



TI-P133-81

CMGT Issue 5

M21Fi ISO

Reduced Bore Firesafe API607 Ball Valve

DN15 to DN150 Flanged PN40

Description

The M21Fi is a reduced bore ball valve, with a single piece body, having ISO mounting as standard. It is designed to be an isolating valve, which can be used with the majority of industrial fluids, not a control valve.


Firesafe design

In normal working conditions, the ball rests against two PDR 0.8 seats ensuring total closure. When the valve is submitted to temperature above the limits the seats can withstand, the seat becomes deformed and renders to extrusion. When the seats have been totally destroyed, the ball will come to rest firmly against the metal seat in the cap, producing a metal-to-metal closing. This secondary seat in the valve cap ensures the valve will operate to international API 607 standard.

Available types

M21Fi2 ISO	Zinc plated carbon steel body, PDR 0.8 seats.
M21Fi3 ISO	Stainless steel body, PDR 0.8 seats.

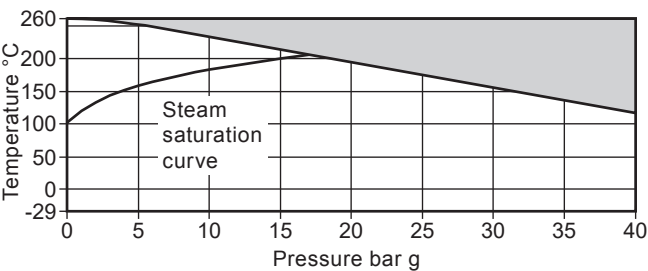
Standards

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.

Pressure/temperature limits

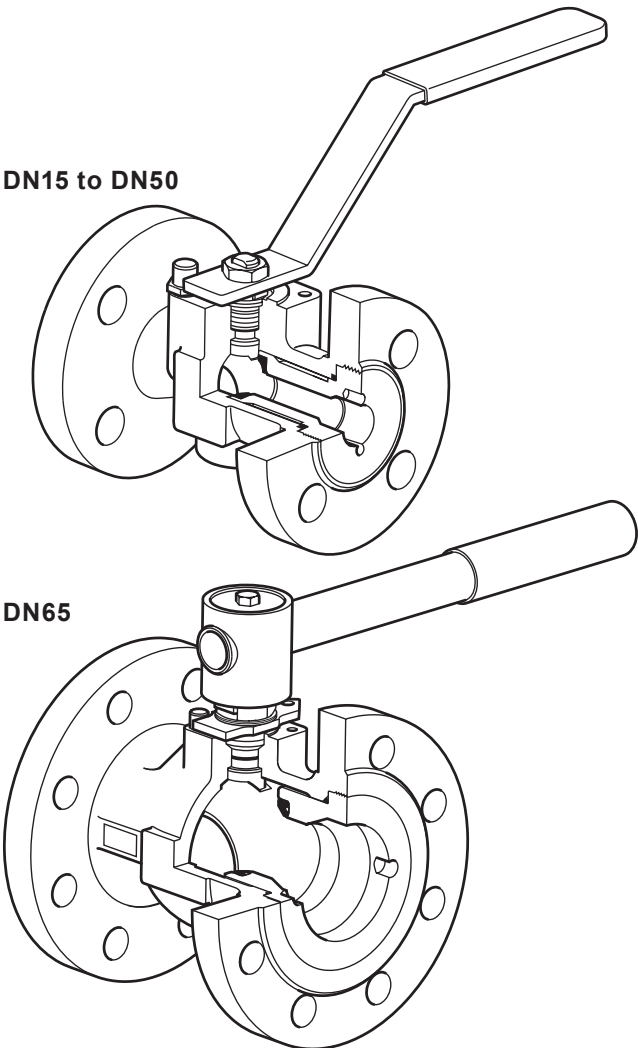


The product **must not** be used in this region.

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	17.5 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



Sizes and pipe connections

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

Standard flange: EN 1092 PN40

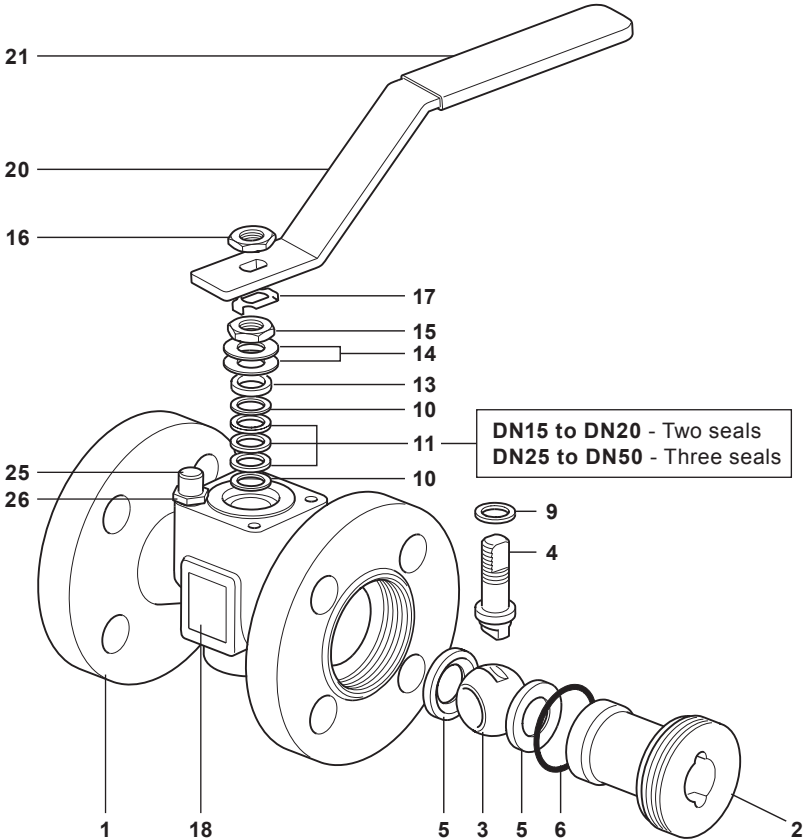
Face-to-face dimensions:

- 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
DN15 to DN50

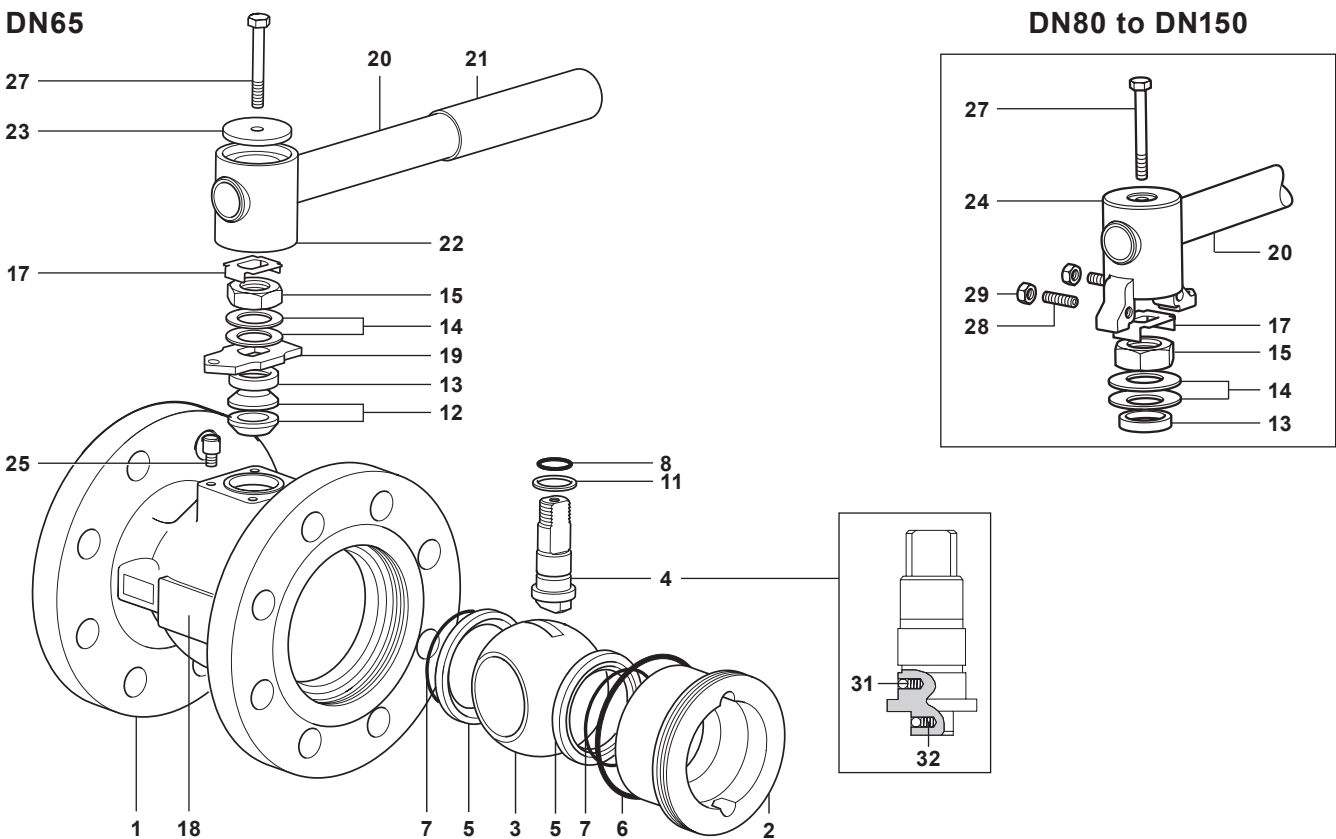


Materials

No. Part		Material		
1	Body	M21Fi2 ISO	Zinc plated carbon steel	ASTM A216 WCB
		M21Fi3 ISO	Stainless steel	ASTM A351 CF8M
2	Insert	M21Fi2 ISO	Zinc plated carbon steel	SAE 1040
		M21Fi3 ISO	Stainless steel	AISI 316
3	Ball		Stainless steel	AISI 316
4	Stem		Stainless steel	AISI 316
5	Seat		Carbon and graphite reinforced PTFE	PDR 0.8
6	Insert gasket		Graphite	
9	Stem seal		Antistatic R-PTFE	
10	Stem seal		Stainless steel	AISI 304
11	Stem seal		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
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	Red
25	Stop screw		Zinc plated carbon steel	SAE 12L14
26	Split lock washer		Stainless steel	AISI 304

DN80 to DN150

DN65



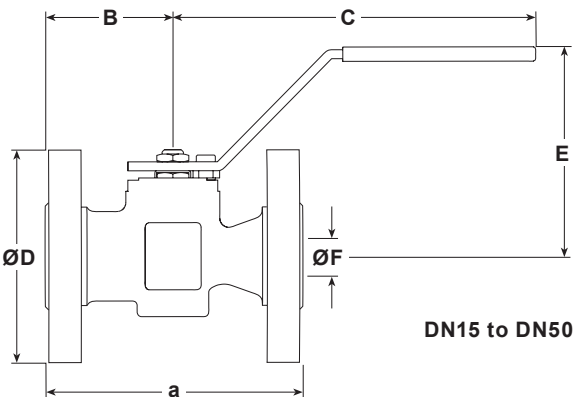
Materials

No.	Part		Material	
1	Body	M21Fi2 ISO	Zinc plated carbon steel	ASTM A216 WCB
		M21Fi3 ISO	Stainless steel	ASTM A351 CF8M
2	Insert	M21Fi2 ISO	Zinc plated carbon steel	SAE 1040
		M21Fi3 ISO	Stainless steel	AISI 316
3	Ball		Stainless steel	AISI 316
4	Stem		Stainless steel	AISI 316/AISI 420
5	Seat		Carbon and graphite reinforced PTFE	PDR 0.8
6	Insert gasket		Graphite	
7	Seat 'O' ring		EPDM	Geothermal
8	Stem 'O' ring		EPDM	Geothermal
11	Lower stem seal		Antistatic R-PTFE	
12	Upper stem packing		Graphite	
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	Red
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		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

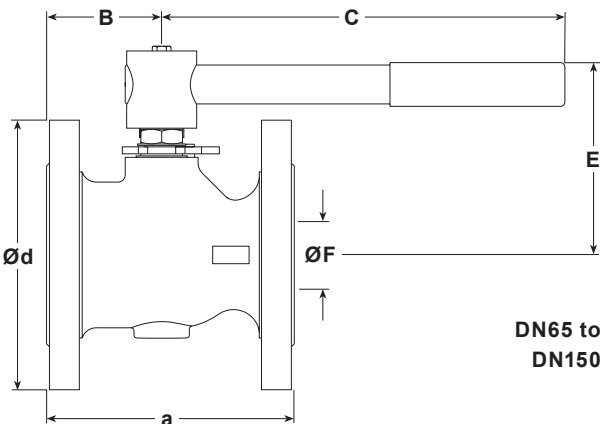
Size	A	B	C	D	E	F	Weight
DN15	115	57	162	95	95	13	2.5
DN20	120	60	162	105	95	13	3.2
DN25	125	62	162	115	101	19	4.0
DN32	130	65	182	140	106	25	5.5
DN40	140	70	186	150	118	30	6.9
DN50	150	75	186	165	123	37	9.3
DN65	170	79	278	185	144	50	13.4
DN80	180	91	417	200	157	57	17.7
DN100	190	98	517	235	172	75	25.0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



DN15 to DN50

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



DN65 to
DN150

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

$C_v \text{ (UK)} = K_v \times 0.963$

$C_v \text{ (US)} = K_v \times 1.156$

Operating torque (N m)

DN	15	20	25	32	40	50	65	80	100	150
N m	8	8	10	15	20	25	80	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	F = Carbon and graphite reinforced PTFE - PDR 0.8
	Material	Body material	2 = Zinc plated carbon steel
			3 = Stainless steel

Example: 1 off Spirax Sarco DN50 M21Fi2 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 DN15 to DN50 sizes and 100 mm (4") for DN65 to DN150 sizes.
- Lockable handle.
- 100 mm extended stem with lockable handle.

DN15 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.

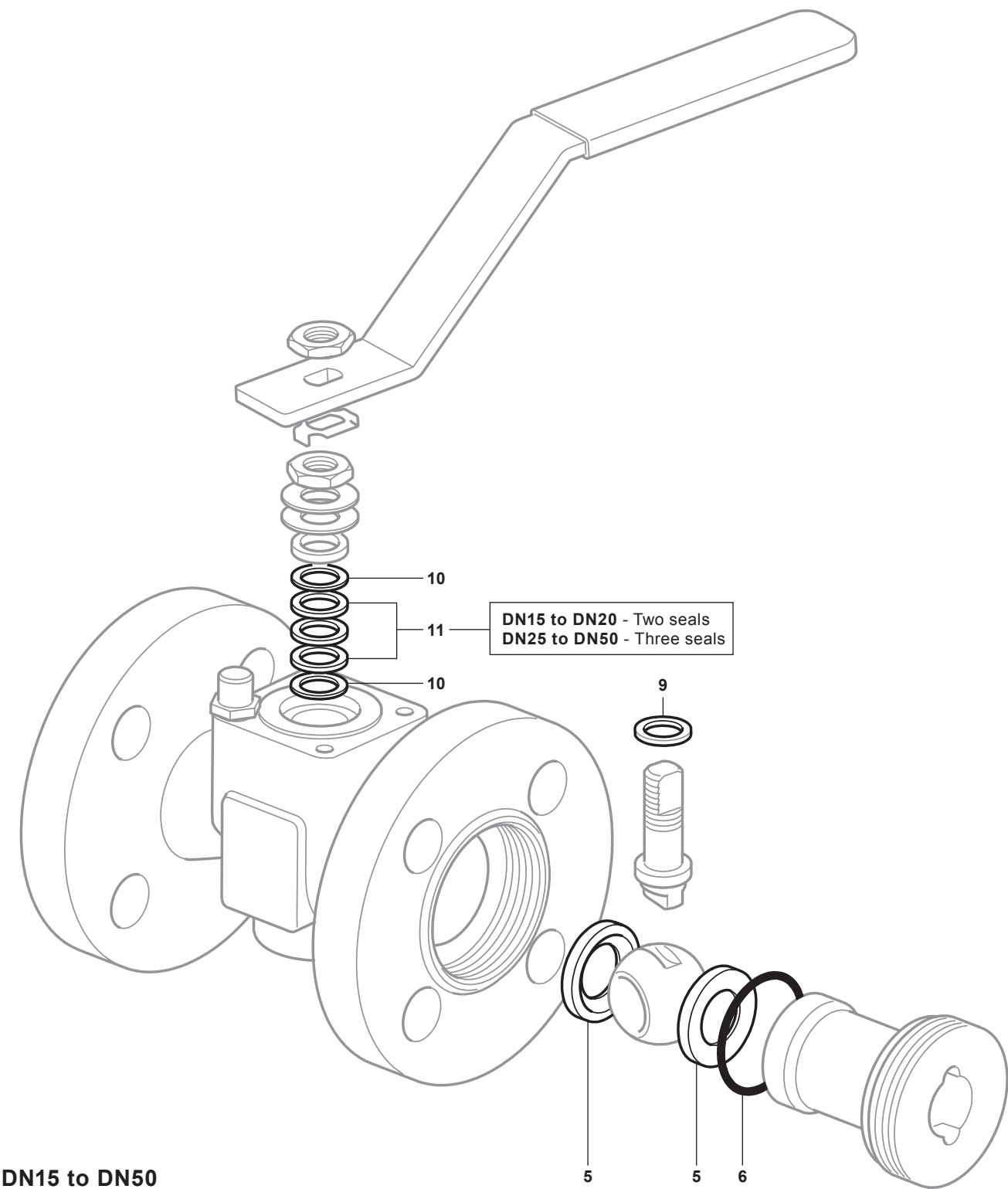
Available spares

Seats, insert gasket and stem seals	5, 6, 9, 10, 11
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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 and stem seals for a Spirax Sarco DN50 flanged PN40 M21Fi2 ball valve.



DN15 to DN50

Pipeline ancillaries
Ball valves

DN65 to DN150 - Spare parts (see page 5 for sizes DN15 - DN50)

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

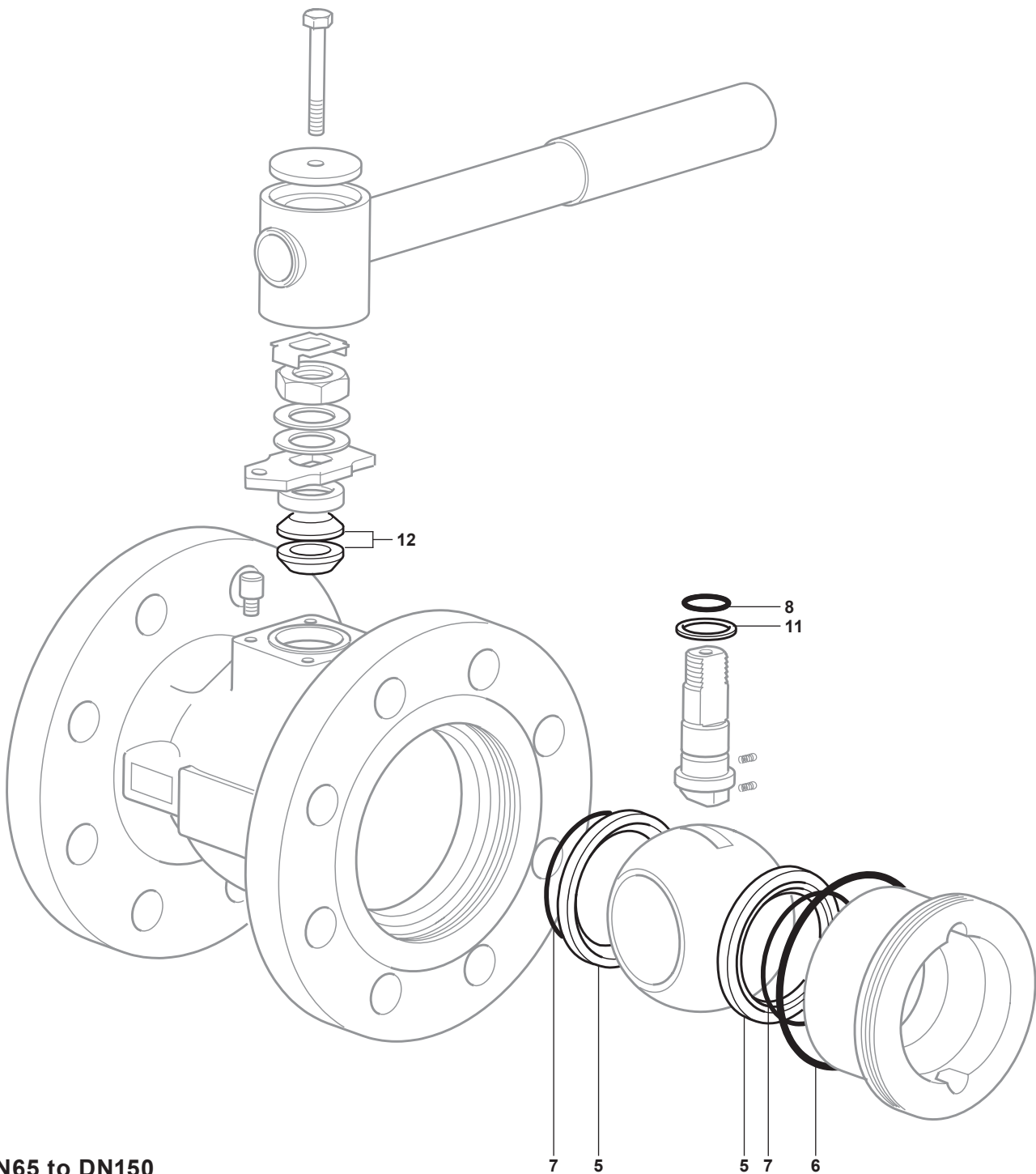
Available spares

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 DN50 flanged PN40 M21Fi2 ball valve.



DN65 to DN150

TI-P133-82
CMGT Issue 7



M40Fi ISO

Reduced Bore Firesafe API 607 Ball Valve
DN25 to DN200 Flanged ASME 150 and ASME 300

Description

The M40Fi is a reduced bore ball valve, with a single piece body, having ISO mounting as standard. It is designed to be an isolating valve, which can be used with the majority of industrial fluids, not a control valve.


Firesafe design

In normal working conditions, the ball rests against two PDR 0.8 seats ensuring total closure. When the valve is submitted to temperature above the limits the seats can withstand, the seat becomes deformed and renders to extrusion. When the seats have been totally destroyed, the ball will come to rest firmly against the metal seat in the cap, producing a metal-to-metal closing. This secondary seat in the valve cap ensures the valve will operate to international API 607 standard.

Available types

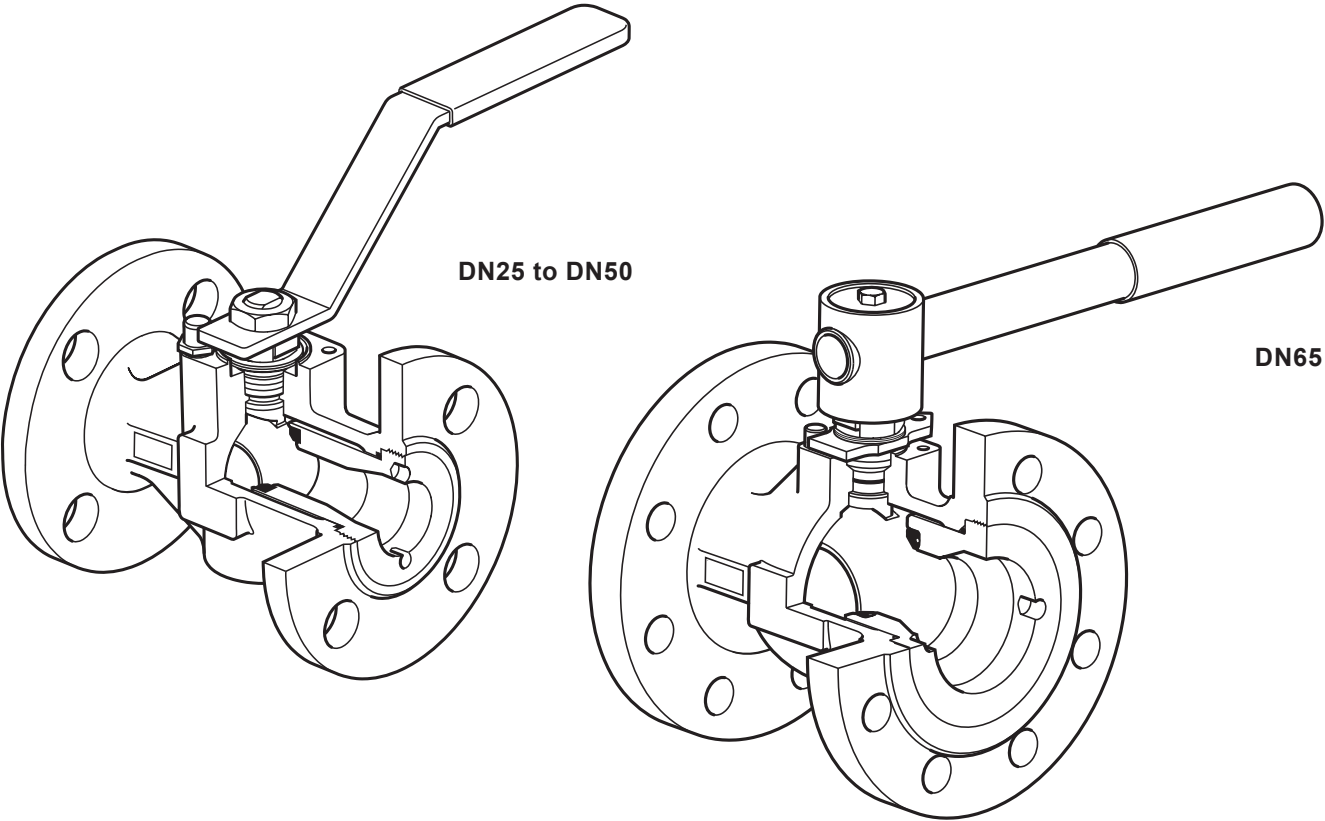
M40Fi2 ISO	Zinc plated carbon steel body, PDR 0.8 seats.
M40Fi3 ISO	Stainless steel body, PDR 0.8 seats.

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.



Pipeline ancillaries
Ball valves

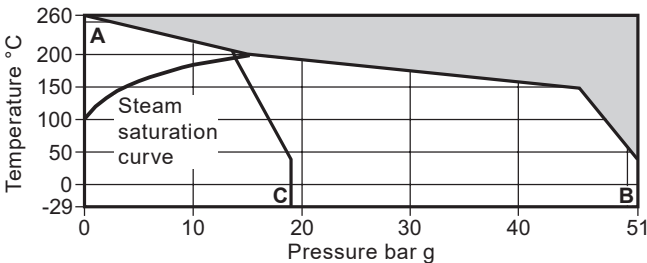
Sizes and pipe connections

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.

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.

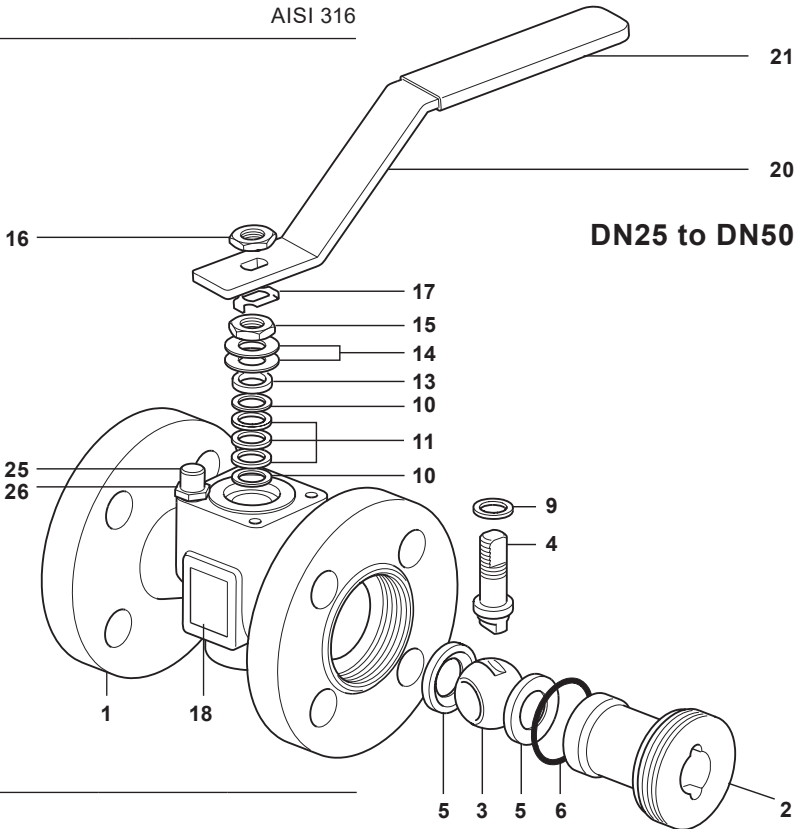
A - B Flanged ASME 300

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	260 °C @ 0 bar g	
Minimum allowable temperature		-29 °C	
PMO	Maximum operating pressure for saturated steam service	ASME 150	13.8 bar g
		ASME 300	17.5 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:		ASME 150	28.5 bar g
		ASME 300	76.5 bar g

Materials

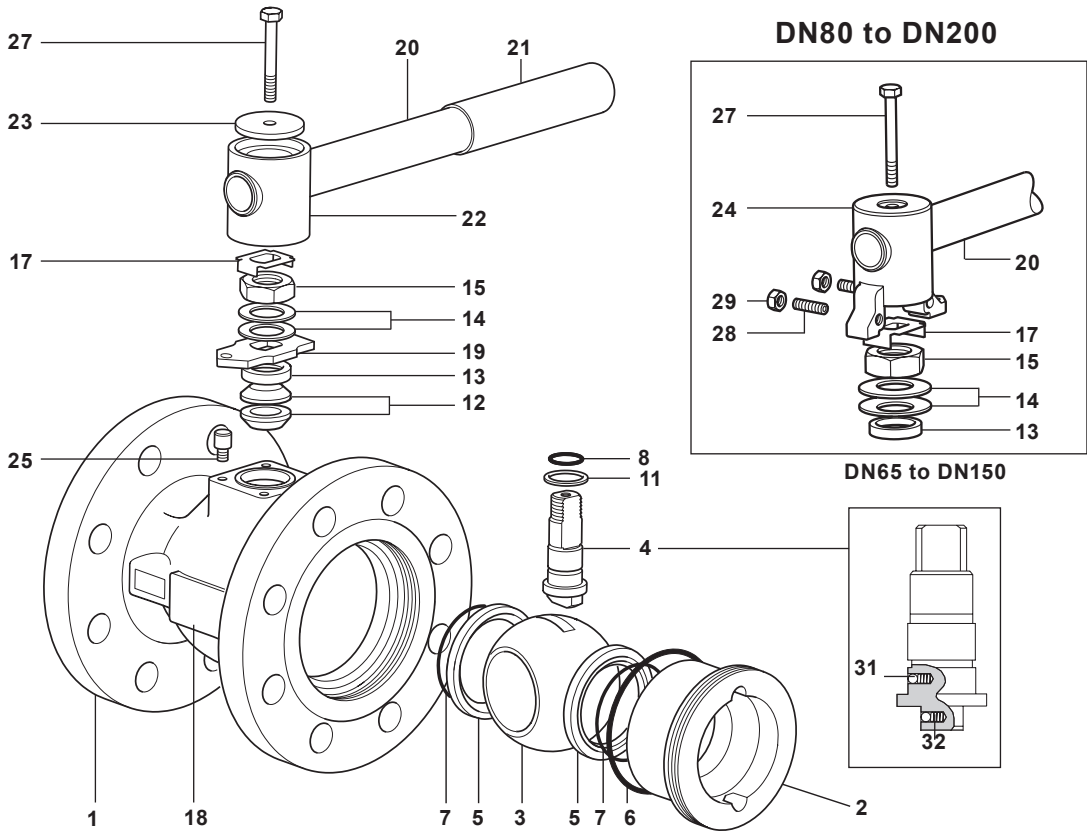
No.	Part	Material		
1	Body	M40Fi2 ISO	Zinc plated carbon steel	ASTM A216 WCB
		M40Fi3 ISO	Stainless steel	ASTM A351 CF8M
2	Insert	M40Fi2 ISO	Zinc plated carbon steel	SAE 1040
		M40Fi3 ISO	Stainless steel	AISI 316



No.	Part	Material		
3	Ball	Stainless steel		AISI 316
4	Stem	Stainless steel		AISI 316
5	Seat	Carbon and graphite reinforced PTFE		PDR 0.8
6	Insert gasket	Graphite		
9	Stem seal	Antistatic R-PTFE		
10	Stem seal	Stainless steel		AISI 304
11	Stem seal	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
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		Red
25	Stop screw	Zinc plated carbon steel		SAE 12L14
26	Split lock washer	Stainless steel		AISI 304

Pipeline ancillaries
Ball valves
Materials

DN65

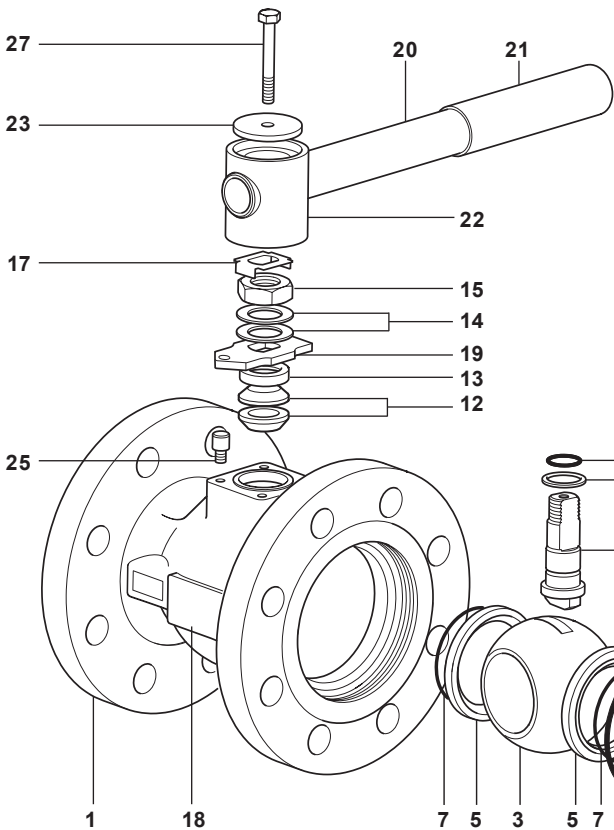


No.	Part	Material		
1	Body	M40Fi2 ISO	Zinc plated carbon steel	ASTM A216 WCB
		M40Fi3 ISO	Stainless steel	ASTM A351 CF8M
2	Insert	M40Fi2 ISO	Zinc plated carbon steel	SAE 1040
		M40Fi3 ISO	Stainless steel	AISI 316
3	Ball		Stainless steel	AISI 316
4	Stem		Stainless steel	AISI 316/AISI 420
5	Seat		Carbon and graphite reinforced PTFE	PDR 0.8
6	Insert gasket		Graphite	
7	Seat 'O' ring		Viton	
8	Stem 'O' ring		Viton	
11	Lower stem seal		Antistatic R-PTFE	
12	Upper stem packing		Graphite	
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

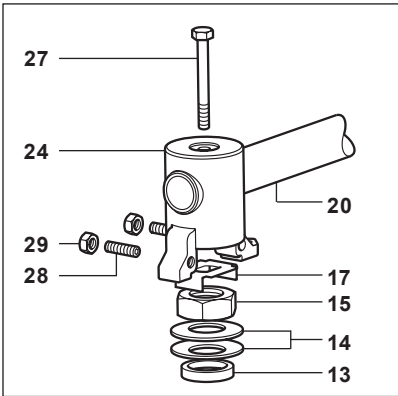
Materials continued on next page

Materials (continued)

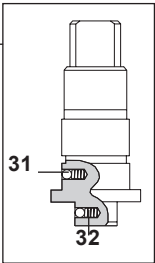
DN65



DN80 to DN200



DN65 to DN150



No.	Part		Material	
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	Red
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 DN200	Zinc plated SG iron	
25	Stop screw		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

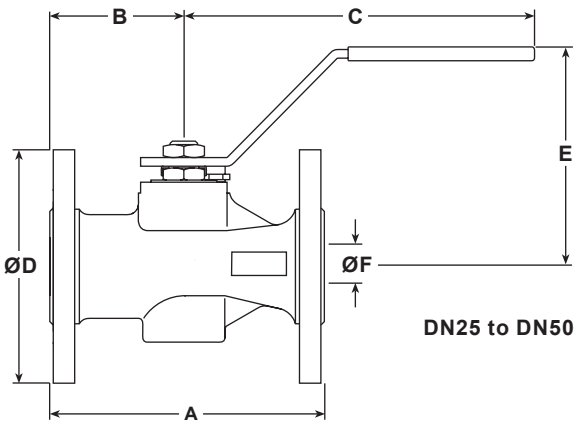
Dimensions/weights (approximate) in mm and kg

Flanged ASME 150

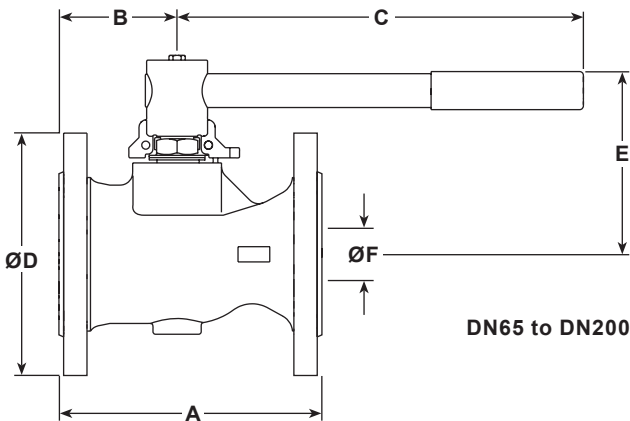
Size	A	B	C	D	E	F	Weight
DN25	127	62	162	108	101	19	2.9
DN32	140	65	182	118	106	25	3.8
DN40	165	70	186	127	118	30	5.4
DN50	178	75	186	152	123	37	7.9
DN65	190	79	278	178	144	50	12.0
DN80	203	91	417	191	157	57	15.8
DN100	229	98	517	229	172	75	24.8
DN150	267	130	700	279	205	100	43.8
DN200	292	146	850	343	286	200	82.5

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



DN25 to DN50



DN65 to DN200

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

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.

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	F = Carbon and graphite reinforced PTFE - PDR 0.8
	Material	Body material	2 = Zinc plated carbon steel
			3 = Stainless steel

Example: 1 off Spirax Sarco DN50 M40Fi2 ISO ball valve having flanged ASME 150 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 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.

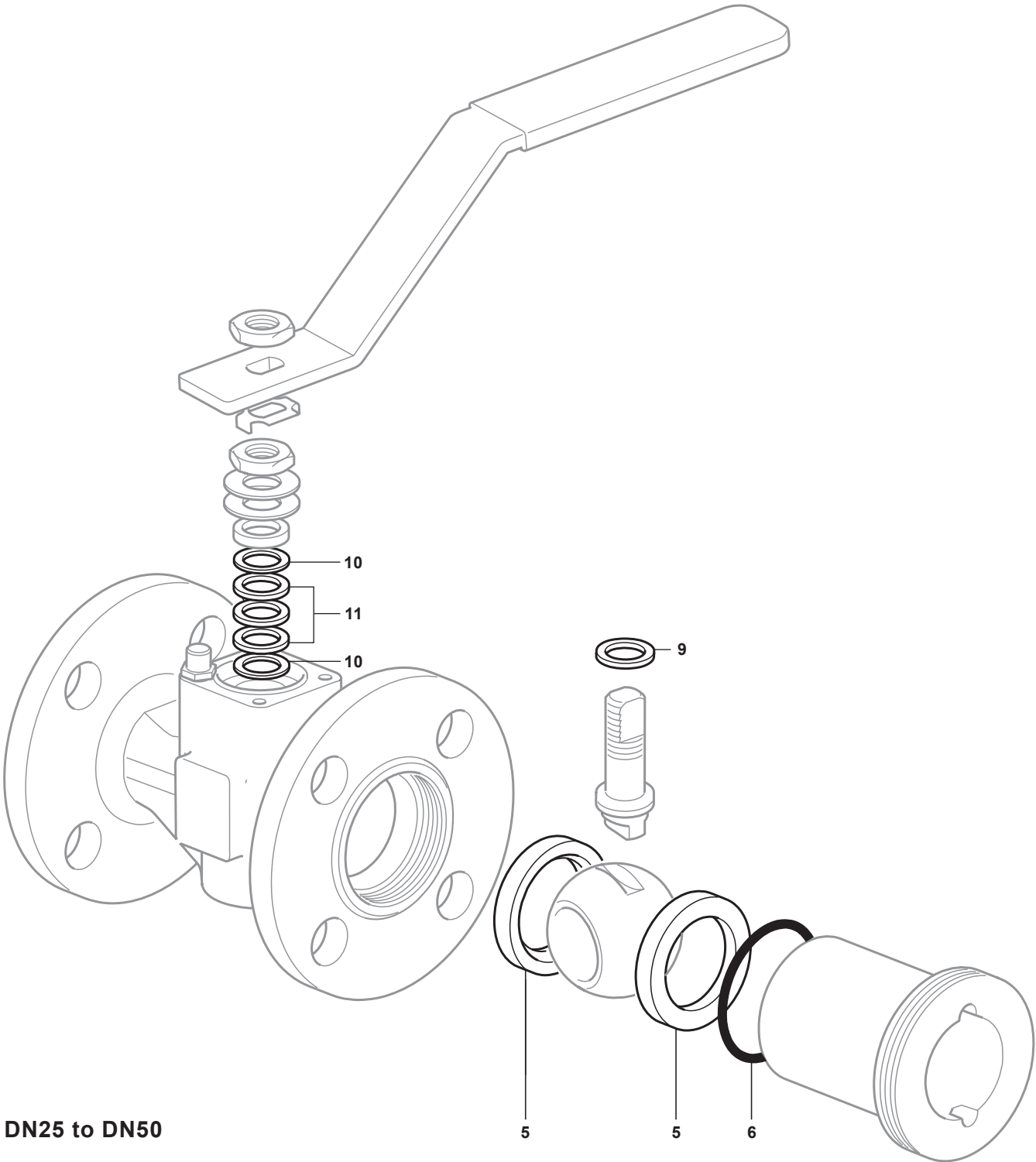
Available spares

Seats, insert gasket and stem seals	5, 6, 9, 10, 11
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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 and stem seals for a Spirax Sarco DN50 flanged ASME 150 M40Fi2 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.

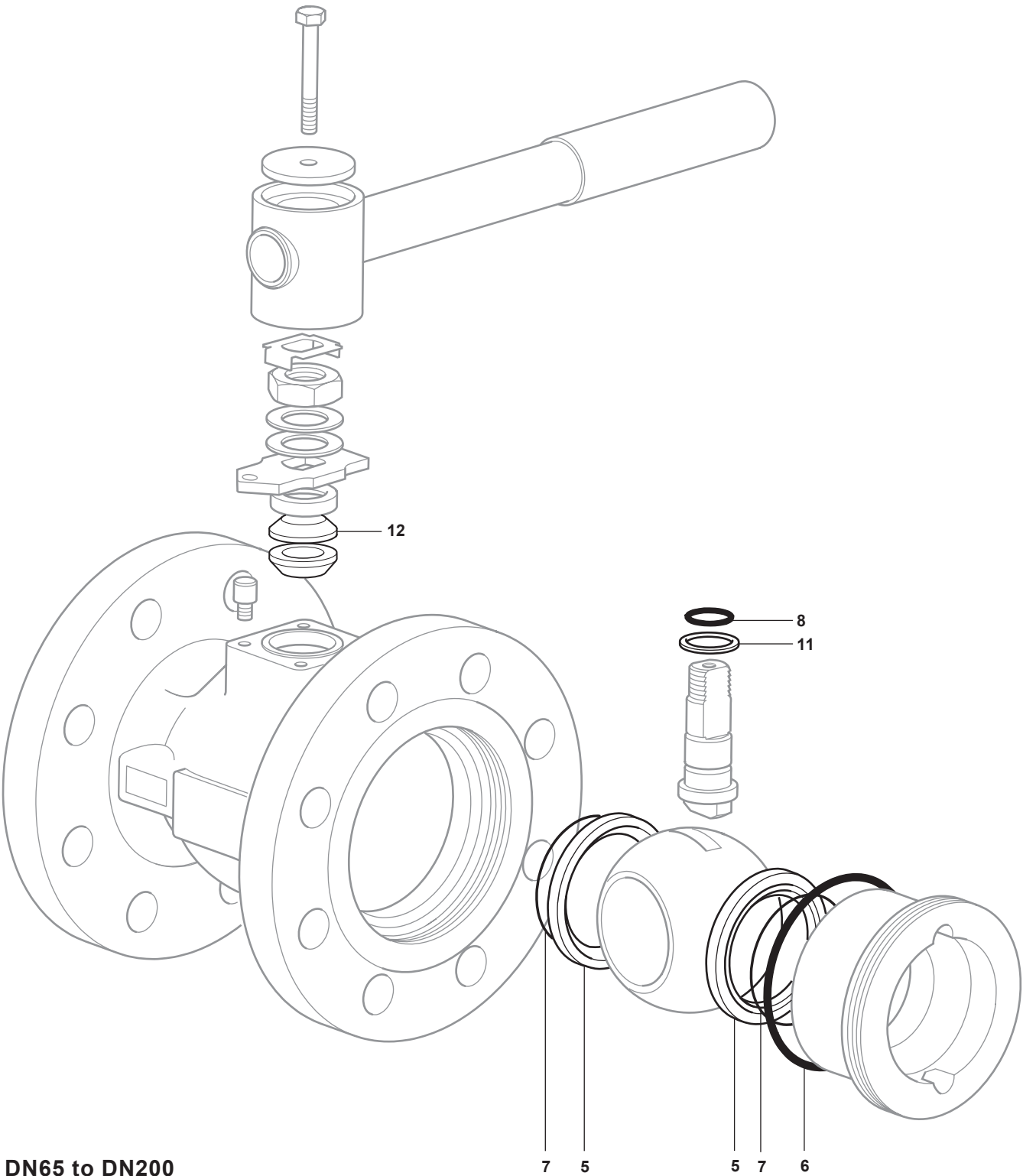
Available spares

Seats, insert gasket, seat 'O' ring, stem 'O' ring, lower stem seal and upper stem packing	5, 6, 7, 8, 11, 12
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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' ring, stem 'O' ring, lower stem seal and upper stem packing for a Spirax Sarco DN80 flanged ASME 150 M40Fi2 ball valve.



DN65 to DN200

