

**RTC TAIWAN  
ATYCO FLUID  
CONTROL**

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## **High Performance Butterfly Valve**

**Manual and Automated  
Double Offset Series 121 and 122  
ASME/ANSI Class 150 and 300**



TAIWAN ATYCO FLUID CONTROL  
EQUIPMENT INTERNATIONAL COMPANY LIMITED  
Liaoning Yuanlu Machinery Equipment Manufacturing Co., Ltd.  
Address:55 Gongnong Road, Zhanqian District,  
Yingkou City, Liaoning Province,China  
TEL:+008613332319780  
FAX:+00860417-3535904  
Website:www.atyco.cn  
Email:atycoln@163.com

# High Performance Butterfly Valve

## SERIES 121 AND 122 HIGH PERFORMANCE BUTTERFLY VALVE

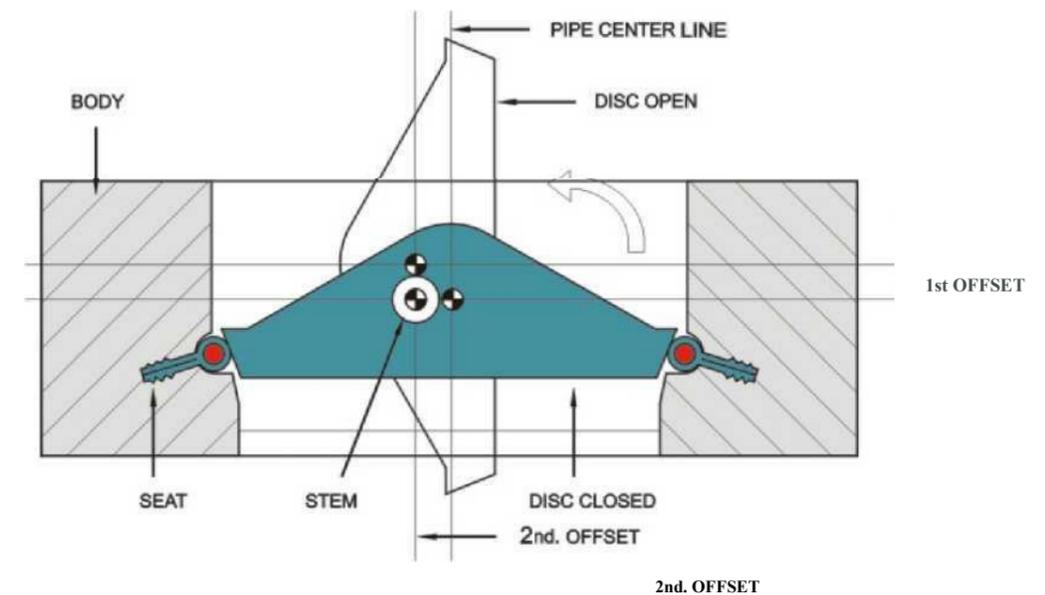
RTC High Performance Butterfly Valve is ideally suited for on-off and regulating control of gas and liquid media. The valves provide a bi-directional bubble-tight shutoff (zero leakage), high flow capacity and long service life.

### Double Offset Design

The double offset butterfly valve has a double disc/stem design.

- 1) The shaft is offset from its disc centerline: this offset will make the valve has a continuous sealing surface on the disc when it's fully closed.
- 2) The shaft is offset from pipe centerline: this offset will make the disc don't touch the seat at all when it's in fully open position.

This double eccentric design produces a cam-like action as the disc swings into and out of the seat. The disc pulls out of seat immediately and this eliminates wear points at the top and bottom of the seat. The elimination of friction increases seat service life, reduces operation torque and improves throttling.



### General Applications

- Chemical and Petrochemical Industry
- Pulp and Paper Plant
- Water Treatment
- District Heat Supply
- Power and Utilities
- Vacuum System
- Shipbuilding
- Food Industry
- Desalination Industry
- Heavy duty service

RTC's standard valve line has been specifically developed to meet most applications. For specific services, RTC offers appropriate valves and materials to meet these needs.

### Design Change

In order to follow the RTC commitment to continuous improvement, we reserve the right to revise or modify product and performance without prior notice.

# High Performance Butterfly Valve

## Features and Advantages

### Blow-out Proof Stem

Large diameter, single piece high strength shaft provides alignment and rigid support for disc.  
Square type stem design simplify adaption to manual or automatic actuation.

### Seat Retainer

The seat retainer with screws facilitates replacement of seat ring. Protects the seat ring from abrasion and erosion.

### Disc Stop in Body

Over-travel stop prevents the disc from rotating through the seat.

### Seat

An advanced two-part seal design provides reliable sealing performance and extends cycle life with less maintenance.

### Stem Retainer

Provides positive stem retention to prevent movement of the stem.



### ISO Bracket

Universal and replaceable mounting bracket meets ISO5211 connection standard.

### Stem Packing

Adjustable V-ring type TFE or Graphite offers positive sealing.

### Stem Bearings

RTFE/SS or Graphite/SS bearings maintain shaft alignment. Self-lubricant bearings reduce wear and friction.

### Body

One-piece casting of high quality with standard availability in carbon steel, stainless steel and alloy steel for services in wide variety of applications and abrasive service.

### Disc

Spherical sealing surface on disc improves sealing capacity. The disc edge is fully machined and polished for minimum torque.

## Coating

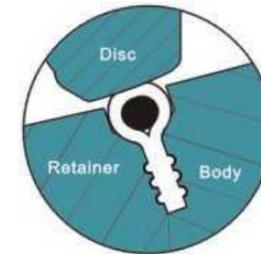
Non stainless steel butterfly valve bodies are ED (Electro Deposition) and Zinc coated as standard. RTC standard coating offers outstanding protection against abrasion and corrosion. The Zinc coating is resistant to most atmospheric conditions and enhances a much longer service life.

TEST	RESULT
Salty Spray Test per ASTM B117-11	No affected
Adhesion Test per ASTM D3359	None of the squares of the lattice is detached

# High Performance Butterfly Valve

## RTC High Performance Butterfly Valve Seat Designs

- R Type Unique Soft Seat design
- P Type Soft Seat design
- S Type S shape Flexible Metal Seat design



### R type

The unique seat consists of a resilient energizer which is completely encapsulated by the seat, is also isolated from all contact with process fluid.

The o-ring energizer is of fluoroelastomer material. This provides excellent resilience and it is able to flex and deform under loads and return to original shape after removal of the load.

The o-ring energizer increases the elasticity of seat as well as seat life and improves the leak-free performance.

The advanced seat design offers a self-energized seal in vacuum and low temperature applications.

## Fugitive Emission Test

RTC R-type Seat Butterfly Valve has been successfully passed Standard ISO15848-1.

Valve is tested at different temperature with helium test gas, using a sniffing test or vacuum technique.

Low emission performance design has been indispensable to RTC valves.

A low fugitive emission design minimizes the costs occurring when a product is lost via leaking valves.

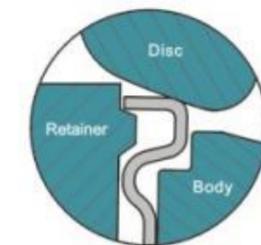
Emission reduction prevents risk and hazards from liquid or vapors to human health, safety and environment issues as well.



### P type

This is standard resilient seat design, constructed of PTFE, Filled PTFE or TFM PTFE, utilizes a flexible lip which will slightly deflects the disc when it bears flow pressure. This movement makes the sealing surface of the seat is constantly pushing against the edge of the disc.

The sealing force is amplified by increasing line pressure.



### S Type

Metal seat is suitable for abrasive and/or high temperature applications.

By its dynamic and flexible design, the disc lifts quickly out of the seat and this produces minimum wear, so operating torques are reduced and seat life is extended.

This metal seat design needs to be applied enough force to obtain an optimum sealing performance.

# High Performance Butterfly Valve

## Standard Material List

No.	Part	Material
1	Body	A216-WCB, A351-CF8/CF8M
2	Disc	A351-CF8/CF8M
3	Disc Pin	Stainless Steel 316
4	*O-ring	EPDM or FKM
5	Seat	Soft / Metal
6	Retainer	Stainless Steel 304/316
7	Stem	AISI 304/316 / 17-4 PH
8	Top Stem Bearing	Stainless Steel + PTFE
9	Packing Retainer	Stainless Steel 316
10	Stem Packing	PTFE/Graphite
11	Packing Gland	A351-CF8/CF8M
12	Stud	A193-B8/B8M
13	Gland Flange	A351-CF8/CF8M
14	Washer	Stainless Steel 304/316
15	Nut	IS03506 A2-70/A4-70
16	Bolt	IS03506 A2-70/A4-70
17	End Cover	A351-CF8/CF8M
18	O-ring	FKM+PTFE
19	Retainer Ring	Stainless Steel 316
20	Bottom Stem Bearing	Stainless Steel + PTFE
21	Nut	IS03506 A2-70/A4-70
22	Bracket	A351-CF8
23	Bolts	IS03506 A2-70/A4-70
24	Screw	IS03506 A2-70/A4-70

\*Seat o-ring only for R type soft seat

## Available Materials

- Ductile Iron
  - Hastelloy
  - Duplex / Super Duplex
  - Alloy 20
  - SMO 254
  - Monel
  - 904L
- Other materials are available on request

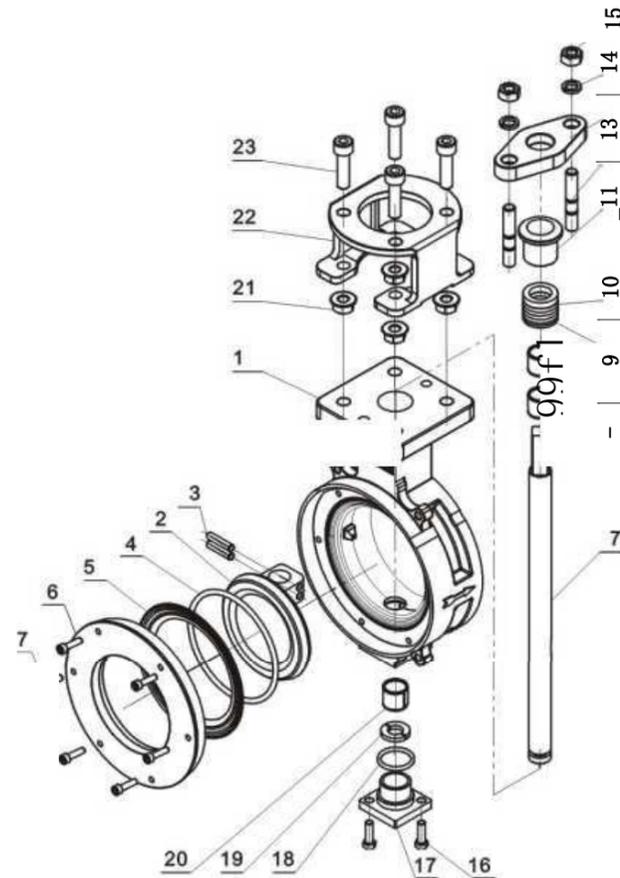
## Seat Materials

- Soft Seat  
PTFE, RTFE, TFM1600, PEEK, UHMWPE
- Metal Seat  
SS316, SS316L, Inconel

## CE Marked Versions Available

CE marked and documented valves that conform to the EUROPEAN Pressure Equipment Directive PED 2014/16/UE are available in ANSI Class 150/300.

## Exploded View (Standard Type)



\*\*\*All valves are supplied with a nameplate in compliance with PED directive.

## Standard Specifications

- Valve Design: MSS SP-68, API 609, ANSI B16.34
- Face to Face: API 609, MSS SP-68, ISO5752
- Flange: ANSI B16.5, EN1092, JIS B2220
- Inspection & Testing: API 598, EN12266

## Product Range

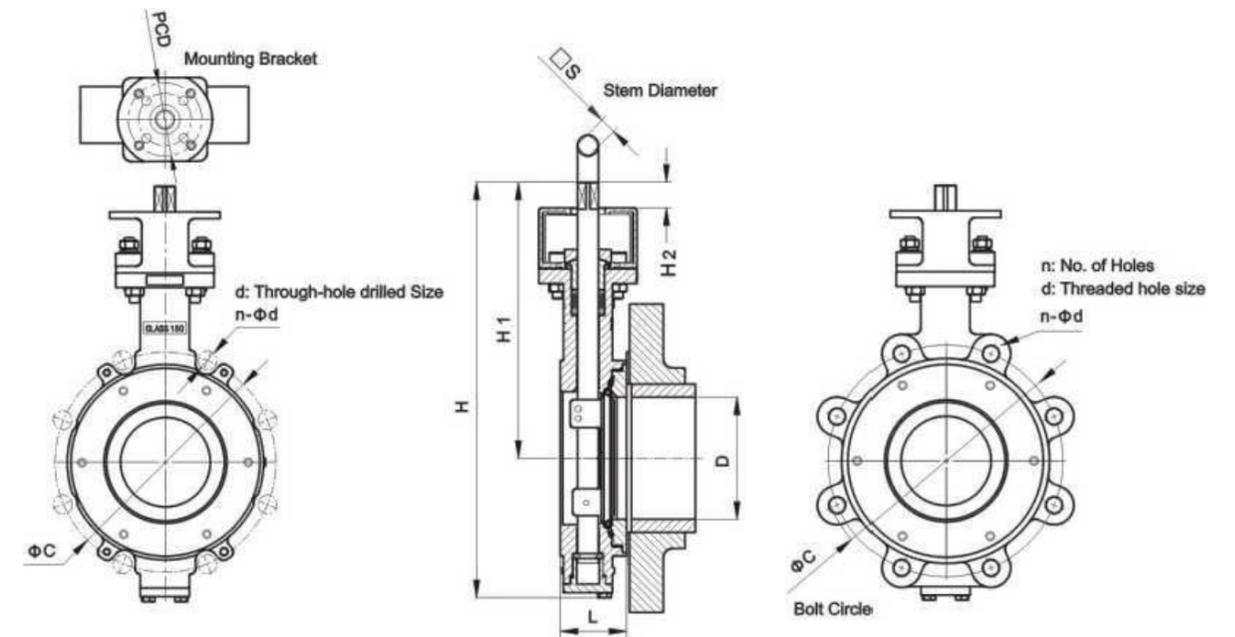
Body Configurations: Wafer and Lug  
Valve Size: 2"~ 24"(DN50 ~ 600)  
Rating: Fig. 121 Class 150  
Fig. 122 Class 300

## Operator Available

Lever Handle, Gear Operator, Pneumatic and Electric Actuators

# High Performance Butterfly Valve

## Series 121 2"~24" Class 150



121W Wafer Body Style

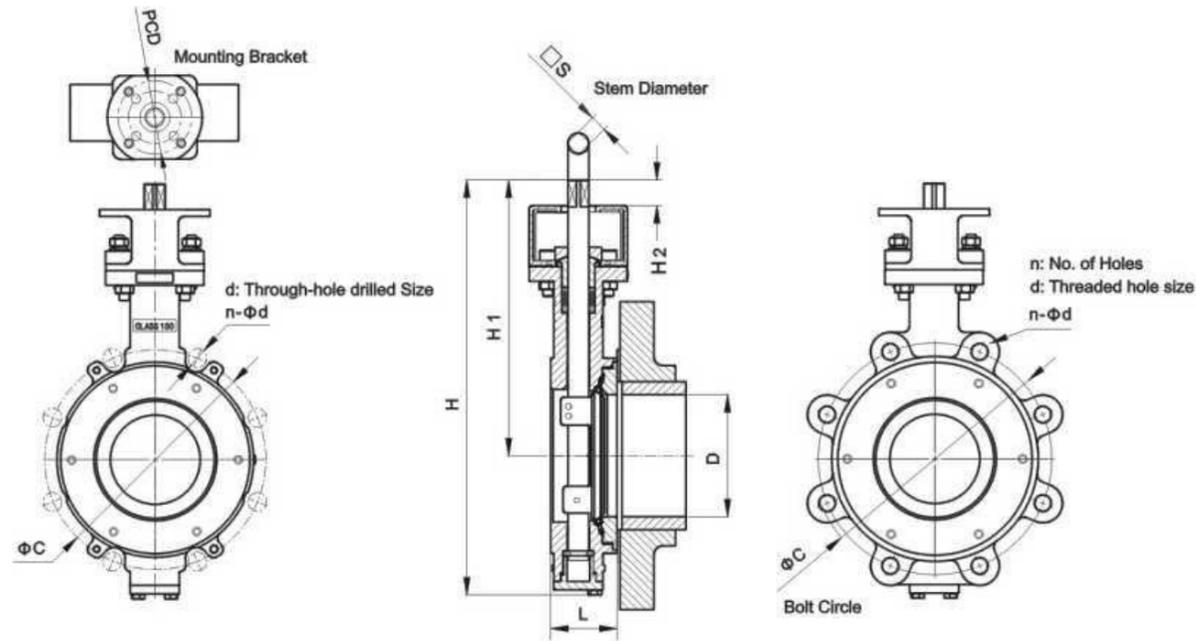
121L Lugged Body Style

## ASME Class 150

SIZE		D	L	H	H1	H2	□S	ISO5211	ΦC	n-Φd (Inch)	
INCH	DN									WAFER	LUG
2	50	58	44	269	188	16	11	F05/F07	120.7	4-3/4	4-5/8
2-1/2	65	62	46	271	189	16	11	F05/F07	139.7	4-3/4	4-5/8
3	80	75	48	291	202	16	11	F05/F07	152.4	4-3/4	4-5/8
4	100	100	54	345	231	16	14	F05/F07	190.5	8-3/4	8-5/8
5	125	130	57	378	247	20	17	F05/F07	215.9	8-7/8	8-3/4
6	150	162	57	418	271	20	17	F07/F10	241.3	8-7/8	8-3/4
8	200	208	64	477	303	21	17	F07/F10	298.5	8-7/8	8-3/4
10	250	257	71	546	332	24	22	F07/F10	362.0	12-1	12-7/8
12	300	316	81	635	379	36	27	F10/F12	431.8	12-1	12-7/8
14	350	340	92	694	420	40	27	F12/F14	476.3	12-1 1/8	12-1
16	400	394	102	803	480	40	36	F14/F16	539.8	16-1 1/8	16-1
18	450	442	114	854	505	40	36	F14/F16	577.9	16-1 1/4	16-1 1/8
20	500	495	127	948	565	50	36	F14/F16	635.0	20-1 1/4	20-1 1/8
24	600	576	154	1086	660	50	46	F16/F25	749.3	20-1 3/8	20-1 1/4

# High Performance Butterfly Valve

## Series 122 2"~24" Class 300



122W Wafer Body Style

122L Lugged Body Style

### ASME Class 300

SIZE		D	L	H	H1	H2	S	ISO5211	ΦC	n-Φd (Inch)	
INCH	DN									WAFER	LUG
2	50	58	44	269	188	16	11	F05/F07	127.0	8-3/4	8-5/8
2-1/2	65	62	46	271	189	16	11	F05/F07	149.2	8-7/8	8-3/4
3	80	75	48	291	202	16	11	F05/F07	168.3	8-7/8	8-3/4
4	100	100	54	345	231	16	14	F05/F07	200.0	8-7/8	8-3/4
5	125	130	59	378	247	20	14	F05/F07	235.0	8-7/8	8-3/4
6	150	162	59	447	292	20	17	F07/F10	269.9	12-7/8	12-3/4
8	200	208	73	500	321	21	17	F07/F10	330.2	12-1	12-7/8
10	250	257	83	540	329	24	22	F07/F10	387.4	16-1-1/8	16-1
12	300	316	92	671	418	36	27	F10/F12	450.8	16-1-1/4	16-1-1/8
14	350	340	117	750	446	40	36	F12/F14	514.4	20-1-1/4	20-1-1/8
16	400	394	133	809	478	40	36	F14/F16	571.5	20-1-3/8	20-1-1/4
18	450	442	149	893	519	40	36	F14/F16	628.6	24-1-3/8	24-1-1/4
20	500	495	159	1023	535	50	Φ72	F14/F16	685.8	24-1-3/8	24-1-1/4
24	600	576	181	1193	722	50	Φ72	F16/F25	812.8	24-1-5/8	24-1-1/2

# High Performance Butterfly Valve

## Valve Flow Coefficient

Cv values (US gallons per minute) represent the flow of 60°F water through a 100% open valve at a pressure drop of 1 psi. The metric equivalent, Kv, is the flow of water at 16°C through the valve in cubic meters per hour at a pressure drop of 1kg/cm2. To convert Cv to Kv, multiply the Cv by 0.8569.

SIZE		Class	Angle of Opening								
INCH	DN		10°	20°	30°	40°	50°	60°	70°	80°	90°
2	50	150	3	7	17	27	41	63	85	106	128
		300	-	-	-	-	-	-	-	-	-
2-1/2	65	150	4	9	21	35	55	80	104	135	149
		300	-	-	-	-	-	-	-	-	-
3	80	150	7	19	40	62	97	134	166	194	206
		300	5	14	25	36	51	74	114	145	165
4	100	150	9	30	62	98	147	223	308	368	386
		300	13	35	60	88	123	178	276	351	400
5	125	150	15	50	96	162	260	384	500	637	736
		300	-	-	-	-	-	-	-	-	-
6	150	150	38	93	163	267	415	607	813	1047	1175
		300	34	92	157	232	323	468	726	923	1050
8	200	150	75	135	305	510	750	1110	1537	2006	2290
		300	60	157	270	397	554	802	1245	1582	1800
10	250	150	92	250	495	770	1125	1670	2346	2980	3558
		300	104	275	472	695	970	1404	2178	2769	3150
12	300	150	135	367	734	1134	1653	2600	3700	4867	5767
		300	156	415	712	1049	1463	2117	3285	4175	4750
14	350	150	192	477	924	1422	2083	3140	4307	5578	6700
		300	171	455	780	1148	1601	2318	3596	4570	5200
16	400	150	220	570	985	1700	2450	3700	5400	7450	9100
		300	228	604	1035	1523	2125	3076	4772	6065	6900
18	450	150	335	705	1425	2470	3670	5280	7486	9330	10588
		300	307	814	1395	2053	2864	4146	6432	8175	9300
20	500	150	397	960	1800	3233	4688	7130	9415	11980	13900
		300	373	989	1695	3495	3880	5037	7815	9932	11300
24	600	150	455	1042	2496	4470	6582	10000	13645	17437	20520
		300	610	1618	2775	4085	5698	8247	12795	16261	18500

## Pressure/Temperature Rating

### Valve Body Ratings - bar

Temperature°C	Carbon Steel		316 Stainless Steel	
	ASME Class	150	300	150
-29 to 38	19.6	51.1	19.0	49.6
100	17.7	46.6	16.2	42.2
150	15.8	45.1	14.8	38.5
200	13.8	43.8	13.7	35.7
250	12.1	41.9	12.1	33.4
Test Pressure	30	77	29	75

• Ratings correspond to ASME/ANSI B16.34 for materials above mentioned.

### Seat Rating

Type and Material	Temperature°C	
	R type Soft Seat	P type Soft Seat
R type Soft Seat	RTFE	-60 to 230
	TFM1600	-120 to 230
P type Soft Seat	PTFE	-60 to 180
	Inconel 718	-73 to 450
S type Metal Seat	316 Stainless Steel	-73 to 315

# High Performance Butterfly Valve

## Valve Torque Data

The following tables can be used as a quick guide for actuator selection. Torque Charts for RTC High Performance Butterfly Valve

(All torques in N-m.)

Series		121 ANSI Class 150					
Seat Type		R type			P type		
Valve Size		Shut-off Differential Pressure					
inch	DN	6 bar	10 bar	19.7 bar	6 bar	10 bar	19.7 bar
2	50	6	8	10	23	24	26
2-1/2	65	8	10	15	29	31	33
3	80	10	15	20	34	37	39
4	100	18	25	30	47	53	58
5	125	28	35	40	65	76	86
6	150	60	65	70	95	110	126
8	200	90	100	110	160	190	217
10	250	160	170	180	220	270	310
12	300	200	240	280	290	990	470
14	350	210	260	300	490	680	840
16	400	350	370	380	620	870	1080
18	450	600	640	660	810	1140	1420
20	500	800	850	880	1090	1540	1920
24	600	1200	1280	1320	1670	2380	2980

Series		122 ANSI Class 300					
Seat Type		R type			P type		
Valve Size		Shut-off Differential Pressure					
inch	DN	20 bar	40 bar	51 bar	20 bar	40 bar	51 bar
3	80	20	26	32	40	55	60
4	100	30	45	50	70	95	110
5	125	-	-	-	-	-	-
6	150	70	140	150	160	240	270
8	200	110	150	170	310	475	550
10	250	180	250	300	480	750	880
12	300	280	440	550	660	1030	1200
14	350	300	480	570	1110	1880	2230
16	400	380	608	722	1340	2240	2670
18	450	660	960	1254	1730	2880	3420
20	500	880	1400	1672	2310	3890	4630
24	600	1320	2100	2508	3130	5250	6250

The above torque values are for normal liquid applications. For other service conditions, unusual fluids or slurries, please consult manufacturer