data ..... 11
  - Process controller ..... 12
  - Materials ..... 13
  - Dimensions and weights ..... 14
  - Installation instructions ..... 18
  - Wiring diagrams ..... 18
  - Specification sheet for valve selection ..... 21
  - Chemical resistance charts ..... 23

## Control Valves / Measurement Valves

### Control Valves to DIN/EN

# BOA-CVE C/CS/W/IMS/EKB



#### Main applications

BOA-CVE C / BOA-CVE CS / BOA-CVE W:

- Hot-water heating systems
- Air-conditioning systems
- Heat recovery systems

BOA-CVE IMS:

- Hot-water heating systems
- Air-conditioning systems
- Cooling circuits

BOA-CVE EKB:

- Domestic water supply
- Water supply systems
- Air-conditioning systems
- Cooling circuits

#### Fluids handled

BOA-CVE C / BOA-CVE CS / BOA-CVE W:

- Water
- Water/glycol mixtures
- Not suitable for fluids containing mineral oils, steam or fluids liable to attack EPDM and cast iron.
- Other fluids on request.

BOA-CVE IMS:

- Hot water for heating systems, with or without glycol ( $\leq 60\%$ )
- Cold water for air-conditioning systems, with or without glycol ( $\leq 60\%$ )
- The fluid handled should meet the requirements as specified in VdTÜV/AGFW TCh 1466 or VDI 2035.
- Only limited measurements of fluids containing gas or air can be made with ultrasound equipment. Proper venting of the systems is therefore essential.

BOA-CVE EKB:

- Drinking water
- Service water
- Not suitable for steam or fluids liable to attack EPDM and the electrostatic plastic coating.
- Other fluids on request.

#### Operating data

Operating properties

Characteristic	Value
Nominal pressure BOA-CVE C	PN 6/16
Nominal pressure BOA-CVE CS	PN 6/10/16
Nominal pressure BOA-CVE W	PN 6/16
Nominal pressure BOA-CVE IMS	PN 16
Nominal pressure BOA-CVE EKB	PN 10/16
Nominal size	DN 15 - 200 <sup>1)</sup>
Max. permissible pressure [bar]	16
Min. permissible temperature [°C]	-10
Max. permissible temperature [°C]	+120 <sup>2)</sup>

Selection as per pressure/temperature ratings (⇒ Page 5)

#### Design details

##### Design

Control valve:

- Straight-way valves PN 6 to 16 for flange connections to DIN EN 1092-2 in short or DN face-to-face length
- $K_v$  values: 3 to 700 m<sup>3</sup>/h
- Rangeability 100:1
- EPDM-encapsulated control valve plug
- Maintenance-free stem seal with EPDM profile ring
- Marked in accordance with DIN EN 19 (ISO 5209)
- The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 2014/68/EU (PED) for fluids in Group 2.

Actuators (technical data refers to basic configuration):

- Configurable, microprocessor-controlled actuators  
 Power supply: 24 V AC/DC  
 Position setpoint: 2 - 10 V DC  
 Actual-position feedback value: 2 - 10 V DC  
 Control valve characteristic: linear  
 Leakage rate: 0.05 % of  $K_v$   
 Limit switching force-dependent in closing direction and stroke-dependent in opening direction.
- 3-point (Open/Stop/Closed) actuators

1) BOA-CVE CS: DN 20-200  
 2) BOA-CVE EKB: 80 °C

Power supply: 230 V AC  
 Actual-position feedback value: 2 limit switches  
 Leakage rate A to DIN EN 12266-1, drop-tight  
 Stopping via limit switches in closing direction and opening direction

- Actuating time and actuating speed can be freely selected as a function of actuator type and  $K_v$  value.
- Operating data stored in permanent memory
- After a power failure, operation is resumed in accordance with the operating data.

#### Variants

- Actuator configured to match the order specification
- Integrated process controller
- Power back-up unit
- Heating of the motor space
- Other supply voltages on request
- Other actuators (e.g. AUMA) on request.

#### Body materials

Overview of available materials

Material	Material number
EN-GJL-250	5.1301

#### Product benefits

- Individually programmable actuators programmed at the factory, for optimum adaptation to all applications
- Maintenance-free design with stem sealed by EPDM profile ring
- Soft-seated valve disc enables drop-tight shut-off.
- Weight of control valve reduced by at least 50 % to simplify installation and cut installation costs.
- User-definable continuous control signal and actual-position feedback for optimum control options
- Programmable  $K_v$ s values
- Four  $K_v$ s values per nominal size
- Optionally available with integrated process controller (for EA-C actuators) for adaptation to numerous control tasks

#### Related documents

Information/documents

Document	Reference number
Operating manual	7520.8
BOA-SuperCompact type series booklet	7113.1
BOA-Compact type series booklet	7112.1
BOA-W type series booklet	7111.1
BOA-Compact EKB type series booklet	7112.11
BOA-Control IMS type series booklet	7128.1
Slide rule selector	0570.31

#### Pressure/temperature ratings

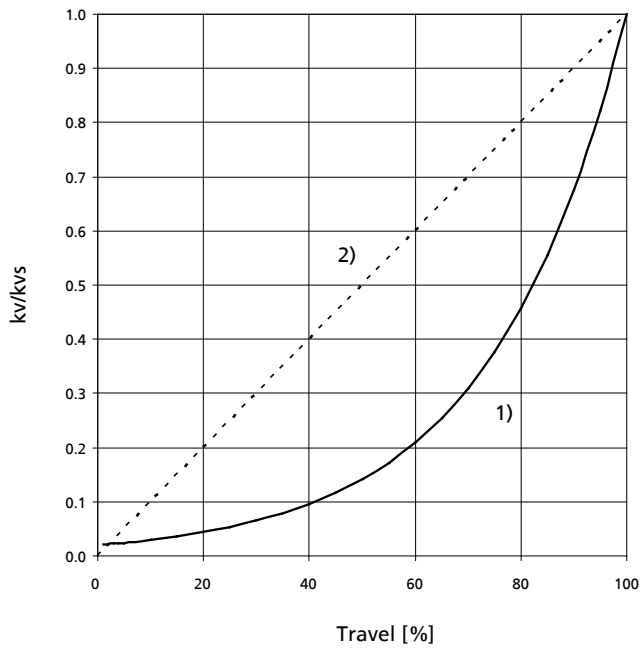
Test pressure and operating pressure

Nominal pressure	Nominal size	Shell test	Leak test (seat)	Permissible operating pressure <sup>3)</sup>
		With water to DIN EN 12266-1		
		P10, P11	P12, leakage rate A	
PN	DN	[bar]	[bar]	[bar]
6	15-200	9	6,6	6
16	15-200	24	17,6	16

3) Static load

### Valve characteristics

The basic control valve configuration runs on a linear characteristic.



1)	Equal-percentage (at customer's request)	2)	Linear (basic parameter configuration)
----	--	----	--

### Maximum permissible closing pressures

BOA-CVE C/CS/W/IMS/EKB are available for the following leakage rates without extra charge:

- Leakage rate 0.05 % of  $K_v_s$
- Leakage rate 0.01 % of  $K_v_s$
- Leakage rate A, drop-tight, to DIN EN 12266-1

The following tables can be used to select a suitable control valve as a function of the required closing pressure, leakage rate and  $K_v_s$  value.

**Leakage rate 0.05 % of Kvs**

Valve / actuator combinations based on actuator stroke to Kvs for a leakage rate of 0.05 % of Kvs

Type	DN	Kv <sub>s</sub> value	Actuator stroke	Actuator type $\Delta p_{smax}^{4)}$ for a leakage rate of 0.05 % of Kvs in bar			
BOA-CVE C/ BOA-CVE W/ BOA-CVE EKB/ BOA-CVE IMS	15	3	5	EA-B 12 11 bar			
	15	6,3	8				
	15	9	16				
BOA-CVE C/ BOA-CVE CS/ BOA-CVE W/ BOA-CVE IMS/ BOA-CVE EKB	20	6,3	7	EA-B 12 11 bar			
	20	10	10				
	20	16	16				
	20	20	19				
	25	6,3	7	EA-B 12 11 bar			
	25	10	10				
	25	16	16				
	25	20	19				
	32	16	12	EA-B 12 9 bar	EA-C 20 14 bar		
	32	20	16				
	32	25	20				
	32	30	27				
	40	25	14	EA-B 12 7,5 bar	EA-C 20 10,5 bar	EA-C 40 16 bar	
	40	30	17				
	40	40	21				
40	50	30					
50	40	15	EA-B 12 5 bar	EA-C 20 7 bar	EA-C 40 13 bar	EA-C 80 16 bar	
50	50	19					
50	63	23					
50	80	32					
65	63	21		EA-C 20 6 bar	EA-C 40 10 bar	EA-C 80 16 bar	
65	80	26					
65	100	32					
65	130	43					
80	100	24		EA-C 20 5 bar	EA-C 40 8 bar	EA-C 80 13,5 bar	
80	130	29					
80	160	38					
80	180	47					
100	160	28			EA-C 40 5 bar	EA-C 80 8 bar	EA-C 140 13 bar
100	200	34					
100	250	42					
100	300	57					
125	200	31			EA-C 40 3 bar	EA-C 80 6 bar	EA-C 140 10 bar
125	250	38					
125	320	48					
125	400	61					
150	250	33				EA-C 80 4 bar	EA-C 140 7 bar
150	320	42					
150	400	50					
150	450	60					
200	400	37					EA-C 140 5 bar
200	550	48					
200	700	62					

4) Maximum permissible closing pressure at a leakage rate of 0.05 % of Kvs in bar

**Leakage rate 0.01 % of Kvs**

Valve / actuator combinations based on actuator stroke to Kvs for a leakage rate of 0.01 % of Kvs

Type	DN	Kv <sub>s</sub> value	Actuator stroke	Actuator type $\Delta p_{smax}^{5)}$ for a leakage rate of 0.01 % of Kvs in bar			
BOA-CVE C/ BOA-CVE W/ BOA-CVE EKB/ BOA-CVE IMS	15	3	5	EA-B 12 10 bar			
	15	6,3	8				
	15	9	16				
BOA-CVE C/ BOA-CVE CS/ BOA-CVE W/ BOA-CVE IMS/ BOA-CVE EKB	20	6,3	7	EA-B 12 10 bar			
	20	10	10				
	20	16	16				
	20	20	19				
	25	6,3	7	EA-B 12 10 bar			
	25	10	10				
	25	16	16				
	25	20	19				
	32	16	12	EA-B 12 8 bar	EA-C 20 13 bar		
	32	20	16				
	32	25	20				
	32	30	27				
	40	25	14	EA-B 12 6,5 bar	EA-C 20 9,5 bar	EA-C 40 16 bar	
	40	30	17				
	40	40	21				
	40	50	30				
50	40	15	EA-B 12 4 bar	EA-C 20 6 bar	EA-C 40 12 bar	EA-C 80 16 bar	
50	50	19					
50	63	23					
50	80	32					
65	63	21		EA-C 20 5 bar	EA-C 40 9 bar	EA-C 80 16 bar	
65	80	26					
65	100	32					
65	130	43					
80	100	24		EA-C 20 4 bar	EA-C 40 7 bar	EA-C 80 12,5 bar	
80	130	29					
80	160	38					
80	180	47					
100	160	28			EA-C 40 4 bar	EA-C 80 7 bar	EA-C 140 12 bar
100	200	34					
100	250	42					
100	300	57					
125	200	31			EA-C 40 2,5 bar	EA-C 80 5 bar	EA-C 140 9 bar
125	250	38					
125	320	48					
125	400	61					
150	250	33				EA-C 80 3 bar	EA-C 140 6 bar
150	320	42					
150	400	50					
150	450	60					
200	400	37					EA-C 140 4 bar
200	550	48					
200	700	62					

5) Maximum permissible closing pressure at a leakage rate of 0.01 % of Kvs in bar



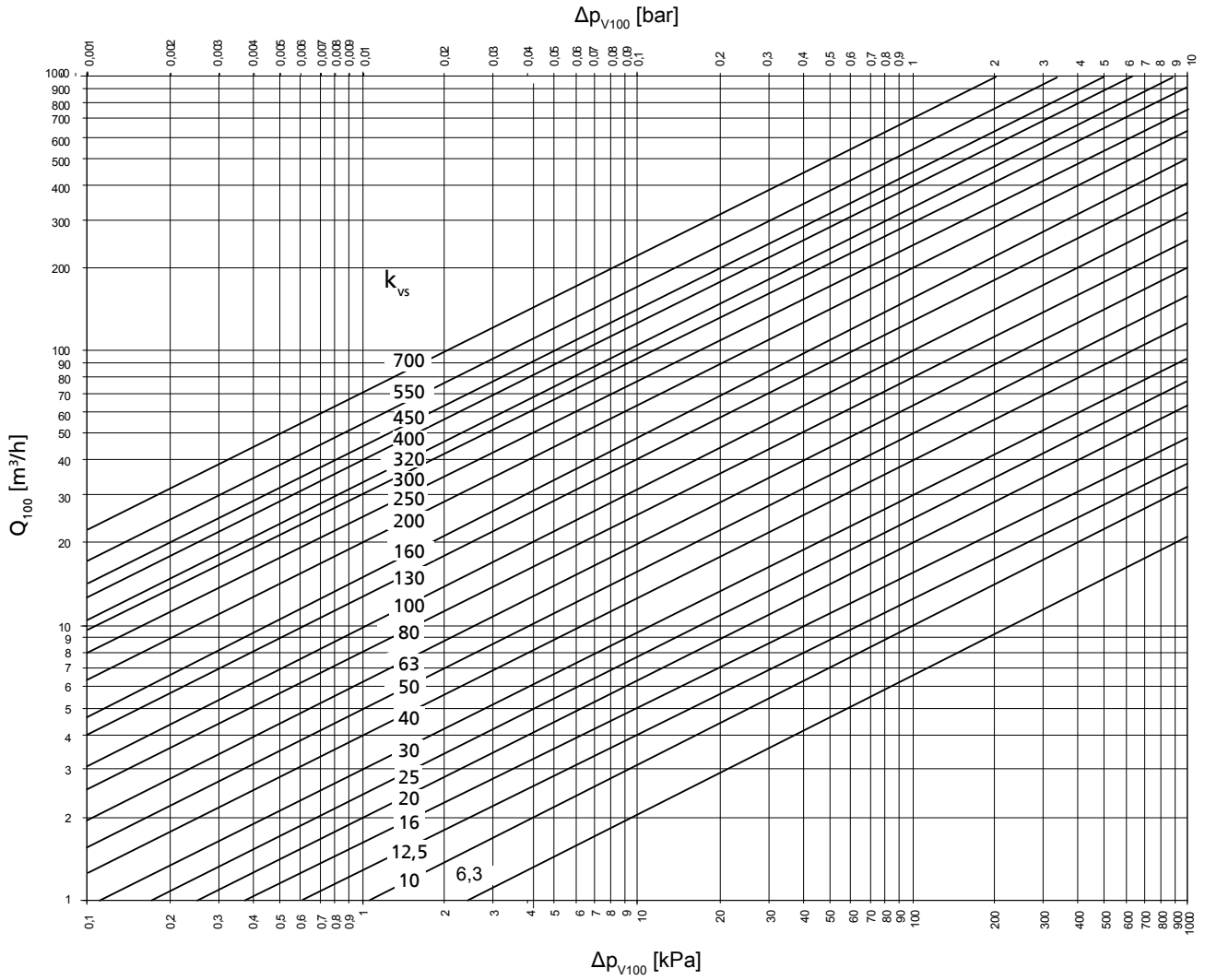
**Leakage rate A to DIN EN 12266-1**

Valve/actuator combinations based on actuator stroke to Kvs for leakage rate A to DIN EN 12266-1

Type	DN	Kv <sub>s</sub> value	Actuator stroke	Actuator type $\Delta p_{smax}^{6)}$ for leakage rate A (drop-tight) in bar			
BOA-CVE C/ BOA-CVE W/ BOA-CVE EKB/ BOA-CVE IMS	15	3	5	EA-B 12 8 bar			
	15	6,3	8				
	15	9	16				
BOA-CVE C/ BOA-CVE CS/ BOA-CVE W/ BOA-CVE IMS/ BOA-CVE EKB	20	6,3	7	EA-B 12 8 bar			
	20	10	10				
	20	16	16				
	20	20	19				
	25	6,3	7	EA-B 12 8 bar			
	25	10	10				
	25	16	16				
	25	20	19				
	32	16	12	EA-B 12 6 bar	EA-C 20 11 bar		
	32	20	16				
	32	25	20				
	32	30	27				
	40	25	14	EA-B 12 4 bar	EA-C 20 7,5 bar	EA-C 40 15 bar	
	40	30	17				
	40	40	21				
	40	50	30				
50	40	15	EA-B 12 2 bar	EA-C 20 4 bar	EA-C 40 9 bar	EA-C 80 16 bar	
50	50	19					
50	63	23					
50	80	32					
65	63	21		EA-C 20 3 bar	EA-C 40 7 bar	EA-C 80 14 bar	
65	80	26					
65	100	32					
65	130	43					
80	100	24		EA-C 20 2 bar	EA-C 40 5,5 bar	EA-C 80 10,5 bar	
80	130	29					
80	160	38					
80	180	47					
100	160	28			EA-C 40 2,5 bar	EA-C 80 5 bar	EA-C 140 10 bar
100	200	34					
100	250	42					
100	300	57					
125	200	31			EA-C 40 1 bar	EA-C 80 3 bar	EA-C 140 8 bar
125	250	38					
125	320	48					
125	400	61					
150	250	33			EA-C 80 1 bar	EA-C 140 5 bar	
150	320	42					
150	400	50					
150	450	60					
200	400	37				EA-C 140 3 bar	
200	550	48					
200	700	62					

6) Maximum permissible closing pressure at leakage rate A (drop-tight) to DIN EN 12266-1 in bar

Flow characteristics



**i** A maximum flow velocity of 2 to 3 m/s in the pipe cross-section must not be exceeded.

Description of units

Unit	Description
$\Delta p_{\max}$	Maximum permissible differential pressure across the control valve's control path ( $\Delta p_{\max} = 0.3 * (p_1 - p_v)$ for water)
$\Delta p_{V100}$	Differential pressure across the open control valve
$Q_{100}$	Nominal volume flow rate

**Technical data**
**Technical data - control valve**

Technical data of BOA-CVE C/CS/W/IMS/EKB

Characteristic	Value
Nominal pressure	PN 6/10/16, depending on the type series
Valve characteristic	linear, optimised in the opening range
Leakage rate	Options: <ul style="list-style-type: none"> <li>▪ 0 - 0.05 % of <math>K_{vs}</math> value, VDI/VDE 2173</li> <li>▪ 0 - 0.01 % of <math>K_{vs}</math> value, VDI/VDE 2173</li> <li>▪ Leakage rate A, drop-tight, to DIN EN 1092-2</li> </ul>
Permissible pressure	6 or 16 bar, depending on the type series
Flanged ends	PN 6, PN 10, PN 16 to DIN EN 1092-2
Fluid temperature	-10 to +120 °C -10 to +80 °C for BOA-CVE EKB

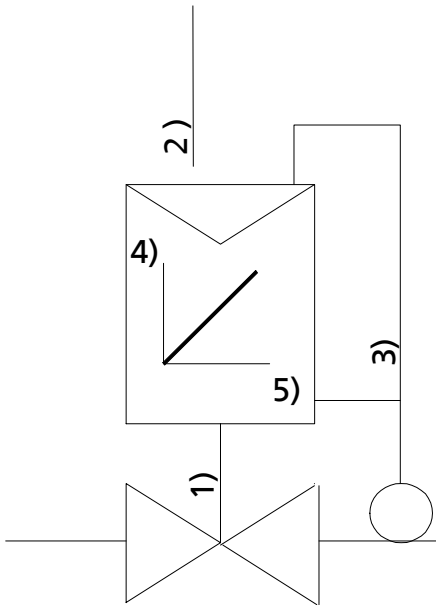
**Technical data - actuators**

Technical data of actuators

Characteristic		Actuator type		
		EA-B 12	EA-C 20 to 140, continuous-action	EA-C 20 to 140, 3-point
Power supply	Supply voltage	24 V AC/DC $\pm$ 20 %	24 V AC/DC $\pm$ 10 % 230 V AC $\pm$ 10 %	230 V AC $\pm$ 10 %
	Max. power input	7 VA	100 VA	
Functional data	Max. actuation force	1200 N	EA-C 20: 2 kN EA-C 40: 4.5 kN EA-C 80: 8 kN EA-C 140: 12 kN	
	Max. actuator stroke	20 mm	50 mm to 65 mm (for 12 kN actuator)	
	Actuating time	Can be freely selected depending on selected $K_{vs}$ value/stroke		
	Actuating speed	0.12 - 0.22 mm/s	EA-C 20...40: 0.45 - 0.9 mm/s EA-C 80: 0.3 - 0.6 mm/s EA-C 140: 0.3 - 0.6 mm/s	EA-C 20...80: 0.5 mm/s EA-C 140: 0.6 mm/s
Signal inputs	Voltage	0/2 - 10 V DC	0/2 - 10 V DC	-
	Input resistance	100 k $\Omega$	100 k $\Omega$	-
	Current	4 - 20 mA	4 - 20 mA	-
	Input resistance		100 k $\Omega$	-
	Binary input (3-point)	24 V AC/DC	24 V AC/DC, optional: 115 V AC / 230 V AC	24 V AC/DC, optional: 115 V AC / 230 V AC
Signal outputs	Voltage	0/2 - 10 V DC	0/2 - 10 V DC	-
	Current load	Max. 1 mA	Max. 1 mA	-
	Current		4 - 20 mA	-
Enclosure to EN 60529		IP54	IP65	
Ambient conditions	Ambient temperature	0 to +50 °C	-20 to +60 °C	
	Storage temperature	-20 to +80 °C		
	Humidity	5 to 95 % rH		
Dimensions	See ( $\Rightarrow$ Page 14)			
Electrical connection		1-m connection cable, 5 x 0.75 mm <sup>2</sup>	Terminal box max. 2.5 mm <sup>2</sup>	Direct connection to printed circuit board max. 2.5 mm <sup>2</sup>

### Process controller

Optional process controller for continuous-action actuators (EA-C 20 to EA-C 140)



Functional schematic of process controller

1)	Actuator stroke	2)	Setpoint Y
3)	Volume flow rate $Q_{\text{actual}}$	4)	Q
5)	Y		

The actuator can be equipped with an integrated process controller, which may be used as a constant-variable controller for an independent control loop.

Possible applications:

- Constant-temperature control
- Volume flow rate control

The control parameters of the PI (proportional-integral) controller can be configured at the site using a parameterisation kit. The setpoint signal and the sensor signal must have the same measuring range.

Accessories

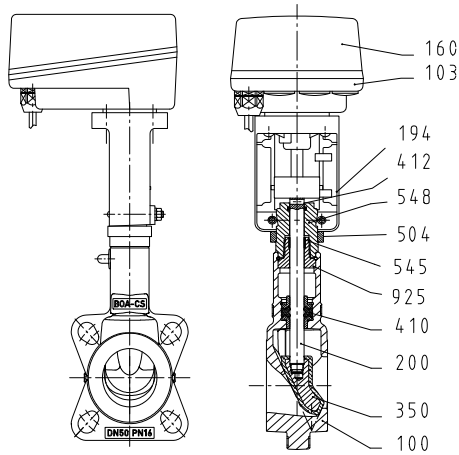
Description	Mat. No.
Parameterisation kit	46001269

The sensor used must supply an active signal (e.g. 4-20 mA or 0/2-10 V). The setpoint can be set externally via an active signal, or the device can be supplied with an internal setpoint as per customer specification.

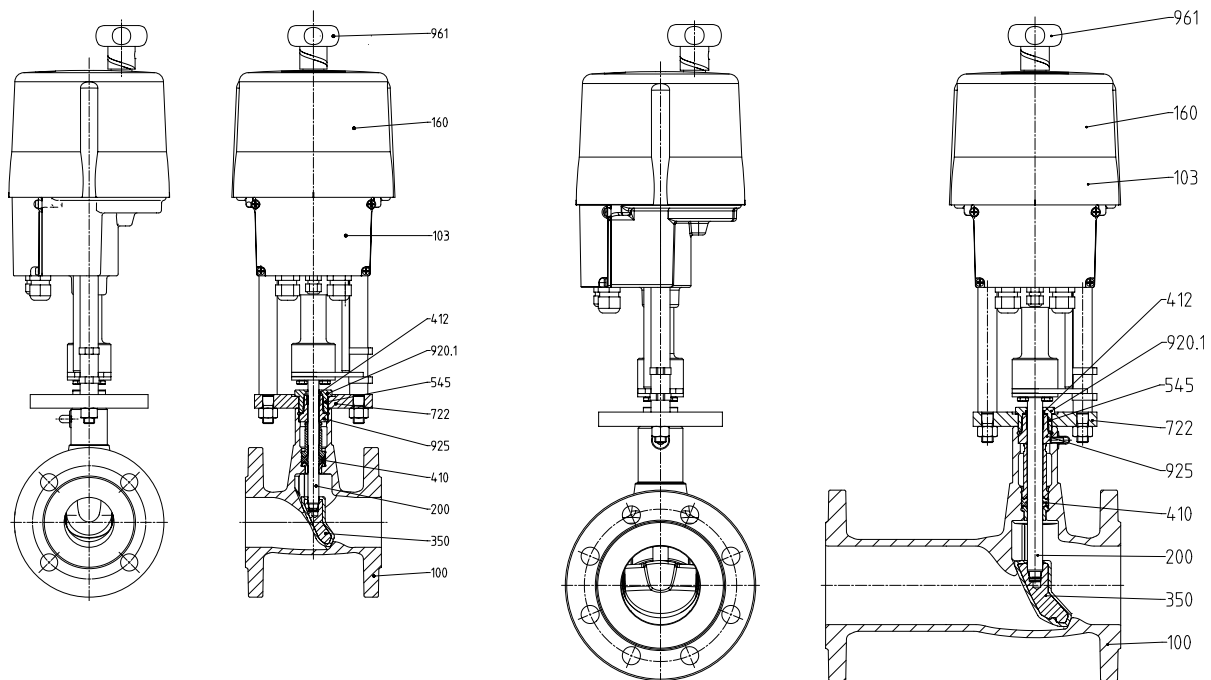
**If combined with the process controller, BOA-CVE IMS with BOATRONIC MS-420 can be used for this purpose.**

Refer to type series booklet 7128.1 for further data.

Materials



DN 15-50 with actuator type EA-B 12

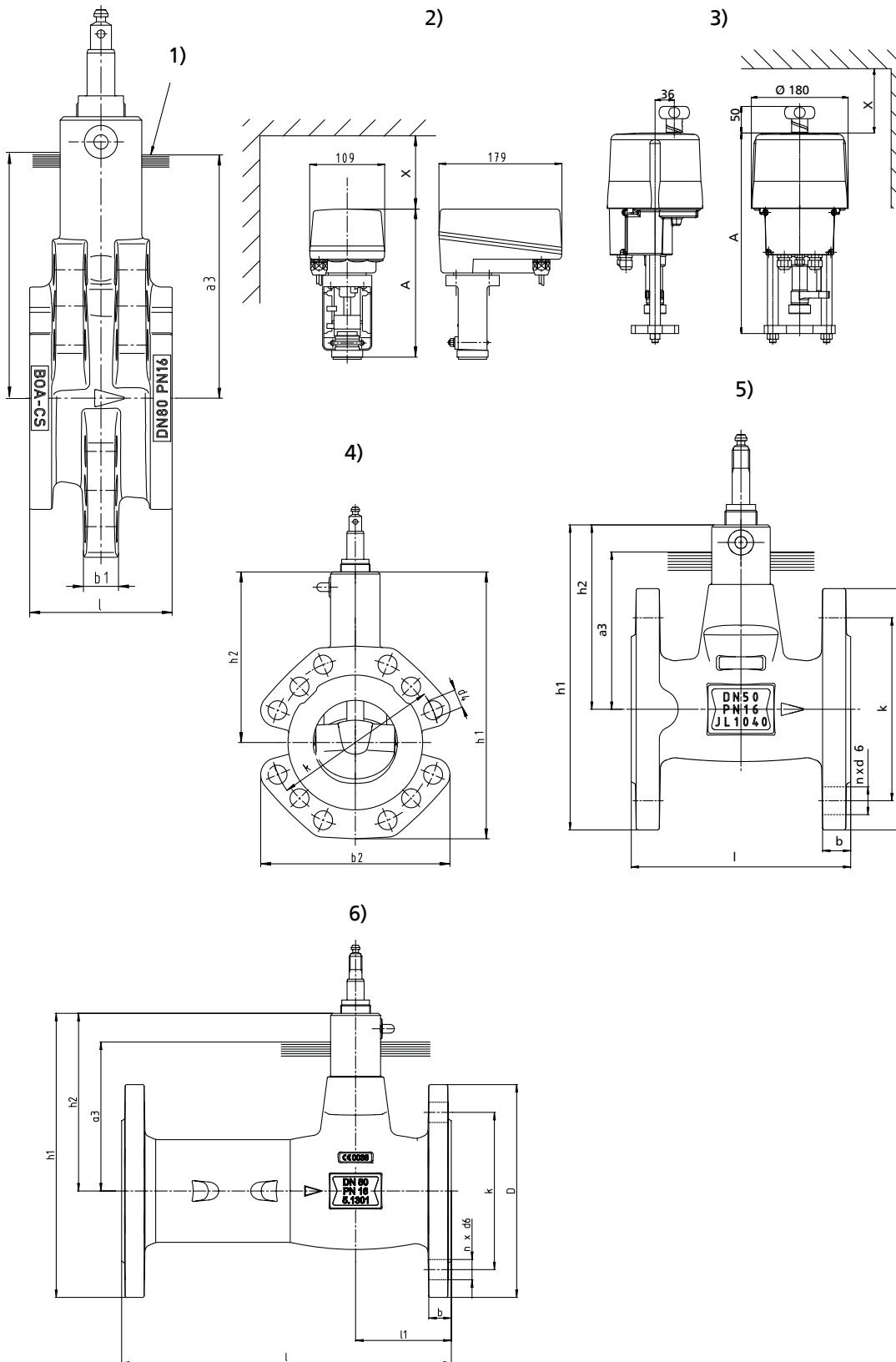


DN 32-200 with actuator type EA-C...

Parts list

Part No.	Description	Material
100	Body	EN-GJL-250 (5.1301)
103	Actuator housing	Aluminium
160	Actuator cover	Plastic/Aluminium
194	Bracket	Aluminium
200	Stem	Stainless steel, min. 13 % chrome (Cr)
350	Control valve disc	Grey cast iron/EPDM
410	Profile seal	Elastomer EPDM
412	O-ring	Elastomer NBR
504	Spacer ring	Galvanised steel
545	Bearing bush	Steel/PTFE
548	Actuating bush	Galvanised steel
722	Top flange	Steel
920.1	Union nut	Galvanised steel
925	Stem nut	Galvanised steel
961	Emergency handwheel	Plastic

Dimensions and weights



1)	Insulating boundary in acc. with German energy-saving regulations	2)	EA-B 12	3)	EA-C 20, EA-C 40, EA-C 80, EA-C 140
4)	BOA-CVE CS	5)	BOA-CVE C / BOA-CVE EKB	6)	BOA-CVE W / BOA-CVE IMS

**Dimensions and weights of BOA-CVE CS**
**Dimensions and weights of BOA-CVE CS control valve**

Dimensions [mm]

PN	DN	l	h <sub>1</sub>	h <sub>2</sub>	a <sub>3</sub>	k	n x d <sub>4</sub>	b <sub>1</sub>	b <sub>2</sub>	[kg]
6	20 <sup>7)</sup>	25	129	87	72,5	65	4 x 11	13	85	0,75
	25 <sup>7)</sup>	25	129	87	72,5	75	4 x 11	13	85	0,75
	32	32	163	112	85	90	4 x 14	16	103	1,5
	40	40	167	112	95	100	4 x 14	16	110	2,0
	50	50	186	126	107,5	110	4 x 14	20	120	3,0
	65	65	233	166	125	130	4 x 14	24	135	5,0
	80	80	253	162	140	150	4 x 18	20	180	7,5
	100	100	303	200	160	170	4 x 18	20	203	10,5
	125	125	365	248	175	200	8 x 18	23	230	15,0
	150	150	397	262	192,5	225	8 x 18	23	266	21,0
10	200	230	575	405	220	280	8 x 19	30	340	67,0
	20 <sup>7)</sup>	25	129	87	72,5	75	4 x 14	13	85	0,75
	25 <sup>7)</sup>	25	129	87	72,5	85	4 x 14	13	85	0,75
	32	32	163	112	85	100	4 x 18	16	103	1,5
	40	40	167	112	95	110	4 x 18	16	110	2,0
	50	50	186	126	107,5	125	4 x 18	20	120	3,0
	65	65	233	166	125	145	4 x 18	24	135	5,0
	80	80	253	162	140	160	8 x 18	20	180	7,5
	100	100	303	200	160	180	8 x 18	20	203	10,5
	125	125	365	248	175	210	8 x 18	23	230	15,0
16	150	150	397	262	192,5	240	8 x 22	23	266	21,0
	20 <sup>7)</sup>	25	129	87	72,5	75	4 x 14	13	85	0,75
	25 <sup>7)</sup>	25	129	87	72,5	85	4 x 14	13	85	0,75
	32	32	163	112	85	100	4 x 18	16	103	1,5
	40	40	167	112	95	110	4 x 18	16	110	2,0
	50	50	186	126	107,5	125	4 x 18	20	120	3,0
	65	65	233	166	125	145	4 x 18	24	135	5,0
	80	80	253	162	140	160	8 x 18	20	180	7,5
	100	100	303	200	160	180	8 x 18	20	203	10,5
	125	125	365	248	175	210	8 x 18	23	230	15,0
16	150	150	397	262	192,5	240	8 x 22	23	266	21,0
	200	230	575	405	220	295	12 x 23	30	340	67,0

**Dimensions and weights of electric actuator types EA-B 12, EA-C 20 to EA-C 140**

Dimensions [mm]

Actuator	Actuating force [N]	A	X	[kg]		
				Continuous-action 24 V AC	Continuous-action 230 V AC	3-point 230 V AC
EA-B 12	1200	215	150	1,5	-	-
EA-C 20	2000	425	120	6,0	7,0	7,0
EA-C 40	4500	425	120	6,0	7,0	7,0
EA-C 80	8000	455	120	9,0	10,0	10,0
EA-C 140	12000	520	120	10,0	10,0	10,0

**Mating dimensions as per standard**

Face-to-face length: DN 25-150: DIN EN 558/94

DN 200: DIN EN 558/14

Flange facing: DIN EN 1092-2, type A

7) Single valve size: DN 20/25

**Dimensions and weights of BOA-CVE C/EKB**
**Dimensions and weights of BOA-CVE C/EKB control valve**

Dimensions [mm]

PN	DN	l	h <sub>1</sub>	h <sub>2</sub>	a <sub>3</sub>	Flange					[kg]
						D	b	k	n	d <sub>6</sub>	
6	15	115	139	99	50	80	12	55	4	11	1,7
	20	120	144	99	55	90	14	65	4	11	2,1
	25	125	149	99	65	100	14	75	4	11	2,3
	32	130	175	115	75	120	16	90	4	14	3,8
	40	140	180	115	85	130	16	100	4	14	4,3
	50	150	196	126	95	140	16	110	4	14	4,9
	65	170	246	166	112,5	160	16	130	4	14	7,7
	80	180	262	167	135	190	18	150	4	19	10,9
	100	190	314	209	155	210	18	170	4	19	14,7
	125	200	368	248	170	240	20	200	8	19	21,0
	150	210	394	261,5	182,5	265	20	225	8	19	26,5
200	230	575	405	220	340	30	280	8	19	71,0	
16	15	115	146,5	99	57,5	95	14	65	4	14	2,3
	20	120	151,5	99	62,5	105	16	75	4	14	2,7
	25	125	156,5	99	72,5	115	14	85	4	14	3,0
	32	130	185	115	85	140	18	100	4	19	4,8
	40	140	190	115	95	150	18	110	4	19	5,5
	50	150	208,5	126	107,5	165	20	125	4	19	6,9
	65	170	258,5	166	125	185	20	145	4	19	10,0
	80	180	267	167	140	200	22	160	8	19	12,5
	100	190	319	209	160	220	24	180	8	19	17,1
	125	200	373	248	175	250	26	210	8	19	26,5
	150	210	404	261,5	192,5	285	26	240	8	23	31,0
200	230	575	405	220	340	30	295	12	23	71,0	

**Dimensions and weights of electric actuator types EA-B 12, EA-C 20 to EA-C 140**

Dimensions [mm]

Actuator	Actuating force [N]	A	X	[kg]		
				Continuous-action 24 V AC	Continuous-action 230 V AC	3-point 230 V AC
EA-B 12	1200	215	150	1,5	-	-
EA-C 20	2000	425	120	6,0	7,0	7,0
EA-C 40	4500	425	120	6,0	7,0	7,0
EA-C 80	8000	455	120	9,0	10,0	10,0
EA-C 140	12000	520	120	10,0	10,0	10,0

**Mating dimensions as per standard**

Face-to-face lengths: DIN EN 558/14, ISO 5752/14  
 Flanges: DIN EN 1092-2, flange type 21  
 Flange facing: DIN EN 1092-2, type B



**Dimensions and weights of BOA-CVE W/IMS**
**Dimensions and weights of BOA-CVE W/IMS control valve**

Dimensions [mm]

PN	DN	l	l <sub>1</sub>	h <sub>1</sub>	h <sub>2</sub>	a <sub>3</sub>	Flange				[kg]
							D	k	n x d <sub>6</sub>	b	
6	15	130	42,5	129	89	50	80	55	4 x 11	12	1,5
	20	150	48	134	89	55	90	65	4 x 11	14	2,0
	25	160	54,5	149	99	65	100	75	4 x 11	14	2,6
	32	180	65	175	115	75	120	90	4 x 14	16	4,1
	40	200	70	180	115	85	130	100	4 x 14	16	4,8
	50	230	75	196	126	95	140	110	4 x 14	16	5,7
	65	290	85	246	166	112,5	160	130	4 x 14	16	9,3
	80	310	90	262	167	135	190	150	4 x 19	18	12,9
	100	350	95	313,5	208,5	155	210	170	4 x 19	18	18,4
	125	400	125	368	248	170	240	200	8 x 19	20	26,1
	150	480	150	394	261,5	182,5	265	225	8 x 19	20	36,0
	200	600	180,5	565	405	220	320	280	8 x 19	22	82,7
16	15	130	42,5	136,5	89	57,5	95	65	4 x 14	14	1,9
	20	150	48	141,5	89	62,5	105	75	4 x 14	16	2,4
	25	160	54,5	156,5	99	72,5	115	85	4 x 14	16	3,1
	32	180	65	185	115	85	140	100	4 x 19	18	5,0
	40	200	70	190	115	95	150	110	4 x 19	18	5,8
	50	230	75	208,5	126	107,5	165	125	4 x 19	20	7,6
	65	290	85	258,5	166	125	185	145	4 x 19	20	11,5
	80	310	90	267	167	140	200	160	8 x 19	22	14,5
	100	350	95	318,5	208,5	160	220	180	8 x 19	24	20,7
	125	400	125	373	248	175	250	210	8 x 19	26	31,7
	150	480	150	404	261,5	192,5	285	240	8 x 23	26	41,6
	200	600	180,5	575	405	220	340	295	12 x 23	30	90,7

**Dimensions and weights of electric actuator types EA-B 12, EA-C 20 to EA-C 140**

Dimensions [mm]

Actuator	Actuating force [N]	A	X	[kg]		
				Continuous-action 24 V AC	Continuous-action 230 V AC	3-point 230 V AC
EA-B 12	1200	215	150	1,5	-	-
EA-C 20	2000	425	120	6,0	7,0	7,0
EA-C 40	4500	425	120	6,0	7,0	7,0
EA-C 80	8000	455	120	9,0	10,0	10,0
EA-C 140	12000	520	120	10,0	10,0	10,0

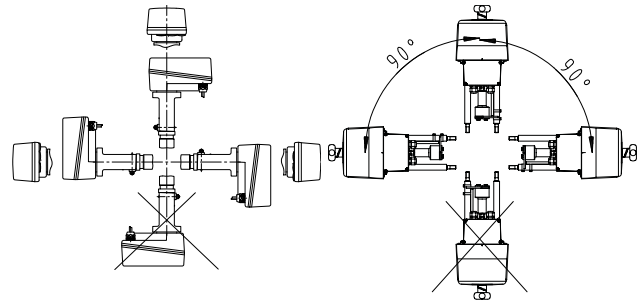
**Mating dimensions as per standard**

Face-to-face lengths: DIN EN 558/1, ISO 5752/1  
 Flanges: DIN EN 1092-2, flange type 21  
 Flange facing: DIN EN 1092-2, type B

### Installation instructions

- Flow through control valves is in the direction of the embossed arrow on the valve body as standard.
- In heating systems, the valves should preferably be installed in the return line, which is characterised by lower temperatures. This will prolong the stem seal's service life.
- Water quality requirements to VdTÜV/AGFW TCh 1466.
- Recommendation: A strainer fitted upstream of the control valve will further enhance the control valve's functional reliability.

Installation positions:



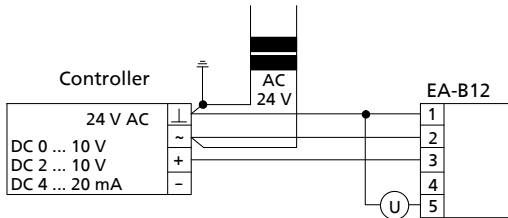
EA-B 12<sup>8)</sup>

EA-C 20 to EA-C 140 and  
EA-C 3-point<sup>8)</sup>

### Wiring diagrams

#### Terminal configuration EA-B 12/24

##### Continuous-action actuation

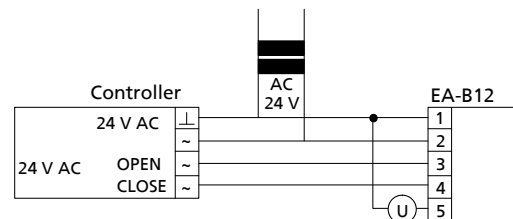


#### Wiring diagram EA-B 12/24

##### 3-point (Open/Stop/Closed) actuation

AC	
1	⊥ 24 V (Ground for Y1, Y2 and U)
2	~ 24 V
3	Y1 Control signal OPEN (24 VAC)
4	Y2 Control signal CLOSE (24 VAC)
5	U Actual-position feedback value (DC 2...10 V)

##### 3-point (Open/Stop/Closed) actuation



8) Installation of BOA-CVE IMS with the valve stem in a horizontal position is not allowed.

**Terminal configuration EA-C 20 to 140, 24 V AC/DC, with terminal box**
**Continuous-action actuation 24 V AC/DC**

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23			RJ-45 TTL	Pushbutton	
↑	↑	↑	↓	↓	↓	↑↓	↑↓	↑	↑	↑	↑	↑	↓	↑	↑	↑	↑↓	↑↓	↑↓	↑↓	↑↓	↑	↑	PE	(Optional)		
+0(2) - 10 V	+0(4) - 20 mA	GND	+0(2) - 10 V	+0(4) - 20 mA	GND		Max. load 100 mA at 24 VDC	L OPEN □	N	L CLOSE □	L (24 V AC/DC)	N (24 V AC/DC)	24 V DC / 100 mA	+0(2) - 10 V	+0(4) - 20 mA	GND	(Optional)	(Optional)	(Optional)	(Optional)	L (see name plate)	N (see name plate)	PE	(Optional)			
Ⓐ				Ⓑ			Ⓒ		Ⓓ		Ⓔ		Ⓕ		Ⓖ			Ⓗ		Ⓘ		Ⓚ		Ⓛ	Ⓚ	Ⓛ	Ⓜ
Ⓝ						Ⓞ						Ⓟ						Ⓠ									

**i** In continuous-action configuration, only the terminals in columns Ⓐ, Ⓑ and Ⓚ are active!

**3-point (Open/Stop/Closed) actuation 24 V AC/DC**

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23			RJ-45 TTL	Pushbutton	
↑	↑	↑	↓	↓	↓	↑↓	↑↓	↑	↑	↑	↑	↑	↓	↑	↑	↑	↑↓	↑↓	↑↓	↑↓	↑↓	↑	↑	PE	(Optional)		
+0(2) - 10 V	+0(4) - 20 mA	GND	+0(2) - 10 V	+0(4) - 20 mA	GND		Max. load 100 mA at 24 VDC	L OPEN □	N	L CLOSE □	L (24 V AC/DC)	N (24 V AC/DC)	24 V DC / 100 mA	+0(2) - 10 V	+0(4) - 20 mA	GND	(Optional)	(Optional)	(Optional)	(Optional)	L (see name plate)	N (see name plate)	PE	(Optional)			
Ⓐ				Ⓑ			Ⓒ		Ⓓ		Ⓔ		Ⓕ		Ⓖ			Ⓗ		Ⓘ		Ⓚ		Ⓛ	Ⓚ	Ⓛ	Ⓜ
Ⓝ						Ⓞ						Ⓟ						Ⓠ									

**i** In 3-point (Open/Stop/Closed) configuration, only the terminals in columns Ⓑ, Ⓓ and Ⓚ are active!

**Key**

Ⓐ	Setpoint input	Ⓚ	Open
Ⓑ	Active actual-position feedback	Ⓛ	Power supply
Ⓒ	Volt-free fault message (optional)	Ⓚ	Field bus connection (optional)
Ⓓ	Binary control (standard 24 V AC/DC)	Ⓛ	Communication with PC
Ⓔ	Power failure signal	Ⓜ	Commissioning
Ⓕ	Supply	Ⓝ	Galvanically isolated 1 kV
Ⓖ	Actual value	Ⓞ	Process sensor (optional)
Ⓗ	Closed	Ⓟ	Limit switch, volt-free contact

Terminal configuration EA-C 20 to 140, 230 V AC

Continuous-action actuation, 230 V AC

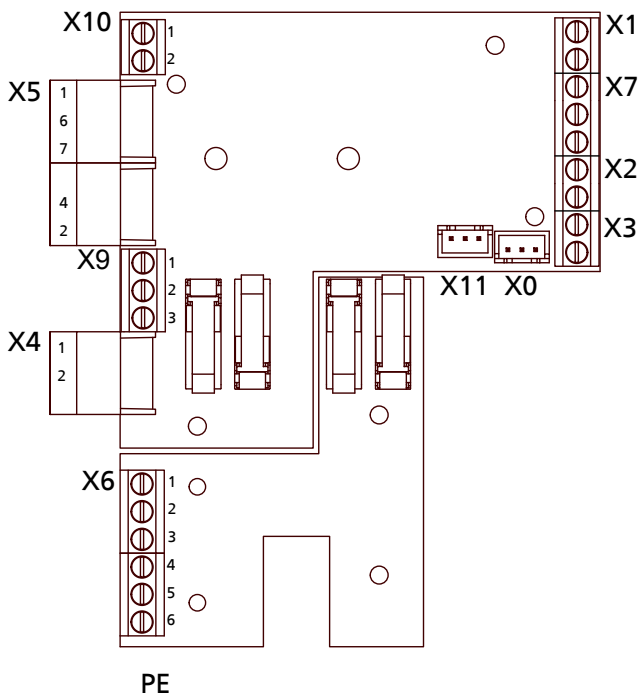
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23			RJ-45 TTL	Push-button	
↑	↑	↑	↓	↓	↓	↑↓	↑↓	↑	↑	↑	↑	↑	↓	↑	↑	↑	↑↓	↑↓	↑↓	↑↓	↑↓	↑	↑	PE	(Optional)		
+0(2) - 10 V	+0(4) - 20 mA	GND	+0(2) - 10 V	+0(4) - 20 mA	GND		Max. load 100 mA at 24 VDC	L OPEN	N	L CLOSE	L (24 V AC/DC)	N (24 V AC/DC)	24 V DC / 100 mA	+0(2) - 10 V	+0(4) - 20 mA	GND	(Optional)	(Optional)	(Optional)	(Optional)	(Optional)	L (see name plate)	N (see name plate)				
A		B			C			D			E		F	G		H			I		J		K	L	M		
N												O			P												

**i** In continuous-action configuration, only the terminals in columns A, B and J are active!

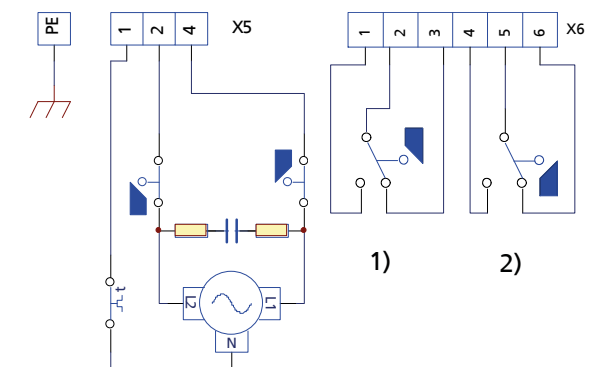
Key

A	Setpoint input	I	Open
B	Active actual-position feedback	J	Power supply
C	Volt-free fault message (optional)	K	Field bus connection (optional)
D	Binary control (standard 24 V AC/DC)	L	Communication with PC
E	Power failure signal	M	Commissioning
F	Supply	N	Galvanically isolated 1 kV
G	Actual value	O	Process sensor (optional)
H	Closed	P	Limit switch, volt-free contact

3-point (Open/Stop/Closed) actuation, 230 V AC



X4	Potentiometer 1
X5/1	Neutral
X5/2	Motor phase to open
X5/4	Motor phase to close
X5/6 and X5/7	Thermal circuit breaker as volt-free contact
X6	Additional limit switches
X7	Not used
X8	Heating resistor
X9	Potentiometer 2
PE	Earth connection on housing



Terminal configuration of power supply

Terminal configuration of additional limit switches

1) Closed	2) Open
-----------	---------

Fig. 1: Terminal configuration on printed circuit board

X1	Internal wiring
X2	Internal wiring
X3	Internal wiring

9) Measuring, open-loop and closed-loop control task

**Specification sheet for valve selection**
**Operating data**

Point of control	Measuring/control task <sup>9)</sup>			Potentially explosive atmosphere (zone)	
Ambient temperature	[°C]	Max.		Min.	
Pipe	-	DN		PN	
Fluid handled	-				

**Process data**

Volume flow rate	[m³/h]	
Kvs value	[m³/h]	
Inlet pressure p1 (pressure upstream of control valve)	[bar]	
Outlet pressure p2 (pressure downstream of control valve)	[bar]	
Closing pressure $\Delta p_{\max}$	[bar]	
Differential pressure in closed-loop control operation $\Delta p_{\max}$	[bar]	

**Valve data**

Valve type	-	BOA-CVE CS	BOA-CVE C	BOA-CVE W	BOA-CVE IMS	BOA-CVE EKB
Pressure class PN	-	6/10/16 □	6 □ 16 □	6 □ 16 □	16 □	10 □ 16 □
Nominal size DN	-					
Body material	- Grey cast iron EN-GJL-250					

Actuator data

Actuator selection	<b>Δp closes (actuator selection)</b>	[bar]			
	<b>Feature/function</b>	<b>Continuous 24 V or 230 V</b>		<b>3-point 24 V</b>	<b>3-point 230 V</b>
	<b>Characteristic</b>	Linear <sup>10)</sup> <input type="checkbox"/> Equal-percentage <input type="checkbox"/>		Linear	Linear
	<b>Actuating time</b>	[s]			
	<b>Position value</b>		Setpoint	Actual	Actual
		DC 0-10 V			<sup>11)</sup> -
		DC 2-10 V <sup>10)</sup>			<sup>11)</sup>
		0-20 mA		<sup>11)</sup>	<sup>11)</sup>
		4-20 mA		<sup>11)</sup>	<sup>11)</sup>
	Feedback via 2 limit switches	-		-	X
Leakage rate	0.05 % of Kvs <sup>10)</sup>			-	-
	0.01 % of Kvs			-	-
	Leakage rate A (DIN EN 12266-1)				X
Accessories	Process controller			-	-
	Programming tool required for process controller			-	-
	Actuator heating				
	Power back-up unit				-

10) Default setting

11) Only possible with EA-C actuators

**Chemical resistance charts**
**BOA-CVE C**
**Chemical resistance chart**

The information provided in this chemical resistance chart is based on experience, the Dechema lists as well as manufacturer information. Corrosion resistance is largely dependent on the operating conditions, temperatures and concentrations. Hydroabrasive wear in fluids containing solids is not covered in this list. All information provided herein, therefore, only serves as an orientation. Warranty claims may not be asserted on the basis of this list!

**Symbols key**

Symbol	Description
✓	The fluid handled is not normally aggressive toward the materials. Valve can be used if and are observed.
✘	The fluid handled is aggressive toward the materials. Valve cannot be used.
○	The materials and/or the valve can only be used under certain operating conditions. Please enquire accordingly, stating the operating conditions such as concentration, temperature, pH and composition of the fluid handled.

**Chemical resistance chart for water<sup>12)</sup>**

Fluids handled	
Bathing water (fresh water)	○
Bathing water (seawater)	✘
Brackish water	✘
Service water	○
Chlorinated water (max. 0.6 mg/kg)	✓
Deionised water (demineralised water) <sup>13)</sup>	○
Distilled water <sup>13)</sup>	○
Heating water <sup>13)</sup>	✓
Condensate	○
Oil-free cooling water	○
Oil-containing cooling water	✘
Seawater	✘
Ozonised water (max. 0.5 mg/kg)	✓
Pure water	✓
Raw water	○
Grey water <sup>14)</sup>	✓
Partly desalinated water <sup>13)</sup>	○
Thermal water	✘
Drinking water	✘
Fully desalinated water <sup>13)</sup>	○

**Chemical resistance chart for oils (aromatic content 5 mg/kg)**

Fluids handled	
Vegetable oils	✘
Mineral oils	✘
Synthetic oils	✘
Petroleum	✘
Oil/water emulsion	✘
Kerosene	✘

**Chemical resistance chart for refrigerants**

Fluids handled	
Ammonium hydroxide (max. 25 %, max. 25 °C)	✓
Glycol (ethylene glycol)	✓
Water/glycol mixture (max. 50 %, max. 90 °C)	✓
Inorganic cooling brine, pH 7.5	✓

**Chemical resistance chart for cleaning agents**

Fluids handled	
Lye for bottle rinsers (e.g. P3)	✓
Lye for metal cleaning	✘

**Chemical resistance chart for other fluids**

Fluids handled	
Landfill gas	○
Oil-containing compressed air	✘
Aqueous glycerine	○
Carbon dioxide (gas)	✓
Carbon dioxide (aqueous solution)	✘
Oxygen O <sub>2</sub>	✘

- 12) General criteria for water to be handled by products made of non-alloyed materials: pH > 7; chlorides (Cl<sup>-</sup>) < 150 mg/kg; chlorine (Cl) < 0.6 mg/kg. Other factors to be considered: hardness, carbon dioxide content (CO<sub>2</sub>), oxygen (O<sub>2</sub>) and dissolved substances. Contact KSB if limits are exceeded!
- 13) Can only be used for installations and the respective water quality as specified in the VdTÜV 1466 or VDI 2035 guidelines. A pH ≥ 9.5 and an oxygen content of ≤ 0.02 mg/l are also recommended.
- 14) Without larger solids or stringy material

**BOA-CVE CS**
**Chemical resistance chart**

The information provided in this chemical resistance chart is based on experience, the Dechema lists as well as manufacturer information. Corrosion resistance is largely dependent on the operating conditions, temperatures and concentrations. Hydroabrasive wear in fluids containing solids is not covered in this list. All information provided herein, therefore, only serves as an orientation. Warranty claims may not be asserted on the basis of this list!

**Symbols key**

Symbol	Description
✓	The fluid handled is not normally aggressive toward the materials. Valve can be used if and are observed.
✘	The fluid handled is aggressive toward the materials. Valve cannot be used.
○	The materials and/or the valve can only be used under certain operating conditions. Please enquire accordingly, stating the operating conditions such as concentration, temperature, pH and composition of the fluid handled.

**Chemical resistance chart for water<sup>15)</sup>**

Fluids handled	
Bathing water (fresh water)	○
Bathing water (seawater)	✘
Brackish water	✘
Service water	○
Chlorinated water (max. 0.6 mg/kg)	✓
Deionised water (demineralised water) <sup>16)</sup>	○
Distilled water <sup>16)</sup>	○
Heating water <sup>16)</sup>	✓
Condensate	○
Oil-free cooling water	○
Oil-containing cooling water	✘
Seawater	✘
Ozonised water (max. 0.5 mg/kg)	✓
Pure water	✓
Raw water	○
Grey water <sup>17)</sup>	✓
Partly desalinated water <sup>16)</sup>	○
Thermal water	✘
Drinking water	✘
Fully desalinated water <sup>16)</sup>	○

**Chemical resistance chart for oils (aromatic content 5 mg/kg)**

Fluids handled	
Vegetable oils	✘
Mineral oils	✘
Synthetic oils	✘
Petroleum	✘
Oil/water emulsion	✘
Kerosene	✘

**Chemical resistance chart for refrigerants**

Fluids handled	
Ammonium hydroxide (max. 25 %, max. 25 °C)	✓
Glycol (ethylene glycol)	✓
Water/glycol mixture (max. 50 %, max. 90 °C)	✓
Inorganic cooling brine, pH 7.5	✓

**Chemical resistance chart for cleaning agents**

Fluids handled	
Lye for bottle rinsers (e.g. P3)	✓
Lye for metal cleaning	✘

**Chemical resistance chart for other fluids**

Fluids handled	
Landfill gas	○
Oil-containing compressed air	✘
Aqueous glycerine	○
Carbon dioxide (gas)	✓
Carbon dioxide (aqueous solution)	✘
Oxygen O <sub>2</sub>	✘

- 15) General criteria for water to be handled by products made of non-alloyed materials: pH > 7; chlorides (Cl<sup>-</sup>) < 150 mg/kg; chlorine (Cl) < 0.6 mg/kg. Other factors to be considered: hardness, carbon dioxide content (CO<sub>2</sub>), oxygen (O<sub>2</sub>) and dissolved substances. Contact KSB if limits are exceeded!
- 16) Can only be used for installations and the respective water quality as specified in the VdTÜV 1466 or VDI 2035 guidelines. A pH ≥ 9.5 and an oxygen content of ≤ 0.02 mg/l are also recommended.
- 17) Without larger solids or stringy material



**BOA-CVE W**
**Chemical resistance chart**

The information provided in this chemical resistance chart is based on experience, the Dechema lists as well as manufacturer information. Corrosion resistance is largely dependent on the operating conditions, temperatures and concentrations. Hydroabrasive wear in fluids containing solids is not covered in this list. All information provided herein, therefore, only serves as an orientation. Warranty claims may not be asserted on the basis of this list!

**Symbols key**

Symbol	Description
✓	The fluid handled is not normally aggressive toward the materials. Valve can be used if and are observed.
✘	The fluid handled is aggressive toward the materials. Valve cannot be used.
○	The materials and/or the valve can only be used under certain operating conditions. Please enquire accordingly, stating the operating conditions such as concentration, temperature, pH and composition of the fluid handled.

**Chemical resistance chart for water<sup>18)</sup>**

Fluids handled	
Bathing water (fresh water)	○
Bathing water (seawater)	✘
Brackish water	✘
Service water	○
Chlorinated water (max. 0.6 mg/kg)	✓
Deionised water (demineralised water) <sup>19)</sup>	○
Distilled water <sup>19)</sup>	○
Heating water <sup>19)</sup>	✓
Condensate	○
Oil-free cooling water	○
Oil-containing cooling water	✘
Seawater	✘
Ozonised water (max. 0.5 mg/kg)	✓
Pure water	✓
Raw water	○
Grey water <sup>20)</sup>	✓
Partly desalinated water <sup>19)</sup>	○
Thermal water	✘
Drinking water	✘
Fully desalinated water <sup>19)</sup>	○

**Chemical resistance chart for oils (aromatic content 5 mg/kg)**

Fluids handled	
Vegetable oils	✘
Mineral oils	✘
Synthetic oils	✘
Petroleum	✘
Oil/water emulsion	✘
Kerosene	✘

**Chemical resistance chart for refrigerants**

Fluids handled	
Ammonium hydroxide (max. 25 %, max. 25 °C)	✓
Glycol (ethylene glycol)	✓
Water/glycol mixture (max. 50 %, max. 90 °C)	✓
Inorganic cooling brine, pH 7.5	✓

**Chemical resistance chart for cleaning agents**

Fluids handled	
Lye for bottle rinsers (e.g. P3)	✓
Lye for metal cleaning	✘

**Chemical resistance chart for other fluids**

Fluids handled	
Landfill gas	○
Oil-containing compressed air	✘
Aqueous glycerine	○
Carbon dioxide (gas)	✓
Carbon dioxide (aqueous solution)	✘
Oxygen O <sub>2</sub>	✘

- 18) General criteria for water to be handled by products made of non-alloyed materials: pH > 7; chlorides (Cl<sup>-</sup>) < 150 mg/kg; chlorine (Cl) < 0.6 mg/kg. Other factors to be considered: hardness, carbon dioxide content (CO<sub>2</sub>), oxygen (O<sub>2</sub>) and dissolved substances. Contact KSB if limits are exceeded!
- 19) Can only be used for installations and the respective water quality as specified in the VdTÜV 1466 or VDI 2035 guidelines. A pH ≥ 9.5 and an oxygen content of ≤ 0.02 mg/l are also recommended.
- 20) Without larger solids or stringy material

**BOA-CVE IMS**
**Chemical resistance chart**

The information provided in this chemical resistance chart is based on experience, the Dechema lists as well as manufacturer information. Corrosion resistance is largely dependent on the operating conditions, temperatures and concentrations. Hydroabrasive wear in fluids containing solids is not covered in this list. All information provided herein, therefore, only serves as an orientation. Warranty claims may not be asserted on the basis of this list!

**Symbols key**

Symbol	Description
✓	The fluid handled is not normally aggressive toward the materials. Valve can be used if <sup>21)</sup> is observed.
✘	The fluid handled is aggressive toward the materials. Valve cannot be used.
X	The fluid handled is not suitable for sensor measurement.
○	The material or valve can only be used under certain operating conditions. Please enquire accordingly, stating the operating conditions such as concentration, temperature, pH and composition of the fluid handled.

**Chemical resistance chart for water**

Fluids handled	
Bathing water (fresh water)	○
Bathing water (seawater)	✘
Brackish water	✘
Service water	○
Chlorinated water (max. 0.6 mg/kg)	✓
Deionised water (demineralised water) <sup>22)</sup>	○
Distilled water <sup>22)</sup>	○
Heating water <sup>22)</sup>	✓
Condensate	○
Oil-free cooling water	○
Oil-containing cooling water	✘
Seawater	✘
Ozonised water (max. 0.5 mg/kg)	✓
Pure water	✓
Raw water	○
Grey water <sup>23)</sup>	○
Partly desalinated water <sup>22)</sup>	○
Thermal water	✘
Drinking water	✘
Fully desalinated water <sup>22)</sup>	○

**Chemical resistance chart for oils (aromatic content 5 mg/kg)**

Fluids handled	
Vegetable oils	✘
Mineral oils	✘
Synthetic oils	✘
Petroleum	✘
Oil/water emulsion	✘
Kerosene	✘

- 21) General criteria for water to be handled by products made of non-alloyed materials: pH > 7; chlorides (Cl<sup>-</sup>) < 150 mg/kg; chlorine (Cl) < 0.6 mg/kg. Other factors to be considered: hardness, carbon dioxide content (CO<sub>2</sub>), oxygen (O<sub>2</sub>) and dissolved substances. Contact KSB if limits are exceeded!
- 22) Can only be used for installations and the respective water quality as specified in the VdTÜV 1466 or VDI 2035 guidelines. A pH ≥ 9.5 and an oxygen content of ≤ 0.02 mg/l are also recommended.
- 23) Without larger solids or stringy material

**Chemical resistance chart for refrigerants**

Fluids handled	
Ammonium hydroxide (max. 25 %, max. 25 °C)	X
Glycol (ethylene glycol)	X
Water/glycol mixture (max. 50 %, max. 90 °C)	✓
Inorganic cooling brine, pH 7.5	○

**Chemical resistance chart for cleaning agents**

Fluids handled	
Lye for bottle rinsers (e.g. P3)	X
Lye for metal cleaning	✘

**Chemical resistance chart for other fluids**

Fluids handled	
Landfill gas	X
Oil-containing compressed air	✘
Aqueous glycerine	X
Carbon dioxide (gas)	X
Carbon dioxide (aqueous solution)	✘
Oxygen O <sub>2</sub>	✘

Evaluation shown includes measurement capability of valve.

**BOA-CVE EKB**
**Chemical resistance chart**

The information provided in this chemical resistance chart is based on experience, the Dechema lists as well as manufacturer information. Corrosion resistance is largely dependent on the operating conditions, temperatures and concentrations. Hydroabrasive wear in fluids containing solids is not covered in this list. All information provided herein, therefore, only serves as an orientation. Warranty claims may not be asserted on the basis of this list!

**Symbols key**

Symbol	Description
✓	The fluid handled is not normally aggressive toward the materials. Valve can be used if and are observed.
✘	The fluid handled is aggressive toward the materials. Valve cannot be used.
○	The material or valve can only be used under certain operating conditions. Please enquire accordingly, stating the operating conditions such as concentration, temperature, pH and composition of the fluid handled.

**Chemical resistance chart for water<sup>24)</sup>**

Fluids handled	
Bathing water (fresh water)	✓
Bathing water (seawater)	✘
Brackish water	✘
Service water	✓
Chlorinated water (max. 0.6 mg/kg)	✓
Deionised water (demineralised water)	✓
Distilled water	✓
Heating water (max. 80 °C)	✓
Condensate	✓
Oil-free cooling water	✓
Oil-containing cooling water	✘
Seawater	✘
Ozonised water (max. 0.5 mg/kg)	✓
Pure water	✓
Raw water	✓
Waste water <sup>25)</sup>	✓
Partly desalinated water	✓
Thermal water	○
Drinking water	✓
Fully desalinated water	✓

**Chemical resistance chart for oils (aromatic content 5 mg/kg)**

Fluids handled	
Vegetable oils	✘
Mineral oils	✘
Synthetic oils	✘
Petroleum	✘
Oil-water emulsion	✘
Kerosene	✘

**Chemical resistance chart for refrigerants**

Fluids handled	
Ammonium hydroxide (max. 25 %, max. 25 °C)	○
Glycol (ethylene glycol)	✘
Water/glycol mixture (max. 50 %, max. 80 °C)	○
Inorganic cooling brine, pH 7.5	✓

**Chemical resistance chart for cleaning agents**

Fluids handled	
Lye for bottle rinsers (e.g. P3)	○
Lye for metal cleaning	○

**Chemical resistance chart for other fluids**

Fluids handled	
Landfill gas	○
Oil-containing compressed air	✘
Aqueous glycerine	○
Carbon dioxide (gas)	✓
Carbon dioxide (aqueous solution)	✘
Oxygen O <sub>2</sub>	✘

24) General criteria for water to be handled by products made of non-alloyed materials: pH 6.5 - 12; chlorides (Cl-) < 150 mg/kg; chlorine (Cl) < 0.6 mg/kg. Other factors to be considered: hardness, carbon dioxide content (CO<sub>2</sub>), oxygen (O<sub>2</sub>) and dissolved substances. Contact KSB if limits are exceeded!

25) Without larger solids or stringy material

Balancing and Shut-off Valve

## BOA-Control SAR

PN 16  
DN 10-50  
NPS  $\frac{3}{8}$ "-2"

## Type Series Booklet



---

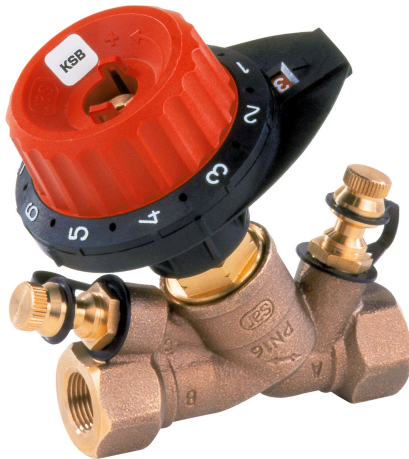
## Contents

<b>Control and Measurement Valves .....</b>	<b>4</b>
Balancing and Shut-off Valves to DIN/EN .....	4
BOA-Control SAR .....	4
Main applications .....	4
Fluids handled .....	4
Operating data .....	4
Body materials .....	4
Design details .....	4
Product benefits .....	4
Related documents .....	4
Purchase order specifications .....	4
Pressure/temperature ratings .....	5
Materials .....	5
Dimensions and weights .....	6
Installation instructions .....	6

## Control and Measurement Valves

### Balancing and Shut-off Valves to DIN/EN

## BOA-Control SAR



### Main applications

- Hot-water heating systems
- Air-conditioning systems

### Fluids handled

- Water
- Water/glycol mixtures
- Other fluids on request.

### Operating data

Operating properties

Characteristic	Value
Nominal pressure	PN 16
Nominal size	DN 10 - 50
Nominal size	NPS 3/8" - 2"
Max. permissible pressure [bar]	16
Min. permissible temperature [°C]	-25
Max. permissible temperature [°C]	+150

### Body materials

Overview of available materials

Material	Temperature limit
Bronze	≤ 150 °C

### Design details

#### Design

Valves to type series booklet 7129.1

- Y-pattern straight-way globe valve with female screwed ends
- 2 self-sealing measuring connections for direct pressure measurement and flow measurement with PFM 2000 measuring computer
- Non-rising handwheel
- Non-rotating stem
- Digital travel position indicator with 40 settings and indication of full and 1/10 rotations, readable from above and below
- Locking device
- Travel stop
- Lead-sealable
- Double stem seal by two O-rings and adjustable gland
- Pressure measurement connection branches with protective cap
- Handwheel colour: orange
- The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 2014/68/EU (PED) for fluids in Group 2.

### Product benefits

- Flow rate can be adjusted precisely and read from above and below, due to digital handwheel with top/bottom display and 40 control positions.
- PTFE joint ring ensures tight shut-off for life.
- Hydraulically optimised body for high flow rates.
- Double sealing to atmosphere as stem is sealed by O-ring and back-up gland packing.

### Related documents

- For precise flow measurement we recommend our PFM 2000 measuring computer (available for hire, please contact KSB for details)

Information/documents

Document	Reference number
Flow characteristics	7129.4
Operating manual	0570.88

### Purchase order specifications

Please specify the following information in all enquiries or purchase orders:

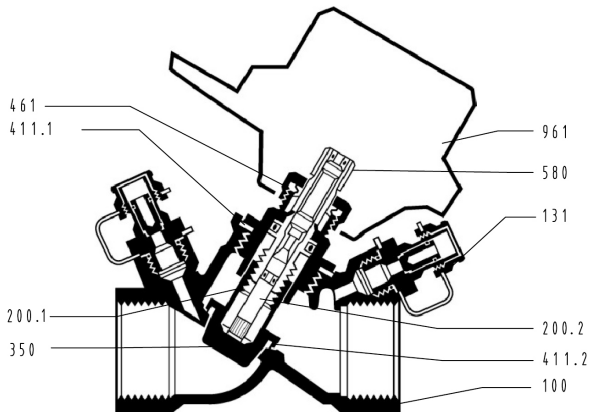
1. Type
2. Nominal pressure
3. Nominal size
4. Reference number

### Pressure/temperature ratings

Test pressure and operating pressure

PN	DN	Shell test	Leak test (seat)	Permissible operating pressure <sup>1)</sup>
		With water		
		Tests P10 and P11 to DIN EN 12266-1 [bar]	Test P12, leakage rate A to DIN EN 12266-1 [bar]	-25 to +150 °C [bar]
16	3/8" -2" (10-50)	24	17,6	16

### Materials



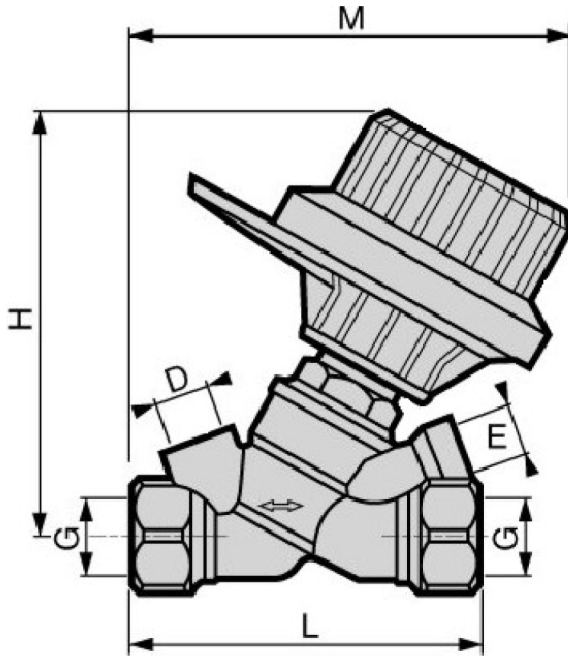
BOA-Control SAR

Overview of available materials

Part No.	Description	Material	Note
100	Body	Bronze	-
131	Pressure measurement connection branch	Brass	-
200.1	Valve stem	Brass	-
200.2	Memo stem	Cu Zn 40 Pb3	Dezincification-free
350	Valve disc	Cu Zn 36 Pb2 AS	-
411.1	Joint ring	EPDM	-
411.2	Joint ring	EPDM	Metal gasket, for DN 3/8"
461	Gland packing	Brass	-
580	Cap	Leaded red brass	-
961	Handwheel	Polyamide 6-6 with 30 % glass fibre	-

1) Static load

### Dimensions and weights



BOA-Control SAR

### Dimensions [mm] and weights [kg]

PN	DN	G	D	E	L	H	M	[kg]
16	10	3/8"	1/4"	1/4"	88,5	104	106	0.6
	15	1/2"	1/4"	1/4"	88,5	104	106	0.6
	20	3/4"	1/4"	1/4"	95,5	104	112	0.6
	25	1"	1/4"	1/4"	96	108	116	0.9
	32	1 1/4"	3/8"	1/4"	117	117	127	1.1
	40	1 1/2"	3/8"	1/4"	125	122	133	1.2
	50	2"	3/8"	1/4"	149	126	146	2

### Installation instructions

BOA-Control SAR balancing and shut-off valves can be installed in supply lines as well as return lines, and in any position. This allows fluid flow in both directions. However, flow direction from A to B (marked on the valve body) is recommended to achieve an optimum valve setting.

**i** For optimum measuring results, a stabilisation distance of 15 x DN is recommended both upstream and downstream of the valve.

However, a minimum upstream stabilisation distance of

- 10 x DN downstream of a pump, and
- 5 x DN downstream of valves and fittings should be provided.

General minimum downstream stabilisation distance: 2 x DN

**i** For adjusting BOA-Control SAR, customers may borrow our PFM 2000 measuring computer. Please contact us for details.



**По вопросам продаж и поддержки обращайтесь:**

Архангельск (8182)63-90-72	Краснодар (861)203-40-90	Санкт-Петербург (812)309-46-40
Астана (7172)727-132	Красноярск (391)204-63-61	Саратов (845)249-38-78
Астрахань (8512)99-46-04	Курск (4712)77-13-04	Севастополь (8692)22-31-93
Барнаул (3852)73-04-60	Липецк (4742)52-20-81	Симферополь (3652)67-13-56
Белгород (4722)40-23-64	Магнитогорск (3519)55-03-13	Смоленск (4812)29-41-54
Брянск (4832)59-03-52	Москва (495)268-04-70	Сочи (862)225-72-31
Владивосток (423)249-28-31	Мурманск (8152)59-64-93	Ставрополь (8652)20-65-13
Волгоград (844)278-03-48	Набережные Челны (8552)20-53-41	Сургут (3462)77-98-35
Вологда (8172)26-41-59	Нижний Новгород (831)429-08-12	Тверь (4822)63-31-35
Воронеж (473)204-51-73	Новокузнецк (3843)20-46-81	Томск (3822)98-41-53
Екатеринбург (343)384-55-89	Новосибирск (383)227-86-73	Тула (4872)74-02-29
Иваново (4932)77-34-06	Омск (3812)21-46-04	Тюмень (3452)66-21-18
Ижевск (3412)26-03-58	Орел (4862)44-53-42	Ульяновск (8422)24-23-59
Казань (843)206-01-48	Оренбург (3532)37-68-04	Уфа (347)229-48-12
Калининград (4012)72-03-81	Пенза (8412)22-31-16	Хабаровск (4212)92-98-04
Калуга (4842)92-23-67	Пермь (342)205-81-47	Челябинск (351)202-03-61
Кемерово (3842)65-04-62	Ростов-на-Дону (863)308-18-15	Череповец (8202)49-02-64
Киров (8332)68-02-04	Рязань (4912)46-61-64	Ярославль (4852)69-52-93
	Самара (846)206-03-16	

**Единый адрес:** [kbs@nt-rt.ru](mailto:kbs@nt-rt.ru) **Веб-сайт:** [www.kbs.nt-rt.ru](http://www.kbs.nt-rt.ru)