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42 048 660

1. Declaration of conformity

Hereby we,

KSB S.A.S.
Zone industrielle Gagnaire Fonsèche
24490 LA ROCHE CHALAIS
Registered Office: 92635 - Gennevilliers
France

declare that the valves listed below comply:

- with the requirements of the Pressure Equipment Directive 2014/68/EU.

Description of the valve types:	Butterfly valves		
	- DANAÏS 150	Class 150	DN 50 (2") -1200 (48") (PS maximum 20 bar)
		PN 25	DN 50 (2") -1200 (48") (PS maximum 25 bar)
	- DANAÏS MT II / CRYO	Class 150	DN 50 (2") -1200 (48") (PS maximum 20 bar)
		PN 25	DN 50 (2") -1200 (48") (PS maximum 25 bar)
		Class 300	DN 50 (2") -1200 (48") (PS maximum 50 bar)
	-- DANAÏS CRYO AIR	PN 25	DN 50 (2") - 600 (24") (PS maximum 20 bar)

As per harmonized European standards:	EN12516-1 - EN12516-2
and other standards / directives:	ASME B16.34 - EN 10213
Suitable for:	Fluids group 1 and 2
Conformity Assessment Procedure:	Module H

Production site :
 LA ROCHE CHALAIS

Name and address of the notified body for orders made from 01/10/2011:	Bureau Veritas Services SAS 8, cours du triangle 92800 Puteaux FRANCE
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Number of notified body: **0062**

Production site :
 DALIAN

Name and address of the notified body for orders made from 01/01/2016:	Bureau Veritas Services SAS 8, cours du triangle 92800 Puteaux FRANCE
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Number of notified body: **0062**

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

For information as per chemicals Regulation (EC) No. 1907/2006 (REACH), see <http://www.ksb.com/reach>.

Petruta Rey
 Integrated Management System Manager

Rev.1 - 01/22

This document was prepared electronically and is valid without signature. Its implementation in the public domain validates his condition.

2. General

These operating instructions apply to KSB offset disc butterfly valves (see section 5).


Design, manufacturing and testing of the KSB valves are subject to a Quality Assurance System according to EN ISO 9001 and to the European Pressure Equipment Directive 2014/68/EU (PED).

For a specific product configuration as an actuated valve, the aggregate can be considered as a partly completed machine according to the machinery directive 2006/42/EC and comply with the requirements of the directive.

Correct installation and maintenance or repair are mandatory to ensure trouble free operation of the valves.

The manufacturer cannot be made liable for these valves if operating instructions are not being observed.

ATTENTION The valves must not be operated beyond the limits defined in the operating instructions/contractual documentation/type leaflet. Any use beyond the above conditions will lead to overload which the valves cannot withstand.

 Nonobservance of this warning may lead to personal injury or property damage, e.g.:

- Injury caused by escaping fluids (cold/hot, toxic, flammable, corrosive or under pressure)
- Incorrect operation or destruction of the valve.

The descriptions and instructions in this manual refer to the standard versions but also apply to the related variants.

These operating instructions do not take into consideration:

- incidents which may occur during installation, operation and maintenance.
- the local safety regulations. It is the user's responsibility to ensure that these are also observed by the installation staff involved.

For actuated valves, the specified connection parameters and the installation and maintenance instructions - including the operating manual for the actuator - must be observed.

ATTENTION Handling a valve requires skilled and experienced personnel.

The personnel in charge of operation, maintenance and installation of this valve must be aware of the interaction between the valve and the plant.

Operator's errors concerning the valve may have serious consequences for the entire plant, e.g.:

- fluid may escape
- downtime of the plant/machine
- adverse effect/reduction/increase of the efficiency/function of a plant/machine.

For further questions or in case of damage to the valve, please contact your KSB Sales Office.

For further questions and supplementary orders, especially when ordering spare parts, please always state the indications of the marking plate.

The specifications (operating data) of the valves are listed in the technical documentation & type leaflet of the related valve (see also section 5).

When returning valves to the manufacturer, please refer to section 5.

3. Safety

This manual contains basic instructions to be complied with during operation and maintenance. It is therefore vital for the fitter and the operator/user to read this manual before installing/commissioning the valve. Also, this manual must always be available at the site where the valve is installed.

It is not enough to observe the general instructions listed in the section "safety", the specific safety instructions listed in the other sections should also be observed.

3.1. Safety Symbols in these Operating Instructions

Safety instructions put forth in this instruction manual, the nonobservance of which would involve the risk of personal injury, they are specially marked with the general hazard symbol:



in accordance with ISO 3864-B.3.1.
or with the electric voltage warning sign:



In accordance with ISO 3864-B.3.6.

Safety instructions the nonobservance of which would involve hazard to the valve and jeopardize its operation have been marked with the word

ATTENTION

Instructions directly attached to the valve, (e.g. nominal pressure) must be complied with and maintained in a legible condition.

3.2. Qualification and training of personnel

The personnel for operation, maintenance, inspection and installation must be adequately qualified for the work involved. The personnel responsibility, competence and supervision must be clearly defined by the user. If the personnel in question is not already in possession of the required know-how, appropriate training and instructions must be provided. If deemed necessary, the manufacturer/supplier will provide such training and instructions at the user's request. In addition, the user is responsible for ensuring that the contents of these operating instructions are fully understood by the personnel involved.

3.3. Danger or nonobservance of the safety instructions

Nonobservance of the safety instructions may lead to personal injury and danger for both the environment and the valve itself. Nonobservance of these safety instructions will also forfeit the user's warranty.

Such noncompliance could result in for example :

- failure of essential functions of the valve/plant
- failure of prescribed maintenance and repair practices
- hazard to people by electrical, mechanical or chemical effects
- hazard to the environment due to leakage of hazardous substances

3.4. Safety Consciousness

The safety instructions contained in this manual, the applicable national accident prevention regulations and any of the user's own applicable internal work, operation or safety instructions must be fully complied with.

3.5. Safety Instructions for the User/Operator

Any hot or cold parts of the valve (e.g. body or handle or actuator) that could cause a hazard must be protected by the user against accidental contact.

Leakage of hazardous substance (e.g. flammable, corrosive, toxic, hot) must be drained so as to avoid all danger to people or the environment. All relevant laws must be observed.



Electrical hazards must be effectively prevented. (For details, please refer to the IEC 364 or equivalent national standard and/or local utility energy supply regulations).

3.6. Safety Instructions for Maintenance, Inspection and Installation work

3.6.1. General

On an actuated valve the operating instructions of the valve must be strictly followed as well as those of the operating instructions of the actuators, the limit switch or automation boxes.

The user is responsible for ensuring that all maintenance, inspection and installation work is carried out by authorized, adequately qualified staff who are thoroughly familiar with this instruction manual.

Any work on a valve may only be performed when the valve is un-pressurized and has cooled down to 60 °C or has warmed up to 0 °C .

The user is responsible for ensuring that all maintenance, inspection and installation work is carried out by authorized, adequately qualified staff who are thoroughly familiar with this instruction manual.

Any work on actuated valves may only be done after that the actuator has been disconnected from its energy supply. The procedure described in the operating instructions to shut down the actuator must be observed. Valves in contact with hazardous media must be decontaminated. Immediately following completion of the work, all safety relevant and protective devices must be reinstalled and/or re-enabled. Prior to recommissioning, refer to the points listed in section 7 Commissioning.

3.6.2. End of line installation

Use as end of line and downstream dismantling at ambient temperature of standard range:

Valves Type 1 (annular shape): use as end of line and downstream dismantling are not authorized.

Valves Type 4 (lug) and Type 7 (flanged): use as end of line and downstream dismantling are authorized, but for DANAIS 150, subject to care explained in section 6.1.

Valves		Gaz or liquids *		Liquids	
		Hazardous (Group 1)	Non hazardous (Group 2)	Hazardous (Group 1)	Non hazardous (Group 2)
DANAIS MT II	class 150 **	All sizes: not authorized	All sizes: $\Delta PS = 15$ bar max.	All sizes: $\Delta PS = 15$ bar max.	All sizes: $\Delta PS = 15$ bar max.
	PN 25	All sizes: not authorized	All sizes: $\Delta PS = 19$ bar max.	All sizes: $\Delta PS = 19$ bar max.	All sizes: $\Delta PS = 19$ bar max.
	class 300	All sizes: not authorized	All sizes: $\Delta PS = 38$ bar max.	All sizes: $\Delta PS = 38$ bar max.	All sizes: $\Delta PS = 38$ bar max.
DANAIS 150	class 150 **	All sizes: not authorized	All sizes: $\Delta PS = 15$ bar max.	All sizes: $\Delta PS = 15$ bar max.	All sizes: $\Delta PS = 15$ bar max.
	PN 25 **	All sizes: not authorized	All sizes: $\Delta PS = 15$ bar max.	All sizes: $\Delta PS = 15$ bar max.	All sizes: $\Delta PS = 15$ bar max.
DANAIS CRYO flanged	class 150 **	All sizes: not authorized	All sizes: $\Delta PS = 15$ bar max.	All sizes: $\Delta PS = 15$ bar max.	All sizes: $\Delta PS = 15$ bar max.
DANAIS CRYO butt weld	class 150 **	All sizes: not authorized	non applicable	non applicable	All sizes: $\Delta PS = 10$ bar max.

ΔPS : Differential pressure

* Liquids whose vapour pressure at the maximum allowable temperature is greater than 0.5 bar above normal atmospheric pressure (1013mbar)

** When shaft material is 316L, ΔPS is reduced to 10 bar max.

NB: A valve fitted at the end of a pipe with a blind flange downstream is not to be considered as an end of pipe service.

3.7. Unauthorized Modification and Manufacturing of Spare Parts

The equipment shall not be altered or modified in any way prior to consultation with the manufacturer. Genuine spare parts and accessories authorized by the manufacturer will ensure operational safety. The manufacturer cannot be held responsible for damage resulting from the use of non-genuine parts or accessories.

3.8. Inadmissible Modes of Operation

Operational safety and reliability of the valve supplied is only warranted for its designated use as defined in section 2 "General" of the operating instructions. The limits stated in the technical documentation must not be exceeded under any circumstances.

4. Transport and Interim Storage

4.1. Transport

The valves in the as-supplied condition are ready for operation.

ATTENTION For transport and storage, the valves must always be maintained in the semi-closed position and be packed in cardboard, crate or case with suitable protection (dessicant, thermowelded barrier).

ATTENTION To prevent damage, do not hang the valve by its handle or actuator. After delivery or prior to installation, the valve should be checked for damage during transit.

4.2. Interim Storage

The valves must be stored in such a way that correct operation is assured even after prolonged storage.

This comprises: - Storing at 5° from the closed position
- Suitable measures against contamination, frost and corrosion (e.g. by using thermowelded plastic bags with dessicant, protection caps and plugs onto threaded holes).

5. Description of valves

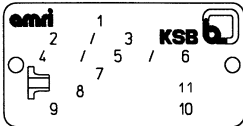
The sectional drawings shown hereafter are examples for the general design of our valves. For drawings and other information pertaining to a specific valve series, please refer to the relevant type leaflets and specific technical drawings.

5.1. Marking

5.1.1. Marking

Å

The valves are marked to PED 2014/68/EU.



Marketing of the identity plate

Example

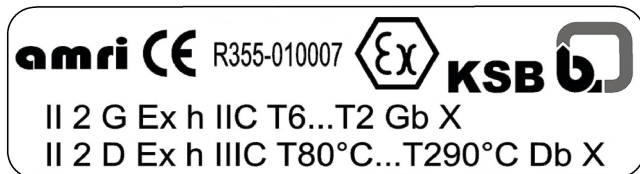
- 1 - Valve type model
- 2 - Internal material code
- 3 - DN
- 4 - Maximum allowable pressure
- 5 - Maximum allowable pressure at end of line or for downstream dismantling
- 6 - Maximum allowable temperature
- 7 - Pipe flange drilling pattern (if known)
- 8 - Month and year of production
- 9 - Equipment serial number
- 10 - CE marking with notified body identification number
- 11 - PN/Class

PS	Size						
	50	65	80	100	125	150	≥200
10							
16							
25							
≥40							

Valves for hazardous liquids and gaz (group 1) according to table 6 of annex II (PED)

5.1.2. Marking

The ATEX valves are marked according to ATEX directive 2014/34/EU:

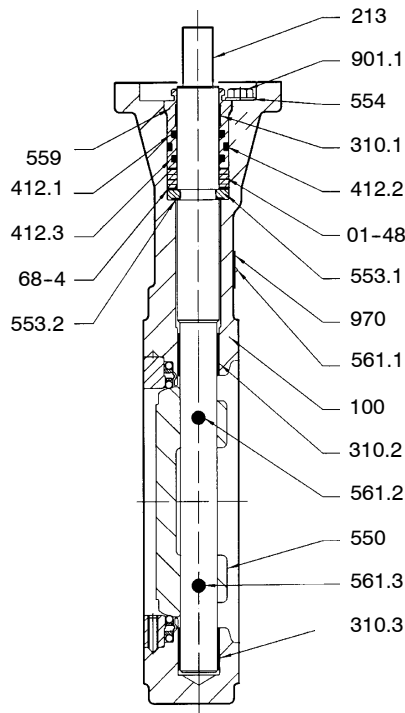


Note: -20 °C ≤ Ambient temperature ≤ +60 °C
See ATEX operating instruction 8610.81 for more information.

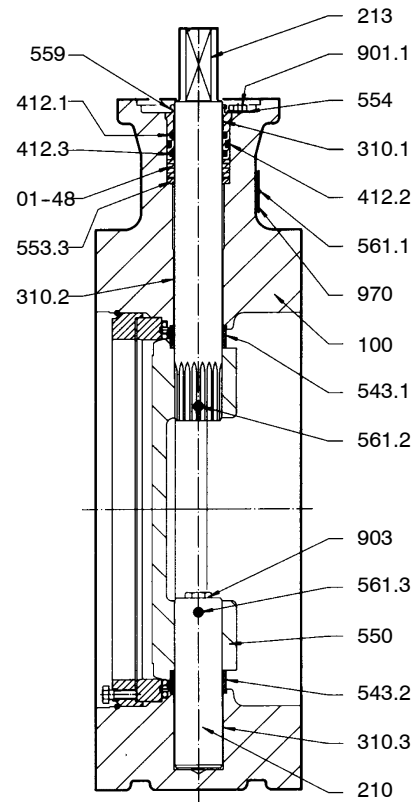
5.2. Drawings and documents

Type	Size (mm)	Type series booklet no.
DANAIS MT II Class 150	50-600	8460.154
	650-1650	Specific technical drawing
DANAIS MT II Class 300	50-600	8460.132

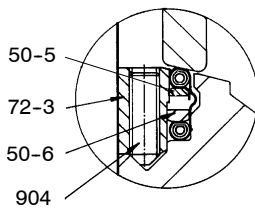
Class 150 DN 50 - 250
Class 300 DN 50 - 200



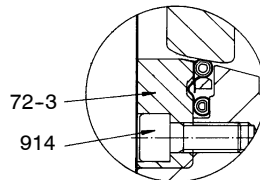
Class 150 DN 300 - 600
Class 300 DN 250 - 600



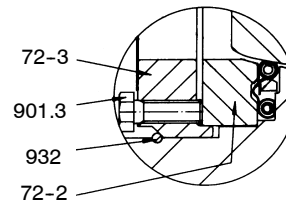
Detail view - Metal seat
DN 50 - 250
All body types



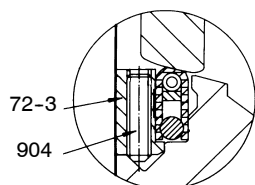
DN 300 - 600
Wafer-type body
Full-lug body



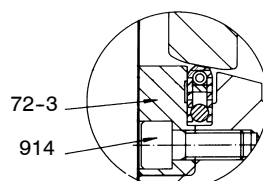
DN 300 - 600
Flanged body



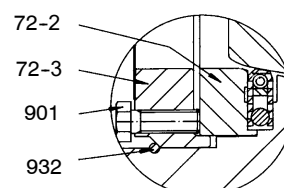
Detail view - Plastomer seat
DN 50 - 250
All body types



DN 300 - 600
Wafer-type body
Full-lug body



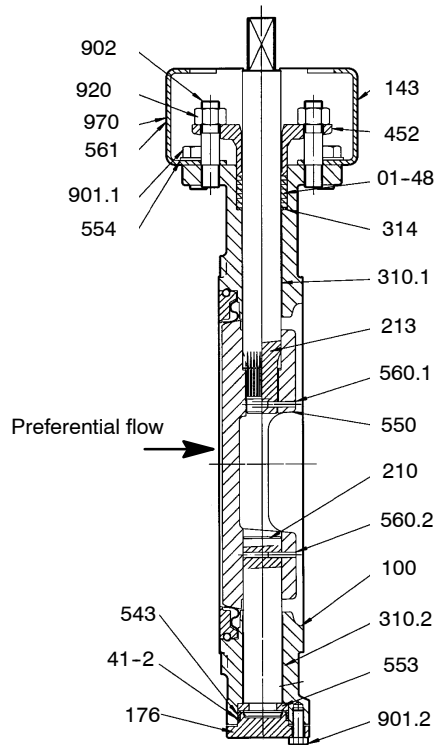
DN 300 - 600
Flanged body



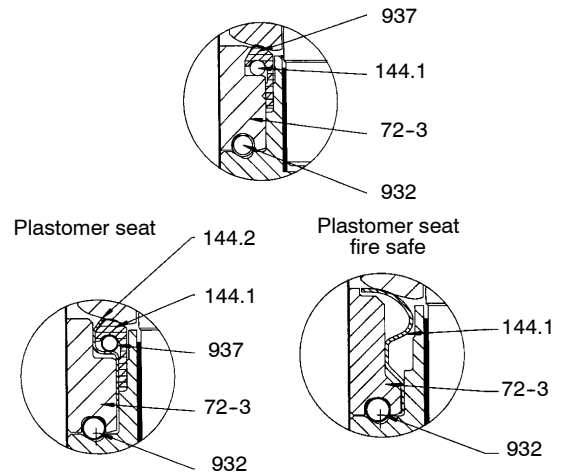
Type	Size (mm)	Type series booklet no.
DANAIS 150	50 - 1200	8460.11

DANAIS 150 - SEATS

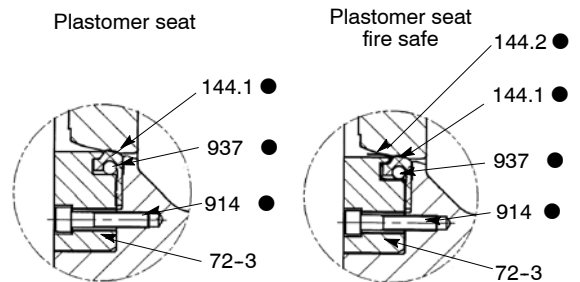
DN 50- 600



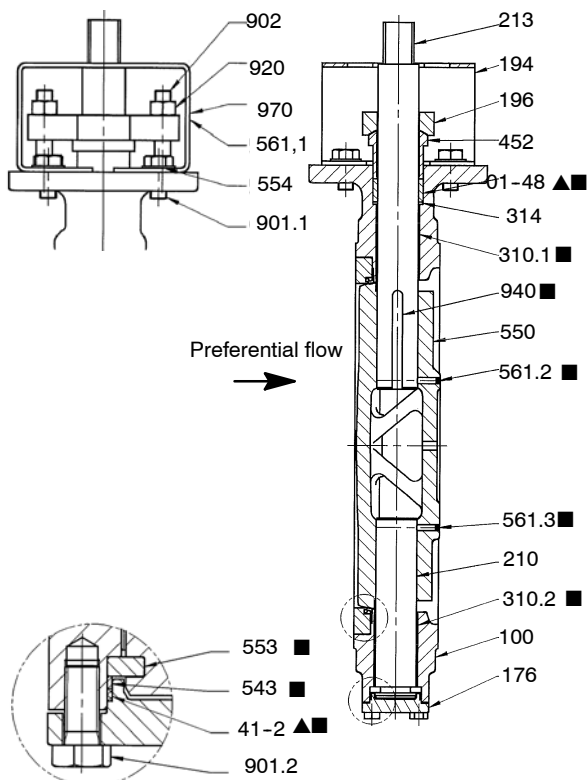
DN 50 - 650



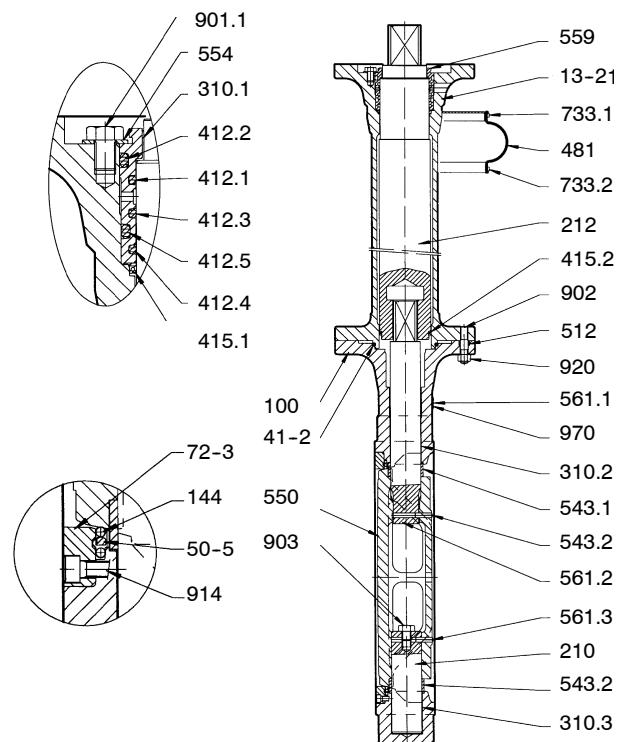
DN 650 - 1200



DN 650 - 1200

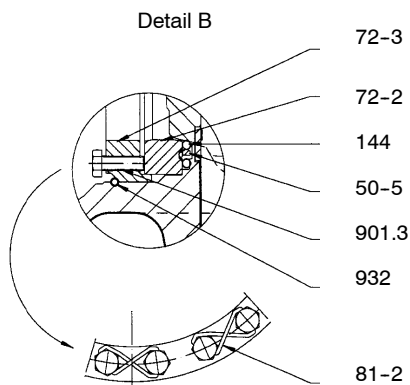
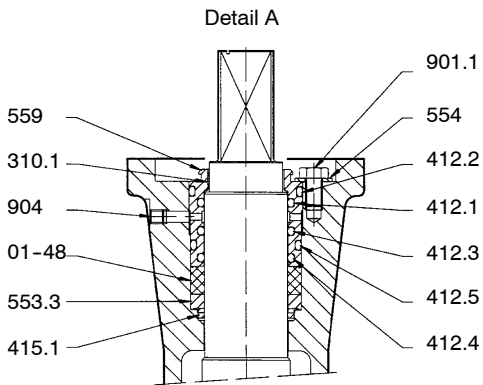
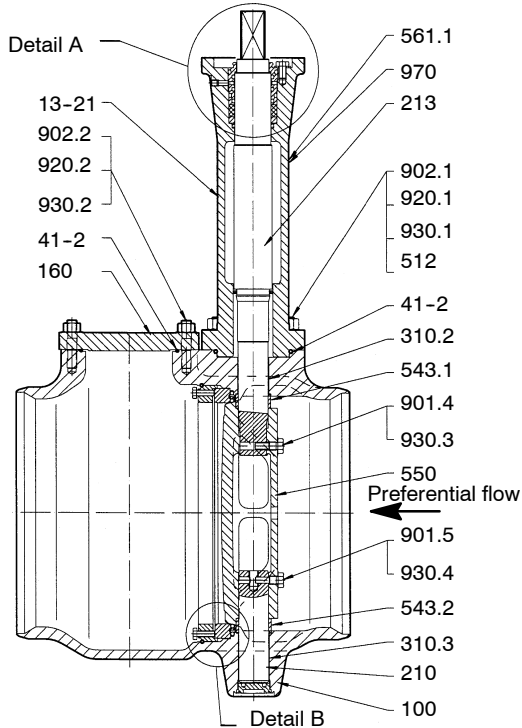


Type	Size (mm)	Type series booklet no.
DANAIS CRYO AIR	50 - 600	8460.1231



Type	DN (mm)	Type series booklet no.
DANAIS CRYO (Flanged and Buttweid)	80 - 1200	8460.1241

Examples with Buttweid ends:



5.3. List of Components

Part No.	Name of Parts
01-48	Fire-safe sealing packing
13-21	Extension
41-2	Static ring
50-5	Reaction ring
50-6	Tightening ring
59-52	Trigger
68-4	Foil
72-2	Centring flange
72-3	Tightening flange
81-2	Wire
100	Body
143	Yoke
144	Seat
144.1	Plastomer / Metallic seat
144.2	Fire safe seat
160	Cover
176	Bottom
194	Extension
196	Tightening washer
210	Shaft
212	Intermediate shaft
213	Operating shaft
310.*	Plain bearing
314	Wedge
412.*	O-ring
415	Lip seal ring
452	Packing gland
481	Bellows
486	Ball
512	Adjusting ring
543.*	Spacer bush
550	Disc
553.*	Thrust
554	Plain washer
559	Gasket holder
560.*	Pin
561	Grooved pin
733	Clamp
900.*	Anti blow-out screw
901.*	Hexagon head screw
902	Stud
903	Threaded plug
904	Grub screw
914	Hexgon socket head screw
916	Plug
920.*	Hexagon nut
930	Retainer
932	Inner ring
937	Elastic wire
940.*	Key
970	Identity plate
*	Repetitive part

5.4. Functioning principle

Description

The valve consists mainly of a body (100), operating shaft (213), shaft (210), disc (550) and different types of seats (144).

Disc-shaft connection: The operating shaft (213) is connected to the disc (550) and different types of seats (144).

Shaft seal area:

MT II type: Made by elastomer O-Ring (412) fitted into a gasket holder (559). Fire safety is achieved by a graphite packing (01-48) tightened by the gasket holder (559), screws (901.1) and washers (554).

150 type: Made by a sealing packing (01-48) tightened by a packing gland (452) studs (902) and nuts (920).

CRYO type: Made by elastomer O-Ring (412) fitted into a gasket holder (559). Fire safety is achieved by a graphite packing (01-48) tightened by the gasket holder (559), screws (901.1) and washers (554). Lip seal ring (415.1) is tightened by the gasket holder (559), the sealing packing (01-48), screws (901.1) and washers (554).

Flow seal area:

MT II types (Wafer, Lug and Flanged Bodies for DN ≤ 10" Class 150 and DN ≤ 8" Class 300): the seat (144) is tightened in the body (100) by a tightening flange (72-3) which is maintained by radial screws (904) or axial screws (901).

CRYO and MT II flanged types for DN > 10" Class 150 and DN > 8" Class 300: the seat (144) is tightened in the body (100) by a centring flange (72-2) maintained by a tightening flange (72-3) which is held in place by inner ring (932) and axial screws (901.3).

150 type: the seat (144) is tightened in the body (100) by a tightening flange (72-3) which is held in place by an inner ring 932 or by 4 screws (914).

Bonnet seal area:

CRYO types: It is made by a metallic seal (41-2) tightened by the extension (T3-21), studs (902) and nuts (920).

The compression of the seating disc edge out of the seat is achieved by double eccentric kinematics.

The axis of the shafts and disc is offset to valve axis and eccentric to pipe axis.

Operation: The valves are quarter-turn operated manually by handles or gear box or hydraulic, pneumatic and electric actuators bolted on the valve top plate (as per ISO 5211 standard).

6. Installation

6.1 General

ATTENTION For DANAIS CRYO II AIR valves, only KSB qualified staff should carry out the installation.

ATTENTION To avoid leakage, deformation or rupture of the body, the piping should be laid out in such a way that no thrust or bending forces act on the valve bodies (100) when they are installed and operational.

ATTENTION The sealing faces of the flanges must be clean and undamaged.



It is mandatory to add gaskets between body and piping flanges. To insert the valve between flanges, pull apart the two pipes flanges to obtain sufficient clearance between valves flanges and piping flanges. All holes provided in the flanges must be used for the flange connection (does not apply for butt-weld type valves).



If construction work is still in progress, non-mounted valves must be protected against dust, sand and building material etc. (cover with suitable means).

Do not use valve handles and gear handwheels as footholds!



Valves and pipes used for high (> 60 °C) or low (< 0 °C) temperatures must either be fitted with a protective insulation, or there must be warning signs fitted showing that it is dangerous to touch these valves.

DANAIS CRYO AIR valves, used for oxygen applications are delivered free from grease, oil and demolding agent, with a severe cleaning procedure. The valves must be touched only with clean and dry gloves. It is prohibited to use any grease or oil on any surface of the valves.



If a valve is used as end-valve in a pipe, this valve should be protected against unauthorized or unintentional opening to prevent personal injury or damage to property.



To guarantee a good operation of the valves at temperatures < 0 °C it is necessary to eliminate all the water (steam or liquid) inside the piping to avoid freezing at the seat gasket or lower shaft level.



For the DANAIS CRYO Butt-weld, the protections inside the valve must be kept until the end of the welding and cleaning operations. These protections must be removed before operation.



DANAIS 150 body type 4 (lug type):

Specific instructions for end of line use:

(see figure 1)

- it is **mandatory** to insert the valve between flanges in the preferential direction, pressure upstream.
- tighten the tightening flange 72-3 against the piping flange.

Specific instructions for downstream dismantling:

Check the position of the valve on the piping (direction of the arrow on the yoke)

In case of piping dismantling downstream side (see figure 1):

- make sure that the valve is in the closed position
- remove the piping downstream side.

In case of piping dismantling upstream side (see figure 2):

- depressurize and drain off the downstream piping
- remove the piping upstream side.

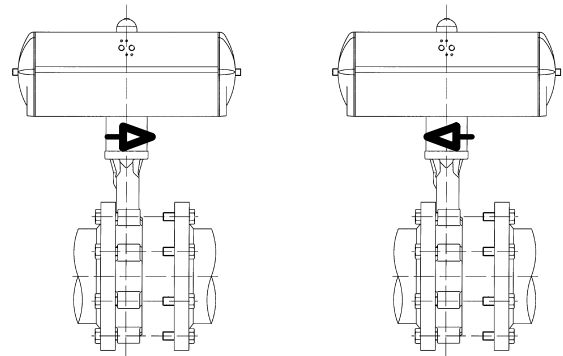


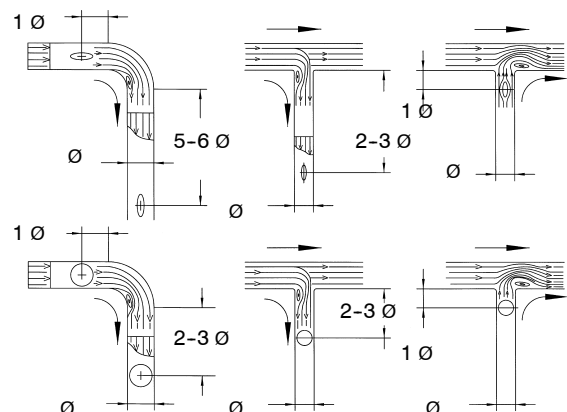
Figure 1

Figure 2

It is advised to put in place a blind flange for safety reasons.

6.2. Installation conditions

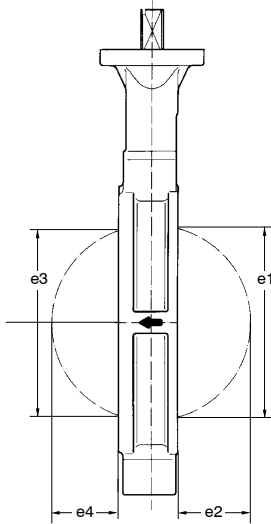
6.2.1 Recommended minimum distances between the position of the valve and of the T-piece or elbow.



Also valid for valve placed at pump discharge

6.2.2. Flanging dimensions

Connection to the piping.
piping flanges must match the following dimensions.



e1: min. allowable diameter on upstream flange face
e3: min. allowable diameter on downstream flange face

6.2.2.1. DANAIS MT II and CRYO

Wafer and Lug type class 150 and PN 25

Size	NPS	Disc clearance			
		e1	e2	e3	e4
50	2	36	9		
65	2 1/2	49	13	13	1
80	3	62	18	38	6
100	4	81	24	67	17
125	5	103	33	91	23
150	6	131	48	117	33
200	8	177	70	163	51
250	10	226	91	212	70
300	12	266	106	254	87
350	14	309	123	297	103
400	16	360	145	346	121
450	18	420	169	408	147
500	20	456	182	444	160
600	24	546	213	537	197

Flanged type class 150 and PN 25

Size	NPS	Disc clearance			
		e1	e2	e3	e4
50-65	2-2 1/2				
80	3			18	2
100	4			52	8
125	5			81	17
150	6			112	29
200	8			158	45
250	10	27	1	208	65
300	12	214	52	197	42
350	14	263	70	245	58
400	16	306	82	289	70
450	18	376	111	359	97
500	20	417	128	399	112
550	22	508	154	437	123
600	24	505	157	487	141
650	26	537	139	524	155
700	28	566	142	559	170
750	30	702	235	614	194
800	32	745	246	655	205
900	36	858	295	765	252
1000	40	918	298	829	258
1050	42	960	303	902	306
1200	48	1041	309	1019	358

Wafer and Lug type class 300

Size	NPS	Disc clearance			
		e1	e2	e3	e4
50	2	36	9		
65	2 1/2	49	13	13	1
80	3	62	18	38	6
100	4	81	24	64	13
125	5	100	31	87	21
150	6	130	46	115	31
200	8	174	64	158	46
250	10	222	84	204	62
300	12	260	96	249	81
350	14	299	105	292	96
400	16	350	125	340	113
450	18	408	147	397	133
500	20	445	160	438	150
600	24	542	201	531	185

Flanged type class 300

Size	NPS	Disc clearance			
		e1	e2	e3	e4
50-65	2-2 1/2				
80	3			18	2
100	4			48	7
125	5			75	15
150	6			106	25
200	8			150	39
250	10			198	56
300	12	80	6		
350	14	154	20	99	8
400	16	219	36	182	24
450	18	291	57	257	43
500	20	329	68	293	53
600	24	425	96	394	80

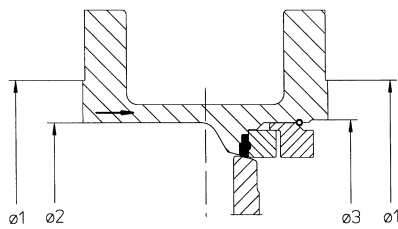
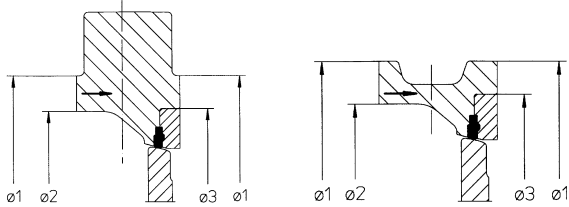
6.2.2.2. DANAIS 150

Size	NPS	Disc clearance			
		e1	e2	e3	e4
50	2	23	0	33	3.5
65	2 1/2	41	6	48	9
80	3	59	13	61	15
100	4	78	18	81	21
125	5	99	27	103	30
150	6	127	39	131	43
200	8	177	62	175	59
250	10	225	82	230	80
300	12	265	96	266	98
350	14	308	112	311	116
400	16	359	133	358	132
450	18	418	155	418	160
500	20	455	167	455	175
600	24	546	201	546	211
650	26	585	222	606	232
700	28	625	237	630	247
750	30	663	250	688	262
800	32	722	274	728	286
900	36	827	320	833	332
1000	40	921	360	928	374
1200	48	1070	423	1103	439

6.2.3. Flange gasket

The dimensional compatibility of the flange gasket must be checked to ensure the connection quality, according to the dimensions defined hereunder:

6.2.3.1. DANAIS MT II, TIGHTNESS AREA AT FLANGE FACING

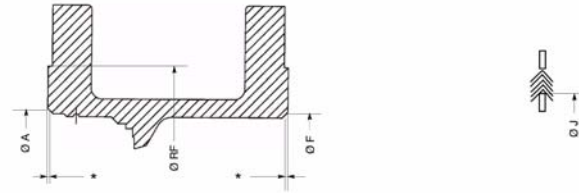


Size	NPS	Class 150 / PN 25						Class 150		
		Wafer			Lug			Flanged		
		Ø1	Ø2	Ø3	Ø1	Ø2	Ø3	Ø1	Ø2	Ø3
50	2	93	61	73	92.1	61	73	92.1	71	73
65	2 1/2	117	73	91	104.8	73	91	104.8	84	91
80	3	127	90	106	127	89	106	127	94	106
100	4	157.5	120	128	157.2	114	128	157.2	120	128
125	5	180	141	148	185.7	141	148	185.7	144	148
150	6	216	170	173	215.9	168	173	215.9	167	173
200	8	260	220	226	269.9	220	226	269.9	220	226
250	10	314	273	273	323.8	273	273	323.8	270	273
300	12	362	322	330	381	322	330	381	339	323
350	14	411	354	385	412.8	381	385	412.8	368	373
400	16	470	406	438	470	433	438	470	421	423
450	18	530	462	498	533.4	492	498	533.4	474	487
500	20	572	508	538	584.2	531	538	584.2	518	526
600	24	676	607	640	692.2	637	640	692.2	625	622

Size	NPS	Class 300								
		Wafer			Lug			Flanged		
		Ø1	Ø2	Ø3	Ø1	Ø2	Ø3	Ø1	Ø2	Ø3
50	2	93	61	73	92.1	61	73	92.1	71	73
65	2 1/2	117	73	91	104.8	73	91	104.8	88	91
80	3	127	90	106	127	89	106	127	100	106
100	4	157	114	128	157.2	114	128	157.2	120	128
125	5	185.7	141	148	185.7	141	148	185.7	144	148
150	6	215.9	168	173	215.9	168	173	215.9	167	173
200	8	269.9	220	226	269.9	220	226	269.9	220	226
250	10	323.8	273	273	323.8	273	273	323.8	281	273
300	12	381	327	330	381	327	330	381	324	323
350	14	412.8	382	385	412.8	382	385	412.8	382	373
400	16	470	433	438	470	433	438	470	422	423
450	18	533.4	494	498	533.4	494	498	533.4	489	487
500	20	584.2	536	538	584.2	536	538	584.2	528	526
600	24	692.2	639	640	692.2	639	640	692.2	625	622

6.2.3.2. DANAIS CRYO, DIMENSIONS OF GASKET FOR FLANGED BODY (T7)

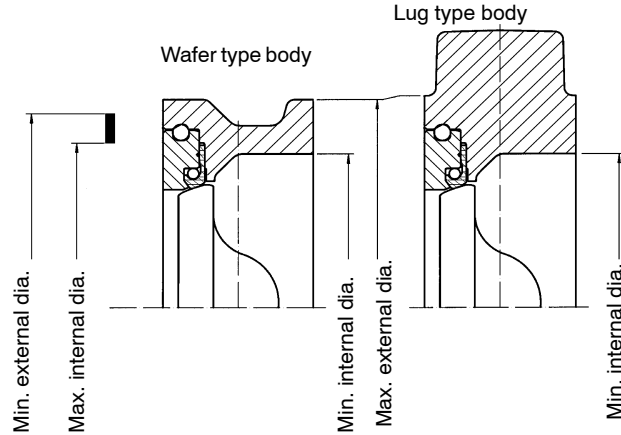
To ensure proper connection the dimensions of flange gaskets must be compatible with the dimensions specified below:



*: 45° chamfer

DN	NPS	ØA +/-0,5	ØF 0/-10	ØJ	RF PN 20 ASME B16.5 Class 150 or ASME B16.47 Class 150
80	3	94,5	90,5	101	127
100	4	128,5	125	135	157,2
150	6	177	174	185	215,9
200	8	230	228	239	269,9
250	10	278	279	287	323,8
300	12	326	330	339	381
350	14	376,5	377	387	412,8
400	16	426,5	432	439	469,9
450	18	490,5	477	499	533,4
500	20	530,5	528	540	584,2
550	22	581	587	594	641,4
600	24	627	638	647	692,2
650	26	673	679	688	749,3
700	28	707	710	724	800
750	30	760,5	760	774	857
800	32	813	815	826	914
900	36	918	924	930	1022
1000	40	1023	1010	1029	1124
1050	42	1066	1060	1079	1194
1200	48	1184	1205	1219	1359

6.2.3.3. DANAIS 150 GASKET DIMENSIONS



DN	NPS	Flange sealing					Connections	
		Min. area internal dia.	Min. ext. dia.	Min int. dia.	Max. area external dia.		Wafer type - T1	Full Lug type body - T3/T4
					T1*	(T3/T4)**		
50	2	69,6	84,6	62	90,5	91,0	PN 10/16/20/25 - ASME B16.5 Class 150 - JIS 10K	
65	2 1/2	83,6	98,6	75	108,0	104,0	PN 10/16/20 - ASME B16.5 Class 150 - JIS 10K	
						117,0	PN 25 - JIS 16K/20K	
80	3	101,2	116,6	91	125,0	126,0	PN 20 - ASME B 16.5 Class 150 - JIS 5K	
						131,0	PN 10/16/25 - JIS 10K/16K/20K	
100	4	126,6	142,6	117	154,0	156,5	PN 10/16/20/25 - ASME B16.5 Class 150 - JIS 5K/10K/16K/20K	
125	5	153,6	169,6	144	183,0	185,0	PN 10/16/20/25 - ASME B16.5 Class 150 - JIS 5K/10K/16K/20K	
150	6	180,6	199,1	171	214,0	215,0	PN 10/16/20/25 - ASME B16.5 Class 150 - JIS 5K/10K/16K/20K	PN 10/16/20/25 - ASME B16.5 Class 150 - JIS 5K/10K
						269,0	PN 10/20 - ASME B 16.5 Class 150 - JIS 5K	
200	8	231,5	253,5	222	267,0	265,0	PN 16/25 - JIS 10K/16K/20K	
						323,0	PN 10/16/20/25 - ASME B16.5 Class 150 - JIS 5K/10K/16K/20K	
250	10	286,9	305,5	275	321,5	380,0	PN 10/16/20 - ASME B16.5 Class 150 - JIS 5K	
						388,0	PN 25 - JIS 10K/16K/20K	
350	14	374,6	400,0	359	411,5	412,0	PN 20 - ASME B16.5 Class 150 - JIS 5K	
						428,0	PN 10/16/25 - JIS 10K/16K/20K	
400	16	425,9	452,0	410	467,5	469,0	PN 10/16/20/25 - ASME B16.5 Class 150 - JIS 5K/10K/16K/20K	
450	18	478,5	510,0	461	530,5	532,5	PN 10/16/20/25 - ASME B16.5 Class 150 - JIS 5K/10K/16K/20K	
500	20	528,0	562,0	512	581,5	583,5	PN 10/16/20/25 - ASME B16.5 Class 150 - JIS 5K/10K/16K/20K	
550	22	584,0	620,0	556	635	635	PN 10/16 - JIS 5K/10K/16K/20K	
600	24	635,0	671,0	614	689,5	691,5	PN 10/16/20/25 - ASME B16.5 Class 150 - JIS 5K/10K/16K/20K	PN 10/16/20/25 - ASME B16.5 Class 150 - JIS 5K
						747,0	PN 10/16/20/25 - ASME B16.47 Class 150 serie A - JIS 5K/10K/16K	
700	28	722,0	756,0	704,0	794,0	794,0	PN 10/16/20/25 - ASME B16.47 Class 150 serie A - JIS 5K/10K/16K	PN 10/16 - JIS 5K/10K
						798,0	PN 20 - ASME B16.47 Class 150 serie A	
750	28	774,0	807,0	754,0	855	853,0	PN 10/16/20/25 ASME B16.47 Class 150 serie A - JIS 5K/10K/16K	PN 10/16 - JIS 5K/10K
						855,0	PN 20 - ASME B16.47 Class 150 serie A	
800	32	830,0	864,0	804,0	899,0	899,0	PN 10/16/20/25 - ASME B16.47 Class 150 serie A - JIS 5K/10K/16K	PN 10/16
						912,0	PN 20 - ASME B16.47 Class 150 serie A - JIS 5K/10K	
900	36	930,0	964,0	904,0	999,0	999,0	PN 10/16/20/25 - ASME B16.47 Class 150 serie A - JIS 10K/16K	PN 10/16 - JIS 10K
						1020,0	PN 20 - ASME B16.47 Class 150 serie A	
1000	40	1030,0	1074,0	1004,0	1114,0	1114,0	PN 10/16/20/25 - ASME B16.47 Class 150 serie A - JIS 10K/16K	PN 10/16 - JIS 10K
						1122,0	PN 20 - ASME B16.47 Class 150 serie A	
1200	48	1232,0	1280,0	1205,0	1329,0	1329,0	PN 10/16/20/25 - ASME B16.47 Class 150 serie A - JIS 10K/16K	PN 10/16 - JIS 10K
						1357,0	PN 20 - ASME B16.47 Class 150 serie A	

Note: The use of spiral -wound gaskets according to ISO 7483 - PN 10 to 25 is recommended for DN ≤ 600.

The use of spiral -wound gaskets according to EN 1514-2 is recommended for DN > 600.

*: T1 = Wafer type body

** : T3/T4 = Full Lug type body (T3 Body = Only DN 50 to 800)

6.3. Handling



Handling only when parts are at ambient temperature.



For valves with lifting lugs, please use only load rings provided by KSB for handling the valve from the box to the pipe. Load rings must be fully screwed (until it stops).



It is forbidden to handle the aggregate only by the actuator.



For valves with lifting lugs, it is necessary to take off the load rings just after valve fitting, and to replace them by bonded seals and screwed plugs provided by KSB, in order to avoid any entry of water into the threaded holes of the valve body.

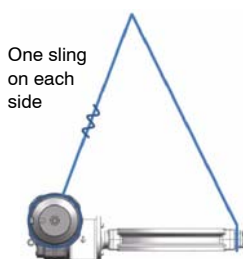
Handling depends on valve size, actuator size, actuator position compared with the valve, and final valve/actuator position onto the pipe, regarding the flipping operation. It may be carried out like not exhaustive examples shown below.

Generally speaking, for bare shaft valves or valve/actuator aggregate, handling must be carried out with minimum 3 slings as far as possible from its gravity center to ensure a good stability. Handling requires skilled and experienced staff (see §3)

Legend — Sling — Chain hoist

T1 (Wafer connection type)

Horizontal

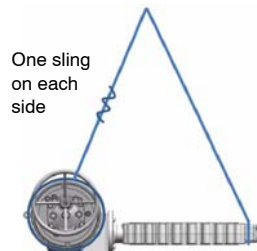


Vertical

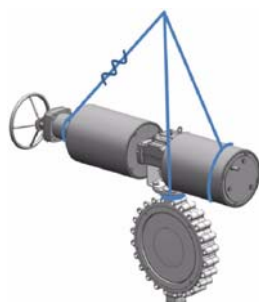


T4 (Lug connection type)

Horizontal

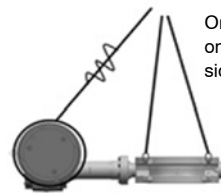


Vertical



T7 (Flanged connection type)

Horizontal



One sling on each side

Vertical



BWSE (Butt-welded connection type)

Horizontal



Vertical



6.4. Recommendations for installation

The wafer, lug and flanged valves have to be inserted lightly between flanges with flange gaskets.

Before assembly

- Verify that the disc and the seat are free of solid particles like chips, packing material, etc...
- Verify that pipeline flanges are located on the same centreline and are parallel
- Verify that dimensions of gaskets flange are compatible with the dimensions mentioned in the table 7.2.3.
- Verify that nothing hinders the complete moving of the disc during opening or closing, in particular at the internal weld seams or at the pipe ends.
- Pull apart the pipeline flanges to allow valve and gaskets insertion.

During assembly

- Place the disc in closed position.
- Position the valve above the pipe and place gasket in contact of each flat face (you can fix them with a spot of glue)
- Insert valve and gaskets between pipe flanges and center using several tie-rods.
- Screw up progressively the nuts until metal complete tightness is achieved between the valve body, the pipeline flanges and gaskets. Note: Respect maximum torque (See paragraph 7.2.4).
- Operate the valve several times to ensure that there is no valve disc obstruction.
- During transport, the valve may have been subjected to important temperature differences or the vibrations making it necessary to retighten the packing. Before performing this operation, please read the maintenance manual.

6.5. Actuated valves



Electrical cables may only be connected by qualified personnel.



The applicable electrical regulations (e.g. IEC and national standards), also for equipment in hazardous locations, must be observed. All electrical equipment such as actuator, switchboard, magnetic valve drive, limit switch etc. must be installed in floodproof dry locations. Voltage and frequency must match the valves stated on the identity plate.



Actuator bumpers are adjusted in KSB factory. Do not modify the adjusting to preserve gasket and to keep the good performances.



Cryogenic type BW: special device like "bracket" used for the positioning of pipe and butt-weld ends of valve will be in austenitic stainless steel and the spot welding will be as light as possible and made with suitable material filler metal and the lowest acceptable energy. The welding spot will be eliminated by flush grinding.



The seat (144) and the disc edge shall be protected against the metallic projections resulting from welding or grinding.



During welding on site, the temperature of the body shell will be lower than 150 °C at a distance of 100 mm from the butt-weld end.

7. Commissioning/Decommissioning

7.1. Commissioning

7.1.1. General

Prior to commissioning the valve, the pressure, temperature and material data stated on the valve should be compared to the actual operating conditions in the piping system to check whether the valve can withstand the loads occurring in the system.



Possible pressure surges (water hammer) must not exceed the highest admissible pressure. Adequate precautions should be taken. In new pipe systems and especially after repair work, the system should be flushed with the valves fully open to remove solids, e.g. weld beads, which may damage the seats.

DANAIS CRYO AIR used for oxygen service shall not be removed from the original packaging until immediately before installation into the system to avoid any contamination.

7.1.2. Operation

The position of the disc is indicated by the pointer of the actuator or by handle lever. The valves are closed by turning in the clockwise direction (top view) and opened in the counterclockwise direction.

7.1.3. Functional Check

The following functions should be checked: Before commissioning, the shut-off-function of the valves should be checked by repeated opening and closing.

7.1.4. Actuated valves

Adjustable end stops and torque limiter have been adjusted in factory.

7.2. Decommissioning

During extended shutdown periods, liquids liable to change their condition due to polymerization, crystallization, solidification etc. must be drained from the piping system. If necessary, the piping system should be flushed with the valves fully open.

8. Maintenance/Repair

8.1 Safety Instructions

Maintenance and repair work may only be carried out by skilled and qualified personnel.

For DANAIS CRYO AIR used for oxygen applications, take care that there is no chemical reaction between cleaning agents and residues of the medium into the valves.

For all maintenance and repair work, the safety instructions listed below and also the general notes in section 2 must be observed. Always use suitable spare parts and tools, even in case of emergency, otherwise correct operation of the valves cannot be assured.

8.2. Removal of draining screw (optional)

For valves equipped with optional draining screw into the bottom, please consult the manual of maintenance of the valve range (listed in the chapter 8.5) before any operation.

All components are specific, so after valve draining, it is mandatory to use the same special screw and only spare parts provided by KSB (like described in the manual of maintenance).

8.3. Valve removal from piping and actuator disconnecting

Identify the valve by identity plate.



Please check what is the relevant spare kit. Place the disc in closing position



The entire valve must be unpressurized and must have cooled down sufficiently so that the temperature of the medium is lower than 60 °C, to prevent scalding or warming so that the temperature is higher than 0 °C.



Opening pressurized valves will cause danger to life and limb! If toxic or highly flammable substances or liquids whose residues may cause corrosion by interaction with the air humidity were handled by the valve, then the valve should be drained and flushed or vented. If necessary, wear safety clothing and a face guard/mask. Depending on the installation position, any liquid remaining in the valve may have to be removed.

Prior to possible transport, the valves must be flushed and drained carefully. If you have any questions please contact your KSB Sales Office.



If actuators powered by an external source of energy (electric, pneumatic, hydraulic) need to be removed from the valves or dismantled, the energy supply must be shut down prior to starting any repair work.

Remove the valve from the piping with its actuator.

Identify the mounting position of the actuator

Disconnect the actuator and take care of all bolting parts.

Before reassembling the actuator, please apply the sealant joint (Type LOXEAL 58-31) between the butterfly valve and the actuator.

8.4. Spares

Use the relevant spare parts included in the kits. Please refer to leaflets.

All constitutive parts of kit and flange gaskets must be replaced.

For DANAIS CRYO AIR used for oxygen service, only original spare parts shall be used for non-metallic parts. They must be compatible with the oxygen service pressure and temperature.



During the mounting /dismantling of the valve, the operations must be respected step by step as defined in section 8.4 to prevent injuries and material damages.

During the tests, closing and opening valves, care must be taken that no operator interferes with the disc travel.

9.5. Valve disassembly and re-assembly

See manual of maintenance reference:

Reference	Manual of maintenance
DANAiS MT II	R355-70037
DANAiS 150	8460.815
DANAiS CRYO flanged	R355-70036
DANAiS CRYO BW	R355-70032
DANAiS CRYO AIR	R355-70036

For DANAiS CRYO AIR used for oxygen applications, before re-assembly, all parts must be absolutely free of grease, oil and demolding agents, and must be touch only with clean and dry gloves.
KSB cleaning procedure must be applied.

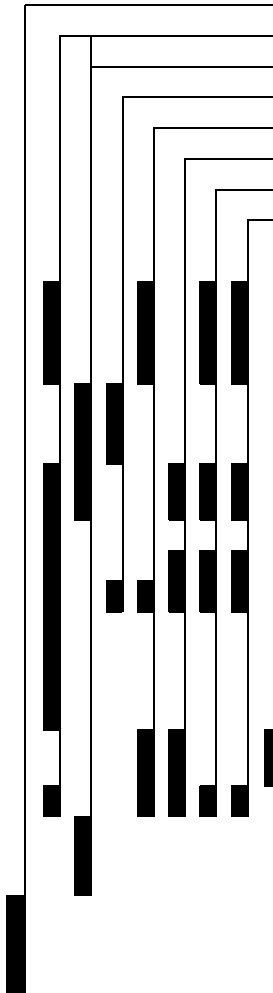
10 Troubleshooting

10.1 General

All repair and service work must be carried out by qualified personnel using suitable tools and genuine spare parts.
The previous safety instructions must be observed.

For DANAiS CRYO AIR used for oxygen applications, please refer to chapter 7.1.

10.2 Faults & Remedies

	Cover or extension leakage (between the shaft and the flange)	
	Downstream/Upstream leakage	
	Shaft leakage	
	Flange leakage	
	Over torque	
	No opening	
	No closing	
	Hard point	
	Vibration / Fluttering	
	Foreign particles in the valve	Actuator on safe position - Open the valve, line without fluid or flow, remove the particle - inspect seal/disc - replace seal/disc
Broken body	Defect due to water hammer Search for the reasons. Replace / Repair the valve	
Broken or warped disc	Defect due to water hammer Search the reasons. Replace / Repair the valve	
Damaged disc, corroded disc	Repair the valve - Replacement of seal	
Broken shaft, twisted shaft	Analyse the defect / research of causes / replace shaft	
Wrong flange gasket	Check type and dimensions	
Wrong flanging	Check type and flange bolting torque	
Wrong flanging size	Follow instructions given in KSB technical leaflet	
Wrong face to face, non parallel flanges	Flanging has to be modified in accordance with KSB technical leaflet requirements.	
Flow conditions Wrong operating conditions	Check the technical offer versus service conditions	
Damaged actuator	Check sizing versus operating conditions (see KSB)	
Defective sealing	Search the reasons Tighten or replace sealing packing Replace O-rings	
Defective sealing	Actuator on safe position Open the valve line without fluid or flow (0 °C < temperature < 60 °C) Inspect metallic seals, sealing area Replace metallic seals, repair sealing area.	

11 End of life

For non-metallic and metallic components, recycling has to be done according to National Regulation.

