

KITZ



Balancing Valve Series



KITZ CORPORATION

Static Balancing Valve



DN65~500
PN16/25 SIGDR Series

Valve Features Introduction



Digital Handwheel

Accurate scale on digital handwheel which could accurate to 0.1 cycle. The humanized design for numerical reading is convenient for operator to regulate flow value accurately and fast.



Opening Lock Mode

The valve can be locked at random position to set the max. opening which will not affect the valve opening and close. After the valve locked, it could still regulating between 0 to the set max. opening.



Complete Close-off Design

Balancing valve core makes it easy to close the valve by rotating handwheel regardless of the medium pressure. Leakage of the valve is approximately "0" when shut off the valve.



Self-sealing Test Plug

There are two test plugs on the both ports of the valve. Use a "Hydraulic Balancing Debugging Instrument" to measure the differential pressure value. Then you can easily regulate the flow by handwheel.



High-quality Materials

Valve body is made of ductile iron QT450-10, valve core and stem are made of high-quality stainless steel, which has excellent corrosion resistance which greatly extend the lifetime of valve.

Type Summary

Valve Body	NPS [in.]	DN [mm]	Type		Kvs [m ³ /h]	Cv [gal/min]
			PN16	PN25		
Medium Temp. -10~150°C Flanged	2 1/2	65	PN16SIGDR65	PN25SIGDR65	107	125
	3	80	PN16SIGDR80	PN25SIGDR80	145	169
	4	100	PN16SIGDR100	PN25SIGDR100	259	302
	5	125	PN16SIGDR125	PN25SIGDR125	430	502
	6	150	PN16SIGDR150	PN25SIGDR150	647	755
	8	200	PN16SIGDR200	PN25SIGDR200	1085	1266
	10	250	PN16SIGDR250	PN25SIGDR250	1630	1902
	12	300	PN16SIGDR300	PN25SIGDR300	2495	2912
	14	350	PN16SIGDR350	PN25SIGDR350	3229	3768
	16	400	PN16SIGDR400	PN25SIGDR400	4850	5660
	18	450	PN16SIGDR450	PN25SIGDR450	6305	7358
	20	500	PN16SIGDR500	PN25SIGDR500	8200	9569

Relationship between Differential Pressure and Flow

$$Kvs = \sqrt{\frac{V}{\frac{\Delta P}{100}}}$$

ΔP : Differential pressure when valve is full open (Unit: kPa)

V: Rating flow at the ΔP (Unit: m³/h)

Kvs: Norminal flow coefficient, which refer to the flow when medium (Density= 1g/cm³) go through the full open control valve, whose ΔP is 100KvPa.

Installation Instruction

1. Remove the valve plugs before installation.
2. Make sure that there are no sundries in the system before installation.
3. Pay attention to the medium flow: keep the same with flow arrow on the valve body.
4. The valve installation directions are arbitrary.
5. The valve is allowed to be installed downward only if the medium is clean.
6. Flanges should be sealed.
7. The measuring joint should be installed before flushing the valve.
8. In order to insure the valve works properly, there need a straight pipe which length is not less than 5 times of pipe diameter at the water inlet, and 2 times at the water outlet. (See Figure 1)
9. The debugging space should be reserved when installation. (See Figure 2)

Size	H1 [mm]	H2 [mm]
DN65-DN150	>200	>230
DN200-DN500	>200	>400

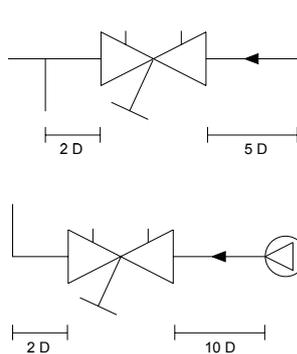


Figure 1

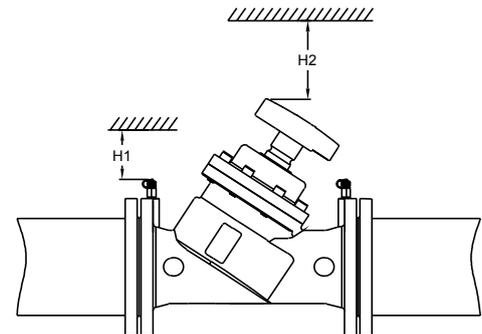
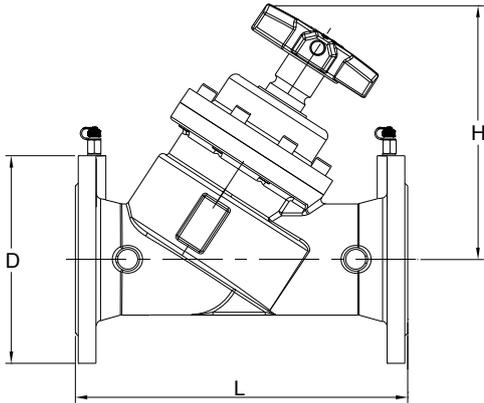


Figure 2

Dimension Figure



Dimensions

NOMINAL SIZE		PN16		PN25		L [mm]	H [mm]	MASS [kg]
NPS [in.]	DN [mm]	Bolt Aperture	D [mm]	Bolt Aperture	D [mm]			
2 1/2	65	4-19	185	8-19	185	290	222	15
3	80	8-19	200	8-19	200	310	257	21
4	100	8-19	220	8-23	235	350	275	30
5	125	8-19	250	8-28	270	400	332	45
6	150	8-23	285	8-28	300	480	396	65
8	200	12-23	340	12-28	360	600	498	123
10	250	12-28	405	12-31	425	730	555	195
12	300	12-28	460	16-31	485	850	630	320
14	350	16-28	520	16-34	555	980	733	440
16	400	16-31	580	16-37	620	1100	800	630
18	450	20-31	640	20-37	670	1200	810	885
20	500	20-34	715	20-37	730	1250	900	1125

Note(S) Please refer to drawing for applicable standard and other detail information.

Operating Instruction

Methods of setting balancing valve according to the given differential pressure. (For example: The preset value is 4.5 ring opening).

Operation methods:

1. Fully close the valve. (Figure 1)
2. Open valve to the preset value. (Figure 2)
3. Tighten internal valve stem clockwise with allen wrench.
4. Complete the valve setting.

How to check the preset value: close the valve and the reading is 0.0 ring. Turn handwheel until stopping and the reading is default value (It is 4.5, see Figure 2).

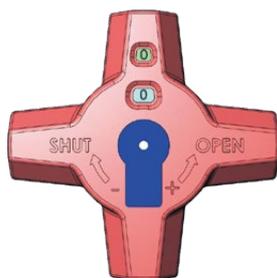


Figure 1
Close

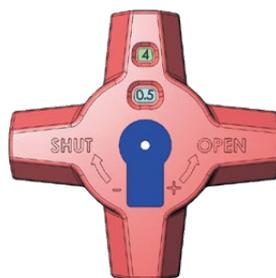


Figure 2
Preset value is 4.5 ring

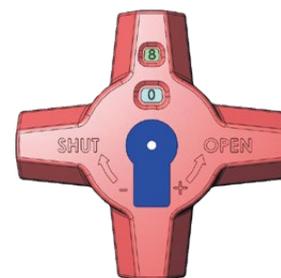


Figure 3
Full open

Technical Parameters

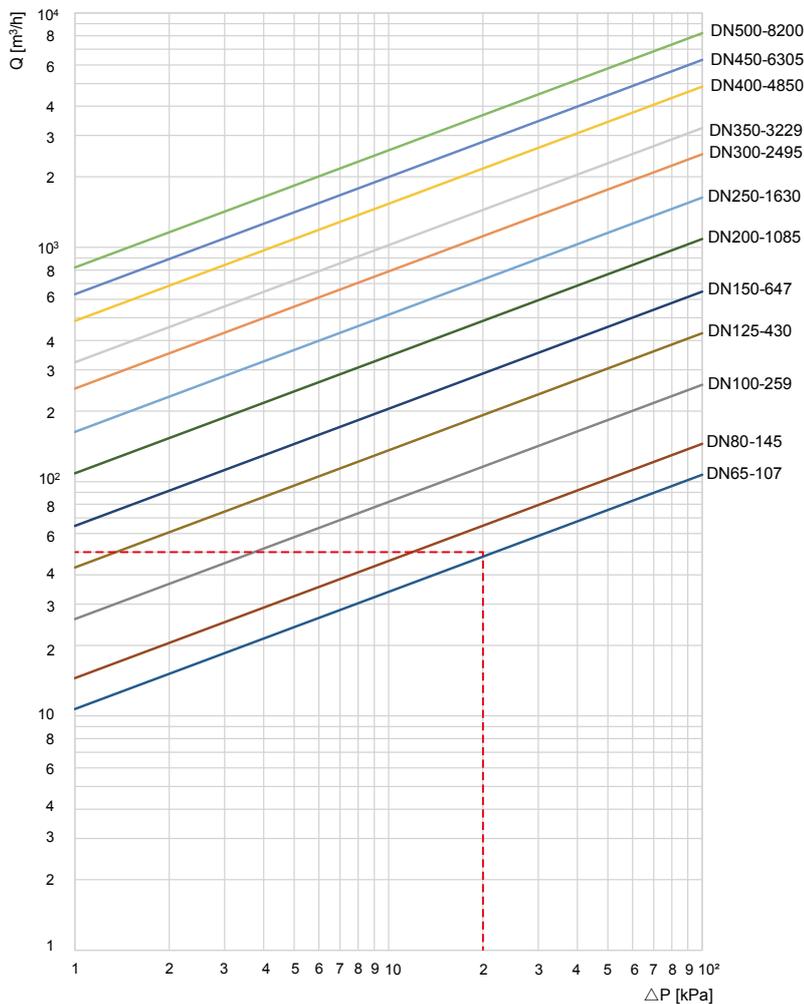
• Operating Parameters

Caliber range	DN65~DN500
Permissible pressure	PN16, PN25
Service temperature	-10~150°C
Connection flange	ISO7005-2
Permissible medium	Cold / Hot water, cooling water, glycol solution (<50%)
Flow accuracy	+/-10%

• Materials

Valve Body	Ductile iron (QT450-10)
Valve Stem	Stainless steel (304SS)
Valve Core	Stainless steel (304SS) + Ductile iron (QT450-10)
Handwheel	Aluminum
O-ring	Rubber (EPDM)
Test Plugs	Stainless Steel (304SS)

Flow Chart



As shown in the left, it is the flow chart of Static balancing valve DN65-DN500 when the valve is full open.

For example:

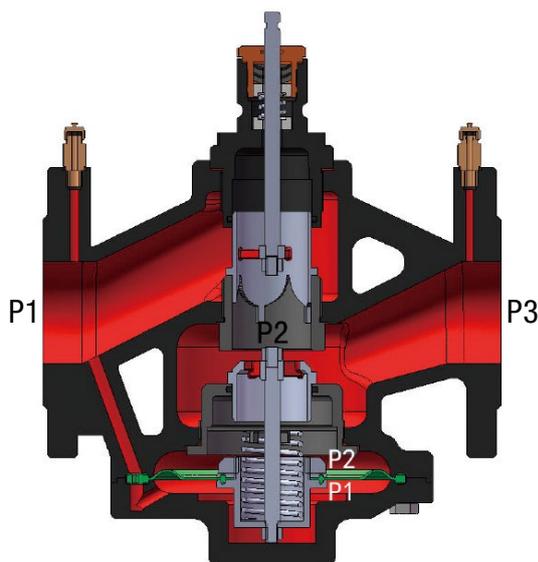
When the PN16/25SIGDR65 (DN65) is full open, $\Delta P=20$ kPa the Q_{max} is about 50m³/h.

Pressure Independent Control Valve



DN65~250
PN16/25SIGPIC Series

Features Introduction



High Control Precision

Both the electric valve core and balancing valve core adopt straight travel design. Compared with rotary design, straight travel has higher control precision.

High Close Off DP, Low Leakage

The valve has a higher close off differential pressure, while the leakage is lower than 0.02% of KVS.

Build-in Diaphragm Capsule and Connecting Pipe

The valve adopts the build-in diaphragm capsule and connecting pipe. It can avoid damaging during installation compared with external connecting pipe.

Anti-blocking Design

The balance structure of spring diaphragm significantly reduces the probability of blocking in valve body. Because of the lower requirement for water quality, it can easily deal with the water in heating pipeline.

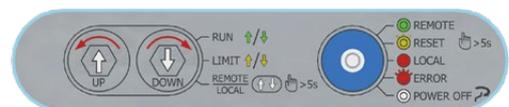
Manual Function

The actuator has the mechanical manual function and manual priority function, that is, when insert the wrench, the actuator will be automatically powered off which is safe and convenient.



Speed Adjustability

The speed can be switched through Dip switch.
1000N/3000N: High speed
1s/mm, medium speed 2s/mm.



Local Mode (Electric manual function)

The actuator has local control function which can control the opening and closing of valve by the button on the plate.

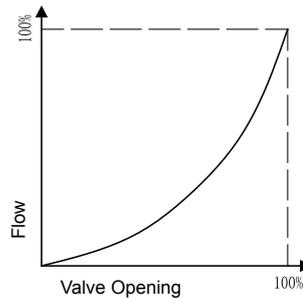
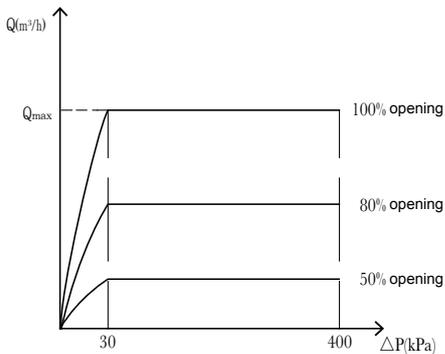
LED Indicating Light

There are LED indicating lights on the actuator cover which is convenient to observe the actuator running status.

Type Summary

				Series	ETW-24-1	ETW-24-2	ETW-24-3				
				Icon							
				Actuator Type	Proportional	Proportional	Proportional				
				Actuator Rated Stroke	30mm	50mm	50mm				
				Nominal Output Force	1000N	1000N	3000N				
Valve Body				NPS [in.]	DN [mm]	Type	Stroke mm	Qmax m³/h	ΔPs Bar	ΔPs Bar	ΔPs Bar
Medium Temp. 0~120°C		Flanged	PN16	2 1/2	65	PN16SIGPIC65	20	21	4		
				3	80	PN16SIGPIC80	40	28		4	
				4	100	PN16SIGPIC100	40	50		4	
				5	125	PN16SIGPIC125	40	90		4	
				6	150	PN16SIGPIC150	40	145		4	
				8	200	PN16SIGPIC200	40	208			4
				10	250	PN16SIGPIC250	40	240			4
			PN25	2 1/2	65	PN25SIGPIC65	20	21	4		
				3	80	PN25SIGPIC80	40	28		4	
				4	100	PN25SIGPIC100	40	50		4	
				5	125	PN25SIGPIC125	40	90		4	
				6	150	PN25SIGPIC150	40	145		4	
				8	200	PN25SIGPIC200	40	208			4
				10	250	PN25SIGPIC250	40	240			4

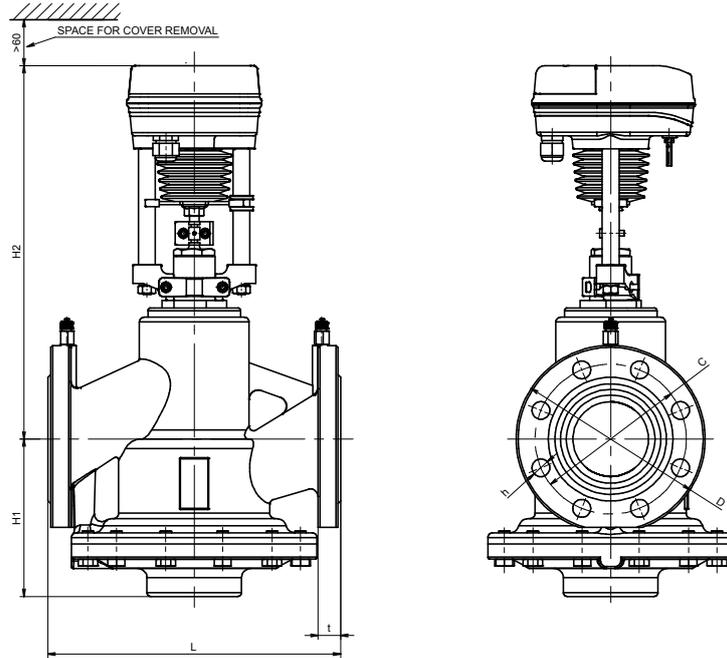
Flow Characteristic



Opening[%]-Flow[m³/h]

DN	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
65	2.55	3.41	4.15	5.26	6.33	7.12	8.9	10.3	11.9	13.4	14.9	16.3	17.6	19.3	21
80	2.76	3.62	4.48	5.57	6.79	7.62	9.33	10.8	12.3	13.9	15.7	17.4	18.9	23.6	28
100	7.91	9.85	11.6	15.7	18.8	21.5	23.8	25.7	27.6	29.4	33.1	38	42.9	46	50
125	8.4	10.5	12.5	16	19.3	24.5	29.8	37.5	46.3	55.6	65.1	72.3	80	84.5	90
150	17	28	41	55	69	80	94	102	112	116	120	124	129	135	145
200	35	43	51	61	71	79	86	96	107	124	140	155	170	190	208
250	42	48	59	65	78	90	101	113	131	150	179	197	216	228	240

Dimension Figure



Dimensions

UNIT: mm

PN16									
DN	H1	H2	L	END FLANGE				t	MASS [kg]
				D	BOLT HOLE				
					C	NO.	h		
65	155	370	290	185	145	4	19	22	30
80	167	423	310	200	160	8	19	24	41
100	181	425	350	220	180	8	19	22	54
125	197	438	400	250	210	8	19	26	74
150	222	473	480	285	240	8	23	24	100
200	245	465	500	340	295	12	23	24	140
250	277	495	600	405	355	12	28	26	204

UNIT: mm

PN25									
DN	H1	H2	L	END FLANGE				t	MASS [kg]
				D	BOLT HOLE				
					C	NO.	h		
65	155	370	290	185	145	8	19	22	31
80	167	423	310	200	160	8	19	24	42
100	181	425	350	235	190	8	23	22	54
125	197	438	400	270	220	8	28	26	76
150	222	473	480	300	250	8	28	24	103
200	245	465	500	360	310	12	28	24	144
250	277	495	600	425	370	12	31	26	209

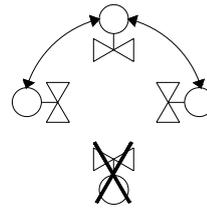
Note(S) Please refer to drawing for applicable standard and other detail information.

Installation Instruction

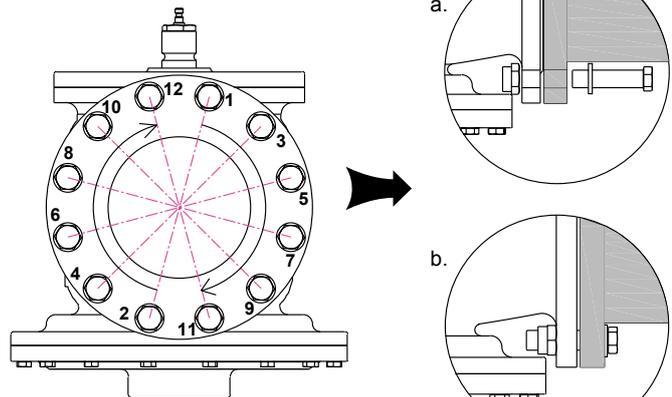
1. Downward installation is forbidden, when the medium is chilled/hot water.



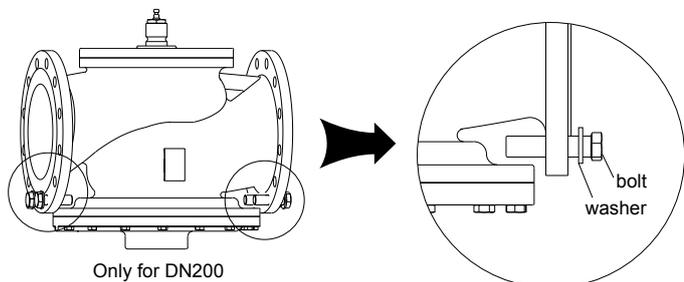
Note:
The medium flow direction in valve should be consistent with the medium of pipeline !



2. As shown in below, when install the valve, tighten bolts and nuts diagonally.



Note:
As shown in the right, the flange hole for DN200 must use the equipped 4 sets of bolt, washer and nut!



3. Valve and actuator can be assembled easily.
Need neither any special tools nor adjustment.

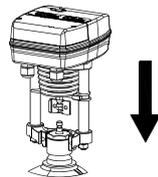


Note:
Made the two connecting faces of valve stem and actuator shaft keep coinciding!

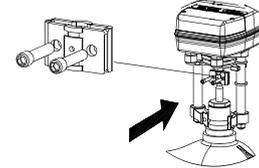


Note:
When do the pipe pressure testing and flushing, the valve body should be in a state of full open, if not, the internal diaphragm of valve body will be damaged and lose the balancing function!

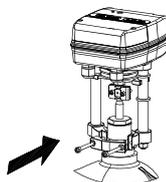
- 1 Prepare for assembling actuator, take down the fixed fitting, and disentangle the clip.



- 2 Made the actuator shaft is concentric with the valve stem which can be observed from the hole, and make these two connecting faces keep coinciding. Then clock the two screws on the clip.



- 3 Pulling the fixed fitting to the groove and locking by two screws.



- 4 The status after assembled, face and back.



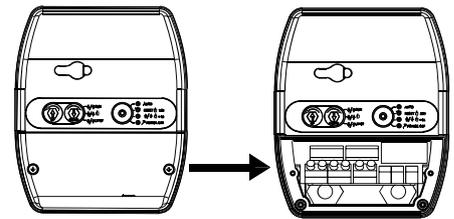
Wiring Instruction



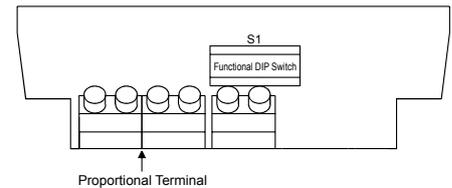
Note:

1. Open the cover when wiring, prohibit to disassemble other spare parts!
2. Carefully check the power voltage when wiring, wire according to the product parameter, if not, it may cause fire and endanger personal safety in server case!
3. Please cut off power supply when wiring in order to ensure personal safety!
4. After wiring, please install the cover to the original position, avoid electric shock for the terminal!

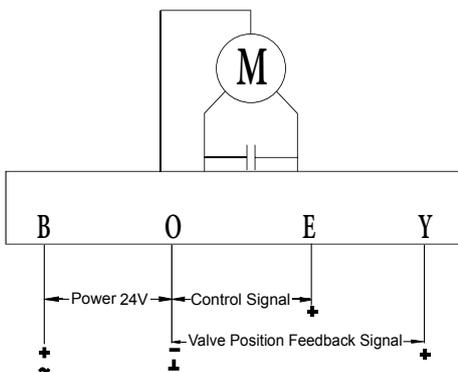
1. Open the cover and prepare to wire.



2. Wiring correctly according to the wiring diagram.



Wiring Diagram



Note:

The actuator power supply is 24V! The circuit board would be burnt out if connected with AC220V, in server case, it could be cause fire as well.

Wiring strictly in accordance with wiring diagram, avoid mixed wiring between powerline and signal wire.

Indicating Light



Retractive Light-UP

UP	Status	Description
Green	Always	Normal mode
Yellow	Always	Reach upper limit position
Red	Flashing (1Hz)	Alarming
Red	Always	Local mode

Extended Light-DOWN

DOWN	Status	Description
Green	Always	Normal mode
Yellow	Always	Reach lower limit position
Red	Flashing (1Hz)	Alarming
Red	Always	Local mode

Reset Light

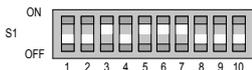
Reset	Status	Description
Green	Always	Normal mode
Red	Always	Local mode
Yellow	Flashing(1Hz)	Self-stroking
Red	Quick flashing(2Hz)	Alarming

The S1 Switch Setting

⚠️ Correctly set DIP switch according to site situation!

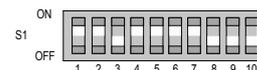
S1-1	Starting of control / feedback signal	ON	20%: the starting control/feedback signal is 20% (namely 4~20mA or 2~10VDC)
		OFF	0: the starting control/feedback signal is 0 (namely 0~20mA or 0~10VDC)
S1-2	Type of control signal	ON	II: current signal
		OFF	UI: voltage signal
S1-3	Impedence match of control signal	ON	UI: voltage signal
		OFF	II: current signal
S1-4	Type of feedback signal	ON	IO: current signal
		OFF	UO: voltage signal
S1-5	Operating mode	ON	DA: DA mode (when control signal increases, the actuator shaft extends)
		OFF	RA: RA mode (when control signal increases, the actuator shaft retracts)
S1-6	Losing control signal mode	ON	DW: When lose control signal (voltage type or current type), actuator will provide a min.control signal internally.
		OFF	UP: 1) When lose control signal (voltage type), actuator will provide a max. control signal internally. 2) When lose control signal (current type), actuator will provide a min.control signal internally.
S1-7	Self-stroking mode	ON	DF: Power on each time, self-stroking starts automatically.
		OFF	RF: Self-stroking starts only when press the self-stroking button manually.
S1-10	Speed	ON	High speed: 1s/mm
		OFF	Medium speed: 2s/mm

Eg.1



Proportional type control mode
Control signal: 0~10VDC
Valve position feedback signal: 0~10VDC
Operating mode: DA
Losing input signal mode: DW
Medium speed: 2s/mm

Eg.2



Proportional type control mode
Control signal: 4~20mA
Valve position feedback signal: 4~20mA
Operating mode: DA
Losing input signal mode: DW
Medium speed: 2s/mm

Debugging Instruction

- A. Connect actuator and valve body.
- B. Wiring power and control signal wires.
- C. Set DIP Switch to needed position. After the setting, turn on actuator power, pre-setting function will come into effect. (DIP Switch can be set with power)
- D. Power on the actuator.
- E. Actuator Self-stroking: this step is for matching stroke of actuator and valve.

- 1) The Reset yellow indicating light will keep flashing (frequency is 1Hz), actuator shaft extends to lower limit position firstly and then, it retracts to upper limit position, actuator will not be controlled by signal by this time.
- 2) Reset yellow light stop flashing, self-stroking stops and the matching of the valve and actuator is finished. By then, actuator running direction can be controlled by control signal.
- 3) If the Reset red light is quick flashing (2Hz) during the self-stroking, it means the self-stroking status is not correct and the actuator start alarming. The actuator can not match with the valve's max. stroke.

Remarks: If self-stroking is needed in a power-on state, press down the Reset button over 5 seconds, and then the actuator start self-stroking. Self-stroking phenomenon are the same as step (1), (2) above.

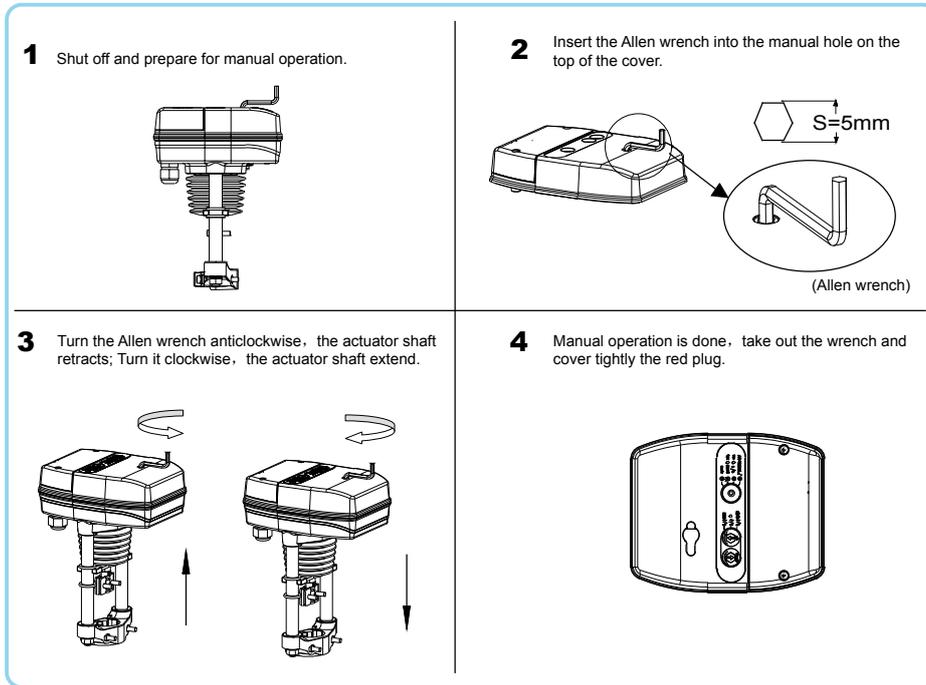
F. Local mode: press the button UP and DOWN at the same time over 5s, loosen the buttons and actuator enter into local mode, at that time the UP, DOWN and Reset light will always be on red. If you need actuator shaft retracts, long press UP, the UP light will always be on green; If you need actuator shaft extends, long press DOWN, the DOWN light will always be on green. After reach to the expected position, repress UP and DOWN at the same time over 5s, and then loosen the buttons, it will exit the local mode.

Note:

1. The factory default setting is automatic self-stroking, it means that actuator will repeat automatic self-stroking when power on each time!
2. If you don't need automatic self-stroking function, you can set the 7th switch to OFF, it will change into manual self-stroking (Phenomenon as same with (1), (2)).

Manual Device Operation

- !** Note: In the case of power off, the actuator needs self-stroking again after the manual operation is completed.
 Manual self-stroking method: press the Reset button on the actuator cover over 5s, actuator will enter self-stroking!



Technical Parameters

Operating Parameters

• Valve

Caliber range	DN65~DN250
Permissible pressure	PN16, PN25
Service temperature	0~120°C
Connection flange	ISO7005-2
Permissible medium	Cold / Hot Water, cooling water, glycol solution (<50%)
Flow accuracy	+/-10%

• Actuator

Type	ETW-24-1	ETW-24-2	ETW24-3
Nominal Output Force	1000N		3000N
Max. Stroke	30mm	50mm	
Power Supply	24V AC/DC		
Frequency	50/60Hz		
Power Consumption(24V)	MAX: 35VA		MAX: 40VA
Motor	Brushless DC motor		
Control Type	Proportional		
Control Feedback signal	0(2)~10VDC, 0(4)~20mA		
Control Precision	±0.8%		
Running Speed	High Speed: 1s/mm, Medium Speed: 2s/mm (factory setting)		
Protection level	IP65		
Ambient temperature	-25°C~65°C		
Ambient humidity	≤95%RH(40°C)		
Neight weight	3.0kg	3.8kg	

Materials

• Valve

Valve Body	Ductile Iron (QT450-10)
Valve Stem	Stainless Steel (304SS)
Lower Valve Core	Stainless Steel (304SS)
Spring	Stainless Steel (304SS)
Diaphragm	EPDM
Test Plugs	Stainless Steel (304SS)

• Actuator

Cover	PC
Braket	Stainless Steel
Base	Alminum

CAUTION

Pressure-temperature ratings and other performance data published in this catalog have been developed from our design calculation, in-house testing, field reports provided by our customers and/or published official standards or specifications. They are good only to cover typical applications as a general guideline to users of KITZ products introduced in this catalog.

For any specific application, users are kindly requested to contact KITZ Corporation for technical advice, or to carry out their own study and evaluation for proving the suitability of these products to such an application. Failure to follow this request could result in property damage and/or personal injury, for which we shall not be liable.

While this catalog has been compiled with the utmost care, we assume no responsibility for errors, impropriety, or inadequacy. Any information provided in this catalog is subject to from-time-to-time change without notice for error rectification, product discontinuation, design modification, new product introduction or any other cause that KITZ Corporation considers necessary. This edition cancels all previous issues.

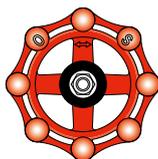
Read the instruction manual carefully before use.

NOTICE

If any products designated as strategic material in the Foreign Exchange and Foreign Trade Law, Cabinet Order Concerning Control of Export Trade, Cabinet Order Concerning Control of Foreign Exchange and other related laws and ordinances ("Foreign Exchange Laws") are exported to any foreign country or countries, an export license issued by the Japanese Government will be required under the Foreign Exchange Laws.

Further, there may be cases where an export license issued by the government of the United States or other country will be required under the applicable export-related laws and ordinances in such relevant countries.

The contract shall become effective subject to the fact that a relevant export license is obtained from the Japanese Government.



*A chrysanthemum-handle is a symbol of KITZ,
the brand of valve reliability*

ISO 9001 certified since 1989

KITZ
KITZ CORPORATION

1-10-1, Nakase, Mihama-ku, Chiba 261-8577, Japan
International Business Development Dept.

Phone : 81-43-299-1730

Fax : 81-43-299-0121

URL : <https://www.kitz.com>

— Distributed by —