

**METAL SEAT CONCENTRIC WAFER BUTTERFLY VALVES EXCELLENCE RANGE TTV
INCOMPLETE TIGHTNESS CARBON STEEL BODY**

Wafer butterfly valves TTV excellence range for closing or setting networks of high temperature smokes, powders.
Metal seat, incomplete tightness.
Carbon steel body, stainless steel disc up to DN100, ductile iron over and cast iron/aluminium handle.
Between flanges PN10, PN16 or Class 150 according to the DN.
Compatible with explosive atmosphere, ATEX Zone 1&21 and Zone 2&22 on request.
Handling possible with stainless steel handle, gearbox or, chain gearbox and stem extension.
Thanks to the ISO 5211 plate and the square stem, an actuator can be installed direct on the valve (up to DN400).



Size : DN40 to DN1400
Connection: Between flanges PN10/16 and Class 150 (PN20)
Min Temperature : -20°C
Max Temperature : +350°C
Max Pressure : 16 Bars up to DN300
Specifications : Long neck for isolation
 Wafer type
 Full crossing stem
 ISO 5211 direct mounting pad

Materials : Carbon steel body ASTM A216 WCB

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SPECIFICATIONS :

- Long neck for isolation
- ISO 5211 mounting pad
- Wafer type
- Between flanges PN10/16 and Class 150 (PN20) up to DN400 included (over on request)
- Between flanges PN10 from DN450 to DN1400
- Crossing stem
- **Incomplete tightness , loss factor : 2% of Kvs**
- Stainless steel disc up to DN100 included
- Ductile iron chromed disc over
- 9 positions lever, with locking device up to DN200 , stop in all positions but non lockable from DN250 to 300
- Stem extension 75 mm length (option)
- Square lever 30x30 mm for special key (option)
- Aluminium painting 50-60 microns thickness

USE :

- High temperature smokes, powders
- Min and max Temperature Ts : - 20°C to + 350°C
(* : higher temperature on request)
- Max Pressure Ps : 16 bars up to DN300 , 10 bars over
- **Not for steam**

RANGE :

- With lever from DN 40 to DN 300
- Naked stem from DN 350 to DN1400
- IP65 Gear box possible (**Ref. 1197**) from DN 40 to DN 1400
- IP65 chain gear box possible (**Ref. 1194**) from DN 40 to DN 500
- On request, stem extension with special length (**Ref. 98665**)
- On request, stainless steel lever and bolting (**Ref. 9831250-9831264**)

ENDS :

- Between flanges PN10-PN16 and Class 150 (PN20) up to DN400
- Between flanges PN10 from DN450 to DN 1400

TORQUE VALUES (in Nm without safety coefficient) at 10 Bars for temperature under 180°C :

DN	40	50	65	80	100	125	150	200	250	300	350	400
Torque (Nm)	5	5	5	5	5	10	10	15	25	35	35	45

DN	450	500	600	700	750	800	900	1000	1100	1200	1300	1400
Torque (Nm)	120	140	300	360	420	480	600	900	1000	1100	1200	1300

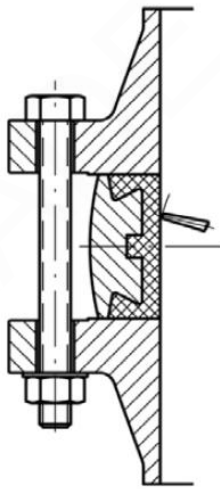
TORQUE VALUES (in Nm without safety coefficient) at 10 Bars for temperature over 180°C :

DN	40	50	65	80	100	125	150	200	250	300	350	400
Torque (Nm)	5	5	10	15	25	45	60	80	110	120	140	160

DN	450	500	600	700	750	800	900	1000	1100	1200	1300	1400
Torque (Nm)	250	300	450	950	1050	1100	1150	1200	1300	1800	1900	2000

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MAXIMUM TIGHTENING TORQUES FOR BOLTING FLANGES :



		Maximum torques (Nm)			
		5,6 / A307 Gr.B	8,8 / A193 B7	10,9	12,9
Bolting DN	Bolting types				
	M12 (1/2")	41,16	84,28	117,6	142,1
	M14 (9/16")	66,64	132,3	186,2	225,4
	M16 (5/8")	102,9	205,8	289,1	347,9
	M18 (3/4")	142,1	284,2	396,9	475,3
	M20 (3/4")	196	401,8	568,4	676,2
	M22 (7/8")	259,7	539	764,4	911,4
	M24 (1")	338,1	695,8	980	1176
	M27 (1"1/8)	499,8	1029	1470	1764
M30 (1"1/4)	666,4	1421	1960	2352	

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FLOW COEFFICIENT Kv (m³ / h) :

DN	Opening angle									
	0°	10°	20°	30°	40°	50°	60°	70°	80°	90°
32-40	2	3	5	10	16	26	48	35	35	35
50	3	10	11	19	39	61	75	61	61	61
65	5	12	15	27	47	64	94	109	109	109
80	7	14	22	47	72	118	179	246	246	246
100	10	16	29	59	96	143	195	265	345	345
125	14	39	51	110	173	253	357	500	598	598
150	19	45	69	149	281	302	498	702	1015	1072
200	21	61	138	260	427	638	910	1388	1751	1751
250	23	95	213	407	673	1015	1473	2062	2993	2993
300	34	135	310	508	990	1490	2135	3013	4224	4507
350	76	153	341	766	881	1772	2783	3963	6190	6199
400	88	202	563	1081	1785	2687	3856	5482	8368	8792
450	95	284	669	1287	2126	3198	4579	6526	9429	9429
500	142	314	624	1416	2563	3844	5597	8019	11830	12485
600	198	399	1057	2234	3645	5941	7865	10763	15020	15020
700	257	659	1555	3164	5342	8133	11737	16764	25947	26463
750	287	687	1847	3326	6946	8994	13121	18743	28002	30946
800	302	727	2172	4151	7011	10671	15411	22030	35819	35596
900	388	1144	2824	5318	8711	13070	18744	26600	40712	40712
1000	415	996	2979	6116	10370	15789	22827	32589	50452	50452
1100	501	1622	3682	7459	12441	19495	29186	36539	64101	68797
1200	588	1463	4280	8810	14944	22800	32970	40812	68309	75485
1300	664	2378	5293	10736	17255	28441	41241	53171	71746	84294
1400	874	2608	6127	11895	21341	31295	45385	65106	75811	117171

HEAD LOSS CALCULATIONS :

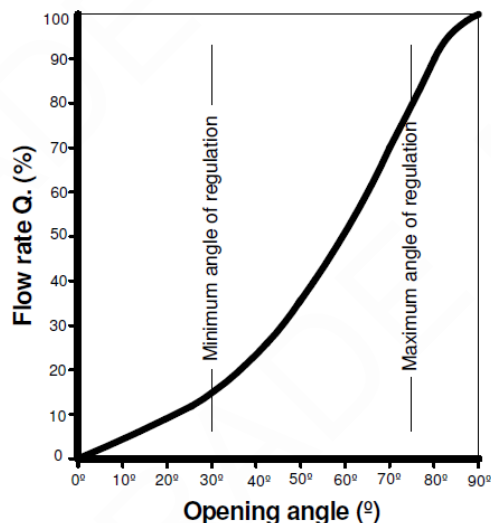
$$\Delta p = (Q / K_v)^2 \times SG$$

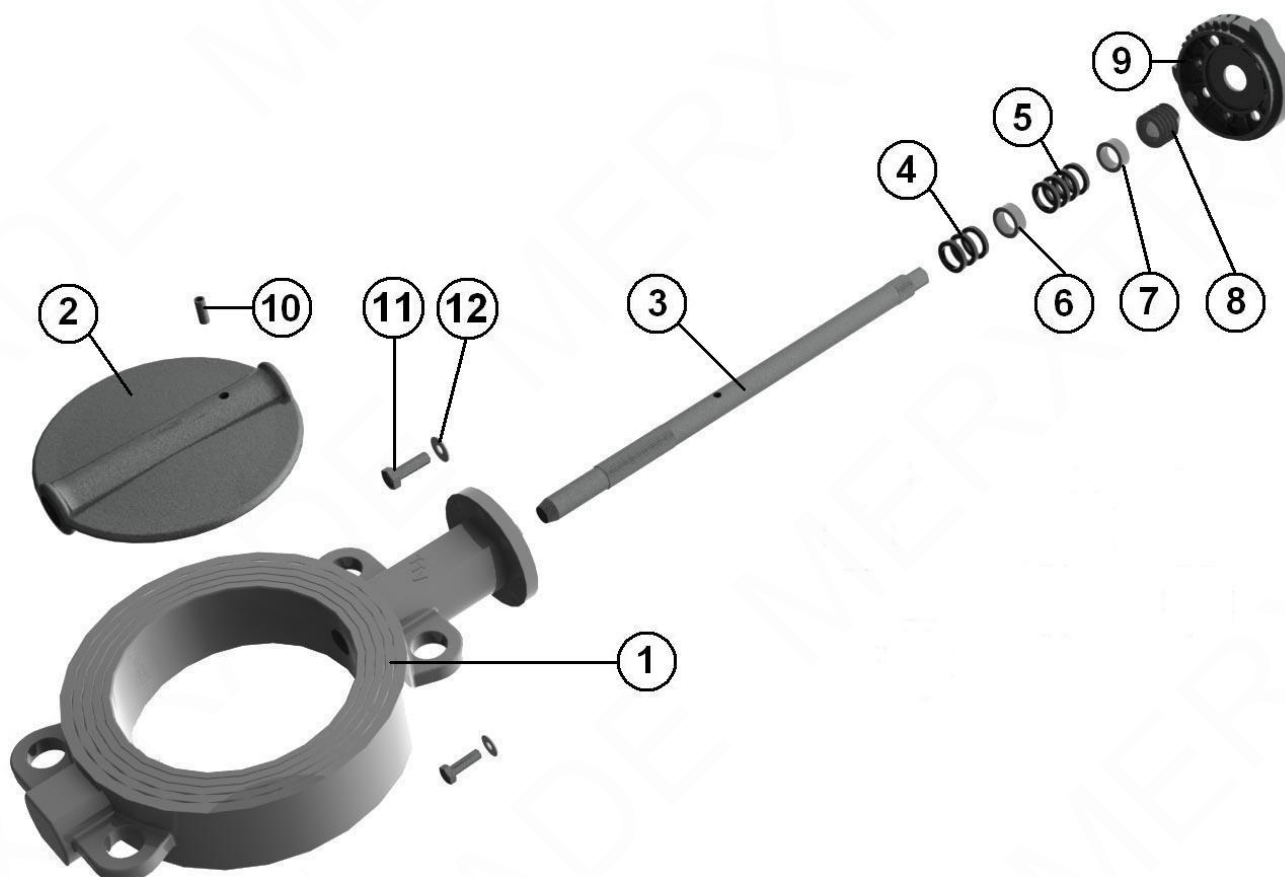
Q : flow in m³/h

Δp : Head loss in bar

SG : Specific gravity (= 1 for water)

Kv : Volume of water in m³/h, that will flow through a given restriction or valve opening with a pressure drop of 1 bar at 20°C)

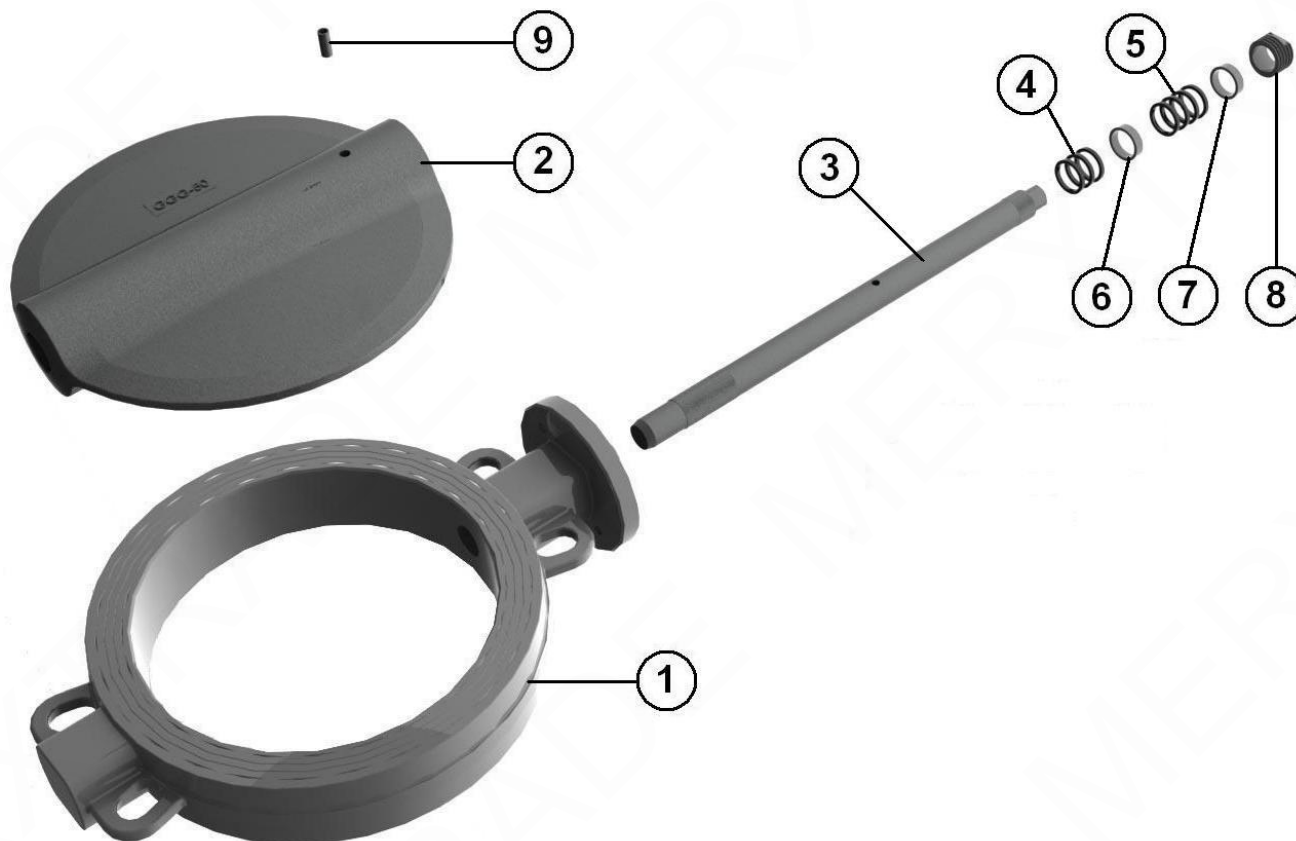


**METAL SEAT CONCENTRIC WAFER BUTTERFLY VALVES EXCELLENCE RANGE TTV
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MATERIALS DN 40 - 200 :


Item	Designation	Materials
1	Body	ASTM A216 WCB
2	Disc DN40-100	ASTM A351 CF8M
2	Disc DN125-200	Ductile iron EN GJS 500-7 chromed
3	Stem	AISI 420
4	Gasket	FILAM. GRAPHITE
5	Gasket	FILAM. GRAPHITE
6	Ring	BRONZE
7	Ring	BRONZE
8	Socket	5.6
9	Plate	ALUMINIUM
10	Pin	ST-34
11	Screw	5.6
12	Washer	Steel
	Lever	Aluminium ADC10 with epoxy painting 50µ thickness

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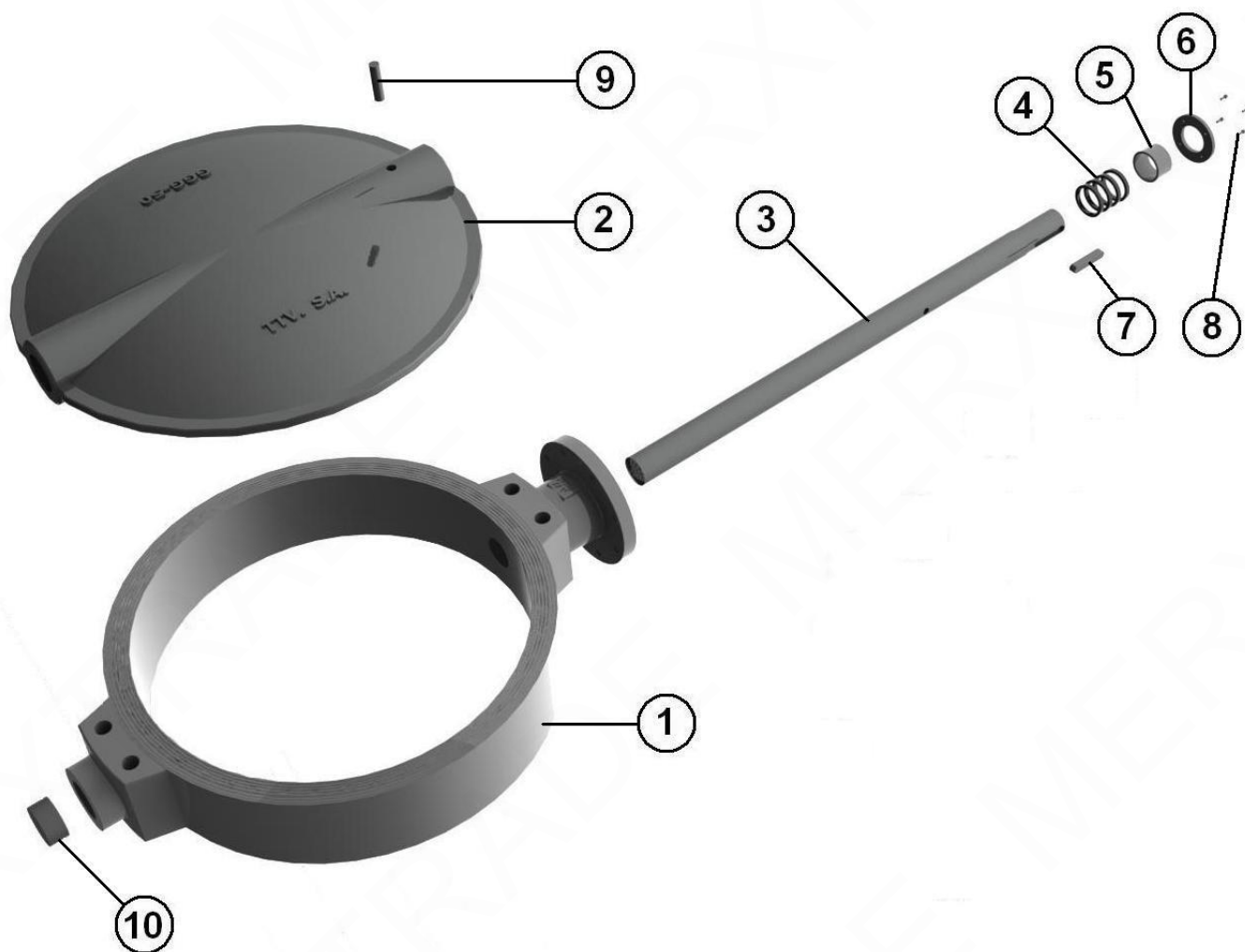
MATERIALS DN 250 - 400 :



Item	Designation	Materials
1	Body	ASTM A216 WCB
2	Disc	Ductile iron EN GJS 500-7 chromed
3	Stem	AISI 420
4	Gasket	FILAM. GRAPHITE
5	Gasket	FILAM. GRAPHITE
6	Ring	BRONZE
7	Ring	BRONZE
8	Socket	5.6
9	Pin	ST-34
Lever (up to DN300)		Ductile iron EN GJS-500-7 with epoxy painting 50µ thickness

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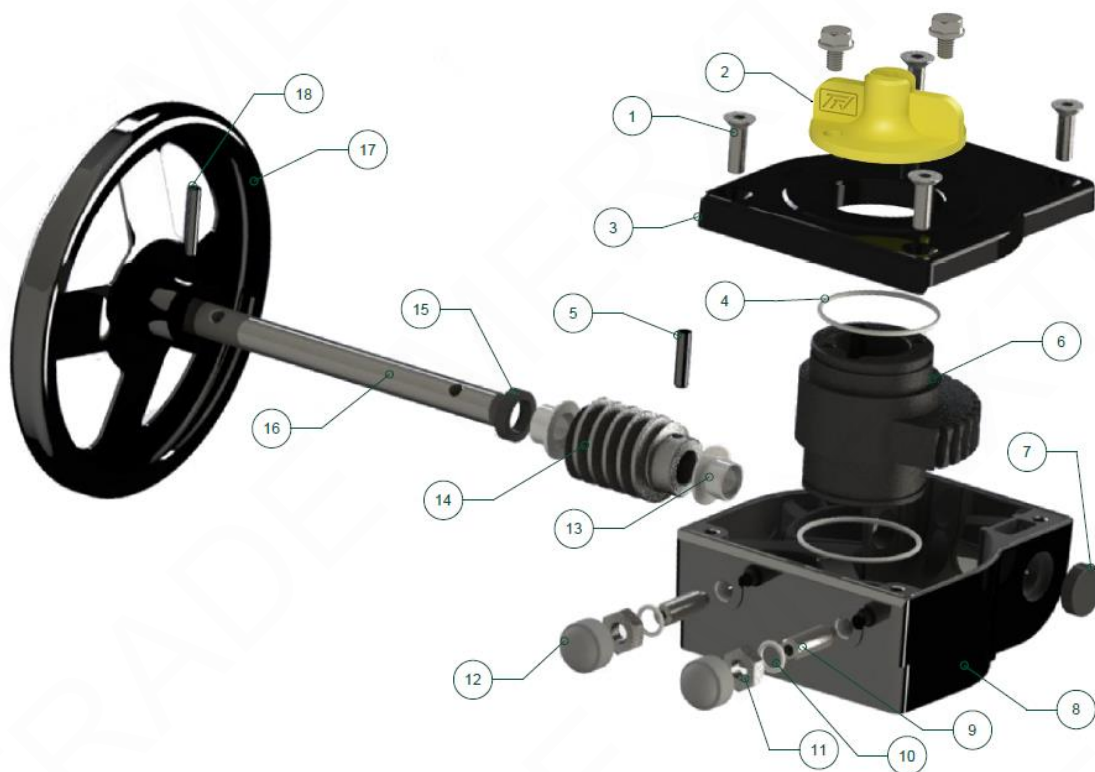
MATERIALS DN 450 - 1400 :



Item	Designation	Materials
1	Body	ASTM A216 WCB
2	Disc	Ductile iron EN GJS 500-7 chromed
3	Stem	AISI 420
4	Gasket	FILAM. GRAPHITE
5	Ring	BRONZE
6	Ring	BRONZE
7	Pin	AISI 420
8	Screw	5.6
9	Pin	ST-34
10	Ring	ASTM A216 WCB

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GEARBOX MATERIALS REF. 1197.:

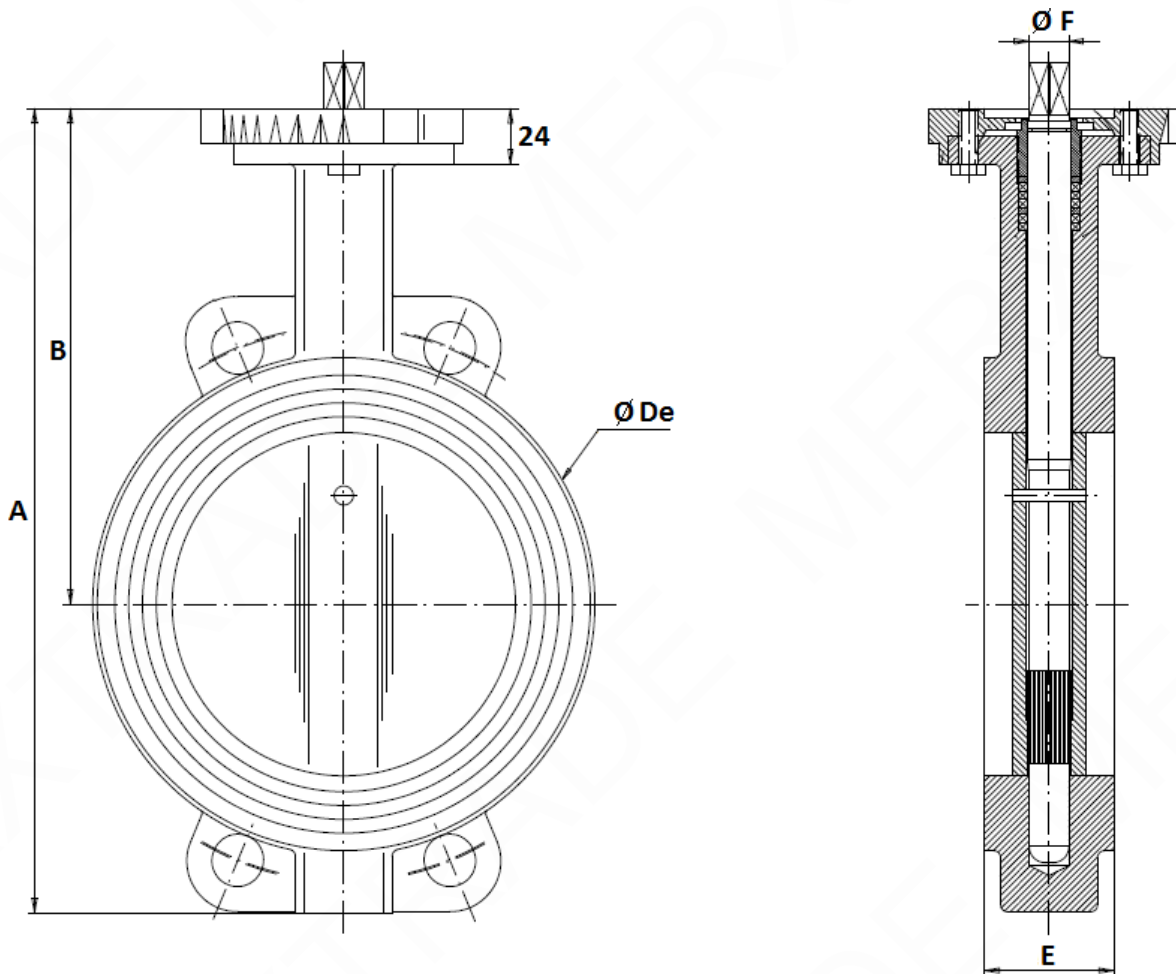


Item	Designation	Materials Ref. 1197
1	Screw	AISI 304
2	Indicator	PVC
3	Cover	Aluminium
4	O ring	NBR
5	Pin	Carbon steel
6	Quadrant	Ductile iron EN GJS-400-15
7	Gasket	NBR
8	Body	Aluminium
9	Adjusting bolt	Carbon steel
10	Washer	Galvanized steel
11	Nut	Galvanized steel
12	Cap	NBR 70
13	Bushing	Bronze
14	Worm	Carbon steel 45
15	Gasket	NBR
16	Shaft	Carbon steel 45
17	Handwheel	Carbon steel
18	Pin	Carbon steel

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SIZE (in mm) :

- **Valves DN 40 - 200 :**

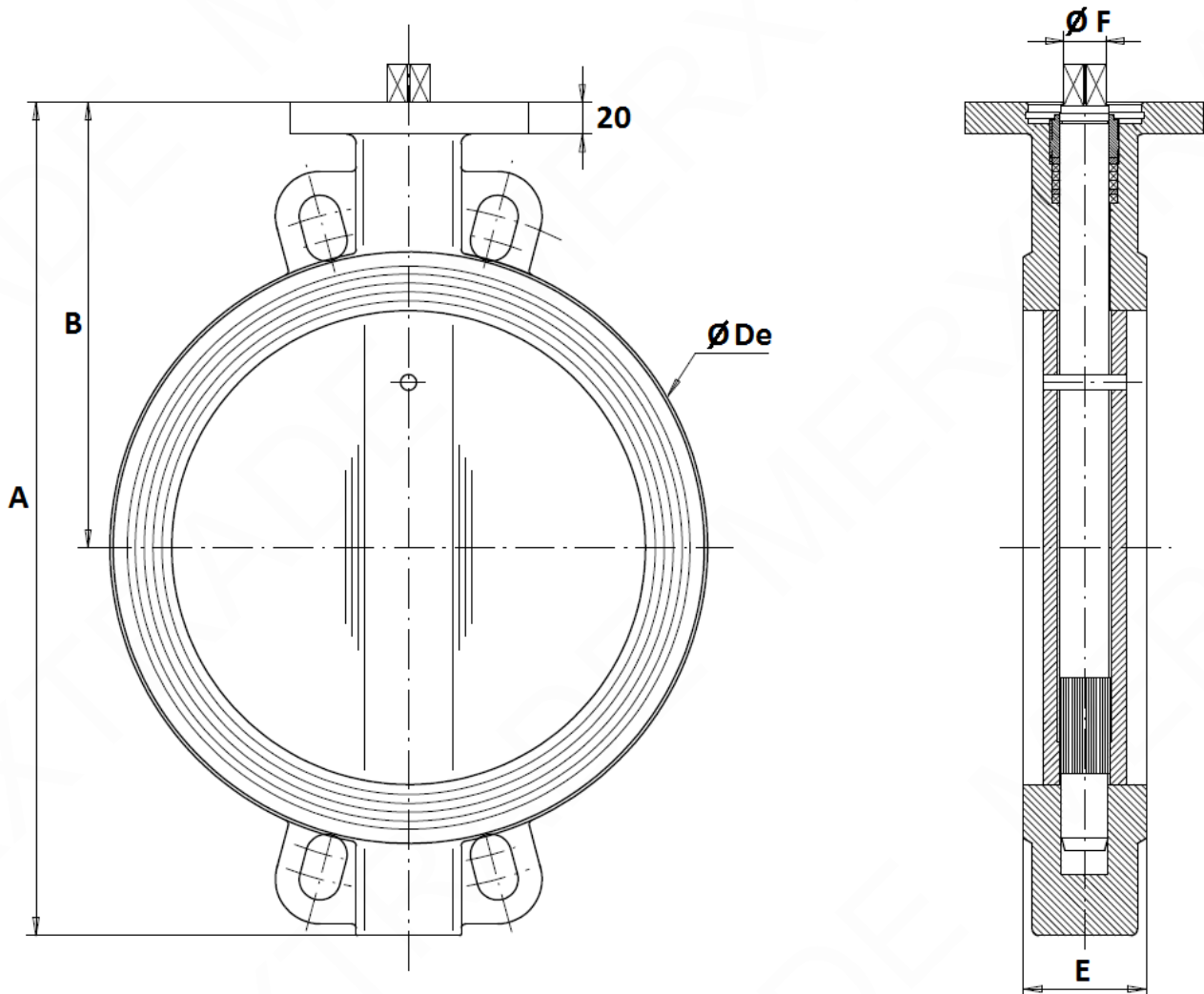


DN	40	50	65	80	100	125	150	200
A	205	228	248	265	298	331	349	430
B	140	156	161	169	187	206	215	255
Ø De	82	102	119	135	155	185	208	270
E	33	43	46	46	52	56	56	60
Ø F	9.5	9.5	12	14	14	17	17	21
Weight (Kg)	3.1	4.27	5.27	5.78	7.4	10.15	11.74	19.6

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SIZE (in mm) :

- **Valves DN 250 -400 :**

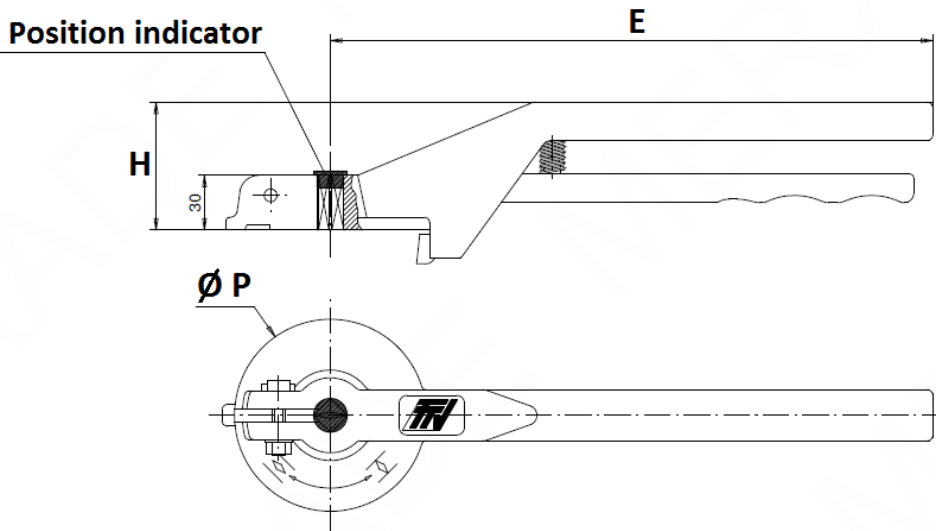


DN	250	300	350	400
A	461	524	570	644
B	248	280	300	340
Ø De	328	381	437	486
E	68	78	78	102
Ø F	23	26.5	26.5	33
Weight (Kg)	30	40	54	75

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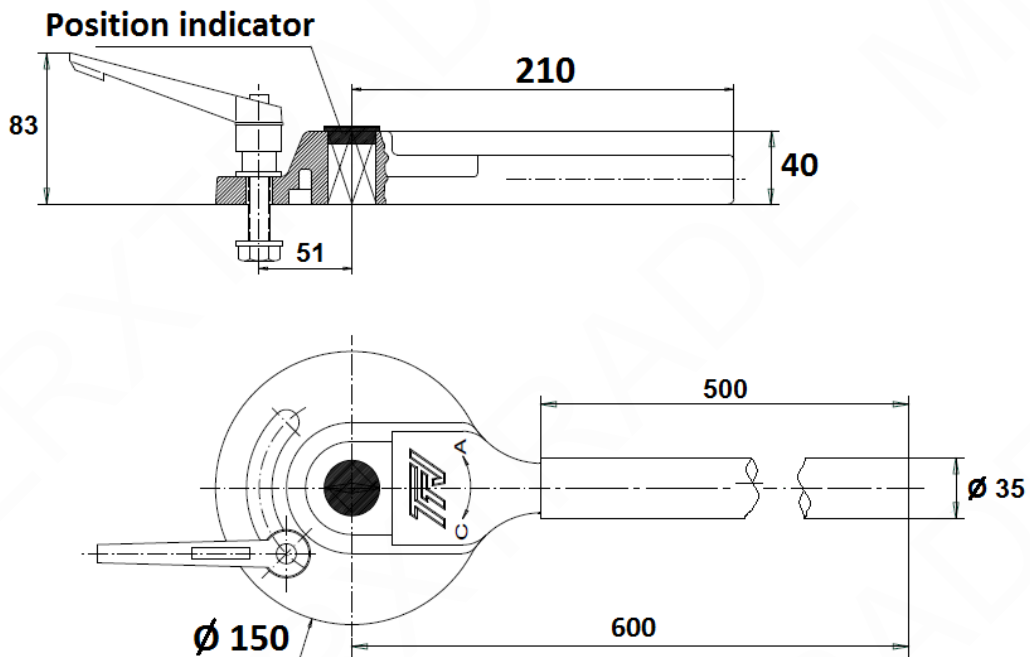
STANDARD LEVERS SIZE (in mm) :

DN 32 – 200 :



DN	32-100	125-200
E	205	330
H	57	70
Ø P	88	105

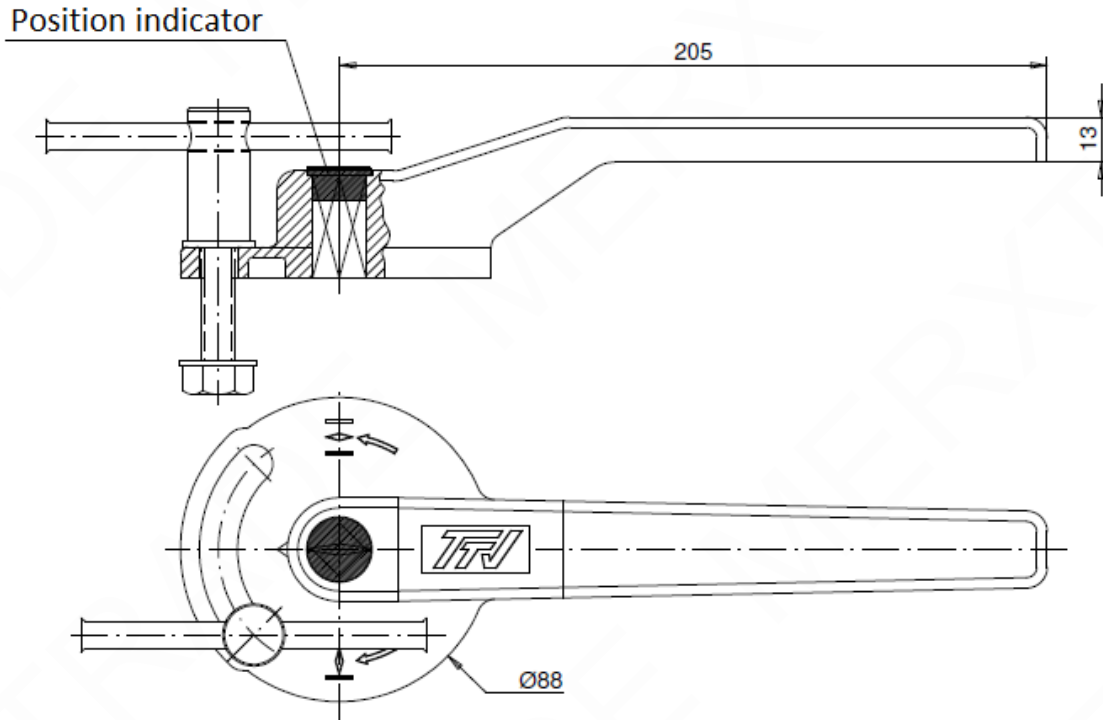
DN 250 – 300 :



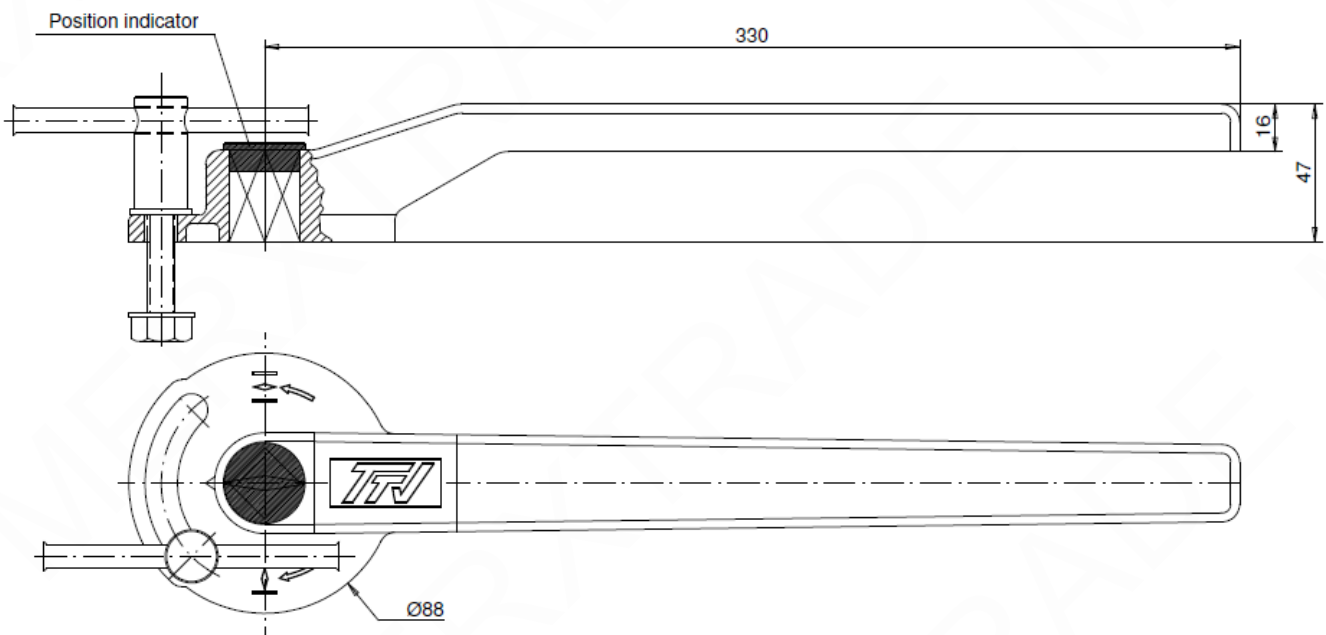
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ASTM A351 CF8M STAINLESS STEEL LEVERS SIZE (in mm) (ON REQUEST) :

DN 40 - 100



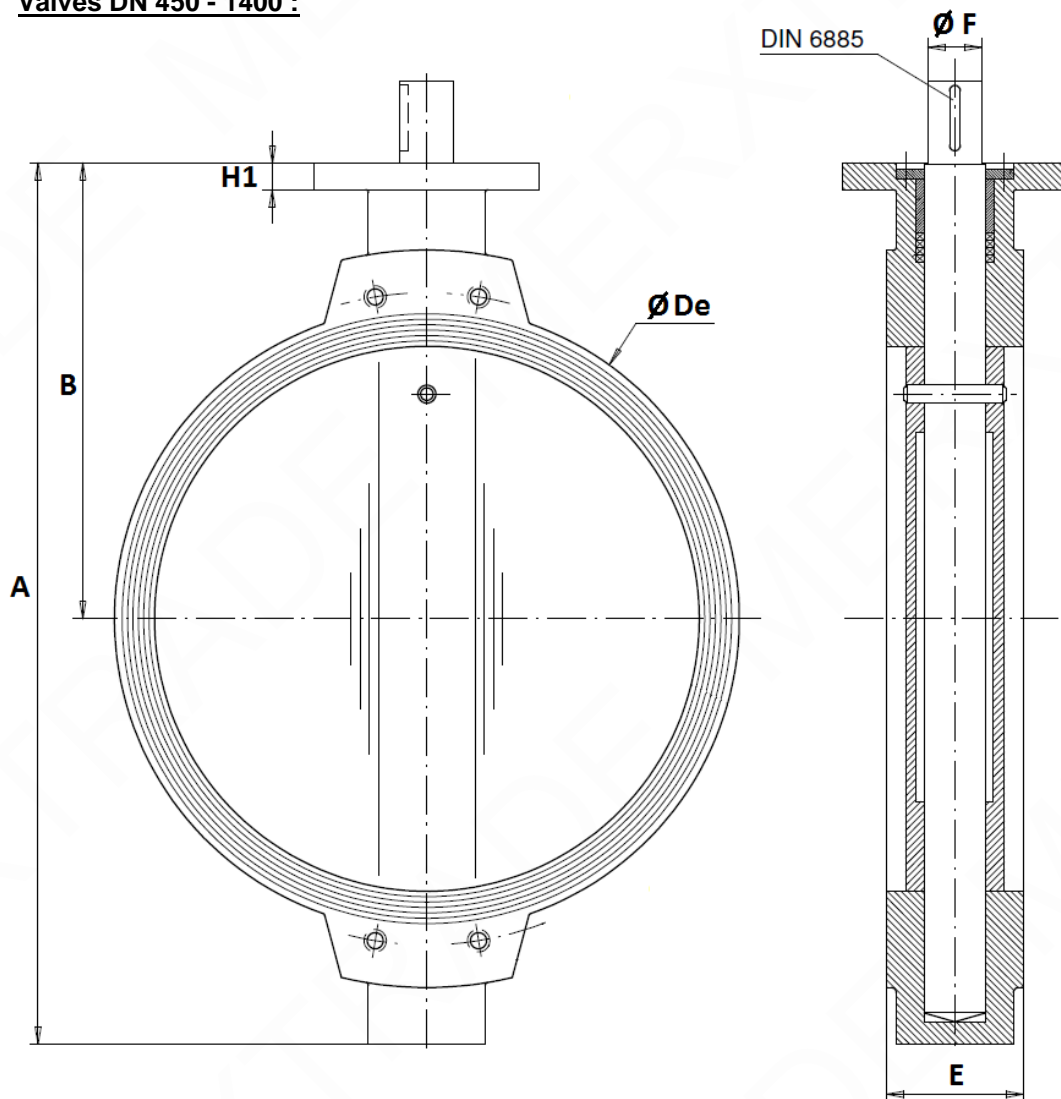
DN 125 - 200



**METAL SEAT CONCENTRIC WAFER BUTTERFLY VALVES EXCELLENCE RANGE TTV
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SIZE (in mm) :

- Valves DN 450 - 1400 :



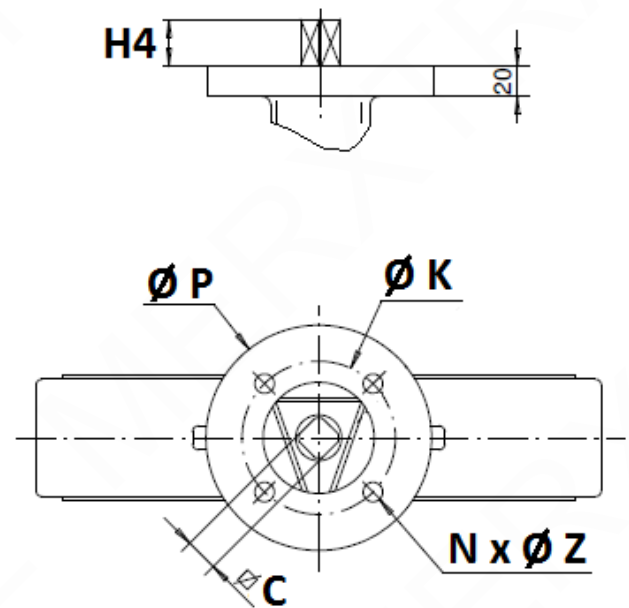
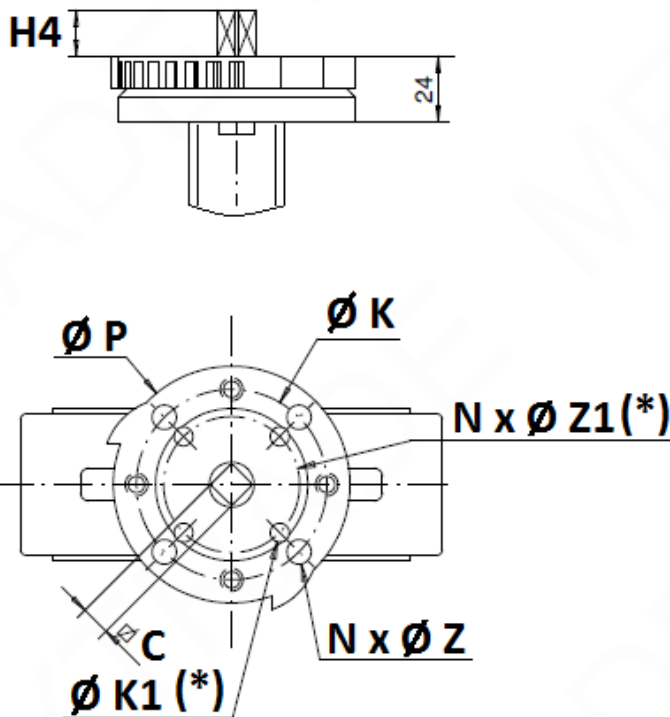
DN	450	500	600	700	750	800	900	1000	1100	1200	1300	1400
A	721	810	950	1085	1135	1233	1310	1442	1565	1706	1895	1975
B	390	440	507	575	600	655	685	754	815	873	1005	1025
Ø De	538	595	695	804	860	911	1010	1124	1225	1330	1460	1530
E	114	127	154	165	190	190	203	216	216	254	360	360
Ø F	50	50	60	60	65	65	80	80	80	100	120	120
Key (DIN6885)	14x9	14x9	18x11	18x11	20x12	20x12	22x14	22x14	22x14	28x16	32x18	32x18
H1	25	25	30	30	30	30	30	30	30	35	35	35
Weight (Kg)	87	117	177	258	296	330	505	661	840	1020	1650	1900

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ISO MOUNTING PAD AND STEM SIZE DN 40 - 400 (in mm) :

DN 40 – 200

DN250 - 400

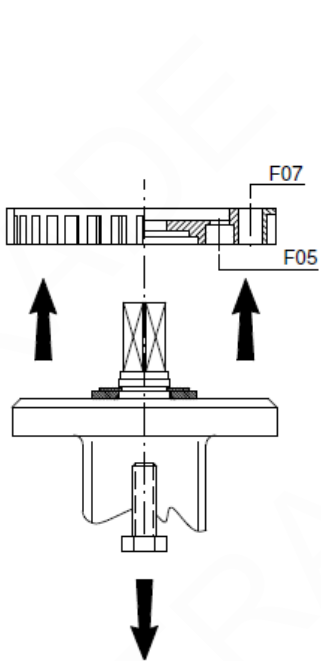


(*) : Only from DN32 to DN100 (see installation with ISO plate F05 page 15)

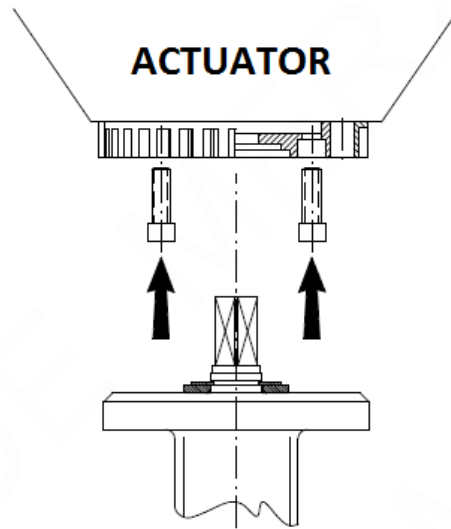
DN	40	50	65	80	100	125	150	200	250	300	350	400
H4	14	14	16	16	20	20	20	24	24	24	29	29
C	8	8	9	11	11	14	14	17	19	22	22	27
Ø K	70	70	70	70	70	70	70	70	102	102	140	140
ISO	F07	F07	F07	F07	F07	F07	F07	F07	F10	F10	F14	F14
N x Ø Z	4 x 9	4 x 9	4 x 9	4 x 9	4 x 9	4 x 9	4 x 9	4 x 9	4 x 11	4 x 11	4 x 18	4 x 18
Ø K1	50	50	50	50	50	-	-	-	-	-	-	-
ISO 1	F05	F05	F05	F05	F05	-	-	-	-	-	-	-
N x Ø Z1	4 x 7	4 x 7	4 x 7	4 x 7	4 x 7	-	-	-	-	-	-	-

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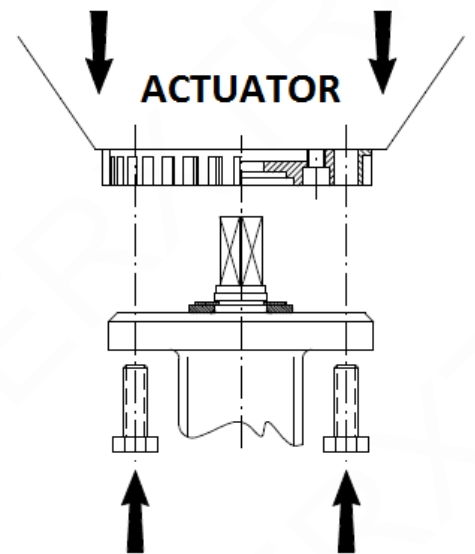
ISO PLATE INSTALLATION FOR DN32-100 ISO F05 :



Unscrew and remove the flange



Screw the flange to the actuator with hexagon socket screws

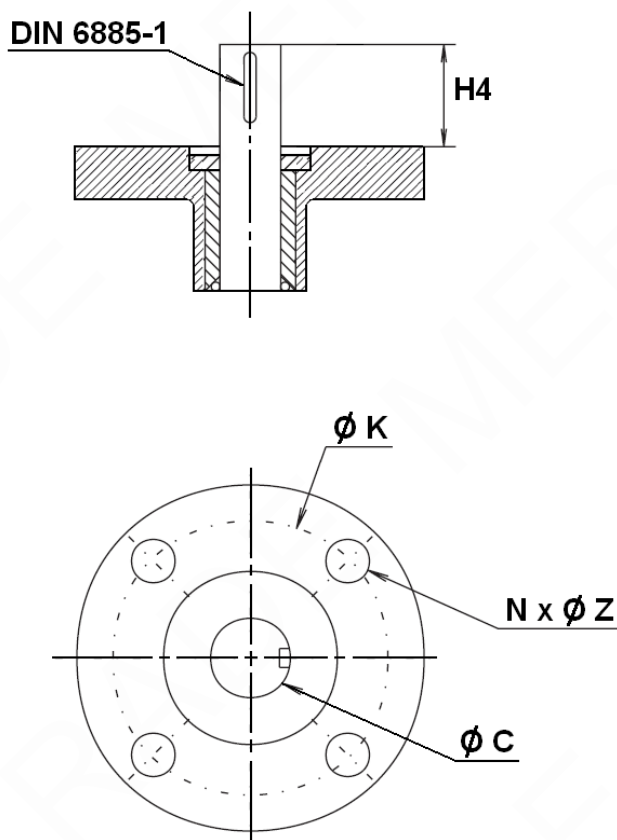


Screw the valve to the flange

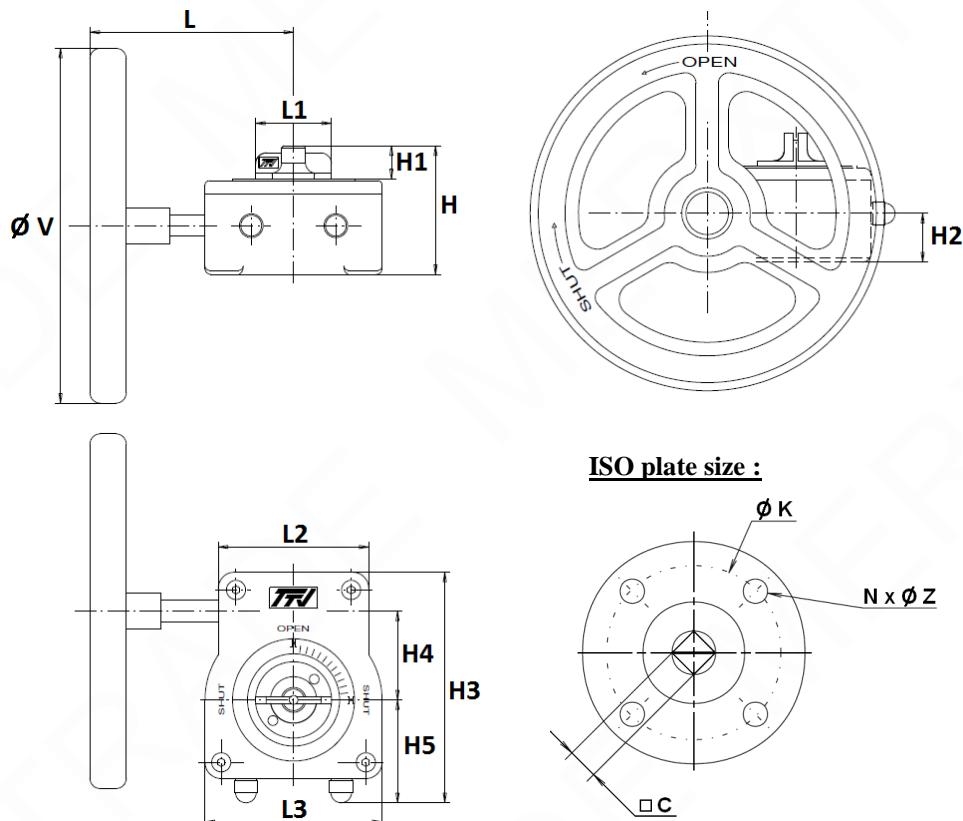
**METAL SEAT CONCENTRIC WAFER BUTTERFLY VALVES EXCELLENCE RANGE TTV
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ISO MOUNTING PAD AND STEM SIZE DN450-1400 (in mm) :

DN 450 - 1400



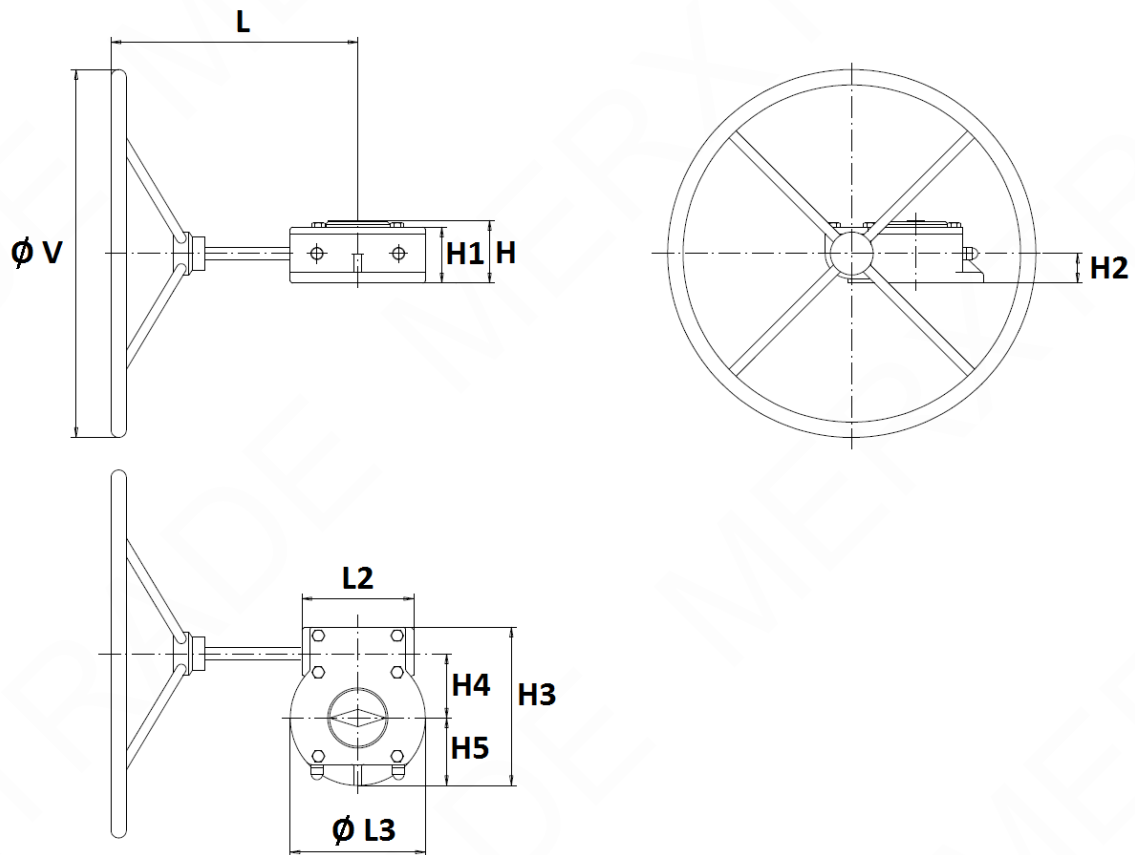
DN	450	500	600	700	750	800	900	1000	1100	1200	1300	1400
H4	80	80	90	90	110	110	110	110	110	110	120	120
Ø C	50	50	60	60	65	65	80	80	80	100	120	120
Ø K	140	140	165	254	254	254	254	254	254	254	298	298
ISO	F14	F14	F16	F25	F25	F25	F25	F25	F25	F25	F30	F30
N x Ø Z	4 x 18	4 x 18	4 x 22	8 x 18	8 x 18	8 x 18	8 x 18	8 x 18	8 x 18	8 x 18	8 x 22	8 x 22

**METAL SEAT CONCENTRIC WAFER BUTTERFLY VALVES EXCELLENCE RANGE TTV
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GEARBOX SIZE REF.1197 DN32-400 (in mm) :


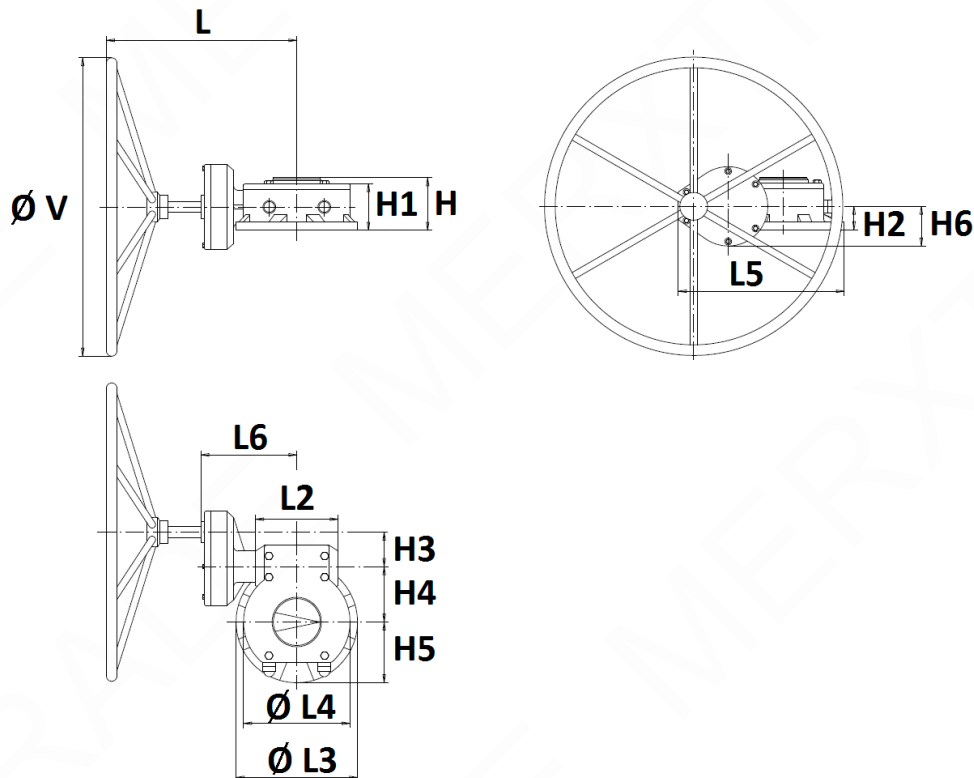
DN	32/50	65	80/100	125/150	200	250	300	350	400
L	115	115	115	115	115	223.5	223.5	325	325
L1	43	43	43	43	43	55	55	75	75
L2	85	85	85	85	85	110	110	150	150
L3	100	100	100	100	100	142	142	185	185
H	73	73	73	73	73	103	103	126	126
H1	19	19	19	19	19	33	33	32	32
H2	27.5	27.5	27.5	27.5	27.5	42	42	51	51
H3	130	130	130	130	130	176	176	224	224
H4	50	50	50	50	50	60	60	80	80
H5	58	58	58	58	58	82	82	98	98
Ø V	140	140	140	200	200	300	300	400	400
C	8	9	11	14	17	19	22	22	27
Ø K	70	70	70	70	70	102	102	140	140
ISO	F07	F07	F07	F07	F07	F10	F10	F14	F14
N x Ø Z	4 x M8	4 x M8	4 x M8	4 x M8	4 x M8	4 x M10	4 x M10	4 x M16	4 x M16
Weight (Kg)	1.35	1.35	1.35	1.75	1.75	4	4	9.5	9.5
Ref.	1197050	1197065	1197100	1197150	1197200	1197250	1197300	1197350	1197400

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GEARBOX SIZE REF.1197 DN450-600 (in mm) :



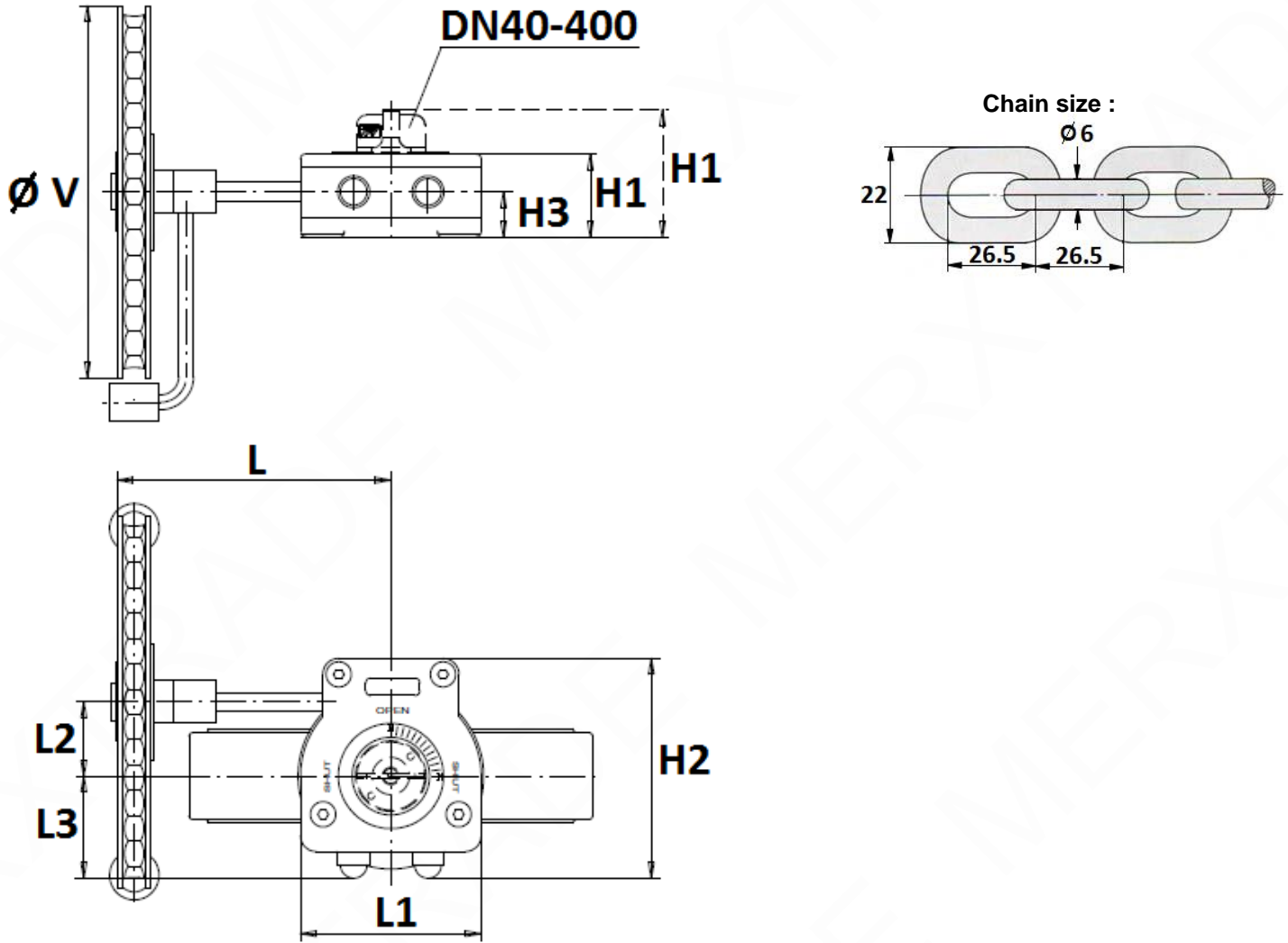
DN	450	500	600
L	381	402	447
L2	150	182	194
Ø L3	200	220	285
H	93	102	123.4
H1	82	91	109.5
H2	42	48	55
H3	226	258	322.5
H4	86	104.5	130
H5	100	110	142.5
Ø V	600	600	700
Weight (in Kg)	18.8	26.8	38.3
Ref.	1197451	1197501	1197601

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GEARBOX SIZE REF.1197 DN700-1200 (in mm) :


DN	700	750	800	900-1100	1200
L	447	447	447	500	556
L2	194	194	194	300	324
Ø L3	285	285	285	370	370
Ø L4	250	250	250	370	370
L5	389.5	389.5	389.5	469	574
H	123.4	123.4	123.4	138.9	139
H1	109.5	109.5	109.5		
H2	55	55	55	59	59
H3	81	81	81	81	175
H4	130	130	130	182	182
H5	142.5	142.5	142.5	170	170
H6	93	93	93	93	90
Ø V	500	500	700	600	800
Weight (Kg)	49	49	49	75	87
Ref.	1197700		1197800		

**METAL SEAT CONCENTRIC WAFER BUTTERFLY VALVES EXCELLENCE RANGE TTV
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CHAIN GEARBOX SIZE REF.1194 (in mm):



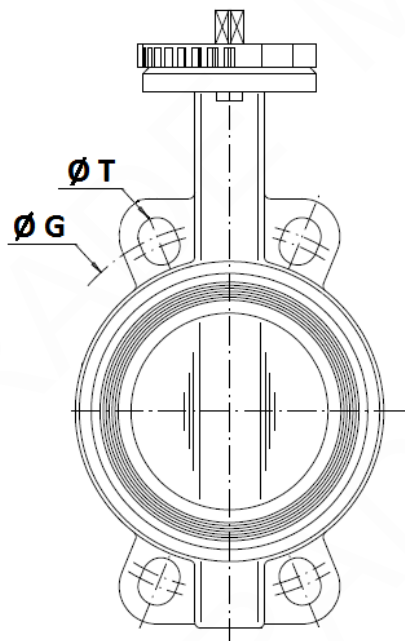
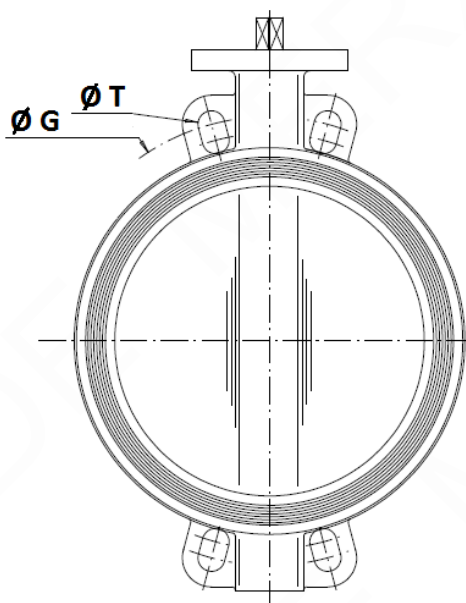
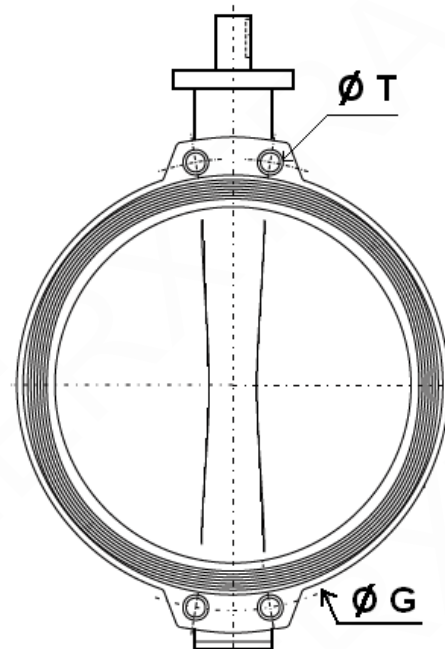
DN	32/50	65	80/100	125/150	200	250	300	350	400	450	500
L	120	120	120	215	215	325	325	331	352	350	365
L1	100	100	100	100	100	142	142	185	185	200	220
L2	50	50	50	50	50	61	61	80	80	86	104.5
L3	56	56	56	56	56	80	80	98	98	100	110
H1	73	73	73	73	73	103	103	126	126	84	91
H2	128	128	128	128	128	175	175	224	224	230	258
H3	27.5	27.5	27.5	27.5	27.5	42	42	51	51	42	48
Ø V	160	160	160	210	210	300	300	400	400	500	500
Weight (Kg)	2.35	2.35	2.35	2.75	2.75	6.8	6.8	14.3	14.3	26.2	33.7
Ref.	1194050	1194065	1194100	1194150	1194200	1194250	1194300	1194350	1194400		

**METAL SEAT CONCENTRIC WAFER BUTTERFLY VALVES EXCELLENCE RANGE TTV
 INCOMPLETE TIGHTNESS CARBON STEEL BODY**
GEARBOX SPECIFICATIONS :

DN	32/50	65	80/100	125/150	200	250	300	350
Ref.	1197050	1197065	1197100	1197150	1197200	1197250	1197300	1197350
Ratio factor	37 : 1	37 : 1	37 : 1	37 : 1	37 : 1	36 : 1	36 : 1	50 : 1
Number of cycles for opening or closing	9.25	9.25	9.25	9.25	9.25	9	9	12.5
Input torque (Nm)	9	9	9	9	9	18.5	18.5	32
Output torque (Nm)	250	250	250	250	250	500	500	1200

DN	400	450	500	600	700	800	900	1000
Ref.	1197400	1197451	1197501	1197601	1197700	1197800	-	-
Ratio factor	50 : 1	38 : 1	55 : 1	52 : 1	208 : 1	208 : 1	312 : 1	312 : 1
Number of cycles for opening or closing	12.5	9.5	13.75	13	52	52	78	78
Input torque (Nm)	32	56.8	64	115.4	43.6	43.6	53.4	53.4
Output torque (Nm)	1200	1620	2640	4500	6800	6800	12500	12500

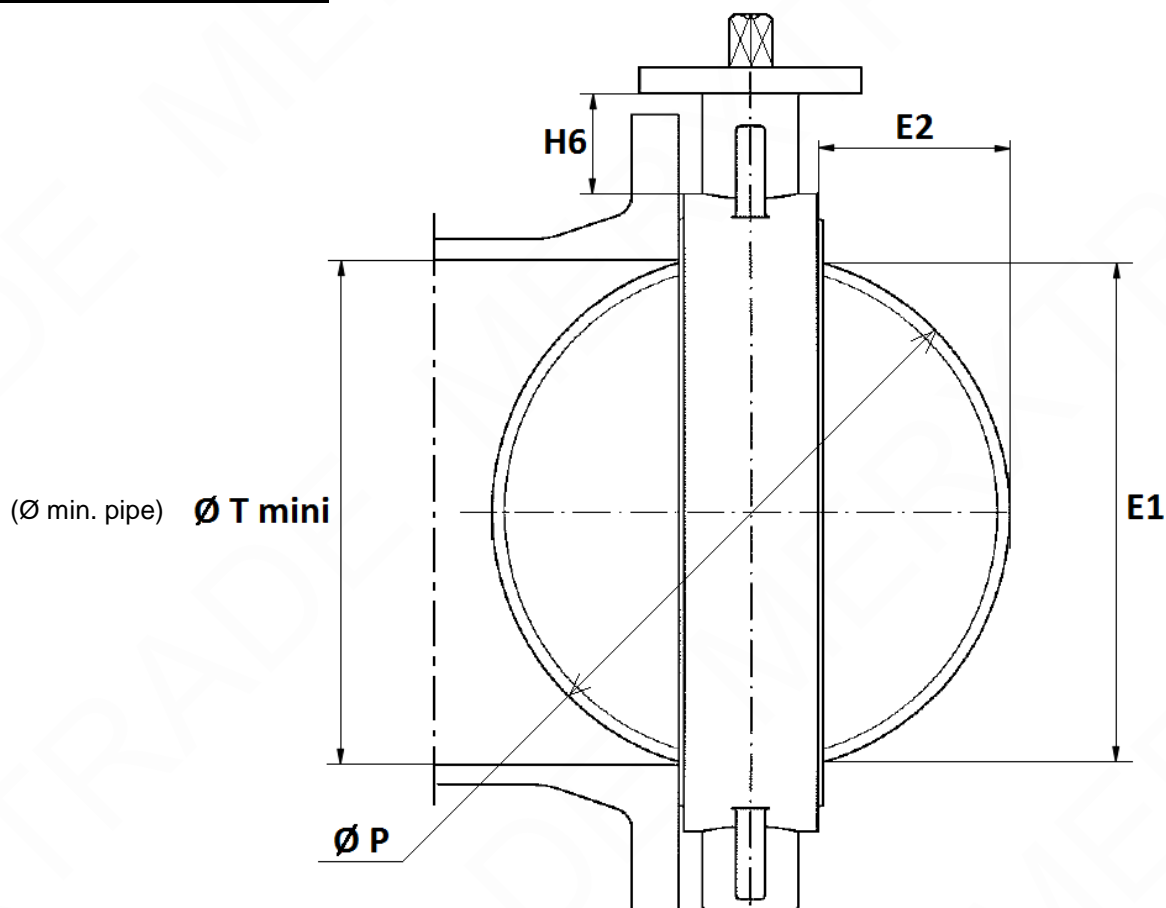
DN	1200
Ratio factor	702 : 1
Number of cycles for opening or closing	175.5
Input torque (Nm)	32.3
Output torque (Nm)	17000

**METAL SEAT CONCENTRIC WAFER BUTTERFLY VALVES EXCELLENCE RANGE TTV
 INCOMPLETE TIGHTNESS CARBON STEEL BODY**
BETWEEN FLANGES SIZE (in mm) :
DN 32-200

DN250 – 400

DN450-1400


	DN (mm)	32	40	50	65	80	100	125	150	200	250	300	350	400
	NPS (")	1" 1/4	1" 1/2	2"	2" 1/2	3"	4"	5"	6"	8"	10"	12"	14"	16"
PN10	Ø G	100	110	125	145	160	180	210	240	295	350	400	460	515
	Ø T	18	18	18	18	18	18	18	23	23	23	23	23	27
PN16	Ø G	100	110	125	145	160	180	210	240	295	355	410	470	525
	Ø T	18	18	18	18	18	18	18	23	23	27	27	27	30
Class 150	Ø G	88.9	98.5	120.6	139.7	152.4	190.5	215.9	241.3	298.5	362	431.8	476.3	539.8
	Ø T	16	16	19	19	19	19	23	23	23	26	26	29	29

	DN (mm)	450	500	600	700	750	800	900	1000	1100	1200	1300	1400
	NPS (")	18"	20"	24"	28"	30"	32"	36"	40"	44"	48"	52"	56"
PN10	Ø G	565	620	725	840	900	950	1050	1160	1270	1380	-	1590
	Ø T	M24	M24	M27	M27	M30	M30	M30	M33	M33	M36	-	M39
PN16	Ø G	585	650	770	840	900	950	1050	1170	1270	1390	-	1590
	Ø T	M27	M30	M33	M33	M33	M36	M36	M39	M39	M45	-	M45
Class 150	Ø G	577.9	635	749.3	863	914	978	1086	1200	1314	1422	1537	1651
	Ø T (BSW)*	1 1/8"	1 1/8"	1 1/4"	1 1/4"	1 1/4"	1 1/2"	1 1/2"	1 1/2"	1 1/2"	1 1/2"	1 3/4"	1 3/4"
	Ø T (Metric)	M30	M30	M33	M33	M33	M39	M39	M39	M39	M39		

* Threaded BSW on standard, on request metric threaded for Class 150

**METAL SEAT CONCENTRIC WAFER BUTTERFLY VALVES EXCELLENCE RANGE TTV
 INCOMPLETE TIGHTNESS CARBON STEEL BODY**
NECK AND DISC SIZE (in mm) :


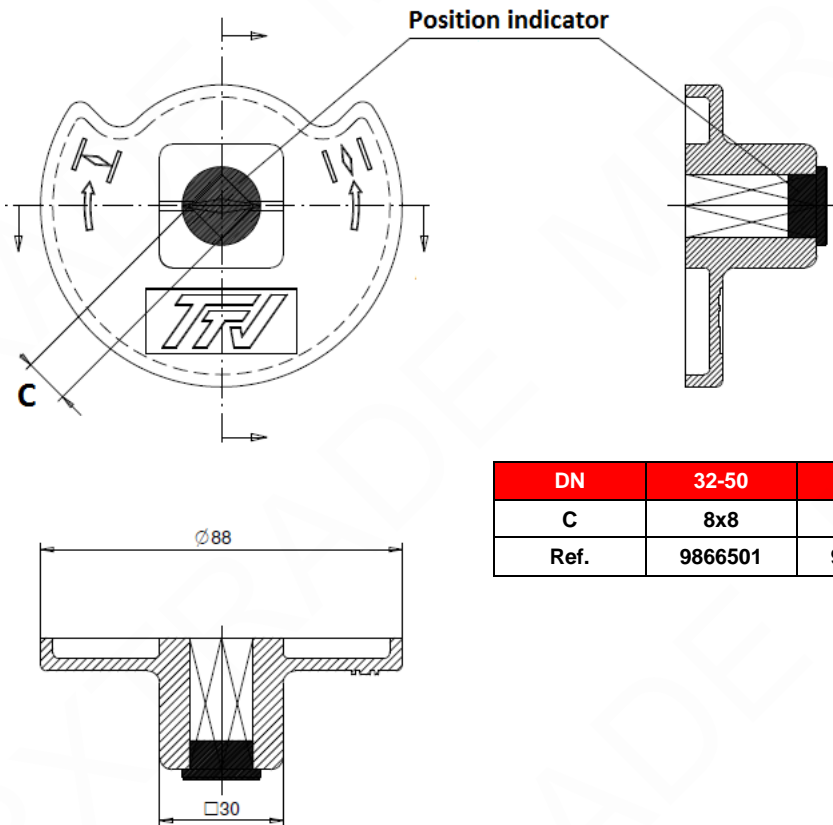
DN	32/40	50	65	80	100	125	150	200	250	300	350	400	450	500	600
E1	23	24.5	46	65	85	109	136	188	238	289	331	385	424	479	575
E2	3.5	3.5	9.5	17	24	33.5	45.5	69	90	110.5	131	148	162.5	184	221
H6	76	82	80	80	88	93	89	99	71	76	69	80	96	119	127
Ø T mini	26	27.5	49	68	88	112	139	191	241	292	334	388	427	482	578
Ø P	40	50	65	80	100	123	147	198	248	299	340	398	439	495	596

DN	700	750	800	900	1000	1100	1200	1300	1400
E1	680	721	777	850	957	1052	1146	1261	1368
E2	267.5	278	305	335.5	382.5	429	460	475.5	527.5
H6	148	140	170	150	162	175	176	240	228
Ø T mini	683	724	780	853	960	1055	1149	1264	1371
Ø P	700	746	800	874	981	1074	1174	1311	1415

**METAL SEAT CONCENTRIC WAFER BUTTERFLY VALVES EXCELLENCE RANGE TTV
INCOMPLETE TIGHTNESS CARBON STEEL BODY**

SIZE (in mm) :

- **Square lever for special key (30x30 mm) :**



DN	32-50	65	80-100	125-150	200
C	8x8	9x9	11x11	14x14	17x17
Ref.	9866501	9866502	9866503	9866504	9866505

METAL SEAT CONCENTRIC WAFER BUTTERFLY VALVES EXCELLENCE RANGE TTV
INCOMPLETE TIGHTNESS CARBON STEEL BODY

STANDARDS :

- Manufacturer certified ISO 9001:2015
- Designing according to ISO 10631 and EN 593
- DIRECTIVE 2014/68/EU : CE N° 0038
Risk Category III module H
- Certificate 3.1 on request
- **Body tests** according to EN 12266-1, Rate A
- Between flanges according to EN 1092-1 PN10/16
- ISO 5211 mounting pad
- Length according to :
 - ISO 5752 short series 20
 - EN 558 series 20 (NF 29305)
 - BS 5155 series 4
 - DIN 3202 part 3, series K1
 - API 609 Table 1 up to DN600
 - ASME B16.10 Table 8 column 3 up to DN350, column 4 from DN400 to 600
- ATEX Group II Category 2 G/2D Zone 1 & 21 Zone 2 & 22 **on request**
- The valves are suitable for use in a safety instrumented system up to SIL 2 in low demand mode. Under consideration of the minimum required hardware fault tolerance HFT= 1 the valves may be used in a redundant architecture up to SIL 3.