

VF209W Butterfly Valves (DN50-DN500)



Product Description

The VF209W butterfly valve is used as an isolation valve or a control valve for heavy duty applications. Manual operation is possible through a hand lever or manual gearbox.

The VF209W is specially designed and tailored to HVAC market needs:

- Cold and hot water applications.
- Water with a 50% maximum glycol (water quality as per VDI 2035).
- Brackish water (sea water and well water).

The tongue and groove seat design lowers torque and provides complete isolation of flowing media from the body. The seat also features a molded O-ring that eliminates the use of flange gaskets.

The wafer type valve body is polyester coated for excellent corrosion resistance. Primary and secondary seals prevent line media from coming in contact with the stem or body. Primary seal is achieved by an interference fit of the molded seat flat with the disc hub. Secondary seal is created because the stem diameter is greater than the diameter of the seat stem hole.

The valve disc is coated with Nylon 11 thermoplastic material (mineral based) ensuring excellent durability against corrosion.

The surface is:

- Resistant to impact and abrasion (low friction coefficient).
- Resistant to ultra-violet radiation.
- Resistant to fungi.

Electric actuator variants cover two position, 3 point floating or modulating control (0[2]...10 Vdc or 4...20 mA signal).

Features

- Optimised Seat and disc design for high close off pressures.
- Nylon-11 valve disc coating to reduce friction losses and provide protective coating for aggressive water (sea water/ brackish water).
- Low Δp for reduced pumping cost.
- Tolerant against moderate levels of fluid contamination.
- Bi-Directional flow.
- Valve sizes DN50...DN500. Larger sizes available on special request.
- KTW Drinking water approved.
- 16 bar nominal pressure.
- GG25 JL1040 cast iron housing, protected from corrosion by a polyester coating. The fluid is in contact only with the valve disc and seat and secondary stem seal.
- A secured and continuous shaft with acetal bearing journal and 'U' formed seal for excellent stem leakage resistance.
- Fits to PN6 (DN50...DN400), PN10 and PN16 flanges.
- Valve disc bubble tight.
- Very low maintenance.
- The flow characteristic is near equal percent up to 70° disc angle.
- Manually operation possible with hand levers up to DN200 and a gearbox handwheel from DN250...DN500.

The VF209W Butterfly Valves can be driven using electric actuators or by hand with levers or gear wheels.



Product Selection

Size	Kvs	Part Number	Max ΔP (kPa)	Actuator	Hand lever	Gear operator
DN50	124	VF209W-050CN	1200	MF68	916 0080 000	
DN65	243	VF209W-065CN	1200	MF68	916 0080 000	
DN80	397	VF209W-080CN	1200	MF68	916 0080 000	
DN100	723	VF209W-100CN	1200	MF68	916 0100 000	
DN125	1083	VF209W-125CN	1200	MF68	916 0150 000	
DN150	1591	VF209W-150CN	1200	MF68	916 0150 000	
DN200	2852	VF209W-200CN	1200	MF200	916 0200 000	
DN250	4670	VF209W-250CN	1200	MF550/700		917 0300 000
DN300	6946	VF209W-300CN	1200	MF550/700		917 0300 000
DN350	9063	VF209W-350CN	1000	MF700		917 0400 000
DN400	12044	VF209W-400CN	1000	MF1450		917 0400 000
DN450	14804	VF209W-450CN	1000	MF1450		917 0500 000
DN500	19212	VF209W-500CN	1000	MF2050		917 0500 000

Specifications

Media	Fluid	Hot and cold water with 50% Glycol vol. max., well water, sea water, drinking water
	Nominal PN	16 bar
	Close-off pressure	1200 kPa DN50...DN300 1000 kPa DN350...DN500
	Fluid temperature	-29...121 °C
	Fluid speed max.	Liquids: 4 m/sec. recommended (max. 9 m/sec) air: 54 m/sec
	Leak rate	Gas tight leak rate A (EN12266-1)
Pipe Connection Flanges	DN50...DN400	Wafer Flange to PN6/PN10/PN16
	DN450 and DN500	Wafer Flange to PN10/PN16
	Mounting Dimension	Per ISO 7005-2 and EN1092-2
	Face-to-face design	As per ISO 5752, EN 558-1 row 20 (DIN 3202 part 3K1)
Actuator mounting		Flange to ISO 5211
Transportation / storage temperature		-20...80 °C, dry and dust free, not exposed to strong sunlight
Turning angle		Angle 90°
Basic-Design standard		EN 593 (DIN 3354)
Mounting orientation		Horizontal and vertical corresponding to the valve stem

Materials

Body	ASTM A 126 Class B ≈ GG 25
Stem	ASTM A582 Type 416 ≈ 1.4405
Primary and secondary seal and seat	EPDM
Disc	ASTM A-536 grade 65-42-12 ≈ GGG40 with Nylon 11 coating
Stem seal	Buna-N strengthened
Stem bushing	Polyacetal
Locking ring	Galvanized steel spring
Shaft lock	CrNiMo- steel
Spacer	CrNiMo- steel

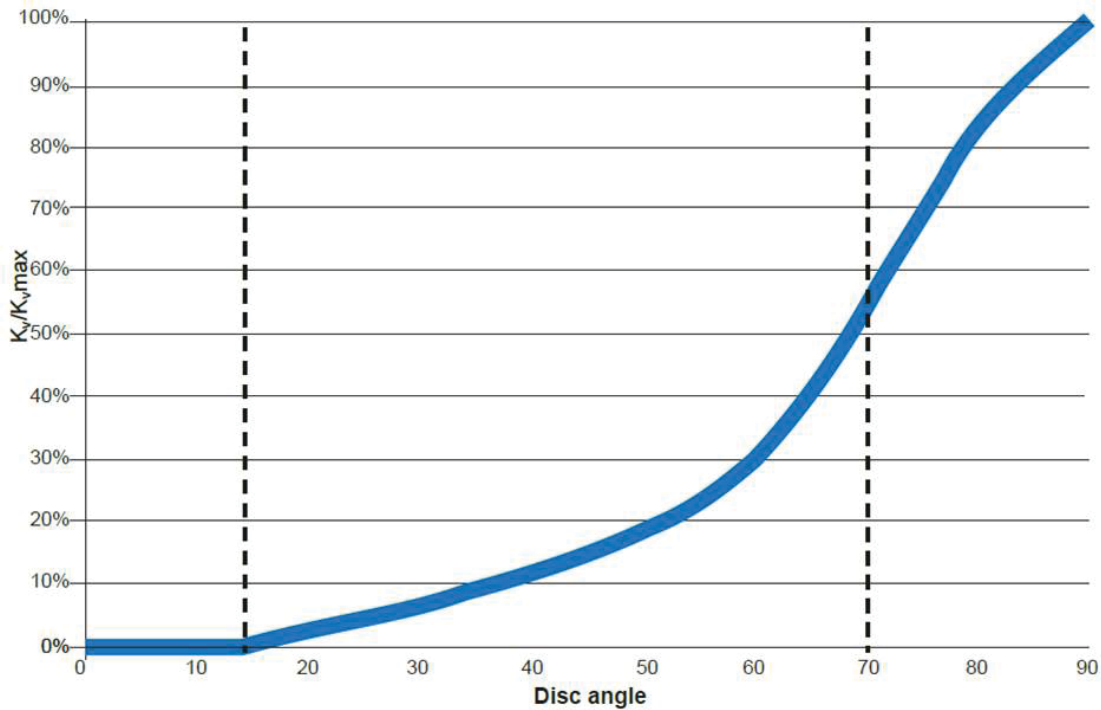
Approvals

Pressure Equipment Directive, PED. The valves are manufactured in accordance with conformity assessment procedure: PED 97/23/EC. Category III. Module B1 EC design examination and module D, production quality assurance as approved by Lloyds (Notified body No. 0038) under EC certificate of conformity COV0512853/1.

Drinking water Approval, KTW.

Flow Curve

The VF209W butterfly valve characteristic curve is a modified equal percent flow characteristic as per VDI 2176. At a disc angle of 70° the Kv value is 55%...60% of the Kvs value. Recommended range for modulating control up to 70%.



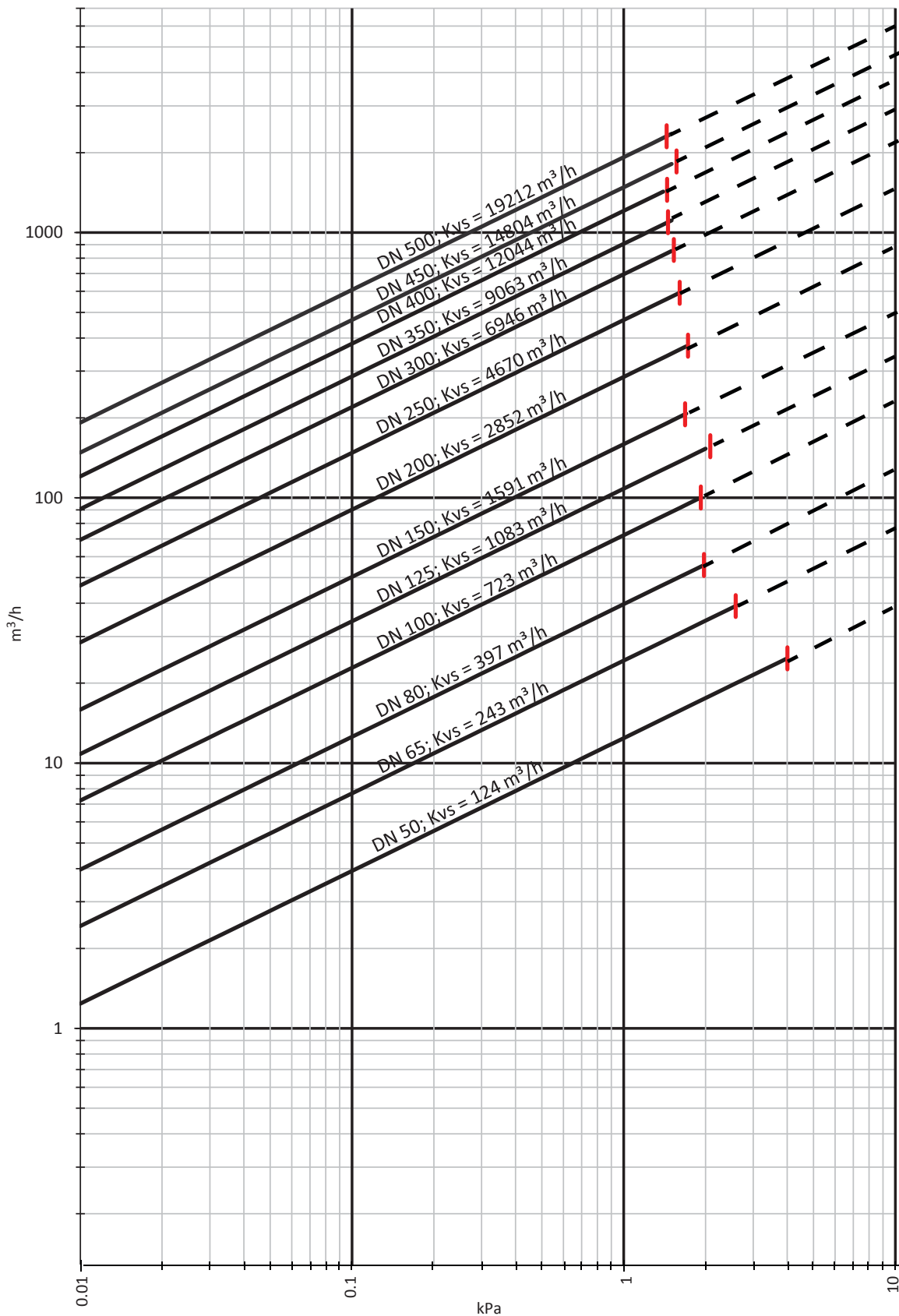
Kvs/Flow Characteristics

The following table and diagram present the flow volume for a fully open valve with water temperatures between 5 ... 30 °C at a Δp across the valve of 100 kPa (Kvs Value) as other varying differential pressures.

Note: During configuration the maximum flow speed of 4 m/s (water) is recommended with regard to flow noise.

DN (mm)	Kvs (m³/h)	Q (m³/h)	Q (m³/h)	Q (m³/h)	Q (m³/h)	Q (m³/h)
		Δp=0.01 kPa	kPa = 0.1	kPa = 1	kPa = 2	kPa = 3
50	124	1.24	3.9	12	17.5	21.5
65	243	2.43	7.7	24	34	42
80	397	4.0	13	40	56	69
100	723	7.2	23	72	102	125
125	1083	11	34	108	153	188
150	1591	16	50	159	225	276
200	2852	29	90	285	403	494
250	4670	47	148	467	660	809
300	6946	69	220	695	982	1203
350	9063	91	287	906	1282	1570
400	12044	120	381	1204	1703	2086
450	14804	148	468	1480	2094	2564
500	19212	192	608	1921	2717	3328

Flow Sizing Chart



NOTE: 4m/s water flow reached at the (|) Δp limit mark.

Proportional Flow Tables

The Kv values give the water flow in m³/h at temperatures between 5 ... 30 °C and a pressure loss of 1 bar (100 kPa) at the corresponding orifice angle. Please note that the recommended maximum water flow speed of 4 m/sec.

Kv Values for Valves DN 50...DN 80

Disc Angle	DN 50 m ³ /h	DN 50	DN 65 m ³ /h	DN 65	DN 80 m ³ /h	DN 80
0	0	0%	0	0%	0	0%
10	0.9	0.7%	1.3	0.5%	1.7	0.4%
20	6	5%	10	4%	13	3%
30	14	11%	21	9%	30	8%
40	23	19%	37	15%	53	13%
50	37	30%	58	24%	83	21%
60	53	43%	92	38%	123	31%
70	72	58%	140	58%	230	58%
80	98	79%	192	79%	313	79%
90	124	100%	243	100%	397	100%

Kv Values for Valves DN 100...DN 150

Disc Angle	DN 100 m ³ /h	DN 100	DN 125 m ³ /h	DN 125	DN 150 m ³ /h	DN 150
0	0	0%	0	0%	0	0%
10	2.6	0.36%	4.3	0.4%	5.2	0.33%
20	23	3%	37	3%	48	3%
30	53	7%	84	8%	111	7%
40	94	13%	146	13%	194	12%
50	147	20%	231	21%	304	19%
60	236	33%	368	34%	488	31%
70	427	59%	667	62%	882	55%
80	603	83%	986	91%	1326	83%
90	723	100%	1083	100%	1591	100%

Kv Values for Valves DN 200...DN 300

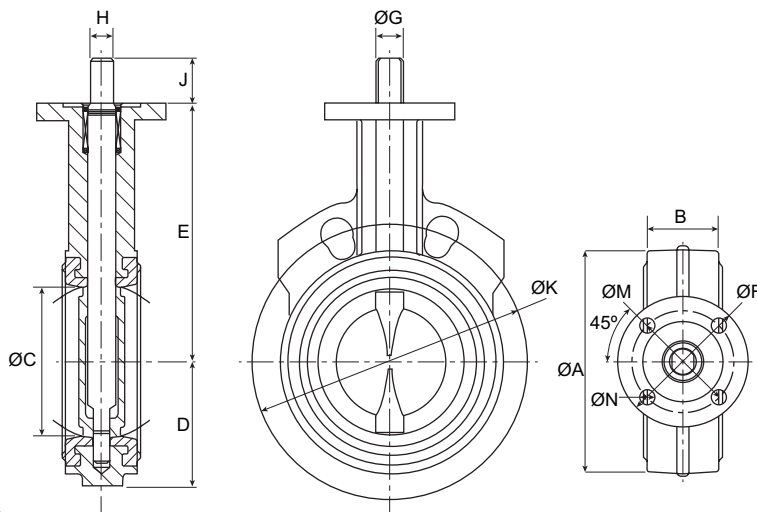
Disc Angle	DN 200 m ³ /h	DN 200	DN 250 m ³ /h	DN 250	DN 300 m ³ /h	DN 300
0	0	0%	0	0%	0	0%
10	10.3	0.36%	16.3	0.35%	23.3	0.34%
20	88	3%	139	3%	202	3%
30	207	7%	329	7%	477	7%
40	362	13%	574	12%	864	12%
50	585	21%	925	20%	1371	20%
60	876	31%	1471	31%	2204	32%
70	1601	56%	2535	54%	3778	54%
80	2444	86%	3892	83%	5789	83%
90	2852	100%	4670	100%	6946	100%

Kv Values for Valves DN 350...DN 500

Disc Angle	DN 350 m ³ /h	DN 350	DN 400 m ³ /h	DN 400	DN 450 m ³ /h	DN 450	DN 500 m ³ /h	DN 500
0	0	0%	0	0%	0	0%	0	0%
10	29.2	0.32%	38.7	0.32%	49.9	0.34%	61.9	0.32%
20	257	3%	341	3%	436	3%	544	3%
30	650	7%	861	7%	1102	7%	1372	7%
40	1135	13%	1504	12%	1924	13%	2326	12%
50	1848	20%	2448	20%	3133	21%	3901	20%
60	2910	32%	3855	32%	4933	33%	6144	32%
70	5108	56%	6766	56%	8656	58%	10780	56%
80	7632	84%	10115	84%	12467	84%	16178	84%
90	9063	100%	12044	100%	14804	100%	19212	100%

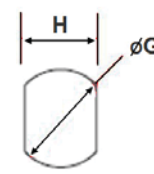
Dimensions

Valve Dimensions



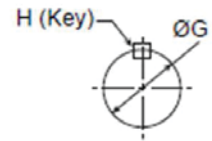
Stem Profile

DN50 to 300



Across Flats

DN350 to 500



Keyway solution

Size DN	Actuator Connection Flange ISO 5211			A	B	C	D	E	J	G	H	
	F	M	N	(mm)							(mm)	
50	90	70	4x10	94	43	51	56	140	32	14	10	
65	90	70	4x10	106	46	64	63	152	32	14	10	
80	90	70	4x10	124	46	76	71	159	32	14	10	
100	90	70	4x10	154	52	102	87	178	32	16	11	
125	90	70	4x10	181	56	127	102	190	32	19	13	
150	90	70	4x10	206	56	146	115	203	32	19	13	
200	150	125	4x14	267	60	197	146	241	32	22	16	
250	150	125	4x14	324	68	248	181	273	51	30	22	
300	150	125	4x14	378	78	298	206	311	51	30	22	
350	150	125	4x14	433	78	337	238	346	51	35	10x10	
400	150	125	4x14	488	102	387	273	375	51	35	10x10	
450	210	165	4x21	536	114	438	305	406	64	50	12x10	
500	210	165	4x21	591	127	489	356	438	64	50	12x10	

The valve is bolted between two flanges. During fitting, the wafer butterfly valve must be opened in accordance with the mounting instructions. The seat is constructed so that no additional seals or gaskets are necessary when the butterfly valve is fitted between the pipe flanges.

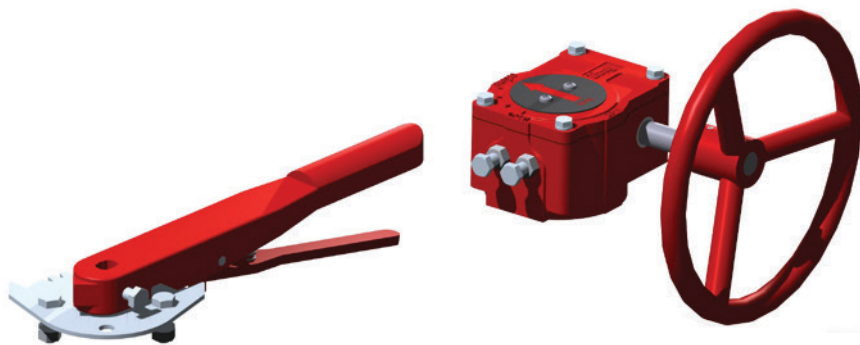
- Face-to-face dimensions in accordance with ISO 5752, EN 558-1 row 20 DIN 3202 Part 3 K1.
- Parts in contact with fluids are the valve disc and seat.
- Actuator connection flange in accordance with ISO 5211.

Flange Dimensions (Fitted flange in accordance with EN 1092-2)

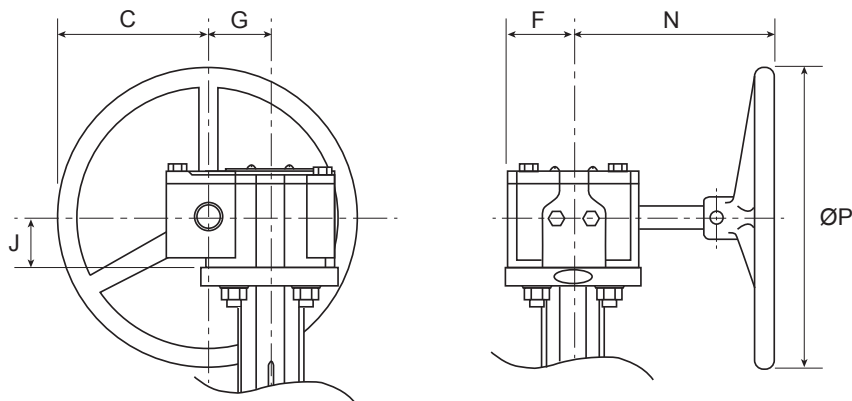
DN Size	PN 6		PN 10		PN 16	
	K	Bolt	K	Bolt	K	Bolt
50	110	4xM12	125	4xM16	125	4xM16
65	130	4xM12	145	4xM16	145	4xM16
80	150	4xM16	160	8xM16	160	8xM16
100	170	4xM16	180	8xM16	180	8xM16
125	200	8xM16	210	8xM16	210	8xM16
150	225	8xM16	240	8xM20	240	8xM20
200	280	8xM16	295	8xM20	295	12xM20
250	335	12xM16	350	12xM20	355	12xM24
300	395	12xM20	400	12xM20	410	12xM24
350	445	12xM20	460	16xM20	470	16xM24
400	495	16xM20	515	16xM24	525	16xM27
450	-	-	565	20xM24	585	20xM27
500	-	-	620	20xM24	650	20xM30

Available Hand Levers / Gear Operators

Hand levers and gear operators provide manual opening and closing of butterfly valves. This allows for isolation to main branches or other HVAC equipment for essential maintenance.

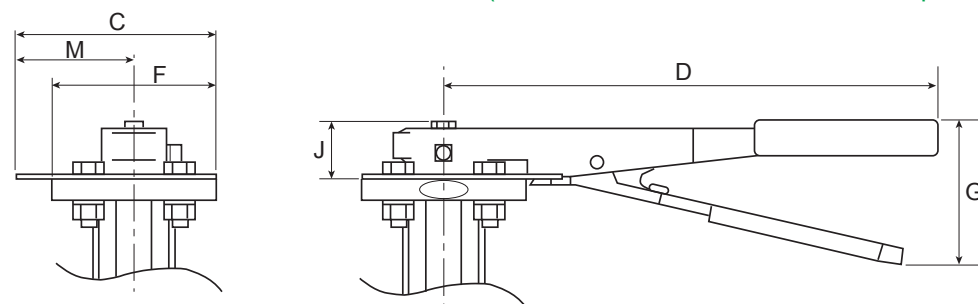


Gear Operator Part Number and Dimensions (DN 250...DN 500)



Part Number	Size DN	Gear Operator	C	F	G	J	N	P
			(mm)					
917 0300 000	250,300	30:1	102	75	67	32	190	305
917 0400 000	350, 400	50:1	152	75	79	43	303	305
917 0500 000	450, 500	80:1	152	105	116	60	379	305

Hand Lever Part Number and Dimensions (DN 50...DN200 with lockable notch plate)



Part Number	Size DN	C	D	E	J	F	G	M
		(mm)						
916 0080 000	50,65,80	110	270	140	32	90	80	65
916 0100 000	100	110	270	178	32	90	80	65
916 0150 000	125,150	110	270	203	32	90	80	65
916 0200 000	200	169	298	241	32	150	80	94

Available Actuator Products

Schneider Electric offers the MF electric rotary actuator series in seven key torque models of 68 Nm, 226 Nm, 565 Nm, 735 Nm, 1470 Nm and 2034 Nm for use with the VF209W butterfly valve.

Actuators are available for proportional or 2-point and 3-point control. All proportional actuators have position feedback.



Features

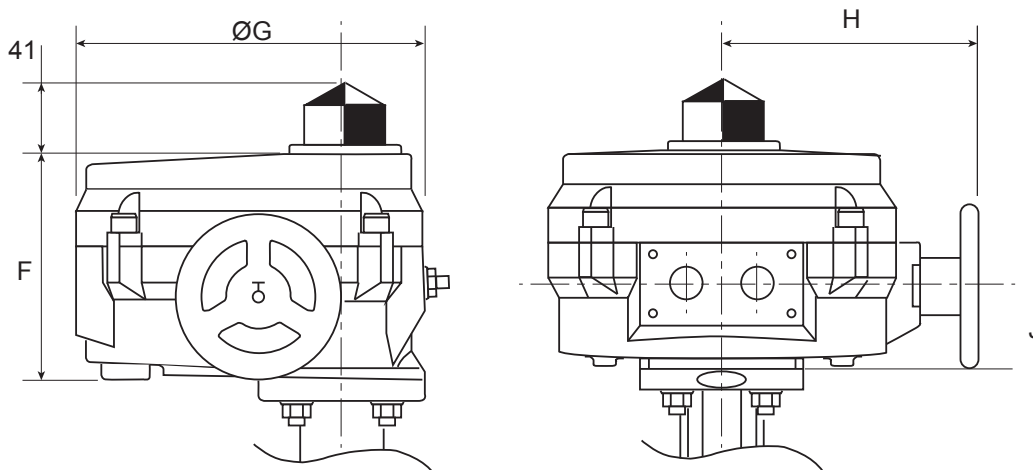
- Adjustable start/end point switch.
- Two additional auxiliary switches as standard.
- Direct fit without any linkage kits.
- Optical position display.
- Suitable for outdoor and industrial environments (IP65).
- Very low maintenance.
- Self-regulating heater to prevent condensation buildup within the actuator.
- Adjustable positioning speed, 60 ... 360 sec (modulating models).
- Control signal sensitivity adjustment (modulation model).

Suitable VF209W Valve Sizes	Control	Part Number	Torque	Supply Voltage	Power Consumption			Operating Time 90°	Cable Entry
					Rest	Operation	Wire Sizing		
DN50-150	24V Floating & On/Off	MF68-24F	68 Nm	24 Vac	5 W	43	48 VA	60 sec	2 x M20 * 1.5
DN200		MF200-24F	226 Nm	24 Vac	5 W	48	53 VA	60 sec	2 x M25 * 1.5
DN250-300		MF550-24F	565 Nm	24 Vac	5 W	72	77 VA	60 sec	2 x M25 * 1.5
DN50-150	0(2)...10 V dc Proportional	MF68-24M	68 Nm	24 Vac	7 W	45	50 VA	60 sec	2 x M25 * 1.5
DN200		MF200-24M	226 Nm	24 Vac	7 W	50	55 VA	60 sec	2 x M25 * 1.5
DN250-300		MF550-24M	565 Nm	24 Vac	7 W	74	79 VA	60 sec	2 x M25 * 1.5
DN50-150	230V Floating & On/Off	MF68-230F	68 Nm	230 Vac	5 W	150	155 VA	36 sec	2 x M20 * 1.5
DN200		MF200-230F	226 Nm	230 Vac	5 W	115	120 VA	36 sec	2 x M25 * 1.5
DN250-350		MF700-230F	735 Nm	230 Vac	5 W	253	258 VA	36 sec	2 x M25 * 1.5
DN400-450		MF1450-230F	1470 Nm	230 Vac	5 W	300	305 VA	132 sec	2 x M25 * 1.5
DN500		MF2050-230F	2034 Nm	230 Vac	5 W	345	350 VA	132 sec	2 x M25 * 1.5

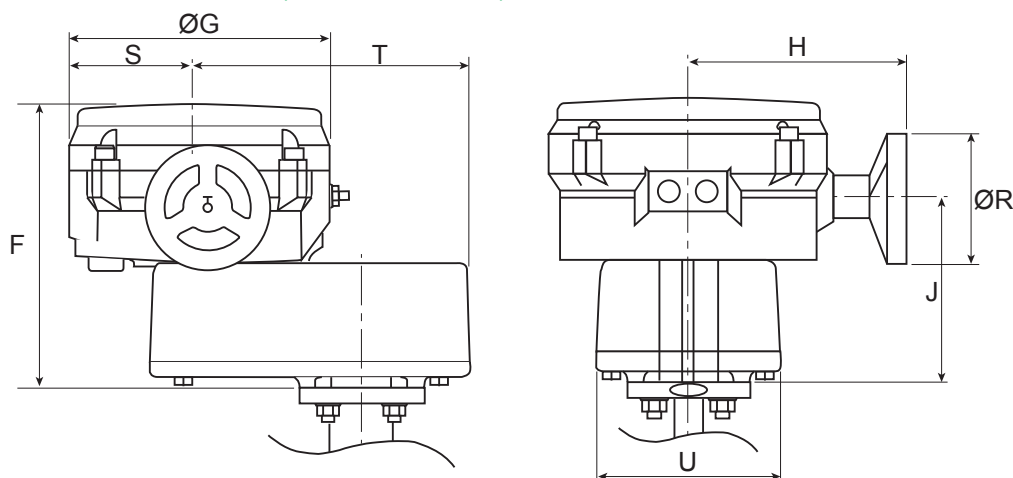
Actuator	Mounting Flange	Stem Sleeve Adapter (supplied with Actuator)	Actuator Drive Socket		Weight
			Diameter	Across flat	
MF68-xxx	F07	DN50-80 = S70 MA1 DN100 = S70 MB1 DN125+150= Direct	Ø 19 mm	ll 13 mm	6 kg
MF200-xxx	F07, F12	DN200 = S70 MD1 DN250= Direct	Ø 30 mm	ll 22 mm	13 kg
MF550-xxx	F12, F16	DN250+300 = S70 ME2 DN350-450= S70 MF1	Ø 50 mm	Keyway 12x10	22 kg
MF700-xxx	F12, F16	DN250+300 = S70 ME2 DN350-500= S70 MF1			22 kg
MF1450-xxx	F12, F16	DN400 = S70 MF1 DN450= Direct			54 kg
MF2050-xxx	F12, F16	DN500= direct			54 kg

Actuators are delivered with one or two stem sleeve adapters allowing connecting onto a selection of valves sizes as detailed above. For valves directly fitting the actuator drive socket, the stem sleeve adapter can be discarded. See Dimensions for the detailed drawing of the products and mating parts.

MF Actuator Dimensions (MF68, MF220, MF550, MF700)



MF Actuator Dimensions (MF1450, MF2050)



Model	F	G	H	J	S	T	R	U	Mounting Flange
	(mm)								
MF68_	130	191	142	48	-	-	89	-	F07
MF200_	165	257	198	64	-	-	203	-	F07/F12
MF550_	183	307	241	74	-	-	305	-	F12/F16
MF700_									
MF1450_	317	307	241	206	155	323	305	203	F12/F16
MF2050_									

Note: Provide adequate room for the valve package assembly to be fitted, operated and maintained in its pipe/system orientation and application.

See datasheet F-27913 for the full specifications on the MF68..2050 product range.