VALVES and TECHNOLOGIES for WATER WORLD
www.acmosrl.com

INSTALLATION, OPERATION & MAINTENANCE MANUAL

EN

TILTING CHECK VALVE WITH LEVER AND COUNTERWEIGHT

FIG. 221-221A-222 - F221-F221A-F222

ACMO | IOM Manuals

Rev. 06 - 20210504
m05n_221-222-F221-F222_EN_2019

Index

Index 03

Chapter 1 04
- Manufacturer identification 04
- Product identification 04
- General safety measures 04
- Packing 05
- Transport and storage 05
- Testing valves 06
- Warranty 06
- Disposal and recycling 06

Chapter 2 07
- Components description fig.221-221A-222 07
- Valve dimensions fig.221 08
- Valve dimensions fig.221A 09
- Valve dimensions fig.222 10
- Components description fig.F221-F221A-F222 11
- Valve dimensions fig.F221 12
- Valve dimensions fig.F221A 13
- Valve dimensions fig.F222 14

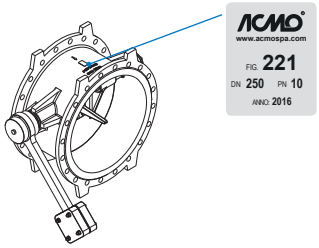
Chapter 3 15
- Flow coefficient diagram 15
- Installation 16
- Installation layout 17
- Maintenance 18
- Replacement of the seal ring 18
- Spare parts 18

MANUFACTURER IDENTIFICATION

AC.MO S.r.l.
Headquarters Street: Via Tommaso da Modena, 28 Z.I. - 31056 RONCADE (TV) ITALY
Tel: +390422840220 r.a. Fax: +390422840923 e-mail: info@acmospa.com
www.acmosrl.com

PRODUCT IDENTIFICATION

Thank you for purchasing our product. We kindly invite you to read carefully the operating instructions and safety rules in this manual, which is part of the product.
On the body of the valve there is a label with the AC.MO S.r.l. logo and the model identification number (see the adhesive label/metal label).



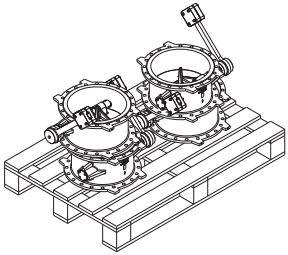
GENERAL SAFETY MEASURES

- Read the IOM manual before using the valve. Comply with the manual at all times.
- Non–compliance with the general safety measures can seriously damage human health and valve functioning. AC.MO S.r.l. will not assume any responsibility or liability for consequential damage due to the non-compliance with these instructions.
- The products provided are manufactured according to the project check valves EN 12334, face to face EN 558 and flanges EN 1092-2. The valve can be used for drinking water and clean service water. Other uses are prohibited because they can alter the valve safety.
- Only qualified staff can install the valve. Unqualified or underage staff cannot perform the installation.
- The IOM manual must be available in the workplace.
- Always use protective equipment such as safety boots, safety helmets, goggles, protective gloves, etc.. Personnel involved in the installation or maintenance of valves should be constantly alert to possibledamages caused by an improper handling of the valve.
- Never use the valve in plants where the pressure is higher than the one indicated.
- Before performing any work on the valve, depressurize the pipeline section and ensure it is free of hazards.
- Unauthorized, unintentional and unexpected actuation, as well as any hazardous movement caused by stored energy (pressurized air, water under pressure) must be prevented.
- When a valve needs to be dismantled from a pipeline, fluid may emerge from the pipeline or the valve. The pipeline must be emptied completely before the valve is dismantled. It is strictly prohibited to disinstall any component when the system is under pressure (working) or when there is any fluid inside.
- Statutory and local provisions as well as the safety and accident prevention regulations must be observed and complied with at all times.
- OPERATING TEMPERATURE: (water temperature) max. + 50°C

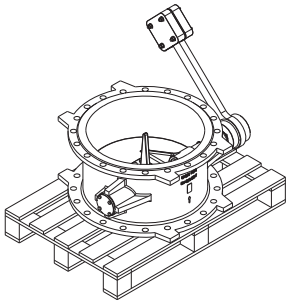
Please note that if the valve closes too rapidly it can generate a surge in the pipes.

PACKING

The valves are generally delivered in europallets, alternatively, in dedicated high thickness paper boxes. In both cases, they are fastened to the pallet using bolts and covered with a polyethylene heat-shrinking film. The package depends on the valve dimensions and on the actuator and/or hydraulic circuit that may be installed on the valve.
Packing examples:



DN 150÷450



DN 500÷1600

Please carefully inspect the unit for damages or discrepancies with the order upon arrival and report a claim immediately before unloading the goods.

TRANSPORT AND STORAGE

WARNING! During the unpacking, removal and installation of the valve, use the lifting eyebolts on the valves (compliant with UNI ISO 3266 if the valve is provided with holes). Don't lift up the valves using the position indicator or the accessories and pipes installed on the valve.

Lifting the valve improperly may damage it. Lift the valve with slings (ISO 4878), chains or cables fastened around the valve body or eyebolts if present, or fastened to bolts or rods through bolt holes in the flanges.

Make sure the slings do not interfere with electric components, levers, counterweights and oil-dynamic components, which could be present on the valve, in order to avoid damage to the system.

Please make sure the lifting tools (lift truck, slings, cranes, hooks, etc.) are adequate for the weight. ***Consult the weight table.***

BE CAREFUL! Flat washers has to be installed under the nuts when installing the valve to the pipeline flanges, to prevent the paint from cracking or chipping.

If the valve is stored for a middle or long term, it is necessary to:

- Lay the valve in a horizontal and firm position, in order to avoid capsizings which could damage things or people.
- Store the valves in an area protected from weather conditions especially from sunlight, which could damage the coats and the gaskets.

STORAGE TEMEPERATURE: (air temperature) min. - 20°C max. + 80°C

TESTING VALVES

All AC.MO S.r.l. valves are tested and controlled before leaving our warehouse, in agreement with a specific internal control plan and current international standards. The test report (inspection certificate) is available on request.

WARRANTY

AC.MO S.r.l. guarantees its products for the supplier or the client for a 12 month consecutive period since the delivery date to the final client. The warranty coverage period will correspond to the date on the final client's delivery note. Product faults and damages must be pointed out within 8 days since their identification.

The warranty covers all the products manufactured/provided by AC.MO S.r.l..

Warranty does not cover normal wear damages .

The warranty does not apply to:

- Valves equipped with tools and accessories, unauthorized by AC.MO S.r.l.
- Valves damaged by misuse, accidents or other chances, negligence, eccess load etc.
- Valves damaged by lack of maintenance.
- Valves equipped with non-original spare parts.
- Valves modified without authorisation.

DISPOSAL AND RECYCLING

Even though AC.MO S.r.l. valves are designed and built to be extremely long-lasting, at the end of their life cycle they must be removed and replaced. Dismantle the valve, separate its components to dispose them of and recycle them (e.g. metal parts must be separated from plastic parts etc.).

Please, always respect the directives on waste collection, disposal and recycling.

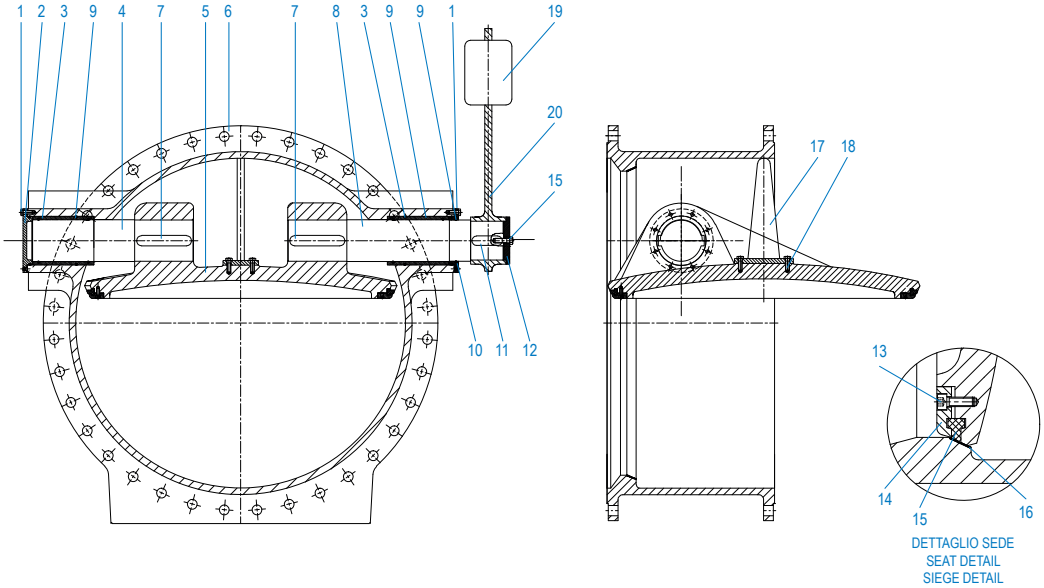
Carefully observe all steps listed in National Laws on waste disposal and recycling.

ADDITIONAL NOTES

For product improvement purposes, AC.MO S.r.l. reserves the right to change the data in this manual at any time and without notice. Unauthorized use of data is forbidden. Please contact us for up-to-date information.

All measures are in mm.

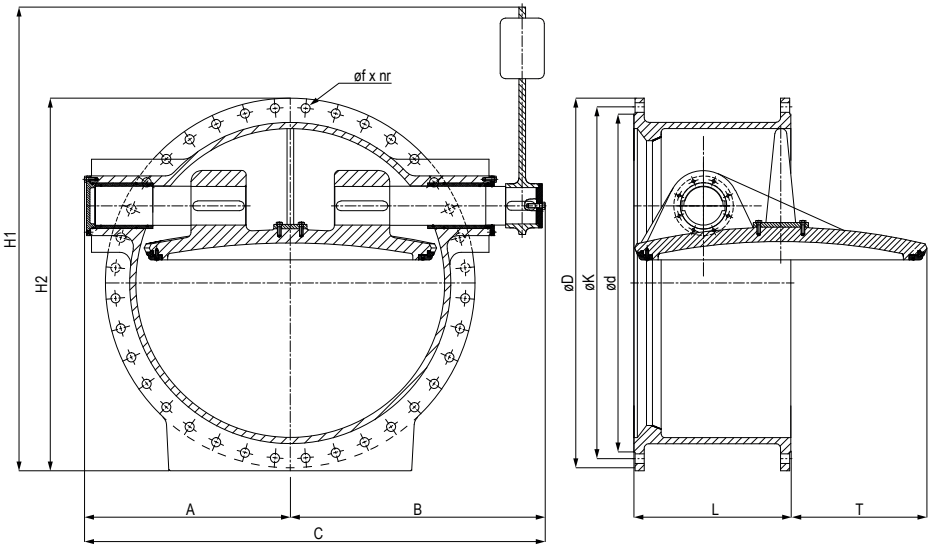
COMPONENTS DESCRIPTION fig.221-221A-222



ITEM	DESCRIPTION	MATERIALS	STANDARDS
1	BOLT	GALVANIZED STEEL CL. 8.8 (OPT. A2-70)	EN 898-1
2	COVER	DUCTILE IRON EN GJS-400-15	EN 1563
3	BEARING	BRONZE G-CuSn5Zn5Pb3	EN 1982
4	STEM IN S.S.	X20Cr13 AISI420 (OPT. AISI304, AISI316,AISI431)	EN 10088-3
5	DISC	DUCTILE IRON EN GJS-500-7	EN 1563
6	BODY	DUCTILE IRON EN GJS-500-7	EN 1563
7	KEY	STEEL (OPT. AISI316, AISI420)	-
8	DRIVING SHAFT IN S.S.	X20Cr13 AISI420 (OPT. AISI304, AISI316,AISI431)	EN 10088-3
9	O-RING	EPDM	EN 681-1
10	COVER	BRONZE G-CuSn5Zn5Pb3	EN 1982

ITEM	DESCRIPTION	MATERIALS	STANDARDS
11	KEY	STEEL (OPT. AISI316, AISI420)	-
12	COVER	DUCTILE IRON EN GJS-500-7	EN 1563
13	SCREW	STAINLESS STEEL A2-70 AISI304	EN 898-1
14	SEAL RETAINER RING	DUCTILE IRON EN GJS-400-15	EN 1563
15	SEAL RING	EPDM	EN 681-1
16	BODY SEAT	STAINLESS STEEL AISI316L	EN 10088-3
17	STOPPER	STEEL	-
18	BOLT	GALVANIZED STEEL CL. 8.8 (OPT. A2-70)	EN 898-1
19	COUNTERWEIGHT	DUCTILE IRON EN GJS-400-15	EN 1563
20	ARM COUNTERWEIGHT	DUCTILE IRON EN GJS-400-15	EN 1563

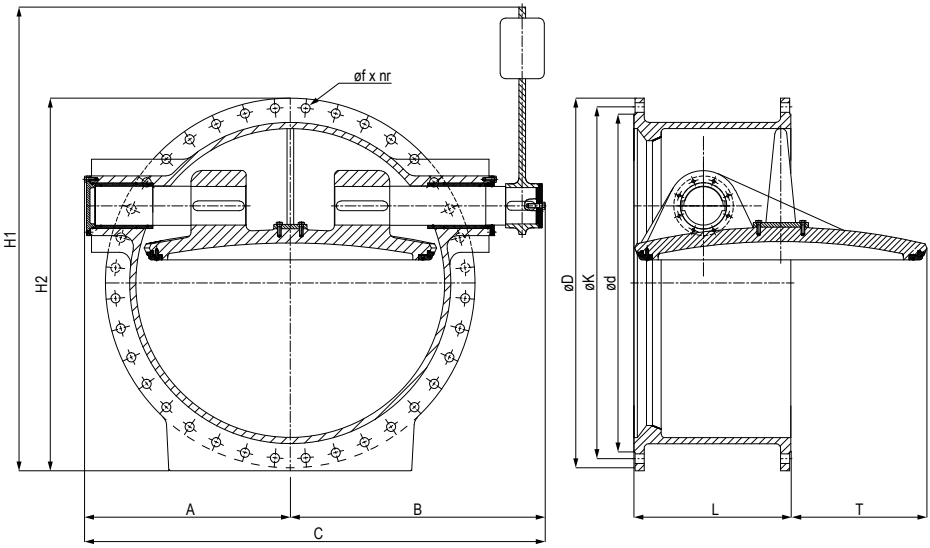
VALVE DIMENSIONS fig.221



EN 558 (S14)								*DRILLING FLANGES EN1092-2 PN10*						*WEIGHT**
DN	*L*	*A**	*B**	*C**	*T**	*H1**	*H2**	*øD*	*øK*	*øf*	*nr*	*M*	*ød*	*Kg*
150	210	175	240	415	-	365	300	285	240	23	8	M20	211	41
200	230	185	260	445	-	535	355	340	295	23	8	M20	266	67
250	250	215	285	500	44	575	410	395	350	23	12	M20	319	85
300	270	250	350	600	69	613	460	445	400	23	12	M20	370	120
350	290	280	390	670	101	755	520	505	460	23	16	M20	429	140
400	310	315	425	740	124	798	580	565	515	28	16	M24	480	145
450	330	350	465	815	140	935	630	615	565	28	20	M24	530	185
500	350	365	480	845	165	980	685	670	620	28	20	M24	582	200
600	390	430	560	990	215	1155	795	780	725	31	20	M27	682	500
700	430	480	630	1110	255	1338	910	895	840	31	24	M27	794	630
800	470	560	715	1275	314	1523	1030	1015	950	34	24	M30	901	750
900	510	620	755	1375	359	1698	1130	1115	1050	34	28	M30	1001	1030
1000	550	740	865	1605	405	1780	1245	1230	1160	37	28	M33	1112	1600
1200	630	850	1050	1900	530	2043	1470	1455	1380	41	32	M36	1328	2980
1400	710	935	1140	2075	617	2403	1690	1675	1590	44	36	M39	1530	3500
1500	750	1020	1225	2300	491	2483	1800	1785	1700	44	36	M39	1640	3500
1600	790	1045	1285	2340	648	2573	1930	1915	1820	50	40	M45	1750	4000

** INDICATIVE DIMENSIONS*

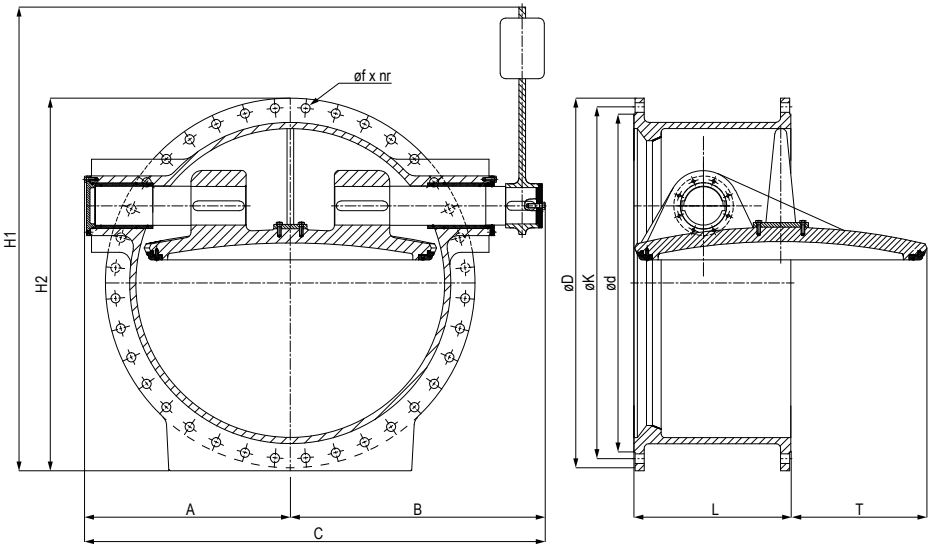
VALVE DIMENSIONS fig.221A



EN 558 (S14)								*DRILLING FLANGES EN1092-2 PN16*						*WEIGHT**
DN	*L*	*A**	*B**	*C**	*T**	*H1**	*H2**	*øD*	*øK*	*øf*	*nr*	*M*	*ød*	*Kg*
150	210	175	240	415	-	365	300	285	240	23	8	M20	211	41
200	230	185	260	445	-	535	355	340	295	23	12	M20	266	67
250	250	215	285	500	44	590	430	405	355	28	12	M24	319	85
300	270	250	350	600	69	620	475	460	410	28	12	M24	370	125
350	290	280	390	670	101	762	535	520	470	28	16	M24	429	195
400	310	315	425	740	124	805	595	580	525	31	16	M27	480	225
450	330	350	465	815	140	947	655	640	585	31	20	M27	548	265
500	350	365	480	845	165	1003	730	715	650	34	20	M30	609	297
600	390	430	560	990	215	1185	855	840	770	37	20	M33	720	624
700	430	480	630	1110	255	1345	925	910	840	37	24	M33	794	680
800	470	560	715	1275	314	1528	1040	1025	950	41	24	M36	901	820
900	510	620	755	1375	359	1703	1140	1125	1050	41	28	M36	1001	1320
1000	550	740	865	1605	405	1793	1270	1255	1170	44	28	M39	1112	2000
1200	630	850	1050	1900	530	2058	1500	1485	1390	50	32	M45	1328	3740
1400	710	935	1140	2075	617	2408	1700	1685	1590	50	36	M45	1530	4580
1500	750	1020	1225	2300	491	2500	1835	1820	1710	57	36	M52	1640	4580
1600	790	1045	1285	2340	648	2580	1945	1930	1820	57	40	M52	1750	5470

** INDICATIVE DIMENSIONS*

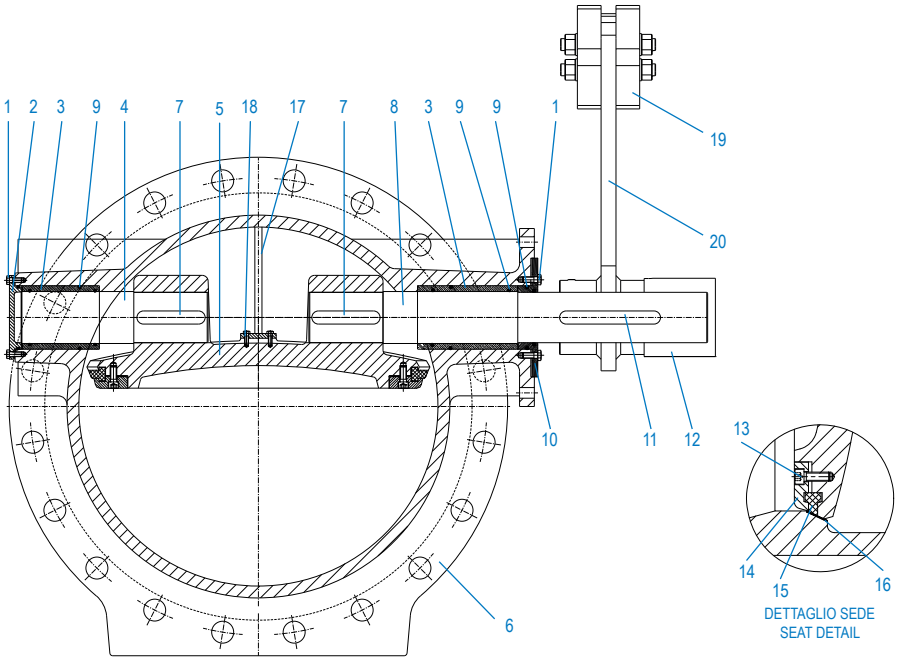
VALVE DIMENSIONS fig.222



	EN 558 (S14)							DRILLING FLANGES EN1092-2 PN25					
DN	L	A*	B*	C*	T*	H1*	H2*	øD	øK	øf	nr	M	ød
150	210	175	240	415	-	372	315	300	250	28	8	M24	211
200	230	185	260	445	-	545	375	360	310	28	12	M24	274
250	250	215	285	500	44	590	440	425	370	31	12	M27	330
300	270	250	350	600	69	633	500	485	430	31	16	M27	389
350	290	280	390	670	101	780	570	555	490	34	16	M30	448
400	310	315	425	740	124	825	635	620	550	37	16	M33	503
450	330	350	465	815	140	962	685	670	600	37	20	M33	548
500	350	365	480	845	165	1010	745	730	660	37	20	M33	609
600	390	430	560	990	215	1188	860	845	770	41	20	M36	720
700	430	480	630	1110	255	1370	975	960	875	44	24	M39	820
800	470	560	715	1275	314	1558	1100	1085	990	50	24	M45	928
900	510	620	755	1375	359	1733	1200	1185	1090	50	28	M45	1028
1000	550	740	865	1605	405	1825	1335	1320	1210	57	28	M52	-
1200	630	850	1050	1900	530	2080	1545	1530	1420	57	32	M52	1350
1400	710	935	1140	2075	617	2443	1770	1755	1640	62	36	M56	1560
1500	750	1020	1225	2300	491	2523	1880	1865	1750	62	36	M56	1678
1600	790	1045	1285	2340	648	2603	1990	1975	1860	62	40	M56	1780

** INDICATIVE DIMENSIONS*

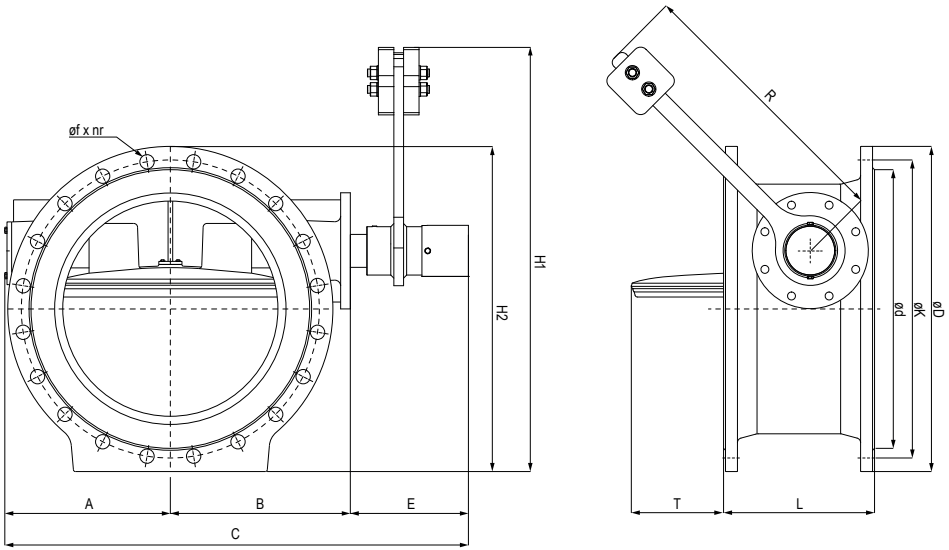
COMPONENTS DESCRIPTION fig.F221-F221A-F222



ITEM	DESCRIPTION	MATERIALS	STANDARDS
1	BOLT	GALVANIZED STEEL CL. 8.8 (OPT. A2-70)	EN 898-1
2	COVER	DUCTILE IRON EN GJS-400-15	EN 1563
3	BEARING	BRONZE G-CuSn5Zn5Pb3	EN 1982
4	STEM IN S.S.	X20Cr13 AISI420 (OPT. AISI304, AISI316,AISI431)	EN 10088-3
5	DISC	DUCTILE IRON EN GJS-500-7	EN 1563
6	BODY	DUCTILE IRON EN GJS-500-7	EN 1563
7	KEY	STEEL (OPT. AISI316, AISI420)	-
8	DRIVING SHAFT IN S.S.	X20Cr13 AISI420 (OPT. AISI304, AISI316,AISI431)	EN 10088-3
9	O-RING	EPDM	EN 681-1
10	COVER	BRONZE G-CuSn5Zn5Pb3	EN 1982

ITEM	DESCRIPTION	MATERIALS	STANDARDS
11	KEY	STEEL (OPT. AISI316, AISI420)	-
12	COVER	CARBON STEEL S355JR	EN 10025
13	SCREW	STAINLESS STEEL A2-70 AISI304	EN 898-1
14	SEAL RETAINER RING	DUCTILE IRON EN GJS-400-15	EN 1563
15	SEAL RING	EPDM	EN 681-1
16	BODY SEAT	STAINLESS STEEL AISI316L	EN 10088-3
17	STOPPER	STEEL	-
18	BOLT	GALVANIZED STEEL CL. 8.8 (OPT. A2-70)	EN 898-1
19	COUNTERWEIGHT	CARBON STEEL S355JR	EN 10025
20	ARM COUNTERWEIGHT	CARBON STEEL S355JR	EN 10025

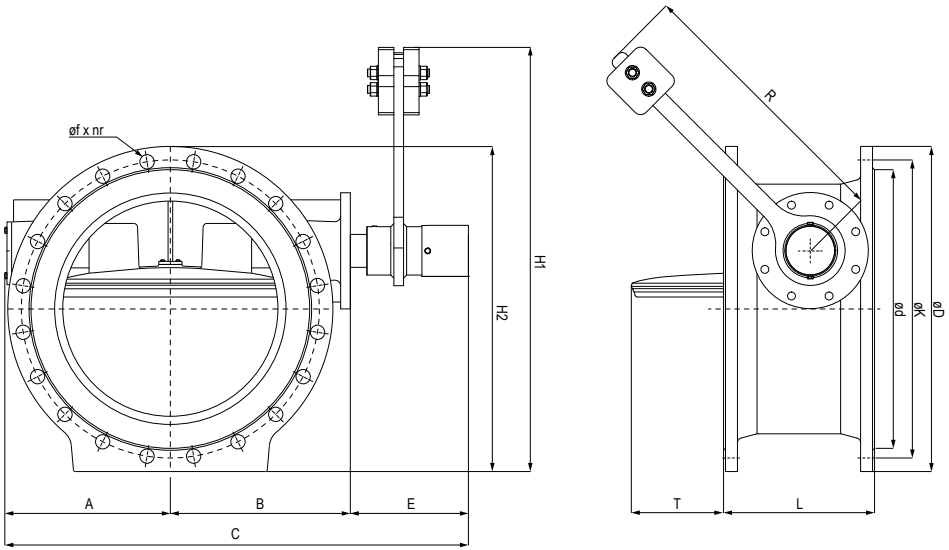
VALVE DIMENSIONS fig.221



	EN 558 S14									DRILLING FLANGES EN1092-2 PN10						WEIGHT*
DN	L	A*	B*	E*	C*	T*	R*	H1*	H2*	øD	øK	øf	nr	M	ød	Kg
150	210	175	173	164	512	-	300	382	300	285	240	23	8	M20	211	43
200	230	185	202	163	550	-	300	432	340	340	295	23	8	M20	266	70
250	250	215	230	163	608	44	395	484	410	395	350	23	12	M20	319	89
300	270	250	265	175	690	69	395	588	463	445	400	23	12	M20	370	126
350	290	280	300	239	819	101	395	635	530	505	460	23	16	M20	429	147
400	310	315	295	236	846	124	395	678	580	565	515	28	16	M24	480	152
450	330	350	378	268	996	140	395	698	640	615	565	28	20	M24	530	194
500	350	365	405	266	1036	165	395	767	717	670	620	28	20	M24	582	210
600	390	430	465	305	1200	215	710	1071	840	780	725	31	20	M27	682	525
700	430	480	515	304	1299	255	710	1141	910	895	840	31	24	M27	794	662
800	470	560	560	303	1423	314	710	1218	1030	1015	950	34	24	M30	901	788
900	510	620	628	300	1548	359	900	1435	1138	1115	1050	34	28	M30	1001	1082
1000	550	740	730	404	1784	405	900	1512	1255	1230	1160	37	28	M33	1112	1680
1200	630	850	860	409	2119	530	1000	1758	1495	1455	1380	41	32	M36	1328	3129
1400	710	935	950	419	2304	617	1000	1905	1688	1675	1590	44	36	M39	1530	3675
1600	790	1045	1075	433	2553	648	1000	2106	1938	1915	1820	50	40	M45	1750	4200

** INDICATIVE DIMENSIONS*

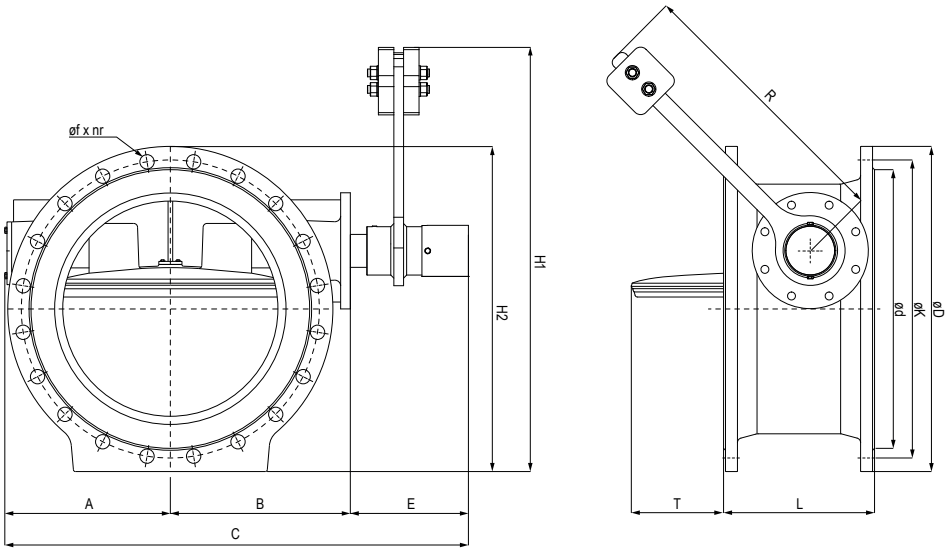
VALVE DIMENSIONS fig.221A



	EN 558 S14									DRILLING FLANGES EN1092-2 PN16						WEIGHT*
DN	L	A*	B*	E*	C*	T*	R*	H1*	H2*	øD	øK	øf	nr	M	ød	Kg
150	210	175	173	164	512	-	300	382	300	285	240	23	8	M20	211	43
200	230	185	202	163	550	-	300	432	340	340	295	23	12	M20	266	70
250	250	215	230	163	608	44	395	484	410	405	355	28	12	M24	319	89
300	270	250	265	175	690	69	395	588	463	460	410	28	12	M24	370	131
350	290	280	300	239	819	101	395	635	530	520	470	28	16	M24	429	205
400	310	315	295	236	846	124	395	678	580	580	525	31	16	M27	480	236
450	330	350	378	268	996	140	395	698	640	640	585	31	20	M27	548	278
500	350	365	405	266	1036	165	395	767	717	715	650	34	20	M30	609	312
600	390	430	465	305	1200	215	710	1071	840	840	770	37	20	M33	720	655
700	430	480	515	304	1299	255	710	1141	910	910	840	37	24	M33	794	714
800	470	560	560	303	1423	314	710	1218	1030	1025	950	41	24	M36	901	761
900	510	620	628	300	1548	359	900	1435	1138	1125	1050	41	28	M36	1001	1386
1000	550	740	730	404	1784	405	900	1512	1255	1255	1170	44	28	M39	1112	2100
1200	630	850	860	409	2119	530	1000	1758	1495	1485	1390	50	32	M45	1328	3927
1400	710	935	950	419	2304	617	1000	1905	1688	1685	1590	50	36	M45	1530	4809
1600	790	1045	1075	433	2553	648	1000	2106	1938	1930	1820	57	40	M52	1750	5744

** INDICATIVE DIMENSIONS*

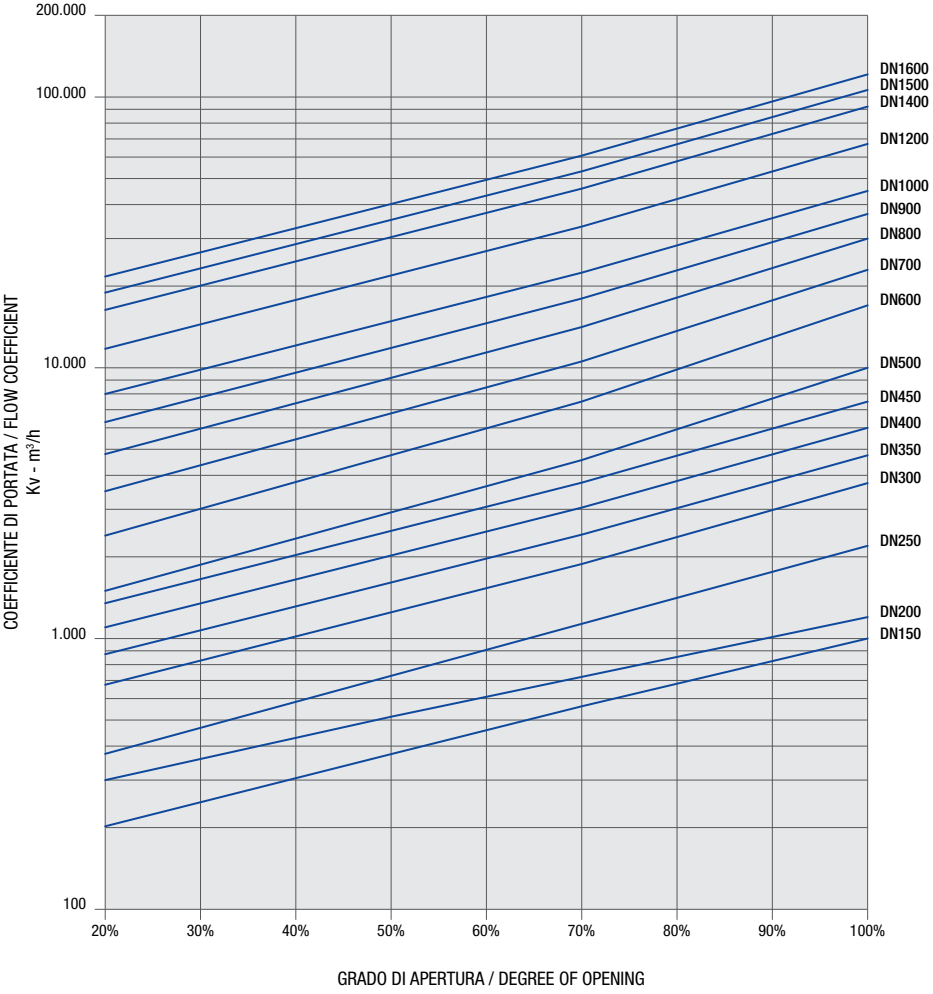
VALVE DIMENSIONS fig.222



	EN 558 S14									DRILLING FLANGES EN1092-2 PN25					
DN	L	A*	B*	E*	C*	T*	R*	H1*	H2*	øD	øK	øf	nr	M	ød
150	210	175	173	164	512	-	300	382	300	300	250	28	8	M24	211
200	230	185	202	163	550	-	300	432	340	340	310	28	12	M24	274
250	250	215	230	163	608	44	395	484	410	410	370	31	12	M27	330
300	270	250	265	175	690	69	395	588	463	463	430	31	16	M27	389
350	290	280	300	239	819	101	395	635	530	530	490	34	16	M30	448
400	310	315	295	236	846	124	395	678	580	580	550	37	16	M33	503
450	330	350	378	268	996	140	395	698	640	615	600	37	20	M33	548
500	350	365	405	266	1036	165	395	767	717	717	660	37	20	M33	609
600	390	430	465	305	1200	215	710	1071	840	840	770	41	20	M36	720
700	430	480	515	304	1299	255	710	1141	910	910	875	44	24	M39	820
800	470	560	560	303	1423	314	710	1218	1030	1030	990	50	24	M45	928
900	510	620	628	300	1548	359	900	1435	1138	1138	1090	50	28	M45	1028
1000	550	740	730	404	1784	405	900	1512	1255	1255	1210	57	28	M52	-
1200	630	850	860	409	2119	530	1000	1758	1495	1495	1420	57	32	M52	1350
1400	710	935	950	419	2304	617	1000	1905	1688	1688	1640	62	36	M56	1560
1600	790	1045	1075	433	2553	648	1000	2106	1938	1975	1860	62	40	M56	1780

** INDICATIVE DIMENSIONS*

FLOW COEFFICIENT DIAGRAM



FULL OPENING HYDRAULIC SPECIFICATIONS

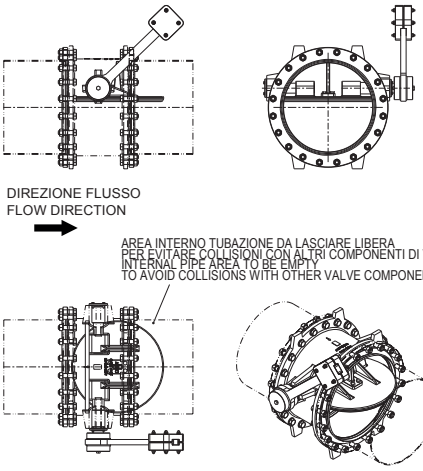
DN	*150*	*200*	*250*	*300*	*350*	*400*	*450*	*500*	*600*	*700*	*800*	*900*	*1000*	*1200*	*1400*	*1500*	*1600*
Kv [m3/h]	1000	1200	2200	3750	4750	6000	7500	10000	17000	23000	30000	37000	45000	67100	92200	106200	121200

INSTALLATION

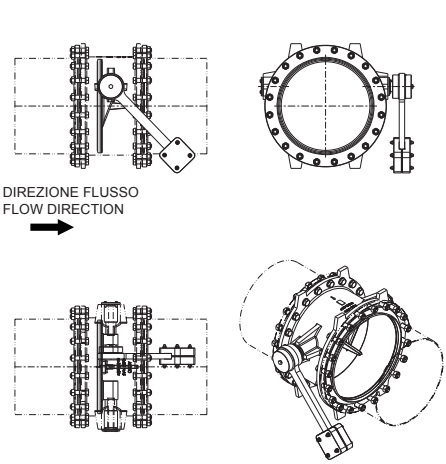
WARNING! The regulations described refer to the installation and use of the valve, and must be strictly observed for the functioning and safety of the system.

- Before installation, verify whether the valve complies with the technical prescription of the design (diameter, pressure, temperature and material grade). Clean the sealing flanges, the pipeline, the valve, the sealing surface and the work surface area. Use running water or compressed air.
- During the installation, verify the alignment of the pipelines, the flanges parallelism, the distance between them and the flange holes dimensions.
- Note that the cast iron valves do not take over the misalignments. Valves installed in misaligned networks may determine deformations, which could affect the sealing and generate body cracks damaging the valve. For this reasons pipes without supports shall be temporally supported by interim horizontal supports.
- Fasten the bolts on the flanges using a tightening torque. Especially for metal flanges, make sure the fixed bolt do not exceed the necessary tension. For this reason, it is highly recommended to use the torque wrench and to oil the bolts with a suitable lubricant.
- During installation, please follow the installation layout on page 17.
- Before installation, consider the necessary space to facilitate the assembling/dismantling and maintenance operations.
- Install the valve so that the arrow on the body corresponds to the flow direction.
- Install the valve in a horizontal position. The valve can be installed in vertical position upon agreement of our Technical Dept.
- During the installation, the valve must be completely closed.
- Max working pressure PFA: 10 bar (PN10), 16 bar (PN16-25).

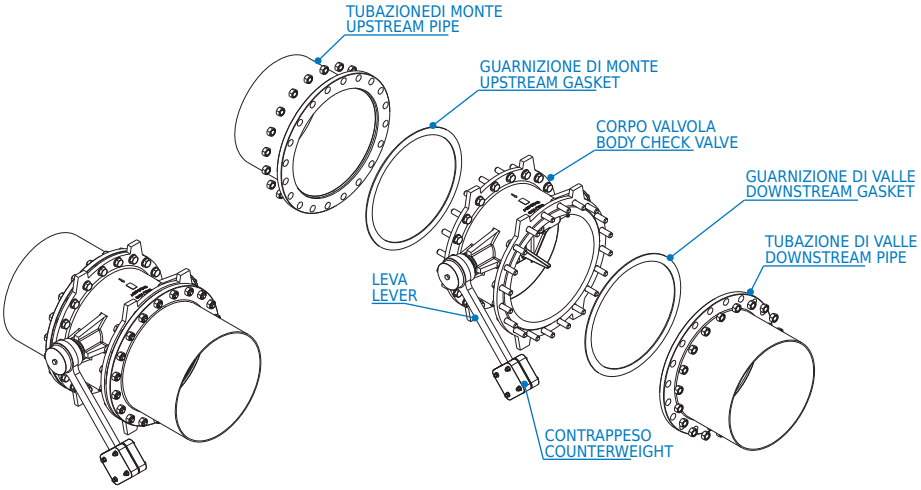
OPEN VALVE



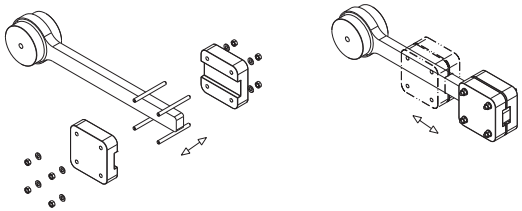
CLOSE VALVE

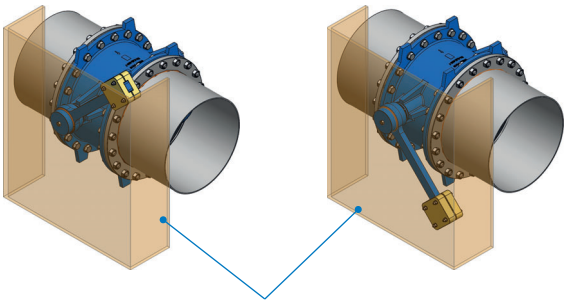


INSTALLATION LAYOUT



SISTEMA CONTRAPPESI COMPONIBILE E RIPOSIZIONABILE
MODULAR AND PLACING COUNTERWEIGHT SYSTEM





PROTEZIONE NON COMPRESA NELLA FORNITURA
PROTECTION BOX NOT INCLUDED IN THE SUPPLY

MAINTENANCE

AC.MO S.r.l. slanted check valves are maintenance free due to their construction.
During manufacturing teflon sliding film is applied to the bearing bushings.

WARNING! For any maintenance operation disassemble the valve from the pipeline.

REPLACEMENT OF THE SEAL RING

- Turn the disc until the seal ring moves from the seat.
- Remove the seal clamping flange bolts.
- Remove the seal ring.
- Clean the seats.
- Fix the new seal ring.
- Fix the flange bolts.
- Close the disc.
- Check the seal ring and the seat adhere perfectly.

SPARE PARTS

ITEM	*QTY*	*DESCRIPTION*	*MATERIALS*
15	1	SEAL RING	EPDM
4-8	1	STEM	STAINLESS STEEL
3	1	BEARING	BRONZE
14	1	SEAL RETAINER RING	DUCTILE IRON
9	1	KIT O-RINGS	EPDM

Member of the AVK group

Headquarters:
31056 Roncade (TV) - Italy - Via T. da Modena, 28 - Z.I.
tel +390422840220 r.a. - fax +390422840923
info@acmospa.com

Legal Office:
00136 Roma - Italy - Via Franco Michelini Tocci, 93
tel +39066628238 - fax +39066628335
inforoma@acmospa.com

www.acmosrl.com