



Cryogenic Axial Flow Check Valve

Technical brochure

COMPANY PROFILE

AMPO is an **international leader** in highly engineered valves for the most severe applications and industries as well as in stainless steel and high alloy castings.

Through our AMPO SERVICE team **we guarantee a prompt response** to customer needs wherever they are throughout the world: technical support in start-up stages, equipment selection, predictive and preventive maintenance, training, etc.



Fully inhouse
manufacturing
process



Worldwide
references



Project based
on people



Innovative
spirit



700+
people



In more than
60 countries



Most important
partners in the industry



Cutting edge
technologies



Our commitment:
the best service



Customer
focus



Since
1964



Notified Body No. 0038
Certificate No. 003

American Petroleum Institute
Certificate No. 80-0175
Certificate No. 80-1447

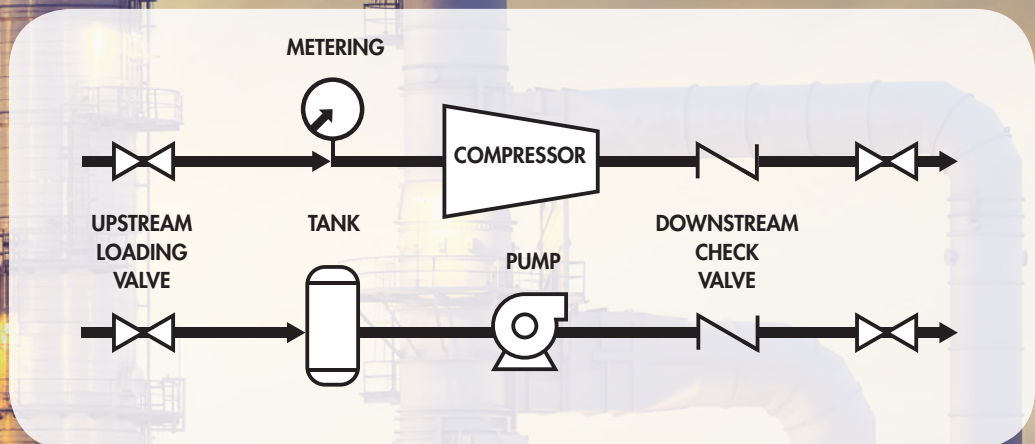


APPLICATION

Cryogenic service valves main applications are focused in LNG and LPG terminals and transportation ships. AMPO manufactures valves for the complete LNG and LPG chain, as gas is obtained from gas cameras, transportation pipelines, liquefaction, carrier vessels, FPSO's, regasification terminals, peak saving plants, storage tanks, etc. Moreover, our valves are also used for low temperatures, offering the best solution for applications such as: Ethylene, Oxygen, Nitrogen, petrochemical plants, special processes on refineries, etc.

As a result of over 30 years of experience in the manufacturing of cryogenic valves, AMPO POYAM VALVES is the leading manufacturer of high specification valves for the LNG market, especially with top entry or split body cryogenic ball valves, cryogenic butterfly valves as well as cryogenic gate, globe and check valves.

CRYOGENIC AXIAL FLOW CHECK VALVES are mainly used to protect rotating equipment and systems in cryogenic services such as LNG and LPG terminals and transportation ships, Ethylene, Oxygen, Nitrogen and petrochemical plants, etc.



CRYOGENIC AXIAL FLOW CHECK VALVE



AXIAL FLOW CHECK VALVE

CHARACTERISTICS

Sizes: 4" up to 36"

Pressure: 150 LBS up to 2500 LBS

Temperature: Down to -196°C

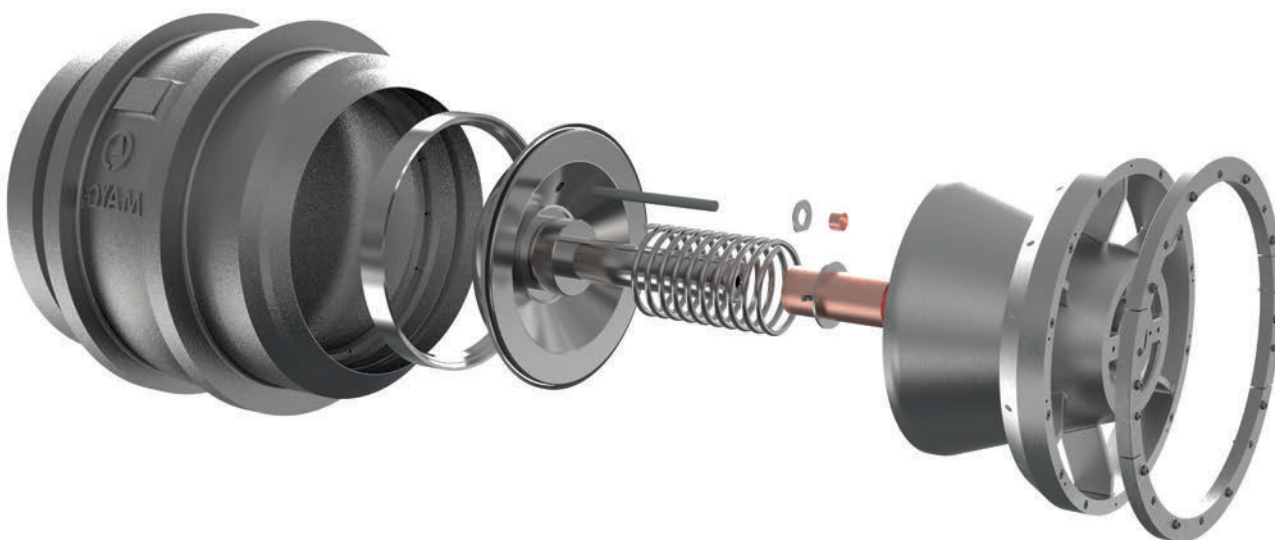
Standards: API 6D, ASME B.16.34, ASME B.16.5, ASME B.16.25

Fire safe certificate as per API 607 and API 6FA

Materials: CF3, CF3M, CF8, CF8C, CF8M, CG8M,

End connections: BW, RF, FF, NPT, RTJ, SW; CLAMPS

Actuation: SPRING ACTIVATED



WHY CHOOSE OUR AXIAL FLOW CHECK VALVE?



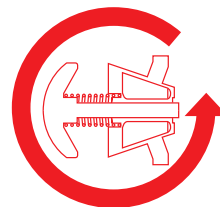
RELIABLE SOLUTION:

- Minimum pressure loss
- Stable operation & water hammer effect avoidance
- Dynamic behavior



ZERO EMISSIONS:

- The absence of a bonnet or any other openings to the environment ensures zero emissions (No leakpath to atmosphere)

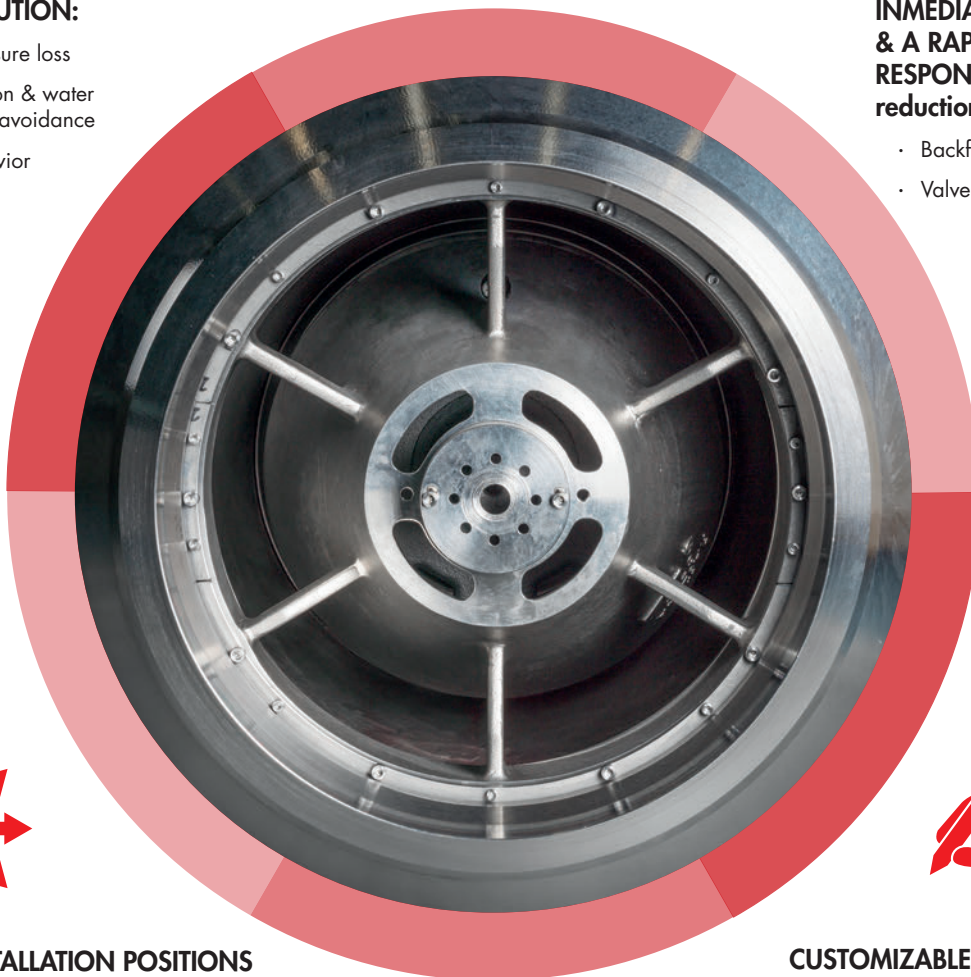


IMMEDIATE DISC REACTION & A RAPID SELF-DAMPENING RESPONSE to noticeable flow reductions, limiting:

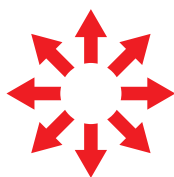
- Backflow
- Valve slamming



COMPACT AND LIGHTWEIGHT DESIGN



STREAMLINED FLOW PATH FOR QUIET OPERATION



FLEXIBILITY IN INSTALLATION POSITIONS & EASE OF INSTALLATION AND SERVICE:

- The AMPO axial flow check valve is suitable for installation in a horizontal, vertical or inclined position.



MAINTENANCE FREE & LONG SERVICE LIFE DESIGN:

- Due to its non-slam design, the valve is not subjected to extreme shocks associated with typical asymmetric valve designs.
- The valve has no soft parts, seals or o-rings which would wear, cause misalignment or need replacing.
- The metal-to-metal disc seat seal achieves tight shut-off with 100% reliability.

CUSTOMIZABLE DESIGN:

- The spring is designed for each project and application, considering fluid/flow properties of each service. Moreover, wide variety of materials are available for body and trim components.



Total reliability and
high performance

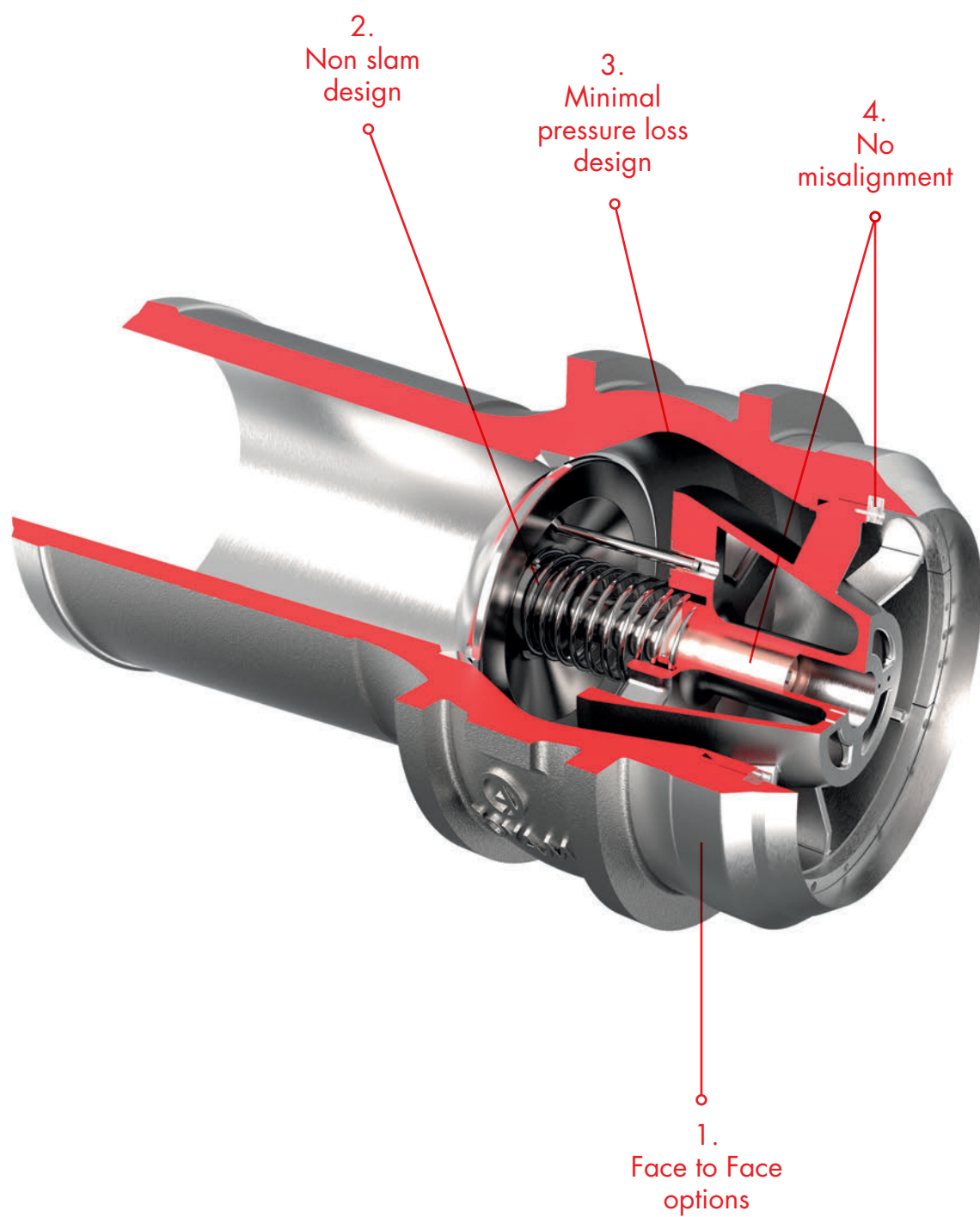


Minimum
maintenance costs



Optimization in spare
parts management

TECHNICAL FEATURES



1. FACE TO FACE OPTIONS:

Short pattern (AMPO standard) and long pattern (API 6D standard) face to face options are available.

Both options achieve the same mechanical and fluid-dynamic characteristics.

Short Pattern



Long Pattern



2. NON SLAM DESIGN:

The design allows the disc to be always in the optimum position:

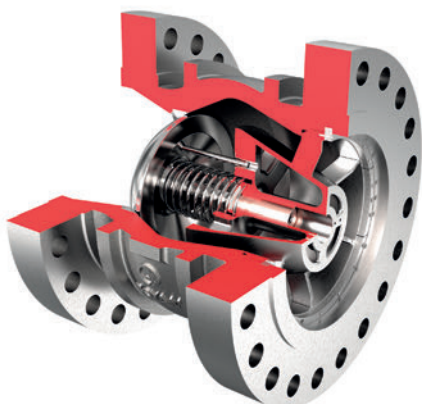
- Fully opened at normal flow.
- Proportionally more closed as the flow reduces.
- Fully closed if there is any attempt of reversal flow.

When fluid velocity decreases, and the force pressing on the valve disc diminishes, the helical spring which is designed specifically for each process and application, will move the disc towards the closed position.

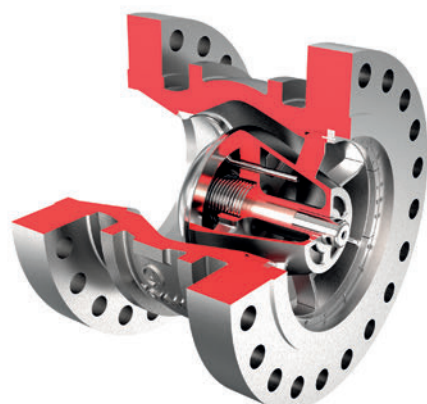
The shock waves that are usually generated inside a pipe when a fluid is stopped brusquely by an object such as a valve disc, cause the WATER HAMMER EFFECT. As a result of this effect, noise, vibration and hammering pipe sounds can lead to equipment damages.

With the spring assisted AMPO POYAM VALVES' Axial Check Valve this effect is eliminated or greatly minimized.

Close



Open



AMPO POYAM VALVES' Axial Check Valve do not require gravity or fluid flow for its closure operation. Instead of that, as the forward velocity of the fluid slows, the spring assist on the valve starts to close the disc.

By the time the forward velocity of the fluid decreased to zero, the valves' disc has reached the seat and the valve is closed, due to the spring assist, the disc must move.

Consequently, with reverse flow removed, the forces required to produce water hammer on both the upstream and downstream sides of the valves are entirely eliminated.

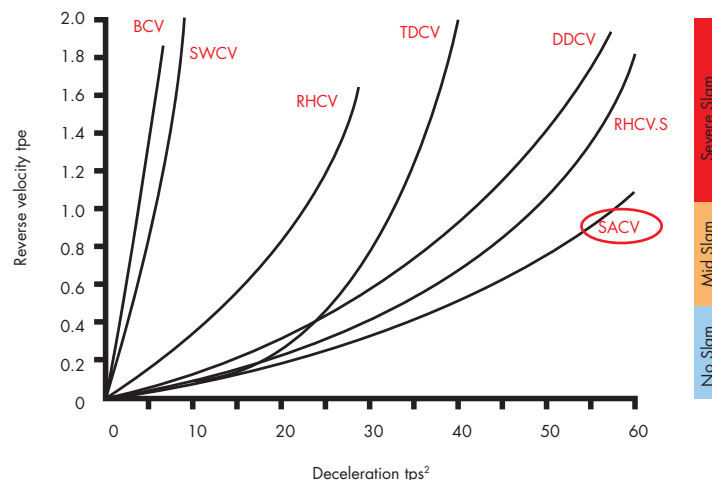
3. MINIMAL PRESSURE LOSS DESIGN:

Valves are designed to guarantee the minimum pressure loss through the valve.

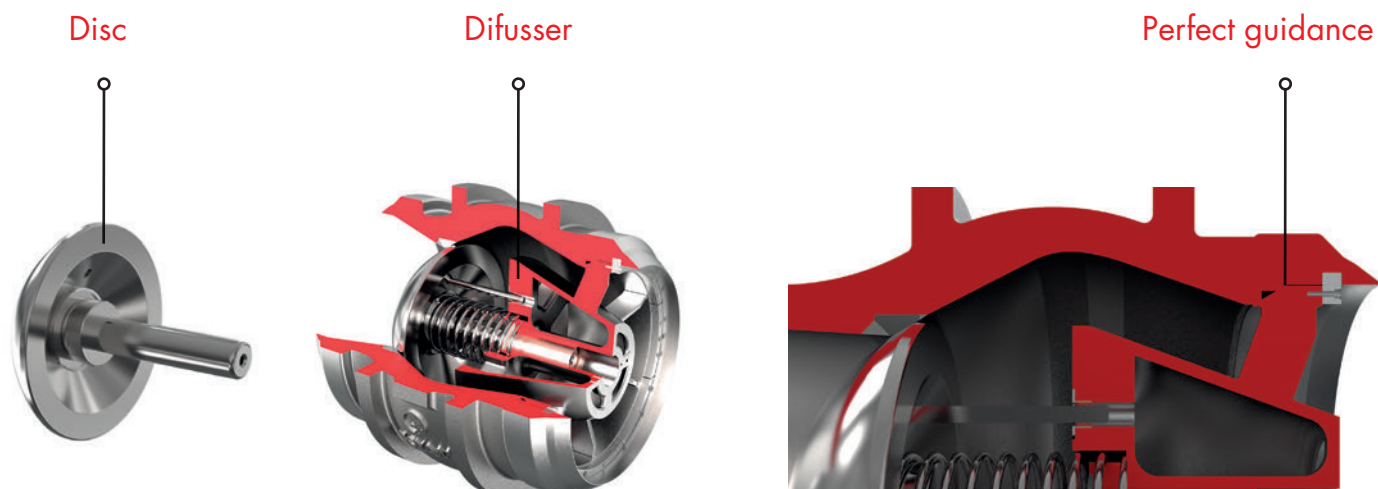
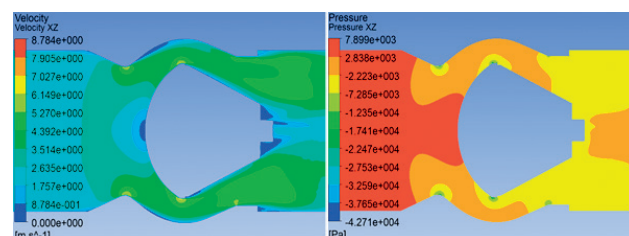
- The internal profile of the valve body and the disc are designed to closely follow the precisely contoured surface of the diffuser.
- The velocity of the fluid will increase as it approaches the constricting throat of the valve.

4. NO MISALIGNMENT:

Zero possibilities for misalignment due to a perfect guidance between the diffuser and the body. Moreover, the disc and the stem are manufactured in an unique piece with an accurate machining.

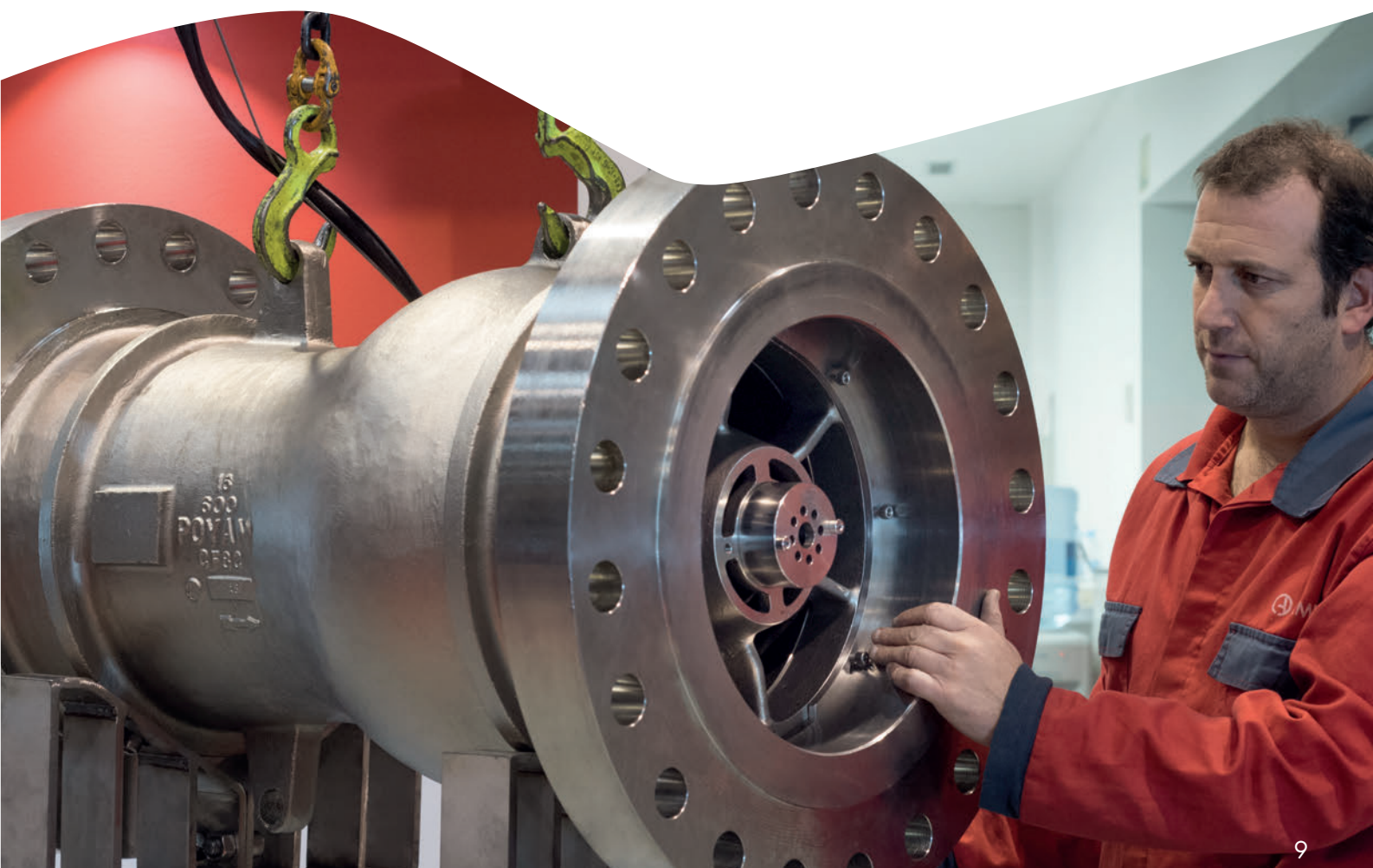
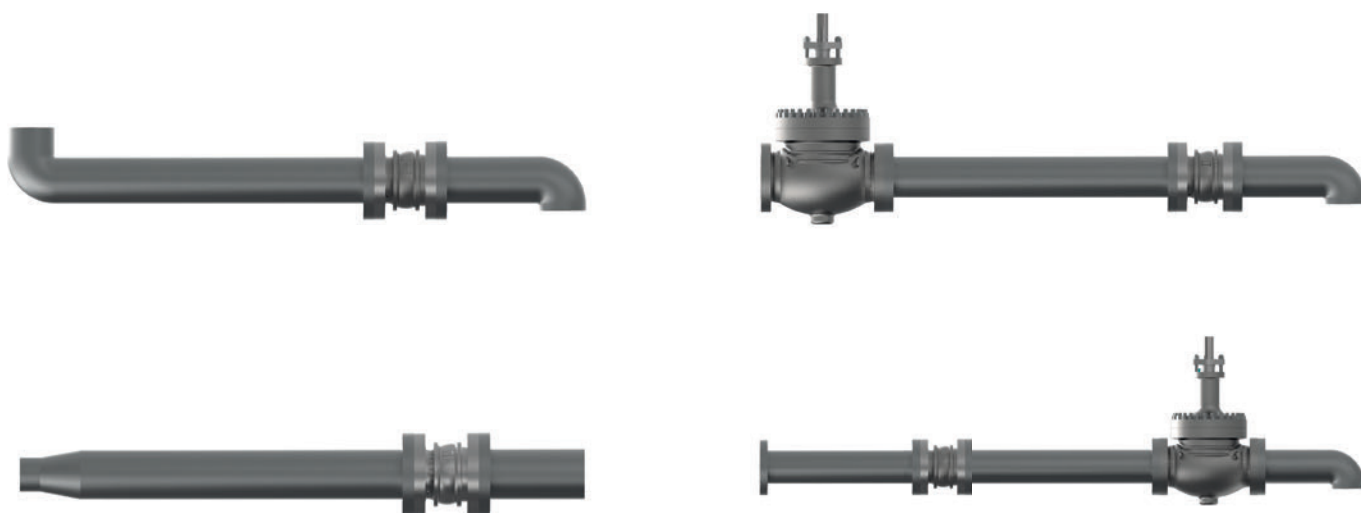


BCV (ball check valve), DDCV (dual disc check valve), RHCv (resilient hinge check valve), RHCv.S (resilient hinge check valve with spring), SACV (silent oxid check valve), SWCV (swing check valve), TDCV (tilted disc check valve).



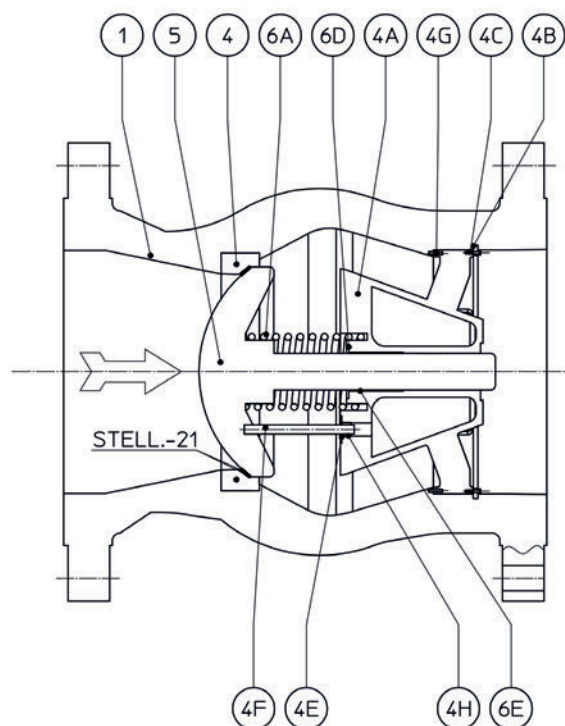
5. INSTALLATION GUIDELINES FOR EQUIPMENT PROTECTION:

In order to guarantee an excellent protection of equipments and the reliability of our valves, AMPO POYAM VALVES Engineering team provides technical guidelines for a proper installation of Axial Flow check valves, based on each customer requirements.



MATERIAL SELECTION

RF & RTJ DESIGN Sample drawing



CF8M-316 MATERIAL

NO.	PART	MATERIAL
1	BODY	ASTM A 351 CF8M
4	SEAT	ASTM A 479 Gr. 316 / ASTM A 351 CF8M + STELL.-21
4A	DIFFUSER	ASTM A 351 CF8M
4B	RETAINING RING	ASTM A 479 Gr. 316
4C	SOCKET BOLT	ASTM A 479 Gr. 316
4E	WASHER	ASTM A 479 Gr. 316
4F	PIN	ASTM A 479 Gr. 316
4G	PIN	ASTM A 479 Gr. 316
4H	BUSHING	316 + PTFE
5	DISC	ASTM A 351 CF8M + STELL.-21
6A	SPRING	INCONEL X-750
6D	WASHER	ASTM A 479 Gr. 316
6E	BUSHING	316 + PTFE

CF8-304 MATERIAL

NO.	PART	MATERIAL
1	BODY	ASTM A 351 CF8
4	SEAT	ASTM A 479 Gr. 304 / ASTM A 351 CF8 + STELL.-21
4A	DIFFUSER	ASTM A 351 CF8
4B	RETAINING RING	ASTM A 479 Gr. 304
4C	SOCKET BOLT	ASTM A 479 Gr. 304
4E	WASHER	ASTM A 479 Gr. 304
4F	PIN	ASTM A 479 Gr. 304
4G	PIN	ASTM A 479 Gr. 304
4H	BUSHING	316 + PTFE
5	DISC	ASTM A 351 CF8 + STELL.-21
6A	SPRING	INCONEL X-750
6D	WASHER	ASTM A 479 Gr. 304
6E	BUSHING	316 + PTFE

CF3M-316L MATERIAL

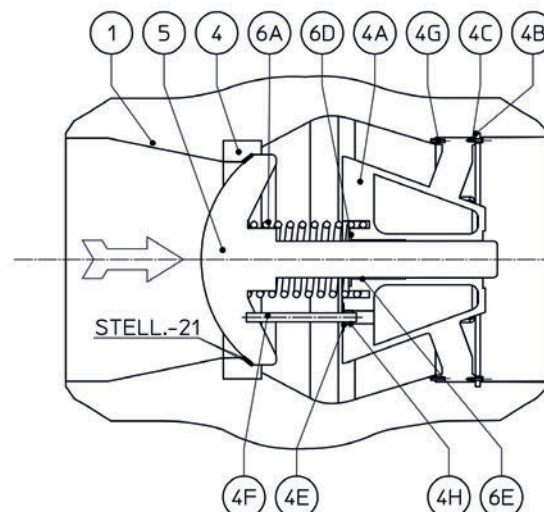
NO.	PART	MATERIAL
1	BODY	ASTM A 351 CF3M
4	SEAT	ASTM A 479 Gr. 316L / ASTM A 351 CF3M + STELL.-21
4A	DIFFUSER	ASTM A 351 CF3M
4B	RETAINING RING	ASTM A 479 Gr. 316L
4C	SOCKET BOLT	ASTM A 479 Gr. 316L
4E	WASHER	ASTM A 479 Gr. 316L
4F	PIN	ASTM A 479 Gr. 316L
4G	PIN	ASTM A 479 Gr. 316L
4H	BUSHING	316 + PTFE
5	DISC	ASTM A 351 CF3M + STELL.-21
6A	SPRING	INCONEL X-750
6D	WASHER	ASTM A 479 Gr. 316L
6E	BUSHING	316 + PTFE

CF3-304L MATERIAL

NO.	PART	MATERIAL
1	BODY	ASTM A 351 CF3
4	SEAT	ASTM A 479 Gr. 304L / ASTM A 351 CF3 + STELL.-21
4A	DIFFUSER	ASTM A 351 CF3
4B	RETAINING RING	ASTM A 479 Gr. 304L
4C	SOCKET BOLT	ASTM A 479 Gr. 304L
4E	WASHER	ASTM A 479 Gr. 304L
4F	PIN	ASTM A 479 Gr. 304L
4G	PIN	ASTM A 479 Gr. 304L
4H	BUSHING	316 + PTFE
5	DISC	ASTM A 351 CF3 + STELL.-21
6A	SPRING	INCONEL X-750
6D	WASHER	ASTM A 479 Gr. 304L
6E	BUSHING	316 + PTFE

BW DESIGN

Sample drawing



CF8M-316 MATERIAL

NO.	PART	MATERIAL
1	BODY	ASTM A 351 CF8M
4	SEAT	ASTM A 479 Gr. 316 / ASTM A 351 CF8M + STELL.-21
4A	DIFFUSER	ASTM A 351 CF8M
4B	RETAINING RING	ASTM A 479 Gr. 316
4C	SOCKET BOLT	ASTM A 479 Gr. 316
4E	WASHER	ASTM A 479 Gr. 316
4F	PIN	ASTM A 479 Gr. 316
4G	PIN	ASTM A 479 Gr. 316
4H	BUSHING	316 + PTFE
5	DISC	ASTM A 351 CF8M + STELL.-21
6A	SPRING	INCONEL X-750
6D	WASHER	ASTM A 479 Gr. 316
6E	BUSHING	316 + PTFE

CF8-304 MATERIAL

NO.	PART	MATERIAL
1	BODY	ASTM A 351 CF8
4	SEAT	ASTM A 479 Gr. 304 / ASTM A 351 CF8 304 + STELL.-21
4A	DIFFUSER	ASTM A 351 CF8
4B	RETAINING RING	ASTM A 479 Gr. 304
4C	SOCKET BOLT	ASTM A 479 Gr. 304
4E	WASHER	ASTM A 479 Gr. 304
4F	PIN	ASTM A 479 Gr. 304
4G	PIN	ASTM A 479 Gr. 304
4H	BUSHING	316 + PTFE
5	DISC	ASTM A 351 CF8 + STELL.-21
6A	SPRING	INCONEL X-750
6D	WASHER	ASTM A 479 Gr. 304
6E	BUSHING	316 + PTFE

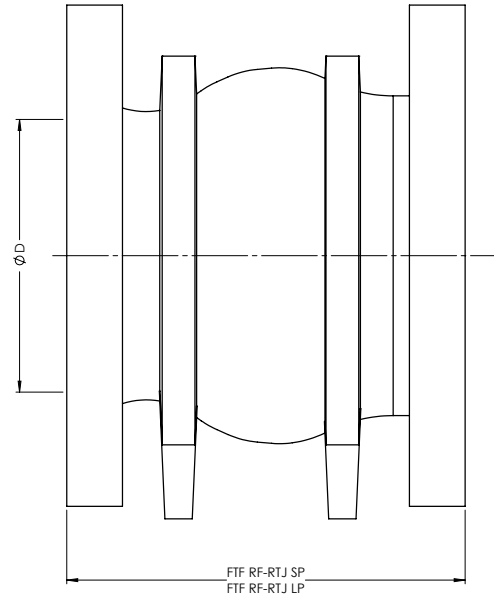
CF3M-316L MATERIAL

NO.	PART	MATERIAL
1	BODY	ASTM A 351 CF3M
4	SEAT	ASTM A 479 Gr. 316L / ASTM A 351 CF3M + STELL.-21
4A	DIFFUSER	ASTM A 351 CF3M
4B	RETAINING RING	ASTM A 479 Gr. 316L
4C	SOCKET BOLT	ASTM A 479 Gr. 316L
4E	WASHER	ASTM A 479 Gr. 316L
4F	PIN	ASTM A 479 Gr. 316L
4G	PIN	ASTM A 479 Gr. 316L
4H	BUSHING	316 + PTFE
5	DISC	ASTM A 351 CF3M + STELL.-21
6A	SPRING	INCONEL X-750
6D	WASHER	ASTM A 479 Gr. 316L
6E	BUSHING	316 + PTFE

CF3-304L MATERIAL

NO.	PART	MATERIAL
1	BODY	ASTM A 351 CF3
4	SEAT	ASTM A 479 Gr. 304L / ASTM A 351 CF3 + STELL.-21
4A	DIFFUSER	ASTM A 351 CF3
4B	RETAINING RING	ASTM A 479 Gr. 304L
4C	SOCKET BOLT	ASTM A 479 Gr. 304L
4E	WASHER	ASTM A 479 Gr. 304L
4F	PIN	ASTM A 479 Gr. 304L
4G	PIN	ASTM A 479 Gr. 304L
4H	BUSHING	316 + PTFE
5	DISC	ASTM A 351 CF3 + STELL.-21
6A	SPRING	INCONEL X-750
6D	WASHER	ASTM A 479 Gr. 304L
6E	BUSHING	316 + PTFE

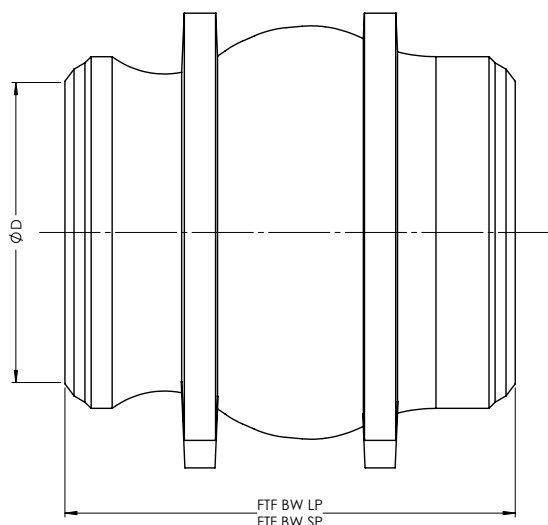
DIMENSIONAL TABLES



RF & RTJ DESIGNS

SIZE	FTF Short pattern RF	FTF Long pattern (API6D) RF	FTF Short pattern RTJ	FTF Long pattern (API6D) RTJ	Ø D	WEIGHT Short pattern	WEIGHT Long pattern (API6D)
150 LBS							
4	167	292	191	305	110	29	38
6	253	356	266	368	162	30	44
8	295	495	308	508	213	70	83
10	365	622	378	635	266	116	139
12	435	698	448	711	315	170	202
14	475	787	488	800	347	224	267
16	545	864	558	876	398	316	371
18	610	978	623	991	448	414	495
20	675	978	688	991	498	534	611
24	810	1295	823	1308	598	848	1029
28	945	1448	937	—	598	1325	—
30	1010	1524	999	—	695	1621	—
36	1215	1956	1186	—	898	2701	—
300 LBS							
4	171	356	184	371	110	30	36
6	253	444	269	460	162	60	71
8	295	533	311	549	211	98	118
10	365	622	381	638	260	162	192
12	435	711	451	727	311	245	287
14	475	838	491	854	342	342	407
16	545	864	561	879	390	447	522
18	610	978	626	994	441	585	690
20	675	1016	694	1035	488	757	873
24	810	1346	832	1368	589	1225	1488
28	945	1499	970	1524	685	1655	2032
30	1010	1594	1035	1619	736	1998	2463
600 LBS							
4	171	432	171	435	102	36	45
6	253	559	256	562	154	85	106
8	295	660	298	664	205	139	175
10	365	787	368	791	254	246	307
12	435	838	438	841	303	340	420
14	475	889	478	892	334	422	521
16	545	991	548	994	385	610	750
18	610	1092	613	1095	436	797	987
20	675	1194	681	1200	487	1042	1287
24	810	1397	819	1407	589	1647	2055
28	945	1600	958	1613	684	2465	3120
30	1010	1651	1023	1664	735	2894	3640

SIZE	FTF Short pattern RF	FTF Long pattern (API6D) RF	FTF Short pattern RTJ	FTF Long pattern (API6D) RTJ	Ø D	WEIGHT Short pattern	WEIGHT Long pattern (API6D)
900 LBS							
4	235	457	238	460	102	52	62
6	303	610	306	613	150	113	138
8	341	737	344	740	201	199	252
10	391	838	394	841	252	308	393
12	448	965	451	968	303	443	584
14	485	1029	494	1038	322	544	718
16	558	1130	610	1140	373	696	960
18	619	1219	632	1232	423	1021	1341
20	684	1321	697	1334	471	1323	1742
24	819	1549	838	1568	570	2196	2879
28	913	—	943	—	679	3244	—
30	970	—	1003	—	730	3805	—
1500 LBS							
4	235	546	238	549	100	72	90
6	300	705	306	711	144	170	218
8	335	832	344	841	192	288	384
10	385	991	394	1000	239	491	666
12	435	1130	451	1146	287	752	1033
14	475	1257	494	1276	315	997	1363
16	545	1384	567	1407	360	1389	1906
18	610	1537	632	1559	406	1815	2537
20	675	1664	697	1686	454	2468	3450
24	810	1943	838	1972	546	3822	5403
2500 LBS							
4	295	673	304	683	154	197	248
6	390	914	403	927	131	335	421
8	430	1022	446	1038	179	512	681
10	540	1270	562	1292	223	970	1292
12	595	1422	617	1445	265	1360	1864
14	—	—	—	—	—	—	—
16	—	—	—	—	—	—	—
18	—	—	—	—	—	—	—
20	—	—	—	—	—	—	—
24	—	—	—	—	—	—	—



“Due to engineering activities, all the dimensions and weights could be subjected to changes by AMPO POYAM VALVES without any notification. Therefore, please consult us for confirmation on the below data as well as for other dimensions and weights not reported in the tables”.

BW DESIGN

SIZE	FTF Short pattern	FTF Long pattern (API6D)	Ø D	WEIGHT Short pattern	WEIGHT Long pattern (API6D)
150 LBS					
4	171	292	110	18	28
6	265	356	162	26	30
8	305	495	213	48	61
10	380	622	266	86	109
12	450	698	315	125	155
14	490	787	347	162	204
16	560	864	398	238	292
18	630	978	448	332	410
20	700	978	498	428	502
24	835	1295	598	703	880
28	975	1448	695	1069	1315
30	1045	1524	749	1332	1626
36	1250	1956	898	2222	2870
300 LBS					
4	148	356	110	20	24
6	265	444	162	30	41
8	305	533	211	53	72
10	380	622	260	95	125
12	450	711	311	149	190
14	490	838	342	210	275
16	560	864	390	282	356
18	630	978	441	384	487
20	700	1016	488	513	625
24	835	1346	590	856	1115
28	975	1499	692	1127	1498
30	1045	1594	742	1399	1863
600 LBS					
4	148	432	102	24	30
6	265	559	154	31	52
8	305	660	205	58	95
10	380	787	254	111	174
12	450	838	304	183	265
14	490	889	336	232	334
16	560	991	387	342	484
18	630	1092	438	473	665
20	700	1194	488	632	880
24	835	1397	590	1055	1471
28	975	1600	692	1695	2360
30	1045	1651	742	2063	2821

SIZE	FTF Short pattern	FTF Long pattern (API6D)	Ø D	WEIGHT Short pattern	WEIGHT Long pattern (API6D)
900 LBS					
4	238	457	102	35	41
6	306	610	154	46	62
8	344	737	202	72	126
10	394	838	254	124	213
12	451	965	304	197	342
14	494	1029	336	260	439
16	610	1130	387	418	511
18	632	1219	438	541	869
20	697	1321	488	732	1164
24	838	1549	590	1050	1755
28	943	—	692	1935	—
30	1003	—	742	2346	—
1500 LBS					
4	238	546	102	48	58
6	306	705	154	68	99
8	344	832	202	90	191
10	394	991	254	157	341
12	451	1130	304	255	545
14	494	1257	336	312	692
16	567	1384	387	507	1037
18	632	1537	438	745	1417
20	697	1664	488	1051	2036
24	838	1943	590	1474	3112
2500 LBS					
4	253	673	154	64	97.6
6	324	914	154	96.1	166
8	367	1022	202	122.9	317.4
10	424	1270	254	210.4	597.8
12	486	1422	304	298.6	890.9
14	532	—	336	402.5	—
16	610	—	387	611.7	—
18	682	—	438	868.1	—
20	752	—	488	1169.1	—
24	904	—	590	2025.7	—

AMPO SERVICE

- Predictive and preventive maintenance
- Technical support
- Technical training
- Valve condition monitoring
- Spare parts and valve supply

On-site support within the shortest time.

Experience in executing global maintenance service for complete projects.



Commitment made of steel

AMPO HEADQUARTERS

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Fax +34 943 188 130

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