

CONTENTS

GENERAL CHARACTERISTICS.....	3
<u>BALL VALVE WITH LEVER OR WITH CAP</u>	6
With full bore flow.....	6
With reduced bore flow.....	7
<u>BALL VALVE WITH ISO FLANGE FOR ACTUATOR</u>	8
With full bore flow.....	9
With reduced bore flow.....	10
<u>BALL VALVE WITH PNEUMATIC ACTUATOR</u>	11
With full bore flow.....	12
With reduced bore flow.....	13
Installing instruction for ball valve with pneumatic actuator.....	14
<u>BALL VALVE WITH ELECTRIC ACTUATOR</u>	15
With full bore flow.....	16
With reduced bore flow.....	20
Installing instruction ball valve with electric actuator.....	24
MAINTENANCE INSTRUCTIONS.....	25
SPARE PARTS.....	29
WEIGHT OF RFF BALL VALVE.....	33
STAINLESS STEEL BALL VALVE.....	specific documentation
REFRIGERATION VALVE.....	specific documentation

Le Robinet Frigorifique Français declines responsibility for any errors or omissions which may occur in its catalogues, drawings or any other document published by Le Robinet Frigorifique Français.
It reserve the right to modify its products without prior notice.

BALL VALVE

The RFF Ball valves have been designed for refrigeration installations using ammonia or halocarbon refrigerants (see listed on page 3)

Temperature range from -50°C up to +150°C. The normal pressure rating is 25 bar with higher pressure up to 40 bar available on request.

Valve flange connections are available to the following :

- Butt welding Class "S" (ASTM Pipe Schedule "standard")
- Butt welding Class "M" (DIN 2448)
- Butt welding Class "H" thickness 2 mm for stainless steel pipe
- Brazing Class "B" (ANSI B.16.22)

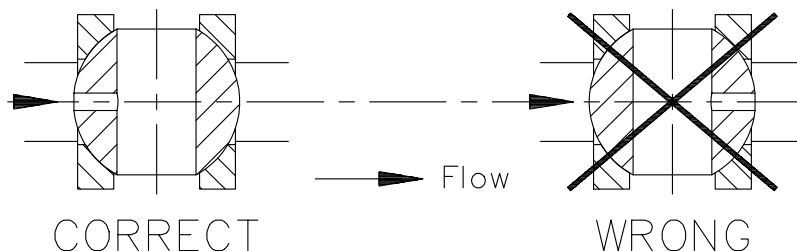
Compared with reduced bore flow ball valve, the ball valve with full bore flow has low pressure drop with high Cv values.

The valve body, subjected to pressure, is manufactured from low temperature impact tested steel. The valves can be supplied with material certificates to EN 10204.3.1.B. when specified on order.

The simple three piece body design is easy to install without the need for special torque tools. Efficient insulation is possible due to extended valve head.

The ball seat seal gas tightness is obtained by two special fibre glass reinforced PTFE rings.

A vent hole is drilled in the ball to avoid trapped liquid and possible damage by hydraulic expansion when the valve is closed. The vent hole is situated on the upstream side of the ball. The valve has only one direction of flow..



The valve has two spindle seals, one under the spindle thread and one above the spindle thread.

The lower end of the valve spindle is sealed tight by a PTFE seat held in place by a compressed spring. This allow the replacement of the spindle "O" ring while the plant is on line..

The top spindle seal incorporates the proven standard RFF design using two "O" rings with a lubricating, non freezing oil, reservoir between them.

If the flats of the spindle are parallel to the piping, the valve is open. If they are perpendicular, the valve is closed.

The ball valve is supplied with a seal cap fitted with a rubber "O" ring. The cap has an internal groove for venting gas to ensure safe removal at atmospheric pressure.

Fitting the cap is recommended to keep the ball valve clean, to stop unauthorised use and for all applications using odourless refrigerants.

For installations with other refrigerants, including ammonia, a lever is available for opening and closing.

An ISO flange is another option available to adapt your own actuators. RFF can also supply pneumatic actuators.

APPROVAL

RFF products have obtained the approval of the pressure equipment directive 97/23/CE. RFF company has obtained the certification EN ISO 9001 : 2000.

OPERATING CONDITIONS

The application of Ball valves are only limited by the "O" ring specification. The "O" rings are manufactured from chloroprene synthetic rubber elastomer which has a design range from -50 °C to +150°C. The "O" rings are compatible with the following refrigerant and lubricating oils :

- Refrigerants :
 - C290 - C316 - C318 - R13b1 - R22 - R32
 - R114b2 - R123 - R124 - R125 - R134 - R134a
 - R141b - R142b - R143a - R152a - R404a - R407
 - R407c - R507 - R717(NH3) - R744(CO2) - Alkali
- Lubricants :
 - Mineral oils, except those with naphthalene base (ASTM 2 et 3)
 - Lubricants with ester silicate base.

WARNING :

It is important that you are aware that by using additives or exceeding the operating conditions may cause the "O" rings to fail.

For all applications (refrigerants or lubricants) other than those defined above, a compatibility study is necessary, in order to check the resistance of our standard O-ring material, or, if necessary, to offer you alternative O-rings more suitable for the specific conditions of your applications.

Our standard O-rings are not compatible with :

- Aromatic hydrocarbons (benzene)
- Chlorinated hydrocarbons (trichlorethylene)
- Polar solvents (ketone, ester, ether, acetone)

MATERIALS

DN	Bodies, Flanges and Bonnet	Disc-Seal	Lever	Cap	External tightness
25	TStE355 or A350LF2	Stainless s.ball /seat PTFE+25%V	Stainl.S 304	steel	O-ring
32	TStE355 or A350LF2	Stainless s.ball /seat PTFE+25%V	Stainl.S 304	steel	O-ring
40	TStE355 or A350LF2	Stainless s.ball /seat PTFE+25%V	Stainl.S 304	steel	O-ring
50	TStE355 or A350LF2	Stainless s.ball /seat PTFE+25%V	Stainl.S 304	steel	O-ring
65	TStE355 or A350LF2	Stainless s.ball /seat PTFE+25%V	Stainl.S 304	steel	O-ring
80	TStE355 or A350LF2	Stainless s.ball /seat PTFE+25%V	Stainl.S 304	steel	O-ring


BALL VALVE PN 40 (CO₂ or other gazes)

RFF ball valve with PN 40 are the same as PN 25 ones. Only last pressure test are different:

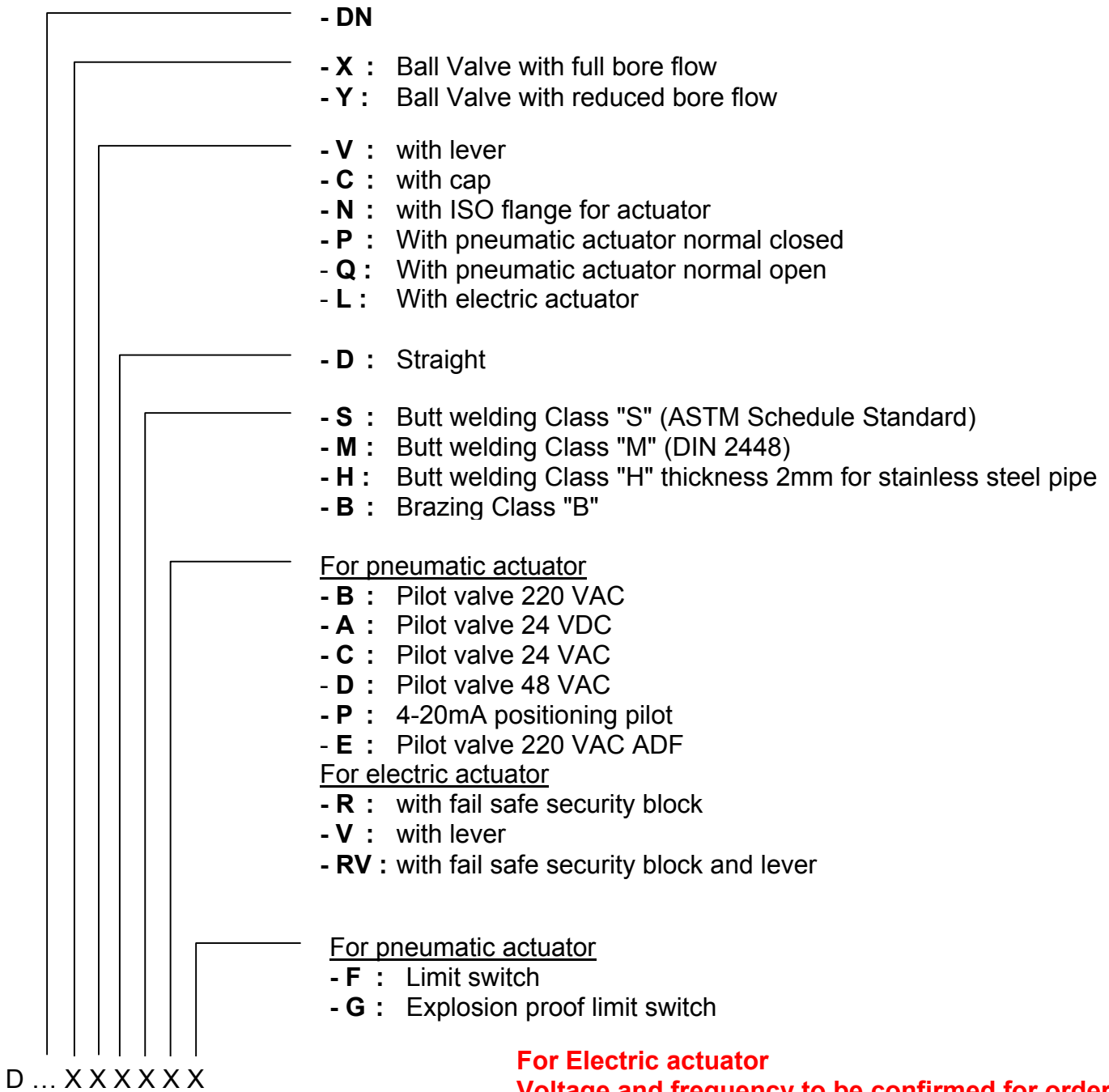
Hydraulic test: 60 bar

Air test under water: 40 bar

These products have received the general TUV approval.

 If pressure rating is more than 25 bar, special lever should be necessary, in this case, please ask us.

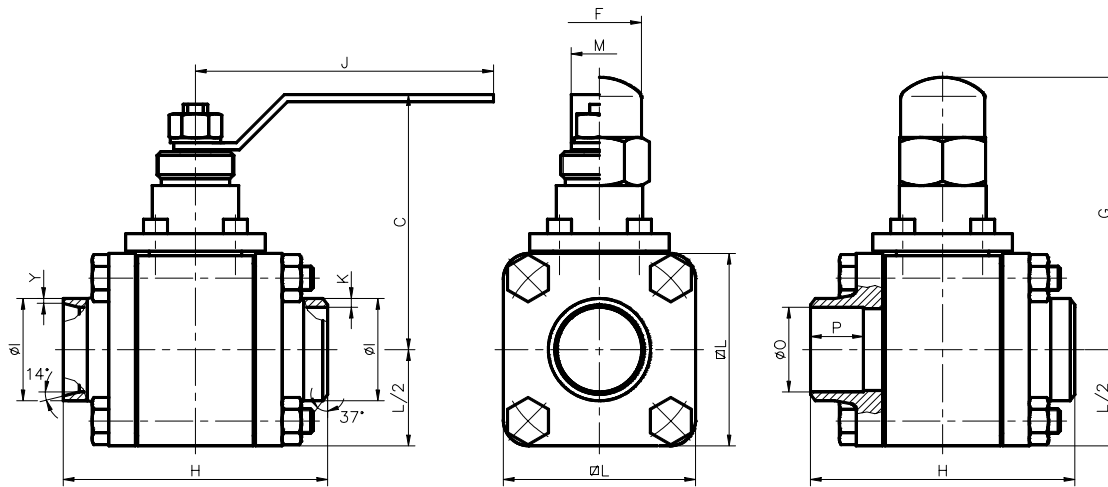
SIGNIFICATION DES REFERENCES RFF :



For Electric actuator
Voltage and frequency to be confirmed for order

STRAIGHT BALL VALVE with full bore flow

With lever, with cap



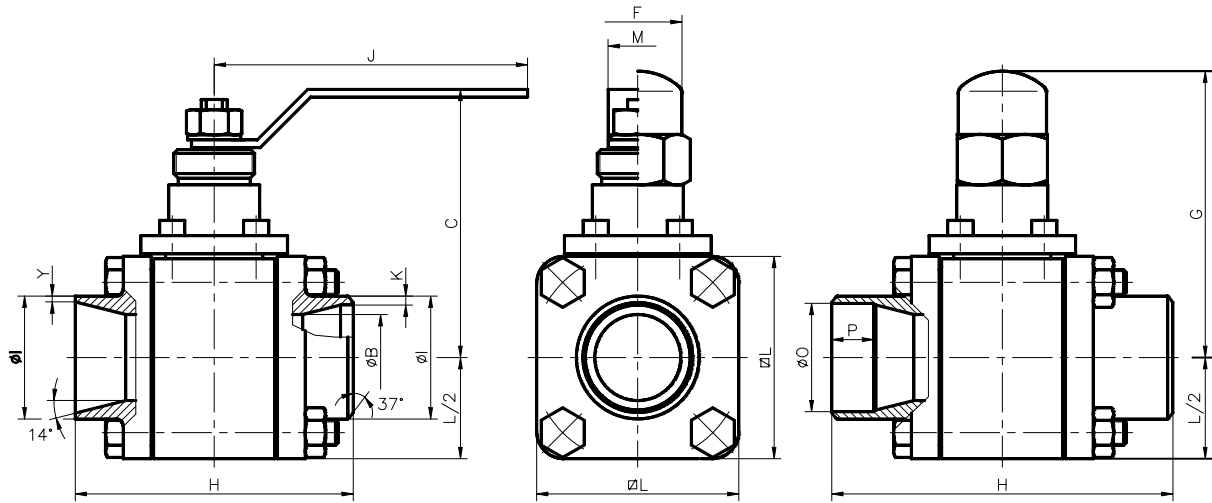
General dimensions							
DN	C	F	G	H	J	L	M
25	99	35	106	102	127	65	22
32	106	35	113	110	127	80	22
40	138	35	139	127	200	90	27
50	148	35	149	154	200	110	27
65	190	47	197	186	354	130	39
80	200	47	207	202	354	150	39

For welding class S					For welding class M				
	DN	I	K	Ref		DN	I	K	Ref
1"	25	33.7	3.6	D025X.DS	1"	25	33.7	2.6	S025X.DM
1"1/4	32	42.4	3.6	D032X.DS	1"1/4	32	42.4	2.6	S032X.DM
1"1/2	40	48.3	3.6	D040X.DS	1"1/2	40	48.3	2.6	S040X.DM
2"	50	60.3	4	D050X.DS	2"	50	60.3	2.9	S050X.DM
2"1/2	65	76.1	5	D065X.DS	2"1/2	65	76.1	2.9	S065X.DM
3	80	88.9	5.6	D080X.DS	3	80	88.9	3.2	S080X.DM

For brazing class B					For welding class H				
	DN	O	P	Ref		DN	I	Y	Ref
1"1/8	25	28.8	20	D025X.DB	1"	25	33.7	2	S025X.DH
1"3/8	32	35.2	22	D032X.DB	1"1/4	32	42.4	2	S032X.DH
1"5/8	40	41.5	22	D040X.DB	1"1/2	40	48.3	2	S040X.DH
2"1/8	50	54.3	25	D050X.DB	2"	50	60.3	2	S050X.DH
2"5/8	65	66.9	25	D065X.DB	2"1/2	65	76.1	2	S065X.DH
3"1/8	80	79.6	30	D080X.DB	3	80	88.9	2	S080X.DH

STRAIGHT BALL VALVE with reduced bore flow

With lever, with cap



DIMENSIONES

DN	B	C	F	G	J	L	M
32	26.5	99	35	106	127	65	22
40	35	106	35	113	127	80	22
50	41.5	138	35	139	200	90	27
65	52.5	148	35	149	200	110	27
80	66	190	47	197	354	130	39
100	78	200	47	207	354	150	39

F					For welding class M						
	DN	H	I	K	Ref		DN	H	I	K	Ref
1"1/4	32	136	42.4	3.6	D032Y.DS	1"1/4	32	102	42.4	2.6	S032Y.DM
1"1/2	40	144	48.3	3.6	D040Y.DS	1"1/2	40	110	48.3	2.6	S040Y.DM
2"	50	127	60.3	4	D050Y.DS	2"	50	167	60.3	2.9	S050Y.DM
2"1/2	65	154	76.1	5	D065Y.DS	2"1/2	65	154	76.1	2.9	S065Y.DM
3"	80	186	88.9	5.6	D080Y.DS	3"	80	186	88.9	3.2	S080Y.DM
4"	100	202	114.4	6.3	D100Y.DS	4"	100	202	114.4	3.6	S100Y.DM

For brazing class B					For welding class H						
	DN	H	O	P	Ref		DN	H	I	Y	Ref
1"3/8	32	136	35.2	22	D032Y.DB	1"1/4	32	102	42.4	2	S032Y.DH
1"5/8	40	144	41.5	22	D040Y.DB	1"1/2	40	110	48.3	2	S040Y.DH
2"1/8	50	167	54.3	25	D050Y.DB	2"	50	127	60.3	2	S050Y.DH
2"5/8	65	194	66.9	25	D065Y.DB	2"1/2	65	154	76.1	2	S065Y.DH
3"1/8	80	236	79.6	30	D080Y.DB	3"	80	186	88.9	2	S080Y.DH
4"1/8	100	262	105	30	D100Y.DB	4"	100	202	114.4	2	S100Y.DH


STRAIGHT BALL VALVE WITH ISO FLANGE FOR ACTUATOR

RFF ball valve range can be supplied with an upper flange for fitting your own actuators. This flange meets ISO standard requirements. (ISO 5211)

An adaptation kit can also be supplied to convert manual valves already installed. The existing bonnet should then be removed and replaced by the adaptation kit.

Actuating torque change with operating condition (temperature range, differential pressure, axial force of the pipe, thermal expansion, lubrication...)

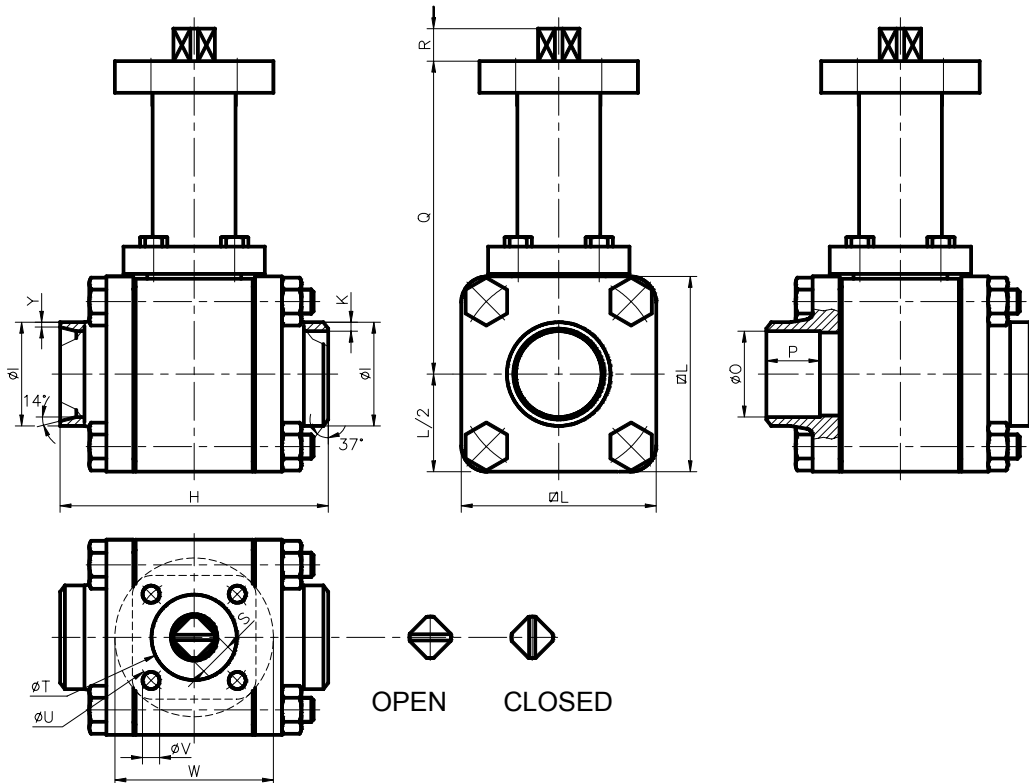
Table below gives the torque of actuators used by RFF. You can use these datas to select your own actuators.

 If pressure rating is more than 25 bar, special lever should be necessary, in this case, please ask us.

Full bore flow				
For Welding	For brazing	DN	Flange	Torque(N.m)
1"	1"1/8	25	F05	20
1"1/4	1"3/8	32	F05	35
1"1/2	1"5/8	40	F07	45
2"	2"1/8	50	F07	100
2"1/2	2"5/8	65	F10	150
3"	3"1/8	80	F10	300

Reduced bore flow				
For Welding	For brazing	DN	Flange	Torque(N.m)
1"1/4	1"3/8	32	F05	20
1"1/2	1"5/8	40	F05	35
2"	2"1/8	50	F07	45
2"1/2	2"5/8	65	F07	100
3"	3"1/8	80	F10	150
4"	4"1/8	100	F10	300

STRAIGHT BALL VALVE WITH FULL BORE FLOW WITH ISO FLANGE FOR ACTUATORS



General Dimensions

DN	H	L	Q	R	S	T	U	V	W
25	102	65	121	13.5	14	35	50	7	65
32	110	80	128	13.5	14	35	50	7	65
40	127	90	162	17.5	17	55	70	9	70
50	154	110	172	17.5	17	55	70	9	70
65	186	130	218	21.5	22	70	102	11	100
80	202	150	228	21.5	22	70	102	11	100

For welding class S

	DN	I	K	Ref		DN	I	K	Ref
1"	25	33.7	3.6	D025XNDS	1"	25	33.7	2.6	S025XNDM
1"1/4	32	42.4	3.6	D032XNDS	1"1/4	32	42.4	2.6	S032XNDM
1"1/2	40	48.3	3.6	D040XNDS	1"1/2	40	48.3	2.6	S040XNDM
2"	50	60.3	4	D050XNDS	2"	50	60.3	2.9	S050XNDM
2"1/2	65	76.1	5	D065XNDS	2"1/2	65	76.1	2.9	S065XNDM
3	80	88.9	5.6	D080XNDS	3	80	88.9	3.2	S080XNDM

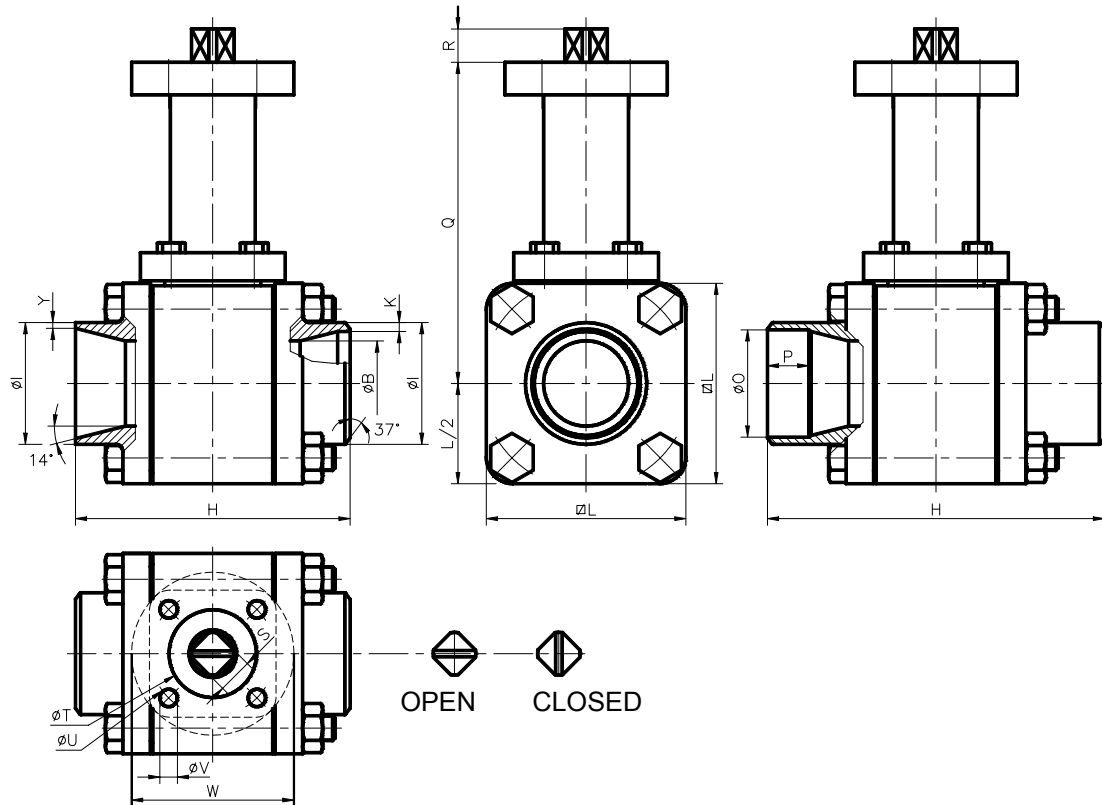
For welding class M

For brazing B

	DN	O	P	Ref		DN	I	Y	Ref
1"1/8	25	28.8	20	D025XNDB	1"	25	33.7	2	S025XNDH
1"3/8	32	35.2	22	D032XNDB	1"1/4	32	42.4	2	S032XNDH
1"5/8	40	41.5	22	D040XNDB	1"1/2	40	48.3	2	S040XNDH
2"1/8	50	54.3	25	D050XNDB	2"	50	60.3	2	S050XNDH
2"5/8	65	66.9	25	D065XNDB	2"1/2	65	76.1	2	S065XNDH
3"1/8	80	79.6	30	D080XNDB	3	80	88.9	2	S080XNDH

For welding class H

STRAIGHT BALL VALVE WITH REDUCED BORE FLOW WITH ISO FLANGE FOR ACTUATORS



General dimensions									
DN	B	L	Q	R	S	T	U	V	W
32	26.5	65	121	13.5	14	35	50	7	65
40	35	80	128	13.5	14	35	50	7	65
50	41.5	90	162	17.5	17	55	70	9	70
65	52.5	110	172	17.5	17	55	70	9	70
80	66	130	218	21.5	22	70	102	11	100
100	78	150	228	21.5	22	70	102	11	100

For welding class S						For welding class M					
	DN	H	I	K	Ref		DN	H	I	K	Ref
1"1/4	32	136	42.4	3.6	D032YNDS	1"1/4	32	102	42.4	2.6	S032YNDM
1"1/2	40	144	48.3	3.6	D040YNDS	1"1/2	40	110	48.3	2.6	S040YNDM
2"	50	127	60.3	4	D050YNDS	2"	50	167	60.3	2.9	S050YNDM
2"1/2	65	154	76.1	5	D065YNDS	2"1/2	65	154	76.1	2.9	S065YNDM
3"	80	186	88.9	5.6	D080YNDS	3"	80	186	88.9	3.2	S080YNDM
4"	100	202	114.4	6.3	D100YNDS	4"	100	202	114.4	3.6	S100YNDM


For brazing B						For welding class H					
	DN	H	O	P	Ref		DN	H	I	Y	Ref
1"3/8	32	136	35.2	22	D032YNDB	1"1/4	32	102	42.4	2	S032YNDH
1"5/8	40	144	41.5	22	D040YNDB	1"1/2	40	110	48.3	2	S040YNDH
2"1/8	50	167	54.3	25	D050YNDB	2"	50	127	60.3	2	S050YNDH
2"5/8	65	194	66.9	25	D065YNDB	2"1/2	65	154	76.1	2	S065YNDH
3"1/8	80	236	79.6	30	D080YNDB	3"	80	186	88.9	2	S080YNDH
4"1/8	100	262	105	30	D100YNDB	4"	100	202	114.4	2	S100YNDH

BALL VALVE WITH PNEUMATIC ACTUATOR

The quarter turn pneumatic actuator has been designed for operating a rotating valve from 0° to 90°.

Designed for safety applications, in the event of electrical failure the actuator will automatically close. It can also be installed in usual applications (open/closed). In this case, power supply is switched on to open the valve and switched off to close it.

Technical characteristics

Function :	Spring return
Rotary mouvement :	90° adjustable +/-10° in opened position
Piloting pressure :	From 6 up to 8 bar
Piloting fluid :	Dry air or neutral gas (Filtered)
	 With dew point < Minimum operating temperature
Connecting :	1 threaded port G1/4"
Installation :	According to ISO 5211 and DIN 3337
Ambient temperature :	-20° / 85°C

Accessories

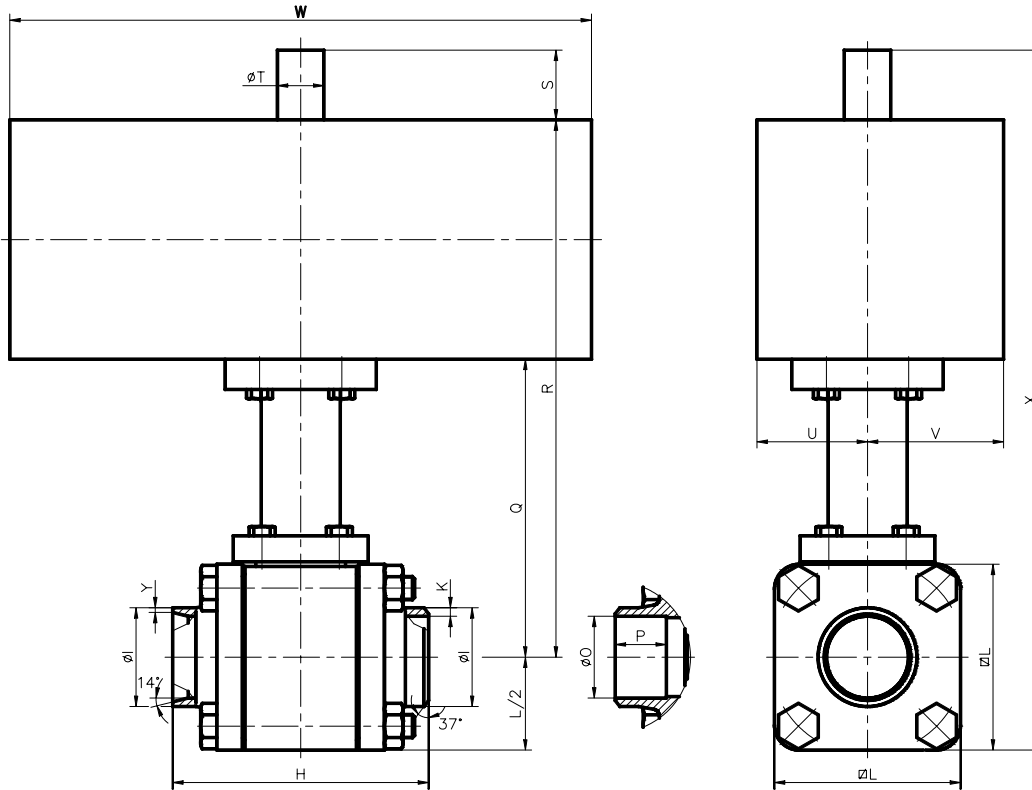
Pilot valve NAMUR

- Voltage to be advised
- Explosion proof Eexd2T5 (optional)

Limit switch (optional)

- IP 65
- Explosion proof IP67 (optional)

BALL VALVE WITH FULL BORE FLOW WITH PNEUMATIC ACTUATOR



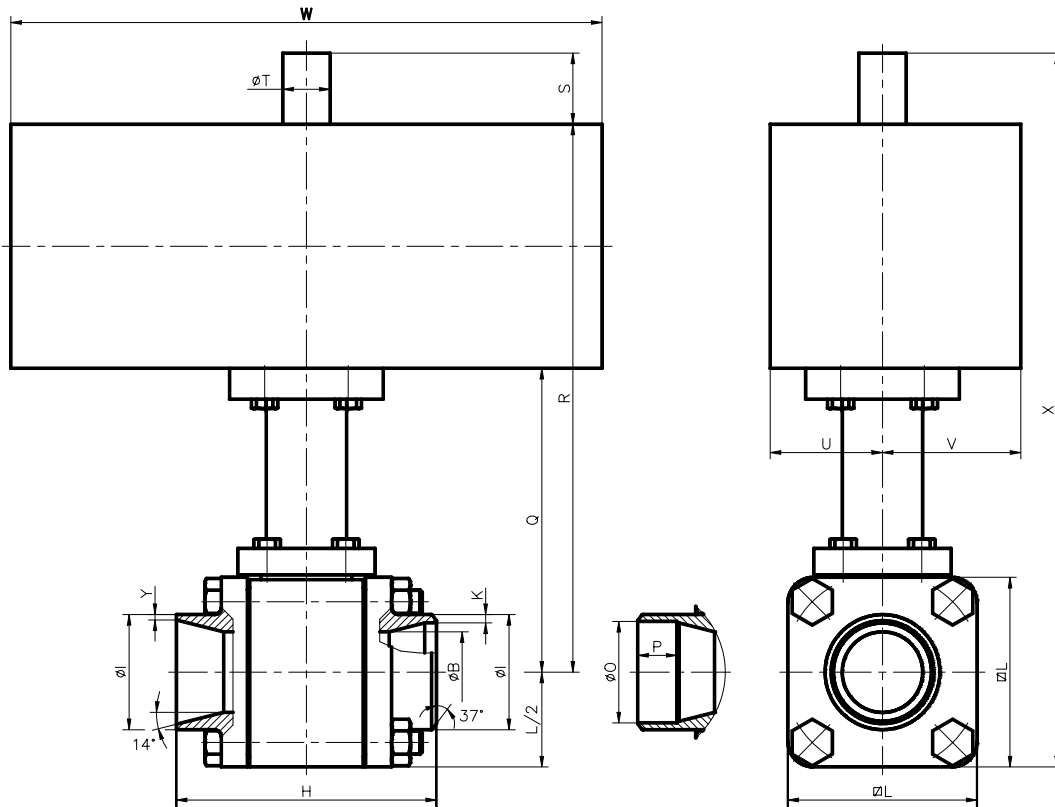
General dimensions										
DN	H	L	Q	R	S	T	U	V	W	X
25	102	65	121	224	30	20	47.5	58.5	250	286.5
32	110	80	128	231	30	20	47.5	58.5	250	301
40	127	90	162	299	30	29	64	73	345	374
50	154	110	172	309	30	29	64	73	345	394
65	186	130	218	406	30	40	87	100	522	501
80	202	150	228	416	30	40	87	100	522	521

For welding class S					For welding class M				
	DN	I	K	Ref		DN	I	K	Ref
1"	25	33.7	3.6	D025XPDS..	1"	25	33.7	2.6	S025XPDM..
1"1/4	32	42.4	3.6	D032XPDS..	1"1/4	32	42.4	2.6	S032XPDM..
1"1/2	40	48.3	3.6	D040XPDS..	1"1/2	40	48.3	2.6	S040XPDM..
2"	50	60.3	4	D050XPDS..	2"	50	60.3	2.9	S050XPDM..
2"1/2	65	76.1	5	D065XPDS..	2"1/2	65	76.1	2.9	S065XPDM..
3	80	88.9	5.6	D080XPDS..	3	80	88.9	3.2	S080XPDM..

For brazing B					For welding class H				
	DN	O	P	Ref		DN	I	Y	Ref
1"1/8	25	28.8	20	D025XPDB..	1"	25	33.7	2	S025XPDH..
1"3/8	32	35.2	22	D032XPDB..	1"1/4	32	42.4	2	S032XPDH..
1"5/8	40	41.5	22	D040XPDB..	1"1/2	40	48.3	2	S040XPDH..
2"1/8	50	54.3	25	D050XPDB..	2"	50	60.3	2	S050XPDH..
2"5/8	65	66.9	25	D065XPDB..	2"1/2	65	76.1	2	S065XPDH..
3"1/8	80	79.6	30	D080XPDB..	3	80	88.9	2	S080XPDH..

References are to be completed according to options that are required (see page 4)

BALL VALVE WITH REDUCED BORE FLOW WITH PNEUMATIC ACTUATOR



General dimensions

DN	B	L	Q	R	S	T	U	V	W
32	26.5	65	121	13.5	14	35	50	7	65
40	35	80	128	13.5	14	35	50	7	65
50	41.5	90	162	17.5	17	55	70	9	70
65	52.5	110	172	17.5	17	55	70	9	70
80	66	130	218	21.5	22	70	102	11	100
100	78	150	228	21.5	22	70	102	11	100

For welding class S

	DN	H	I	K	Ref		DN	H	I	K	Ref
1"1/4	32	136	42.4	3.6	D032YPDS..	1"1/4	32	102	42.4	2.6	S032YPDM..
1"1/2	40	144	48.3	3.6	D040YPDS..	1"1/2	40	110	48.3	2.6	S040YPDM..
2"	50	127	60.3	4	D050YPDS..	2"	50	167	60.3	2.9	S050YPDM..
2"1/2	65	154	76.1	5	D065YPDS..	2"1/2	65	154	76.1	2.9	S065YPDM..
3"	80	186	88.9	5.6	D080YPDS..	3"	80	186	88.9	3.2	S080YPDM..
4"	100	202	114.4	6.3	D100YPDS..	4"	100	202	114.4	3.6	S100YPDM..

For welding class M

For brazing B

	DN	H	O	P	Ref		DN	H	I	Y	Ref
1"3/8	32	136	35.2	22	D032YPDB..	1"1/4	32	102	42.4	2	S032YPDH..
1"5/8	40	144	41.5	22	D040YPDB..	1"1/2	40	110	48.3	2	S040YPDH..
2"1/8	50	167	54.3	25	D050YPDB..	2"	50	127	60.3	2	S050YPDH..
2"5/8	65	194	66.9	25	D065YPDB..	2"1/2	65	154	76.1	2	S065YPDH..
3"1/8	80	236	79.6	30	D080YPDB..	3"	80	186	88.9	2	S080YPDH..
4"1/8	100	262	105	30	D100YPDB..	4"	100	202	114.4	2	S100YPDH..

For welding class H

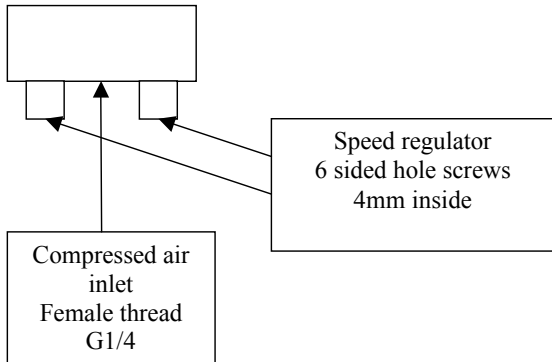
References are to be completed according to options that are required (see page 4)

INSTALLING INSTRUCTION BALL VALVE WITH PNEUMATIC ACTUATOR

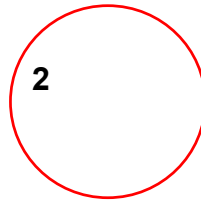
WIRING INSTRUCTIONS

- 1 Connect the compressed air inlet
- 2 Wire the pilot.
- 3 Wire if necessary the limit switch used

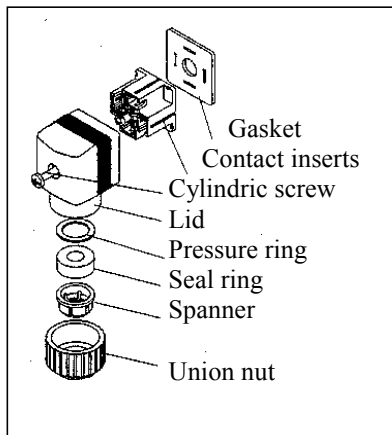
1 – SPEED REGULATOR CONTROL



3



2 – PILOT SOLENOID VALVE



1

PILOT WIRING

Connection 1: Phase
Connection 2: Neutral
⊥ : Earth

3 – LIMIT SWITCH WIRING

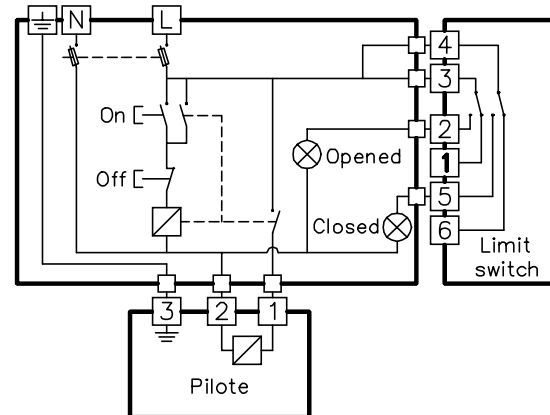
Valve opened

Connection 3 : Common
Connection 2 : Normal opened
Connection 1: Normal closed

Valve closed

Connection 4 : Common
Connection 5 : Normal opened
Connection 6 : Normal closed

Wiring example



BALL VALVE WITH ELECTRIC ACTUATOR

The quarter turn electric actuator has been designed for operating a rotating valve from 0° to 90°. It can also be installed in usual applications (open/closed).
With the fail safe security block option and in the event of electrical failure power is switched on a battery and actuator will automatically close.

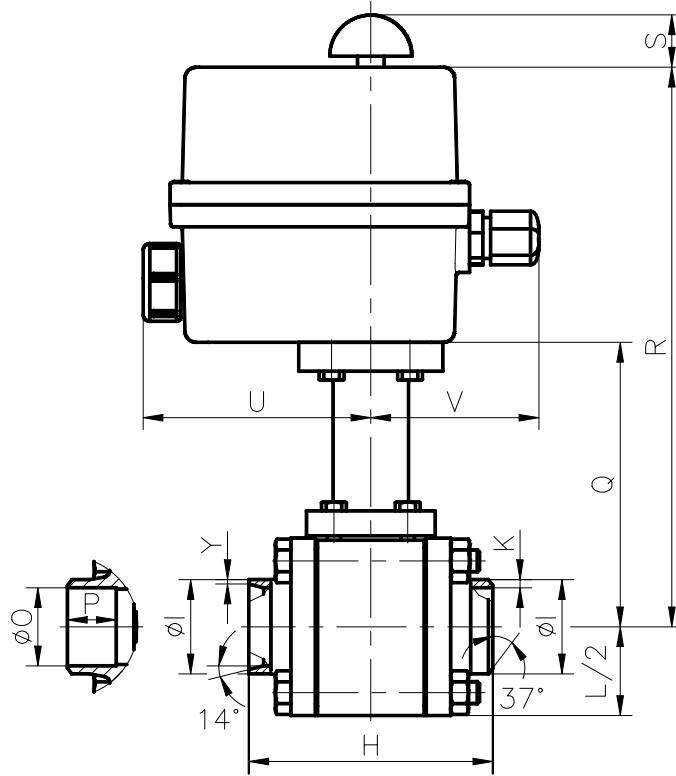
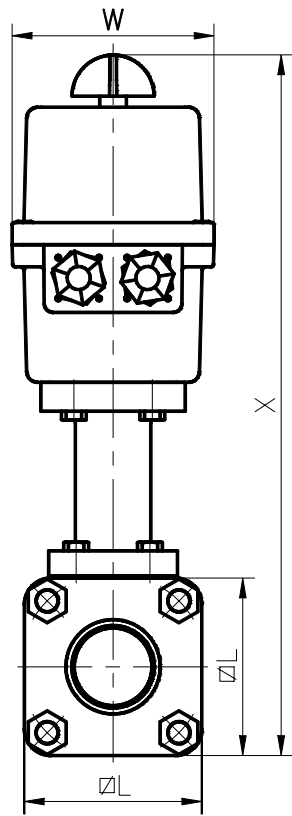
Technical characteristics

Voltage :	220 V AC 50 Hz
Enclosure :	IP 65
Rotary movement :	90°
Connecting :	2 x ISO20 IP68
Installation :	According to ISO 5211 and DIN 3337
Ambient temperature :	-10°/ 55°C

Accessories

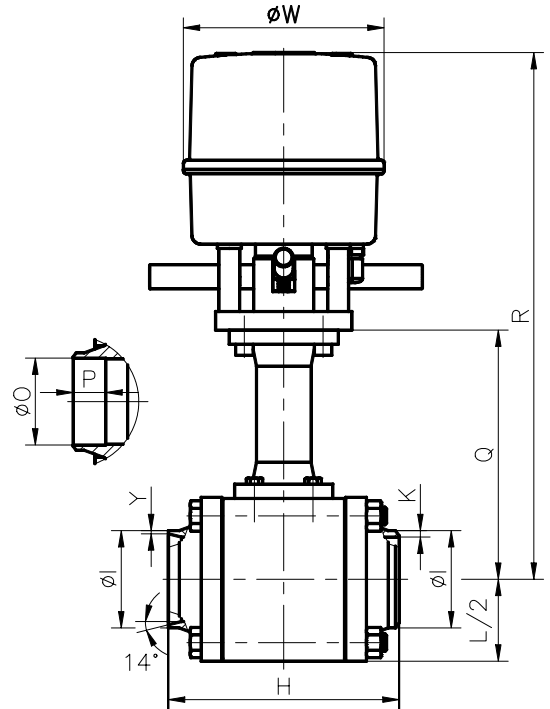
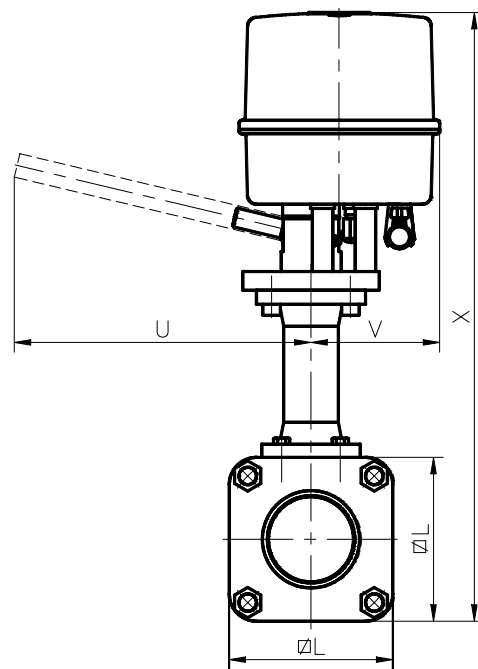
- Optional Fail safe security block: in the event of electrical failure power is switched on a battery and actuator will automatically close.
- Optional Lever for DN 25, 32, 40 and 50
(For DN 65 and 80, the lever is included in the standard actuator).

BALL VALVE WITH FULL BORE FLOW Passage Intégral ELECTRIC ACTUATOR - Fail safe security block optionnal



DN 25, 32, 40 and 50

DN 65 and 80

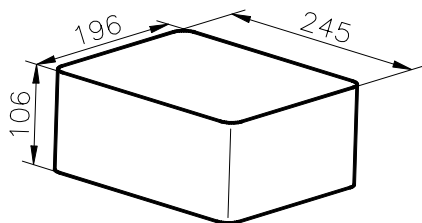


General dimensions									
DN	H	L	Q	R	S	U	V	W	X
25	102	65	121	224	24	103	76	91	302
32	110	80	128	231	24	103	76	91	316
40	127	90	162	299	24	106	87	127	381
50	154	110	172	309	24	106	87	127	401
65	186	130	218	406	-	280	118	184	538
80	202	150	228	416	-	280	118	184	558

For welding class S					For welding class M				
	DN	I	K	Ref		DN	I	K	Ref
1"	25	33.7	3.6	D025XLDS	1"	25	33.7	2.6	S025XLDM..
1"1/4	32	42.4	3.6	D032XLDS	1"1/4	32	42.4	2.6	S032XLDM..
1"1/2	40	48.3	3.6	D040XLDS	1"1/2	40	48.3	2.6	S040XLDM..
2"	50	60.3	4	D050XLDS	2"	50	60.3	2.9	S050XLDM..
2"1/2	65	76.1	5	D065XLDS	2"1/2	65	76.1	2.9	S065XLDM..
3	80	88.9	5.6	D080XLDS	3	80	88.9	3.2	S080XLDM..

For brazing class B					For welding class H				
	DN	O	P	Ref		DN	I	Y	Ref
1"1/8	25	28.8	20	D025XLDB..	1"	25	33.7	2	S025XLDH..
1"3/8	32	35.2	22	D032XLDB..	1"1/4	32	42.4	2	S032XLDH..
1"5/8	40	41.5	22	D040XLDB..	1"1/2	40	48.3	2	S040XLDH..
2"1/8	50	54.3	25	D050XLDB..	2"	50	60.3	2	S050XLDH..
2"5/8	65	66.9	25	D065XLDB..	2"1/2	65	76.1	2	S065XLDH..
3"1/8	80	79.6	30	D080XLDB..	3	80	88.9	2	S080XLDH..

Fail safe security block (optional)

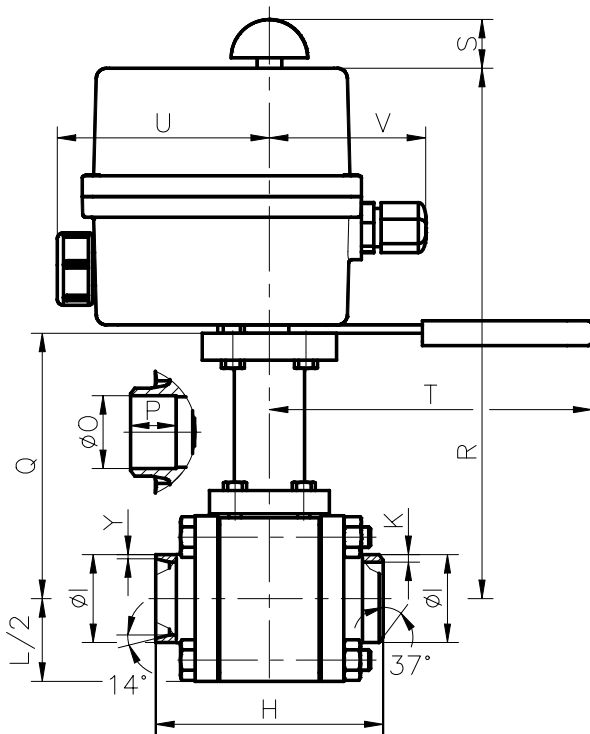
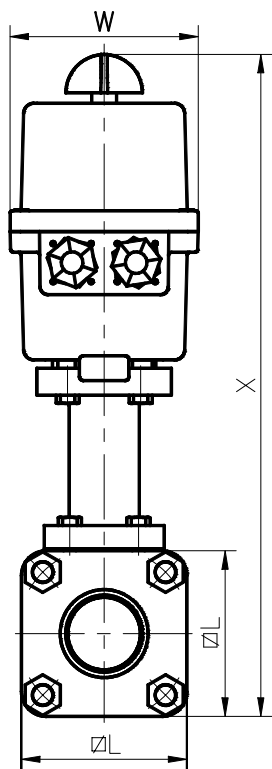


BLOC DE SECURITE
SECURITY BLOCK

Code : « R » to be added to the reference
D025XLDSR

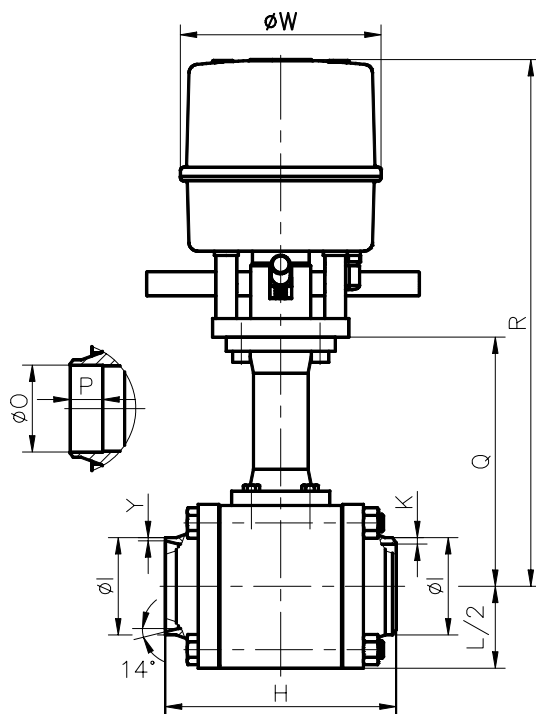
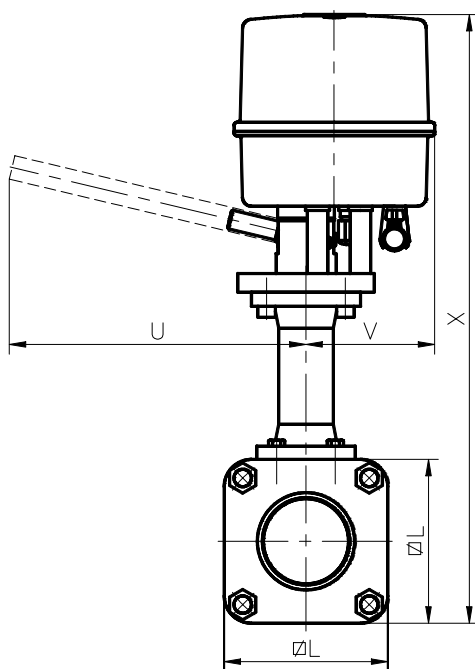
BALL VALVE WITH FULL BORE FLOW

ELECTRIC ACTUATOR with lever – fail safe security block (optional)



DN 25, 32, 40 and 50

DN 65 and 80

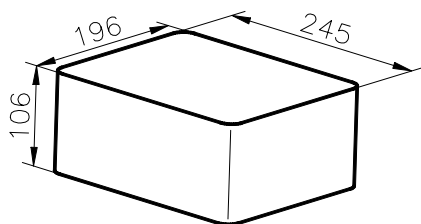


General dimensions										
DN	H	L	Q	R	S	T	U	V	W	X
25	102	65	121	224	24	156	103	76	91	306
32	110	80	128	231	24	156	103	76	91	320
40	127	90	162	299	24	171	106	87	127	397
50	154	110	172	309	24	171	106	87	127	417
65	186	130	218	406	-	-	280	118	184	538
80	202	150	228	416	-	-	280	118	184	558

For welding class S					For welding class M				
	DN	I	K	Ref		DN	I	K	Ref
1"	25	33.7	3.6	D025XLDSV	1"	25	33.7	2.6	S025XLDMV
1"1/4	32	42.4	3.6	D032XLDSV	1"1/4	32	42.4	2.6	S032XLDMV
1"1/2	40	48.3	3.6	D040XLDSV	1"1/2	40	48.3	2.6	S040XLDMV
2"	50	60.3	4	D050XLDSV	2"	50	60.3	2.9	S050XLDMV
2"1/2	65	76.1	5	D065XLDS	2"1/2	65	76.1	2.9	S065XLDM
3	80	88.9	5.6	D080XLDS	3	80	88.9	3.2	S080XLDM

For brazing class B					For welding class H				
	DN	O	P	Ref		DN	I	Y	Ref
1"1/8	25	28.8	20	D025XLDBV	1"	25	33.7	2	S025XLDHV
1"3/8	32	35.2	22	D032XLDBV	1"1/4	32	42.4	2	S032XLDHV
1"5/8	40	41.5	22	D040XLDBV	1"1/2	40	48.3	2	S040XLDHV
2"1/8	50	54.3	25	D050XLDBV	2"	50	60.3	2	S050XLDHV
2"5/8	65	66.9	25	D065XLDB	2"1/2	65	76.1	2	S065XLDH
3"1/8	80	79.6	30	D080XLDB	3	80	88.9	2	S080XLDH

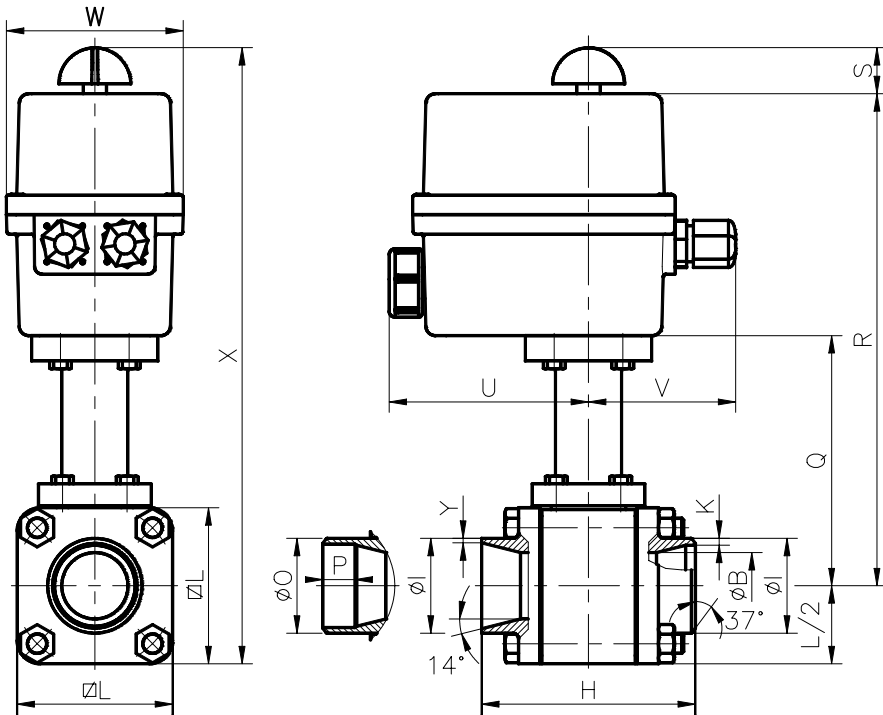
Fail safe security block (optional)



BLOC DE SECURITE
SECURITY BLOCK

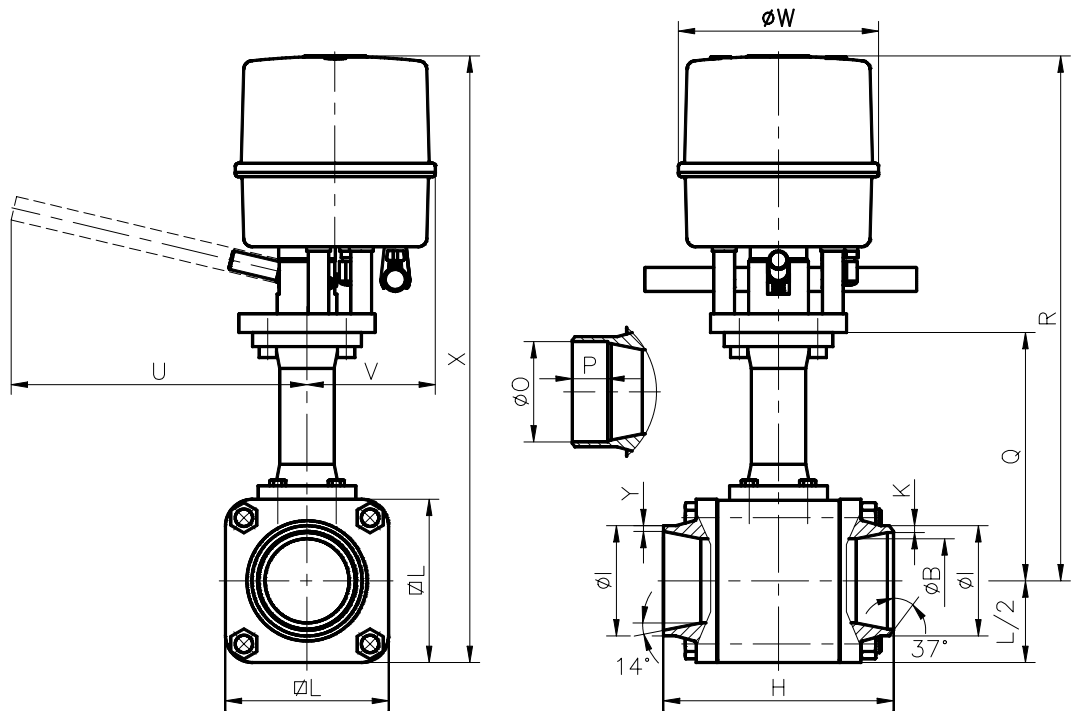
Code : « R » to be added to the reference
D025XLDSRV

BALL VALVE FOR REDUCED BORE FLOW ELECTRIC ACTUATOR – fail safe security block (optional)



DN 32 , 40, 50 and 65

DN 80 and 100

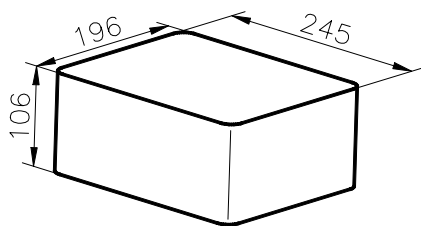


General dimensions									
DN	B	L	Q	R	S	U	V	W	X
32	26.5	65	121	246	24	103	76	91	302
40	35	80	128	253	24	103	76	91	316
50	41.5	90	162	313	24	106	87	127	381
65	52.5	110	172	323	24	106	87	127	401
80	66	130	218	473	-	280	118	184	538
100	78	150	228	483	-	280	118	184	558

For welding class S						For welding class M					
	DN	H	I	K	Ref		DN	H	I	K	Ref
1"1/4	32	136	42.4	3.6	D032YLDS	1"1/4	32	102	42.4	2.6	S032YLDM
1"1/2	40	144	48.3	3.6	D040YLDS	1"1/2	40	110	48.3	2.6	S040YLDM
2"	50	127	60.3	4	D050YLDS	2"	50	167	60.3	2.9	S050YLDM
2"1/2	65	154	76.1	5	D065YLDS	2"1/2	65	154	76.1	2.9	S065YLDM
3"	80	186	88.9	5.6	D080YLDS	3"	80	186	88.9	3.2	S080YLDM
4"	100	202	114.4	6.3	D100YLDS	4"	100	202	114.4	3.6	S100YLDM

For brazing B						For welding class H					
	DN	H	O	P	Ref		DN	H	I	Y	Ref
1"3/8	32	136	35.2	22	D032YLDB	1"1/4	32	102	42.4	2	S032YLDH
1"5/8	40	144	41.5	22	D040YLDB	1"1/2	40	110	48.3	2	S040YLDH
2"1/8	50	167	54.3	25	D050YLDB	2"	50	127	60.3	2	S050YLDH
2"5/8	65	194	66.9	25	D065YLDB	2"1/2	65	154	76.1	2	S065YLDH
3"1/8	80	236	79.6	30	D080YLDB	3"	80	186	88.9	2	S080YLDH
4"1/8	100	262	105	30	D100YLDB	4"	100	202	114.4	2	S100YLDH

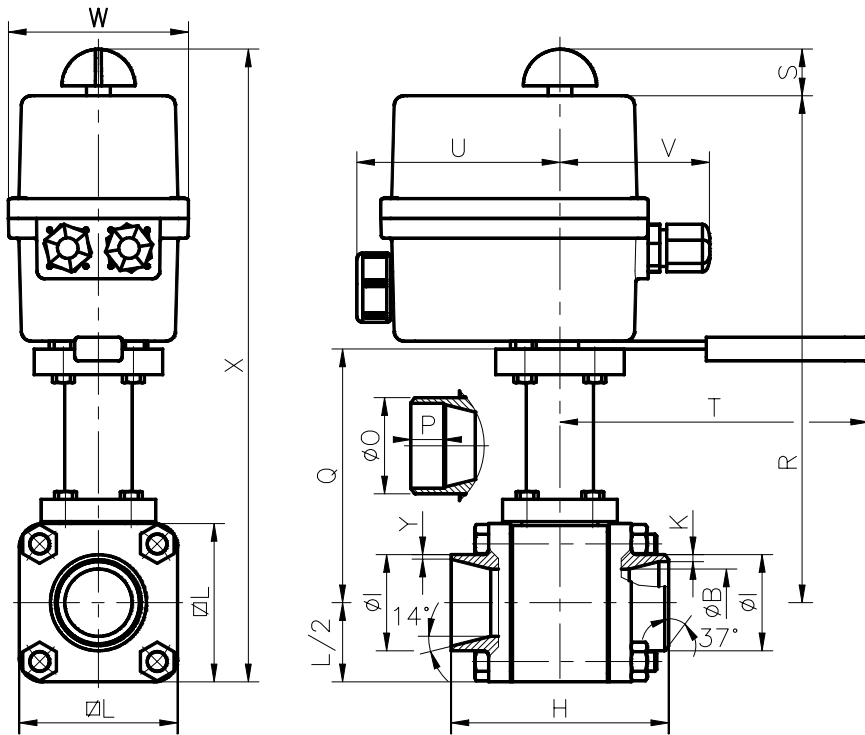
Fail safe security block (optional)



BLOC DE SECURITE
SECURITY BLOCK

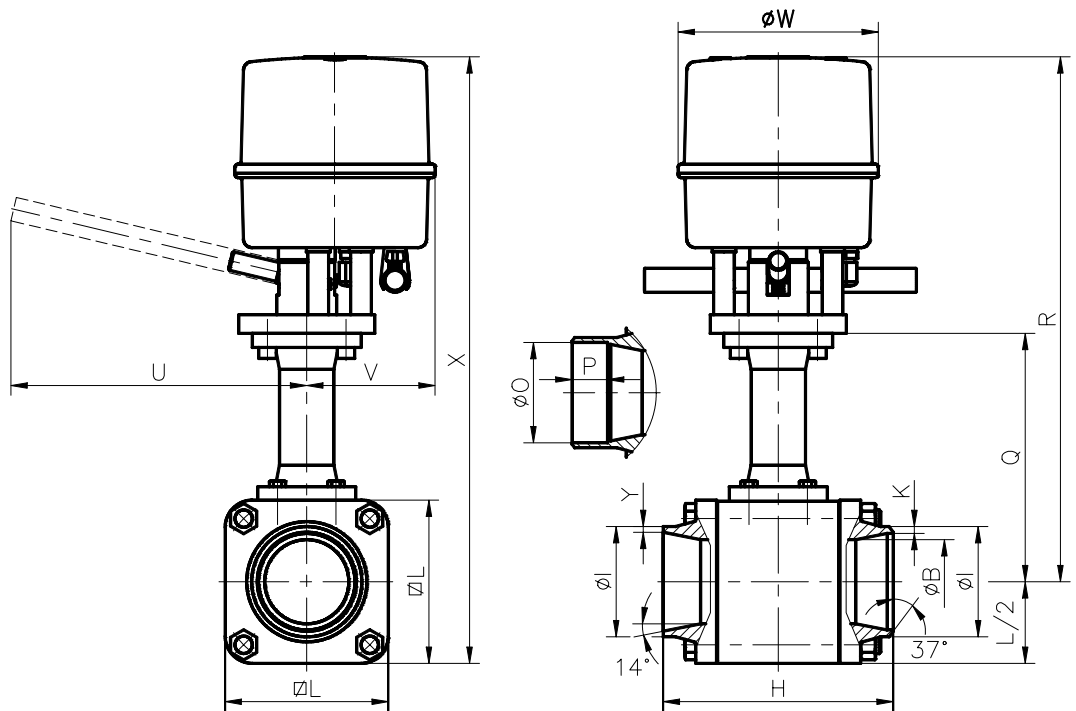
Code : « R » to be added to the reference
D032YLDSR

BALL VALVE WITH REDUCED BORE FLOW ELECTRIC ACTUATOR with lever – fail safe security block (optional)



DN 32 , 40, 50 and 65

DN 80 and 100

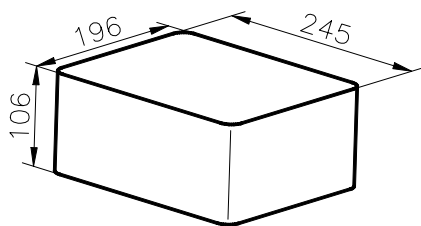


General dimensions										
DN	B	L	Q	R	S	T	U	V	W	X
32	26.5	65	121	250	24	156	103	76	91	306
40	35	80	128	257	24	156	103	76	91	320
50	41.5	90	162	329	24	171	106	87	127	397
65	52.5	110	172	339	24	171	106	87	127	417
80	66	130	218	473	-		280	118	184	538
100	78	150	228	483	-		280	118	184	558

For welding class S						For welding class M					
	DN	H	I	K	Ref		DN	H	I	K	Ref
1"1/4	32	136	42.4	3.6	D032YLDSV	1"1/4	32	102	42.4	2.6	S032YLDMV
1"1/2	40	144	48.3	3.6	D040YLDSV	1"1/2	40	110	48.3	2.6	S040YLDMV
2"	50	127	60.3	4	D050YLDSV	2"	50	167	60.3	2.9	S050YLDMV
2"1/2	65	154	76.1	5	D065YLDSV	2"1/2	65	154	76.1	2.9	S065YLDMV
3"	80	186	88.9	5.6	D080YLDS	3"	80	186	88.9	3.2	S080YLDM
4"	100	202	114.4	6.3	D100YLDS	4"	100	202	114.4	3.6	S100YLDM

For brazing class B						For welding class H					
	DN	H	O	P	Ref		DN	H	I	Y	Ref
1"3/8	32	136	35.2	22	D032YLDBV	1"1/4	32	102	42.4	2	S032YLDHV
1"5/8	40	144	41.5	22	D040YLDBV	1"1/2	40	110	48.3	2	S040YLDHV
2"1/8	50	167	54.3	25	D050YLDBV	2"	50	127	60.3	2	S050YLDHV
2"5/8	65	194	66.9	25	D065YLDBV	2"1/2	65	154	76.1	2	S065YLDHV
3"1/8	80	236	79.6	30	D080YLDB	3"	80	186	88.9	2	S080YLDH
4"1/8	100	262	105	30	D100YLDB	4"	100	202	114.4	2	S100YLDH

Fail safe security block



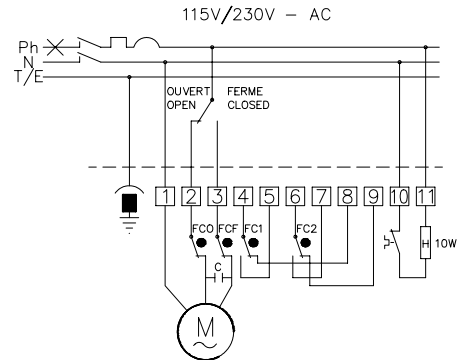
BLOC DE SECURITE
SECURITY BLOCK

Code : « R » to be added to the reference
D032YLDSRV

INSTALLING INSTRUCTION BALL VALVE WITH ELECTRIC ACTUATOR



Wiring example for ball valve DN 25 à 50



Wiring
 Connection 1 Common motor
 Connection 2 Pilot switch : open
 Connection 3 Pilot switch : close

OPENED LIMIT SWITCH
 Connection 4 Common
 Connection 5 Normal closed
 Connection 8 Normal opened

CLOSED LIMIT SWITCH
 Connection 6 Common
 Connection 7 Normal closed
 Connection 9 Normal opened

FCO Open limit switch
 FCF Closed limit switch
 FC1 Auxiliary 1 limit switch
 FC2 Auxiliary 2 limit switch

C Capacitor
 M Motor
 H Heating resistor

Screw



Wiring example for ball valve DN 65 and 80

Remove the two black screw cover and unscrew to open the box

Wiring
 Connection 1 Common motor
 Connection 2 Pilot switch : open
 Connection 3 Pilot switch : close

OPENED LIMIT SWITCH

Connection 4
 Connection 5

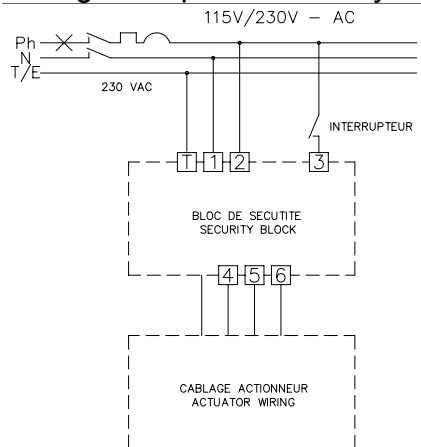
CLOSED LIMIT SWITCH

Connection 6
 Connection 7

FCO Open limit switch
 FCF Closed limit switch
 FC1 Auxiliary 1 limit switch
 FC2 Auxiliary 2 limit switch

C Capacitor
 M Motor
 H Heating resistor

Wiring example for security block

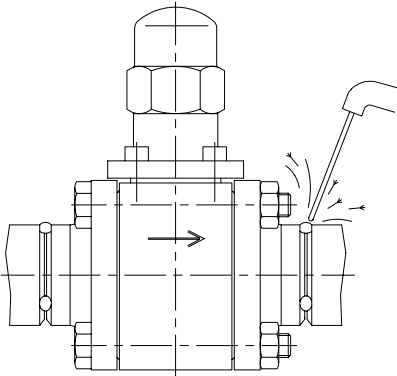
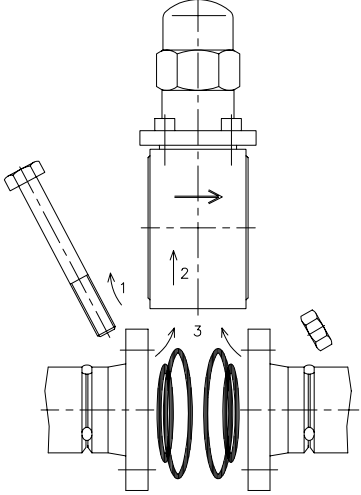
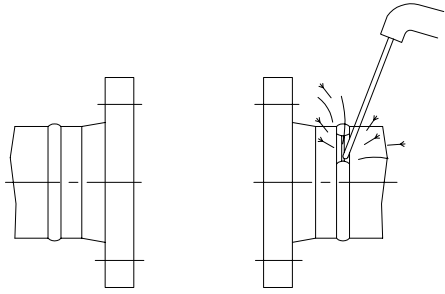
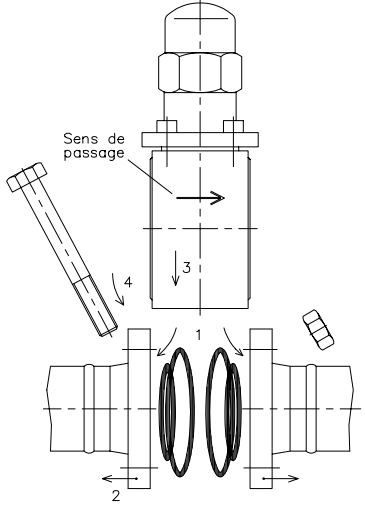


INSTRUCTIONS FOR INSTALLING BALL VALVES

The ball valve must be installed in pipework which can be moved apart slightly to allow for the installation and removal of the valve ball assembly.

This axial movement should be no less than 1mm.

The ball valve flanges are sealed by two contained 'O' ring gaskets. To avoid heat damage during the welding of the flanges to the pipework the following procedure should be carried out.

<p>1</p> 	<p>2</p> 
<p>3</p> 	<p>4</p> 
<ol style="list-style-type: none"> 1. With the complete ball valve in position the pipe work should be correctly lined up and the two flanges fixed by tack welds. 2. For valves DN 25, 32 and 40 the four bolts should be unscrewed and removed from each flange. The ball valve assembly should be lifted out taking care not to damage the 'O' ring gaskets. 3. The welding of the flanges should then be completed. 4. Any dirt, welding slag and splatter should be removed from inside the pipe work and the flange seating face. 5. The seating faces of the flanges should be lightly oiled and the 'O' ring gaskets replaced for valves DN 25, 32 and 40. <p>The arrow direction should then be checked with the flow. The valve body should be reassembled by springing open the flanges taking care not to damage the faces or sealing 'O' rings. Check the ball : the vent hole is to be situated on the upstream side of the ball.</p>	

MAINTENANCE

GENERAL INSTRUCTIONS :

To ensure the safe operation and effectiveness of RFF valves and fittings during their operational life the valves should be regularly checked and serviced.

Particular attention should be paid to the valves:

- When constructing new installations,
- When recommissioning installations after modification or new plant extensions.
- When restarting plant after long periods of shut-down.

The following maintenance instructions are the minimum manufacturers recommendations.

SAFETY WARNING "Valves under pressure"!

During checking or dismantling operations, care must be taken as parts of the valves may still contain refrigerant gas under pressure.

MAINTENANCE PLAN:

1/ Annual inspection:

a) Test opening and closing operation :

Check that the valves operate freely by opening and closing the valves by hand.

Should it be difficult to turn the spindle, the valve bonnet should be removed, dismantled and cleaned, and the spindle lubricated with grease. It may be necessary to change the o-rings and replace the body gasket.

When reassembling the valves, the body fixing screws should be lubricated with grease.

Special care should be taken to ensure the correct orientation of the ball valve during re-assembly, the vent hole drilled in the ball must be installed on the upstream side (pressure side) of the valve.

b) Gas leakage check:

From the top of the gland nut:

With cap valves, leaks may be detected when unscrewing the cap : if there is any pressure inside the cap there will be a noise when the gas is relieved.

Should there be any trace of leakage the o-rings must be replaced.

From body gasket:

The flat body gasket should be replaced if necessary. When reassembling the body fixing screws should be lubricated with grease.

2/ Dismantling every four years :

Every four years, the following additional procedures are recommended:

a) Valve seat check:

If the Teflon seal face is damaged, the PTFE or the ball should be replaced.

b) Fixing screw check:

Any screws which are corroded or damaged should be replaced (screw class 8/8).

c) External surface check:

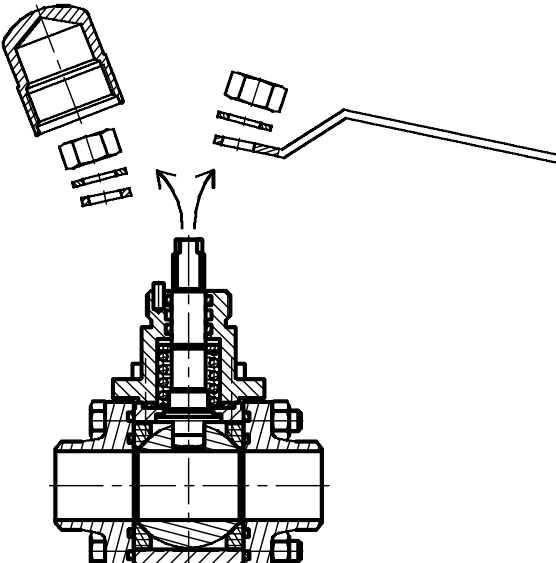
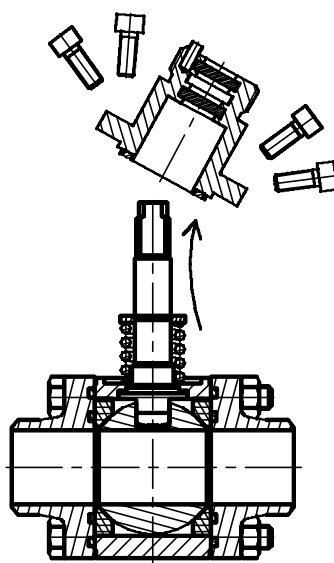
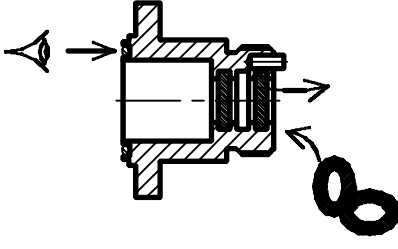
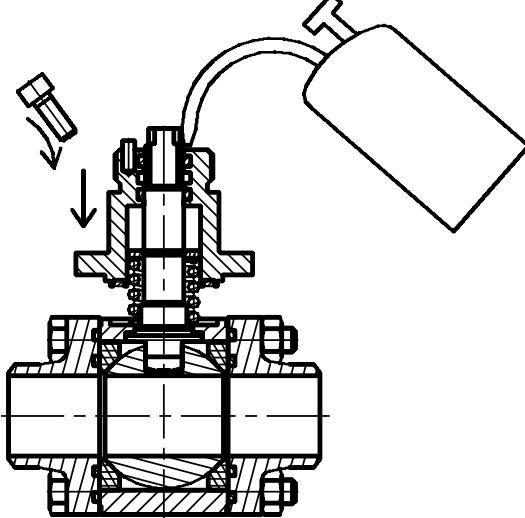
Where necessary, all external surfaces, which are corroded, should be cleaned and repainted.

General re-assembly note:

When re-assembling valves and appliances, the body fixing screws should be lubricated with grease, and all moving parts in the bonnet should be cleaned and lubricated with low-temperature oil.

As a preventive measure, all O-rings and body gaskets should be also replaced.

INSTRUCTIONS TO CHANGE PACKING GLAND "O" RINGS

<p>1</p> 	<p>2</p> 
<p>3</p> 	<p>1. Remove the Hand lever or the cap (Note : Position and orientation of the top thrust washer and lift off)</p> <p>2. Note the correct position of the Bonnet before removing. The bonnet is located by a pin with 2 possible positions at 180°.</p> <p>3. Change the two "O" rings (1st and 3rd grooves). Replace the body gasket, if necessary.</p> <p>4. Fill the gland oil reservoir with non-freezing, low temperature, compressor oil. Refit the bonnet in the correct position previously identified.</p> <p>Refit the Lever or the cap with the thrust washer.</p>
<p>4</p> 	

SPARE PARTS for BALL VALVE DN 25 - 32 - 40 with cap or with lever

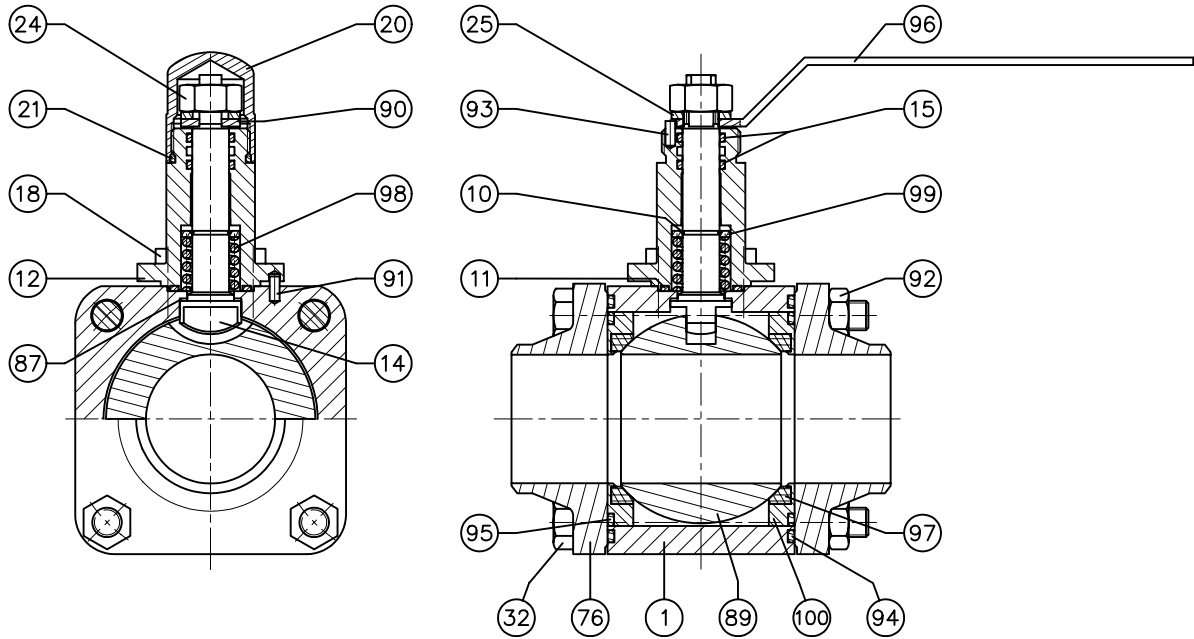
Ref.	Description	Ref.	Description
1	Body	87	Back Seat gasket
10	Circlip	89	Ball
11	Body gasket	90	Thrust washer
12	Bonnet	91	Grooved pin
14	Spindle	92	Prevailing torque nut
15	Packing gland O-ring	93	Thrust grooved pin
18	Screw	94	Flange O-ring
20	Cap	95	Seat O-ring
21	Cap O-ring	96	Lever
24	Nut	97	Seat
25	Lever top washer	98	Spring
32	Screw	99	Stoppage washer
76	Pipe flange		

TO ORDER

DESCRIPTION	With parts number	DESCRIPTION	With parts number
Body gasket	11	Pipe flange with O-ring	76+94+95
Packing gland O-ring	15	Complete lever	96+25+24
Cap O-ring	21	Ball	89
Complete cap	20+21	Seat	97
Spindle	14+10+99+87	Gaskets for lever ball valve	94+95+11+15
Bonnet	11+12+15+93	Gaskets for cap ball valve	94+95+11+15+21
Screw	18	Flange O-ring + seat O-ring	94+95
Prevailing torque nut	92+32	Bonnet with lever	11+12+18+15+24+25+96
Spring	98	Bonnet with cap	11+12+15+18+20+21+24+25+90
Complete thrust washer	24+25+90	Body	1+10+14+87+91+98+99

SPARE PARTS for BALL VALVE

DN 50 - 65 - 80 with cap or with lever



Ref.	Description	Ref.	Description
1	Body	87	Back Seat gasket
10	Circlip	89	Ball
11	Body gasket	90	Thrust washer
12	Bonnet	91	Grooved pin
14	Spindle	92	Prevailing torque nut
15	Packing gland O-ring	93	Thrust grooved pin
18	Screw	94	Flange O-ring
20	Cap	95	Seat O-ring
21	Cap O-ring	96	Lever
24	Nut	97	Seat
25	Lever top washer	98	Spring
32	Screw	99	Stoppage washer
76	Pipe flange	100	Seat thrust washer

TO ORDER			
DESCRIPTION	With parts number	DESCRIPTION	With parts number
Body gasket	11	Pipe flange	76
Packing gland O-ring	15	Complete lever	96+25+24
Cap O-ring	21	Ball	89
Complete cap	20+21	Seat	97
Spindle	14+10+99+87	Gaskets for lever ball valve	94+95+11+15
Bonnet	11+12+15+93	Gaskets for cap ball valve	94+95+11+15+21
Screw	18	Flange O-ring+seat O-ring	94+95
Prevailing torque nut	92+32	Bonnet with lever	11+12+18+15+24+25+96
Seat thrust washer	100	Bonnet with cap	11+12+15+18+20+21+24+25+90
Spring	98	Body	1+10+14+87+91+98+99
Complete thrust washer	24+25+90		

SPARE PARTS for BALL VALVE

DN 25 - 32 - 40 with ISO Flange for actuators

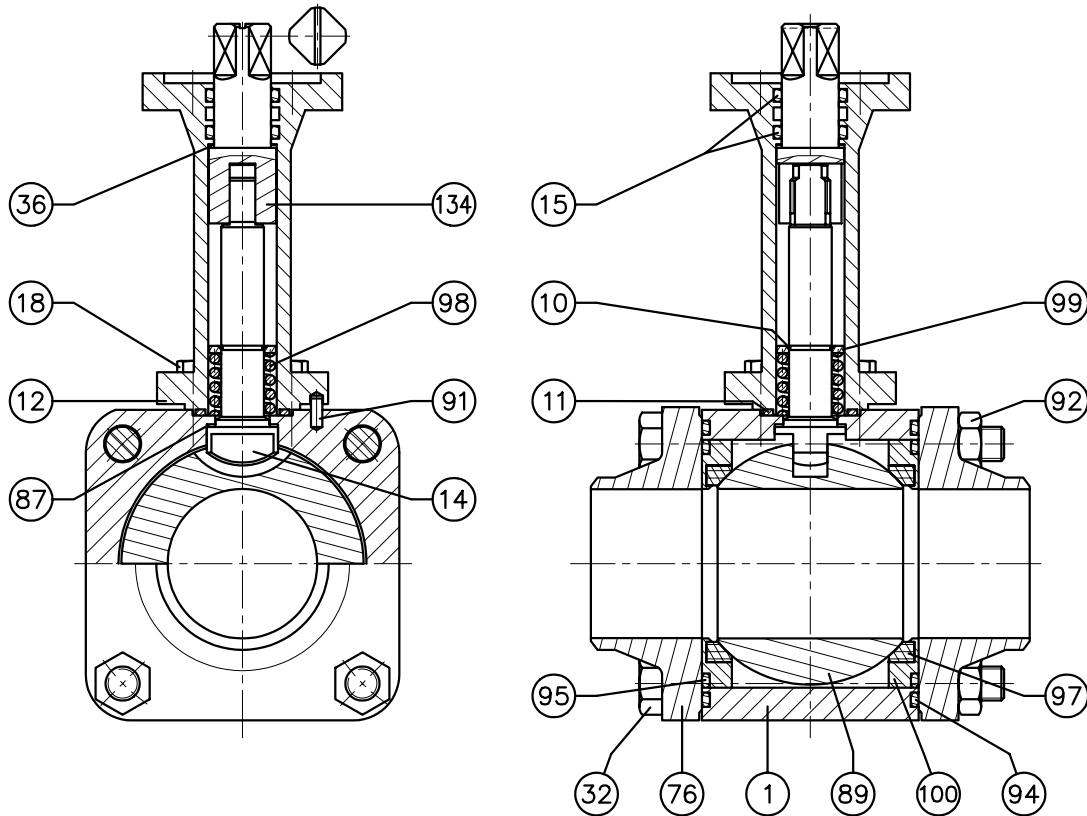
Ref.	Description	Ref.	Description
1	Body	87	Back Seat gasket
10	Circlip	89	Ball
11	Body gasket	91	Grooved pin
12	Bonnet	92	Prevailing torque nut
14	Spindle	94	Flange O-ring
15	Packing gland O-ring	95	Seat O-ring
18	Screw	97	Seat
32	Screw	98	Spring
36	Sliding ring	99	Stoppage washer
76	Pipe flange	134	Coupling spindle

TO ORDER

DESCRIPTION	With parts number	DESCRIPTION	With parts number
Body gasket	11	Ball	89
Packing gland O-ring	15	Seat	97
Spindle	14+10+99+87	Set of gaskets	94+95+11+15
Bonnet	11+12+15	Flange O-ring+seat O-ring	94+95
Screw	18	Coupling spindle	36+134
Prevailing torque nut	92+32	Bonnet with ISO flange	11+12+15+18+36+134
Spring	98	Body	1+10+14+87+91+98+99
Pipe flange with O-ring	76+94+95		

SPARE PARTS for BALL VALVE

DN 50 - 65 - 80 with ISO Flange for actuators



Ref.	Description	Ref.	Description
1	Body	89	Ball
10	Circlip	91	Grooved pin
11	Body gasket	92	Prevailing torque nut
12	Bonnet	94	Flange O-ring
14	Spindle	95	Seat O-ring
15	Packing gland O-ring	97	Seat
18	Screw	98	Spring
32	Screw	99	Stoppage washer
36	Sliding ring	100	Seat thrust washer
76	Pipe flange	134	Coupling spindle
87	Back Seat gasket		

TO ORDER

DESCRIPTION	With parts number	DESCRIPTION	With parts number
Body gasket	11	Pipe flange	76
Packing gland O-ring	15	Ball	89
Spindle	14+10+99+87	Seat	97
Bonnet	11+12+15	Body	1+10+14+87+91+98+99
Screw	18	Set of gaskets	94+95+11+15
Prevailing torque nut	92+32	Flange O-ring+seat O-ring	94+95
Spring	98	Coupling spindle	36+134
Seat thrust washer	100	Bonnet with ISO flange	11+12+15+18+36+134

WEIGHT (kg)

BALL VALVE									
DN	With cap XCDS XCDB XCDM	With lever XVDS XVDB XVDM	With ISO flange XNDS XNDB XNDM	Actuator					
				pneumatic			electric		
				Act.	Pilot valve	Limit switch	Act.	lever	Security block
25	2.280	2.200	2.480	4.700	0.520	0.400	1.500	0.200	3.500
32	3.440	3.360	3.640	4.700	0.520	0.400	1.500	0.200	3.500
40	4.800	4.820	5.100	11.200	0.520	0.400	3.000	0.700	3.500
50	8.240	8.260	8.540	11.200	0.520	0.400	3.000	0.700	3.500
65	14.600	14.300	15.000	30.400	0.520	0.400	7.300	Include avec actionneur	3.500
80	21.620	21.920	22.020	30.400	0.52	0.400	7.300		3.500

Example :

Ball valve DN 25 with pneumatic actuator, pilot valve and limit switch

Ref : **XPDSBF**

Weight = 2.480 + 4.700 + 0.520 + 0.400 = 8.100 kg

Ball valve DN 25 with electric actuator

Ref : **XLDS**

Weight = 2.480 + 1.500 = 3.980 kg

CONTENTS

STAINLESS STEEL BALL VALVE

GENERAL DESCRIPTION	2
BALL VALVE WITH LEVER OR WITH CAP	5
BALL VALVE WITH ISO FLANGE FOR ACTUATOR.....	6
BALL VALVE WITH PNEUMATIC ACTUATOR.....	8
INSTALLING INSTRUCTION BALL VALVE WITH PNEUMATIC ACTUATOR	10
BALL VALVE WITH ELECTRIC ACTUATOR	11
INSTALLING INSTRUCTION BALL VALVE WITH ELECTRIC ACTUATOR	14
MAINTENANCE INSTRUCTIONS.....	15
SPARE PARTS	19
WEIGHT OF RFF BALL VALVE	23
STEEL BALL VALVE.....	specific documentation
REFRIGERATION VALVE.....	specific documentation

Le Robinet Frigorifique Français declines responsibility for any errors or omissions which may occur in its catalogues, drawings or any other document published by Le Robinet Frigorifique Français.
It reserve the right to modify its products without prior notice.

BALL VALVE CHARACTERISTICS

The RFF Ball valves have been designed for refrigeration installations using ammonia or halocarbon refrigerants (see listed on page 3)

Temperature range from -50°C up to $+150^{\circ}\text{C}$. The normal pressure rating is 25 bar with higher pressure up to 40 bar available on request.

Valve flange connections are available to the following:
Butt welding Class "H" thickness 2mm for stainless steel pipe

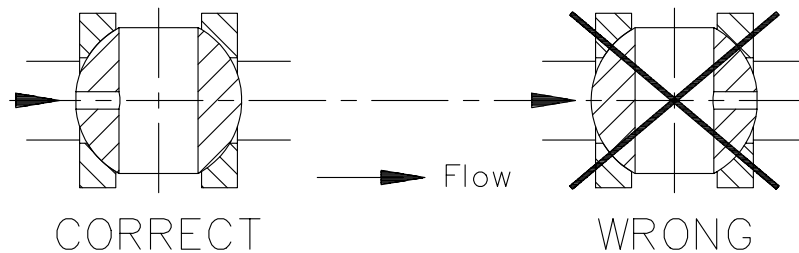
Designed with full bore flow, the RFF Ball valve has low pressure drop with high Cv values.

The valve body, subjected to pressure, is manufactured from low temperature impact tested steel. The valves can be supplied with material certificates to EN 10204.3.1.B. when specified on order.

The simple three piece body design is easy to install without the need for special torque tools. Efficient insulation is possible due to extended valve head.

The ball seat seal gas tightness is obtained by two special fibre glass reinforced PTFE rings.

A vent hole is drilled in the ball to avoid trapped liquid and possible damage by hydraulic expansion when the valve is closed. The vent hole is situated on the upstream side of the ball. The valve has only one direction of flow.



The valve has two spindle seals, one under the spindle thread and one above the spindle thread.

The lower end of the valve spindle is sealed tight by a PTFE seat held in place by a compressed spring. This allows the replacement of the spindle "O" ring while the plant is on line..

The top spindle seal incorporates the proven standard RFF design using two "O" rings with lubricating, non-freezing oil, reservoir between them.

If the flats of the spindle are parallel to the piping, the valve is open. If they are perpendicular, the valve is closed.

The ball valve is supplied with a seal cap fitted with a rubber "O" ring. The cap has an internal groove for venting gas to ensure safe removal at atmospheric pressure.

Fitting the cap is recommended to keep the ball valve clean, to stop unauthorised use and for all applications using odourless refrigerants.

For installations with other refrigerants, including ammonia, a lever is available for opening and closing.

An ISO flange is another option available to adapt your own actuators. RFF can also supply pneumatic actuators.

APPROVAL

RFF products have obtained the approval of the pressure equipment directive 97/23/CE. RFF company has obtained the certification EN ISO 9001 : 2000.

OPERATING CONDITIONS

The application of ball valves are only limited by the "O" ring specification. The "O" rings are manufactured from chloroprene synthetic rubber elastomer which has a design range from -50°C to $+150^{\circ}\text{C}$. The "O" rings are compatible with the following refrigerant and lubricating oils:

- Refrigerants :
 - C290 - C316 - C318 - R13b1 - R22 - R32
 - R114b2 - R123 - R124 - R125 - R134 - R134a
 - R141b - R142b - R143a - R152a - R404a - R407
 - R407c - R507 - R717(NH3) - R744(CO2) - Alkali
- Lubricants :
 - Mineral oils, except those with naphthalene base (ASTM 2 and 3)
 - Lubricants with ester silicate base.

WARNING :

It is important that you are aware that by using additives or exceeding the operating conditions may cause the "O" rings to fail.

For all applications (refrigerants or lubricants) other than those defined above, a compatibility study is necessary, in order to check the resistance of our standard O-ring material, or, if necessary, to offer you alternative O-rings more suitable for the specific conditions of your applications.

Our standard O-rings are not compatible with :

- Aromatic hydrocarbons (benzene)
- Chlorinated hydrocarbons (trichlorethylene)
- Polar solvents (ketone, ester, ether, acetone)

MATERIALS

DN	Bodies, Flanges and Bonnet	Disc-Seal	Lever	Cap	External tightness
25	Inox X5CrNi18-10	Stainless s.ball /seat PTFE+25%V	Stainl.S 304	Alu	O-ring
32	Inox X5CrNi18-10	Stainless s.ball /seat PTFE+25%V	Stainl.S 304	Alu	O-ring
40	Inox X5CrNi18-10	Stainless s.ball /seat PTFE+25%V	Stainl.S 304	Alu	O-ring
50	Inox X5CrNi18-10	Stainless s.ball /seat PTFE+25%V	Stainl.S 304	Alu	O-ring
65	Inox X5CrNi18-10	Stainless s.ball /seat PTFE+25%V	Stainl.S 304	Alu	O-ring
80	Inox X5CrNi18-10	Stainless s.ball /seat PTFE+25%V	Stainl.S 304	Alu	O-ring


BALL VALVE PN 40 (CO₂ or other gazes)

RFF ball valve with PN 40 are the same as PN 25 ones. Only last pressure test are different:

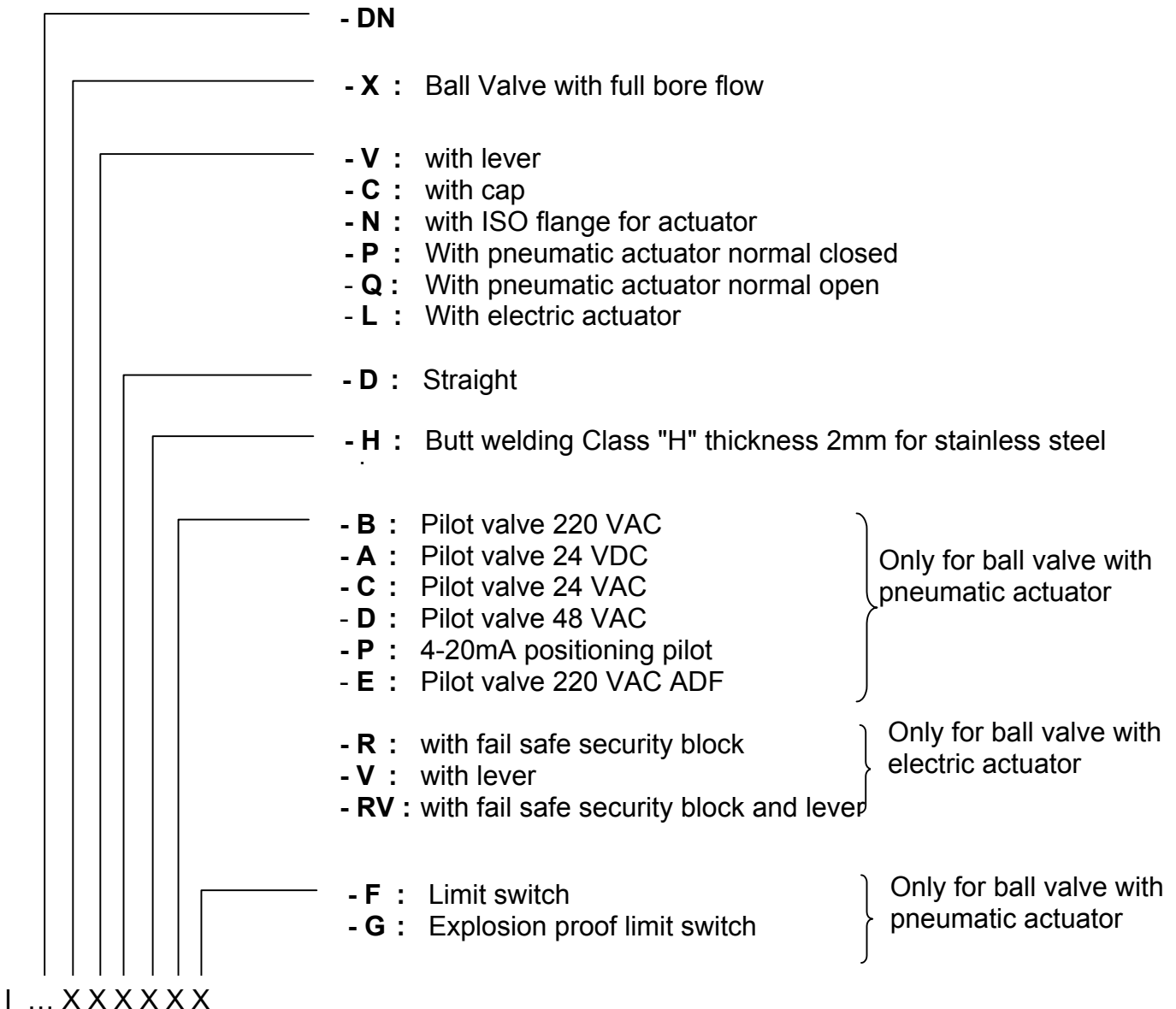
Hydraulic test: 60 bar

Air test under water: 40 bar

These products have received the general TUV approval.

 If pressure rating is more than 25 bar, special lever should be necessary, in this case please ask us.

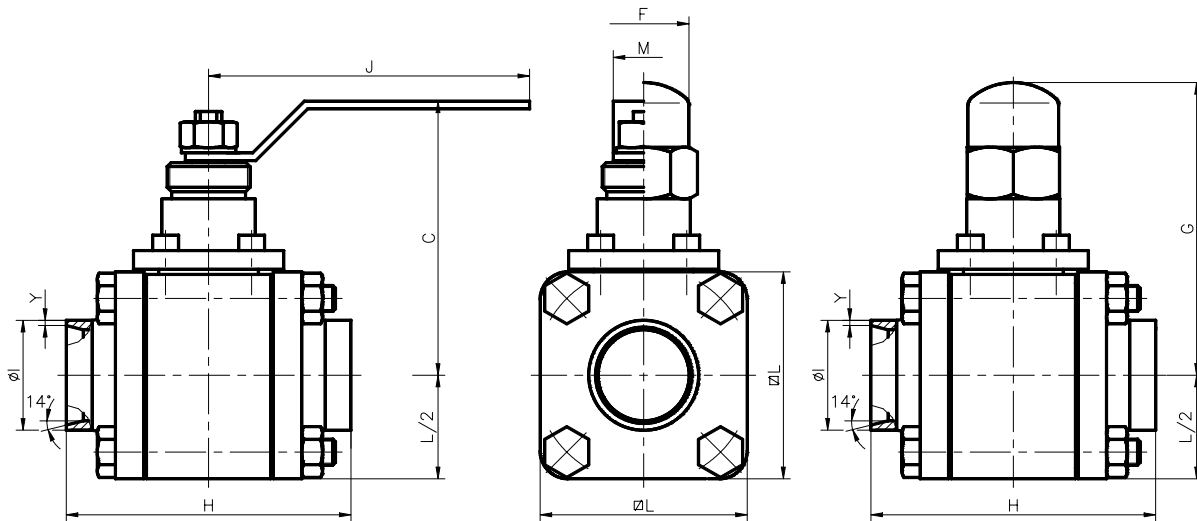
RFF REFERENCES CODE FOR BALL VALVES :



**For Electric actuator
Voltage and frequency to be confirmed for order**

STRAIGHT BALL VALVE

With lever, with cap



	DN	C	F	G	H	I	J	L	M	Y	Ref with cap	Ref with lever
1"	25	99	35	106	102	33.7	127	65	22	2	I025XCDH	I025XVDH
1"1/4	32	106	35	113	110	42.4	127	80	22	2	I032XCDH	I032XVDH
1"1/2	40	138	35	139	127	48.3	200	90	27	2	I040XCDH	I040XVDH
2"	50	148	35	149	154	60.3	200	110	27	2	I050XCDH	I050XVDH
2"1/2	65	190	47	197	186	76.1	354	130	39	2	I065XCDH	I065XVDH
3"	80	200	47	207	202	88.9	354	150	39	2	I080XCDH	I080XVDH


STRAIGHT BALL VALVE WITH ISO FLANGE FOR ACTUATORS

RFF ball valve range can be supplied with an upper flange for fitting your own actuators. This flange meets ISO standard requirements. (ISO 5211)

An adaptation kit can also be supplied to convert manual valves already installed. The existing bonnet should then be removed and replaced by the adaptation kit.

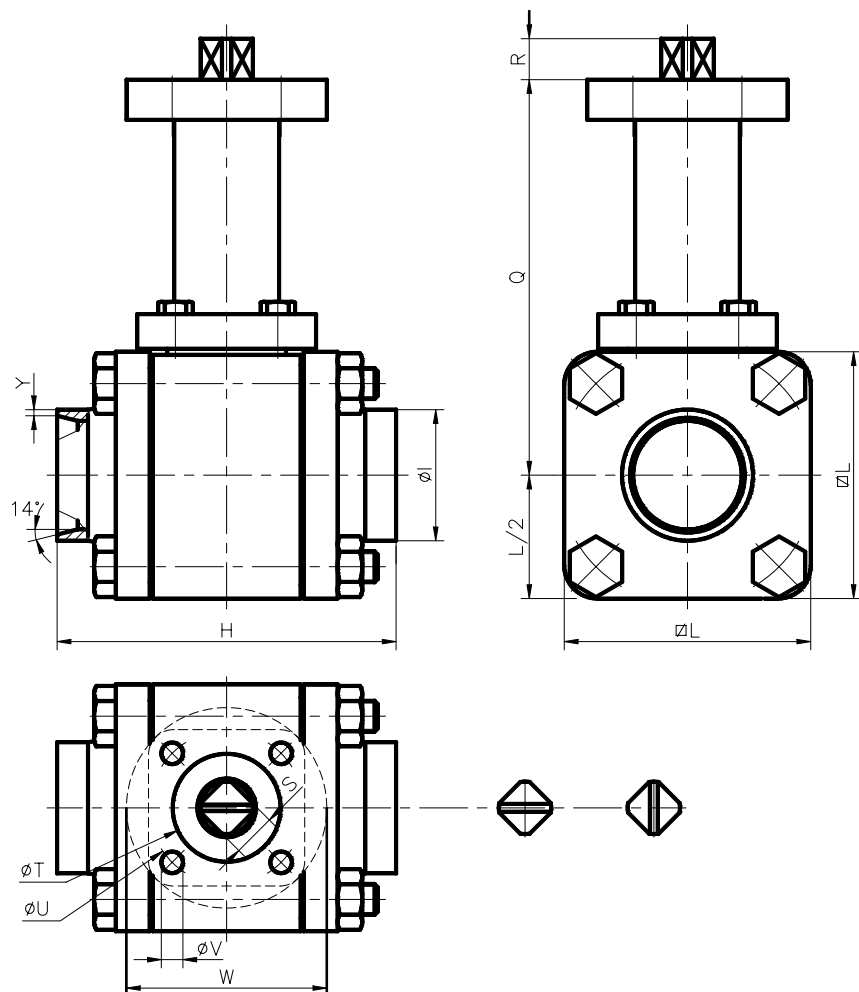
Actuating torque change with operating condition (temperature range, differential pressure, axial force of the pipe, thermal expansion, lubrication...)

Table below gives the torque of actuators used by RFF. You can use these datas to select your own actuators.

 If pressure rating is more than 25 bar, special lever should be necessary, in this case please ask us.

For Welding	For brazing	DN	Flange	Torque(N.m)
1"	1"1/8	25	F05	20
1"1/4	1"3/8	32	F05	35
1"1/2	1"5/8	40	F07	45
2"	2"1/8	50	F07	100
2"1/2	2"5/8	65	F10	150
3"	3"1/8	80	F10	300

STRAIGHT BALL VALVE WITH ISO FLANGE FOR ACTUATORS




	DN	H	I	L	Q	R	S	T	U	V	W	Y	Ref
1"	25	102	33.7	65	121	13.5	14	35	50	7	Ø 65	2	I025XNDH
1"1/4	32	110	42.4	80	128	13.5	14	35	50	7	Ø 65	2	I032XNDH
1"1/2	40	127	48.3	90	162	17.5	17	55	70	9	/ 70	2	I040XNDH
2"	50	154	60.3	110	172	17.5	17	55	70	9	/ 70	2	I050XNDH
2"1/2	65	186	76.1	130	218	21.5	22	70	102	11	/ 100	2	I065XNDH
3"	80	202	88.9	150	228	21.5	22	70	102	11	/ 100	2	I080XNDH

BALL VALVE WITH PNEUMATIC ACTUATOR

The quarter turn pneumatic actuator has been designed for operating a rotating valve from 0° to 90°.

Designed for safety applications, in the event of electrical failure the actuator will automatically close. It can also be installed in usual applications (open/closed). In this case, power supply is switched on to open the valve and switched off to close it.

Technical characteristics

Function :	Spring return
Rotary movement :	90° adjustable +/-10° in opened position
Piloting pressure :	From 6 up to 8 bar
Piloting fluid :	Dry air or neutral gas (Filtered)
	 With dew point < Minimum operating temperature
Connecting :	1 threaded port G1/4"
Installation :	According to ISO 5211 et DIN 3337
Ambient temperature :	-20° / 85°C

Accessories

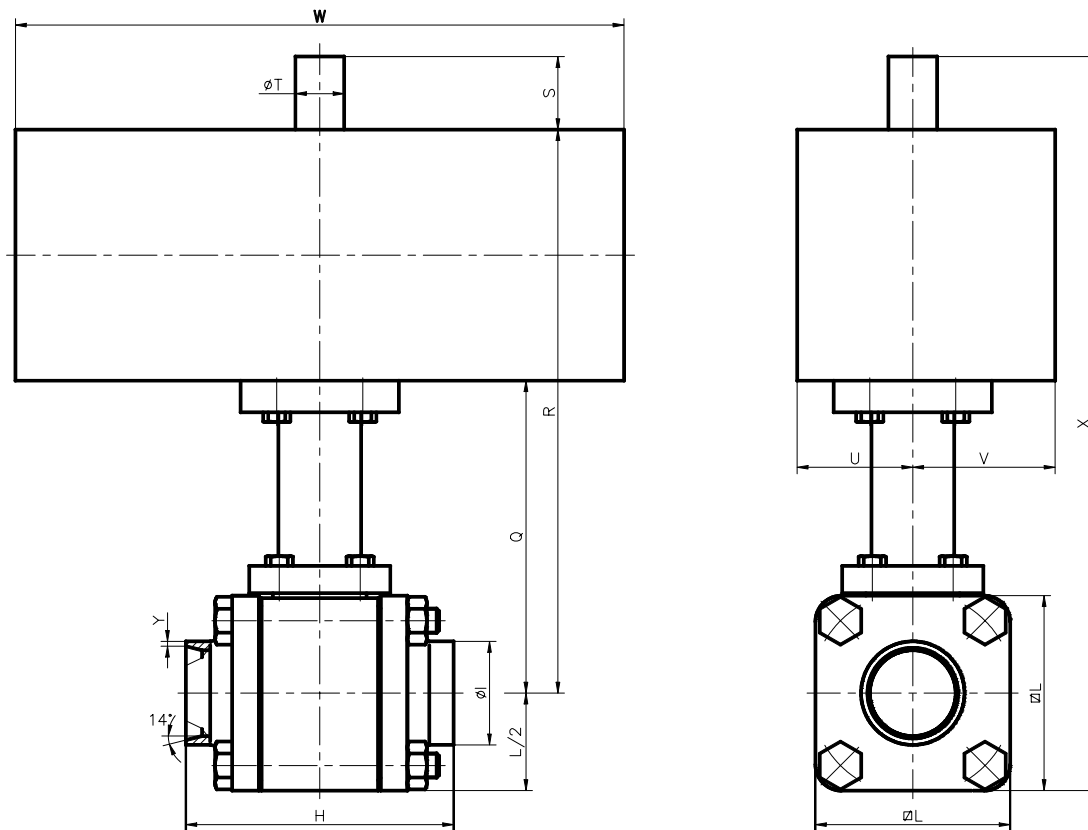
Pilot valve NAMUR

- Voltage to be advised
- Explosion proof Eexd2T5 (optional)

Limit switch (optional)

- IP 65
- Explosion proof IP67 (optional)

BALL VALVE WITH PNEUMATIC ACTUATOR



	DN	H	I	L	Q	R	S	T	U	V	W	X	Y	Ref
1"	25	102	33.7	65	121	13.5	14	35	50	7	Ø 65	286.5	2	I025XPDH..
1"1/4	32	110	42.4	80	128	13.5	14	35	50	7	Ø 65	301	2	I032XPDH..
1"1/2	40	127	48.3	90	162	17.5	17	55	70	9	/ 70	374	2	I040XPDH..
2"	50	154	60.3	110	172	17.5	17	55	70	9	/ 70	394	2	I050XPDH..
2"1/2	65	186	76.1	130	218	21.5	22	70	102	11	/ 100	501	2	I065XPDH..
3"	80	202	88.9	150	228	21.5	22	70	102	11	/ 100	521	2	I080XPDH..

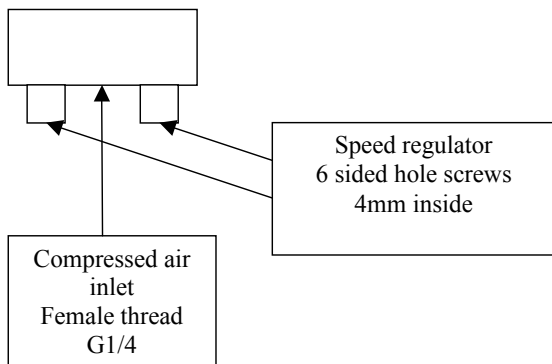
References are to be completed according to options that are required (see page 4)

INSTALLING INSTRUCTION BALL VALVE WITH PNEUMATIC ACTUATOR

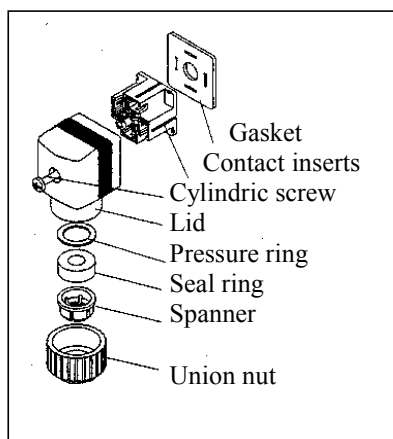
WIRING INSTRUCTIONS

- 1 Connect the compressed air inlet
- 2 Wire the pilot.
- 3 Wire if necessary the limit switch used

1 – SPEED REGULATOR CONTROL



2 – PILOT SOLENOID VALVE



PILOT WIRING

Connection 1: Phase
Connection 2: Neutral
⊥ : Earth

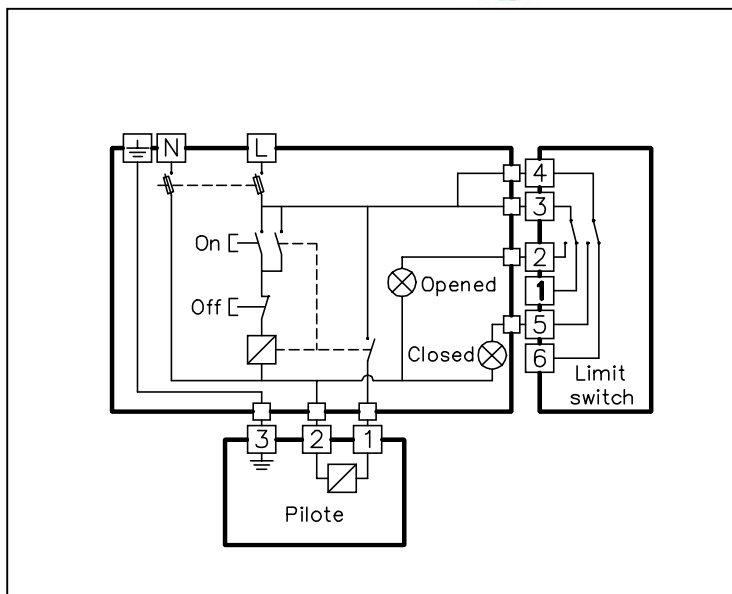
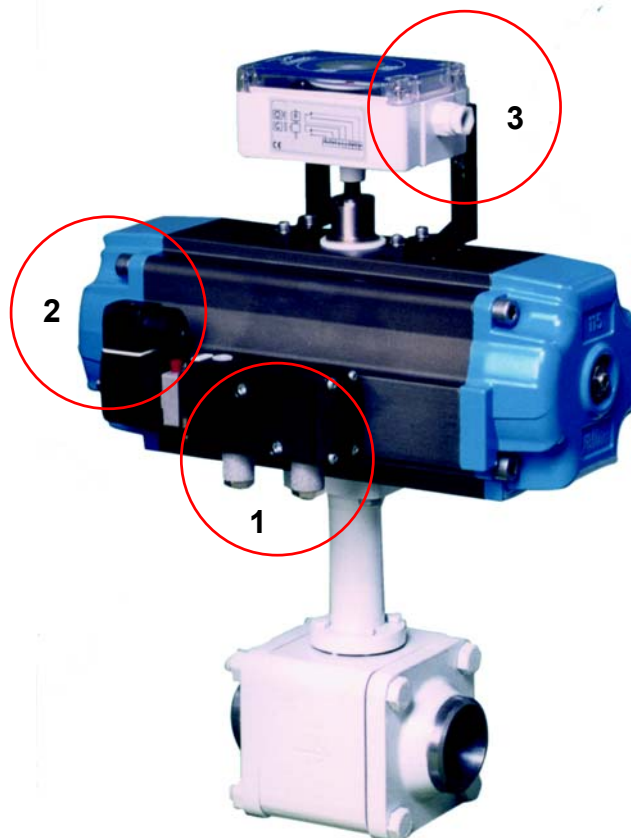
3 – LIMIT SWITCH WIRING

Valve opened

Connection 3 : Common
Connection 2 : Normal opened
Connection 1 : Normal closed

Valve closed

Connection 4 : Common
Connection 5 : Normal opened
Connection 6 : Normal closed



BALL VALVE WITH ELECTRIC ACTUATOR

The quarter turn electric actuator has been designed for operating a rotating valve from 0° to 90°. It can also be installed in usual applications (open/closed).
With the fail safe security block option and in the event of electrical failure power is switched on a battery and actuator will automatically close

Technical characteristics

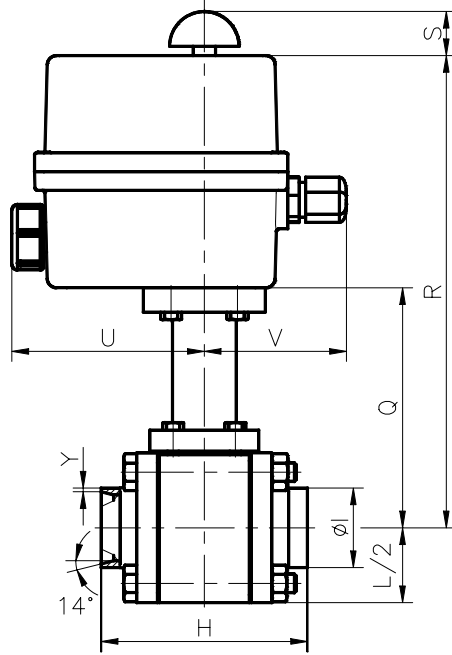
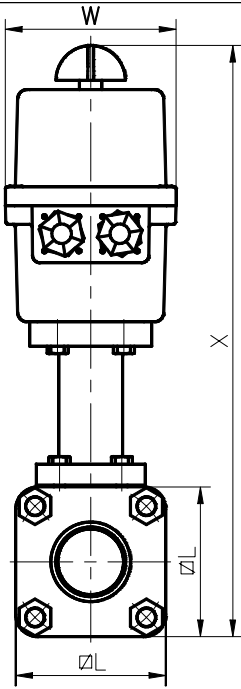
Voltage :	220 V AC 50 Hz
Enclosure :	IP 65
Rotary movement :	90°
Connecting :	2 x ISO20 IP68
Installation :	According to ISO 5211 and DIN 3337
Ambient temperature :	-10°/ 55°C

Accessories

- Optional Fail safe security block: in the event of electrical failure power is switched on a battery and actuator will automatically close.
- Optional Lever for DN 25, 32, 40 and 50
(For DN 65 and 80, the lever is included in the standard actuator).

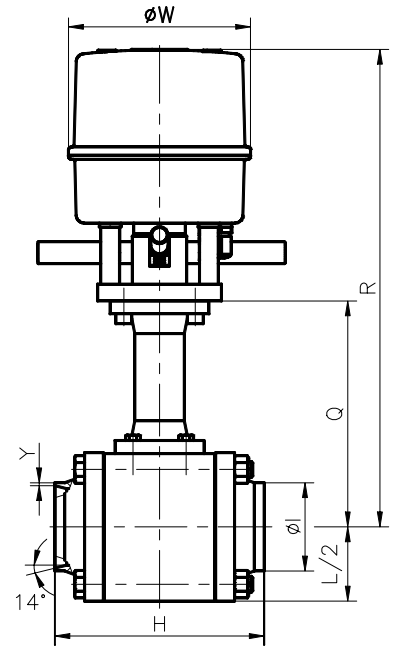
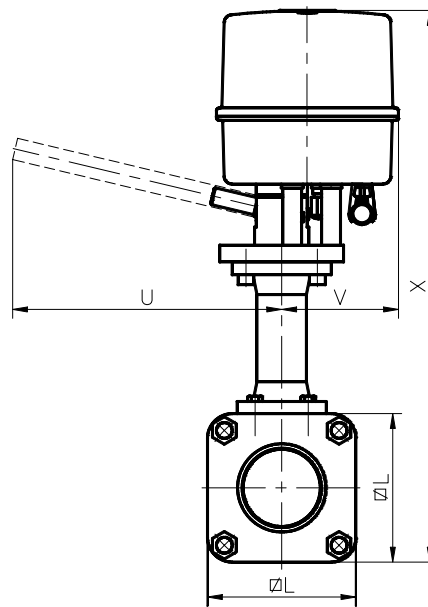
BALL VALVE WITH ELECTRIC ACTUATOR

Fail safe security block optional

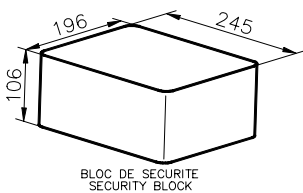


DN 25, 32, 40 and 50

DN 65 and 80



	DN	H	I	Y	/ L	Q	R	S	U	V	W	X	Reference
1"	25	102	33.7	2	65	121	246	24	103	76	91	302	I025XLDS
1"1/4	32	110	42.4	2	80	128	253	24	103	76	91	316	I032XLDS
1"1/2	40	127	48.3	2	90	162	313	24	106	87	127	381	I040XLDS
2"	50	154	60.3	2	110	172	323	24	106	87	127	401	I050XLDS
2"1/2	65	186	76.1	2	130	218	473	-	280	118	184	538	I065XLDS
3"	80	202	88.9	2	150	228	483	-	280	118	184	558	I080XLDS

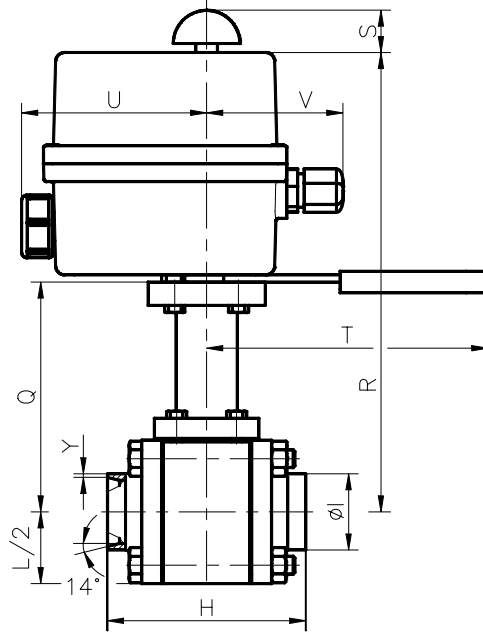
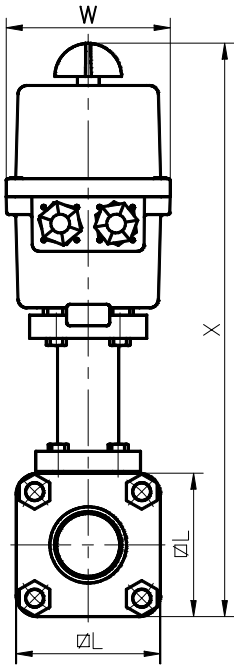


Fail safe security block

code « R » to be added to the reference
I025XLDSR

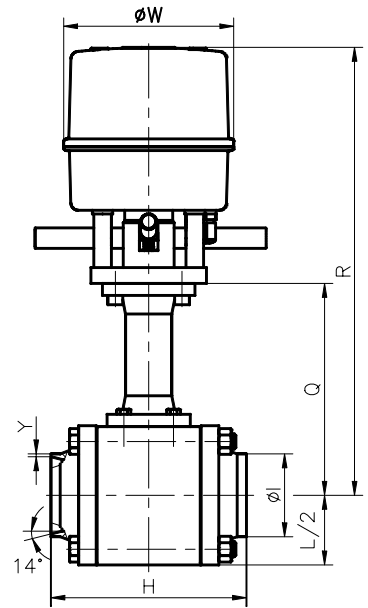
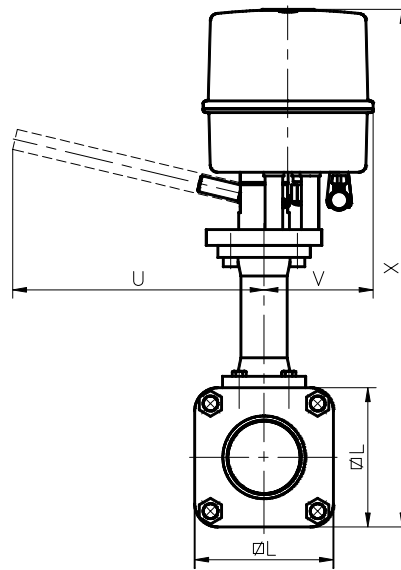
BALL VALVE WITH ELECTRIC ACTUATOR

with lever and fail safe security block optional

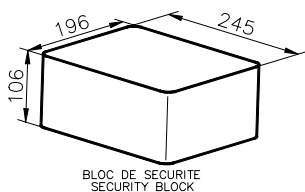


DN 25, 32, 40 and 50

DN 65 and 80
Lever included
in the standard



	DN	H	I	Y	/ L	Q	R	S	T	U	V	W	X	Reference
1"	25	102	33.7	2	65	121	250	24	156	103	76	91	306	I025XLDSV
1"1/4	32	110	42.4	2	80	128	257	24	156	103	76	91	320	I032XLDSV
1"1/2	40	127	48.3	2	90	162	329	24	171	106	87	127	397	I040XLDSV
2"	50	154	60.3	2	110	172	339	24	171	106	87	127	417	I050XLDSV
2"1/2	65	186	76.1	2	130	218	473	-	-	280	118	184	538	I065XLDS
3"	80	202	88.9	2	150	228	483	-	-	280	118	184	558	I080XLDS



BLOC DE SECURITE
SECURITY BLOCK

Fail safe security block

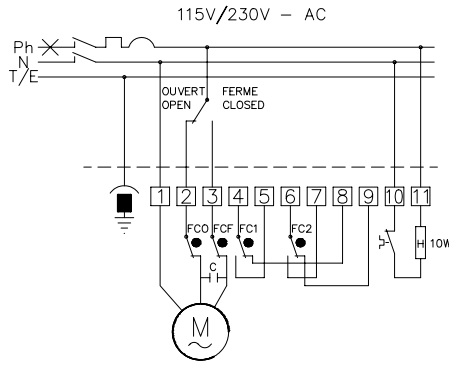
code « R » to be added to the reference
I025XLDSRV

INSTALLING INSTRUCTION

BALL VALVE WITH ELECTRIC ACTUATOR



Wiring example for ball valve DN 25 to 50



WIRING

- Connection 1 Common motor
- Connection 2 Pilot switch : open
- Connection 3 Pilot switch : close

OPENED LIMIT SWITCH

- Connection 4 Common
- Connection 5 Normal closed
- Connection 8 Normal opened

CLOSED LIMIT SWITCH

- Connection 6 Common
- Connection 7 Normal closed
- Connection 9 Normal opened

- FCO Open limit switch
- FCF Closed limit switch
- FC1 Auxiliary 1 limit switch
- FC2 Auxiliary 2 limit switch

- C Capacitor
- M Motor
- H Heating resistor



Wiring example for ball valve DN 65 et 80

Remove the two black screw cover and unscrew to open the box

Wiring

- Connection 1 Common motor
- Connection 2 Pilot switch : open
- Connection 3 Pilot switch : close

OPENED LIMIT SWITCH

- Connection 4
- Connection 5

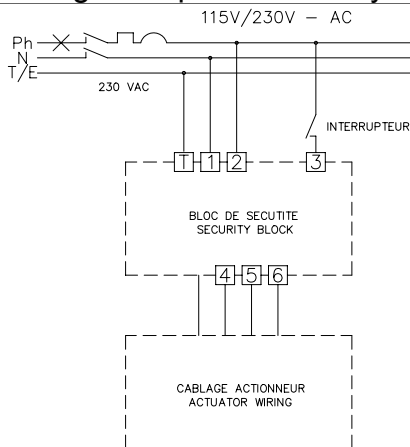
CLOSED LIMIT SWITCH

- Connection 6
- Connection 7

- FCO Open limit switch
- FCF Closed limit switch
- FC1 Auxiliary 1 limit switch
- FC2 Auxiliary 2 limit switch

- C Capacitor
- M Motor
- H Heating resistor

Wiring example for security block

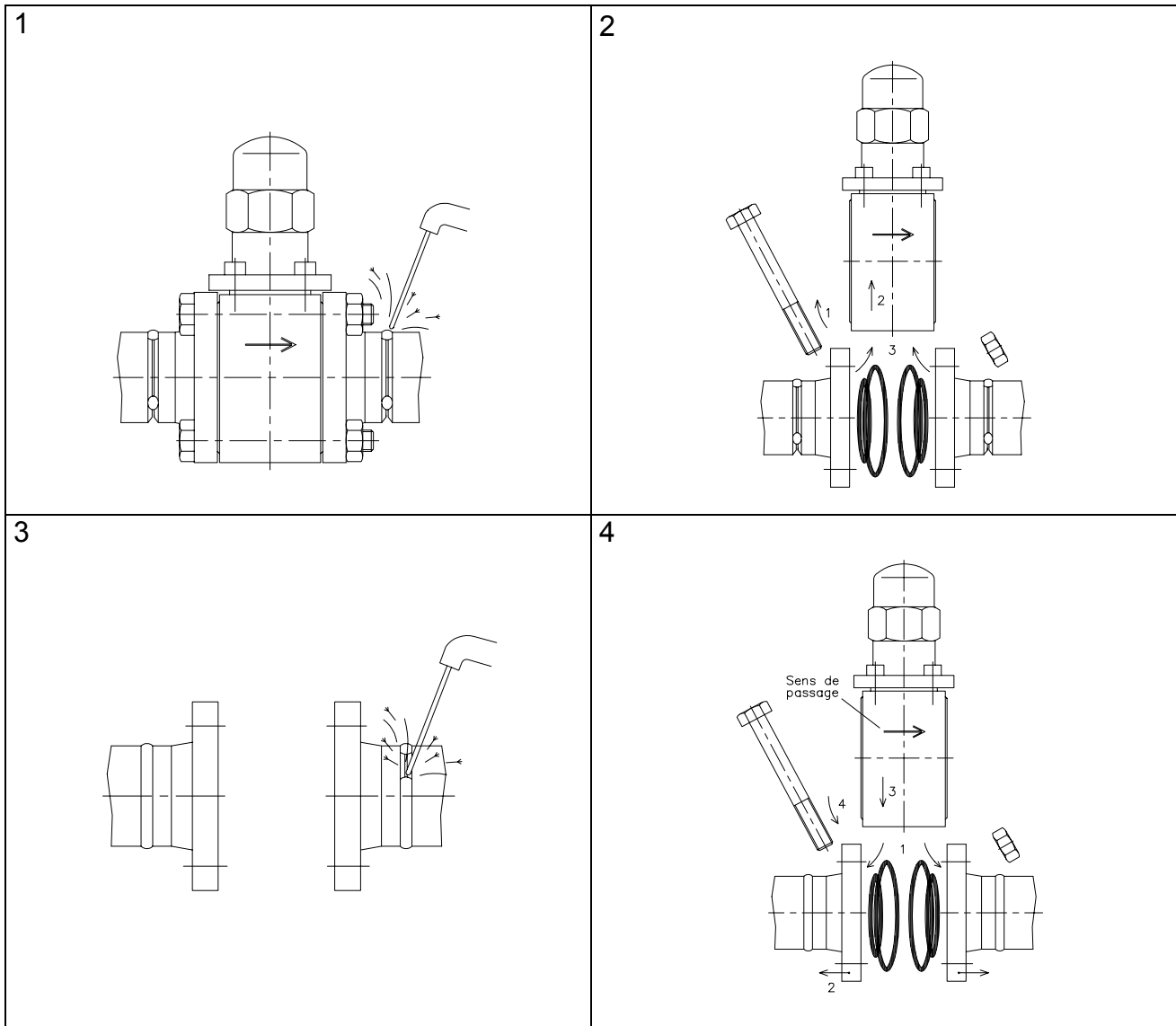


INSTRUCTIONS FOR INSTALLING BALL VALVES

The ball valve must be installed in pipework which can be moved apart slightly to allow for the installation and removal of the valve ball assembly.

This axial movement should be no less than 1mm.

The ball valve flanges are sealed by two contained 'O' ring gaskets. To avoid heat damage during the welding of the flanges to the pipework the following procedure should be carried out.



1. With the complete ball valve in position the pipe work should be correctly lined up and the two flanges fixed by tack welds.
2. For valves DN 25, 32 and 40 the four bolts should be unscrewed and removed from each flange. The ball valve assembly should be lifted out taking care not to damage the 'O' ring gaskets.
3. The welding of the flanges should then be completed.
4. Any dirt, welding slag and splatter should be removed from inside the pipe work and the flange seating face.
5. The seating faces of the flanges should be lightly oiled and the 'O' ring gaskets replaced for valves DN 25, 32 and 40.
The arrow direction should then be checked with the flow. The valve body should be reassembled by springing open the flanges taking care not to damage the faces or sealing 'O' rings. Check the ball : the vent hole is to be situated on the upstream side of the ball

MAINTENANCE

GENERAL INSTRUCTIONS :

To ensure the safe operation and effectiveness of RFF valves and fittings during their operational life the valves should be regularly checked and serviced.

Particular attention should be paid to the valves:

- When constructing new installations,
- When recommissioning installations after modification or new plant extensions.
- When restarting plant after long periods of shut-down.

The following maintenance instructions are the minimum manufacturers recommendations.

SAFETY WARNING "Valves under pressure"!

During checking or dismantling operations, care must be taken as parts of the valves may still contain refrigerant gas under pressure.

MAINTENANCE PLAN :

1/ Annual inspection:

a) Test opening and closing operation :

Check that the valves operate freely by opening and closing the valves by hand.

Should it be difficult to turn the spindle, the valve bonnet should be removed, dismantled and cleaned, and the spindle lubricated with grease. It may be necessary to change the o-rings and replace the body gasket.

When reassembling the valves, the body fixing screws should be lubricated with grease.

Special care should be taken to ensure the correct orientation of the ball valve during re-assembly, the vent hole drilled in the ball must be installed on the upstream side (pressure side) of the valve.

b) Gas leakage check:

From the top of the gland nut:

With cap valves, leaks may be detected when unscrewing the cap: if there is any pressure inside the cap there will be a noise when the gas is relieved.

Should there be any trace of leakage the o-rings must be replaced.

From body gasket:

The flat body gasket should be replaced if necessary. When reassembling the body fixing screws should be lubricated with grease.

2/ Dismantling every four years :

Every four years, the following additional procedures are recommended:

a) Valve seat check:

If the Teflon seal face is damaged, the PTFE or the ball should be replaced.

b) Fixing screw check:

Any screws which are corroded or damaged should be replaced (screw class 8/8).

c) External surface check:

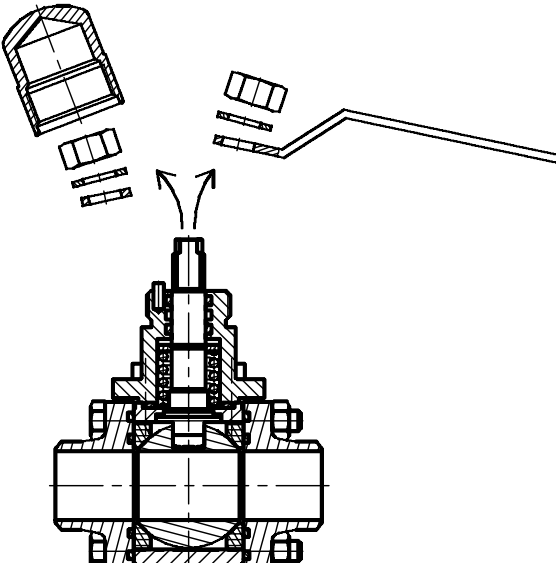
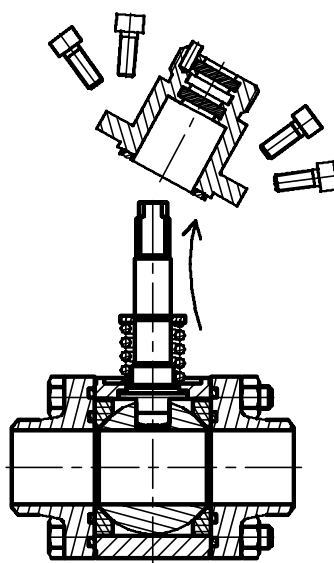
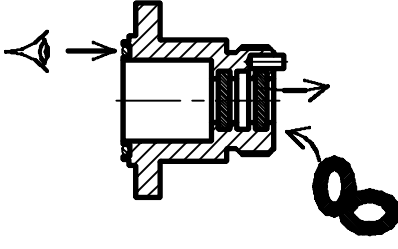
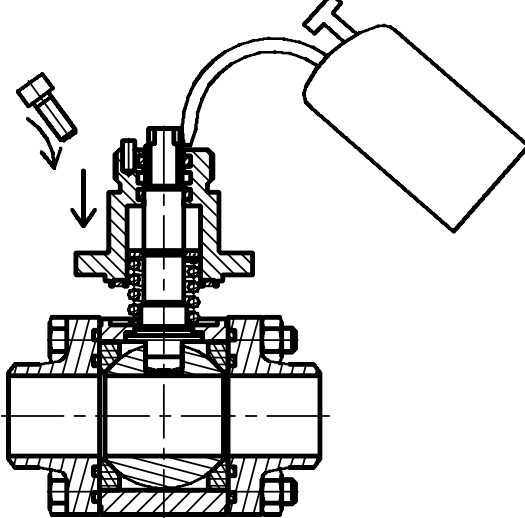
Where necessary, all external surfaces, which are corroded, should be cleaned and repainted.

General re-assembly note:

When re-assembling valves and appliances, the body fixing screws should be lubricated with grease, and all moving parts in the bonnet should be cleaned and lubricated with low-temperature oil.

As a preventive measure, all O-rings and body gaskets should be also replaced.

INSTRUCTIONS TO CHANGE PACKING GLAND "O" RINGS

<p>1</p> 	<p>2</p> 
<p>3</p> 	<p>1. Remove the Hand lever or the cap (Note : Position and orientation of the top thrust washer and lift off)</p> <p>2. Note the correct position of the Bonnet before removing. The bonnet is located by a pin with 2 possible positions at 180°.</p>
<p>4</p> 	<p>3. Change the two "O" rings (1st and 3rd grooves). Replace the body gasket, if necessary.</p> <p>4. Fill the gland oil reservoir with non-freezing, low temperature, compressor oil. Refit the bonnet in the correct position previously identified.</p> <p>Refit the Lever or the cap with the thrust washer.</p>

SPARE PARTS for BALL VALVE DN 25 - 32 - 40 with cap or with lever

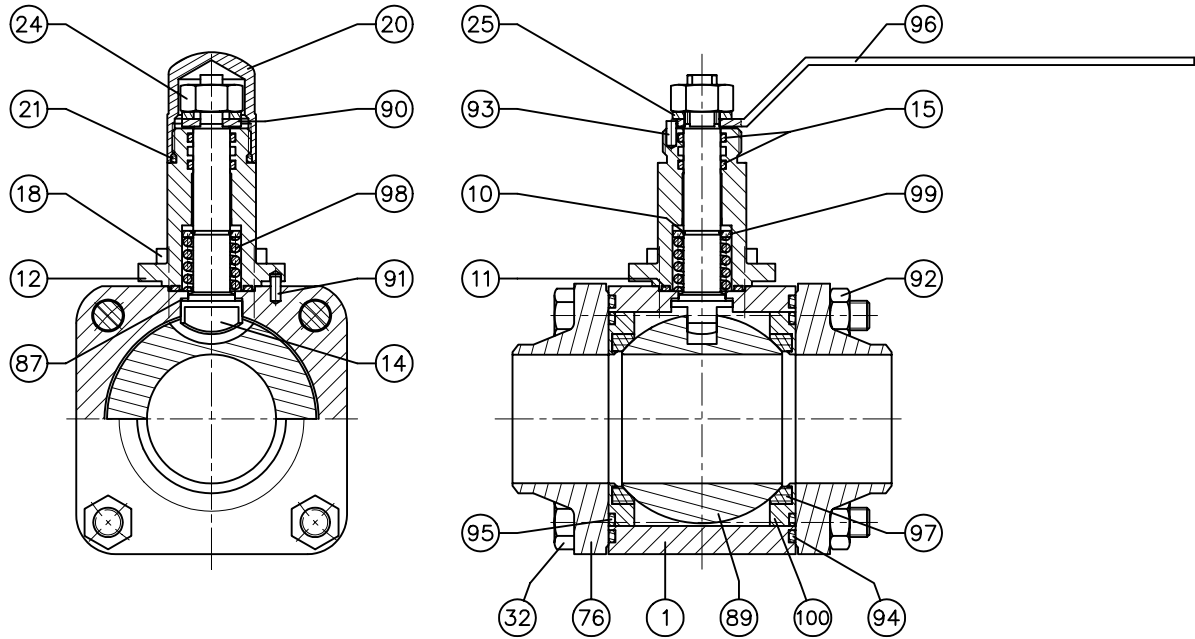
Ref.	Description	Ref.	Description
1	Body	87	Back Seat gasket
10	Circlip	89	Ball
11	Body gasket	90	Thrust washer
12	Bonnet	91	Grooved pin
14	Spindle	92	Prevailing torque nut
15	Packing gland O-ring	93	Thrust grooved pin
18	Screw	94	Flange O-ring
20	Cap	95	Seat O-ring
21	Cap O-ring	96	Lever
24	Nut	97	Seat
25	Lever top washer	98	Spring
32	Screw	99	Stoppage washer
76	Pipe flange		

TO ORDER

DESCRIPTION	With parts number	DESCRIPTION	With parts number
Body gasket	11	Pipe flange with O-ring	76+94+95
Packing gland O-ring	15	Complete lever	96+25+24
Cap O-ring	21	Ball	89
Complete cap	20+21	Seat	97
Spindle	14+10+99+87	Gaskets for lever ball valve	94+95+11+15
Bonnet	11+12+15+93	Gaskets for cap ball valve	94+95+11+15+21
Screw	18	Flange O-ring + seat O-ring	94+95
Prevailing torque nut	92+32	Bonnet with lever	11+12+18+15+24+25+96
Spring	98	Bonnet with cap	11+12+15+18+20+21+24+25+90
Complete thrust washer	24+25+90	Body	1+10+14+87+91+98+99

SPARE PARTS for BALL VALVE

DN 50 - 65 - 80 with cap or with lever



Ref.	Description	Ref.	Description
1	Body	87	Back Seat gasket
10	Circlip	89	Ball
11	Body gasket	90	Thrust washer
12	Bonnet	91	Grooved pin
14	Spindle	92	Prevailing torque nut
15	Packing gland O-ring	93	Thrust grooved pin
18	Screw	94	Flange O-ring
20	Cap	95	Seat O-ring
21	Cap O-ring	96	Lever
24	Nut	97	Seat
25	Lever top washer	98	Spring
32	Screw	99	Stoppage washer
76	Pipe flange	100	Seat thrust washer

To ORDER			
DESCRIPTION	With parts number	DESCRIPTION	With parts number
Body gasket	11	Pipe flange	76
Packing gland O-ring	15	Complete lever	96+25+24
Cap O-ring	21	Ball	89
Complete cap	20+21	Seat	97
Spindle	14+10+99+87	Gaskets for lever ball valve	94+95+11+15
Bonnet	11+12+15+93	Gaskets for cap ball valve	94+95+11+15+21
Screw	18	Flange O-ring+seat O-ring	94+95
Prevailing torque nut	92+32	Bonnet with lever	11+12+18+15+24+25+96
Seat thrust washer	100	Bonnet with cap	11+12+15+18+20+21+24+25+90
Spring	98	Body	1+10+14+87+91+98+99
Complete thrust washer	24+25+90		

SPARE PARTS for BALL VALVE

DN 25 - 32 - 40 with ISO Flange for actuators

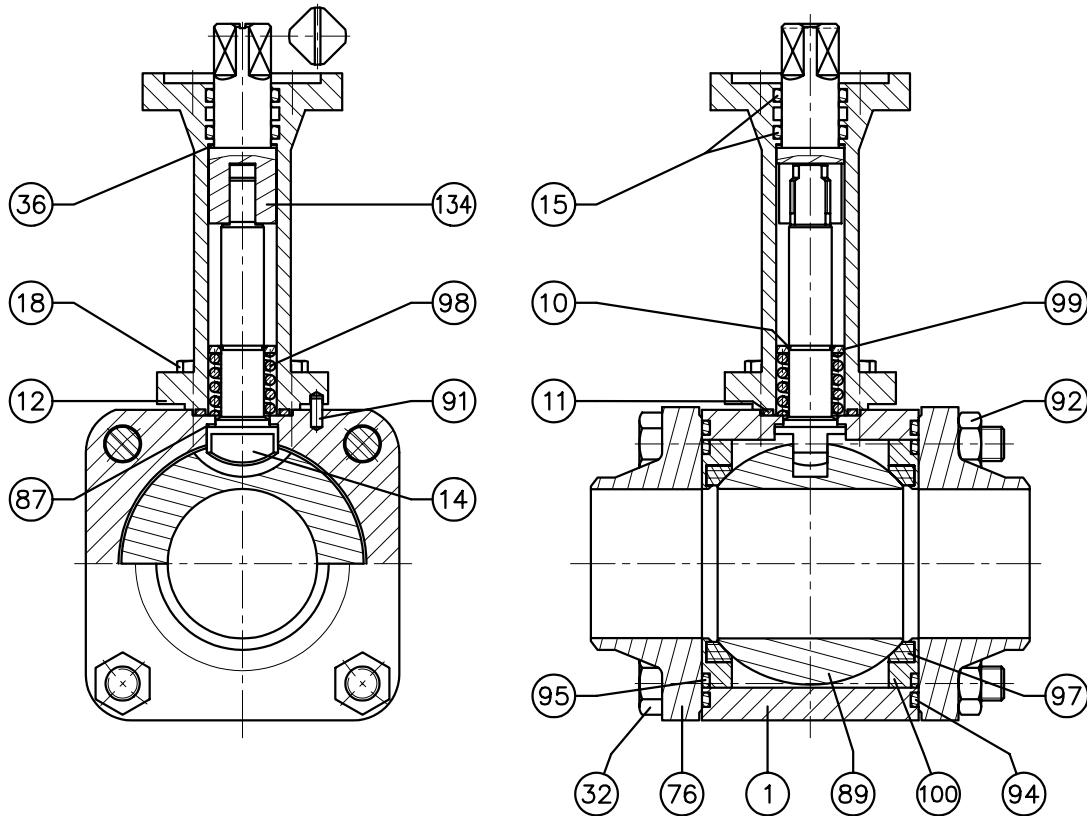
Ref.	Description	Ref.	Description
1	Body	87	Back Seat gasket
10	Circlip	89	Ball
11	Body gasket	91	Grooved pin
12	Bonnet	92	Prevailing torque nut
14	Spindle	94	Flange O-ring
15	Packing gland O-ring	95	Seat O-ring
18	Screw	97	Seat
32	Screw	98	Spring
36	Sliding ring	99	Stoppage washer
76	Pipe flange	134	Coupling spindle

TO ORDER

DESCRIPTION	With parts number	DESCRIPTION	With parts number
Body gasket	11	Ball	89
Packing gland O-ring	15	Seat	97
Spindle	14+10+99+87	Set of gaskets	94+95+11+15
Bonnet	11+12+15	Flange O-ring+seat O-ring	94+95
Screw	18	Coupling spindle	36+134
Prevailing torque nut	92+32	Bonnet with ISO flange	11+12+15+18+36+134
Spring	98	Body	1+10+14+87+91+98+99
Pipe flange with O-ring	76+94+95		

SPARE PARTS for BALL VALVE

DN 50 - 65 - 80 with ISO Flange for actuators



Ref.	Description	Ref.	Description
1	Body	89	Ball
10	Circlip	91	Grooved pin
11	Body gasket	92	Prevailing torque nut
12	Bonnet	94	Flange O-ring
14	Spindle	95	Seat O-ring
15	Packing gland O-ring	97	Seat
18	Screw	98	Spring
32	Screw	99	Stoppage washer
36	Sliding ring	100	Seat thrust washer
76	Pipe flange	134	Coupling spindle
87	Back Seat gasket		

POUR COMMANDER			
DESCRIPTION	With parts number	DESCRIPTION	With parts number
Body gasket	11	Pipe flange	76
Packing gland O-ring	15	Ball	89
Spindle	14+10+99+87	Seat	97
Bonnet	11+12+15	Body	1+10+14+87+91+98+99
Screw	18	Set of gaskets	94+95+11+15
Prevailing torque nut	92+32	Flange O-ring+seat O-ring	94+95
Spring	98	Coupling spindle	36+134
Seat thrust washer	100	Bonnet with ISO flange	11+12+15+18+36+134

WEIGHT (kg)

STAINLESS STEEL BALL VALVE									
DN	With cap XCDS XCDB XCDM	With lever XVDS XVDB XVDM	With ISO flange XNDS XNDB XNDM	Actuator					
				pneumatic			electric		
				Act.	Pilot valve	Limit switch	Act.	lever	Security block
25	2.280	2.200	2.480	4.700	0.520	0.400	1.500	0.200	3.500
32	3.440	3.360	3.640	4.700	0.520	0.400	1.500	0.200	3.500
40	4.800	4.820	5.100	11.200	0.520	0.400	3.000	0.700	3.500
50	8.240	8.260	8.540	11.200	0.520	0.400	3.000	0.700	3.500
65	14.600	14.300	15.000	30.400	0.520	0.400	7.300	Included with actuator	3.500
80	21.620	21.920	22.020	30.400	0.52	0.400	7.300		3.500

Example:

Ball valve DN 25 with pneumatic actuator, pilot valve and limit switch

Ref: **XPDSBF**

Weight = 2.480 + 4.700 + 0.520 + 0.400 = 8.100 kg

Ball valve DN 25 with electric actuator

Ref: **XLDS**

Weight = 2.480 + 1.500 = 3.980 kg