TI-P405-33
EMM Issue 9

BDV60
Blowdown Vessels

Description

BDV60 blowdown vessels are CE marked and comply with the Pressure Equipment Directive (PED).
They also comply with Blowdown Systems, Guidance for Industrial Steam Boilers (Ref: BG03), for the construction of vessels used in boiler blowdown applications, issued by the Health and Safety Executive.

BDV60 blowdown vessels are designed to accept discharges from:

- Manual/automatically controlled bottom blowdown.
- Automatic TDS blowdown control valves and systems.
- Controlled bleed valves for continuous blowdown.
- Level control chambers and level gauge glasses.
- Heat recovery equipment.

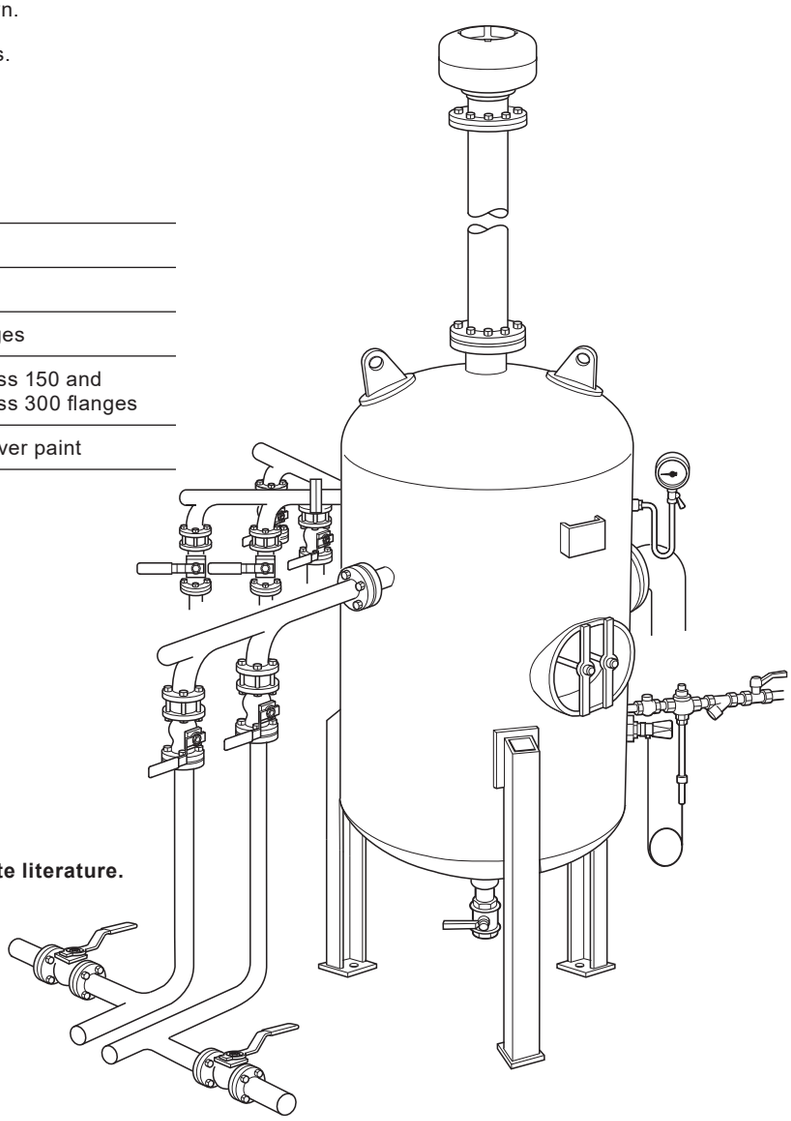
Design and construction

Design code		ASME VIII DIV 1 2015	
Material		Carbon steel	
Connection	**Standard**	EN 1092	PN16 flanges
	Optional	ASME B16.5	ASME Class 150 and ASME Class 300 flanges
Paint finish		Temperature resistant silver paint	

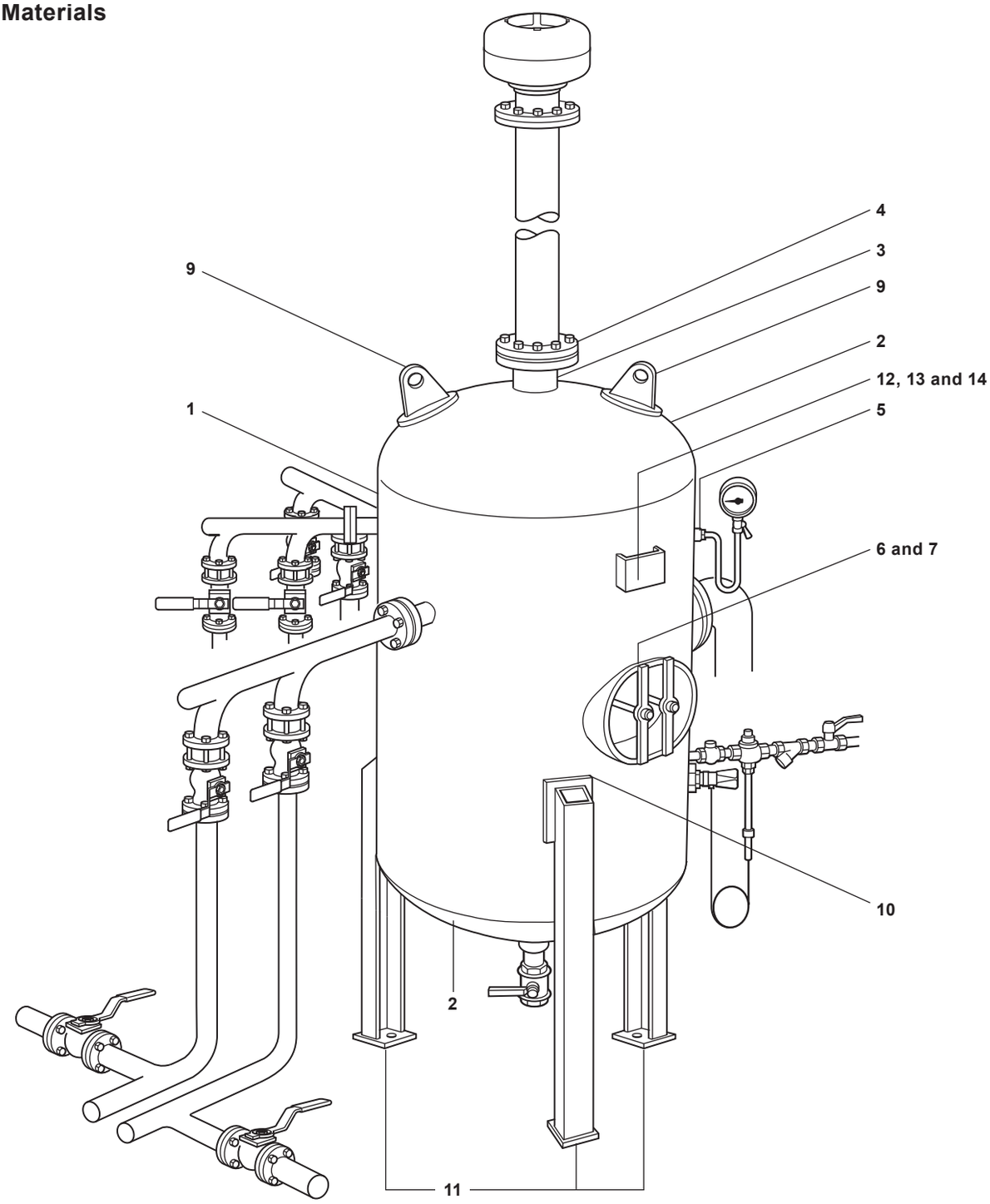
Associated equipment

- VH vent head
- M21S2 ball valve
- DCV2 check valves
- Pressure gauge and 'U' syphon
- Vessel drain valve
- Cooling water system

For further details please refer to the appropriate literature.

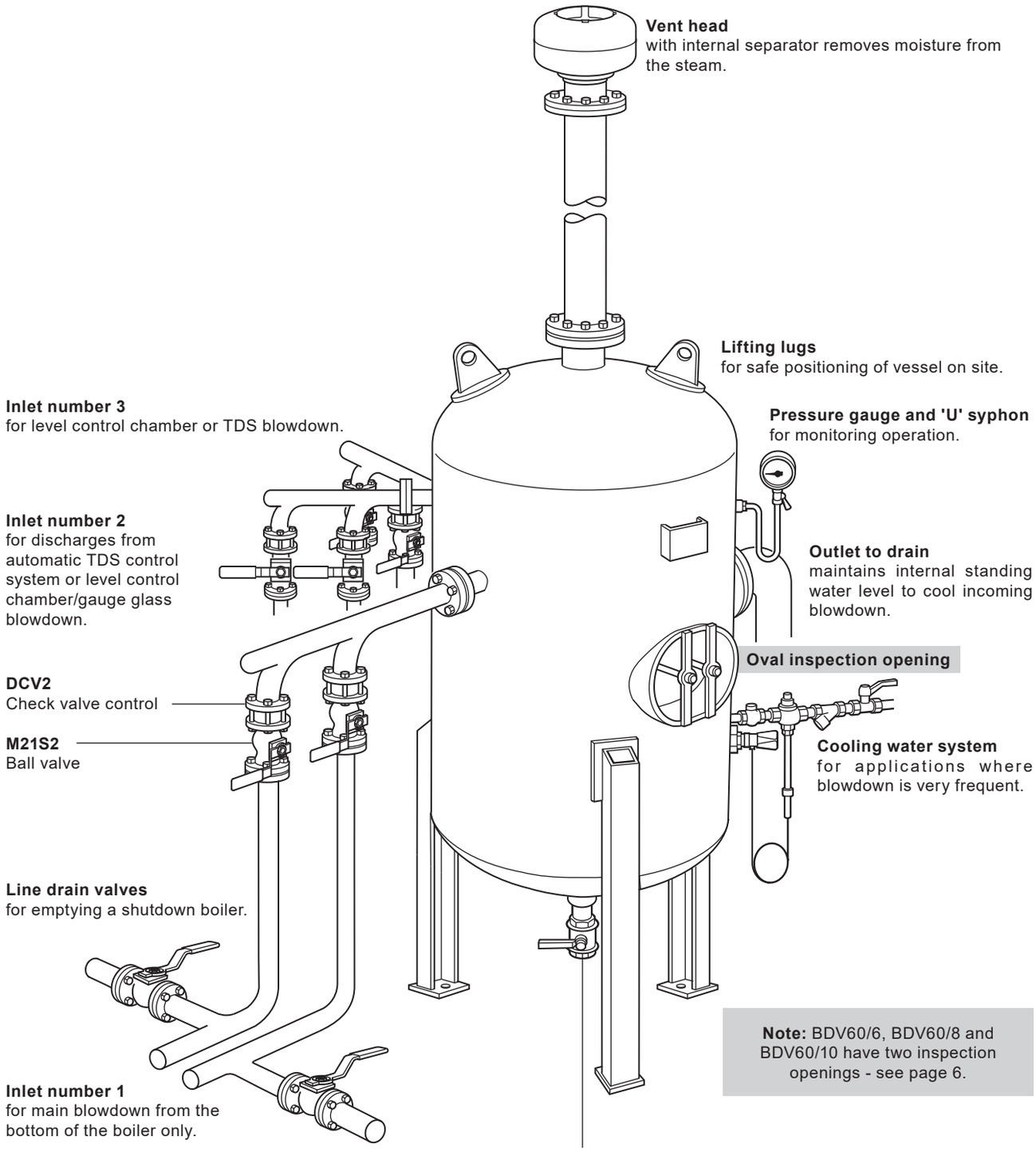


Materials



No.	Part	Material
1	Shell cylinder	BS EN 10028-2 P265GH
2	Dished ends	BS EN 10028-2 P265GH
3	Nozzle, pipe	ASTM A333 Gr.6
4	Nozzle, flange	A105N
5	Nozzle, coupling	ASTM A350 LF2
6	Inspection opening	BS EN 10028-2 P265GH
7	Inspection opening gasket	Rubber, NR/SBR
8	Impingement plate	ASTM A240, 304

No.	Part	Material
9	Lifting lug	BS EN 10028-2 P265GH
10	Wrapper plate	BS EN 10028-2 P265GH
11	Support leg/foot	BS EN 10025 S275
12	Nameplate stand-off	BS EN 10028-2 P265GH
13	Nameplate bracket	BS EN 10025 S275
14	Nameplate	Aluminium
15	Long radius butt weld elbow (Internal)	ASTM A420 WPL6



This is only a representation of a possible set-up, the product may have 3 or 4 legs and the inspection port may be different on the product.

Sizing and selection

The selection of a blowdown vessel depends on the flowrate and the proportion of flash steam released.

The following factors affect the selection:

- The boiler pressure.
- The number of boilers.
- The duration of blowdown.
- The blowdown line size.
- The length of blowdown line between the boiler and the blowdown vessel.
- The blowdown regime.

For example the sizing below assumes the blowdown line has an 'equivalent straight length' of at least 7 m.

When estimating 'equivalent straight length' the lengths shown in **Table 1** should be added to the length of straight pipe to allow for valves and fittings.

From **Table 1** it will be seen that in most practical applications it would be unusual for the equivalent straight length to be less than 7 m.

If the length is less than 7 m multiply the actual boiler pressure by 1.15 before using the sizing table, **Table 2**.

The blowdown regime:

- Typical normal bottom blowdown of, perhaps, 5 seconds duration.
- Weekly low level alarm testing where practice is in accordance with BG01 and INDG436 - steam down from normal level to first low water level and blow down from first to second low water level.
- Blowdown discharges from sequencing valves on external chambers, gauge glasses etc.
- Automatic TDS control discharges.

The selection table (Table 2) only applies if the blowdown duration is no longer than 20 seconds in total, starting with a cold vessel (water at a temperature of 15 °C to 20 °C).

If this time is exceeded, carryover of water with the flash steam may occur through the vent. The water may also be too hot to discharge safely and legally into a public drainage system.

Always incorporate a cooling water system for multi-boiler applications or in instances where the frequency or duration of blowdown is considerably in excess of the requirements stated in Blowdown Systems, Guidance for Industrial Steam Boilers (Ref: BG03), BG01 and INDG436.

If there is any doubt about correct vessel selection, please contact Spirax Sarco outlining the specific conditions and blowdown regime.

Table 1 Equivalent straight lengths

Blowdown line size	25 mm (1")	32 mm (1¼")	40 mm (1½")	50 mm (2")
Pipe fitting or valve	**Equivalent length in metres**			
Long radius bend	0.5	0.7	0.8	0.9
Manifold inlet	1.1	1.5	1.7	2.2
Globe valve	9.6	12.2	13.9	17.8
Check valve	3.6	4.3	5.0	6.3
Blowdown valve	0.3	0.4	0.4	0.5

Table 2 Blowdown vessel selection

Blowdown line size		25 mm (1")	32 mm (1¼")	40 mm (1½")	50 mm (2")
Boiler pressure		**Blowdown vessel BDV60/_**			
bar g	**psi g**				
5.5	**80**	3	3	3	4
7.6	**110**	3	3	4	5
8.3	**120**	3	4	4	6
10.3	**150**	3	4	5	6
12.1	**175**	4	4	5	8
17.2	**250**	4	5	6	8
20.7	**300**	5	6	8	10
24.1	**350**	5	6	8	10
27.6	**400**	6	8	8	-

Note: For intermediate pressures go to the next higher pressure.

Table 1 Equivalent straight lengths

Blowdown line size	25 mm (1")	32 mm (1¼")	40 mm (1½")	50 mm (2")
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Globe valve	9.6	12.2	13.9	17.8
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Blowdown valve	0.3	0.4	0.4	0.5

Table 2 Blowdown vessel selection

Blowdown line size		25 mm (1")	32 mm (1¼")	40 mm (1½")	50 mm (2")
Boiler pressure bar g	**psi g**	**Blowdown vessel BDV60/_**			
5.5	**80**	3	3	3	4
7.6	**110**	3	3	4	5
8.3	**120**	3	4	4	6
10.3	**150**	3	4	5	6
12.1	**175**	4	4	5	8
17.2	**250**	4	5	6	8
20.7	**300**	5	6	8	10
24.1	**350**	5	6	8	10
27.6	**400**	6	8	8	-

Note: For intermediate pressures go to the next higher pressure.

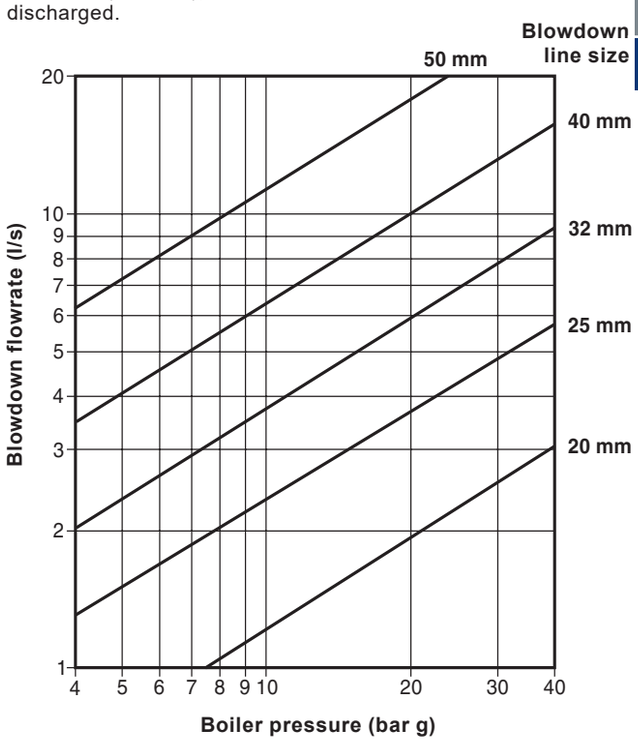
Table 3 Vent head selection

Note: The vent head required depends on the vessel selected

For a **BDV60/3** select a **VH4** vent head
For a **BDV60/4** select a **VH4** vent head
For a **BDV60/5** select a **VH6** vent head
For a **BDV60/6** select a **VH6** vent head
For a **BDV60/8** select a **VH8** vent head
For a **BDV60/10** select a **VH8** vent head

Graph 1 Blowdown flowrates

This graph will give the flowrate of blowdown in litres per second. When this value has been read, multiply it by the duration of blowdown (seconds), and the answer will be the maximum volume discharged.



How to select the blowdown vessel:

Step 1. With the aid of **Table 1**, determine the equivalent straight length of the blowdown line.

Step 2. Use **Table 2** to initially establish the correct size of vessel. Note that if the result of Step 1 is less than 7 m, multiple the boiler pressure by 1.15.
If the vessel is to be used in the conditions set out above, then continue to Step 4.

Step 3. Using **Table 4** which contains the vessel data, establish the volume of standing water in the selected vessel.
This volume should be at least **twice** that of the maximum volume of blowdown. The maximum volume of blowdown is usually the volume discharged when blowing down from 1st low level to 2nd low level alarm. If this volume is unknown, it can be calculated with the aid of **Graph 1**, where details on its use are given.
If it is determined that the volume of standing water is insufficient, then a larger blowdown vessel must be selected in order to satisfy this requirement.

Step 4. With the aid of **Table 3**, the correct vent head can be selected to suit the vessel.

The selection is now complete.

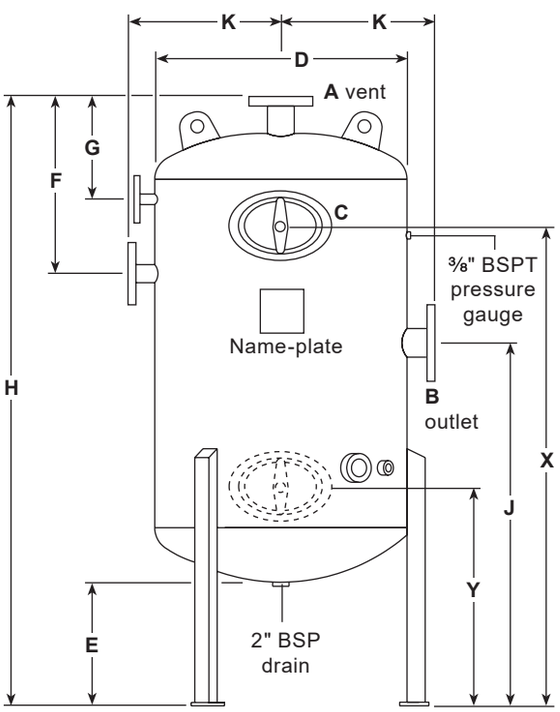
Selection example:

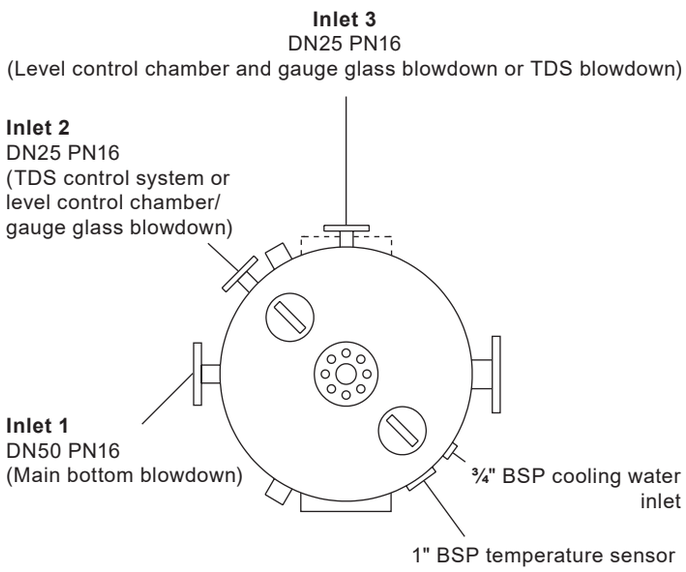
For a 10 bar g boiler with 40 mm blowdown line at least 7 m long select, from **Table 2**, a **BDV60/5**.
From **Table 3** select a **VH6** vent head.

Table 4 Sizes, pipe connections, dimensions, weights and capacities (approximate) in mm, kg and L

Blowdown vessel type				BDV60/3	BDV60/4	BDV60/5	BDV60/6	BDV60/8	BDV60/10
Sizes,pipe connections and dimensions	A	Flanged PN16*		100	100	150	150	200	200
	B	Flanged PN16*		80	80	100	100	150	150
	C	Oval Inspection opening	Height (Internal)	100	100	100	100	100	100
			Width (Internal)	150	150	150	150	150	150
	D			460	610	765	915	1205	1500
	E			400	400	400	400	400	400
	F			500	540	580	630	705	770
	G			310	350	390	440	525	590
	H			1830	1910	1995	2095	2240	2370
	J			1080	1125	1165	1215	1290	1355
	K			330	405	485	560	705	850
	X			1080	1120	1163	1568	1612	1676
	Y			-	-	-	864	962	1026
Number of legs				3	3	3	3	4	4
Weights	Empty			185	220	275	392	630	910
	Full (e.g. for hydraulic test)			376	580	861	1267	2252	3610
Capacities - standing water				96	180	293	437	811	1350

*** Note:** Flanged ASME B16.5 Class 150 and 300 connections are available at extra cost. For further details contact Spirax Sarco.





This is only a representation of a possible set-up, the product may have 3 or 4 legs and the inspection port may be different on the product.

How to order

Example: 1 off Spirax Sarco BDV60/5 blowdown vessel and a VH6 vent head to suit a 10 bar g boiler having a 40 mm blowdown line.

Pressure/temperature limits

Please note:
For the application of boiler blowdown and to comply with the HSE Guidance Note Blowdown Systems, Guidance for Industrial Steam Boilers (Ref: BG03) the vessel internal pressure should not exceed 0.35 bar g.

Body design conditions	PN16
Maximum design pressure	7 bar g @ 171 °C
Maximum design temperature	171 °C @ 7 bar g
Minimum design temperature	-10 °C
Maximum operating pressure re. Blowdown Systems, Guidance or Industrial Steam Boilers (Ref: BG03)	0.35 bar g
Maximum operating temperature re. Blowdown Systems, Guidance for Industrial Steam Boilers (Ref: BG03)	109 °C
Minimum operating temperature	0 °C
Designed for a maximum cold hydraulic test pressure of	11 bar g

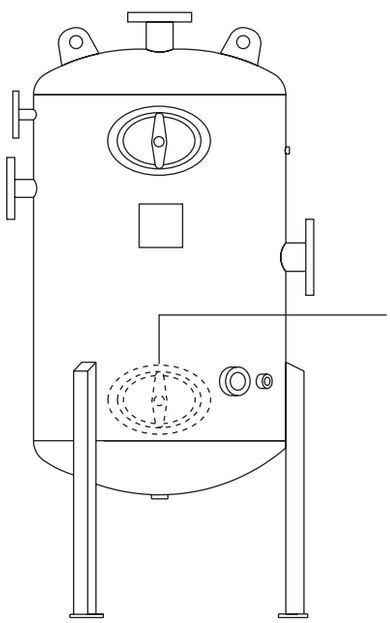
Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions supplied with the product.

Maintenance note:
The vessel must be drained every six months to remove concentrated blowdown water/sludge. Before reusing, the vessel must be refilled with fresh water.

Blowdown vessels should be thoroughly examined by a 'competent person' every 14 months or at every major boiler inspection.

Spare parts:
New gaskets for the inspection openings are available as spares from Spirax Sarco.



Note: There is a second inspection opening on the BDV60/6, BDV60/8 and BDV60/10 which is fitted 180° to the top opening. Other sizes have a single central opening, similar to the one shown on page 2.

2 Boiler house
Blowdown vessels

TI-P405-47
EMM Issue 2

KBV21i and KBV40i
Key Operated Boiler Blowdown Valves

Description

The key operated boiler blowdown valve consists of a carbon steel reduced bore ball valve with carbon reinforced PTFE seats and a key operated mechanism in stainless steel. Two types of key are sold as optional extras and are available as follows:

- **Standard length key**.
- **Extended length 'T' bar type key** for use where access to the valve is limited.

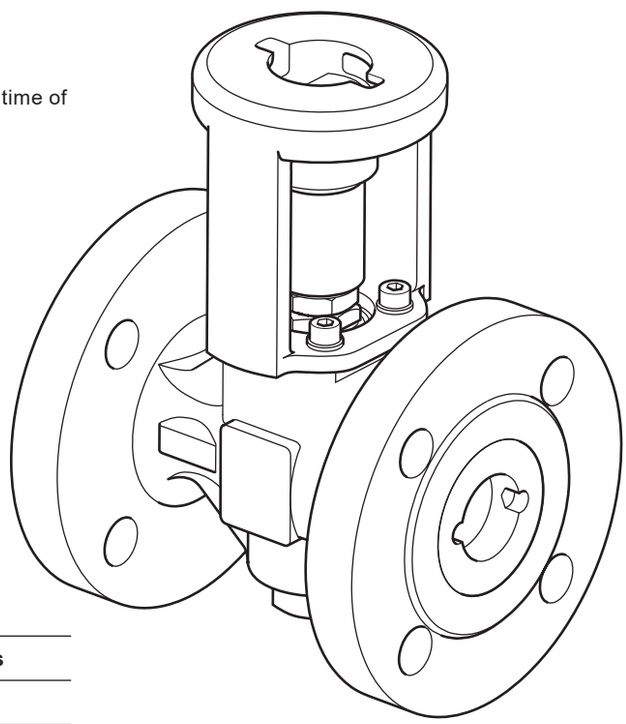
To ensure compliance with boiler regulations the key cannot be removed when the valve is open.
Note: The standard length key and extended length 'T' bar type key are sold separately. It is recommended that an extended length 'T' bar type key is purchased for valve sizes DN50 and DN65.

Standards

These products comply with the requirements of the European Pressure Equipment Directive 2014/68/EU and carries the CE mark when so required.
ISO mounting in accordance with ISO 5211.
Antistatic device complying with ISO 7121 and BS 5351.

Certification

These products are available with certififcation to EN 10204 3.1.
Note: All certification / inspection requirements must be stated at the time of order placement.



Sizes and pipe connections

DN25, DN32, DN40, DN50 and DN65
Flanged PN40 (F4), PN40 (BS) or ASME (ANSI) B 16.5 Class 300.

Available flange options:

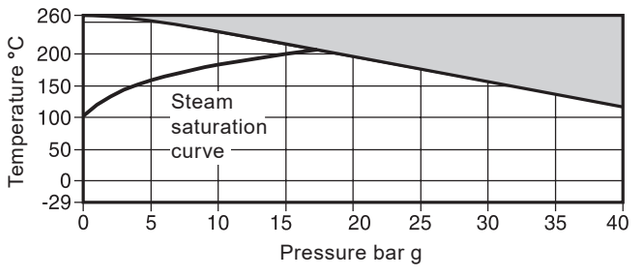
Flange	Face-to-face	Flange thickness
PN40 (F4)	DIN 3002 F4	EN 1092 Part 1
PN40 (BS)	BS 2080	EN 1092 Part 1
ASME (ANSI) 300	ASME B 16.10	ASME B 16.5

Materials

Body and insert		Zinc plated carbon steel	ASTM A216 WCB
Stem seals		Antistatic R-PTFE	
Vented ball		Austenitic stainless steel	AISI 316
Stem	DN65	Austenitic stainless steel	AISI 316
	DN25 - DN50	Martensitic stainless steel	AISI 420
Seats		Carbon and graphite reinforced PTFE	PDR 0.8

Pressure / temperature limits

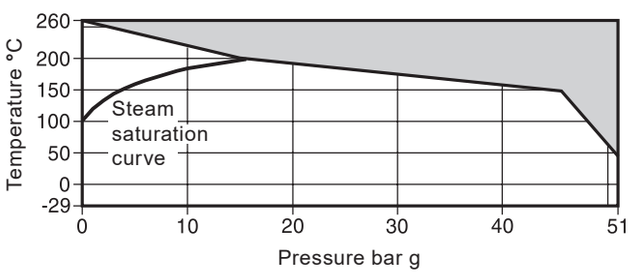
KBV21i



The product **must not** be used in this region

Body design conditions	PN40
PMA Maximum allowable pressure	40 bar g @ 120°C
TMA Maximum allowable temperature	260°C @ 0 bar g
Minimum allowable temperature	-29°C
PMO Maximum operating pressure for saturated steam service	17.25 bar g
TMO Maximum operating temperature	260°C @ 0 bar g
Minimum operating temperature. **Note:** For lower operating temperatures consult Spirax Sarco	-29°C
ΔPMX Maximum differential pressure is limited to the PMO	
Designed for a maximum cold hydraulic test pressure of :	60 bar g

KBV40i



The product **must not** be used in this region

Body design conditions	ASME 300
PMA Maximum allowable pressure	51 bar g @ 38°C
TMA Maximum allowable temperature	260°C @ 0 bar g
Minimum allowable temperature	-29°C
PMO Maximum operating pressure for saturated steam service	17.25 bar g
TMO Maximum operating temperature	260°C @ 0 bar g
Minimum operating temperature. **Note:** For lower operating temperatures consult Spirax Sarco	-29°C
ΔPMX Maximum differential pressure is limited to the PMO	
Designed for a maximum cold hydraulic test pressure of :	76.5 bar g

Valve coefficients

Size	DN25	DN32	DN40	DN50	DN65
Kv value	30	40	81	103	197

How to specify

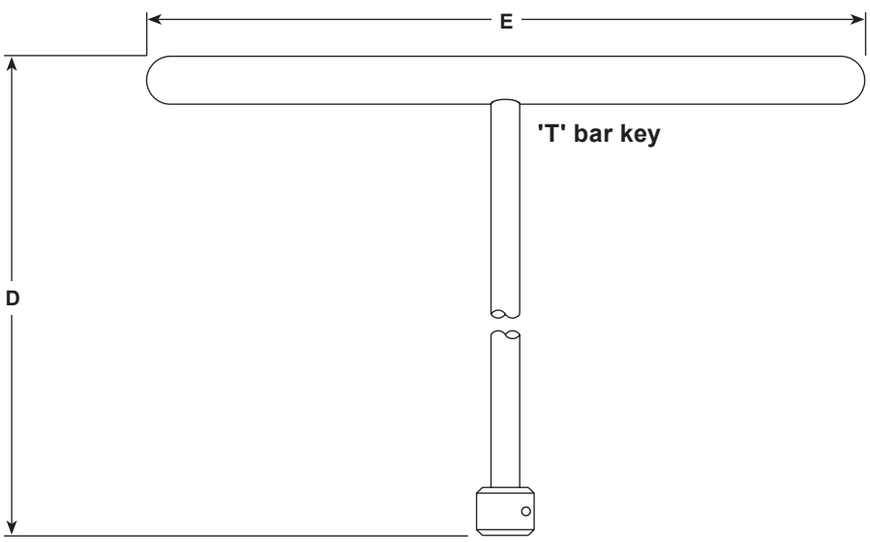
DN40 key operated boiler blowdown valve, flanged PN40 with carbon reinforced seats and stainless steel key.

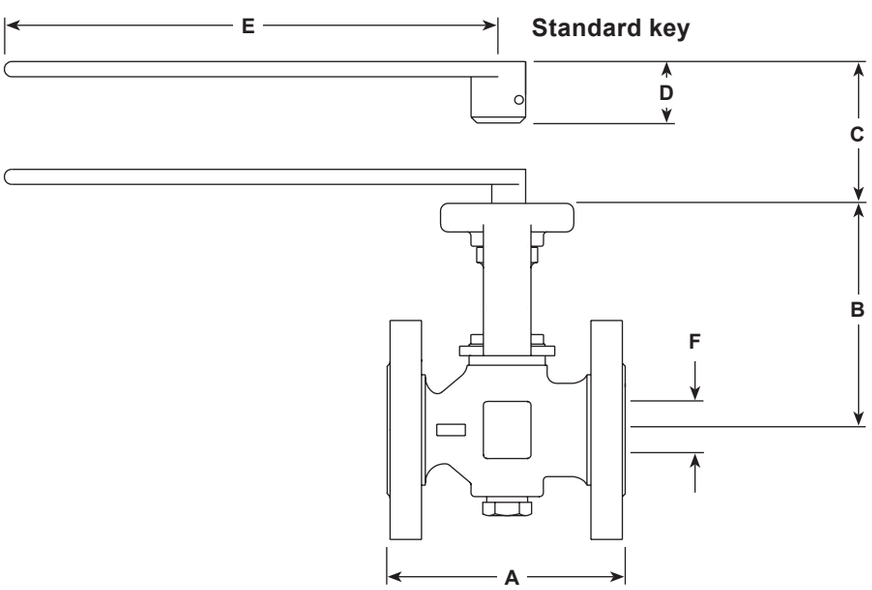
How to order

Example: 1 off Spirax Sarco DN40 KBV21i key operated boiler blowdown valve having PN40 (F4) flanged connections.

Dimensions/weights (approximate) in mm and kg

Valve size	Flange	A	B	C	D	E	F	Weight
DN25	F4	125	119	35			19	3.9
	BS	165	119	35			19	4.1
	A300	165	119	35			19	4.3
DN32	F4	130	130	35			25	5.3
	BS	178	130	35			25	5.7
	A300	178	130	35			25	5.5
DN40	F4	140	131	35			30	6.7
	BS	190	131	35			30	7.1
	A300	190	131	35			30	8.0
DN50	F4	150	139	35			37	9.0
	BS	216	139	35			37	9.9
	A300	216	139	35			37	10.1
DN65	F4	170	140	35			50	12.4
	BS	241	140	35			50	13.9
	A300	241	140	35			50	15.0
Standard length key					32	258		0.4
Extended length 'T' bar key					500	375		0.9





Spare parts - DN25 to DN50

The spare parts available are shown in solid outline. Parts drawn in a grey line are not supplied as spares.
To ensure correct operation and maintain the warranty, use only Spirax Sarco original parts.
Before actioning any maintenance programme observe the 'Safety Information' in Section 1 of the Information and Maintenance Instructions IM-P405-48 supplied with the unit.

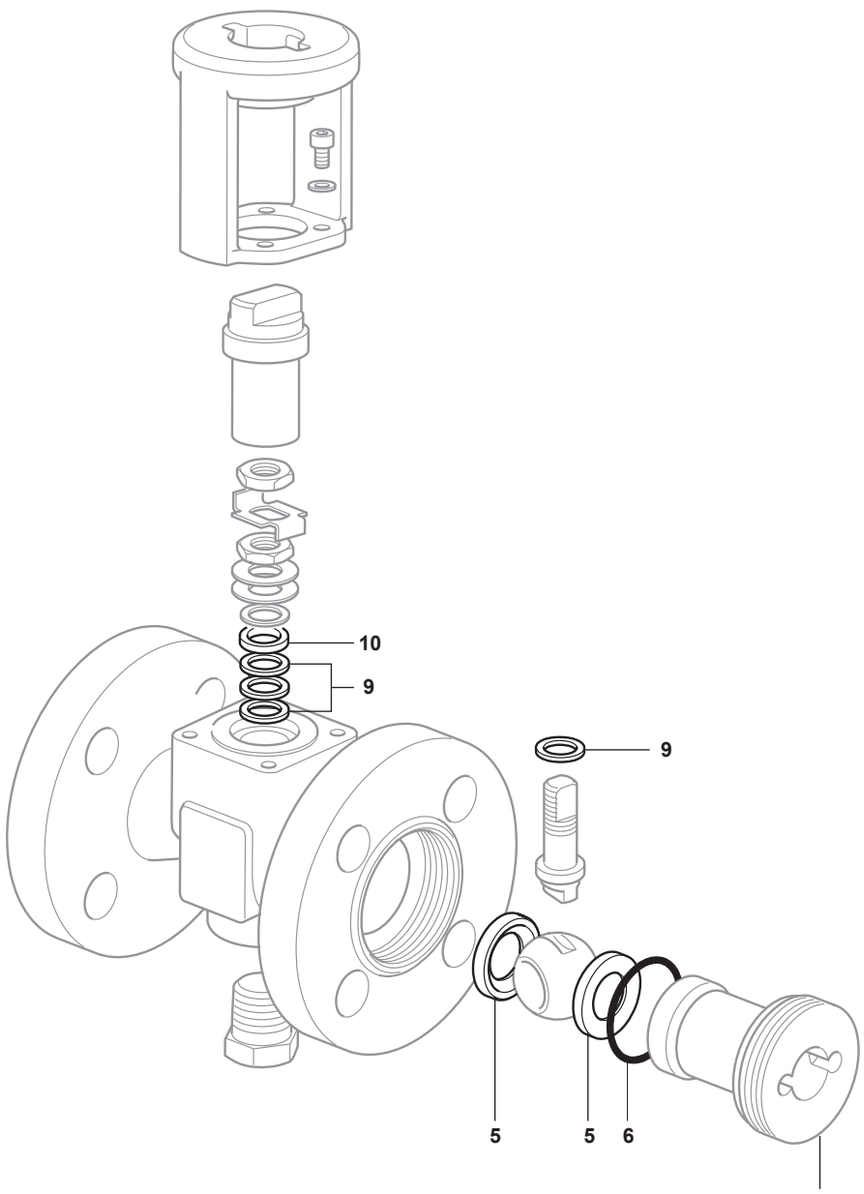
Available spares	
Seats, insert 'O' ring and stem seals	**5, 6, 9, 10**
Insert tool - Required to aid the removal of the ball valve insert (**2**)	**Not shown**

Please note: Spare parts are common for both the KBV21i and KBV40i.

Caution - The ball must be installed with the vent hole on the upstream side of the valve.

How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the size and type of ball valve.
Example: 1 set of seats, insert 'O' ring and stem seals for a Spirax Sarco DN50 KBV21i boiler blowdown valve.



Ball valve insert (**2**)
(not an available spare).
Please note: You will need to order the **Insert tool** listed in the table above to aid removal.

Spare parts - DN65

The spare parts available are shown in solid outline. Parts drawn in a grey line are not supplied as spares.
To ensure correct operation and maintain the warranty, use only Spirax Sarco original parts.
Before actioning any maintenance programme observe the 'Safety Information' in Section 1 of the Information and Maintenance Instructions IM-P405-48 supplied with the unit.

Available spares

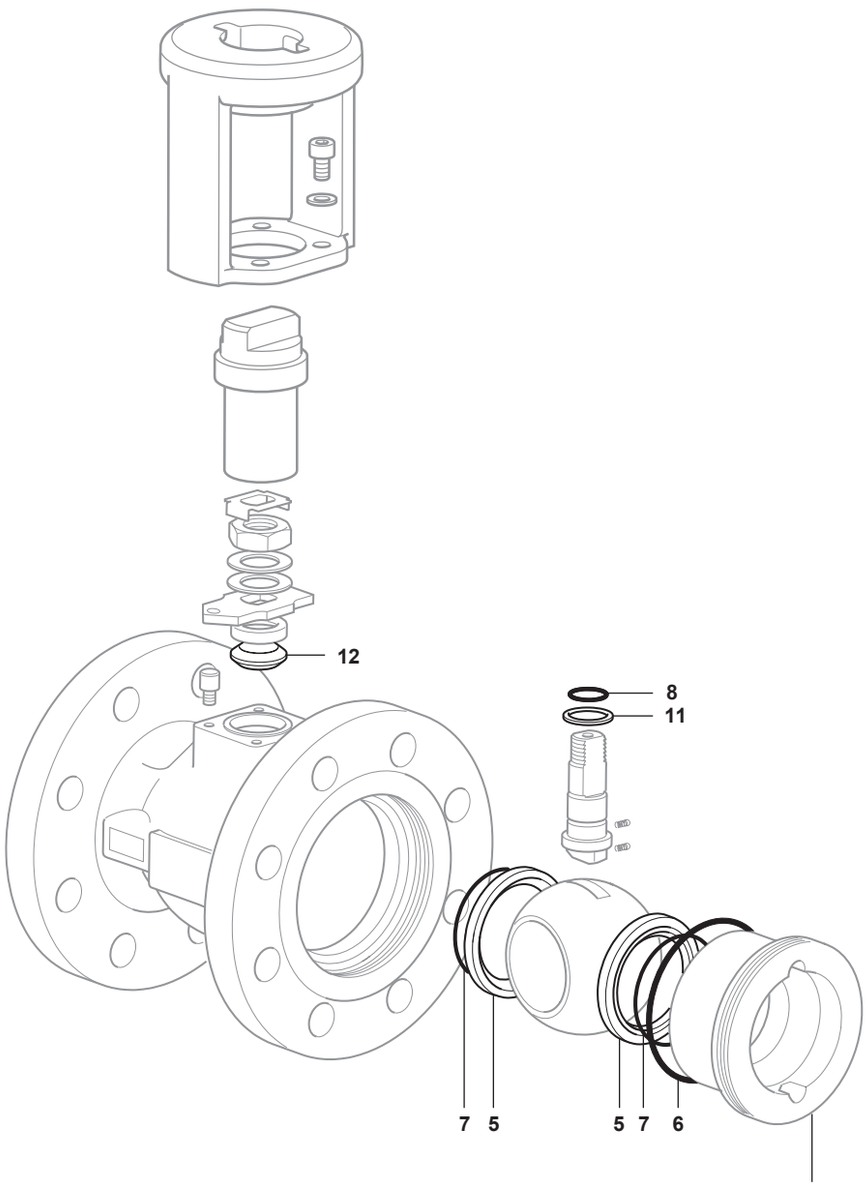
Seats, insert 'O' ring, seat 'O' ring, stem 'O' ring, lower stem seals and upper stem packing	**5, 6, 7, 8, 11, 12**
Insert tool - Required to aid the removal of the ball valve insert (**2**)	**Not shown**

Please note: Spare parts are common for both the KBV21i and KBV40i.

Caution - The ball must be installed with the vent hole on the upstream side of the valve.

How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the size and type of ball valve.
Example: 1 set of seats, insert 'O' ring, seat 'O' ring, stem 'O' ring, lower stem seals and upper stem packing for a Spirax Sarco DN65 KBV40i boiler blowdown valve.



Ball valve insert (**2**)
(not an available spare).
Please note: You will need to order the **Insert tool** listed in the table above to aid removal.

2 Boiler house
Blowdown vessels

TI-P405-45
EMM Issue 3

ABV21i and ABV40i
Air Actuated Boiler Blowdown Valves

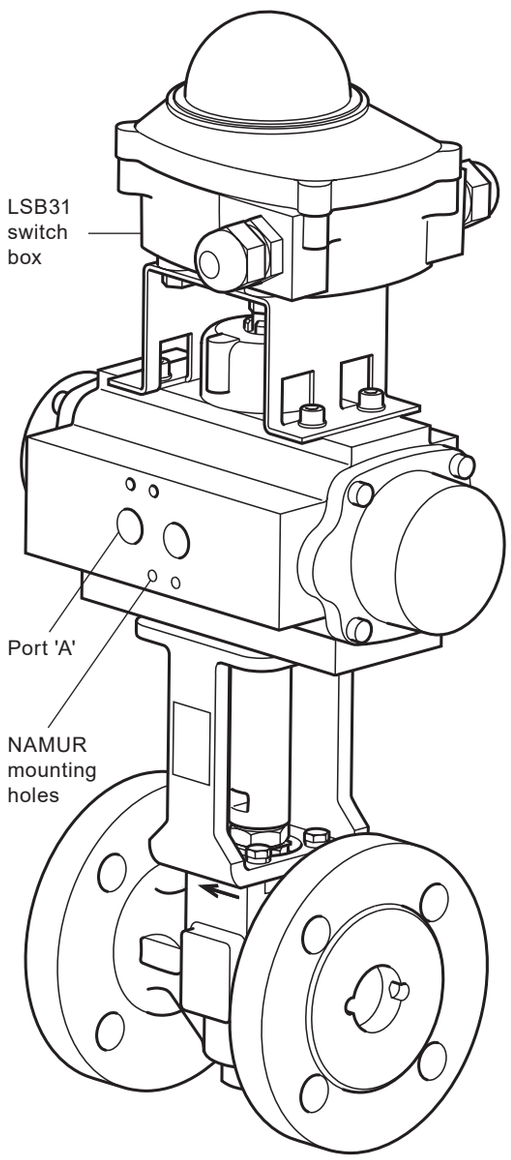
Description

The Spirax Sarco ABV21i and ABV40i one piece end entry, reduced bore ball valves are fitted with 90° rotary spring return pneumatic actuator, for boiler blowdown duties.
They are used in conjunction with a Spirax Sarco blowdown timer to provide timed control of bottom blowdown, ensuring that the recommended boiler blowdown cycles occur with minimum heat loss, avoiding duplication or omission.
The pneumatic actuator, (which can also be operated with other non-corrosive gases), moves through 90° to open the valve, and has a spring return fail-close operation.
A switch box is mounted on the actuator, and either or both microswitches may be wired to a Building Management System if required.
Note: The BT1050 blowdown timer uses one switch only to indicate 'valve fully closed' or 'valve not fully closed' positions, and does not indicate that the valve has opened fully.
A solenoid valve is required, which may be directly mounted to the NAMUR (VDI/VDE 3845) interface on the actuator.
A suitable solenoid valve may be selected from the Spirax Sarco MV range.
Alternatively, an air supply may be connected directly to the actuator port 'A' (¼" BSP), where it is necessary to install the solenoid valve remote from the actuator.
A standard ¼" BSP 3-way solenoid valve may also be used.

3-port/2-way NAMUR mounting solenoid types:

MV11 - 230 Vac, **MV12** - 110 Vac, **MV13** - 24 Vac, **MV14** - 24 Vdc

The ABV21i and ABV40i must be installed with the flow in the direction of the arrow on the body.



Principal features:

- Automatic timed blowdown minimises wasted heat.
- Suitable for boiler pressures up to 17.25 bar g.
- Spring return for fail-safe operation.
- Pneumatic actuator for fast response.

Standards

These products comply with the requirements of the European Pressure Equipment Directive 2014/68/EU and carries the CE mark when so required.
ISO mounting in accordance with ISO 5211.
Antistatic device complying with ISO 7121 and BS 5351.

Certification

These products are available with certififcation to EN 10204 3.1.
Note: All certification/inspection requirements must be stated at the time of order placement.

Sizes and pipe connections

DN25, DN32, DN40, DN50 and DN65
Flanged PN40 (F4), PN40 (BS) or ASME B 16.5 Class 300.

Available flange options:

Flange	Face-to-face	Flange thickness
PN40 (F4)	DIN 3002 F4	EN 1092 Part 1
PN40 (BS)	BS 2080	EN 1092 Part 1
ASME 300	ASME B 16.10	ASME B 16.5

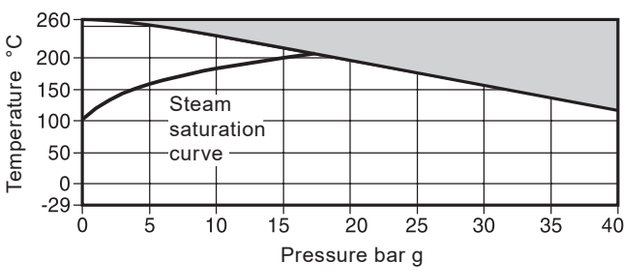
Technical data

Operating time (full stroke)			0.25 - 0.6 seconds
Operating media			Clean compressed air Non-corrosive gas
Compressed air consumption @ 6 bar g	DN25	BVA315S/14	0.0002 (N)m³/stroke
	DN32	BVA320S/14	0.0006 (N)m³/stroke
	DN40 DN50	BVA325S/14 actuator	0.0008 (N)m³/stroke
	DN65	BVA330S/14 actuator	0.0011 (N)m³/stroke
LSB31 switch rating			10 A 250 Vac
Protection rating			IP67
Switch sensor			Mechanical 2 - SPDT

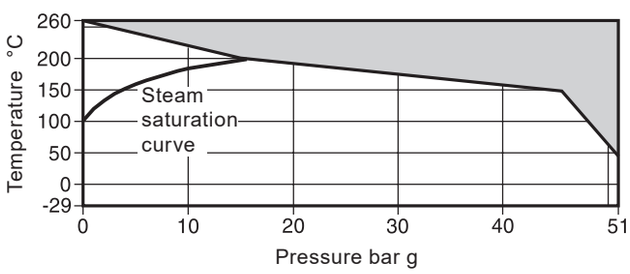
Pressure / temperature limits

The product **must not** be used in this region.

ABV21i



ABV40i



Valve

Body design conditions	**ABV21i**	PN40
	ABV40i	ASME 300
PMA Maximum allowable pressure	**ABV21i**	40 bar g @ 120 °C
	ABV40i	51 bar g @ 38 °C
TMA Maximum allowable temperature		260 °C @ 0 bar g
Minimum allowable temperature		-29 °C
PMO Maximum operating pressure for saturated steam service		17.25 bar g
TMO Maximum operating temperature		260 °C @ 0 bar g
Minimum operating temperature (**Note:** For lower operating temperatures consult Spirax Sarco)		-29 °C
ΔPMX Maximum differential pressure is limited to the PMO		
Designed for a maximum cold hydraulic test pressure of:	**ABV21i**	60 bar g
	ABV40i	76.5 bar g

Actuator

Maximum ambient temperature	80 °C
Minimum ambient temperature	0 °C
Maximum air supply pressure	8 bar g
Minimum air supply pressure	Depends on operating conditions

MV series solenoid

Maximum ambient temperature	50 °C
Minimum ambient temperature	0 °C

Valve coefficients

Size	DN25	DN32	DN40	DN50	DN65
Kv value	30	40	81	103	197

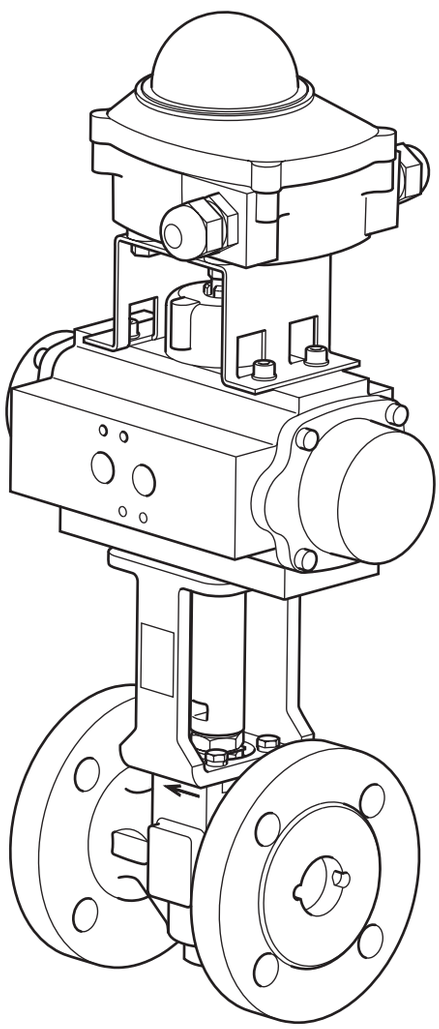
Materials

Valve

Body and insert		Zinc plated carbon steel	ASTM A216 WCB
Stem seals		Antistatic R-PTFE	
Vented ball		Austenitic stainless steel	AISI 316
Stem	DN65	Austenitic stainless steel	AISI 316
	DN25 - DN50	Martensitic stainless steel	AISI 420
Seats		Carbon and graphite reinforced PTFE	PDR 0.8

Actuator

Body, piston and end caps	Aluminium - anodised
Pinion	Carbon steel - nickel plated
'O' ring seals	Nitrile rubber



How to specify

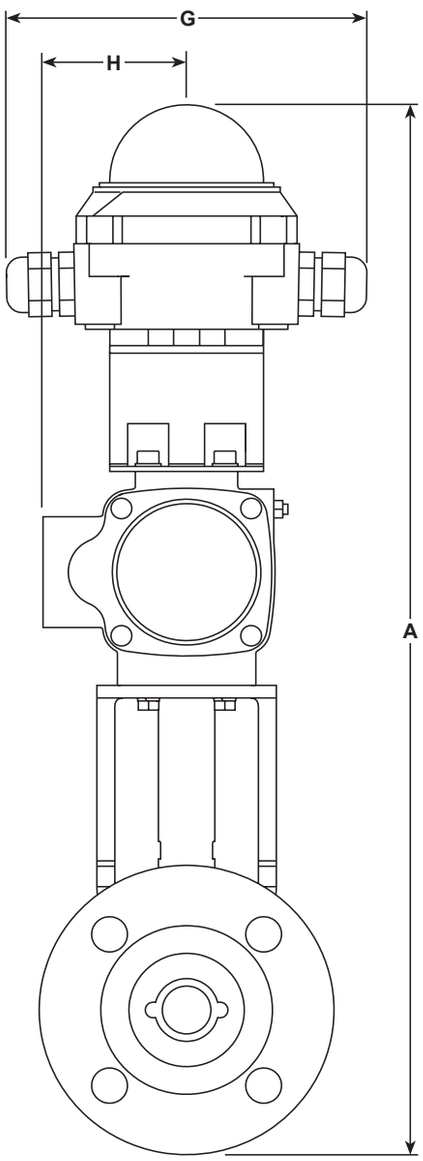
Air actuated ball valve, DN40, PN40 with carbon reinforced seats, 90 degree rotary pneumatic actuator and switch box. NAMUR compatible solenoid valve 220 / 240 Vac.

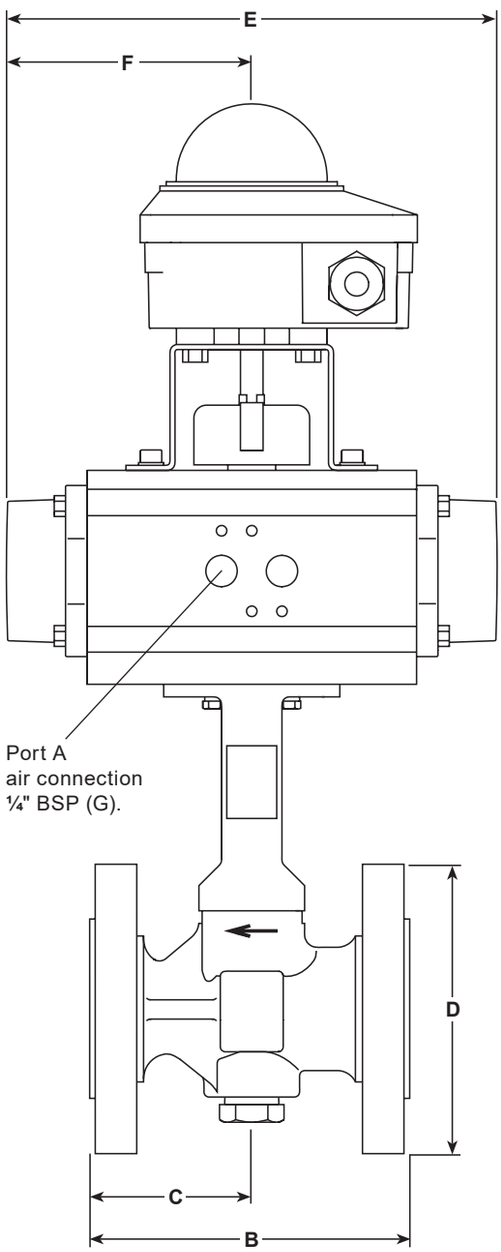
How to order

Example: 1 off Spirax Sarco DN40 ABV21i air actuated boiler blowdown valve having PN40 (F4) flanged connections plus 1 off MV11 solenoid valve 220 / 240 Vac.

Dimensions/weights (approximate) in mm and kg

Valve size	Actuator type	Flange	A	B	C	D	E	F	G	H	Weight
		PN40 (F4)	417	125	63	115	196	98	140	56	6.7
DN25	BVA315S/14	PN40 BS	417	165	103	115	196	98	140	56	6.5
		Class 300	421	165	103	124	196	98	140	56	6.8
		PN40 (F4)	456	130	65	140	217	108.5	140	66	9.2
DN32	BVA320S/14	PN40 BS	456	178	113	140	217	108.5	140	66	9.6
		Class 300	450	178	65	134	217	108.5	140	66	9.4
		PN40 (F4)	475	140	70	150	258	129	140	71	11.7
DN40	BVA325S/14	PN40 BS	475	190	120	150	258	129	140	71	12.2
		Class 300	478	190	120	156	258	129	140	71	13.0
		PN40 (F4)	488	150	75	165	258	129	140	71	14.1
DN50	BVA325S/14	PN40 BS	488	216	141	165	258	129	140	71	15.0
		Class 300	488	216	141	165	258	129	140	71	15.1
		PN40 (F4)	530	170	91	185	299	149.5	140	78	20.7
DN65	BVA330S/14	PN40 BS	530	241	162	185	299	149.5	140	78	22.2
		Class 300	533	241	162	191	299	149.5	140	78	23.3





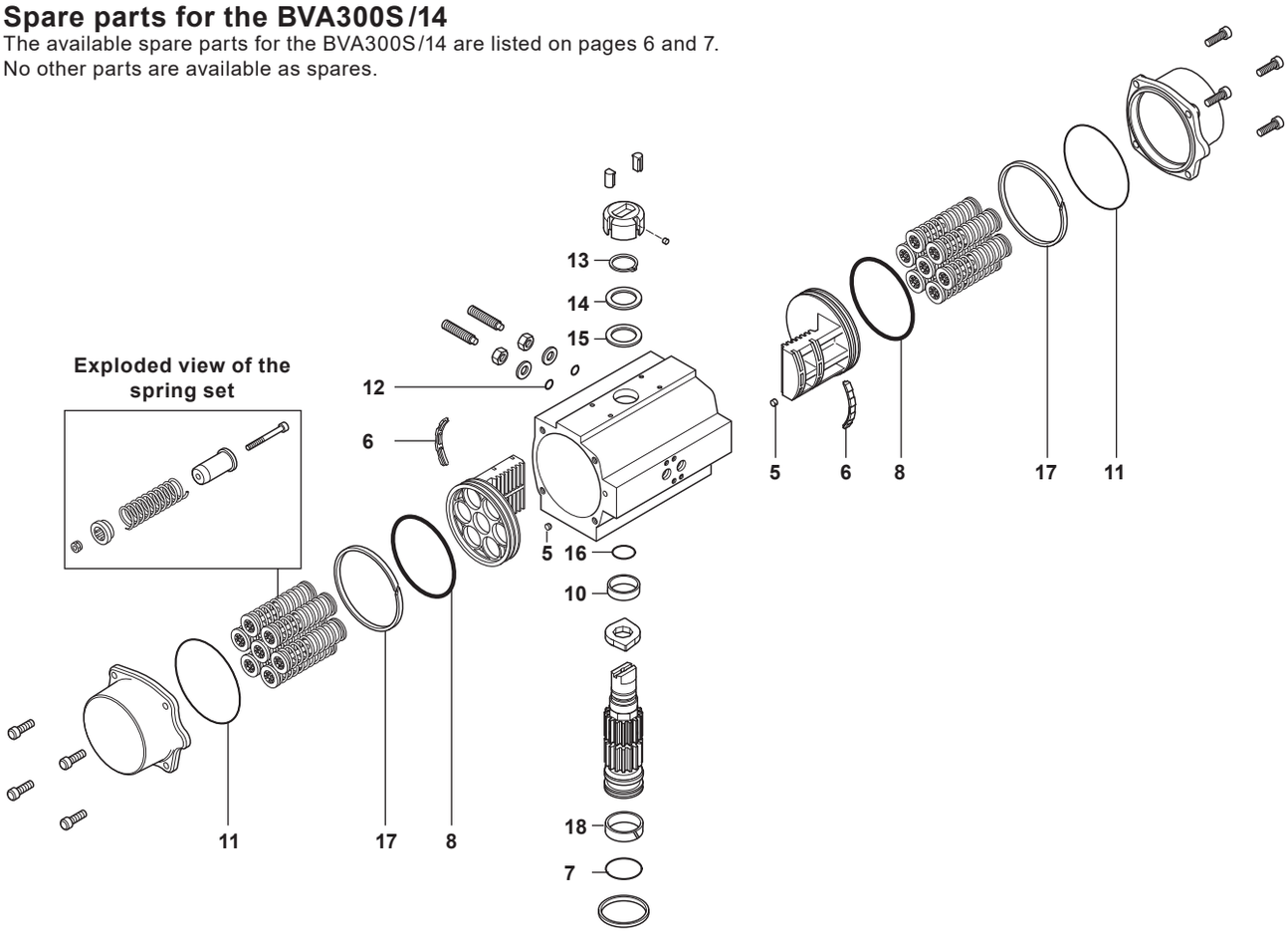
Spare parts

The spare parts available are detailed below. No other parts are available as spares.
Please note: There are no spares available for the switch box.
To ensure correct operation and maintain the warranty, use only Spirax Sarco original parts.
Before actioning any maintenance programme observe the 'Safety Information' in Section 1 of IM-P405-46 supplied with the unit.

Actuator

Spare parts for the BVA300S/14

The available spare parts for the BVA300S/14 are listed on pages 6 and 7.
No other parts are available as spares.



Spare parts

The spare parts available are detailed below. No other parts are supplied as spares.

Available spares

BVA300 series maintenance kit	'O' rings set (NBR)	**7, 8, 11, 12, 16**
	Pinion washers	**13, 14, 15**
	Others	**5, 6, 10, 17, 18**

How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the nomenclature of the pneumatic actuator that they are intended for.
Note: all the spares mentioned above are sold together in one spare part kit.

Example: 1 - BVA300 series maintenance kit with 'O' rings in NBR for a Spirax Sarco BVA320S/14 pneumatic actuator.

Valve

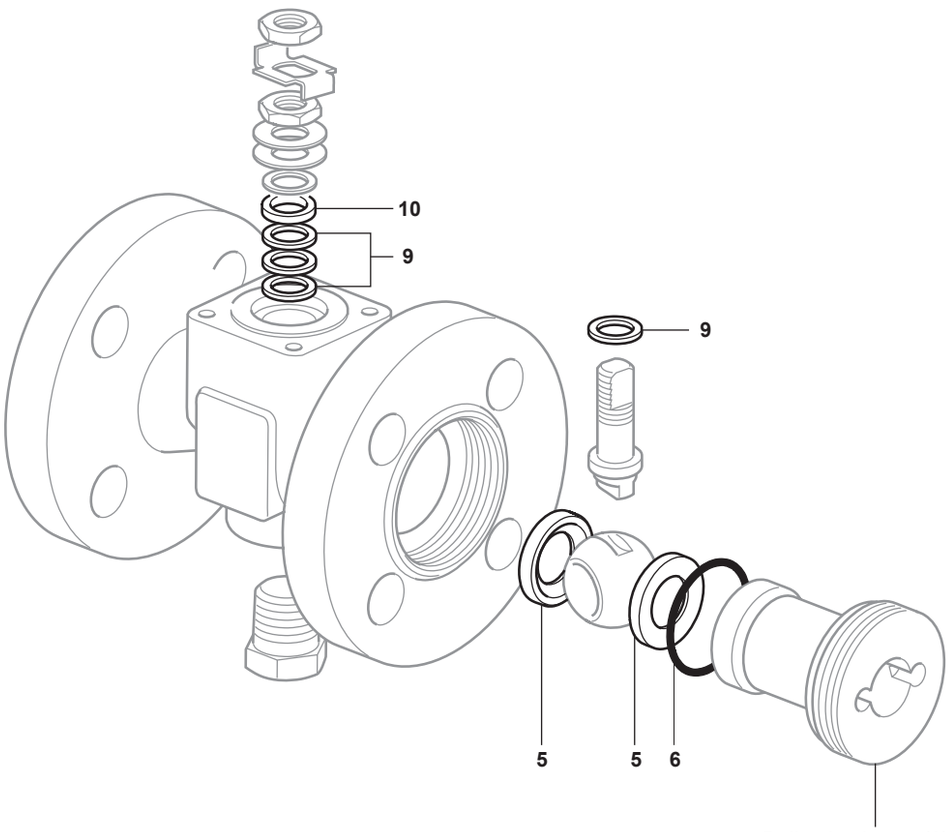
DN25 to DN50 Spare parts

The spare parts available are shown in solid outline. Parts drawn in a grey line are not supplied as spares.

Available spares	
Seats, insert 'O' ring and stem seals	**5, 6, 9, 10**
Insert tool - Required to aid the removal of the ball valve insert (**2**)	**Not shown**

Please note: Spare parts are common for both the ABV21i and ABV40i.

Caution - The ball must be installed with the vent hole on the upstream side of the valve.



Ball valve insert (**2**)
(not an available spare).
Please note: You will need to order the **Insert tool** listed in the table above to aid removal.

How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the size and type of ball valve.
Example: 1 set of seats, insert 'O' ring and stem seals for a Spirax Sarco DN50 ABV21i boiler blowdown valve.

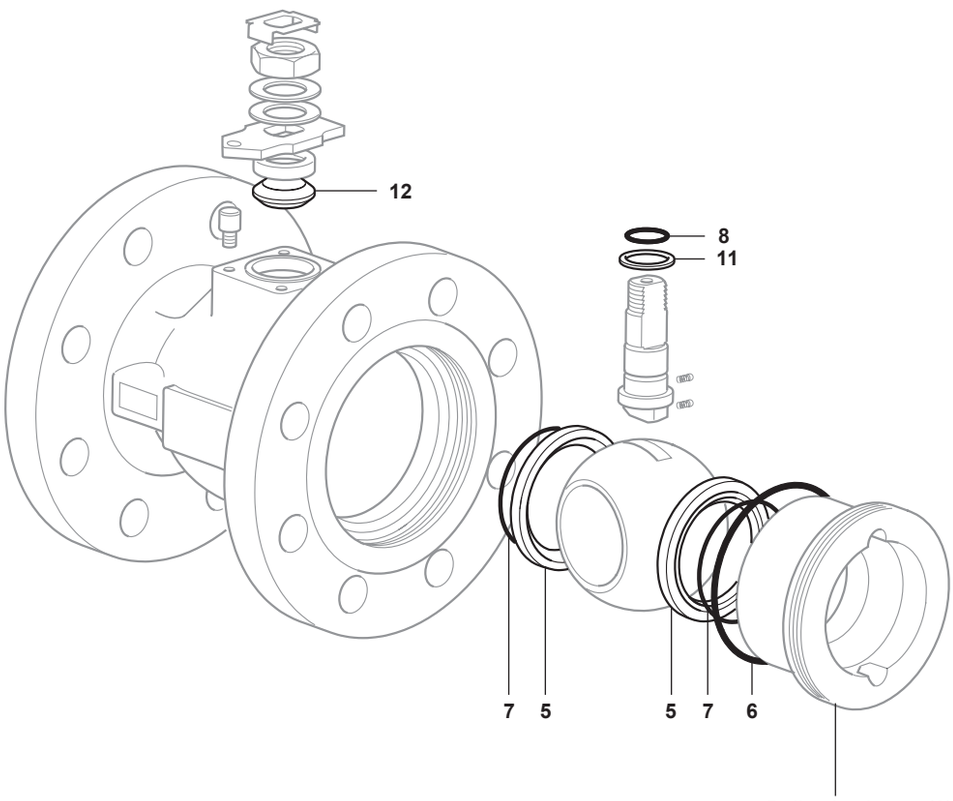
DN65 Spare parts

The spare parts available are shown in solid outline. Parts drawn in a grey line are not supplied as spares.

Available spares	
Seats, insert 'O' ring, seat 'O' ring, stem 'O' ring, lower stem seals and upper stem packing	**5, 6, 7, 8, 11, 12**
Insert tool - Required to aid the removal of the ball valve insert (**2**)	**Not shown**

Please note: Spare parts are common for both the ABV21i and ABV40i.

Caution - The ball must be installed with the vent hole on the upstream side of the valve.



Ball valve insert (**2**)
(not an available spare).
Please note: You will need to order the **Insert tool** listed in the table above to aid removal.

How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the size and type of ball valve.
Example: 1 set of seats, insert 'O' ring, seat 'O' ring, stem 'O' ring, lower stem seals and upper stem packing for a Spirax Sarco DN50 ABV40i boiler blowdown valve.

AI-P693-36
EMM Issue 1

BCSR3
Blowdown Control System

Typical installation

Warning: This document does not contain sufficient information to install the system safely. See the Installation and Maintenance Instructions supplied with the products for full details.

The Spirax Sarco BCSR3 Blowdown Control System provides accurate, automatic control of boiler water total dissolved solids (TDS) and is suitable for shell and water tube boilers. Accurate control of TDS minimises blowdown and reduces the risk of carryover.

Carryover of boiler water can cause waterhammer, corrosion and deposits within a steam system. The accumulation of deposits in control valves, steam traps and on heat transfer surfaces will adversely affect their performance resulting in decreased productivity and reduced efficiency.

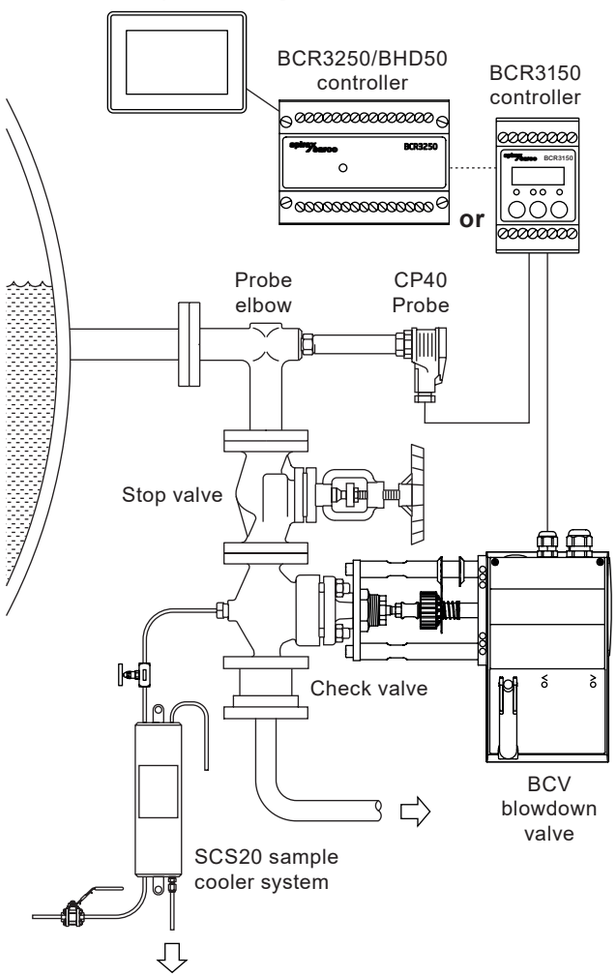
An automatic TDS control system can significantly reduce operating costs whilst maintaining good quality steam production.

Operation

The CP40 probe continuously monitors the conductivity of the boiler water, which is directly related to the level of TDS present. This measured value is compared with a 'set point' utilising the controller. If the measured value is lower than the 'set point', the BCV blowdown valve remains closed. If it is higher, the blowdown valve will open, purging the boiler of high TDS concentration water. The boiler water is replenished by clean make-up water, lowering the measured conductivity and closing the blowdown valve.

The optional SCS20 sample cooler system provides a safe and effective method of taking regular boiler water samples for analysis. The cooling water jacket prevents flashing due to the pressure drop and sub-cools the boiler water sample to an acceptable analysis temperature.

The BCR3250/BHD50 can operate a bottom blowdown valve by a real time clock controlled timer.



Available options

Blowdown valve	Actuation	Connections
BCV	230 Vac	see BCV TI
	24 Vac	
	Pneumatic	

Controller	Voltage	Min. conductivity
BCR3250/BHD50 BCR3150	24 Vac	≥ 1 µS @ 25 °C

Conductivity probe	Probe length
CP40	300 mm
	500 mm
	1000 mm
	1500 mm

Probe elbow	Size/connection (boiler)
PE1	DN15/PN40
PE2	DN20/PN40
PE3	DN25/PN40
PE4	DN20/BS10 Table H
PE5	DN25/BS10 Table H

Available options continued on next page

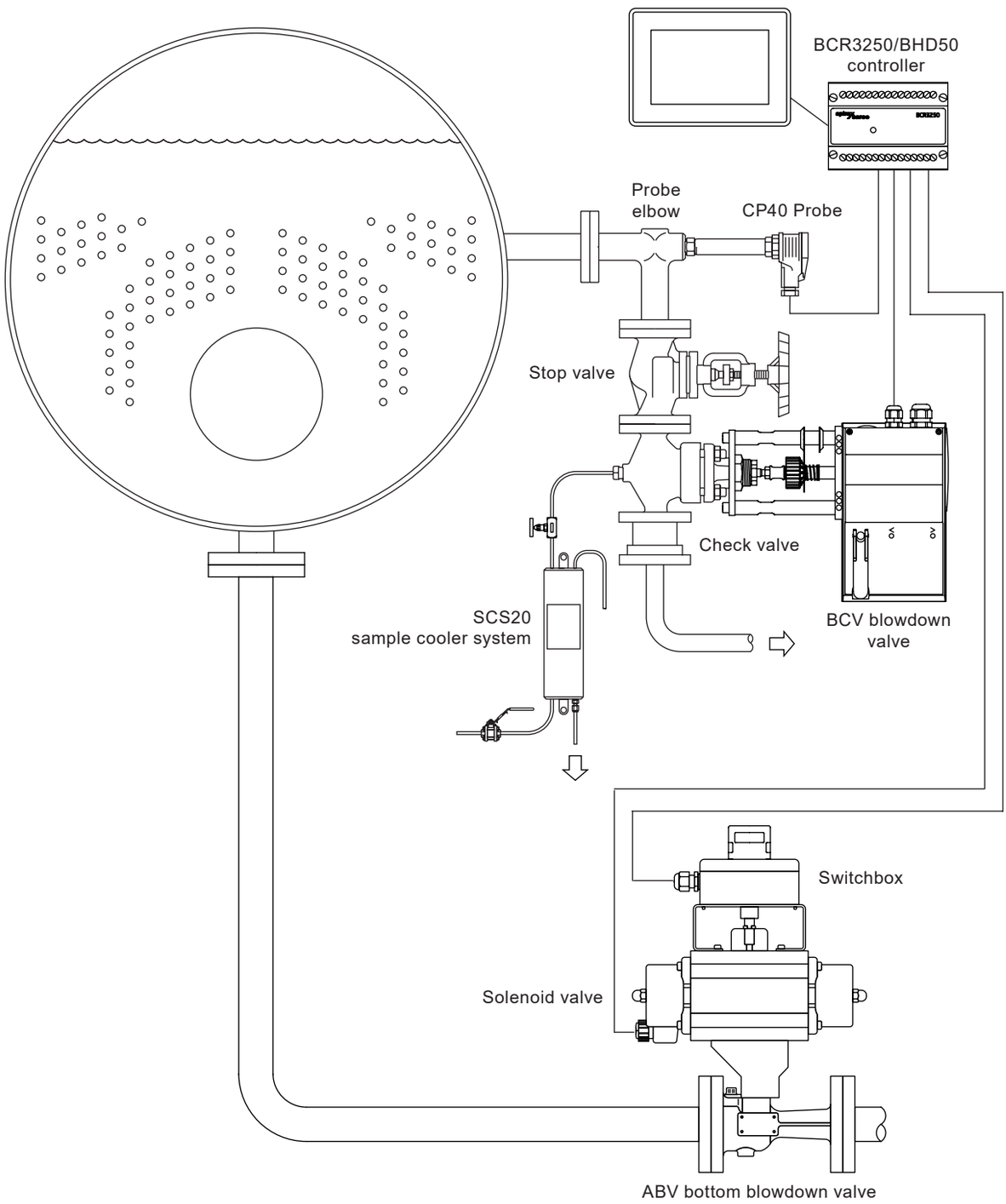
Note: See specific product TI's for further information.

Available options - continued

ABV Bottom Blowdown valve	Connections
DN25 ABV21i	PN40/ANSI 300
DN32 ABV21i	PN40
DN40 ABV21i	PN40/ANSI 300
DN50 ABV21i	PN40/ANSI 300
DN65 ABV21i	PN40/ANSI 300

Solenoid valve	Voltage
MV11	230 Vac
MV12	110 Vac
MV13	24 Vac
MV14	24 Vdc

Note: See specific product TI's for further information.



2 Boiler house
Blowdown vessels