

Control Valve

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

For Automation of
BOA-Compact, BOA-SuperCompact,
BOA-W, BOA-Control IMS,
BOA-Compact EKB and BOA-Control IMS EKB

Type Series Booklet



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Type Series Booklet BOA-CVE C/CS/W/IMS/EKB/IMS EKB

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Control Valves / Measurement Valves

Control Valves to DIN/EN

BOA-CVE C/CS/W/IMS/EKB/ 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 / BOA-CVE IMS 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.
- Fluids containing gas or air can be measured with ultrasound equipment to a limited extent only. Proper venting of the systems is therefore essential.

BOA-CVE EKB / BOA-CVE IMS 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

Table 1: 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 pressure BOA-CVE IMS EKB	PN 16 ¹⁾
Nominal size	DN 15 - 200 ²⁾
Max. permissible pressure [bar]	16
Min. permissible temperature [°C]	≥ -10
Max. permissible temperature [°C]	$\leq +120$ ³⁾

Selection as per pressure/temperature ratings (⇒ Page 6)

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
- BOA-CVE IMS and BOA-CVE IMS EKB with sensors for measuring flow rate and temperature
- K_{vs} values: 3 to 700 m³/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)

Actuators (technical data refers to basic configuration):

- Configurable, microprocessor-controlled actuators
 Supply voltage: 24 V AC/DC
 Position setpoint: 2 - 10 V DC
 Actual-position feedback: 2 - 10 V DC
 Control valve characteristic: linear
 Leakage rate: 0.05 % of K_{vs}

¹ BOA-CVE IMS EKB: 40 °C

² BOA-CVE CS: DN 20 - 200

³ BOA-CVE EKB: 80 °C

- Limit switching force-dependent in closing direction and stroke-dependent in opening direction
- 3-point actuators
- Supply voltage: 230 V AC
- Actual-position feedback: 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_{vs} value.
- Operating data stored in permanent memory
- After a power failure, operation is resumed in accordance with the operating data.

- Programmable K_{vs} values
- Four K_{vs} values per nominal size
- Optionally available with integrated process controller (for EA-C actuators) for adaptation to numerous control tasks

Product information

Product information as per Regulation No. 1907/2006 (REACH)

For information as per European chemicals regulation (EC) No. 1907/2006 (REACH) see <https://www.ksb.com/en-global/company/corporate-responsibility/reach>.

Product information as per Pressure Equipment Directive 2014/68/EU (PED)

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 information as per Pressure Equipment (Safety) Regulations 2016

The valves satisfy the safety requirements of the UK Pressure Equipment (Safety) Regulations 2016 (PER) for fluids in Group 2.

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

Valve body materials

Table 2: 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

Certifications

Table 3: Overview

Label	Effective in:	Comment
	Germany	Approved in accordance with German drinking water regulation BOA-Control EKB / BOA-Control IMS EKB only

Note on DVGW approval:

Valid for BOA-CVE EKB and BOA-CVE IMS EKB only.

Related documents

Table 4: Information/documents

Document	Reference number
Operating manual	7520.8
BOATRONIC MS, BOATRONIC MS-420 operating manual	7134.8
Operating manual for EA-B/EA-C actuators	7520.85
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
Typical tender for BOA-CVE Compact	7520.522
Typical tender for BOA-CVE SuperCompact	7520.521
Typical tender for BOA-W	7520.524
Typical tender for BOA-CVE IMS	7520.525
Typical tender for BOA-CVE Compact EKB	7520.523
Typical tender for BOA-CVE IMS EKB	7520.526

Pressure/temperature ratings

Table 5: Test pressure and operating pressure

Nominal pressure	Nominal size	Shell test	Leak test (seat)	Permissible operating pressure ⁴⁾
		With water to DIN EN 12266-1		
		P10, P11	P12, leakage rate A	-10 to +120 °C ⁵⁾
PN	DN	[bar]	[bar]	[bar]
6	15 - 200	9	6,6	6
16 ⁶⁾	15 - 200	24	17,6	16

Valve characteristics

The basic control valve configuration runs on a linear characteristic.

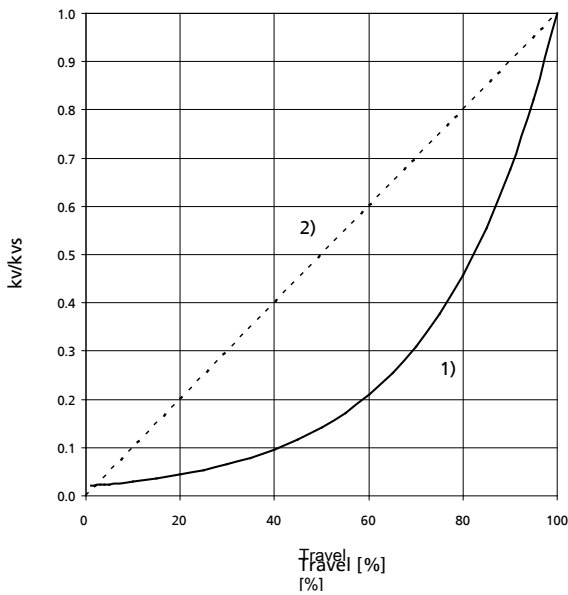


Fig. 1: Valve characteristics

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

The valves are available for the following leakage rates without extra charge:

- Leakage rate 0.05 % of K_{vs}
- Leakage rate 0.01 % of K_{vs}
- 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_{vs} value.

⁴ Static load
⁵ BOA-CVE IMS EKB up to 40 °C, BOA-CVE EKB up to 80 °C
⁶ EKB variants also available in PN 10

Leakage rate 0.05 % of Kvs
Table 6: Valve/actuator combinations based on actuator stroke to K_{vs} for a leakage rate of 0.05 % of K_{vs}

Type	DN	K_{vs} value	Actuator stroke	Actuator type $\Delta p_{smax}^7)$ for a leakage rate of 0.05 % of K_{vs} in bar				
BOA-CVE C/ BOA-CVE W/ BOA-CVE EKB/ BOA-CVE IMS BOA-CVE IMS EKB	15	3	5	EA-B 10 11 bar				
	15	6,3	8					
	15	9	16					
BOA-CVE C/ BOA-CVE CS/ BOA-CVE W/ BOA-CVE IMS/ BOA-CVE EKB BOA-CVE IMS EKB	20	6,3	7	EA-B 10 11 bar				
	20	10	10					
	20	16	16					
	20	20	19					
	25	6,3	7	EA-B 10 11 bar				
	25	10	10					
	25	16	16					
	25	20	19					
	32	16	12	EA-B 10 9 bar	EA-C 20 14 bar			
	32	20	16					
	32	25	20					
	32	30	27					
	40	25	14	EA-B 10 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 10 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						

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⁷ Maximum permissible closing pressure at a leakage rate of 0.05 % of K_{vs} in bar

Leakage rate 0.01 % of Kvs
Table 7: Valve/actuator combinations based on actuator stroke to K_{vs} for a leakage rate of 0.01 % of K_{vs}

Type	DN	K_{vs} value	Actuator stroke	Actuator type $\Delta p_{smax}^{8)}$ for a leakage rate of 0.01 % of K_{vs} in bar				
BOA-CVE C/ BOA-CVE W/ BOA-CVE EKB/ BOA-CVE IMS BOA-CVE IMS EKB	15	3	5	EA-B 10 10 bar				
	15	6,3	8					
	15	9	16					
BOA-CVE C/ BOA-CVE CS/ BOA-CVE W/ BOA-CVE IMS/ BOA-CVE EKB BOA-CVE IMS EKB	20	6,3	7	EA-B 10 10 bar				
	20	10	10					
	20	16	16					
	20	20	19					
	25	6,3	7	EA-B 10 10 bar				
	25	10	10					
	25	16	16					
	25	20	19					
	32	16	12	EA-B 10 8 bar	EA-C 20 13 bar			
	32	20	16					
	32	25	20					
	32	30	27					
	40	25	14	EA-B 10 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 10 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						

⁸ Maximum permissible closing pressure at a leakage rate of 0.01 % of K_{vs} in bar

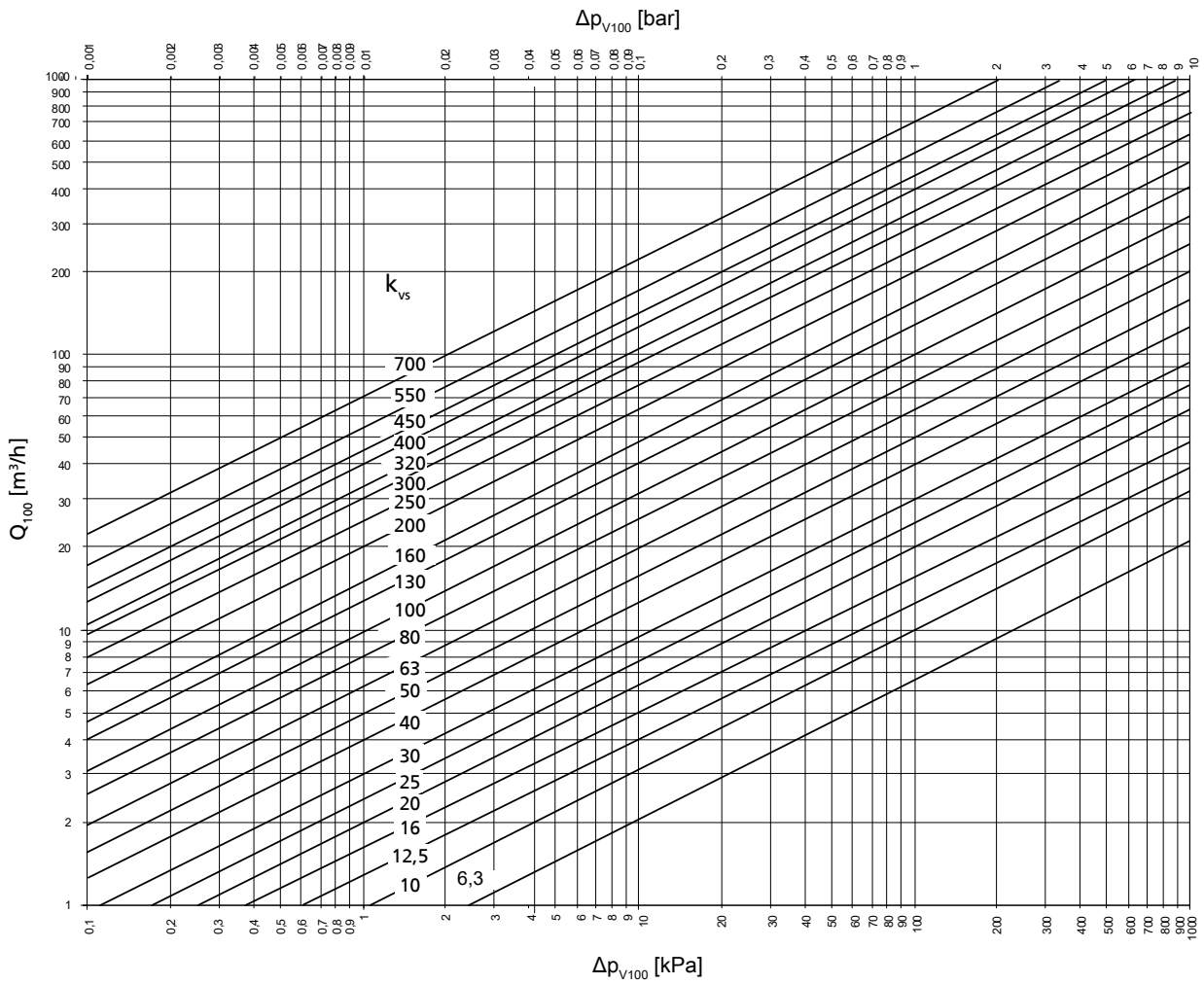
Leakage rate A to DIN EN 12266-1
Table 8: Valve/actuator combinations based on actuator stroke to K_{vs} for leakage rate A to DIN EN 12266-1

Type	DN	K_{vs} value	Actuator stroke	Actuator type $\Delta p_{smax}^{9)}$ for leakage rate A (drop-tight) in bar			
BOA-CVE C/ BOA-CVE W/ BOA-CVE EKB/ BOA-CVE IMS BOA-CVE IMS EKB	15	3	5	EA-B 10 8 bar			
	15	6,3	8				
	15	9	16				
BOA-CVE C/ BOA-CVE CS/ BOA-CVE W/ BOA-CVE IMS/ BOA-CVE EKB BOA-CVE IMS EKB	20	6,3	7	EA-B 10 8 bar			
	20	10	10				
	20	16	16				
	20	20	19				
	25	6,3	7	EA-B 10 8 bar			
	25	10	10				
	25	16	16				
	25	20	19				
	32	16	12	EA-B 10 6 bar	EA-C 20 11 bar		
	32	20	16				
	32	25	20				
	32	30	27				
	40	25	14	EA-B 10 4 bar	EA-C 20 7,5 bar	EA-C 40 1 -5 bar	
	40	30	17				
	40	40	21				
	40	50	30				
	50	40	15	EA-B 10 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					

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⁹ 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 3 to 4 m/s in the pipe cross-section must not be exceeded.

Table 9: Description of units

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

Technical data
Technical data - control valve
Table 10: Technical data of control valves

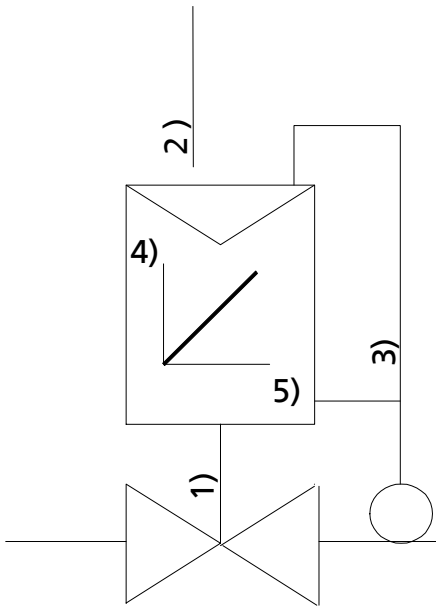
Characteristic	Value
Nominal pressure	PN 6/10/16, depending on the type series
Valve characteristic	linear, optimised in the opening range
Leakage rate	Options: <ul style="list-style-type: none"> ▪ 0 - 0.05 % of K_{vs} value, VDI/VDE 2173 ▪ 0 - 0.01 % of K_{vs} value, VDI/VDE 2173 ▪ Leakage rate A, drop-tight, to DIN EN 1092-2
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 -10 to +40 °C for BOA-CVE IMS EKB

Technical data - actuators
Table 11: Technical data of actuators

Characteristic		Actuator type		
		EA-B 10	EA-C 20 to 140, continuous-action	EA-C 20 to 140, 3-point
Power supply	Supply voltage	24 V AC/DC \pm 10 %	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	1000 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 - 1,3 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 Ω	100 k Ω	-
	Current	4-20 mA	4-20 mA	-
	Input resistance		100 k Ω	-
	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-metre connection cable, 4 x 0.75 mm ²	Terminal box max. 2.5 mm ²	Direct connection to printed circuit board max. 2.5 mm ²

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_{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

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

Table 12: Accessories

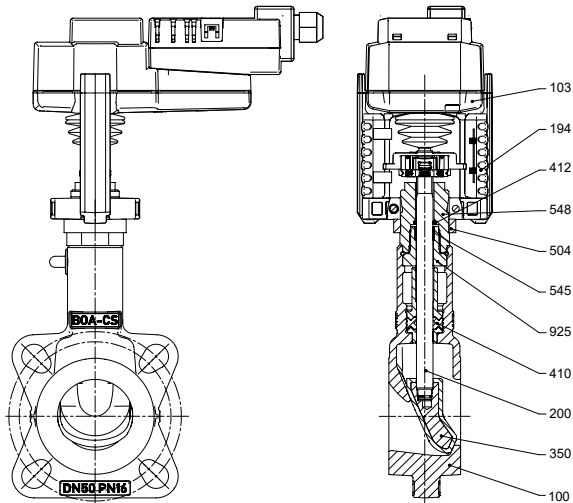
Description	Mat. No.
Parameterisation kit	46001269

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.

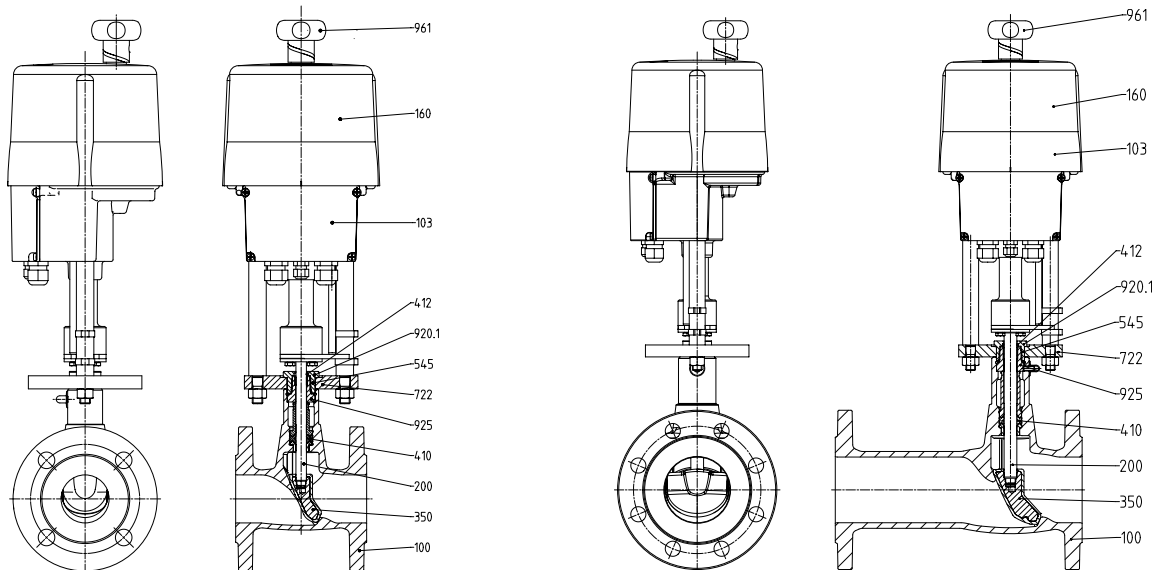
If combined with the process controller, BOA-CVE IMS or BOA-CVE IMS EKB with BOATRONIC MS-420 can be used for this purpose.

Refer to type series booklet 7128.1 for further data.

Materials



DN 15 - 50 with actuator type EA-B 10



DN 32 - 200 with actuator type EA-C 20 -

140

Fig. 2: Sectional drawings of control valve with electric actuator

Table 13: Parts list

Part No.	Description	Material
100	Body	EN-GJL-250 (5.1301) ¹⁰⁾
103	Actuator housing	Plastic
160	Actuator cover	Plastic/Aluminium
194	Bracket	Aluminium
200	Stem	Stainless steel, min. 13 % chrome (Cr)
350	Control valve disc	Grey cast iron/EPDM ¹¹⁾
410	Profile seal ¹¹⁾	Elastomer EPDM ¹¹⁾
412	O-ring	Elastomer NBR
504	Spacer ring	Galvanised steel
545	Bearing bush	Steel/PTFE
548	Actuating bush	Galvanised steel
722	Top flange	Steel

¹⁰⁾ EKB variant with internal and external electrostatic plastic coating, as per KTW recommendation (5.1301)

¹¹⁾ EKB variant as per KTW recommendation

Part No.	Description	Material
920.1	Union nut	Galvanised steel
925	Stem nut	Galvanised steel
961	Emergency handwheel	Plastic

Dimensions and weights

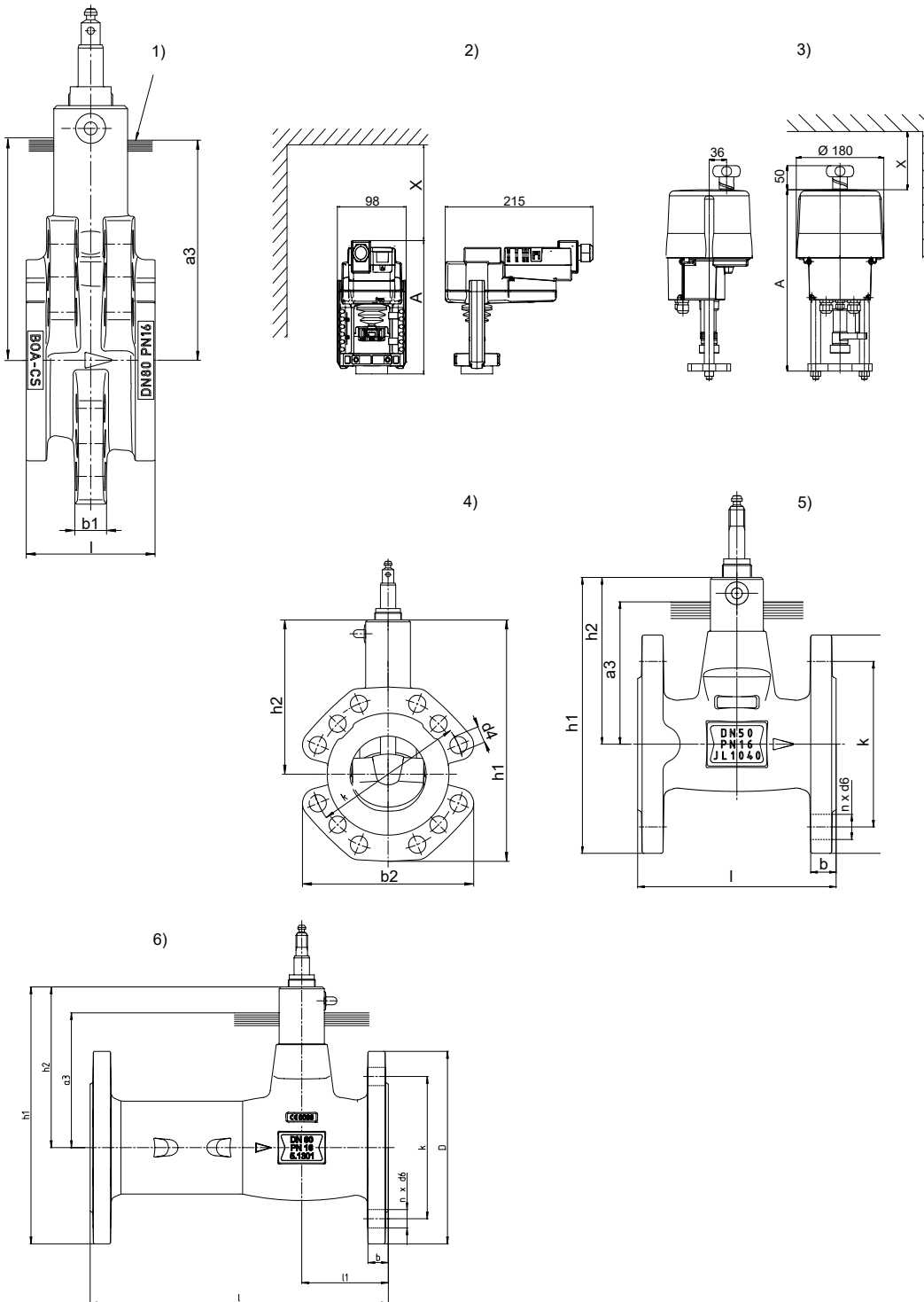


Fig. 3: Valve and actuator dimensions

1)	Insulation boundary in acc. with German energy-saving regulations	2)	EA-B 10	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 / BOA-CVE IMS EKB

Dimensions and weights of BOA-CVE CS
Table 14: BOA-CVE CS control valve

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

Table 15: Electric actuator types EA-B 10, EA-C 20 - 140

Actuator	Actuating force	A	X	Continuous-action 24 V AC	Continuous-action 230 V AC	3-point 230 V AC
	[N]	[mm]	[mm]	[kg]	[kg]	[kg]
EA-B 10	1000	170	150	1,2	-	-
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

7520.1/19-EN

¹² Single valve size: DN 20/25

Dimensions and weights of BOA-CVE C/EKB
Table 16: BOA-CVE C/EKB control valve

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

Table 17: Electric actuator types EA-B 10, EA-C 20 to EA-C 140

Actuator	Actuating force	A	X	Continuous-action 24 V AC	Continuous-action 230 V AC	3-point 230 V AC
	[N]	[mm]	[mm]	[kg]	[kg]	[kg]
EA-B 10	1000	170	150	1,2	-	-
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/IMS EKB
Table 18: BOA-CVE W/IMS/IMS EKB control valve

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

Table 19: Electric actuator types EA-B 10, EA-C 20 to EA-C 140

Actuator	Actuating force	A	X	Continuous-action 24 V AC	Continuous-action 230 V AC	3-point 230 V AC
	[N]	[mm]	[mm]	[kg]	[kg]	[kg]
EA-B 10	1000	170	150	1,2	-	-
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

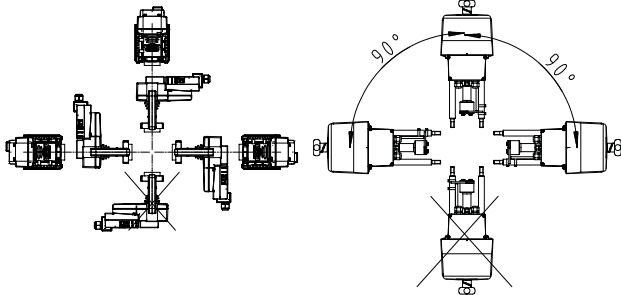
Mating dimensions as per standard

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 information

- 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 10¹³⁾

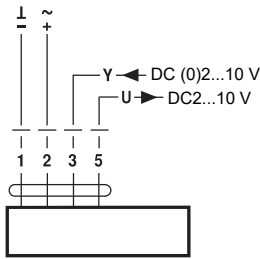
EA-C 20 to EA-C 140 and
EA-C 3-point¹³⁾

¹³⁾ Installation of BOA-CVE IMS and BOA-CVE IMS EKB with the valve stem in a horizontal position is not allowed.

Wiring diagrams

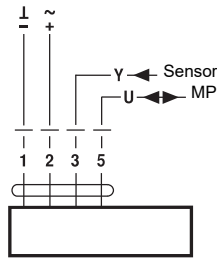
Terminal configuration EA-B 10/24

AC/DC 24 V, continuous-action



Cable colours:
1 = black
2 = red
3 = white
5 = orange

Operation on MP bus



Cable colours:
1 = black
2 = red
3 = white
5 = orange

Fig. 4: Continuous-action actuation

Wiring diagram EA-B 10/24

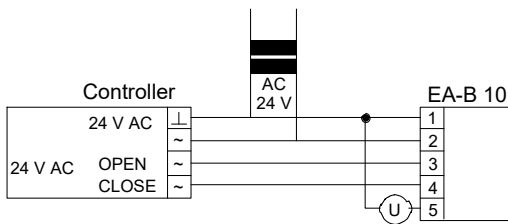


Fig. 5: 3-point actuation

Terminal configuration EA-C 20 to 140

Table 20: Continuous-action and 3-point 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	Push button																																	
↑	↑	↑	↓	↓	↓	↑↓	↑↓	↑	↑	↑	↑	↑	↓	↑	↑	↑	↑↓	↑↓	↑↓	↑↓	↑	↑																																					
+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	24 V AC/DC □ 115 V AC □ 230 V AC □	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 configuration, only the terminals in columns Ⓑ, ⓔ and ⓙ are active. ⓔ is set to 24 V AC/DC by default.

Table 21: Key

Ⓐ	Setpoint input	ⓙ	Supply voltage: single-phase alternating current or direct current
Ⓑ	Active actual-position feedback	ⓚ	Field bus connection (optional)
Ⓝ	Volt-free fault message (optional)	ⓛ	Communication with PC
ⓓ	Binary control (standard 24 V AC/DC)	ⓜ	Commissioning
ⓔ	Power failure signal ¹⁴⁾	ⓞ	Galvanically isolated 1 kV
ⓕ	Supply	ⓟ	Process sensor (optional)
ⓖ	Actual value	ⓠ	Limit switch, volt-free contact
ⓗ	Closed	ⓡ	Supply voltage: three-phase current
ⓙ	Open		

¹⁴ Optional connections for external power back-up unit

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

Table 22: 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	
↑	↑	↑	↓	↓	↓	↑↓	↑↓	↑	↑	↑	↑	↑	↓	↑	↑	↑	↑↓	↑↓	↑↓	↑↓	↑↓	↑	↑				
+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 24 V AC/DC □ 115 V AC □ 230 V AC □	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)	PE	(Optional)		
Ⓐ			Ⓑ			Ⓒ		Ⓓ			Ⓔ		Ⓕ		Ⓖ		Ⓗ		Ⓘ		Ⓚ		Ⓛ	Ⓜ			
Ⓝ						Ⓖ						Ⓘ															

In continuous-action configuration, only the terminals in columns Ⓐ, Ⓑ and Ⓓ are active.

Table 23: 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

3-point actuation, 230 V AC

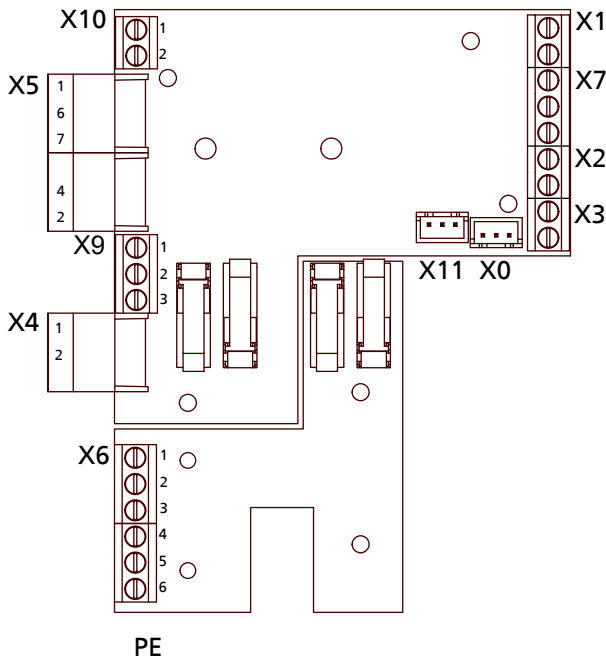
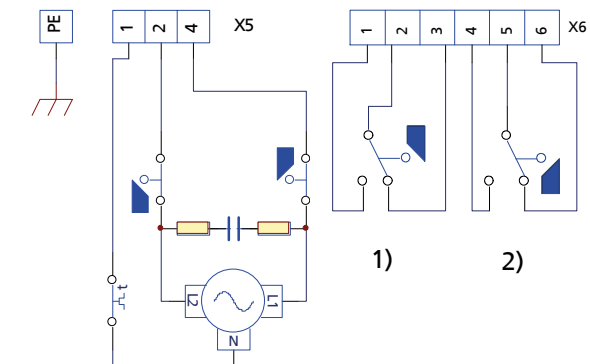


Fig. 6: Terminal configuration on printed circuit board

X1	Internal wiring
X2	Internal wiring
X3	Internal wiring

X4	Potentiometer 1
X5/1	Neutral
X5/2	Motor phase to open
X5/4	Motor phase to close
X5/6 and X5/7	Thermal switch 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
----	--------	----	------

Specification sheet for valve selection
Operating data

Place of installation	Measuring/control task ¹⁵⁾			Potentially explosive atmosphere (zone)	
Ambient temperature	[°C]	Max.		Min.	
Piping	-	DN		PN	
Fluid handled	-				

Process data

Volume flow rate	[m ³ /h]	
K _{vs} value	[m ³ /h]	
Inlet pressure p1 (pressure upstream of control valve)	[bar]	
Outlet pressure p2 (pressure downstream of control valve)	[bar]	
Closing pressure Δp _{s,max}	[bar]	
Differential pressure in closed-loop control operation Δp _{max}	[bar]	

Valve data

Valve type	-	BOA-CVE CS	BOA-CVE C	BOA-CVE W	BOA-CVE IMS BOA-CVE IMS EKB	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	Δp closes (actuator selection)	[bar]				
	Feature/function	Continuous 24 V or 230 V		3-point 24 V	3-point 230 V	
	Characteristic	Linear ¹⁶⁾ □ Equal-percentage □		Linear	Linear	
	Actuating time	[s]				
	Position value		Setpoint	Actual	Actual	
		DC 0-10 V				¹⁷⁾ -
		DC 2-10 V ¹⁶⁾				¹⁷⁾
		0-20 mA				¹⁷⁾
		4-20 mA				¹⁷⁾
	Feedback via 2 limit switches	-				X
Leakage rate	0.05 % of K _{vs} ¹⁶⁾				-	
	0.01 % of K _{vs}				-	
	Leakage rate A (DIN EN 12266-1)				X	

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¹⁵⁾ Measuring, open-loop and closed-loop control task
¹⁶⁾ Default setting
¹⁷⁾ Only possible with EA-C actuators

Accessories	Process controller		-	-
	Programming tool required for process controller		-	-
	Actuator heating			
	Power back-up unit			-

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. The information provided in this list is for orientation only. Warranty claims may not be asserted on the basis of this list.

Table 24: Symbols key

Symbol	Description
✓	The fluid handled is not normally aggressive toward the materials. Valve can be used if ¹⁸⁾ and ¹⁹⁾ 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.

Table 25: Chemical resistance chart for water¹⁸⁾

Fluids handled	
Bathing water (fresh water)	○
Bathing water (seawater)	✗
Brackish water	✗
Service water	○
Chlorinated water (≤ 0.6 mg/kg)	✓
Deionised water (demineralised water) ²⁰⁾	○
Distilled water ²⁰⁾	○
Heating water ²⁰⁾	✓
Condensate	○
Oil-free cooling water	○
Oil-containing cooling water	✗
Seawater	✗
Ozonised water (≤ 0.5 mg/kg)	✓
Pure water	✓
Raw water	○
Waste water ¹⁹⁾	✓
Partly desalinated water ²⁰⁾	○
Thermal water	✗
Drinking water	✗
Fully desalinated water ²⁰⁾	○

Table 26: Chemical resistance chart for oils (aromatic content 5 mg/kg)

Fluids handled	
Vegetable oils	✗
Mineral oils	✗
Synthetic oils	✗

Fluids handled	
Petroleum	✗
Oil/water emulsion	✗
Kerosene	✗

Table 27: Chemical resistance chart for refrigerants

Fluids handled	
Ammonium hydroxide (≤ 25 %, ≤ 25 °C)	✓
Glycol (ethylene glycol)	✓
Water/glycol mixture (20 % $\leq c \leq 50$ %, ≤ 90 °C)	✓
Inorganic cooling brine, pH 7.5	✓

Table 28: Chemical resistance chart for cleaning agents

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

Table 29: 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 ₂	✗

¹⁸⁾ General criteria for water to be handled by products made of non-alloyed materials: pH > 7; chlorides (Cl-) < 150 mg/kg; chlorine (Cl) < 0.6 mg/kg. Other factors to be considered: hardness, carbon dioxide content (CO₂), oxygen (O₂) and dissolved substances. Contact KSB if limits are exceeded!

¹⁹⁾ Without larger solids or stringy material

²⁰⁾ 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.

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. The information provided in this list is for orientation only. Warranty claims may not be asserted on the basis of this list.

Table 30: Symbols key

Symbol	Description
✓	The fluid handled is not normally aggressive toward the materials. Valve can be used if ²¹⁾ and ²²⁾ 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.

Table 31: Chemical resistance chart for water²¹⁾

Fluids handled	
Bathing water (fresh water)	○
Bathing water (seawater)	✗
Brackish water	✗
Service water	○
Chlorinated water (≤ 0.6 mg/kg)	✓
Deionised water (demineralised water) ²³⁾	○
Distilled water ²³⁾	○
Heating water ²³⁾	✓
Condensate	○
Oil-free cooling water	○
Oil-containing cooling water	✗
Seawater	✗
Ozonised water (≤ 0.5 mg/kg)	✓
Pure water	✓
Raw water	○
Waste water ²²⁾	✓
Partly desalinated water ²³⁾	○
Thermal water	✗
Drinking water	✗
Fully desalinated water ²³⁾	○

Table 32: 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⁻) < 150 mg/kg; chlorine (Cl) < 0.6 mg/kg. Other factors to be considered: hardness, carbon dioxide content (CO₂), oxygen (O₂) and dissolved substances. Contact KSB if limits are exceeded!

²²⁾ Without larger solids or stringy material

²³⁾ 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.

Table 33: Chemical resistance chart for refrigerants

Fluids handled	
Ammonium hydroxide (≤ 25 %, ≤ 25 °C)	✓
Glycol (ethylene glycol)	✓
Water/glycol mixture (20 % $\leq c \leq 50$ %, ≤ 90 °C)	✓
Inorganic cooling brine, pH 7.5	✓

Table 34: Chemical resistance chart for cleaning agents

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

Table 35: 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 ₂	✗

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. The information provided in this list is for orientation only. Warranty claims may not be asserted on the basis of this list.

Table 36: Symbols key

Symbol	Description
✓	The fluid handled is not normally aggressive toward the materials. Valve can be used if ²⁴⁾ and ²⁵⁾ 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.

Table 37: Chemical resistance chart for water²⁴⁾

Fluids handled	
Bathing water (fresh water)	○
Bathing water (seawater)	✗
Brackish water	✗
Service water	○
Chlorinated water (≤ 0.6 mg/kg)	✓
Deionised water (demineralised water) ²⁶⁾	○
Distilled water ²⁶⁾	○
Heating water ²⁶⁾	✓
Condensate	○
Oil-free cooling water	○
Oil-containing cooling water	✗
Seawater	✗
Ozonised water (≤ 0.5 mg/kg)	✓
Pure water	✓
Raw water	○
Waste water ²⁵⁾	✓
Partly desalinated water ²⁶⁾	○
Thermal water	✗
Drinking water	✗
Fully desalinated water ²⁶⁾	○

Table 38: Chemical resistance chart for oils (aromatic content 5 mg/kg)

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

²⁴⁾ General criteria for water to be handled by products made of non-alloyed materials: pH > 7; chlorides (Cl⁻) < 150 mg/kg; chlorine (Cl) < 0.6 mg/kg. Other factors to be considered: hardness, carbon dioxide content (CO₂), oxygen (O₂) and dissolved substances. Contact KSB if limits are exceeded!

²⁵⁾ Without larger solids or stringy material

²⁶⁾ 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.

Table 39: Chemical resistance chart for refrigerants

Fluids handled	
Ammonium hydroxide (≤ 25 %, ≤ 25 °C)	✓
Glycol (ethylene glycol)	✓
Water/glycol mixture (20 % $\leq c \leq 50$ %, ≤ 90 °C)	✓
Inorganic cooling brine, pH 7.5	✓

Table 40: Chemical resistance chart for cleaning agents

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

Table 41: 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 ₂	✗

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. The information provided in this list is for orientation only. Warranty claims may not be asserted on the basis of this list.

Table 42: Symbols key

Symbol	Description
✓	The fluid handled is not normally aggressive toward the materials. Valve can be used if ²⁷⁾ and are observed.
X	The fluid handled is aggressive toward the materials. Valve cannot be used. The fluid handled is not suitable or applicable for sensor measurement.
○	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.

Table 43: Chemical resistance chart for water

Fluids handled	BOA Control/ BOA Control IMS	BOA Control EKB/ BOA Control IMS EKB
Bathing water (fresh water)	○	✓
Bathing water (seawater)	X	X
Brackish water	X	X
Service water	○	✓
Chlorinated water (≤ 0.6 mg/kg)	✓	✓
Deionised water (demineralised water)	○ ²⁸⁾	✓
Distilled water	○ ²⁸⁾	✓
Heating water ²⁸⁾	✓	○ ²⁹⁾
Condensate	○	✓
Oil-free cooling water	○	✓
Oil-containing cooling water	X	X
Seawater	X	X
Ozonised water (≤ 0.5 mg/kg)	✓	✓
Pure water	✓	✓
Raw water	○	✓
Grey water ³⁰⁾	○	✓
Partly desalinated water	○ ²⁸⁾	✓
Thermal water	X	○
Drinking water	X	✓
Fully desalinated water	○ ²⁸⁾	✓

Table 44: Chemical resistance chart for oils (aromatic content 5 mg/kg)

Fluids handled	BOA Control/ BOA Control IMS	BOA Control EKB/ BOA Control IMS EKB
Vegetable oils	X	X
Mineral oils	X	X
Synthetic oils	X	X
Petroleum	X	X
Oil/water emulsion	X	X
Kerosene	X	X

²⁷ General criteria for water to be handled by products made of non-alloyed materials: pH > 7; chlorides (Cl-) < 150 mg/kg; chlorine (Cl) < 0.6 mg/kg. Other factors to be considered: hardness, carbon dioxide content (CO₂), oxygen (O₂) and dissolved substances. Contact KSB if limits are exceeded.

²⁸ Can only be used with systems and water qualities complying with VdTÜV 1466 or VDI 2035 guidelines. A pH ≥ 9.5 and an oxygen content of ≤ 0.02 mg/l are also recommended.

²⁹ Variants BOA-Control EKB / BOA-Control IMS EKB up to a max. fluid temperature of 40 °C

³⁰ Without larger solids or stringy material

Table 45: Chemical resistance chart for refrigerants

Fluids handled	BOA Control/ BOA Control IMS	BOA Control EKB/ BOA Control IMS EKB
Ammonium hydroxide ($\leq 25\%$, $\leq 25\text{ °C}$)	X	X
Glycol (ethylene glycol)	X	X
Water/glycol mixture ($20\% \leq c \leq 60\%$, $\leq 90\text{ °C}$)	✓	○ ²⁹⁾
Inorganic cooling brine, pH 7.5 ³¹⁾	○	○

Table 46: Chemical resistance chart for cleaning agents

Fluids handled	BOA Control/ BOA Control IMS	BOA Control EKB/ BOA Control IMS EKB
Lye for bottle rinsers (e.g. P3)	X	X
Lye for metal cleaning	X	X

Table 47: Chemical resistance chart for other fluids

Fluids handled	BOA Control/ BOA Control IMS	BOA Control EKB/ BOA Control IMS EKB
Landfill gas	X	X
Oil-containing compressed air	X	X
Aqueous glycerine	X	X
Carbon dioxide (gas)	X	X
Carbon dioxide (aqueous solution)	X	X
Oxygen O ₂	X	X

³¹ Reduced accuracy of flow measurement

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. The information provided in this list is for orientation only. Warranty claims may not be asserted on the basis of this list.

Table 48: Symbols key

Symbol	Description
✓	The fluid handled is not normally aggressive toward the materials. Valve can be used if ³²⁾ and ³³⁾ 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.

Table 49: Chemical resistance chart for water³²⁾

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	✓
Grey water ³³⁾	✓
Partly desalinated water	✓
Thermal water	○
Drinking water	✓
Fully desalinated water	✓

Table 50: Chemical resistance chart for oils (aromatic content 5 mg/kg)

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

Table 51: 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	✓

Table 52: Chemical resistance chart for cleaning agents

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

Table 53: 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 ₂	✗

³²⁾ General criteria for water to be handled by valves 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 (CO₂), oxygen (O₂) and dissolved substances. Contact KSB if limits are exceeded!

³³⁾ Without larger solids or stringy material



KSB SE & Co. KGaA
Johann-Klein-Straße 9 • 67227 Frankenthal (Germany)
Tel. +49 6233 86-0
www.ksb.com