

Masoneilan™ 34005 Series

Triple Offset
Butterfly Valves



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Overview

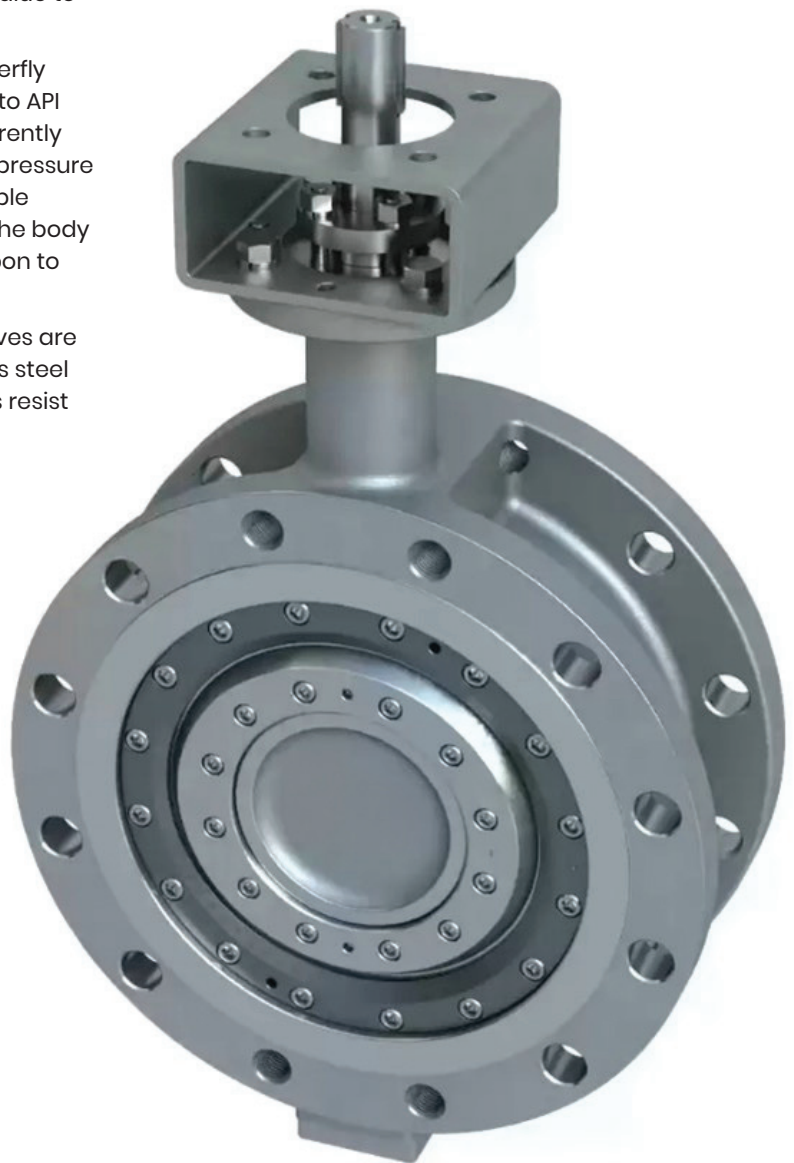
The Masoneilan 34005 Series Triple Offset Butterfly Valve (TOBV) is a superior rotary control and isolation valve for operation in vacuum to high-pressure applications. The non-rubbing, metal-to-metal seal delivers zero-leakage bi-directional shutoff with minimal torque and is certified fire-tested.

Compared to gate, globe, or ball valves of the same size and pressure class, 34005 Series TOBV provides space and weight savings, while minimizing installation and maintenance costs.

Masoneilan Triple Offset 34005 Series Butterfly Valve incorporates design features that most other triple offset valves do not have, that improve performance in abrasive, erosive and corrosive environments, and substantially extend the overall service life of the valve and the value to the customer.

Although Masoneilan Triple Offset 34005 Series Butterfly Valve has undergone multiple successful fire-tests to API 607, the metal-to-metal seat-to-seal design is inherently fire-safe regardless of the direction of flow or high-pressure side. Unlike most gate valves and ball valves, the triple offset butterfly valve design does not trap fluids in the body cavity and thus further reduces hazards if called upon to operate and isolate following a fire.

Masoneilan Triple Offset 34005 Series Butterfly Valves are provided as standard with a hardfaced 316 stainless steel seat with a surface hardness of 67 HRC, which helps resist abrasion and erosion.



Industries and Applications

The Masoneilan 34005 Series High Performance Butterfly Valve can handle a wide range of conditions and media, such as corrosive chemicals, water, gases, acids, alkalies, hydrocarbons and many other fluids.

Services and optional material include:

Industries

- LNG – Liquefaction | Storage | Transportation | Regasification
- Upstream Production
- Petrochemical – Ethylene
- Power Generation

Applications

- LNG – Liquefaction | Storage | Transportation | Regasification
- Compressor Hot Gas Bypass Valves
- Petrochemical – Ethylene
- Power Generation

Features and Benefits

Design Features

1. Field-replaceable seat and seal system

The fully field-replaceable seat and seal extends overall life, minimizes downtime, and reduces the need for costly off-site repairs or total replacement.

2. Enhanced seat hardness

Eliminates risk of seat and/or seal galling, offering superior performance, durability, and abrasion resistance compared to other materials.

3. Metal-to-metal sealing

34005 Series Triple Offset Butterfly Valves have a non-rubbing, metal-to-metal sealing system that is inherently firesafe and fire-tested, while meeting zero-leakage requirements for many critical applications.

4. Seal ring

Offers a flexible design and wide range of materials to provide torque-loaded sealing with zero-leakage (optional solid seal ring available).

5. Splined disc-to-stem connection

The strong and reliable connection allows for axial movement of the stem independent of the disc, to protect the disc/stem connection from temperature fluctuations and pressure effects. This connection prevents typical misalignment problems of rigidly attached discs and stems, minimizes hysteresis, eliminates external connections and associated hardware, and allows for easy assembly and disassembly.

6. Adjustable stem packing

Fully-adjustable, field-replaceable stem seal system is certified to international fugitive emission standards.

7. Robust blowout-proof stem

One-piece stem features blowout prevention ring located outside of the pressure boundary, as well as redundant blowout prevention mechanisms fully conforming to API 609 and safety requirements.

8. Indexed stem

Provides positive visual indication of disc and seal ring position after installation.

9. Elongated stem bearings

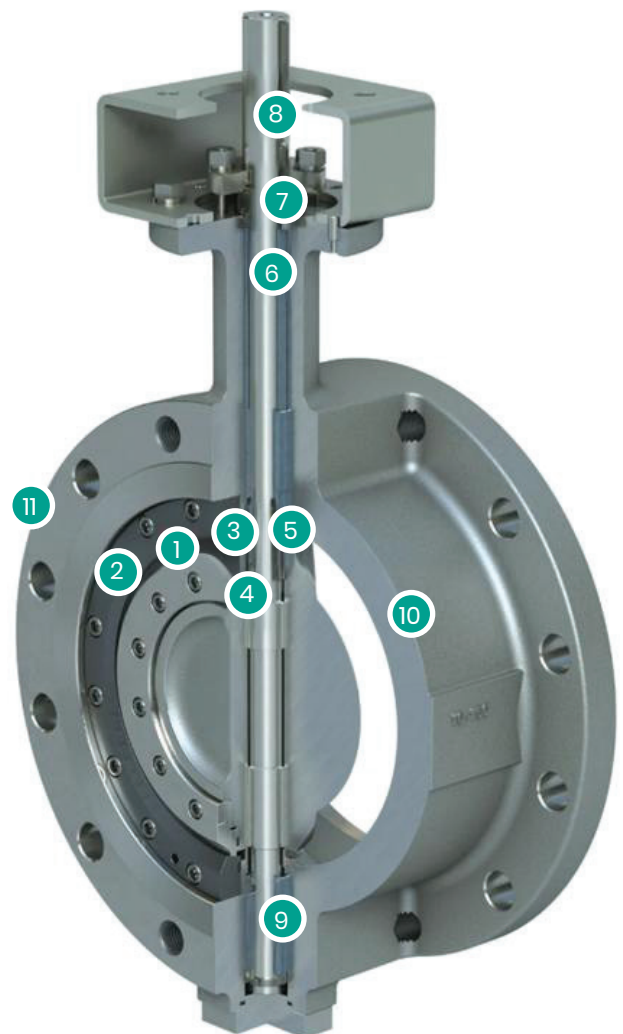
Hardened bearings provide maximum stem support.

10. Increased body wall thickness

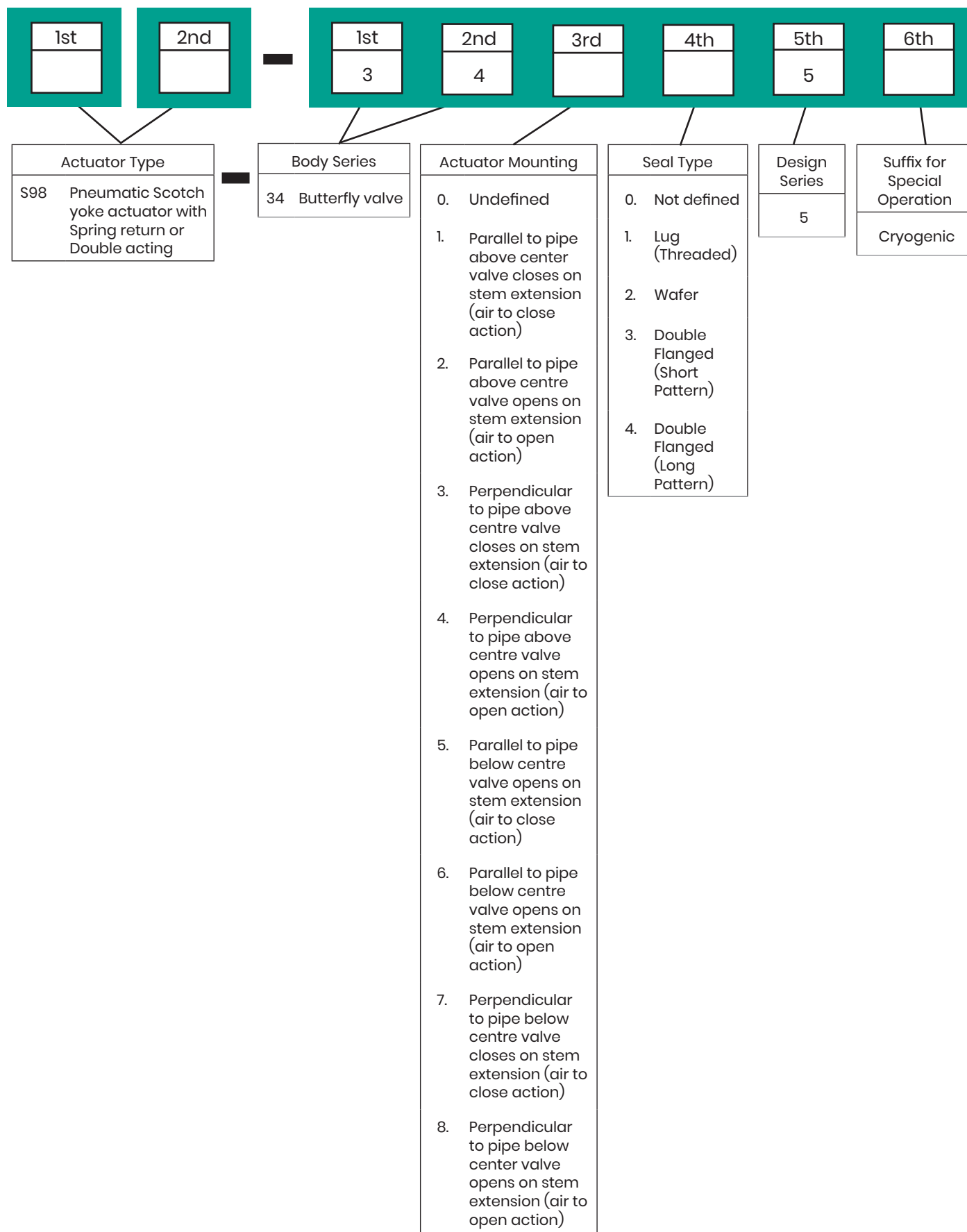
In accordance with API 600, provides greater corrosion allowance.

11. SIL 3 capable

The 34005 Series Triple Offset Butterfly Valve is SIL 3 capable.



Numbering System



Sizing Coefficients (Cv)

Pressure recovery coefficient and valve Cv are tightly linked to good control because together they determine how smoothly and predictably a valve converts pressure drop into flow. Cv defines the valve's flow capacity, while the pressure recovery coefficient indicates how much of the pressure drop is recovered downstream of the trim. A well-matched Cv with controlled (lower) pressure recovery ensures stable throttling across the operating range, minimizes sensitivity to small position changes, and reduces the risk of cavitation, flashing, and noise. When these parameters are properly balanced, the valve delivers linear, repeatable response, maintains control authority at varying loads, and supports accurate, reliable process control.

Pressure Recovery Coefficients (F_L, X_T, F_d, Sigma mr, rw, XF_z)

Disc Degree Opening	Pressure recovery Coefficients	Opening %									
		10	20	30	40	50	60	70	80	90	100
Flow to Open and Flow to Close	F _L	0.850	0.842	0.826	0.802	0.770	0.730	0.685	0.631	0.606	0.600
	X _T	0.46	0.46	0.45	0.41	0.36	0.28	0.27	0.24	0.22	0.19
	F _d	0.26	0.34	0.38	0.42	0.46	0.50	0.52	0.53	0.55	0.57
	Sigma mr	2.8	2.8	2.8	2.9	3.1	3.4	3.8	4.3	5.0	5.4
	rw	0.5									
	XF _z	0.36									

Class 150 Valve Coefficient preferred direction (Shaft side) – Flow to Close

Body style: Lug, Wafer, Double Flange (short pattern) & Double Flange (long pattern)												
Size (in.)	Class	C _v – Opening %										
		0	10	20	30	40	50	60	70	80	90	100
		Angle (Degrees)										
		0	9	18	27	36	45	54	63	72	81	90
3	150	0	2.3	7.7	14.8	22.9	32	42	52	62	67	68
4	150	0	4.7	16.0	31	47	66	87	108	128	140	141
6	150	0	17.0	58	111	172	240	314	392	465	506	511
8	150	0	36	122	234	362	505	661	825	978	1065	1076
10	150	0	65	222	427	661	921	1206	1505	1784	1942	1962
12	150	0	111	377	725	1122	1564	2047	2555	3028	3298	3331
14	150	0	133	454	872	1351	1883	2465	3076	3646	3971	4011
16	150	0	194	661	1270	1967	2741	3590	4479	5309	5782	5840
18	150	0	263	896	1720	2663	3712	4861	6065	7189	7829	7908
20	150	0	334	1141	2190	3392	4727	6190	7723	9155	9969	10070
24	150	0	545	1861	3574	5534	7713	10100	12602	14939	16268	16432
28	150	0	732	2497	4795	7425	10348	13550	16905	20041	21824	22044
30	150	0	814	2777	5333	8258	11509	15071	18803	22291	24274	24519
36	150	0	1489	5079	9754	15105	21051	27565	34392	40770	44398	44846
40	150	0	1687	5754	11051	17112	23849	31229	38964	46190	50299	50807
42	150	0	2028	6919	13288	20576	28677	37551	46851	55540	60481	61092
48	150	0	2696	9198	17665	27354	38123	49921	62284	73835	80404	81216

Sizing Coefficients (Cv)

Class 150 Valve Coefficient non-preferred direction (Disc side) – Flow to Open

Body style: Lug, Wafer, Double Flange (short pattern) & Double Flange (long pattern)												
Size (in.)	Class	C _v - Opening %										
		0	10	20	30	40	50	60	70	80	90	100
		Angle (Degrees)										
		0	9	18	27	36	45	54	63	72	81	90
3	150	0	1.9	7.3	13.8	20.6	28	36	44	53	59	60
4	150	0	4.0	15.0	28	42	57	73	91	109	122	123
6	150	0	15.5	59	111	165	221	284	353	424	477	479
8	150	0	33	124	233	347	467	599	746	894	1006	1011
10	150	0	60	229	432	643	864	1109	1380	1654	1862	1870
12	150	0	96	364	686	1021	1374	1762	2193	2629	2958	2972
14	150	0	114	431	812	1210	1627	2087	2597	3113	3504	3520
16	150	0	165	624	1177	1753	2358	3025	3765	4513	5079	5102
18	150	0	220	833	1571	2339	3145	4035	5022	6020	6775	6806
20	150	0	268	1015	1914	2849	3832	4917	6119	7334	8254	8292
24	150	0	483	1826	3445	5129	6898	8849	11014	13201	14857	14925
28	150	0	581	2198	4145	6172	8300	10649	13253	15886	17878	17960
30	150	0	761	2879	5431	8086	10874	13952	17363	20812	23423	23530
36	150	0	1233	4663	8795	13096	17612	22596	28122	33708	37937	38110
40	150	0	1480	5598	10558	15721	21143	27126	33759	40465	45541	45749
42	150	0	1546	5849	11032	16426	22091	28342	35273	42279	47583	47800
48	150	0	2419	9150	17259	25698	34561	44341	55184	66145	74443	74783

Sizing Coefficients (Cv)

Class 300 Valve Coefficient preferred direction (Shaft side) – Flow to Close

Body style: Lug, Wafer, Double Flange (short pattern) & Double Flange (long pattern)												
Size (in.)	Class	C _v – Opening %										
		0	10	20	30	40	50	60	70	80	90	100
		Angle (Degrees)										
		0	9	18	27	36	45	54	63	72	81	90
3	300	0	2.3	7.7	14.8	22.9	32	42	52	62	67	68
4	300	0	4.7	16.0	31	47	66	87	108	128	140	141
6	300	0	13.1	45	86	133	185	243	303	359	391	395
8	300	0	27	94	180	279	388	508	634	752	819	827
10	300	0	58	198	380	589	821	1075	1341	1590	1732	1749
12	300	0	91	310	596	922	1285	1683	2100	2489	2711	2738
14	300	0	99	338	648	1004	1399	1832	2286	2710	2951	2981
16	300	0	171	583	1119	1733	2415	3162	3945	4677	5093	5144
18	300	0	209	712	1367	2118	2951	3864	4821	5716	6224	6287
20	300	0	266	906	1740	2694	3755	4917	6135	7273	7920	8000
24	300	0	412	1404	2697	4176	5820	7621	9508	11271	12274	12398
28	300	0	538	1837	3528	5463	7613	9969	12438	14745	16057	16219
30	300	0	644	2196	4217	6530	9101	11918	14869	17627	19195	19389
36	300	0	991	3383	6496	10060	14020	18359	22906	27154	29569	29868
40	300	0	1323	4516	8672	13429	18715	24507	30576	36247	39471	39870
42	300	0	1516	5173	9935	15384	21441	28075	35029	41525	45219	45676
48	300	0	2028	6919	13288	20576	28677	37551	46851	55540	60481	61092

Sizing Coefficients (Cv)

Class 300 Valve Coefficient non-preferred direction (Disc side) – Flow to Open

Body style: Lug, Wafer, Double Flange (short pattern) & Double Flange (long pattern)												
Size (in.)	Class	C _v - Opening %										
		0	10	20	30	40	50	60	70	80	90	100
		Angle (Degrees)										
		0	9	18	27	36	45	54	63	72	81	90
3	300	0	1.9	7.3	13.8	20.6	28	36	44	53	59	60
4	300	0	4.0	15.0	28	42	57	73	91	109	122	123
6	300	0	11.8	45	84	125	168	216	269	322	362	364
8	300	0	24	91	171	254	342	439	546	655	737	740
10	300	0	52	196	370	552	742	952	1184	1420	1598	1605
12	300	0	81	307	580	863	1160	1489	1853	2221	2500	2511
14	300	0	95	358	676	1006	1353	1735	2160	2589	2914	2927
16	300	0	131	497	937	1395	1877	2408	2997	3592	4043	4061
18	300	0	171	647	1220	1816	2443	3134	3901	4675	5262	5286
20	300	0	230	869	1640	2441	3283	4212	5242	6283	7072	7104
24	300	0	355	1343	2532	3770	5071	6506	8097	9705	10922	10972
28	300	0	490	1853	3495	5204	6999	8979	11175	13395	15075	15144
30	300	0	581	2196	4143	6169	8296	10644	13246	15878	17869	17951
36	300	0	849	3211	6057	9019	12129	15561	19367	23214	26126	26245
40	300	0	1126	4260	8036	11965	16091	20645	25693	30796	34660	34818
42	300	0	1392	5265	9930	14785	19885	25512	31751	38057	42832	43027
48	300	0	1912	7232	13642	20312	27317	35047	43618	52282	58840	59109

Sizing Coefficients (Cv)

Class 600 Valve Coefficient preferred direction (Shaft side) – Flow to Close

Body style: Lug, Wafer, Double Flange (short pattern) & Double Flange (long pattern)												
Size (in.)	Class	C _v - Opening %										
		0	10	20	30	40	50	60	70	80	90	100
		Angle (Degrees)										
		0	9	18	27	36	45	54	63	72	81	90
3	600	0	2.8	9.4	18.1	28	39	51	64	75	82	83
4	600	0	4.6	15.7	30	47	65	85	107	126	138	139
6	600	0	14.8	50	97	150	209	274	341	405	441	445
8	600	0	23	77	148	229	320	419	522	619	674	681
10	600	0	39	133	256	396	552	723	903	1070	1165	1177
12	600	0	71	241	463	717	999	1308	1632	1935	2107	2128
14	600	0	95	324	623	965	1344	1760	2196	2604	2835	2864
16	600	0	119	407	782	1212	1688	2211	2759	3270	3561	3597
18	600	0	164	559	1073	1661	2316	3032	3783	4485	4884	4933
20	600	0	194	661	1270	1966	2740	3588	4477	5307	5780	5838
24	600	0	301	1026	1970	3051	4252	5568	6947	8236	8968	9059

Class 600 Valve Coefficient preferred direction (Shaft side) – Flow to Close

Body style: Lug, Wafer, Double Flange (short pattern) & Double Flange (long pattern)												
Size (in.)	Class	C _v - Opening %										
		0	10	20	30	40	50	60	70	80	90	100
		Angle (Degrees)										
		0	9	18	27	36	45	54	63	72	81	90
3	600	0	2.7	10.2	19.2	29	38	49	61	73	82	83
4	600	0	3.9	14.8	28	42	56	72	89	107	120	121
6	600	0	14.0	53	100	148	200	256	319	382	430	432
8	600	0	21	79	149	222	299	384	477	572	644	647
10	600	0	39	146	276	411	552	709	882	1057	1190	1195
12	600	0	64	242	456	678	912	1170	1457	1746	1965	1974
14	600	0	92	349	659	981	1319	1692	2106	2524	2841	2854
16	600	0	117	442	834	1242	1670	2142	2666	3196	3597	3613
18	600	0	157	594	1121	1669	2245	2880	3585	4297	4836	4858
20	600	0	190	717	1352	2013	2708	3474	4323	5182	5832	5859
24	600	0	276	1043	1967	2928	3938	5053	6289	7538	8483	8522

Technical Data

Specifications

Size Range	NPS 6 to 48 (DN 150 to 1200), depending on connection style
Body Style	Wafer Lug Double Flanged
Temperature Range	-320°F to 842°F (-196°C to 450°C) Material dependent - Consult Baker Hughes
Pressure Ratings	ASME Class 150 300 600 PN 10 16 25 40 63 100
Leakage Rate	Zero Leakage (bi-directional)

Material Options

Body	Carbon Steel, WCB
	Stainless Steel, CF8M
	Others on request
Disc	Stainless Steel, CF8M
	Carbon Steel
	Others on request
Seat	316 Stainless Steel (hardened)
Laminated Seal Ring	318 Stainless Steel/Graphite
Solid Seal Ring	318 Stainless Steel
	XM-19
	Inconel® 625
Stem	17-4PH Stainless Steel
	410 Stainless Steel
	Inconel® 625

Design Standards

Valve Design	ASME B16.34
	API 609
	EN 12516
	ASME BPVC VIII
	API 600
Seat Leakage Test	ANSI Class 70-2
Face-to-Face	ASME B16.10
	API 609
	EN 558
	ISO 5752
Flange Drilling	ASME B16.5
	ASME B16.47
	EN 1092-1
	ISO 7005

Certifications and Approvals

Certifications	ATEX
	CE: PED 2014/68/EU
	SIL 3 Capable
Fire Test	API 607
	ISO 10497
Fugitive Emissions	ISO 15848-1
	API 641
Approvals	ABS Type
	CRN

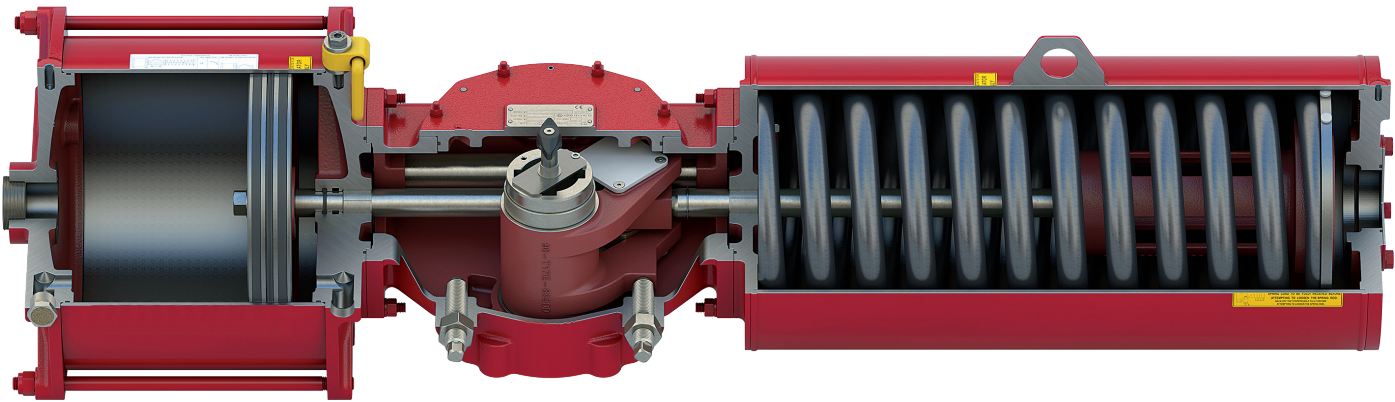
Series 98 Actuators and Controls

Overview

Baker Hughes offers a variety of Masoneilan valve instrumentation suitable for a wide range of applications. The portfolio includes Electro-Pneumatic Transducer, air filter regulators, Booster Relays and Electric Rotary Switches.

Other actuator types can be provided on request, such as:

- Pneumatic Scotch Yoke
- Hydraulic
- Electro-Hydraulic
- Electric



The Scotch Yoke actuators were designed primarily for pneumatic operation to a maximum pressure of 150 psi (10.3 Bar) and for temperature ranges of -50°F to 300°F (-46°C to 149°C).

- Compact design offers a high torque-to-weight ratio
- Modular design offers easy configuration in the field
- Module alignment ensured by precision machined centering rings
- Torque output ranging from 2,744 to 885,100 lb-in (310 to 100,000 Nm)
- Spring end torque ranging from 2,744 to 445,261 lb-in (310 to 50,306 Nm)
- Premium epoxy/polyurethane coating as standard

Design and Construction

Series 98 actuators are suitable for a specific application can be configured by combining modules.



Operating Conditions

Pressure Range ⁽¹⁾	40 - 150 psi (2.8 - 10.3 bar)
Media	Dry Compressed Air/Inert Gas ⁽¹⁾
Temperature Range Options	Standard: -20°F to 200°F (-29°C to 93°C)
	High Temperature: Up to 300°F (149°C) ⁽¹⁾
	Low Temperature: Down to -50°F (-46°C) ⁽¹⁾

Note:

1. Contact factory for other media or non-standard temperature range.

Compliances

Torque Base	Mounting Dimensions as per ISO 5211: 2001(E)
Accessories	Shaft Driven Accessories Mounting per NAMUR-VDE
Performance Testing	EN 15714-3:2009
Ingress Protection	IP66/IP67M per IEC 60529
Safety	ATEX, SIL 3 Suitable, PED on request

Actuator Modules

Design and Construction

The symmetrical yoke provides a balanced torque output curve. This is the best choice in applications where the torque requirements at the seat break out and end positions are similar. As the name suggests, the output torque curve is symmetrical about the mid rotation point.

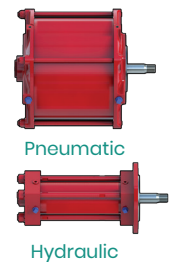
Torque Module

- Integral single piece cast housing for rigidity
- Two ISO drilling patterns in base to maximize direct mounting
- Symmetrical and Canted Yoke options
- Integral travel stops
- Replaceable self lubricating metal backed PTFE bearings for enhanced service life
- NAMUR mounting for shaft driven accessories, standardized across models
- Guided drive supports side loads
- Relief vent prevents ingress and over pressurization



Pressure Modules

- Corrosion protected external tie rods designed for long seal life and reliability
- Honed and hard chrome plated cylinder barrel for wear and corrosion protection and enhanced seal performance
- Multiple ports available
- Quad ring and U-cup seals for dynamic sealing
- Dual wear bands for better guidance of piston



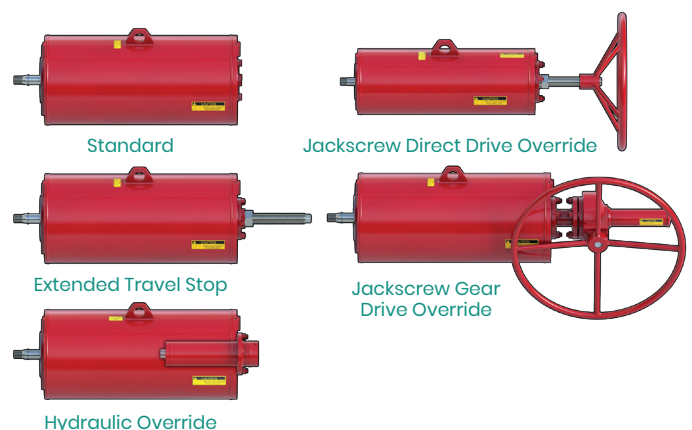
Direct Acting Modules

- Extended stop
- Jack screw
- Pneumatic
- Jack screw with gear drive
- Hydraulic override



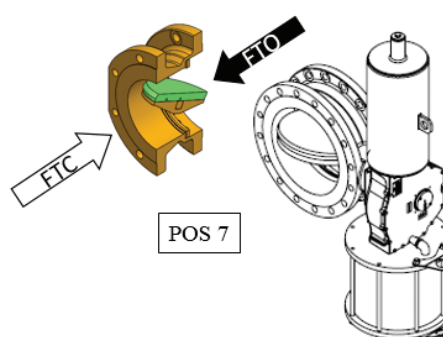
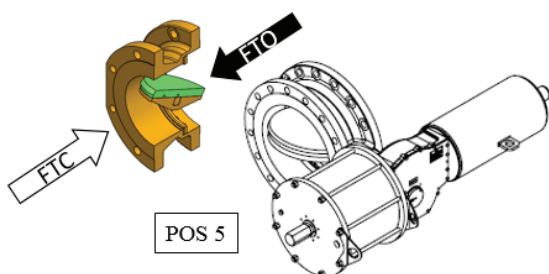
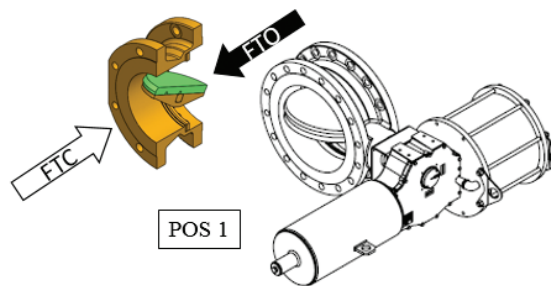
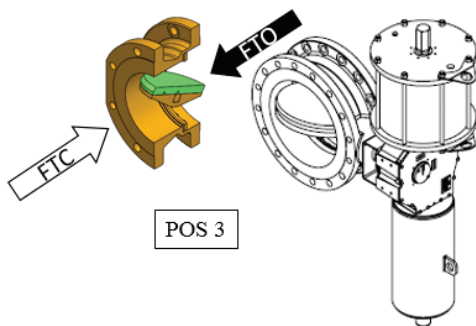
Spring Modules

- Fully enclosed and welded design for safety
- Guided and centered springs for smooth operation
- No metal to metal contact of spring or guide
- Thrust base for mounting jackscrew and hydraulic override
- Tectyl coated springs for corrosion protection

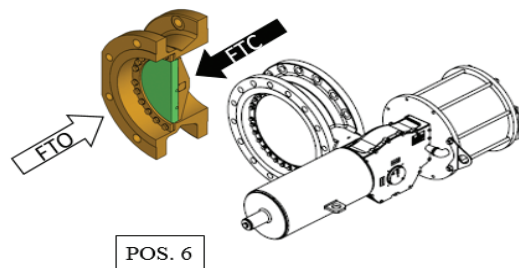
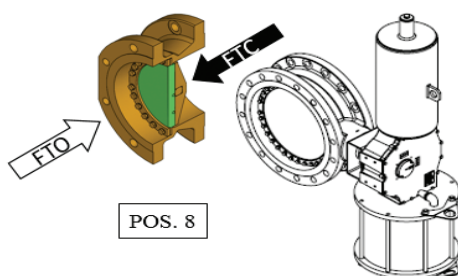
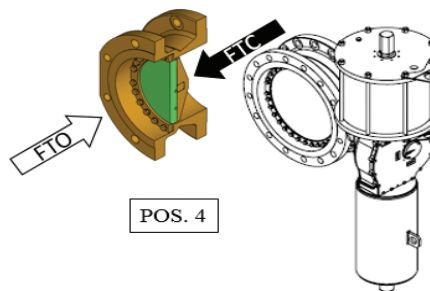
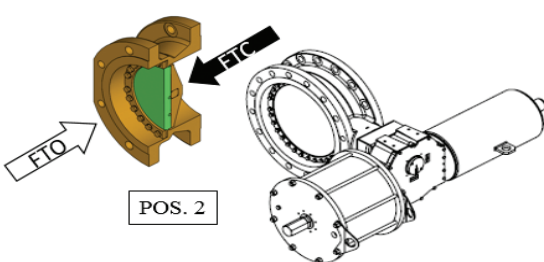


Actuator Mounting Guide

AIR-TO-CLOSE:

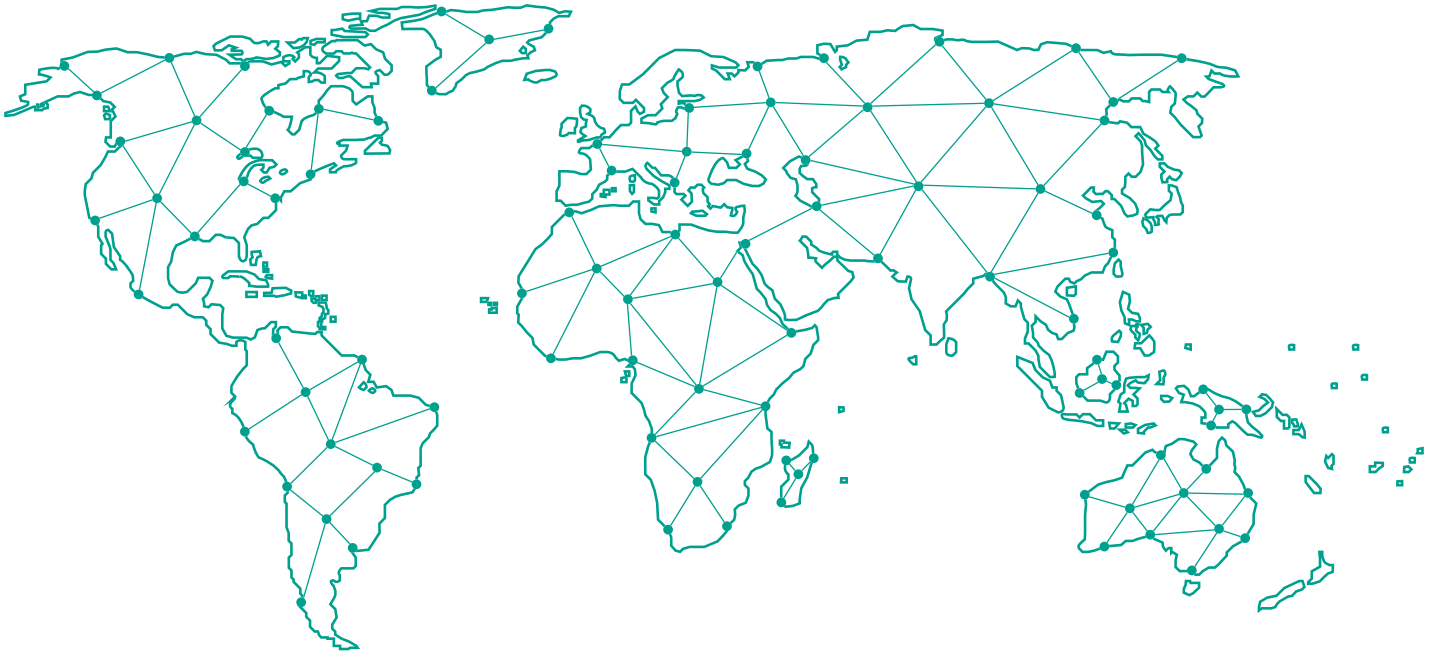


AIR-TO-OPEN:



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Tech Field Support and Warranty:

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