

spirax

sarco

M21Si ISO and M21Vi ISO
Reduced Bore Ball Valves
DN15 to DN150 Flanged PN40

TI-P133-77
ST Issue 4


Description

Both the M21Si and M21Vi are reduced bore ball valves, with a single piece body, having ISO mounting as standard. They are designed to be isolating valves, which can be used with the majority of industrial fluids, not control valves.

Available types

M21Si2 ISO	Zinc plated carbon steel body, PDR 0.8 seats.
M21Si3 ISO	Stainless steel body, PDR 0.8 seats.
M21Vi2 ISO	Zinc plated carbon steel body, PTFE seats.
M21Vi3 ISO	Stainless steel body, PTFE seats.

Standards

These products fully comply with the requirements of the European Pressure Equipment Directive 97/23/EC and carry the  mark when so required.

Certification

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

Sizes and pipe connections

DN15, DN20, DN25, DN32, DN40, DN50, DN65, DN80, DN100 and DN150

Standard flange: EN 1092 PN40

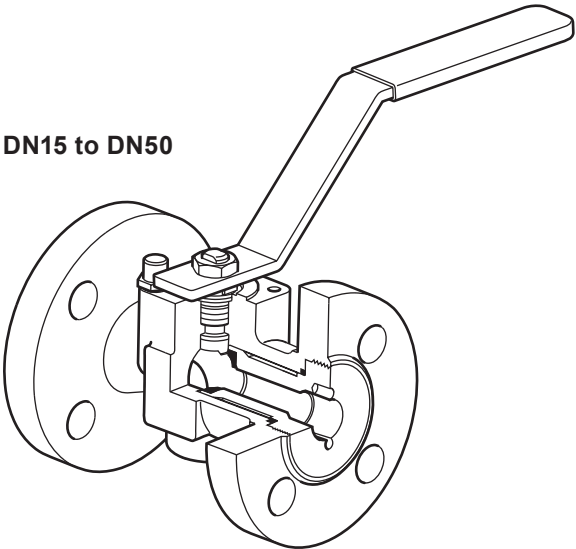
Face-to-face dimensions:

- DN15 to DN100 according to DIN 3202 F4.
- DN25 to DN150 according to BS 2080.

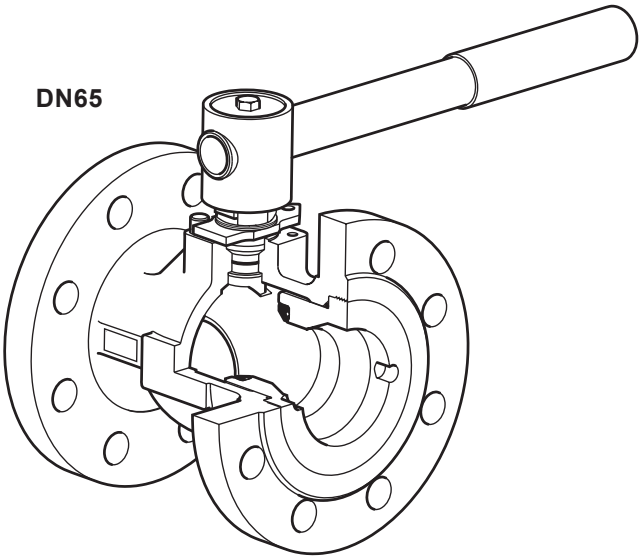
Technical data

Flow characteristic	Modified linear
Port	Reduced bore
Leakage test procedure to ISO 5208 (Rate A)/EN 12266-1 (Rate A)	
Antistatic device	Complies with ISO 7121 and BS 5351

DN15 to DN50



DN65



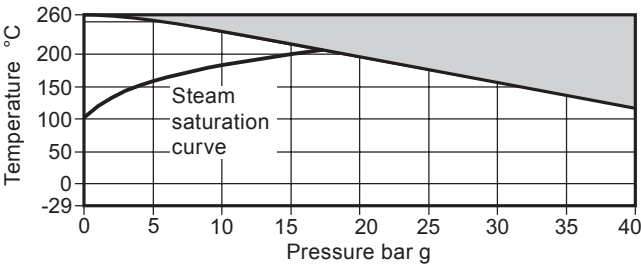
10.3

135

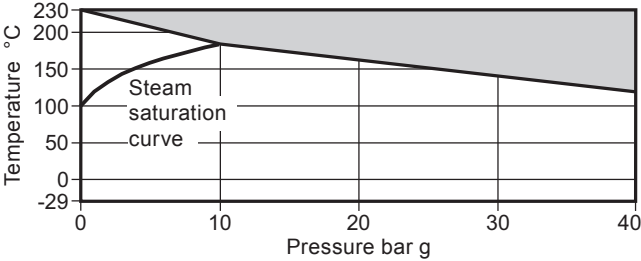
Pipeline ancillaries
Ball valves

Pressure / temperature limits

M21Si2 ISO and M21Si3 ISO - PDR 0.8 seats



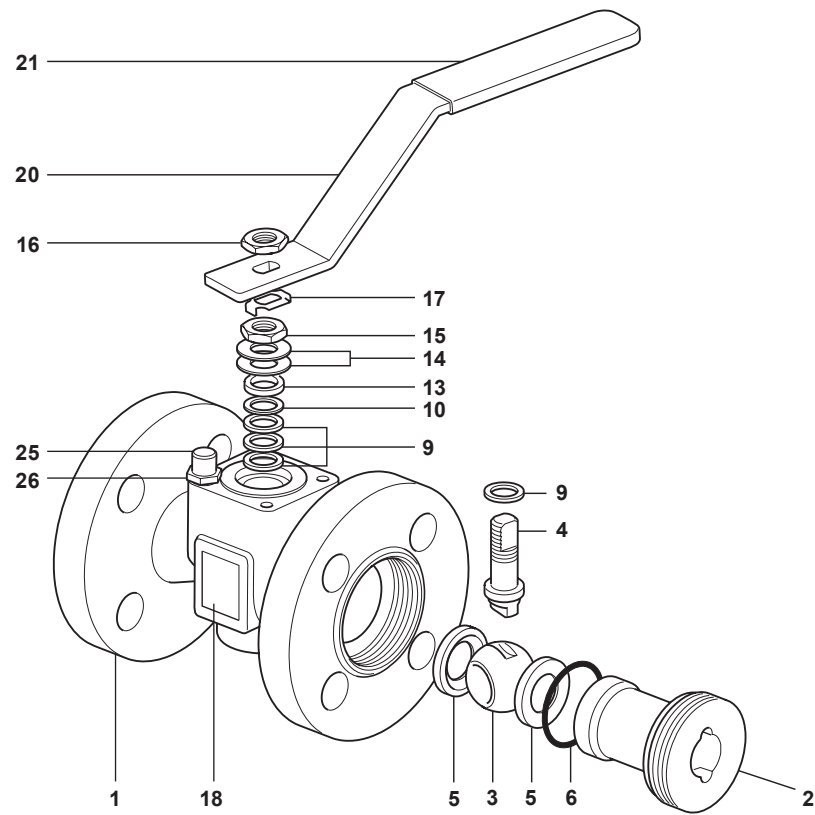
M21Vi2 ISO and M21Vi3 ISO - PTFE seats



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

Body design conditions			PN40
PMA	Maximum allowable pressure	M21Si	40 bar g @ 120 °C
		M21Vi	40 bar g @ 120 °C
TMA	Maximum allowable temperature	M21Si	260 °C @ 0 bar g
		M21Vi	230 °C @ 0 bar g
Minimum allowable temperature			-29 °C
PMO	Maximum operating pressure for saturated steam service	M21Si	17.5 bar g
		M21Vi	10.0 bar g
TMO	Maximum operating temperature		260 °C @ 0 bar g
Minimum operating temperature			-29 °C
Note: For lower operating temperatures consult Spirax Sarco			
ΔPMX	Maximum differential pressure is limited to the PMO		
Designed for a maximum cold hydraulic test pressure of 60 bar g			

DN15 to DN50

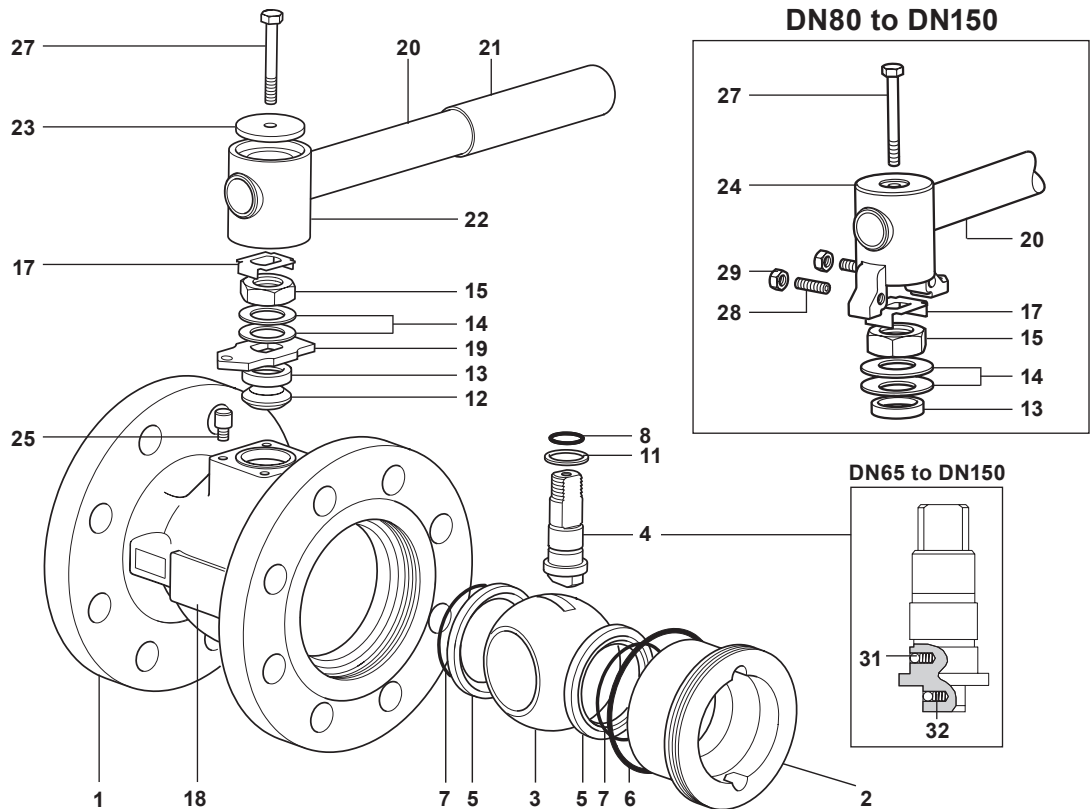


Materials

No.	Part	Material		
1	Body	M21Si2 ISO and M21Vi2 ISO	Zinc plated carbon steel	ASTM A216 WCB
		M21Si3 ISO and M21Vi3 ISO	Stainless steel	ASTM A351 CF8M
2	Insert	M21Si2 ISO and M21Vi2 ISO	Zinc plated carbon steel	SAE 1040
		M21Si3 ISO and M21Vi3 ISO	Stainless steel	AISI 316
3	Ball		Stainless steel	AISI 316
4	Stem		Stainless steel	AISI 316
5	Seat	M21Si2 ISO and M21Si3 ISO	Carbon and graphite reinforced PTFE	PDR 0.8
		M21Vi2 ISO and M21Vi3 ISO	Virgin PTFE	
6	Insert 'O' ring		EPDM	Geothermal
9	Stem seal		Antistatic R-PTFE	
10	Stem seal		Stainless steel	AISI 304
13	Separator		Zinc plated carbon steel	SAE 1010
14	Belleville washer		Stainless steel	AISI 301
15	Gland nut		Zinc plated carbon steel	SAE 1010/SAE 12L14
16	Upper steam nut		Zinc plated carbon steel	SAE 1010/SAE 12L14
17	Locking plate		Stainless steel	AISI 304
18	Nameplate		Stainless steel	AISI 430
20	Lever		Zinc plated carbon steel	SAE 1010
21	Grip		Vinyl	
25	Stop screw		Zinc plated carbon steel	SAE 12L14
26	Split lock washer		Stainless steel	AISI 304

Pipeline ancillaries
Ball valves

DN65



Materials

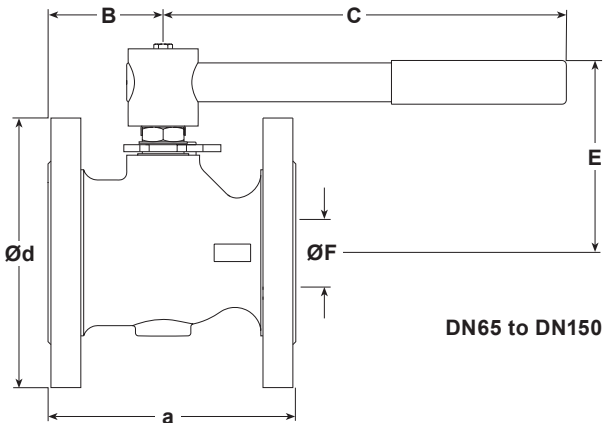
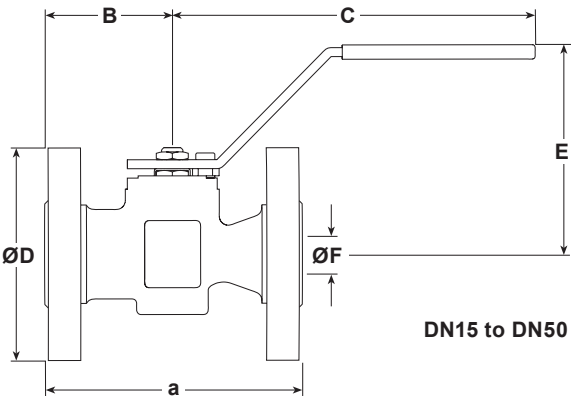
No.	Part		Material	
1	Body	M21Si2 ISO and M21Vi2 ISO	Zinc plated carbon steel	ASTM A216 WCB
		M21Si3 ISO and M21Vi3 ISO	Stainless steel	ASTM A351 CF8M
2	Insert	M21Si2 ISO and M21Vi2 ISO	Zinc plated carbon steel	SAE 1040
		M21Si3 ISO and M21Vi3 ISO	Stainless steel	AISI 316
3	Ball		Stainless steel	AISI 316
4	Stem		Stainless steel	AISI 316/AISI 420
5	Seat	M21Si2 ISO and M21Si3 ISO	Carbon and graphite reinforced PTFE	PDR 0.8
		M21Vi2 ISO and M21Vi3 ISO	Virgin PTFE	
6	Insert 'O' ring		EPDM	Geothermal
7	Seat 'O' ring		EPDM	Geothermal
8	Stem 'O' ring		EPDM	Geothermal
11	Lower stem seal		Antistatic R-PTFE	
12	Upper stem packing		Virgin PTFE	
13	Separator		Zinc plated carbon steel	SAE 1010
14	Belleville washer		Carbon steel/stainless steel	
15	Gland nut		Zinc plated carbon steel	SAE 1010/SAE 12L14
17	Locking plate		Stainless steel	AISI 304
18	Nameplate		Stainless steel	AISI 430
19	Stop plate with indicator	DN65 only	Zinc plated carbon steel	SAE 1010
20	Lever		Zinc plated carbon steel	SAE 1010
21	Grip		Vinyl	
22	Adaptor		Zinc plated SG iron	
23	Adaptor plate		Zinc plated carbon steel	SAE 1010
24	Adaptor with indicator	DN80 to DN150	Zinc plated SG iron	
25	Stop screw	DN80 to DN150	Zinc plated carbon steel	SAE 12L14
27	Adaptor screw		Zinc plated carbon steel	Grade 5
28	Stop screw	DN80 to DN150	Carbon steel	
29	Adaptor hex. nut	DN80 to DN150	Zinc plated carbon steel	
31	Antistatic device ball		Stainless steel	AISI 302
32	Antistatic device spring		Stainless steel	AISI 301

Dimensions/weights (approximate) in mm and kg
PN40 DIN 3202 F4 flanges

Size	A	B	C	D	E	F	Weight
DN15	115	57	162	95	95	13	2.5
DN20	120	60	162	105	95	13	3.2
DN25	125	62	162	115	101	19	4.0
DN32	130	65	182	140	106	25	5.5
DN40	140	70	186	150	118	30	6.9
DN50	150	75	186	165	123	37	9.3
DN65	170	79	278	185	144	50	13.4
DN80	180	91	417	200	157	57	17.7
DN100	190	98	517	235	172	75	25.0
DN150	-	-	-	-	-	-	-

PN40 BS 2080 flanges

Size	A	B	C	D	E	F	Weight
DN15	-	-	-	-	-	-	-
DN20	-	-	-	-	-	-	-
DN25	165	62	162	115	101	19	4.2
DN32	178	65	182	140	106	25	5.9
DN40	190	70	186	150	118	30	7.4
DN50	216	75	186	165	123	37	10.2
DN65	241	79	278	185	144	50	14.9
DN80	283	91	417	200	157	57	20.2
DN100	305	98	517	235	172	75	29.4
DN150	403	130	700	300	205	100	56.9



K_v values

DN	15	20	25	32	40	50	65	80	100	150
K _v	10	10	30	40	81	103	197	248	581	735

For conversion C_v (UK) = K_v x 0.963 C_v (US) = K_v x 1.156

Operating torque (N m)

DN	15	20	25	32	40	50	65	80	100	150
N m	8	8	10	15	20	25	50	70	100	155

Note: The torque figures shown are for a valve that is frequently operated at the maximum operating pressure. Valves that are subject to long static periods, may require a greater break-out torque.

Safety information, installation and maintenance

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

Welding

Only the models that have connections designed for welding (SW, BW, Imperial Tube connections) should be welded. Valves with flanged connections must not be welded to avoid damages to the valve and/or injury to personnel.

How to order

Specify	Model	Seat material	S = Carbon and graphite reinforced PTFE - PDR 0.8
			V = Virgin PTFE
	Material	Body material	2 = Zinc plated carbon steel
			3 = Stainless steel

Example: 1 off Spirax Sarco DN50 M21Si2 ISO ball valve having flanged EN 1092 PN40 connections.

Optional extras:

- Self-venting ball.
- Extended stems to allow full insulation: 50 mm (2") for DN15 to DN50 sizes and 100 mm (4") for DN15 to DN150 sizes.
- Lockable handle.
- 100 mm extended stem with lockable handle.

Pipeline ancillaries

Ball valves

DN15 to DN50 - Spare parts (see page 7 for sizes DN65 - DN150)

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

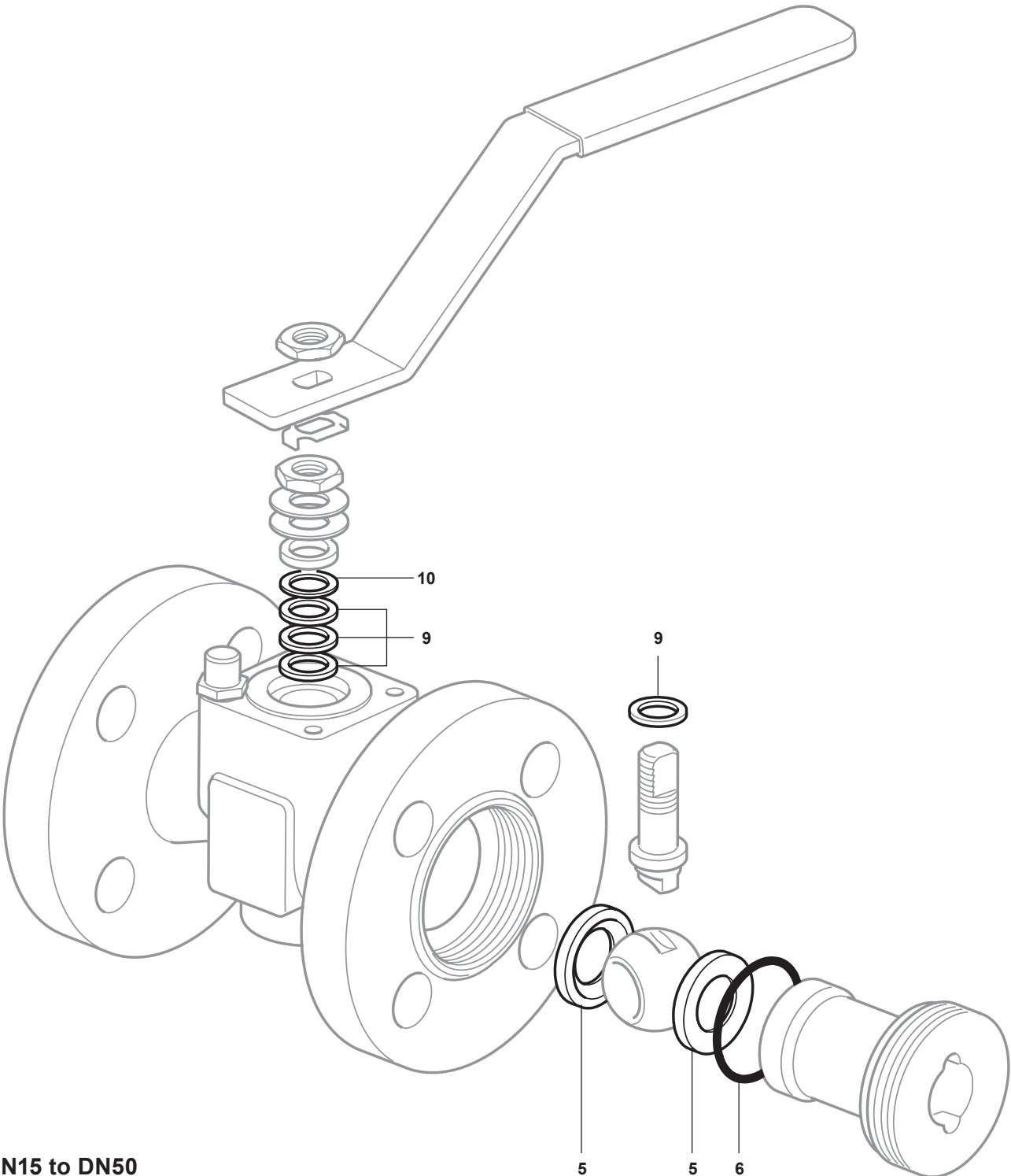
Available spares

Seats, insert 'O' ring and stem seals	5, 6, 9, 10
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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 flanged PN40 M21Si2 ball valve.



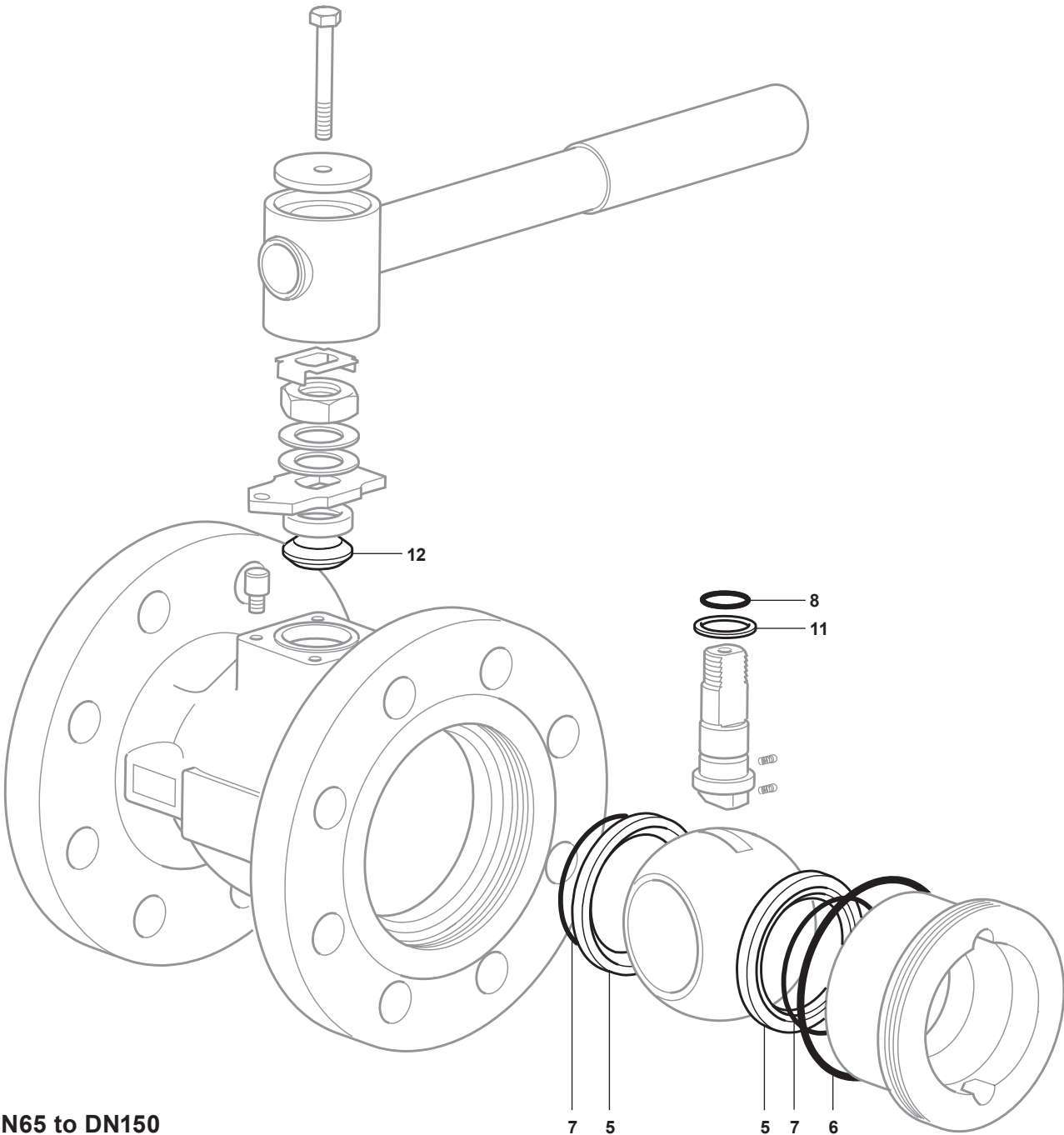
DN15 to DN50

DN65 to DN150 - Spare parts (see page 6 for sizes DN15 - DN50)
The spare parts available are shown in solid outline. Parts drawn in 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

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 packaging for a Spirax Sarco DN80 flanged PN40 M21Si2 ball valve.



DN65 to DN150

TI-P133-85

CMGT Issue 2

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M21Hi ISO

Reduced Bore Ball Valve

DN15 to DN150 Flanged PN40


Description

The M21Hi is a reduced bore ball valve, with a single piece body, having ISO mounting as standard. As a main feature the valve has a special ball which has received a surface hardening and also benefits from having reinforced PEEK seats. The M21Hi can be used on applications that use steam and other industrial fluids for services ranging from vacuum to the higher temperatures and pressures. The M21Hi has been designed for use as an isolating valve, not a control valve.

Available types

- M21Hi2 ISO Zinc plated carbon steel body, reinforced PEEK seats.
- M21Hi3 ISO Stainless steel body, reinforced PEEK seats.

Standards

This product fully complies with the requirements of the Pressure Equipment Directive (PED) and carries the  mark when so required.

Certification

This product is available with certification to EN 10204 3.1.
Note: All certification/inspection requirements must be stated at the time of order placement.

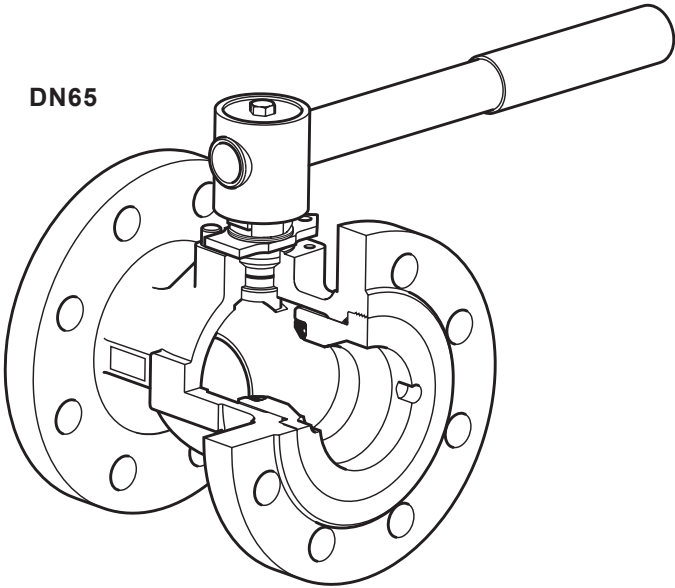
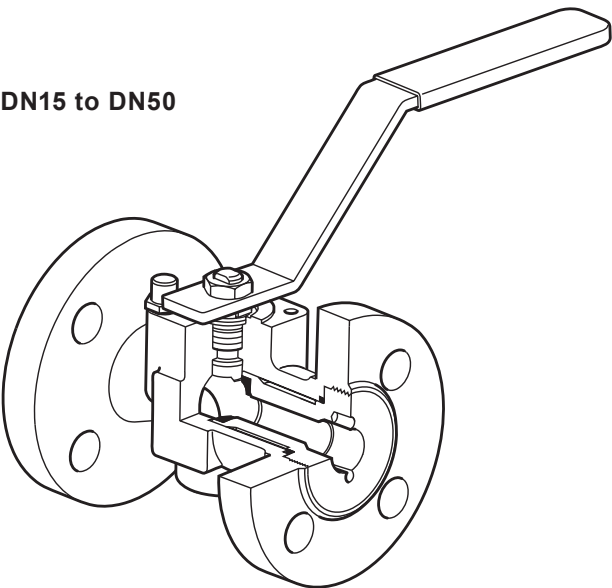
Sizes and pipe connections

DN15, DN20, DN25, DN32, DN40, DN50, DN65, DN80, DN100 and DN150
Standard flange: EN 1092 PN40
Face-to-face dimensions:

- DN15 to DN100 according to DIN 3202 F4.
- DN25 to DN150 according to BS 2080.

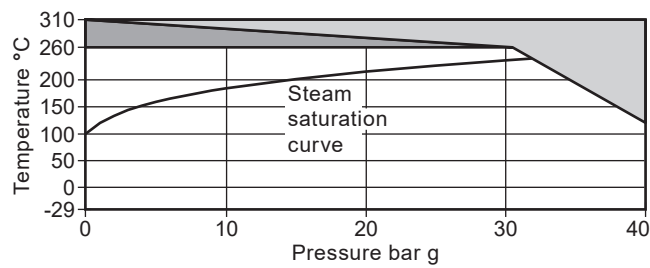
Technical data

Flow characteristic	Modified linear
Port	Reduced bore
Leakage test procedure to ISO 5208 (Rate A)/EN 12266-1 (Rate A)	
Antistatic device	Complies with ISO 7121 and BS 5351



Pipeline ancillaries
Ball valves

Pressure/temperature limits

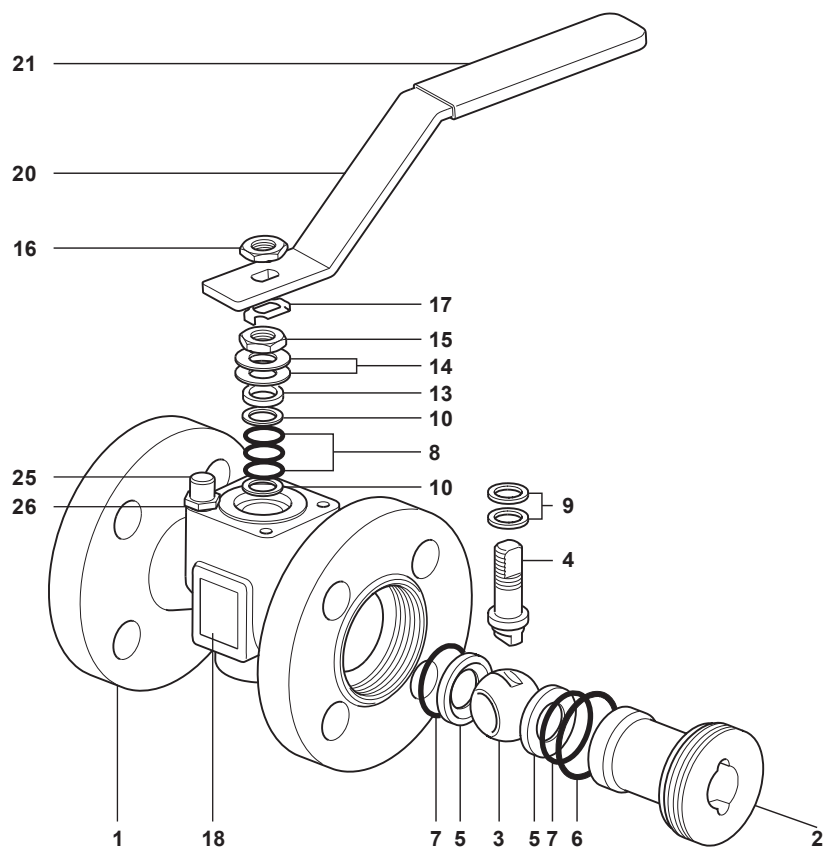


- The product **must not** be used in this region.
- The product can only be used in this region for short periods of time.

Body design conditions		PN40
PMA	Maximum allowable pressure	40 bar g @ 120 °C
TMA	Maximum allowable temperature	310 °C @ 0 bar g
Minimum allowable temperature		-29 °C
PMO	Maximum operating pressure for saturated steam service	32 bar g
TMO	Maximum operating temperature	260 °C @ 0 bar g
Minimum operating temperature		-29 °C
Note: For lower operating temperatures consult Spirax Sarco.		
Δ PMX Maximum differential pressure is limited to the PMO		
Designed for a maximum cold hydraulic test pressure of: 60 bar g		

Materials - DN15 to DN50

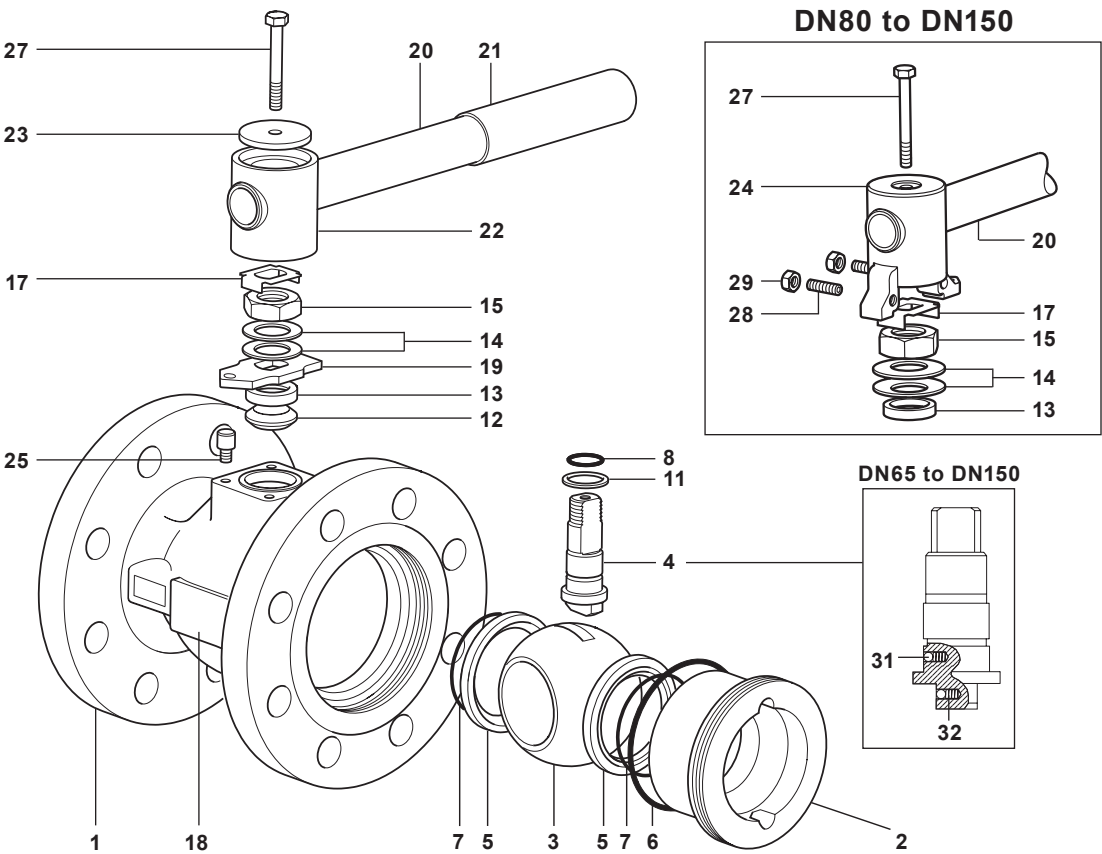
No.	Part	Material		
1	Body	M21Hi2 ISO	Zinc plated carbon steel	ASTM A216 WCB
		M21Hi3 ISO	Stainless steel	ASTM A351 CF8M
2	Insert	M21Hi2 ISO	Zinc plated carbon steel	SAE 1040
		M21Hi3 ISO	Stainless steel	AISI 316
3	Ball	Stainless steel	AISI 316 hardened surface	
4	Stem	Stainless steel	AISI 316/AISI 420	
5	Seats	PEEK	Reinforced	
6	Insert gasket	Graphite		
7	Seat 'O' ring	EPDM	Geothermal	
8	Stem seals	Graphite		
9	Stem seals	PEEK	Reinforced	
10	Stem seals	Stainless steel	AISI 304	
13	Separator	Zinc plated carbon steel	SAE 1010	
14	Belleville washer	Stainless steel	AISI 301	
15	Gland nut	Zinc plated carbon steel	SAE 1010/SAE 12L14	
16	Upper stem nut	Zinc plated carbon steel	SAE 1010/SAE 12L14	
17	Locking plate	Stainless steel	AISI 304	
18	Name-plate	Stainless steel	AISI 430	
20	Lever	Zinc plated carbon steel	SAE 1010	
21	Grip	Vinyl		
25	Stop screw	Zinc plated carbon steel	SAE 12L14	
26	Split lock washer	Stainless steel	AISI 304	



Pipeline ancillaries
Ball valves

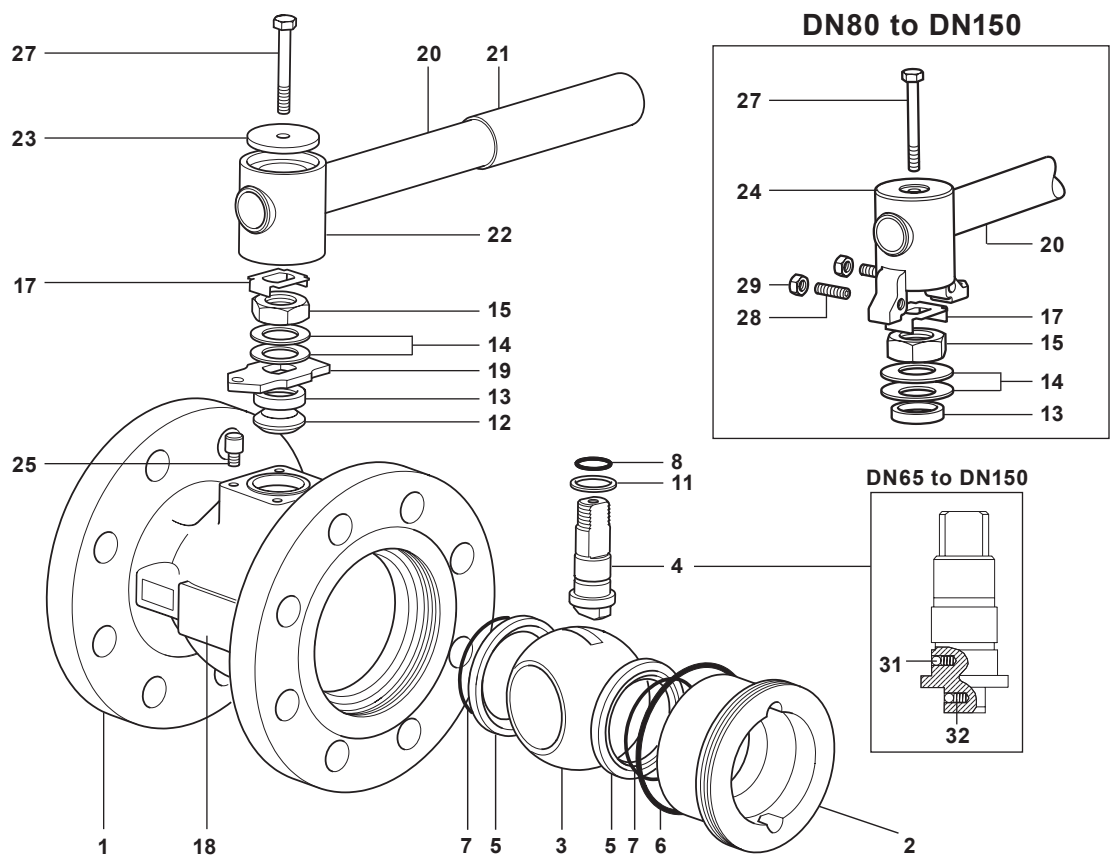
Materials - DN65

No. Part		Material		
1	Body	M21Hi2 ISO	Zinc plated carbon steel	ASTM A216 WCB
		M21Hi3 ISO	Stainless steel	ASTM A351 CF8M
2	Insert	M21Hi2 ISO	Zinc plated carbon steel	SAE 1040
		M21Hi3 ISO	Stainless steel	AISI 316
3	Ball	Stainless steel	AISI 316 hardened surface	
4	Stem	Stainless steel	AISI 316/AISI 420	
5	Seats	PEEK	Reinforced	
6	Insert gasket	Graphite		
7	Seat 'O' ring	EPDM	Geothermal	
8	Stem seal	EPDM	Geothermal	
11	Lower stem seal	PEEK	Reinforced	
12	Upper stem packing	Graphite		
13	Separator	Zinc plated carbon steel	SAE 1010	
14	Belleville washer	Stainless steel	AISI 301	
15	Gland nut	Zinc plated carbon steel	SAE 1010/SAE 12L14	



Materials - DN65 (continued)

No.	Part		Material	
17	Locking plate		Stainless steel	AISI 304
18	Name-plate		Stainless steel	AISI 430
19	Stop plate with indicator	DN65 only	Zinc plated carbon steel	SAE 1010
20	Lever		Zinc plated carbon steel	SAE 1010
21	Grip		Vinyl	
22	Adaptor	DN65 only	Zinc plated SG iron	
23	Adaptor plate	DN65 only	Zinc plated carbon steel	SAE 1010
24	Adaptor with indicator	DN80 to DN150	Zinc plated SG iron	
25	Stop screw	DN80 to DN150	Zinc plated carbon steel	SAE 12L14
27	Adaptor screw		Zinc plated carbon steel	Grade 5
28	Stop screw	DN80 to DN150	Carbon steel	
29	Adaptor hex. nut	DN80 to DN150	Zinc plated carbon steel	
31	Antistatic device ball		Stainless steel	AISI 302
32	Antistatic device spring		Stainless steel	AISI 301



Pipeline ancillaries
Ball valves

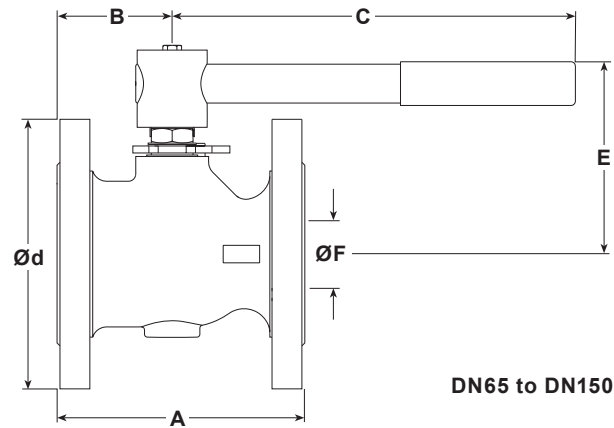
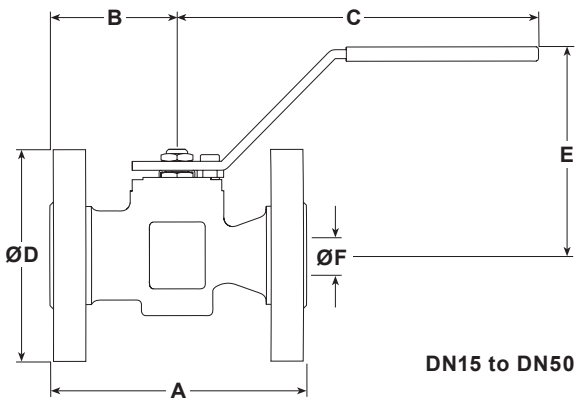
Dimensions/weights (approximate) in mm and kg

PN40 DIN 3202 F4 flanges

Size	A	B	C	D	E	F	Weight
DN15	115	57	162	95	95	13	2.5
DN20	120	60	162	105	95	13	3.2
DN25	125	62	162	115	101	19	4.0
DN32	130	65	182	140	106	25	5.5
DN40	140	70	186	150	118	30	6.9
DN50	150	75	186	165	123	37	9.3
DN65	170	79	278	185	144	50	13.4
DN80	180	91	417	200	157	57	17.7
DN100	190	98	517	235	172	75	25.0
DN150	-	-	-	-	-	-	-

PN40 BS 2080 flanges

Size	A	B	C	D	E	F	Weight
DN15	-	-	-	-	-	-	-
DN20	-	-	-	-	-	-	-
DN25	165	62	162	115	101	19	4.2
DN32	178	65	182	140	106	25	5.9
DN40	190	70	186	150	118	30	7.4
DN50	216	75	186	165	123	37	10.2
DN65	241	79	278	185	144	50	14.9
DN80	283	91	417	200	157	57	20.2
DN100	305	98	517	235	172	75	29.4
DN150	403	130	700	300	205	100	56.9



K_v values

DN	15	20	25	32	40	50	65	80	100	150
K _v	10	10	30	40	81	103	197	248	581	735

For conversion
C_v (UK) = K_v x 0.963
C_v (US) = K_v x 1.156

Operating torque (N m)

DN	15	20	25	32	40	50	65	80	100	150
N m	15	15	20	25	35	60	100	120	170	400

Note: The torque figures shown are for a valve that is frequently operated at the maximum operating pressure. Valves that are subject to long static periods, may require a greater break-out torque.

Safety information, installation and maintenance

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

How to order

Specify	Body material	2 = Zinc plated carbon steel
		3 = Stainless steel

Example: 1 off Spirax Sarco DN50 M21Hi2 ISO ball valve having flanged EN 1092 PN40 connections. Face-to-face according to BS 2080.

Optional extras:

- Self-venting ball.
- Extended stems to allow full insulation: 50 mm (2") for the DN15 to DN50 and 100 mm (4") for the DN15 to DN150.
- Lockable handle.
- 100 mm extended stem with lockable handle.

Pipeline ancillaries
Ball valves

DN15 to DN50 - Spare parts

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

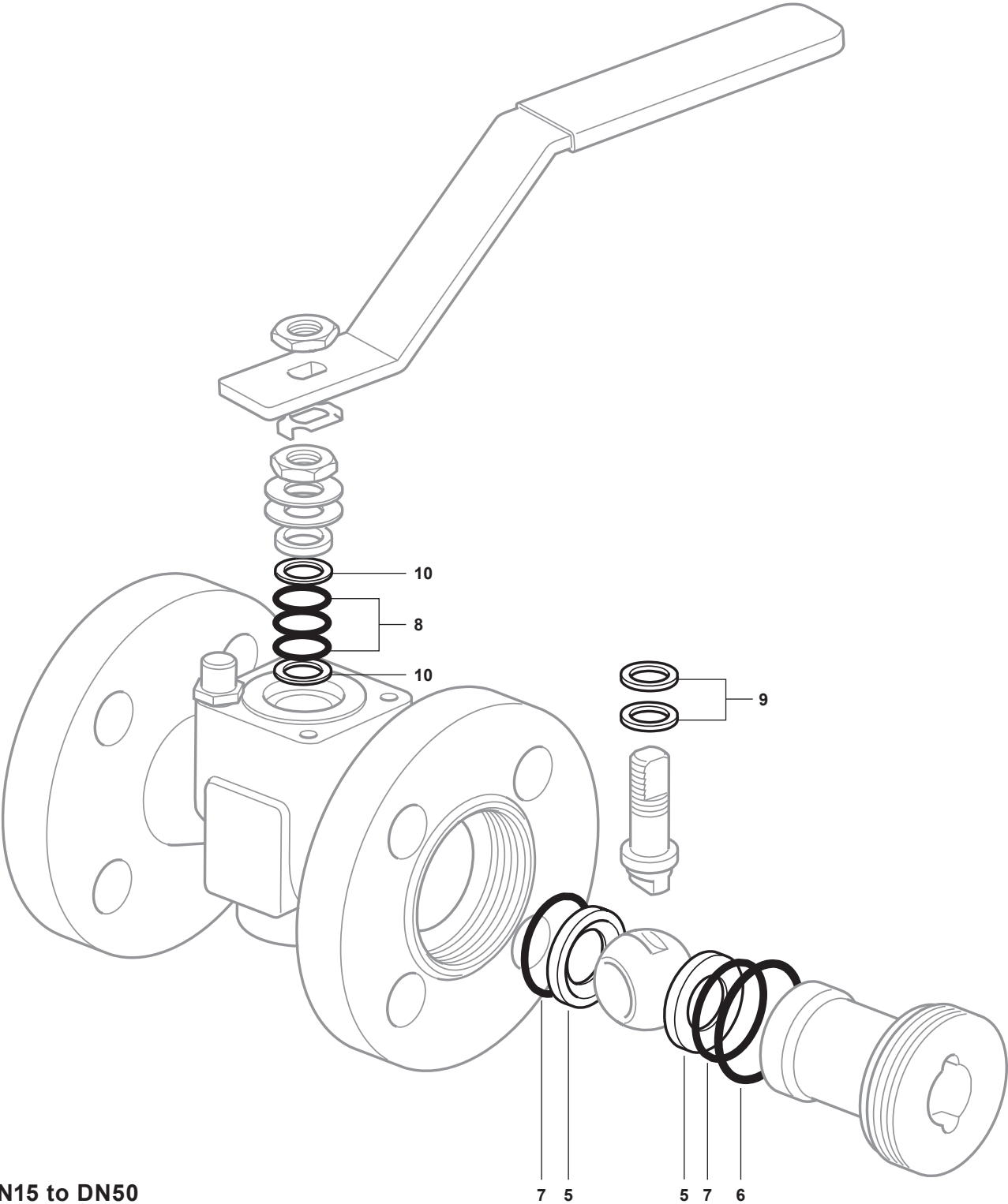
Available spares

Seats, insert gasket, seat 'O' rings and stem seals	5, 6, 7, 8, 9, 10
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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 gasket, seat 'O' rings and stem seals for a Spirax Sarco DN50 flanged PN40 M21Hi2 ball valve.



DN15 to DN50

DN65 to DN150 - Spare parts

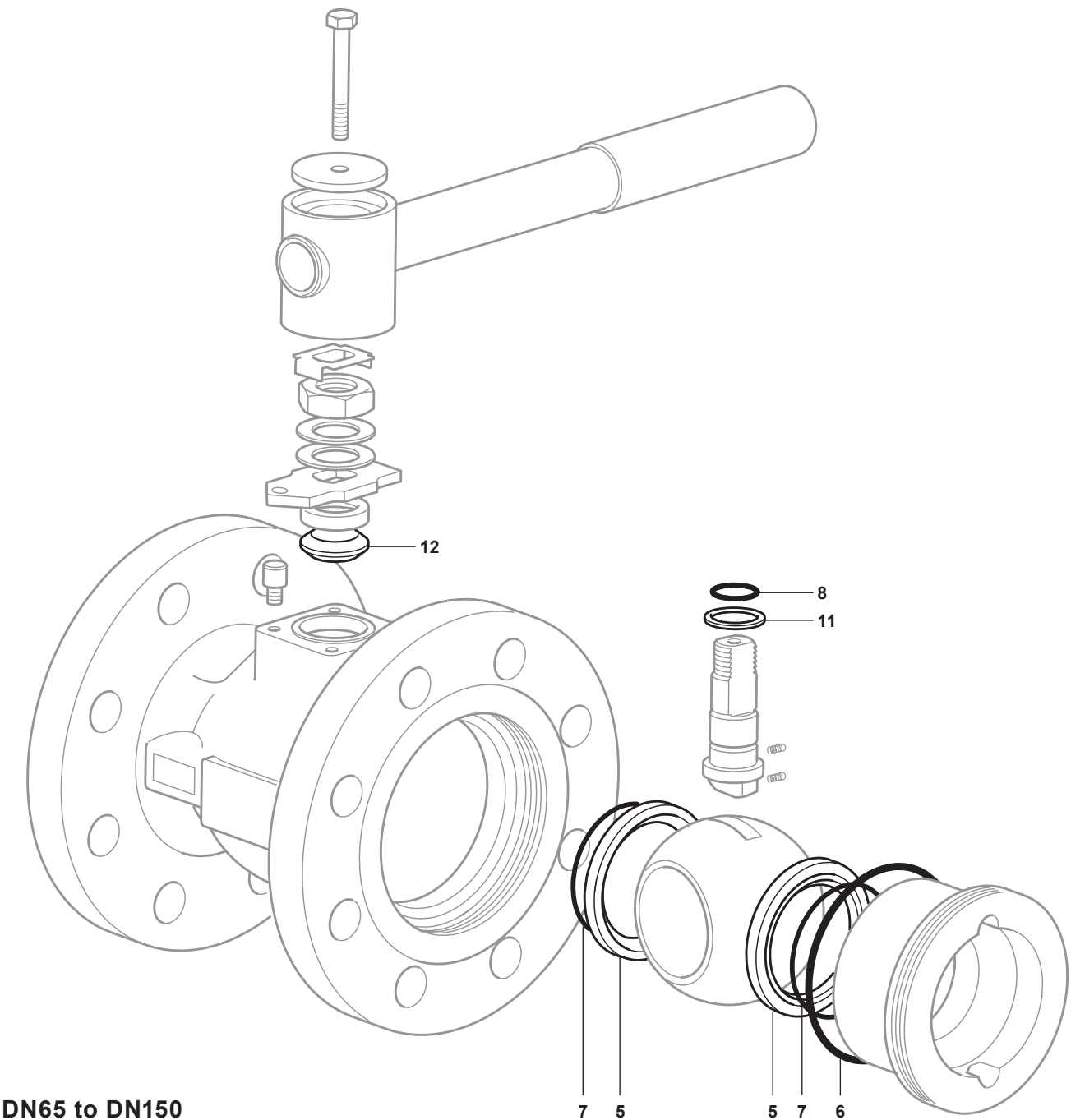
The spare parts available are shown in solid outline. Parts drawn in a grey line are not supplied as spares.

Available spares

Seats, insert gasket, seat 'O' ring, stem 'O' ring, lower stem seal and upper stem packing 5, 6, 7, 8, 11, 12

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 gasket, seat 'O' ring, stem 'O' ring, lower stem seal and upper stem packing for a Spirax Sarco DN50 flanged PN40 M21Hi2 ball valve.



DN65 to DN150

TI-P133-78

CMGT Issue 7



M40Si ISO and M40Vi ISO

Reduced Bore Ball Valves

DN25 to DN200 Flanged ASME 150 and ASME 300


Description

Both the M40Si and M40Vi are reduced bore ball valves, with a single piece body, having ISO mounting as standard. They are designed to be isolating valves, which can be used with the majority of industrial fluids, not control valves.

Available types

M40Si2 ISO	Zinc plated carbon steel body, PDR 0.8 seats.	M40Vi2 ISO	Zinc plated carbon steel body, PTFE seats.
M40Si3 ISO	Stainless steel body, PDR 0.8 seats.	M40Vi3 ISO	Stainless steel body, PTFE seats.

Standards

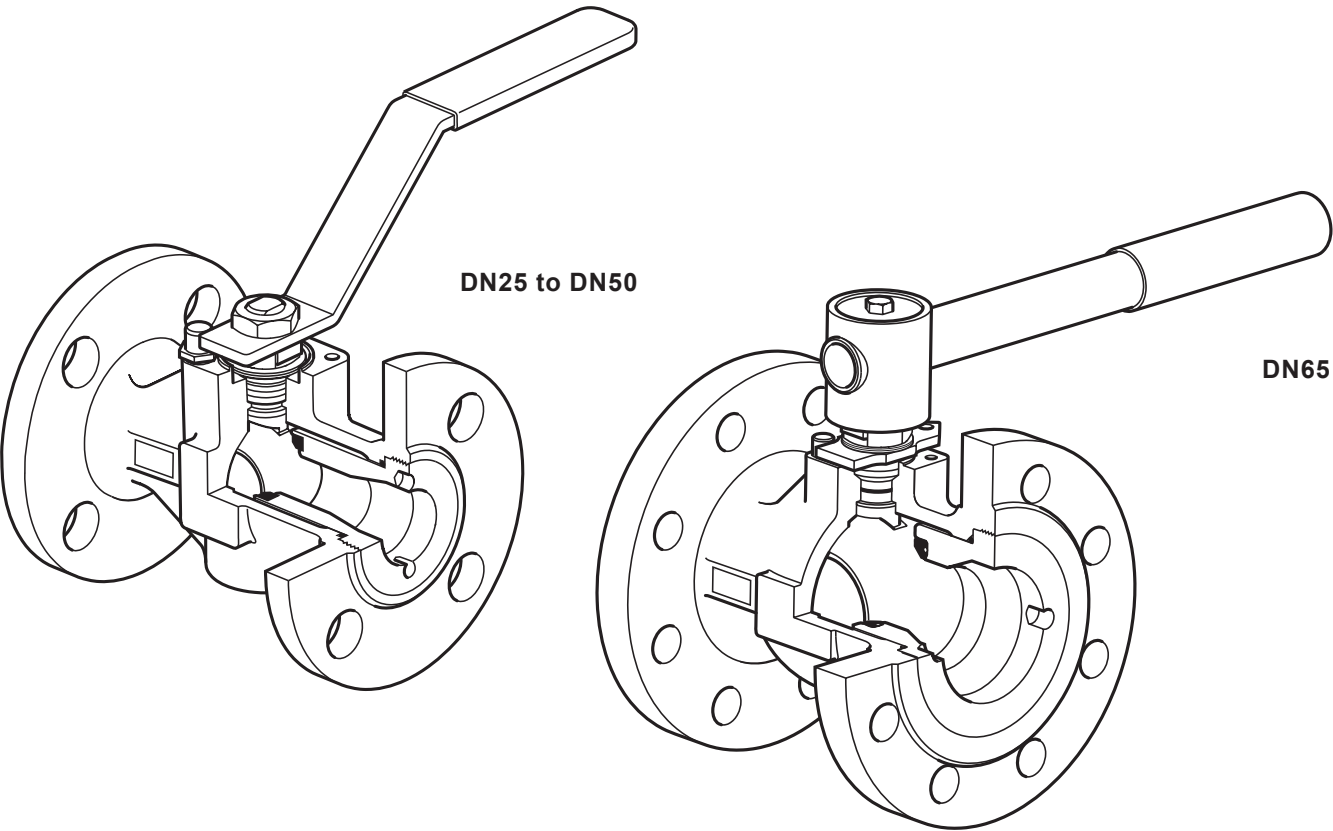
These products fully comply with the requirements of the Pressure Equipment Directive (PED) and carry the  mark when so required.

Certification

These products are available with certification 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, DN65, DN80, DN100, DN150 and DN200.
Standard flanges ASME 150 and ASME 300 with face-to-face dimensions according to ASME B16.10.



DN65

10.3

175

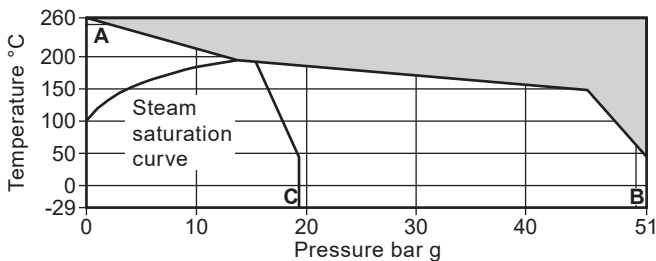
Pipeline ancillaries
Ball valves

Technical data

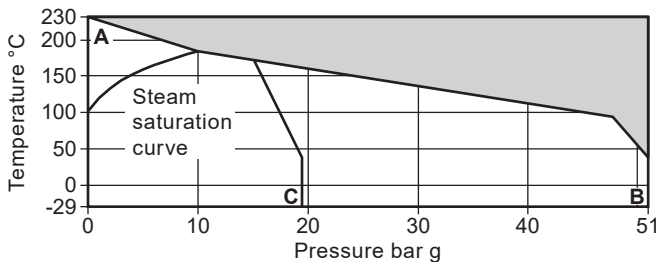
Flow characteristic	Modified linear
Port	Reduced bore
Leakage test procedure to ISO 5208 (Rate A)/EN 12266-1 (Rate A)	
Antistatic device (optional) complies with ISO 7121 and BS 5351	

Pressure/temperature limits

M40Si2 ISO and M40Si3 ISO - PDR 0.8 seats



M40Vi2 ISO and M40Vi3 ISO - PTFE seats



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

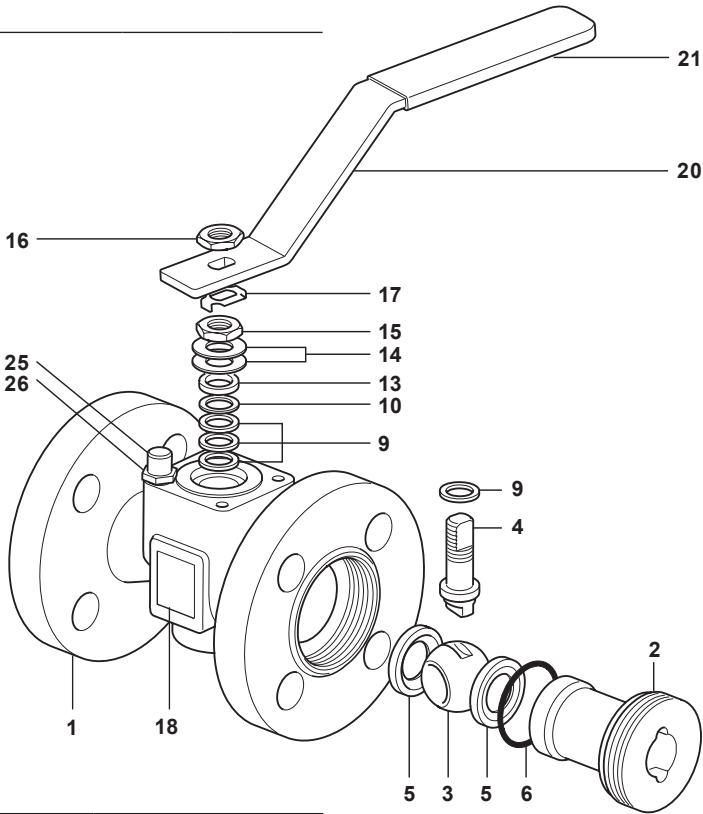
A - B Flanged ASME 300

A - C Flanged ASME 150

Body design conditions			ASME 150 and ASME 300	
PMA	Maximum allowable pressure		ASME 150	19 bar g @ 38 °C
			ASME 300	51 bar g @ 38 °C
TMA	Maximum allowable temperature	M40Si		260 °C @ 0 bar g
		M40Vi		230 °C @ 0 bar g
Minimum allowable temperature				-29 °C
PMO	Maximum operating pressure for saturated steam service	M40Si	ASME 150	13.8 bar g
			ASME 300	17.5 bar g
		M40Vi		10 bar g
TMO	Maximum operating temperature	M40Si		260 °C @ 0 bar g
		M40Vi		230 °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:			ASME 150	28.5 bar g
			ASME 300	76.5 bar g

Materials - DN25 to DN50

No.	Part	Material		
1	Body	M40Si2 ISO and M40Vi2 ISO	Zinc plated carbon steel	ASTM A216 WCB
		M40Si3 ISO and M40Vi3 ISO	Stainless steel	ASTM A351 CF8M
2	Insert	M40Si2 ISO and M40Vi2 ISO	Zinc plated carbon steel	SAE 1040
		M40Si3 ISO and M40Vi3 ISO	Stainless steel	AISI 316
3	Ball	Stainless steel		AISI 316
4	Stem	Stainless steel		AISI 316
5	Seat	M40Si2 ISO and M40Vi2 ISO	Carbon and graphite reinforced PTFE	PDR 0.8
		M40Si3 ISO and M40Vi3 ISO	Virgin PTFE	



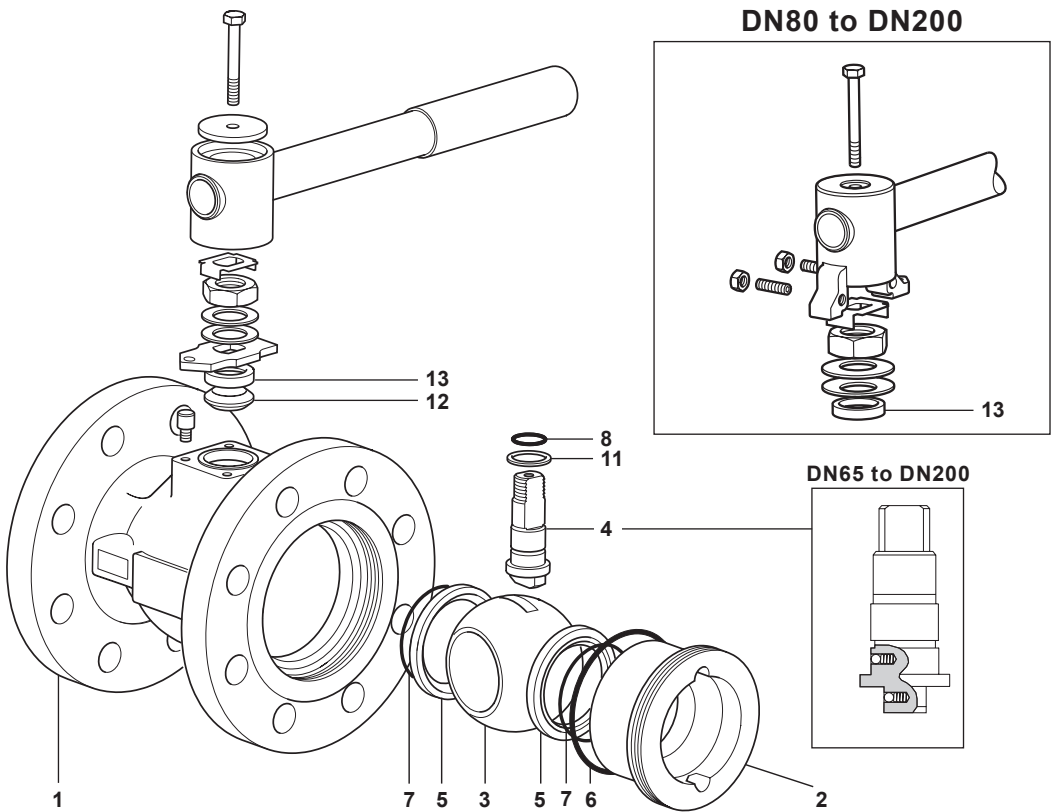
No.	Part	Material		
6	Insert 'O' ring	EPDM		Geothermal
9	Stem seal	Antistatic R-PTFE		
10	Stem seal	Stainless steel		AISI 304
13	Separator	Zinc plated carbon steel		SAE 1010
14	Belleville washer	Stainless steel		AISI 301
15	Gland nut	Zinc plated carbon steel	SAE 1010/SAE 12L14	
16	Upper stem nut	Zinc plated carbon steel	SAE 1010/SAE 12L14	
17	Locking plate	Stainless steel		AISI 304
18	Nameplate	Stainless steel		AISI 430
20	Lever	Zinc plated carbon steel		SAE 1010
21	Grip	Vinyl		
25	Stop screw	Zinc plated carbon steel		SAE 12L14
26	Split lock washer	Stainless steel		AISI 304

Pipeline ancillaries

Ball valves

Materials

DN65

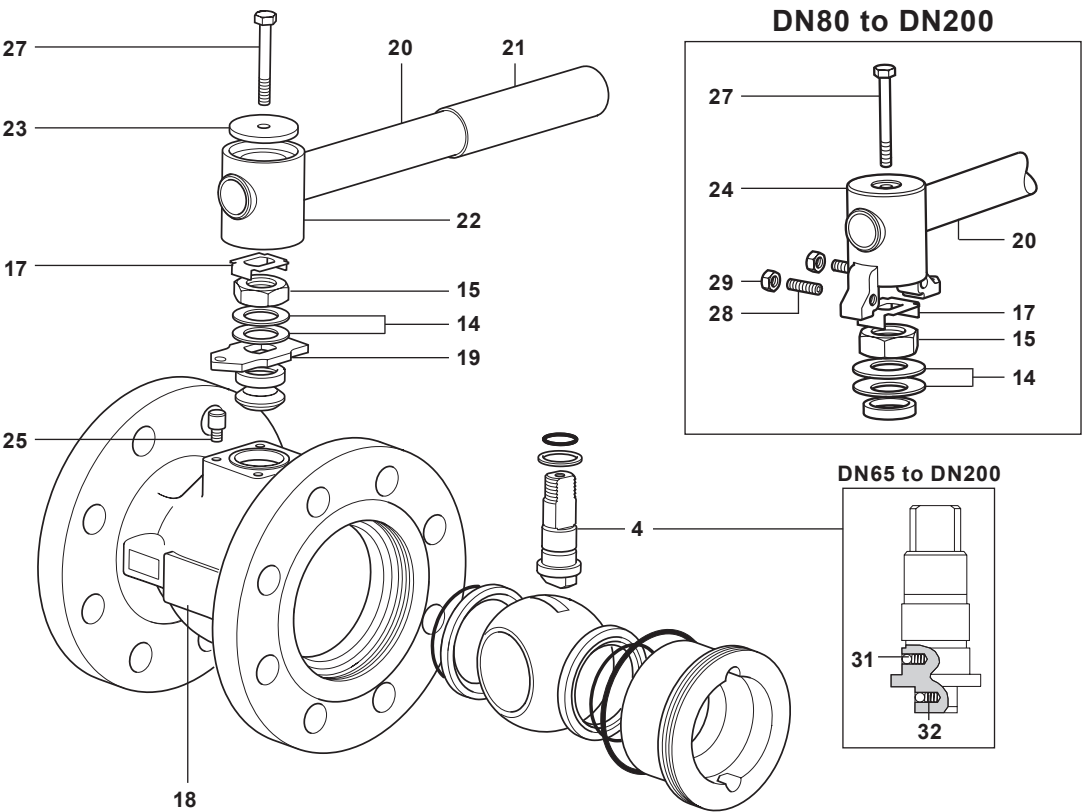


No.	Part	Material		
1	Body	M40Si2 ISO and M40Vi2 ISO	Zinc plated carbon steel	ASTM A216 WCB
		M40Si3 ISO and M40Vi3 ISO	Stainless steel	ASTM A351 CF8M
2	Insert	M40Si2 ISO and M40Vi2 ISO	Zinc plated carbon steel	SAE 1040
		M40Si3 ISO and M40Vi3 ISO	Stainless steel	AISI 316
3	Ball		Stainless steel	AISI 316
4	Stem		Stainless steel	AISI 316/AISI 420
5	Seat	M40Si2 ISO and M40Si3 ISO	Carbon and graphite reinforced PTFE	PDR 0.8
		M40Vi2 ISO and M40Vi3 ISO	Virgin PTFE	
6	Insert 'O' ring		EPDM	Geothermal
7	Seat 'O' ring		EPDM	Geothermal
8	Stem 'O' ring		EPDM	Geothermal
11	Lower stem seal		Antistatic R-PTFE	
12	Upper stem packing		Virgin PTFE	
13	Separator		Zinc plated carbon steel	SAE 1010

Materials continued on the next page

Materials (continued)

DN65



No. Part		Material	
14	Belleville washer	Carbon steel/stainless steel	
15	Gland nut	Zinc plated carbon steel	SAE 1010/SAE 12L14
17	Locking plate	Stainless steel	AISI 304
18	Nameplate	Stainless steel	AISI 430
19	Stop plate with indicator	DN65 only	Zinc plated carbon steel SAE 1010
20	Lever	Zinc plated carbon steel SAE 1010	
21	Grip	Vinyl	
22	Adaptor	Zinc plated SG iron	
23	Adaptor plate	Zinc plated carbon steel	SAE 1010
24	Adaptor with indicator	DN80 to DN200	Zinc plated SG iron
25	Stop screw	DN80 to DN200	Zinc plated carbon steel SAE 12L14
27	Adaptor screw	Zinc plated carbon steel Grade 5	
28	Stop screw	DN80 to DN200	Carbon steel
29	Adaptor hex. nut	DN80 to DN200	Zinc plated carbon steel
31	Antistatic device ball	Stainless steel	AISI 302
32	Antistatic device spring	Stainless steel	AISI 301

Pipeline ancillaries
Ball valves

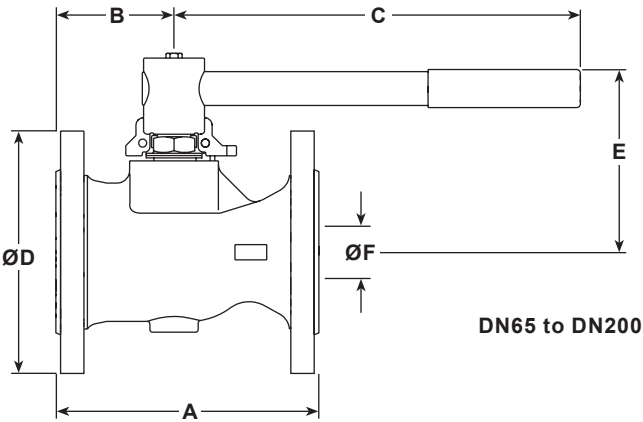
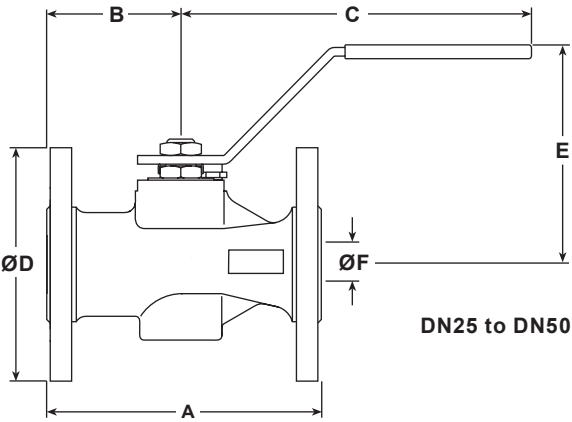
Dimensions/weights (approximate) in mm and kg

Flanged ASME 150

Size	A	B	C	D	E	F	Weight
DN25	127	62	162	108	101	19	2.9
DN32	140	65	182	118	106	25	3.8
DN40	165	70	186	127	118	30	5.4
DN50	178	75	186	152	123	37	7.9
DN65	190	79	278	178	144	50	12.0
DN80	203	91	417	191	157	57	15.8
DN100	229	98	517	229	172	75	24.8
DN150	267	130	700	279	205	100	43.8
DN200	292	146	850	343	286	200	82.6

Flanged ASME 300

Size	A	B	C	D	E	F	Weight
DN25	165	62	162	124	101	19	4.5
DN32	178	65	182	134	106	25	5.7
DN40	190	70	186	156	118	30	8.2
DN50	216	75	186	165	123	37	10.3
DN65	241	79	278	190	144	50	16.0
DN80	283	91	417	210	157	57	22.3
DN100	305	98	517	254	172	75	36.1
DN150	403	130	700	318	205	100	66.6
DN200	419	146	850	381	286	200	117.5



K_v values

DN	25	32	40	50	65	80	100	150	200
K _v	30	40	81	103	197	248	581	735	1600

For conversion:
C_v (UK) = K_v x 0.963
C_v (US) = K_v x 1.156

Safety information, installation and maintenance

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

Welding

Only the models that have connections designed for welding (SW, BW, Imperial Tube connections) should be welded. Valves with flanged connections must not be welded to avoid damages to the valve and/or injury to personnel.

How to order

Specify	Model	Seat material	S = Carbon and graphite reinforced PTFE - PDR 0.8
			V = Virgin PTFE
	Material	Body material	2 = Carbon steel
			3 = Stainless steel

Example: 1 off Spirax Sarco DN50 M40Vi2 ISO ball valve having flanged ASME 150 connections.

Operating torques (Nm)

DN	25	32	40	50	65	80	100	150	200
N m	10	15	20	25	50	70	100	155	720

Note: The torque figures shown are for a valve that is frequently operated at the maximum operating pressure. Valves that are subject to long static periods, may require a greater break-out torque.

Optional extras:

- Self-venting ball.
- Extended stems to allow full insulation: 50 mm (2") for DN25 and DN50 sizes and 100 mm (4") for DN25 to DN200 sizes.
- Lockable handle.
- 100 mm extended stem with lockable handle.

Pipeline ancillaries

Ball valves

DN25 to DN50 - Spare parts (see page 9 for sizes DN65 - DN200)

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

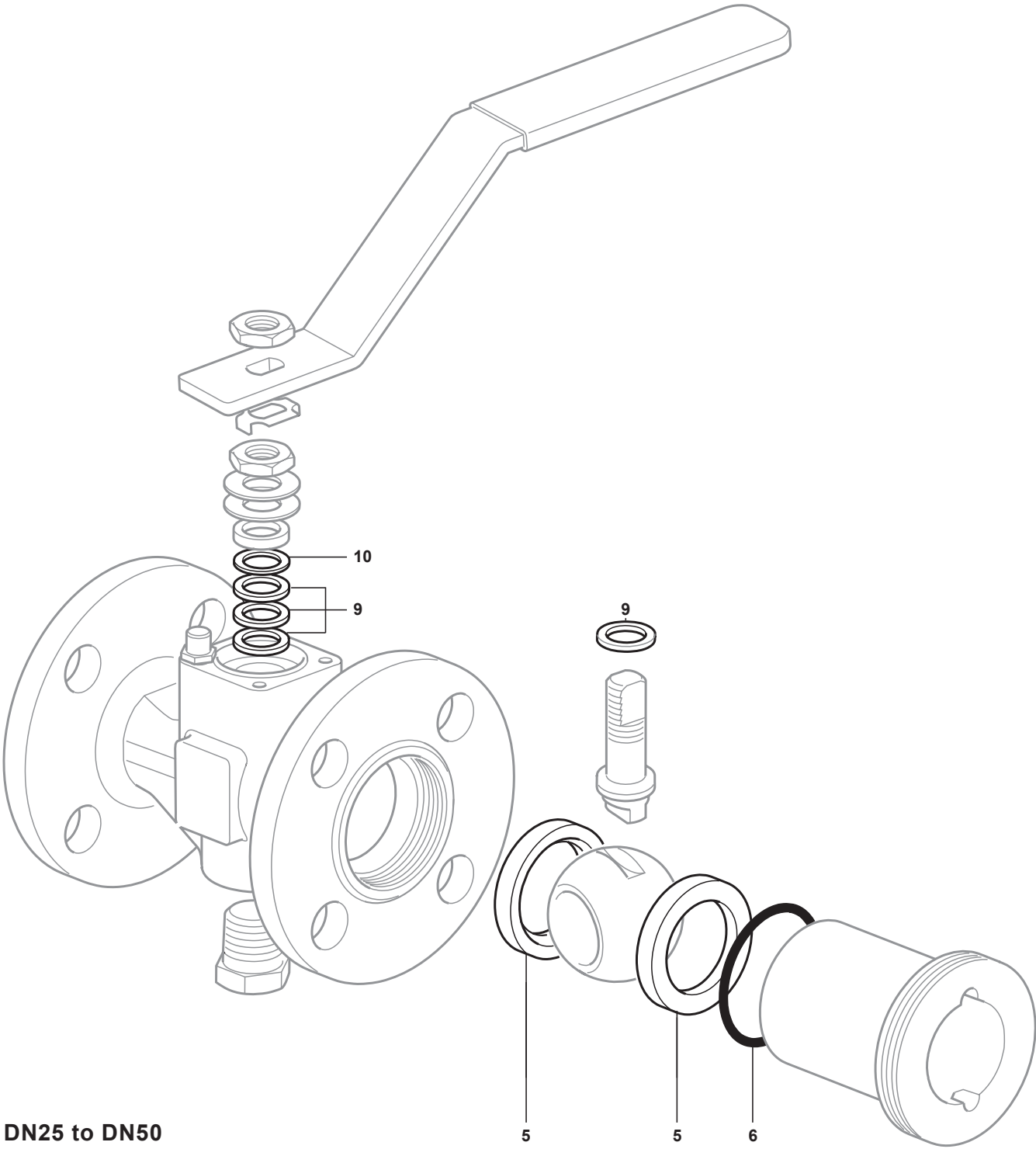
Available spares

Seats, insert 'O' ring and stem seals	5, 6, 9, 10
---------------------------------------	-------------

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 flanged ASME 150 M40Si2 ball valve.



DN25 to DN50

DN65 to DN200 - Spare parts (see page 8 for sizes DN25 - DN50)

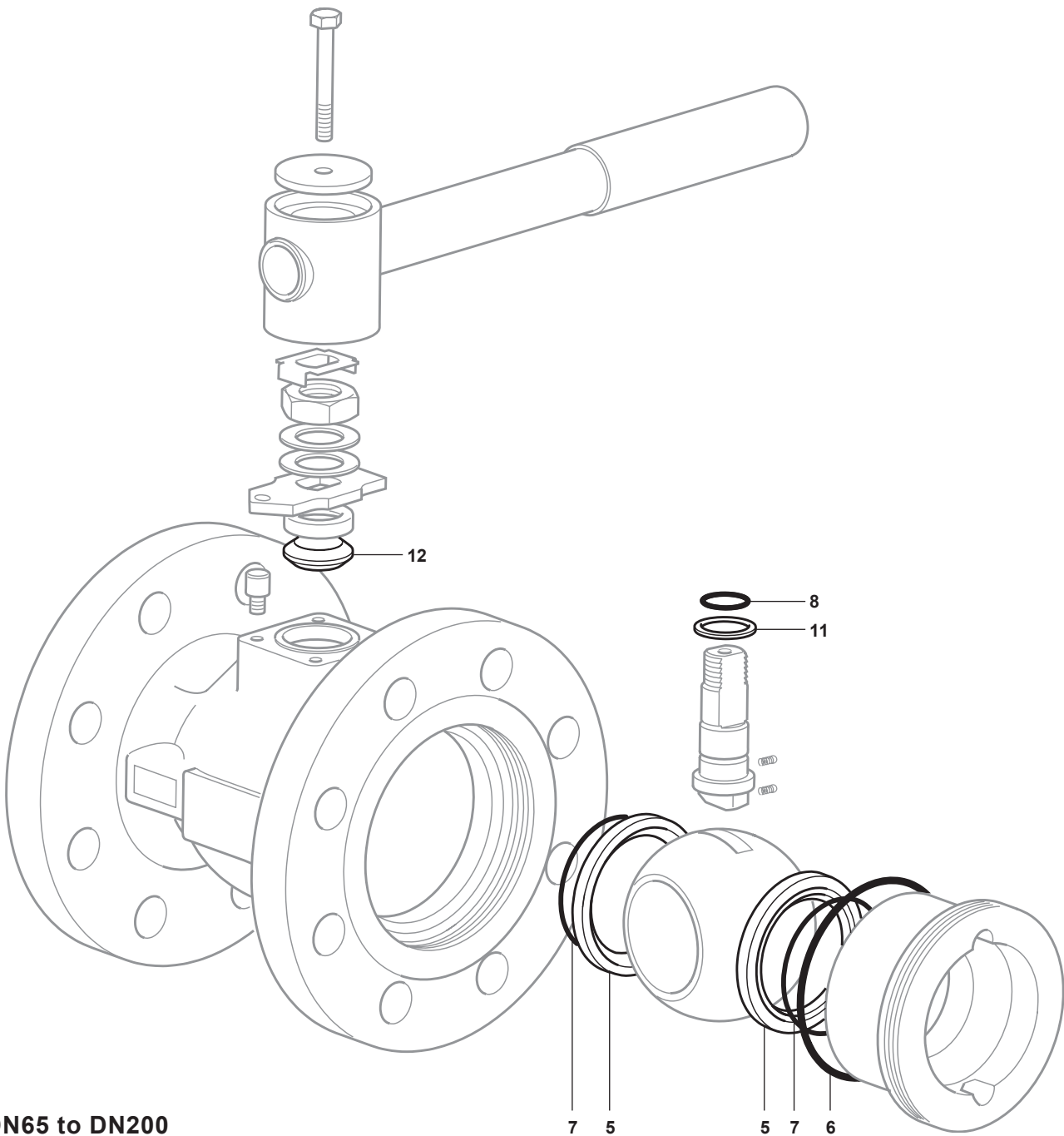
The spare parts available are shown in solid outline. Parts drawn in a grey line are not supplied as spares.

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
---	--------------------

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 DN80 flanged ASME 150 M40Si2 ball valve.



DN65 to DN200

TI-P133-87

CMGT Issue 3

spirax

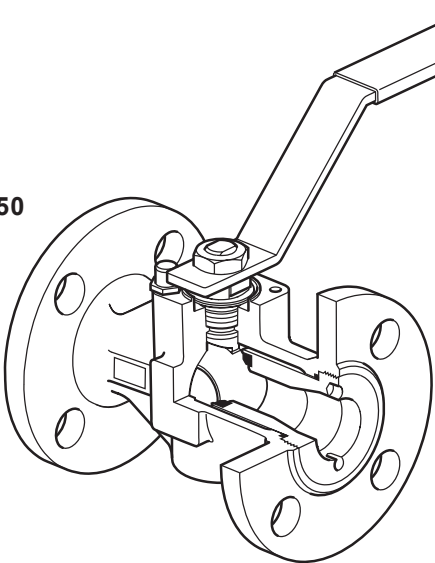
sarco

M40Hi ISO

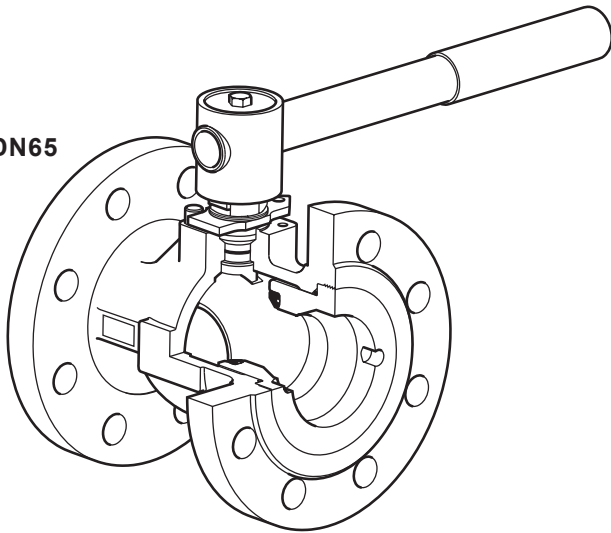
Reduced Bore Ball Valve

DN25 to DN150 Flanged ASME 150 and ASME 300

DN25 to DN50



DN65



Description

The M40Hi is a reduced bore ball valve, with a single piece body, having ISO mounting as standard. As a main feature the valve has a special ball which has received a surface hardening and also benefits from having reinforced PEEK seats. The M40Hi has been designed for use as an isolating valve, not a control valve and can be installed in high temperature applications such as steam up to 39 bar g and thermal oils.


Available types

- M40Hi2 ISO Zinc plated carbon steel body, reinforced PEEK seats.
- M40Hi3 ISO Stainless steel body, reinforced PEEK seats.

10.3

195

Standards

This product fully complies with the requirements of the Pressure Equipment Directive (PED) and carries the  mark when so required.

Certification

This product is available with certification to EN 10204 3.1.
Note: All certification/inspection requirements must be stated at the time of order placement.

Sizes and pipe connections

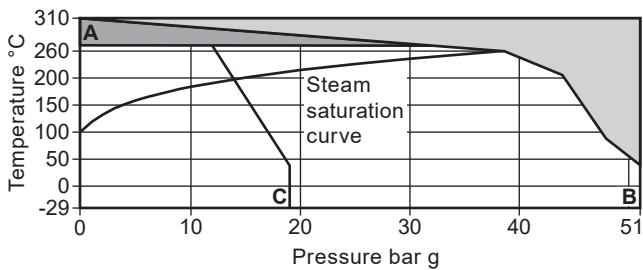
DN25, DN32, DN40, DN50, DN65, DN80, DN100 and DN150.
Standard flanges ASME 150 and ASME 300 with face-to-face dimensions according to ASME B16.10.

Pipeline ancillaries
Ball valves

Technical data

Flow characteristic	Modified linear
Port	Reduced bore
Leakage test procedure to ISO 5208 (Rate A)/EN 12266-1 (Rate A)	
Antistatic device (optional) complies with ISO 7121 and BS 5351	

Pressure/temperature limits



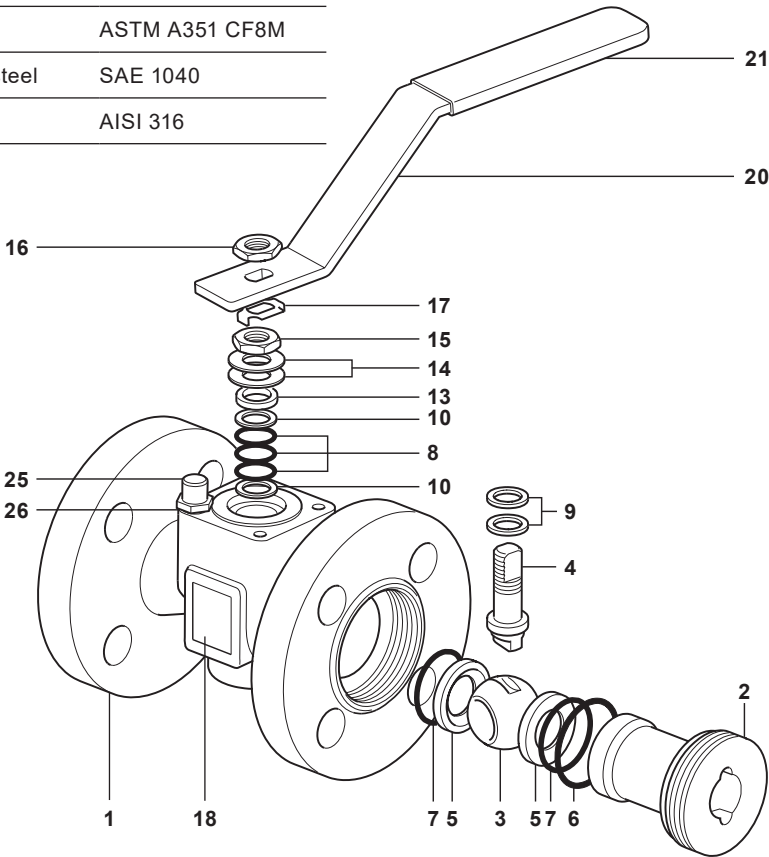
- The product **must not** be used in this region.
- The product can only be used in this region for short periods of time.

- A - B Flanged ASME 300
- A - C Flanged ASME 150

Body design conditions		ASME 150 and ASME 300	
PMA	Maximum allowable pressure	ASME 150	19 bar g @ 38 °C
		ASME 300	51 bar g @ 38 °C
TMA	Maximum allowable temperature	310 °C @ 0 bar g	
For continuous operation, the maximum temperature is 260 °C			
310 °C is for short periods only			
Minimum allowable temperature		-29 °C	
PMO	Maximum operating pressure for saturated steam service	ASME 150	13.8 bar g
		ASME 300	39 bar g
TMO	Maximum operating temperature	310 °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		ASME 150	28.5 bar g
		ASME 300	76.5 bar g

Materials - DN25 to DN50

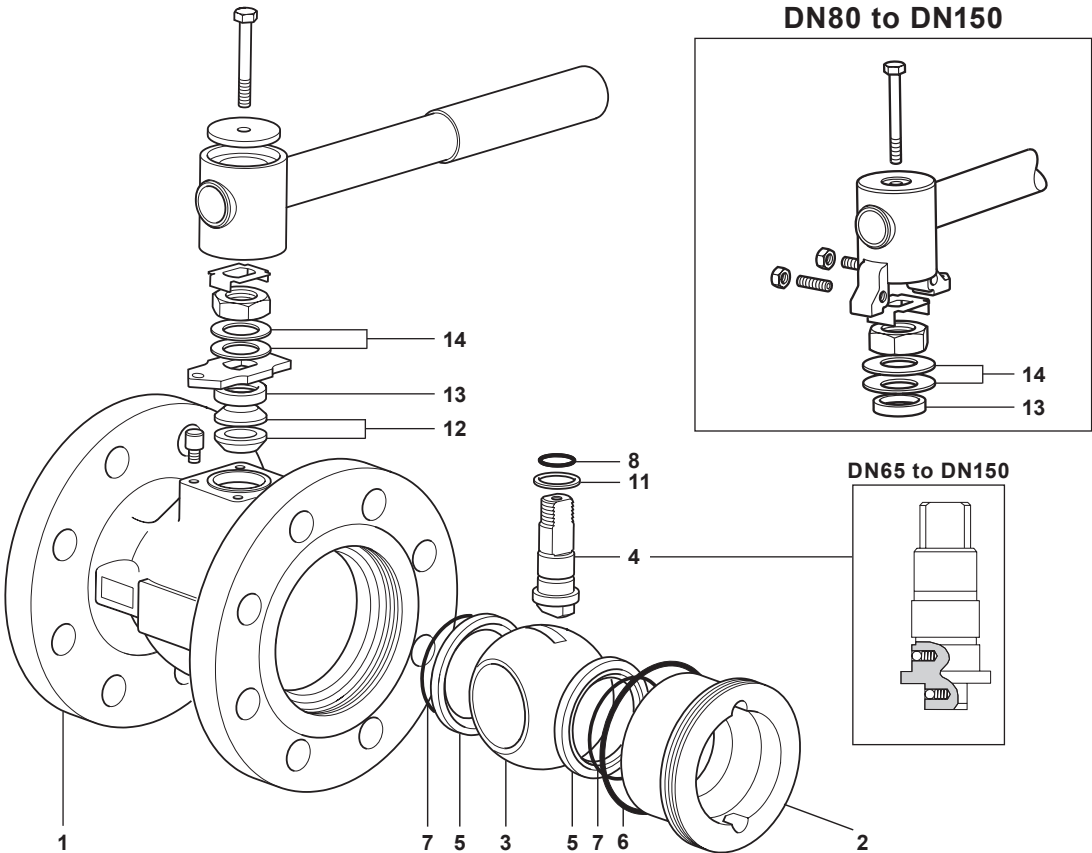
No.	Part	Material		
1	Body	M40Hi2 ISO	Zinc plated carbon steel	ASTM A216 WCB
		M40Hi3 ISO	Stainless steel	ASTM A351 CF8M
2	Insert	M40Hi2 ISO	Zinc plated carbon steel	SAE 1040
		M40Hi3 ISO	Stainless steel	AISI 316



No.	Part	Material	
3	Ball	Stainless steel	AISI 316 hardened surface
4	Stem	Duplex stainless steel	AISI 318 LN
5	Seat	PEEK	Reinforced
6	Insert gasket	Graphite	
7	Seat 'O' ring	EPDM	Geothermal
8	Stem seal	Graphite	
9	Stem seal	PEEK	Reinforced
10	Stem seal	Stainless steel	AISI 304
13	Separator	Zinc plated carbon steel	SAE 1010
14	Belleville washer	Stainless steel	AISI 301
15	Gland nut	Zinc plated carbon steel	SAE 1010/SAE 12L14
16	Upper stem nut	Zinc plated carbon steel	SAE 1010/SAE 12L14
17	Locking plate	Stainless steel	AISI 304
18	Nameplate	Stainless steel	AISI 430
20	Lever	Zinc plated carbon steel	SAE 1010
21	Grip	Vinyl	Yellow
25	Stop screw	Zinc plated carbon steel	SAE 12L14
26	Split lock washer	Stainless steel	AISI 304

Pipeline ancillaries
Ball valves
Materials

DN65

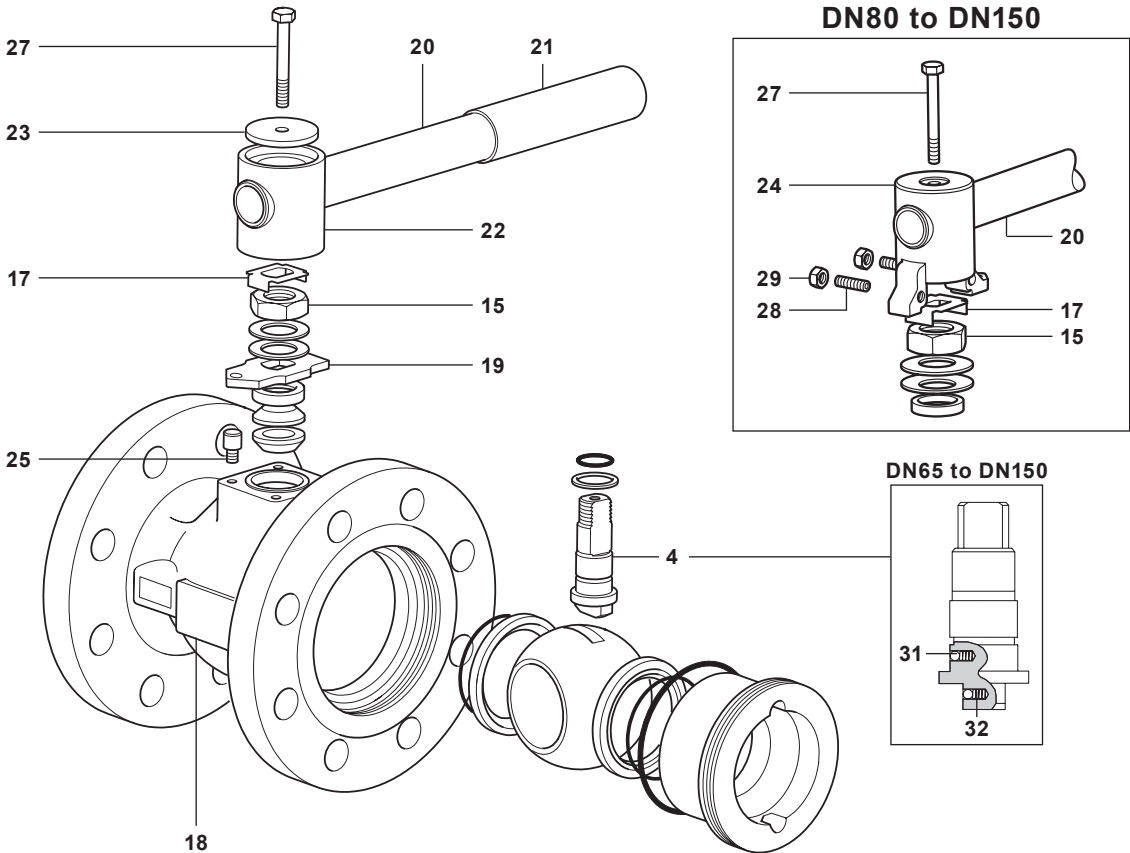


No. Part		Material		
1	Body	M40Hi2 ISO	Zinc plated carbon steel	ASTM A216 WCB
		M40Hi3 ISO	Stainless steel	ASTM A351 CF8M
2	Insert	M40Hi2 ISO	Zinc plated carbon steel	SAE 1040
		M40Hi3 ISO	Stainless steel	AISI 316
3	Ball		Stainless steel	AISI 316 hardened surface
4	Stem	DN65 to DN100	Duplex stainless steel	AISI 318 LN
		DN150	Stainless steel	AISI 316/AISI 420
5	Seat		PEEK	Reinforced
6	Insert gasket		Graphite	
7	Seat 'O' ring		EPDM	Geothermal
8	Stem seal		EPDM	Geothermal
11	Lower stem seal		PEEK	Reinforced
12	Upper stem packing		Graphite	
13	Separator		Zinc plated carbon steel	SAE 1010
14	Belleville washer		Carbon steel/stainless steel	

Materials are continued on the next page

Materials (continued)

DN65



No. Part		Material	
15	Gland nut	Zinc plated carbon steel	SAE 1010/SAE 12L14
17	Locking plate	Stainless steel	AISI 304
18	Nameplate	Stainless steel	AISI 430
19	Stop plate with indicator	DN65 only	Zinc plated carbon steel SAE 1010
20	Lever	Zinc plated carbon steel	SAE 1010
21	Grip	Vinyl	Yellow
22	Adaptor	DN65 only	Zinc plated SG iron
23	Adaptor plate	DN65 only	Zinc plated carbon steel SAE 1010
24	Adaptor with indicator	DN80 to DN150	Zinc plated SG iron
25	Stop screw	DN80 to DN150	Zinc plated carbon steel SAE 12L14
27	Adaptor screw		Zinc plated carbon steel Grade 5
28	Stop screw	DN80 to DN150	Carbon steel
29	Adaptor hex. nut	DN80 to DN150	Zinc plated carbon steel
31	Antistatic device ball		Stainless steel AISI 302
32	Antistatic device spring		Stainless steel AISI 301

Pipeline ancillaries
Ball valves

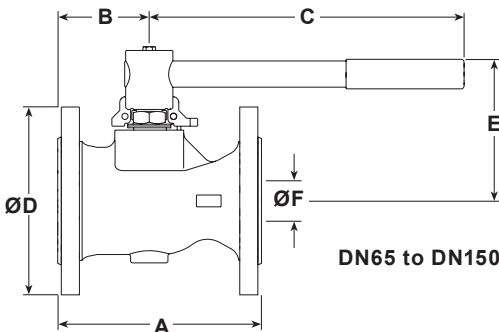
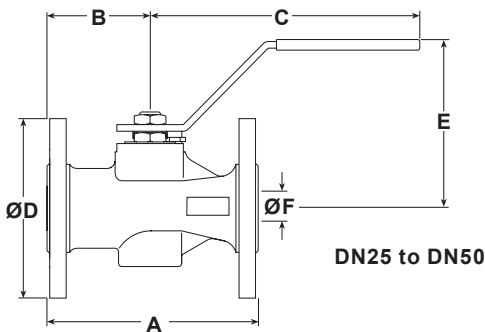
Dimensions/weights (approximate) in mm and kg

Flanged ASME 150

Size	A	B	C	D	E	F	Weight
DN25	127	62	162	108	101	19	2.9
DN32	140	65	182	118	106	25	3.8
DN40	165	70	186	127	118	30	5.4
DN50	178	75	186	152	123	37	7.9
DN65	190	79	278	178	144	50	12.0
DN80	203	91	417	191	157	57	15.8
DN100	229	98	517	229	172	75	24.8
DN150	267	130	700	279	205	100	43.8

Flanged ASME 300

Size	A	B	C	D	E	F	Weight
DN25	165	62	162	124	101	19	4.5
DN32	178	65	182	134	106	25	5.7
DN40	190	70	186	156	118	30	8.2
DN50	216	75	186	165	123	37	10.3
DN65	241	79	278	190	144	50	16.0
DN80	283	91	417	210	157	57	22.3
DN100	305	98	517	254	172	75	36.1
DN150	403	130	700	318	205	100	66.6



K_v values

DN	25	32	40	50	65	80	100	150
K _v	30	40	81	103	197	248	581	735

For conversion:
C_v (UK) = K_v x 0.963
C_v (US) = K_v x 1.156

Operating torques (Nm)

DN	25	32	40	50	65	80	100	150
N m	20	25	35	60	100	120	170	400

Note: The torque figures shown are for a valve that is frequently operated at the maximum operating pressure. Valves that are subject to long static periods, may require a greater break-out torque.

Safety information, installation and maintenance

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

Welding

Only the models that have connections designed for welding (SW, BW, Imperial Tube connections) should be welded. Valves with flanged connections must not be welded to avoid damages to the valve and/or injury to personnel.

How to order

Specify	Body material		Example:
	2 =	Zinc plated carbon steel	1 off Spirax Sarco DN50 M40Hi2 ISO ball valve
	3 =	Stainless steel	having flanged ASME 150 connections.

Optional extras:

- Self-venting ball.
- Extended stems to allow full insulation: 50 mm (2") for DN25 to DN50 sizes and 100 mm (4") for DN25 to DN150 sizes.
- Lockable handle.
- 100 mm extended stem with lockable handle.

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.

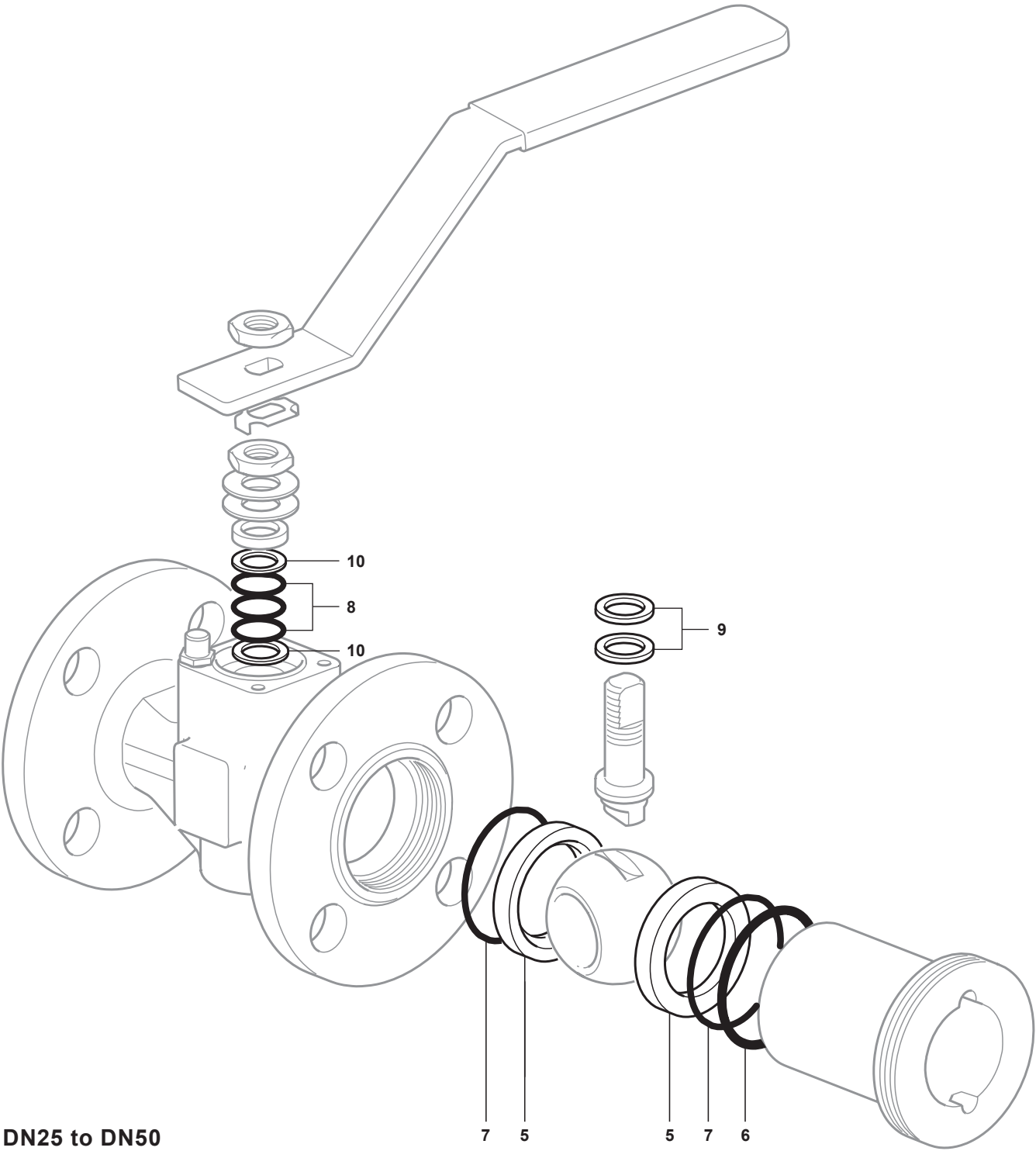
Available spares

Seats, insert gasket, seat 'O' rings and stem seals	5, 6, 7, 8, 9, 10
---	-------------------

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 gasket, seat 'O' rings and stem seals for a Spirax Sarco DN50 flanged ASME 150 M40Hi2 ball valve.



DN25 to DN50

Pipeline ancillaries

Ball valves

DN65 to DN150 - Spare parts

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

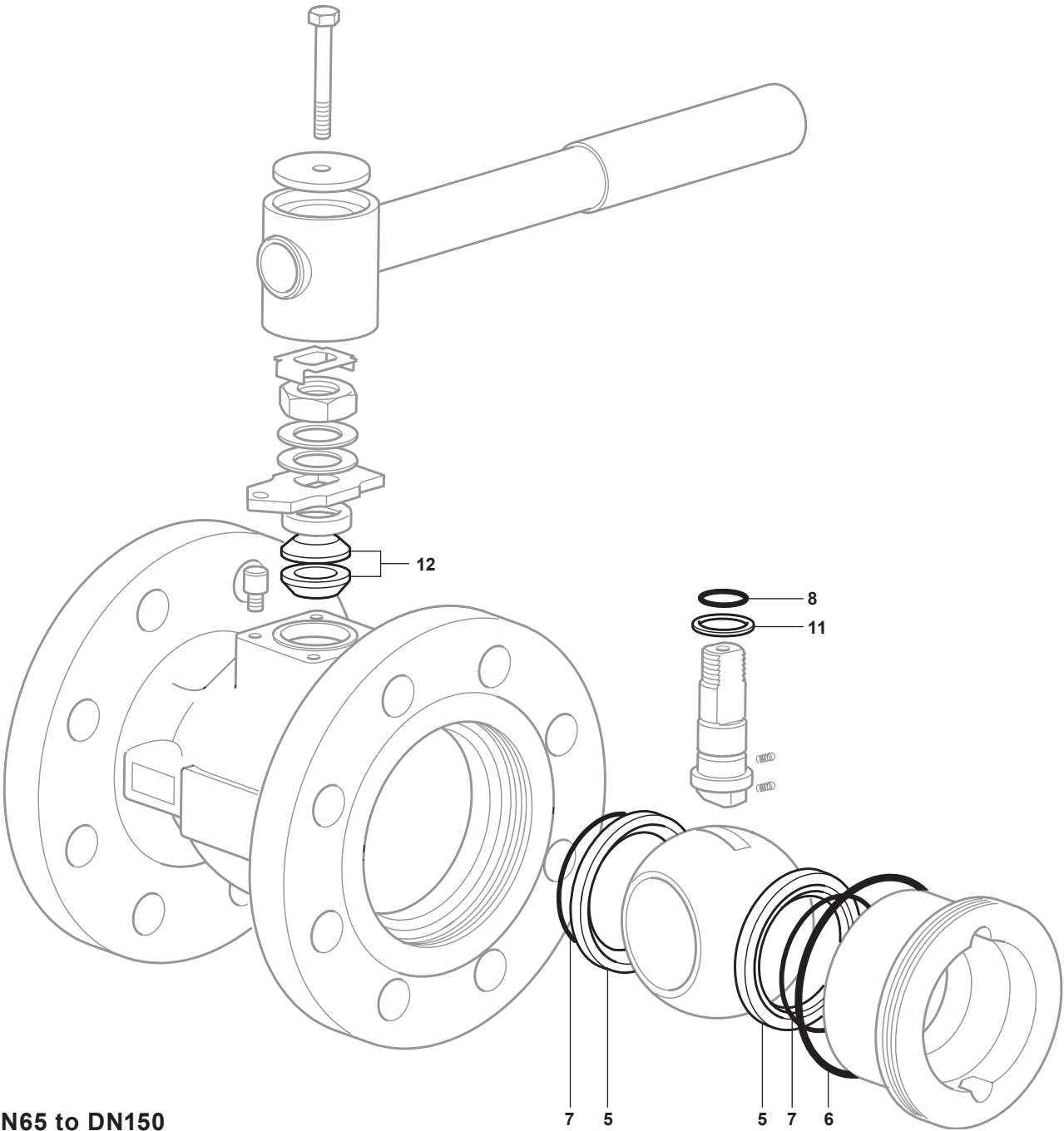
Available spares

Seats, insert gasket, seat 'O' ring, stem 'O' ring, lower stem seal and upper stem packing 5, 6, 7, 8, 11, 12

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 gasket, seat 'O' ring, stem 'O' ring, lower stem seal and upper stem packing for a Spirax Sarco DN80 flanged ASME 150 M40Hi2 ball valve.



DN65 to DN150

spirax

sarco

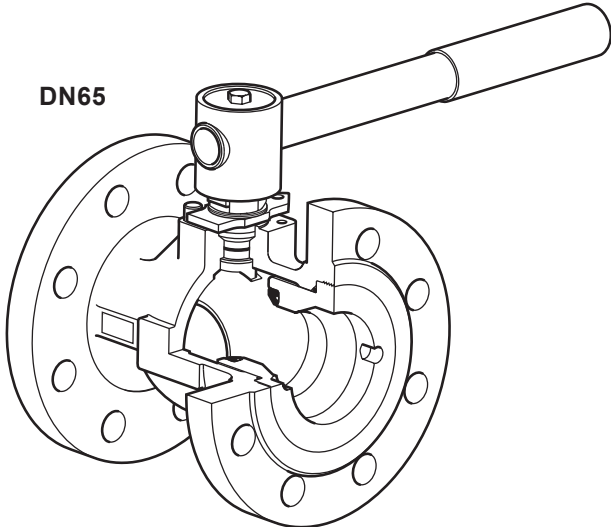
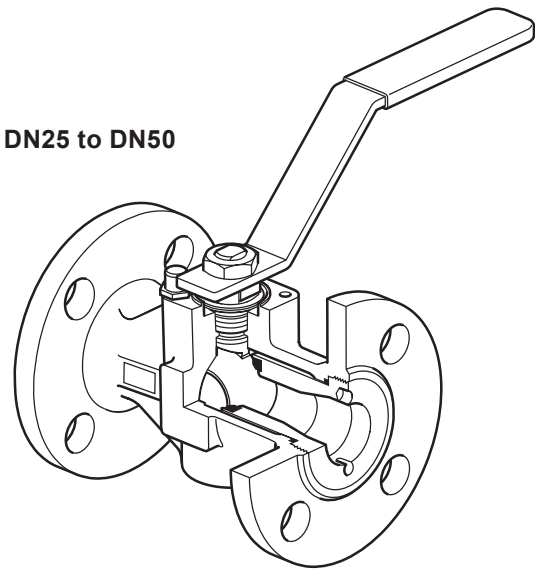
M45i ISO

TI-P133-102

ST Issue 1

Reduced Bore Ball Valve

DN25 to DN150 Flanged ASME 150 and ASME 300




Description

The M45i is a reduced bore ball valve, with a single piece body, having ISO mounting as standard. As a main feature the valve has metal seats - The ball and seats are ENP coated and secured in place using belleville washers making it suitable for use with fluids that contain suspended solids. The M45i ISO has been designed for use in applications that require temperature modulating control.

Available types

- M45i2 ISO Zinc plated carbon steel body + Metal seats.
- M45i3 ISO Stainless steel body + Metal seats.

Standards

This product fully complies with the requirements of the European Pressure Equipment Directive 97/23/EC and carries the  mark when so required.

Certification

This product is available with certification to EN 10204 3.1.
Note: All certification/inspection requirements must be stated at the time of order placement.

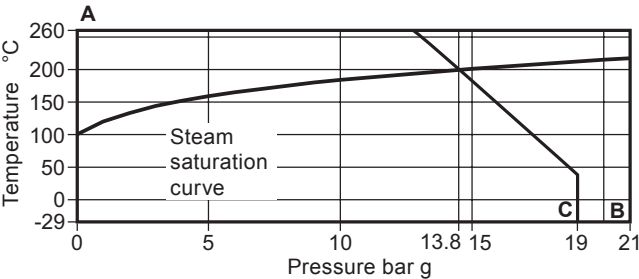
Sizes and pipe connections

DN25, DN32, DN40, DN50, DN65, DN80, DN100 and DN150. Standard flanges ASME Class 150 and ASME Class 300.

Technical data

Flow characteristic	Modified linear
Port	Reduced bore
Leakage test procedure to ANSI B16.104 Class IV	
Antistatic device (optional) complies with ISO 7121 and BS 5351	

Pressure/temperature limits

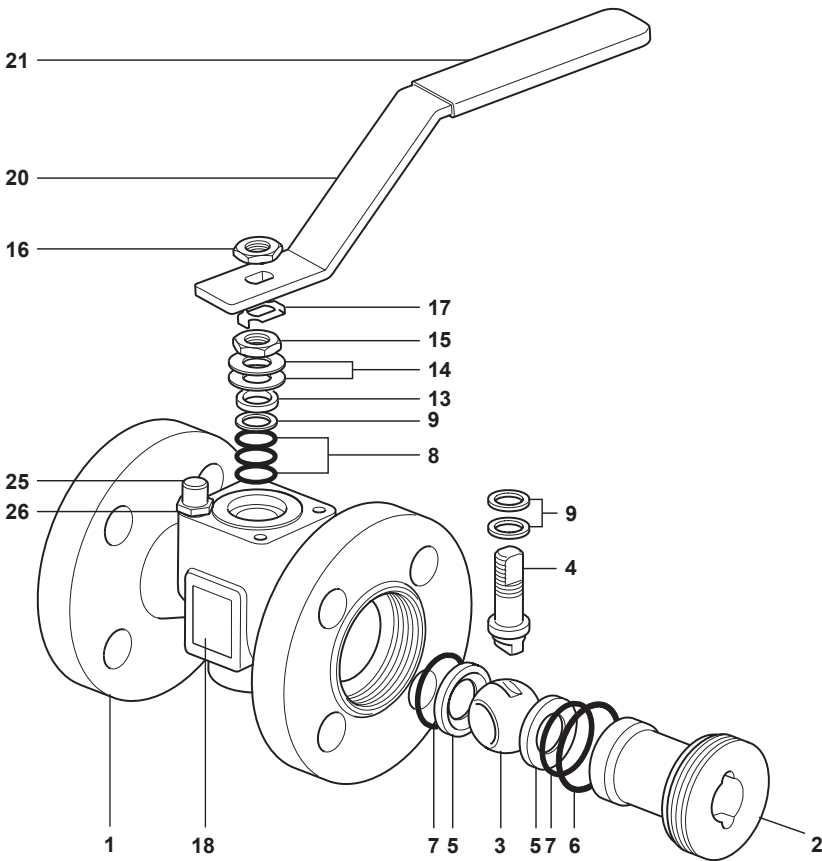


A - B Flanged ASME 300

A - C Flanged ASME 150

Body design conditions		ASME 150 and ASME 300	
PMA	Maximum allowable pressure	ASME 150	19 bar g @ 38 °C
		ASME 300	21 bar g @ 260 °C
TMA	Maximum allowable temperature	ASME 150	260 °C @ 11.7 bar g
		ASME 300	260 °C @ 21 bar g
Minimum allowable temperature			-29 °C
PMO	Maximum operating pressure for saturated steam service	ASME 150	13.8 bar g
		ASME 300	21 bar g
TMO	Maximum operating temperature	ASME 150	260 °C @ 11.7 bar g
		ASME 300	260 °C @ 21 bar g
Minimum operating temperature			-29 °C
Note: For lower operating temperatures consult Spirax Sarco			
ΔPMX	Maximum differential pressure is limited to the PMO		
Designed for a maximum cold hydraulic test pressure of:	ASME 150	28.5 bar g	
	ASME 300	76.5 bar g	

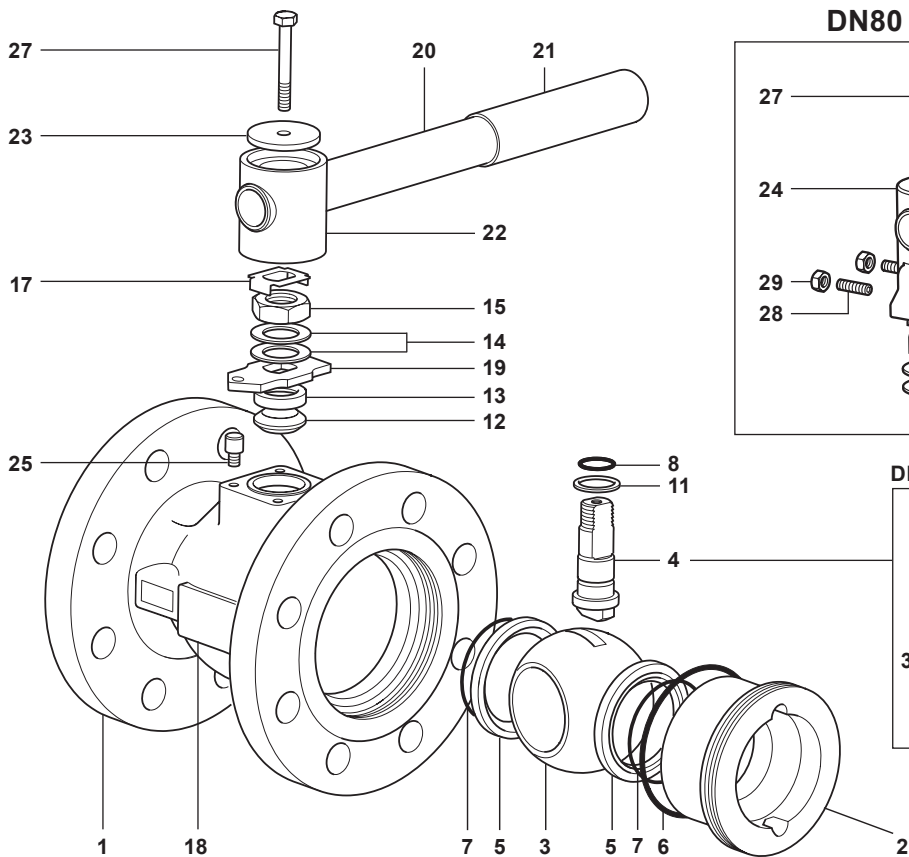
Pipeline ancillaries
Ball valves
DN25 to DN50



Materials

No.	Part	Material		
1	Body	M452i ISO	Zinc plated carbon steel	ASTM A216 WCB
		M453i ISO	Stainless steel	ASTM A351 CF8M
2	Insert	M452i ISO	Zinc plated carbon steel	SAE 1040
		M453i ISO	Stainless steel	AISI 316
3	Ball	Stainless steel	AISI 316 ENP coated	
4	Stem	Duplex stainless steel	AISI 318 LN	
5	Seat	Stainless Steel	AISI 316 ENP coated	
6	Insert gasket	Graphite		
7	Seat 'O' ring	EPDM	Geothermal	
8	Stem seal	Antistatic R-PTFE		
9	Stem seal	PEEK	Reinforced	
13	Separator	Zinc plated carbon steel	SAE 1010	
14	Belleville washer	Stainless steel	AISI 301	
15	Gland nut	Zinc plated carbon steel	SAE 1010 / SAE 12L14	
16	Upper stem nut	Zinc plated carbon steel	SAE 1010 / SAE 12L14	
17	Locking plate	Stainless steel	AISI 304	
18	Name-plate	Stainless steel	AISI 430	
20	Lever	Zinc plated carbon steel	SAE 1010	
21	Grip	Vinyl	Blue	
25	Stop screw	Zinc plated carbon steel	SAE 12L14	
26	Split lock washer	Stainless steel	AISI 304	

DN65



Materials

No.	Part		Material	
1	Body	M452i ISO	Zinc plated carbon steel	ASTM A216 WCB
		M453i ISO	Stainless steel	ASTM A351 CF8M
2	Insert	M452i ISO	Zinc plated carbon steel	SAE 1040
		M453i ISO	Stainless steel	AISI 316
3	Ball		Stainless steel	AISI 316 ENP coated
4	Stem	DN65 to DN100	Duplex stainless steel	AISI 318 LN
		DN150	Stainless steel	AISI 316 / AISI 420
5	Seat		Stainless steel	AISI 316 ENP coated
6	Insert gasket		Graphite	
7	Seat 'O' ring		EPDM	Geothermal
8	Stem seal		EPDM	Geothermal
11	Lower stem seal		PEEK	Reinforced
12	Upper stem packing		Graphite	
13	Separator		Zinc plated carbon steel	SAE 1010
14	Belleville washer		Stainless steel	AISI 301
15	Gland nut		Zinc plated carbon steel	SAE 1010 / SAE 12L14
17	Locking plate		Stainless steel	AISI 304
18	Name-plate		Stainless steel	AISI 430
19	Stop plate with indicator	DN65 only	Zinc plated carbon steel	SAE 1010
20	Lever		Zinc plated carbon steel	SAE 1010
21	Grip		Vinyl	
22	Adaptor	DN65 only	Zinc plated SG iron	
23	Adaptor plate	DN65 only	Zinc plated carbon steel	SAE 1010
24	Adaptor with indicator	DN80 to DN150	Zinc plated SG iron	
25	Stop screw	DN80 to DN150	Zinc plated carbon steel	SAE 12L14
27	Adaptor screw		Zinc plated carbon steel	Grade 5
28	Stop screw	DN80 to DN150	Carbon steel	
29	Adaptor hex. nut	DN80 to DN150	Zinc plated carbon steel	
31	Antistatic device ball		Stainless steel	AISI 302
32	Antistatic device spring		Stainless steel	AISI 301

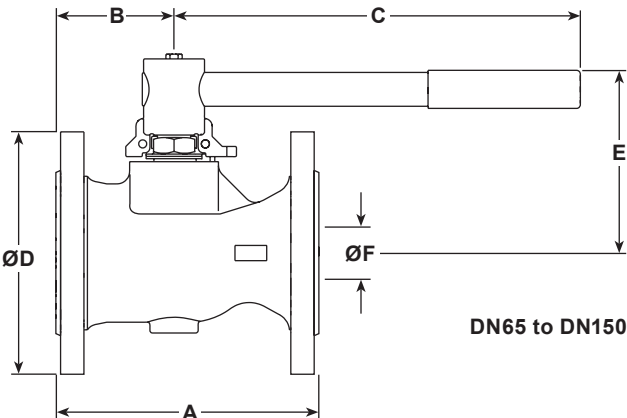
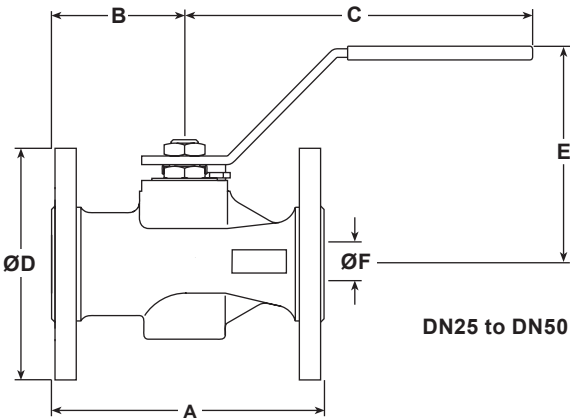
Pipeline ancillaries
Ball valves

Dimensions/weights (approximate) in mm and kg
Flanged ASME 150

Size	A	B	C	D	E	F	Weight
DN25	127	62	162	108	101	19	2.9
DN32	140	65	182	118	106	25	3.8
DN40	165	70	186	127	118	30	5.4
DN50	178	75	186	152	123	37	7.9
DN65	190	79	278	178	144	50	12.0
DN80	203	91	417	191	157	57	15.8
DN100	229	98	517	229	172	75	24.8
DN150	267	130	700	279	205	100	43.8

Flanged ASME 300

Size	A	B	C	D	E	F	Weight
DN25	165	62	162	124	101	19	4.5
DN32	178	65	182	134	106	25	5.7
DN40	190	70	186	156	118	30	8.2
DN50	216	75	186	165	123	37	10.3
DN65	241	79	278	190	144	50	16.0
DN80	283	91	417	210	157	57	22.3
DN100	305	98	517	254	172	75	36.1
DN150	403	130	700	318	205	100	66.6



K_V values

DN	25	32	40	50	65	80	100	150
K _V	30	40	81	103	197	248	581	735

For conversion:
C_V (UK) = K_V x 0.963
C_V (US) = K_V x 1.156

Operating torques (Nm)

DN	25	32	40	50	65	80	100	150
N m	20	25	35	60	100	120	170	400

Note: The torque figures shown are for a valve that is frequently operated at the maximum operating pressure. Valves that are subject to long static periods, may require a greater break-out torque.

Safety information, installation and maintenance

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

Welding

Only the models that have connections designed for welding (SW, BW, Imperial Tube connections) should be welded. Valves with flanged connections must not be welded to avoid damages to the valve and/or injury to personnel.

How to order

Specify	Body material
	2 = Zinc plated carbon steel
	3 = Stainless steel

Example: 1 off Spirax Sarco DN50 M45i2 ISO ball valve having flanged ASME 150 connections.

Optional extras:

- Self-venting ball.
- Extended stems to allow full insulation: 50 mm (2") for DN25 to DN50 sizes and 100 mm (4") for DN65 to DN150 sizes.
- Lockable handle.
- 100 mm extended stem with lockable handle.

DN25 to DN50 - Spare parts (see page 6 for sizes DN65 - DN150)

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

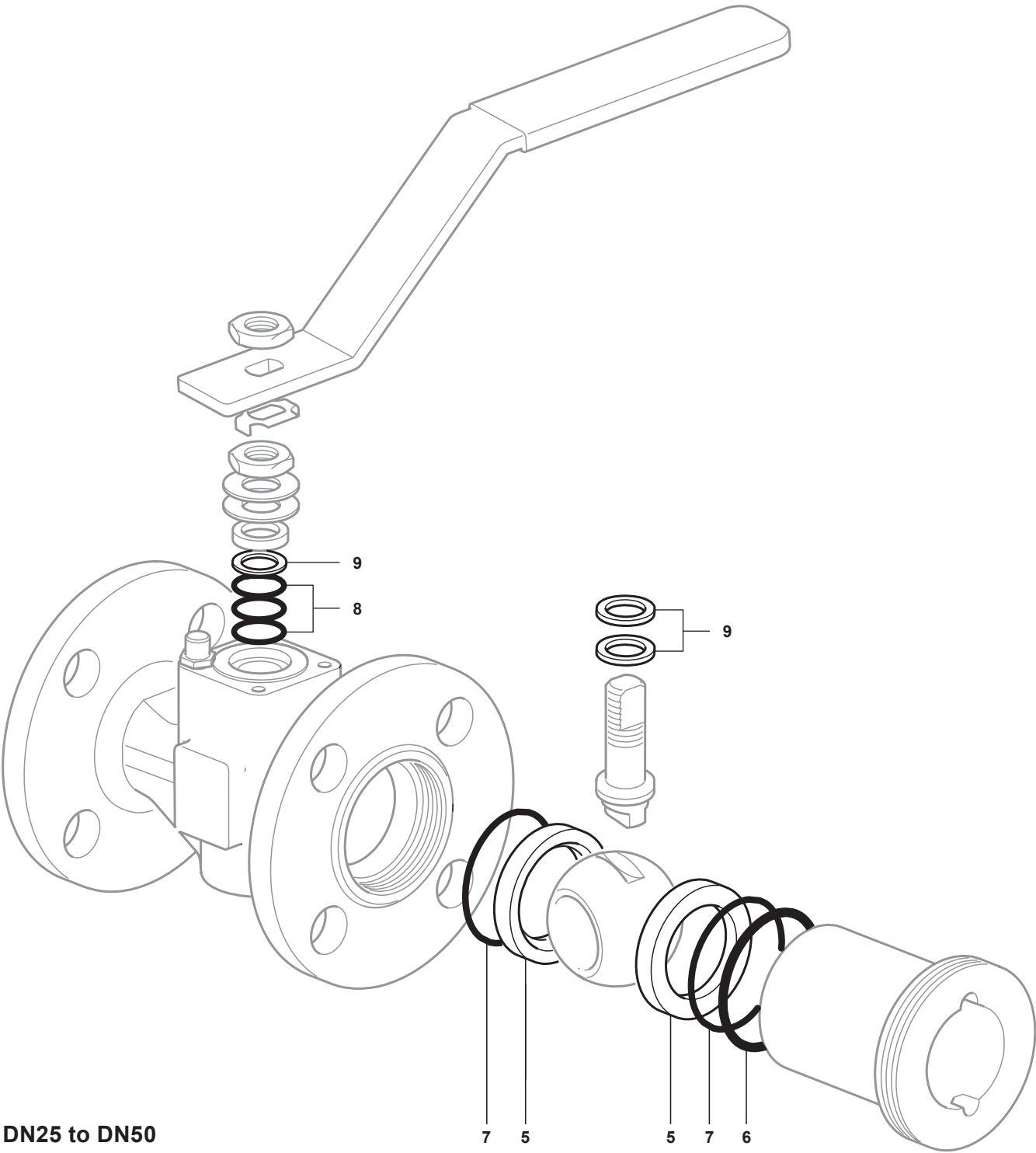
Available spares

Seats, insert gasket, seat 'O' rings and stem seals	5, 6, 7, 8, 9, 10
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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 gasket, seat 'O' rings and stem seals for a Spirax Sarco DN50 flanged ASME 150 M452i ball valve.



DN25 to DN50

Pipeline ancillaries
Ball valves

DN65 to DN150 - Spare parts (see page 5 for sizes DN25 - DN50)

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

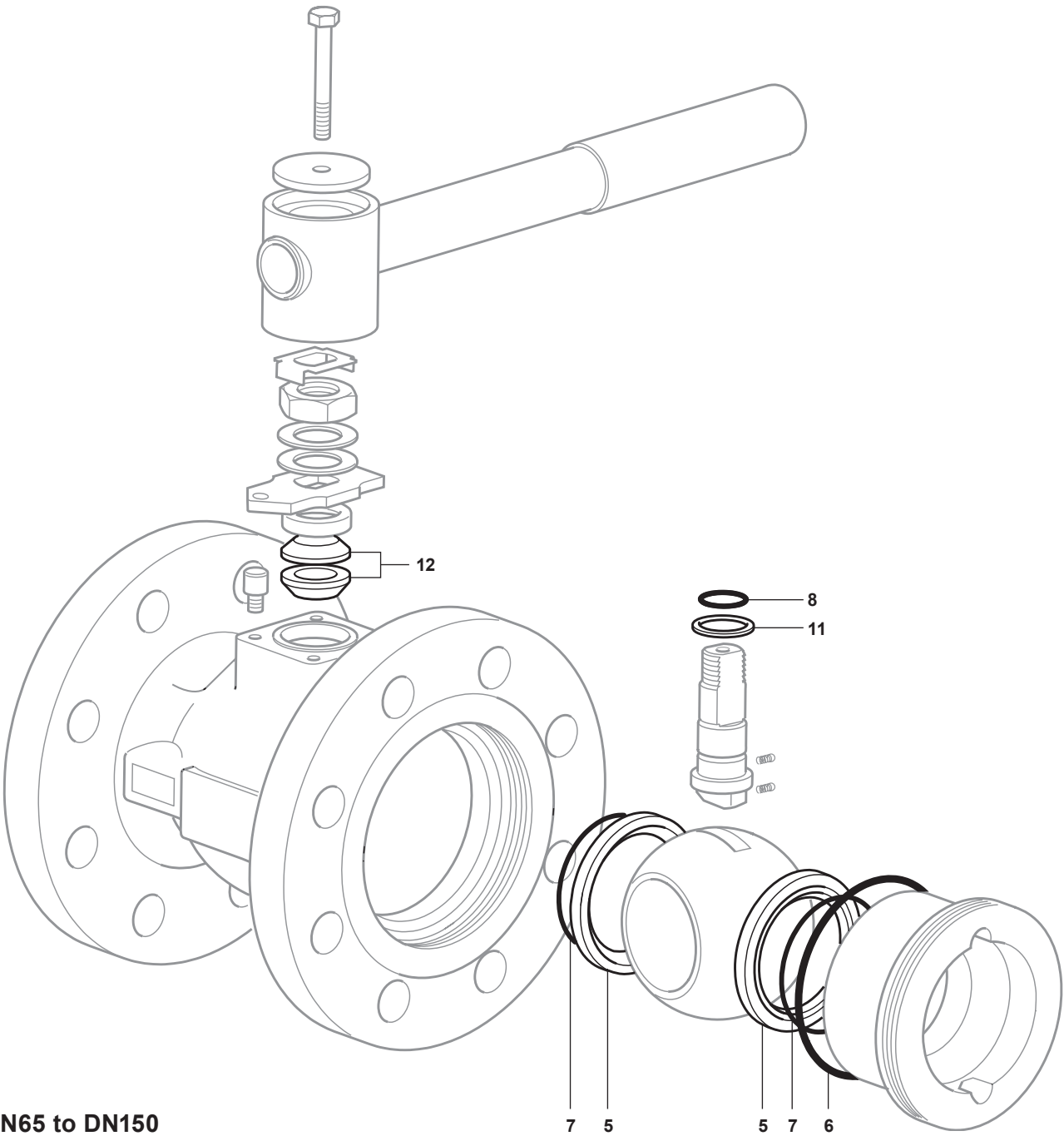
Available spares

Seats, insert gasket, seat 'O' ring, stem 'O' ring, lower stem seal and upper stem packing 5, 6, 7, 8, 11, 12

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 gasket, seat 'O' ring, stem 'O' ring, lower stem seal and upper stem packing for a Spirax Sarco DN80 flanged ASME 150 M452i ball valve.



DN65 to DN150