

BEIER-04R. 01-019



  
**BEIER**  
CONTROLVALVE

## **GYR-71700**

### High Performance Seal Butterfly Valve

**ZHEJIANG BEIER CONTROL VALVE CO.,LTD.**  
[Http://www.Controlvalves.cn](http://www.Controlvalves.cn)

## High Quality & Performance Butterfly Valve

### GYR-71700 Double Dimensional Bias Butterfly Valve

This Double Dimensional Bias Butterfly series is high performance of high seating performance and high durability as the disk and seat ring have the particular construction design. The valve has the function of adjustment and cut-off performance, also is an economical, useful and automatic control valve. The volume is small, weight is light, the circulation is wide and is convenient to maintenance. The actuator standard uses pneumatic cylinder type, automatic type and electric type actuator.

The perfect union of long-term precision and stable control

BEIER Yours succeed partner.

The long service life, maintains conveniently

## GYR-71700 SERIES BUTTERFLY VALVES

Trim type: GYR-71700 adopts double dimensional eccentricity structure

Size range: 4" ~ 40"

Body spec: ANSI 100# 150# 300#  
PN 0.6、 1.0、 1.6 、 4.0Mpa

Body type: GYR-71700

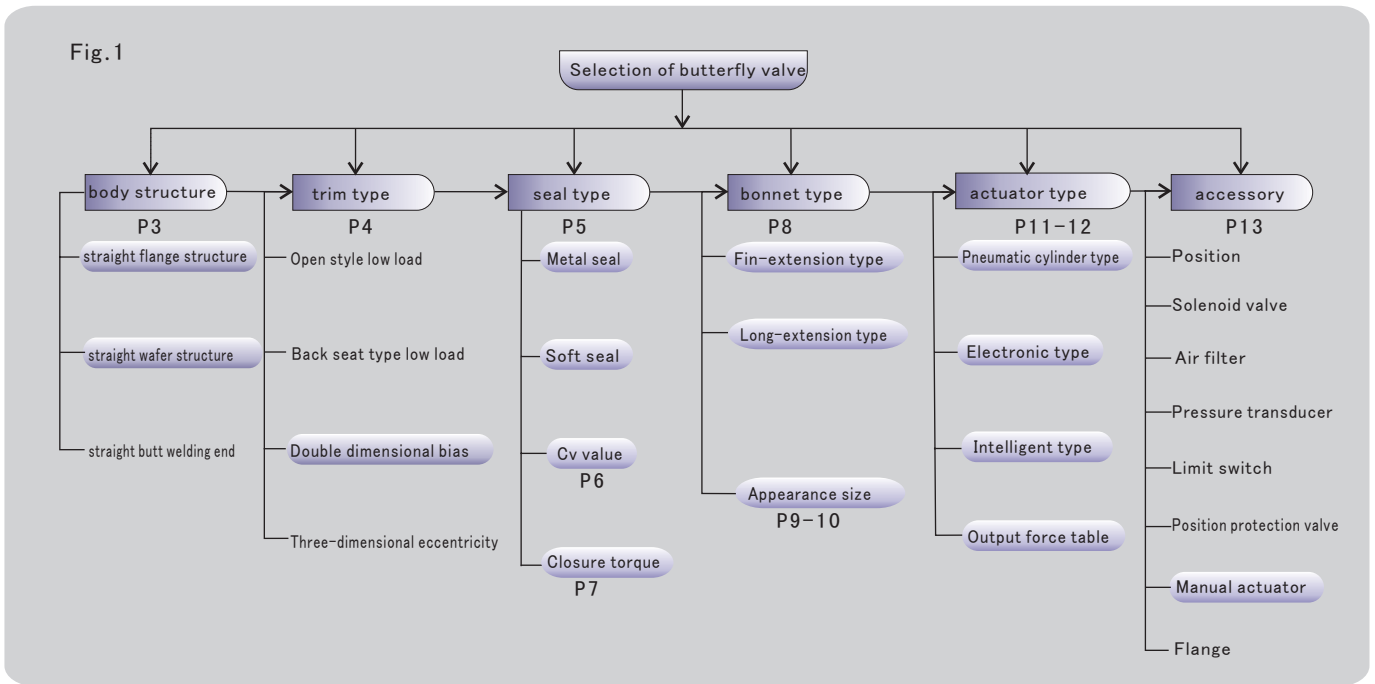
Packing: PTFE、 asbestos、 Flexible graphite

Seat leakage: ANSI CLASS VI(Standard type Soft seal) ANSI CLASS V(Optional type Metal seal)

Application situation: Be suitable to control and shut off the fluid in each kind of operating mode.  
For example, in controlling fluid system like natural gas treatment, purification system and storage tank, the refinery oil thick liquid system, air separation plant, molecular sieve, etc. Suitable temperature range is  $-196^{\circ}\text{C}$ ~ $+430^{\circ}\text{C}$ .

## High performance double dimension bias butterfly valve

GYR-71700 double dimension bias butterfly valve



※ Note:

You may configure the 71700 series valve according to the arrow to show by the Fig.1 of guidance chart.

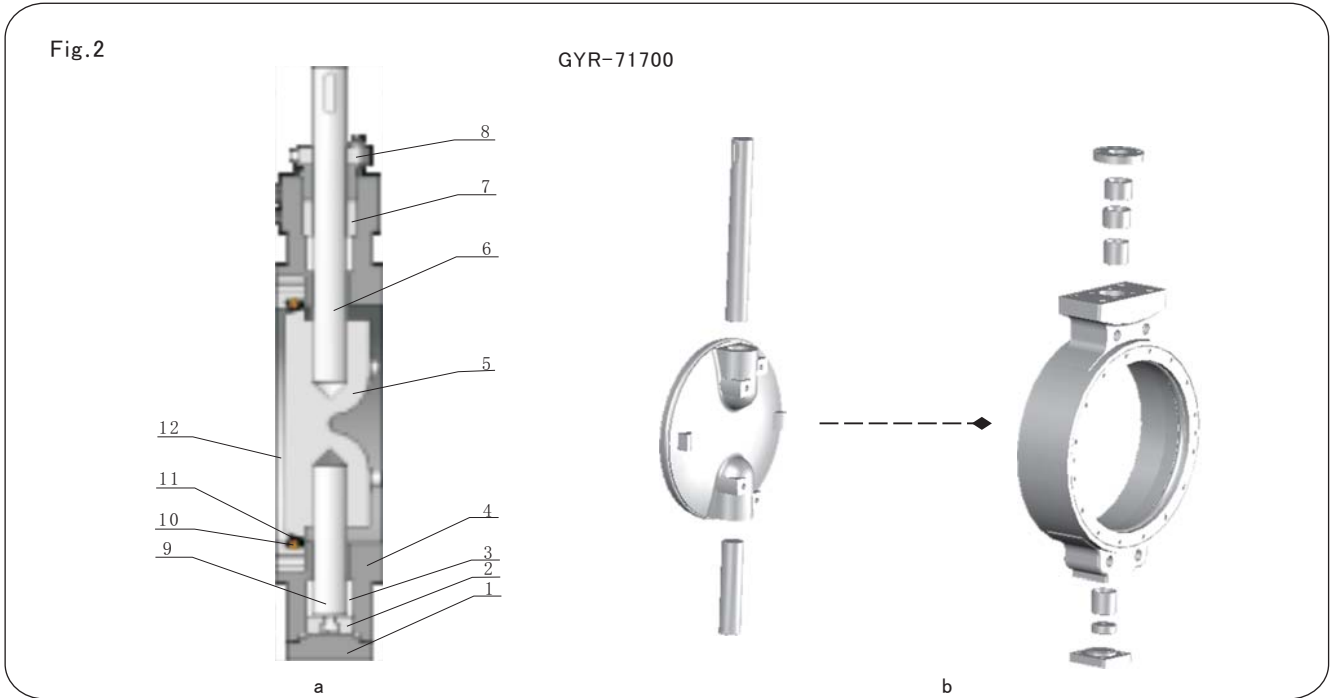
The shadowed content is addressed in this manual.

Please see the corresponding page for the content you concern.

Some parts such as bonnet, actuator and accessory component are optional according to different operation conditions and specific requirements of customers, please consult BEIER engineers for detailed parameters.

The max pressure difference allowed when configuring actuators for control valves is not listed in this manual, and if necessary, please consult your BEIER engineers or calculate it with the control valve software of BEIER.

## GYL-71700 Body structure



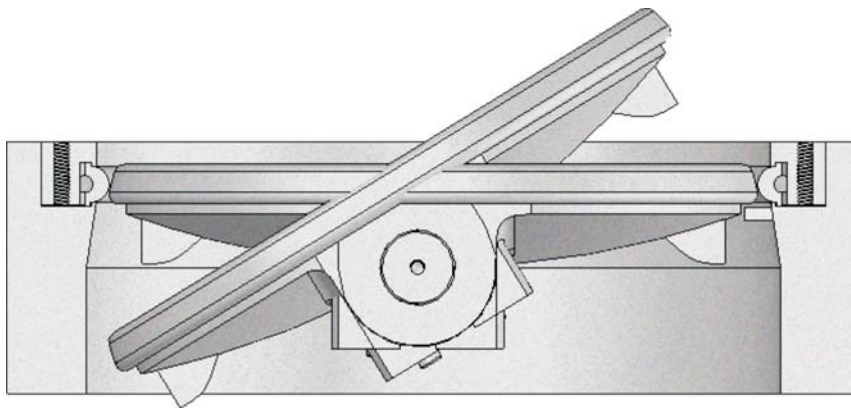
- ◆ Fig.2 (a) is the Sectional drawing of GYR-71700 series, the (b) is Detonation chart.
- ◆ The air tight seal completely to conform to the ANSI VI level of seals standards.
- ◆ Guarantees the precise adjustment by low shut off torque; (even if in small open degree)
- ◆ Expedite valve seat structural design.
- ◆ Easy to disconnect and replacing.
- ◆ Form the seat with the disc a stricter seal by the function of the redeem ring.
- ◆ The disc can leave the seat immediately when opening, prevent attrition to seat.
- ◆ As a result of the disc ideal outline, may adjust the flow rate precisely when the disc is apart from the seat very recently.

Table.1

No	Part name	Material	Temperature range (°C)
1	Back cover	A216-WCB	-5~425
		A351-CF8	-196~538
		A351-CF8M	-196~538
2	Limited piece	316SS	-196~538
3	Bushing	SF-1	-195~280
		H62	-195~280
4	Body	17-4PHAlloy	-40~425
		A216-WCB	-5~425
		A351-CF8	-196~538
5	Disc	A351-CF8M	-196~538
		A216-WCB	-5~425
		A351-CF8	-196~538
6	Front shaft	A351-CF8M	-196~538
		A351-CF8M	-196~538
7	Packing	Reinforced Teflon	-40~232
		Flexible graphite	-196~538
8	Gland	A216-WCB	-5~425
9	Shaft	A351-CF8M	-196~538
10	Gasket ring (redeem ring)	Fluorine rubber gasket ring	-20~250
		SUS316VGasket ring	-196~538
11	Soft seat	Reinforced Teflon +Carbon Fiber	-40~250
		molybdenum bisulfide reinforced Teflon	-10~160
12	Clamp	A216-WCB	-5~425
		A351-CF8	-196~538
		A351-CF8M	-196~538

## GYL-71700 Trim type

Fig.3



GYL-71700 butterfly valve body

### Characteristic:

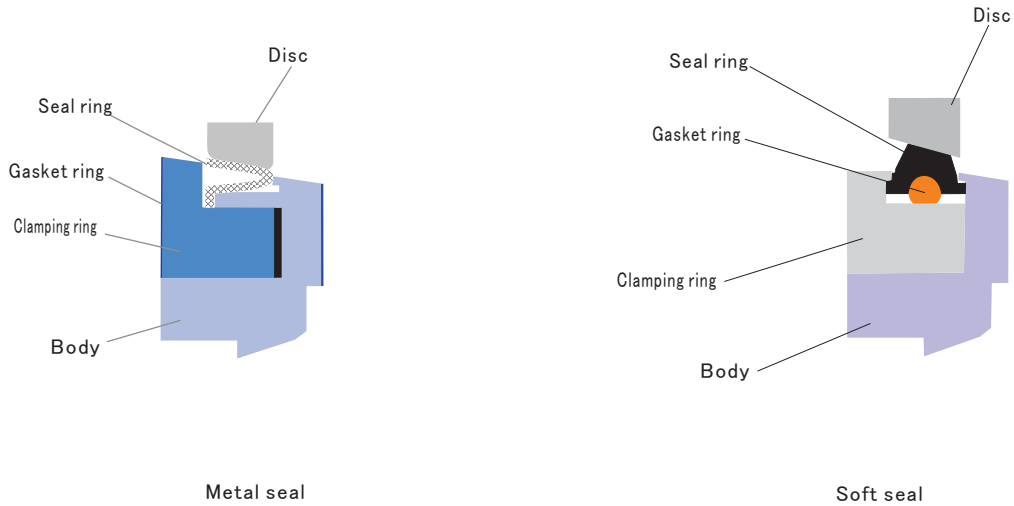
- ◆ The identical valve body is suitable for ANSI pressure rank 150#, 300# and 600# when the nominal diameter is smaller than 8 inches.
- ◆ The circulation ability is higher than the valve like straight, plug type.
- ◆ The design of disc limited piece prevent to destroy the seat by the disc is revolved excessively.
- ◆ After the service the disc may reposition on the pipeline
- ◆ May choose blows the sweeping valve cover and the oil vessel
- ◆ Guarantees the higher control characteristic by big thrust force
- ◆ Reduce spare parts cost

Table.2

Part name	material	Temperature range (°C)
Disc	A216-WCB	-5~425
	A351-CF8	-196~538
	A351-CF8M	-196~538
Gasket ring (redeem ring)	Fluorine rubber gasket ring	-20~250
	SUS316V Gasket ring	-196~538
Soft seat	Reinforced Teflon +Carbon Fiber	-40~250
	molybdenum bisulfide reinforced Teflon	-10~160
Metal seat	A351-CF8M	-196~538
	A351-CF8M+partial satellite alloy	-196~538

## GYL-71700 Seal type

Fig.4



### Seal type

#### Metal seal

- ◆ The metal seal butterfly valve, the surface of disc adopts surfacing stainless steel or surfacing harden alloy, wear-resisting, the service life is long.
- ◆ The streamline design of disc, stem, wear-resisting axle sleeve enable the valve to have the fine leak-proof quality, the heat resistance, the pressure resistance, wear-resisting, anti-corrosive performance.

#### Soft seal

- ◆ Valve seat gasket ring (redeem ring) is effective practical, has the good memory ability and is not easy to distort. When the disc isn't closed completely, the valve seat radial direction has the certain flexibility, reduce contact with the disc, thus reduce the valve seat attrition and the valve torque. When the disc closure, it provides the valve peripheral tight strength, thus guarantee strict seal between the disc and the seat.
- ◆ The GYR-71700 series seal is the true full seal design. It does not need the pipeline pressure to help the seal, all valve seats all can maintain the bidirectional seal under the low pressure and the high pressure

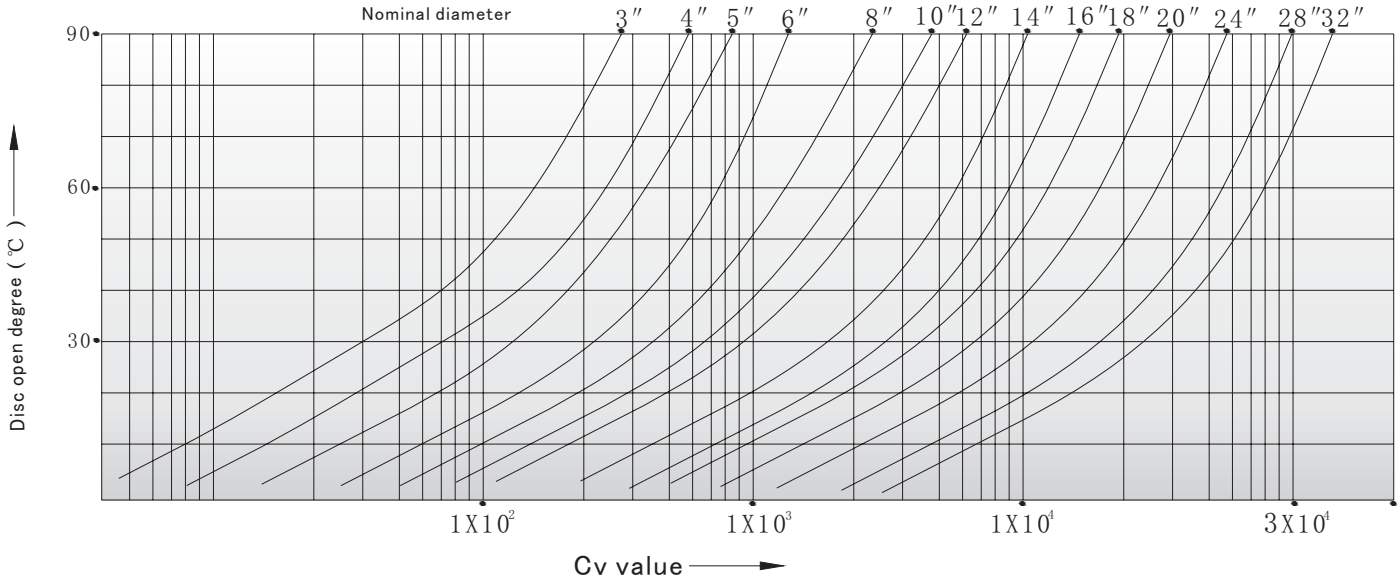
Soft seal can bear the highest temperature is 250°C

If needs higher temperature product, please conduct you BEIER engineer.

## Cv Value

### Flow rate characteristic

Table.3



The conversion of Kv and Cv as follows:  $Cv = 1.167 Kv$

- ◆ The Cv definition is: when the valve all opens, with the 40–60° F water, keep valve beginnings and ends differential pressure is 1 psi, under this condition has flowed the flux(unit: gallon) of the water per minute. (A gallon is a unit of measure for liquid.1 US gallon=3.785 liter)

- ◆ The Cv value, is an important parameter of control valve, it reflected that the ability the fluid passes the control valve, also is the control valve capacity. According to the control valve circulation ability Cv value computation, may determine the diameter of the control valve, in order to choose the size of the control valve correctly, must calculate the rated flow rate coefficient Cv value of the control valve accurately.

Table.4 Cv value

Nominal diameter in h(cm)	150#									
	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
3(80)	34.45	60.07	85.68	111.3	136.92	162.53	188.15	213.77	139.38	265
4(100)	62.4	108.8	155.2	201.6	248	294.4	340.8	387.2	433.6	480
5(125)	97.5	170	242.5	315	387.5	460	532.5	605	677.5	750
6(150)	152.1	265.2	378.3	491.4	604.5	717.6	830.7	943.8	1056.9	1170
8(200)	300.3	523.6	746.9	970.2	1193.5	1416.8	1640.1	1863.4	2086.7	2310
10(250)	448.5	782	1115.5	1449	1782.5	2116	2449.5	2783	3116.5	3450
12(300)	764.4	1332.8	1901.2	2469.6	3038	3606.4	4174.8	4743.2	5311.6	5880
14(350)	989.3	1724.9	2460.6	3196.2	3931.8	4667.5	5403.1	6138.7	6874.4	7610
16(400)	1399	2334.7	3330.3	4326	5321.7	6317.3	7313	8308.7	9304.3	10300
18(450)	1781	3105.3	4429.3	5754	7078.3	8402.7	9227	11051.3	12375.7	13700
20(500)	2288	3989.3	5690.7	7392	9093.3	10794.7	12496	14197.3	15898.7	17600
24(600)	3393	5916	8439	10962	13485	16008	18531	21054	23577	26100
28(700)	4953	8636	12319	16002	19685	23368	27051	30734	34417	38100
32(800)	6266	10925.3	15584.7	20244	24903.3	29562.7	34222	38881.3	43540.7	48200
36(900)	6890	12013.3	17136.7	22260	27383.3	32506.7	37630	42753.3	47876.7	53000
40(1000)	7436	12965.3	18494.7	24024	29553.3	35082.7	40612	46141.3	51670.7	57200

## Close torque

Butterfly open (flow to close) torque (Units: N M )

Table.5

CaliberDN(mm)	Closure differential pressure (Units : Kpa)				
	200	400	600	800	1000
80	105	110	115	120	125
100	110	115	125	130	140
150	165	185	200	220	235
200	230	260	290	320	335
250	330	410	490	565	645
300	480	665	845	1025	1210
350	585	815	1050	1285	1585
400	705	1015	1320	1625	2015
450	840	1235	1625	2015	2495
500	985	1470	1955	2440	3025
600	1305	2005	2710	3410	4235
700	1665	2625	3585	4545	5645
800	2060	3320	4580	5840	7260
900	2895	4895	6895	8895	10895
1000	3475	5945	8420	10895	13365

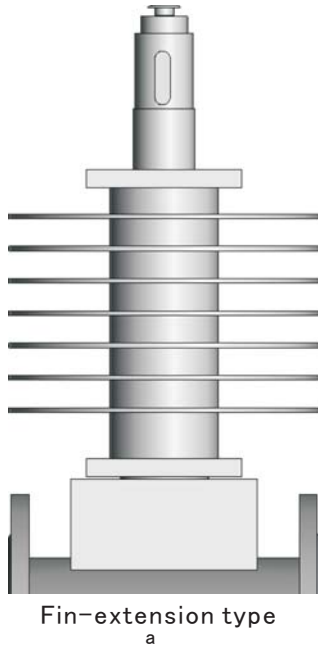
Butterfly close (flow to open) torque (Units: N M )

Table.6

CaliberDN(mm)	Closure differential pressure (Units : Kpa)				
	100	300	500	700	900
80	100	110	115	120	125
100	105	110	120	125	135
150	160	175	190	210	225
200	215	245	275	305	335
250	290	370	445	525	605
300	390	575	755	935	1115
350	475	720	970	1215	1465
400	560	885	1205	1530	1855
450	655	1065	1470	1880	2290
500	750	1255	1760	2265	2770
600	965	1690	2420	3145	3870
700	1195	2185	3170	4160	5150
800	1445	2735	4030	5325	6615
900	1900	3900	5900	7895	9895
1000	2235	4710	7185	9655	12130

## Bonnet type

Fig.5



### ◆ Fin-extension type Bonnet

Fig.5.c chart is a fin-extension bonnet type, design for high temperature service, chooses special material, the maximum temperature can bear 750°C.

BEIER high temperature butterfly valve characteristic

- ◆ The long stem can keep the packing cooling effectively.
- ◆ The trim after the surface carburizing, strengthen the intensity in very heavy duty services.
- ◆ To prevent movement and guarantee no leakage, uses welding in high temperature.
- ◆ Outstanding achievement about high temperature duty services.

### ◆ Long-extension type Bonnet

Fig.5.b chart is a long-extension bonnet type, design for cryogenic service, which suitable temperature is  $-196\sim 538^{\circ}\text{C}$ , according to the different of the valve size, the strengthen range is 400mm~900mm, this kind bonnet can protect the packing and actuator effectively, adopts the low temperature material which can bear impact and suitable for different temperature requirement.

BEIER low temperature butterfly valve characteristic:

- ◆ Air bubble strict level seal under low temperature;
- ◆ The Smallest hotly consumes;
- ◆ The smallest cooling gathers;
- ◆ Change structure quickly;
- ◆ Simple structure;
- ◆ The material can bear the appropriate impact intensity under the low temperature and has the different temperature contraction coefficient.

## GYL-71700 Appearance size

Fig.6

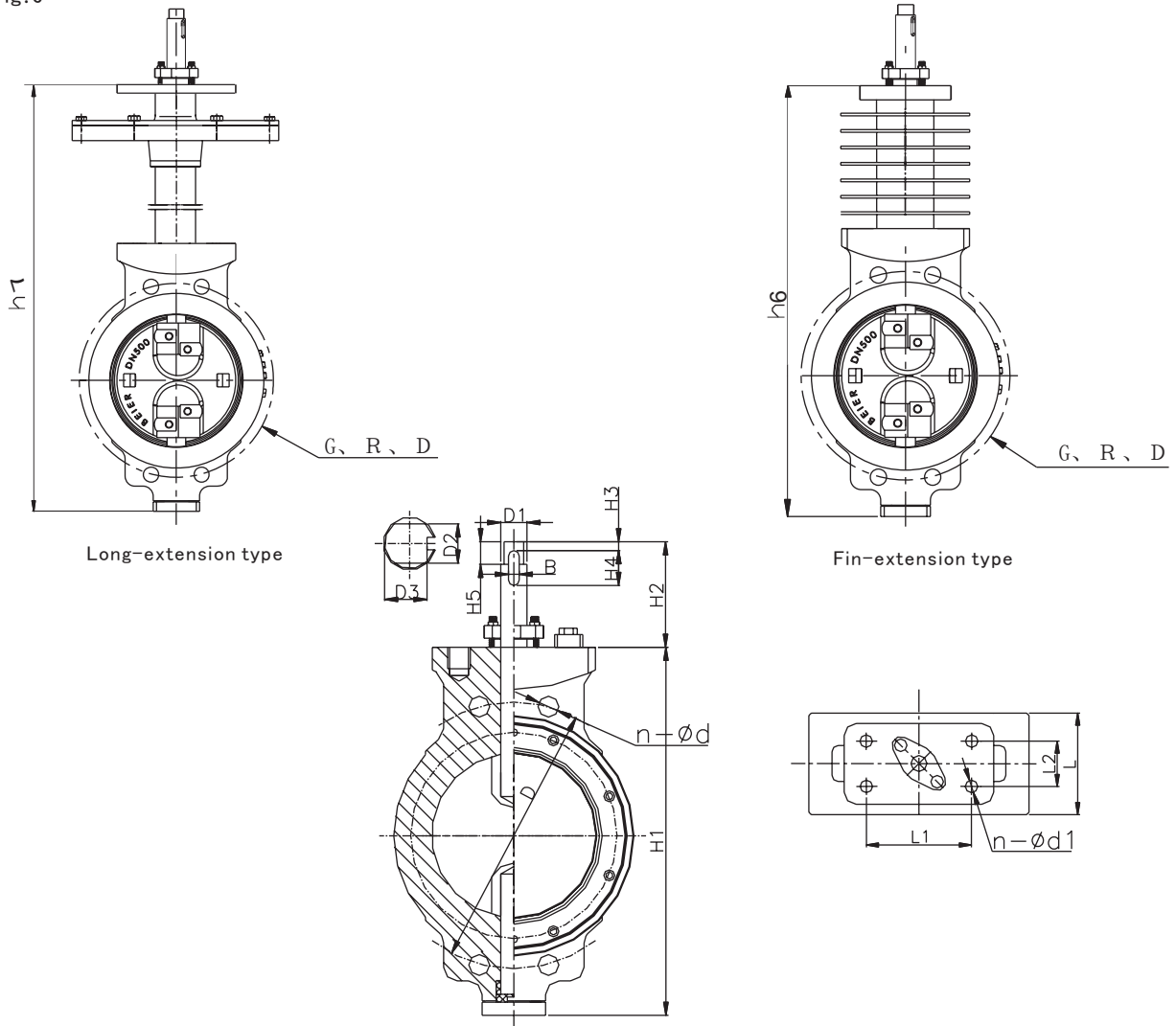


Table.7

Body size	L	L1	L2	H1	H2	H3	H4	H5	H6	H7 (L=800)	B	D1	D2	D3	D		n- $\phi d$		G, R, D	n- $\phi d_1$
															PN10	PN16	PN10	PN16		
100	70	120	45	292	100	5	35	14	429	1192	6	$\phi 20$	16	16.5	$\phi 180$	$\phi 180$	4- $\phi 18$	4- $\phi 18$	200	4-M16
150	76	120	45	347	100	5	35	14	547	1247	8	$\phi 26$	20	22	$\phi 180$	$\phi 240$	4- $\phi 23$	4- $\phi 23$	240	4-M16
200	89	120	45	404	100	5	40	14	654	1304	8	$\phi 28$	22	24	$\phi 295$	$\phi 295$	4- $\phi 23$	4- $\phi 23$	295	4-M16
250	114	140	70	477	100	5	40	14	727	1377	10	$\phi 32$	25	27.5	$\phi 350$	$\phi 355$	4- $\phi 23$	4- $\phi 25$	355	4-M16
300	114	140	70	527	100	5	45	14	777	1427	10	$\phi 35$	28	30.5	$\phi 400$	$\phi 410$	4- $\phi 23$	4- $\phi 25$	410	4-M20
350	127	165	80	595	120	5	50	14	875	1495	12	$\phi 38$	31	33.5	$\phi 460$	$\phi 470$	4-M20	4-M22	470	4-M20
400	140	165	80	663	120	5	45	14	943	1563	12	$\phi 45$	38	40	$\phi 515$	$\phi 525$	4-M22	4-M27	525	4-M20
450	152	180	97	742	130	5	50	14	1042	1642	16	$\phi 50$	40	45	$\phi 565$	$\phi 585$	4-M22	4-M27	585	4-M24
500	152	180	97	812	130	5	50	15	1112	1712	16	$\phi 50$	40	45	$\phi 620$	$\phi 650$	4-M22	4-M30	650	4-M24
600	178	180	97	922	130	5	58	20	1222	1822	18	$\phi 65$	55	59.5	$\phi 725$	/	4-M27	/	770	4-M24
700	199	210	105	998	155	5	60	20	1348	1898	20	$\phi 75$	65	69	$\phi 840$	/	4-M27	/	840	4-M27
800	211	210	105	1123	155	8	64	20	1473	2023	24	$\phi 85$	75	78	$\phi 950$	/	4-M30	/	950	4-M27

## GYL-71700 Appearance size(Electric)

Fig.7

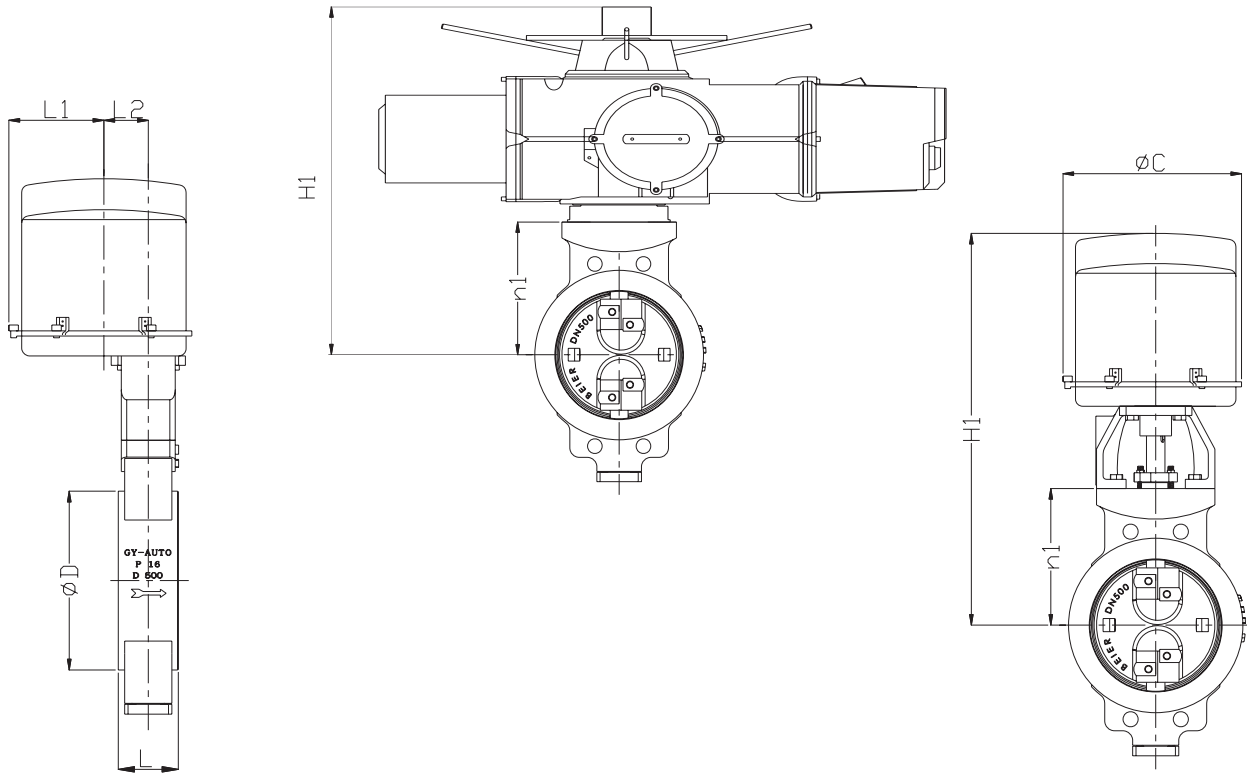
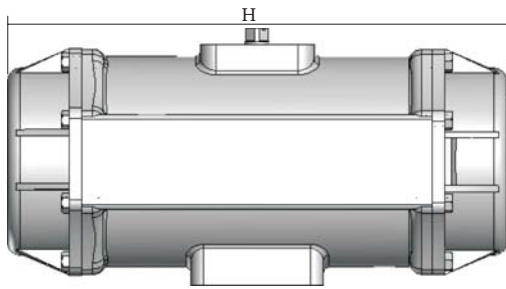


Table.8

body size inch (mm)	ANIS 150# PN 1.6MPa				Actuator type			Flange size	
	L	h1	D	H1				G、R、D	N-ΦH
6" (150)	76	190	208	527	381RSB-10	81RXB-10	36D1RA	240	4-Φ23
8" (200)	89	208	265	585	381RSB-10	81RXB-10	36D1RA	295	4-Φ23
10" (250)	114	255	318	632	381RSB-20	381RXB-20	36D2RA	355	4-Φ25
12" (300)	114	270	370	735	381RSB-20	381RXB-20	36D2RA	410	4-M30
14" (350)	127	300	430	765	381RSC-30	36D2RA		470	4-M22
16" (400)	140	340	480	808	381RSC-50	36D2RA		525	4-M30
18" (450)	152	380	538	885	IQT500			585	4-M27
20" (500)	152	420	608	925	IQT500	IQT1000		650	4-M30
24" (600)	178	485	678	1051	IQT1000	IQT2000		770	4-M33
28" (700)	199	510	785	1163	IQT2000			840	4-M27
32" (800)	241	580	888	1227	---			950	4-M30

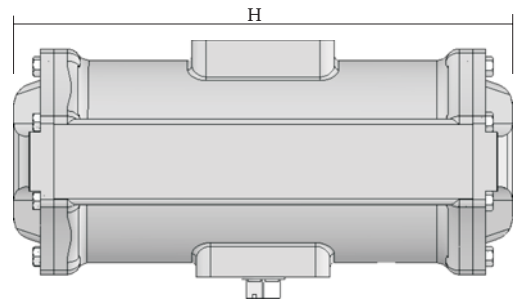
## Actuator type

Fig.8



R6000 Single action cylinder actuator

a



R6000 Double action cylinder actuator

b

- ◆ Model R6900 Double action type  
R6500 R6600 Single action type

- ◆ This series is one kind of the small size, high performance actuator, divides into the double action and single action, combination with the angle stroke control valve, adjusts and shuts off the valve.

Air supply: 500Kpa

Angle rotation: 90

Performance hysteretic: With position, within 1.5%FS

Ambient temperature: -20~80°C

Material: Cylinder WCB/ Aluminum alloy

Piston Lf2

Output shaft Stainless steel

Piston ring O-type ring

Cylinder cover WCB

the diameter of cylinder: A(Φ)

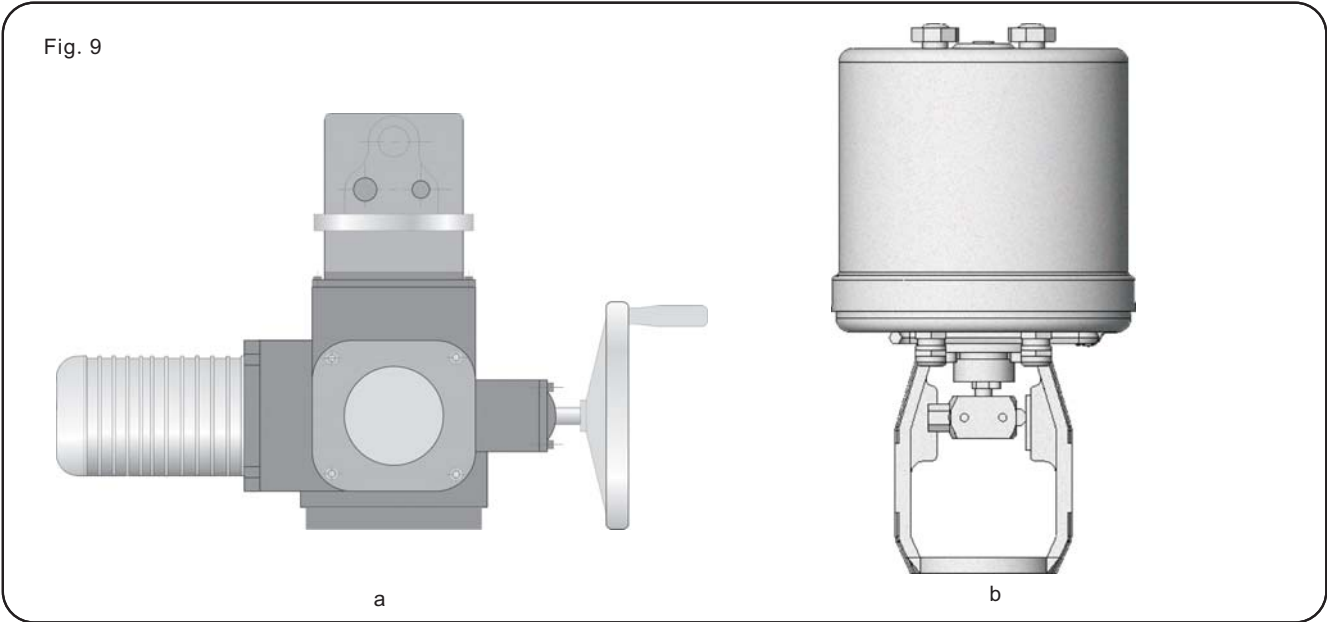
Accessory: Position, Air filter, Speed increaser, Air bells controlled valve, Limited switch, Solenoid valve, Handwheel

Table.9

Actuator model and appearance	Output torque					
	Single action type			Double action type		
	H	A	Output forceN	H	A	Output forceN
R6030	175	364	130	175	472	180
R6040	215	466	206	215	568	346
R6050	255	540	300	255	640	600
R6060	315	616	604	315	770	1092
R6070	375	645	1116	375	805	2056
R6080	435	896	1607	435	1182	3140
R6090	490	990	2310	490	1314	6000



## Electronic actuator



Intelligent type electric actuator (Fig. 10. a)

- ◆ The liquid crystal display(LCD),the liquid crystal screen can display the open degree of valve by digital lively, and can give an alarm according to the working condition, instructs the valve open or close by the high brightness LCD diode.
- ◆ The long-distance control, the switch signal can be controlled (optional 4~20mA current signal control), can regulate the valve position by change the input signal.
- ◆ Debugging without opening the cover
- ◆ High Intellectualization
- ◆ Aluminum alloy shell, high strength protection
- ◆ Effective and low noise
- ◆ The coupling can reset automatically
- ◆ Connection is convenient and fast
- ◆ Absolute code the position transducer

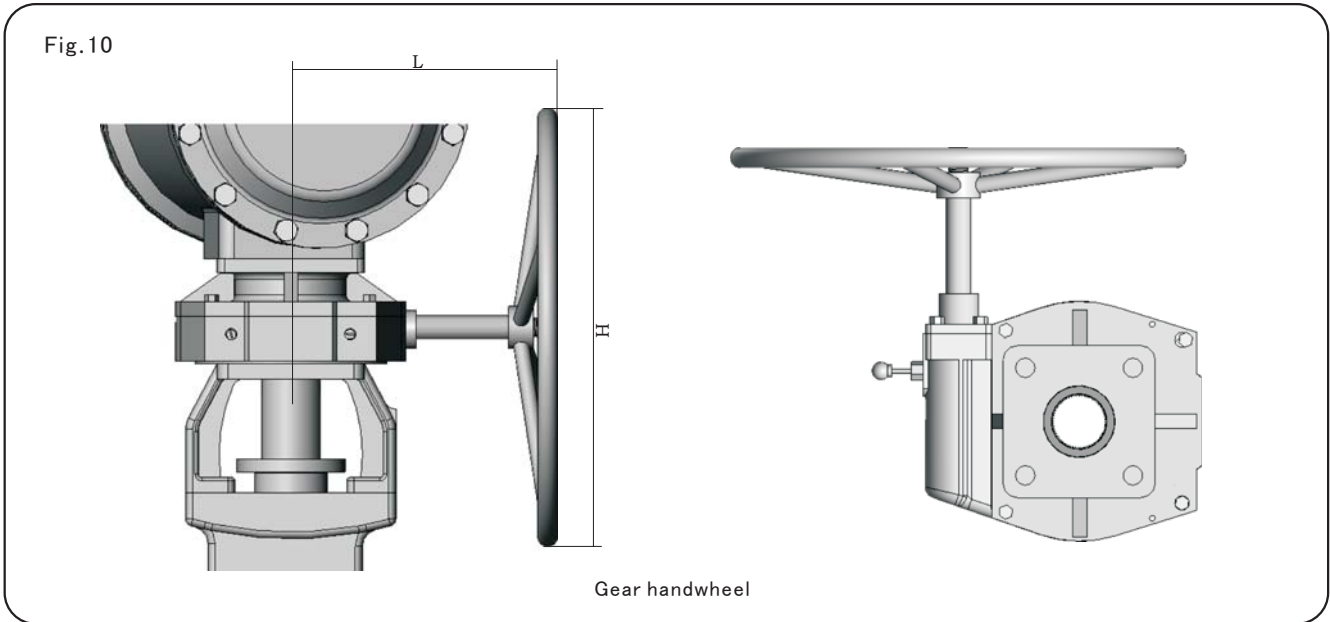
Intelligent type electric actuator is a main scene control device in automatic control system, is widely matched to ball valve, butterfly valve, plug valve and air door, etc. Used in pipeline, dumps pollutants, paper pulp, shipbuilding and so on and which is serviced for the power plant, metallurgy, petroleum, chemical industry, water conservation, machinery, light industry, fire prevention and environmental protection, it can also provides the most reasonable solution in the scope of output torque in 60NM~2500NM.

Electronic actuator (Fig. 10. b)

3810L Electric performer of straight stroke&Electric-type			Table. 10	
Model specifications	Output force(N)	Operating Speed (mm/s)	MAX TRAVEL (mm)	
381LSA-08	800	4.2	30	
381LXA-08				
381LSA-20	2000	2.1		
381LXA-20				
381LSB-30	3000	3.5		60
381LXB-30				
381LSB-50	5000	1.7		
381LXB-50				
381LSC-65	6500	2.8	100	
381LXC-65				
381LSC-99	10000	2.0		
381LXC-99				
381LSC-160	16000	1.0		
381LXC-160				
381LSC-260	26000			
381LXC-260				

Electronic actuator is divided into straight stroke and angle stroke series, GYL-71700 series control valve is matched to straight stroke electronic actuator, uses AC 220V as drive power, accepts the control single from the regulate (DC4-20mA or DC1-5V),realize scheduled to-and-for movement. This series actuator,nearly has all functions like movement transformation, valve open degree signal and the manual function, therefore is widely used in generate electricity, metallurgy, petrification, light industry and environmental protection.

## GYR-71700 Valve accessory



◆ Handwheel

Action: Open or close the valve by handwheel

Type: Gear handwheel

◆ Position

Function: Control the valve according to input signal from regulator quickly and high accurately, and can change direct or reverse action, characteristic.

◆ Air filter

Function: adjust the air supply and filtrate pollutants.

◆ solenoid valve

Function: Open or close the valve by electrical signal provided by solenoid valve.

◆ Limited switch

Function: Transform the open or close position of control valve to electrical signal.

◆ Pneumatic accelerator

Function: Improves the control valve movement speed.

◆ keep position valve

Function: keep control valve open degree when the gas signal or air supply has the undulation.

Table.11

valve size inch (mm)	Handwheel	
	L	H(Φ)
4" (100)	225	250
6" (150)	225	250
8" (200)	225	250
10" (250)	233	300
12" (300)	233	300
14" (350)	233	300
16" (400)	277	400
18" (450)	277	400
20" (500)	277	400
24" (600)	271	400
28" (700)	277	400
32" (800)	277	400

## BEIER Control Valve

Product Code Model

GY 

1	2	3	4	5	6	7	8	9	10	×	11	·	12	·	13	·	14	15	16	17	18
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Body

Specification

Actuator

### 1. Code of the valve body

1 CodeNo.	Type	2 CodeNo.	Type	3 CodeNo.	Circulate type	6 CodeNo	Connection type
L	Straight stroke	2	Unbalance trim series	1	Straight structure	1	Flange
		4	Balance trim series	2	Angle structure	2	Wafer
R	Angle stroke	5	Spherical series	3	Three way structure	3	Butt welding End
		7	Butterfly series	4	“z” structure	4	Thread

4 CodeNo.	GYL series trim	GYR series trim	5 CodeNo.	Bonnet type	8 Code No.	Multistage pressure reducing level		
1	Economic type thread screw-in type seat	Eccentric partial spherical	1	Standard	II	II level		
2	High performance type cage embed type seat	Concentric partial spherical	2	Fin-Extension	III	III level		
3	High performance type double plug relief type	Concentric total spherical	3	Long-Extension	IV	IV level		
4	Cut-off type	—	4	Corrugated pipe seal	V	V level		
5	Economic type sleeve double valve seat seat	Normal seal type	5	Clamp cover	VI	VI level		
6	Sleeve single seat	End-face seal type	7 CodeNo.	Trim supplement explanation	VII	VII level		
7	Multi-hole type cage structure	High performance eccentric type			R	Soft seal	VIII	VIII level
8	Labyrinth type cage structure	Triple eccentric multi-layers structure			Y	Metal seal	9 CodeNo. Special request	
9	Multi-stage pressure reducing type	—			S	Seat guided type		
			C	Lining structure type	18 CodeNo. Spring range			
						A	20—100KPa	
						B	40—200KPa	
						C	80—240KPa	
						D	120—360KPa	
						E	160—480KPa	

### 2. Code of the Specification parameter

10 Code No.	11 Code No.	12 Code No.	13 Code No.	Flow characteristics
Nominal Diameter	Plug size	Nominal pressure	Z	linearity
The code number above may be filled in directly according to the concrete number.			D	Equal-percentage
			X	Special request

### 3. Code of the actuator

14 CodeNo.	Actuator type	15 CodeNo	Actuator type	17 CodeNo.	Pneumatic type Specification	Piston size	Diaphragm type specification	
L	Straight stroke	4	Multi-Spring diaphragm type	1	Straight stroke	Angle stroke		
		5	Single-Spring diaphragm type					
R	Angle stroke	6	Cylinder type	2	—	80	2#	
		7	Solid state electronic type	3	180	100	3#	
			8	Electrical type	4	—	130	4#
			19 CodeNo. Manual operation		5	250	160	5#
					P	Side	6	320
					7	350	250	
					8	—	300	
					9	—	350	



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# High Performance Seal Butterfly Valve

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