thermionics laboratory, inc.

INSTRUCTION MANUAL

Ultra High Vacuum Gate Valve DN63 ~ DN250

Version 2

SERIAL # _____

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31118 Depot Road, Hayward, CA 94545 | (510) 786-0680

Contents

Safety Notice

Valves are suitable for medium to air and the corrosive gas, as the opening and closing mechanism in ultra high vacuum line. Make sure to read this instruction manual before using. Especially pay attention to article 7 of the "installation wiring method" and the matters of attention in the "use" of article 9 of the request.

Main Performance Index

ULTRA HIGH VACUUM GATE VALVE (DYNAMIC)

Model		**DN63P**	**DN80P**	**DN100P**	**DN160P**	**DN200P**	**DN250P**
Pressure range	Pa	1.3×10^{-7} ~1.2×10^{5}					
Inside nominal diameter	mm	63	80	100	150	200	250
Leak rate	Pa·L/s	1.3×10^{-7}					
Different pressure in opening direction	Pa	3000 (arbitrary)					
Connection flange	—	CF、ISO-K、GB-LP、ISO-F					
Service life until first maintenance	times	100,000					
Heating temperature (Valve body)	℃	Closed≤120, opend≤150					
Supply voltage	V	220±10 % (Other specifications can be customized)					
Opening / closing time	s	≤ 6					
Compressed air	MPa	ISO63-ISO200：0.4~0.7；ISO250：0.5~0.7					
Position indicator of the valve	—	Magnetic switch					
Installation orientation	—	any					
Ambient temperature	℃	5~40					

ULTRA HIGH VACUUM GATE VALVE (MANUAL)

Model		**DN63M**	**DN63M**	**DN100M**	**DN160M**	**DN200M**	**DN250M**
Pressure range	Pa	1.3×10-7Pa～1.2×105Pa					
Inside nominal diameter	mm	63	80	100	150	200	250
Leak rate	Pa·L /s	1.3×10-7					
Different pressure in opening direction	Pa	3000 (arbitrary)					

Connection flange	**—**	**CF、ISO-K、GB-LP、ISO-F**
Service life until first maintenance	times	100,000
Heating temperature (Valve body)	℃	Closed≤120, opend≤150
Opening / closing time	s	Manual operation time
Position indicator of the valve	—	Mechanical instructions
Installation orientation	—	any
Ambient temperature	℃	5~40

Ultra High Vacuum Gate Valve (dynamic)

Model		DN100D	DN160D	DN200D	DN250D
Pressure range	Pa	$1.3\times10^{-7}\sim1.2\times10^{5}$			
Inside nominal diameter	mm	100	150	200	250
Leak rate	Pa·L/s	1.3×10^{-7}			
Different pressure in opening direction	Pa	3000 (arbitrary)			
Connection flange	—	CF、ISO-K、GB-LP、ISO-F			
Service life until first maintenance	times	100,000			
Heating temperature (Valve body)	℃	Closed≤120, opend≤150			
Supply voltage	V	220±10 % (Other specifications can be customized)			
Opening / closing time	s	≤50s			
Position indicator of the valve	—	micro switch			
Installation orientation	—	any			
Ambient temperature	℃	5~40			

Structural Characteristics

1. The material of valve body is stainless steel, with overall rigidity, small volume, beautiful appearance.

2. It is integrated of the structure of support plate with uniform distribution and good rigidity.

3. The driver and positioning plate are connected with roller and Positioning pin shaft. Positioning plate 、sealing plate and support plate are connected with positioning pin shaft. The center spring makes the sealing clamp and support plate pressure symmetrically to the driver.

4. The structure of move body is double guide roller bearings with high stationarity and accuracy.

5. It is two arms lifting of transmission with good symmetry. The cylinder (or controller) is located in the valve on the central axis.

6. The shaft (lever) is bellows seal (stainless steel), other seals are fluorine rubber.

7. It can anti-hold one atmospheric pressure and the installation position is arbitrary.

8. Users can choose pneumatic, dynamic or manual style according to their own requirements. Manual valve is with simple structure, flexible operation while pneumatic and dynamic valves are suitable for the automatic controlling.

9. There are four ways of the vacuum system connection of this series of valve: CF(GB code) copper gasket sealing blade flange, ISO-K rubber sealing flange GB-LP fixed flange and ISO-F fixed flange.

Boundary Dimension

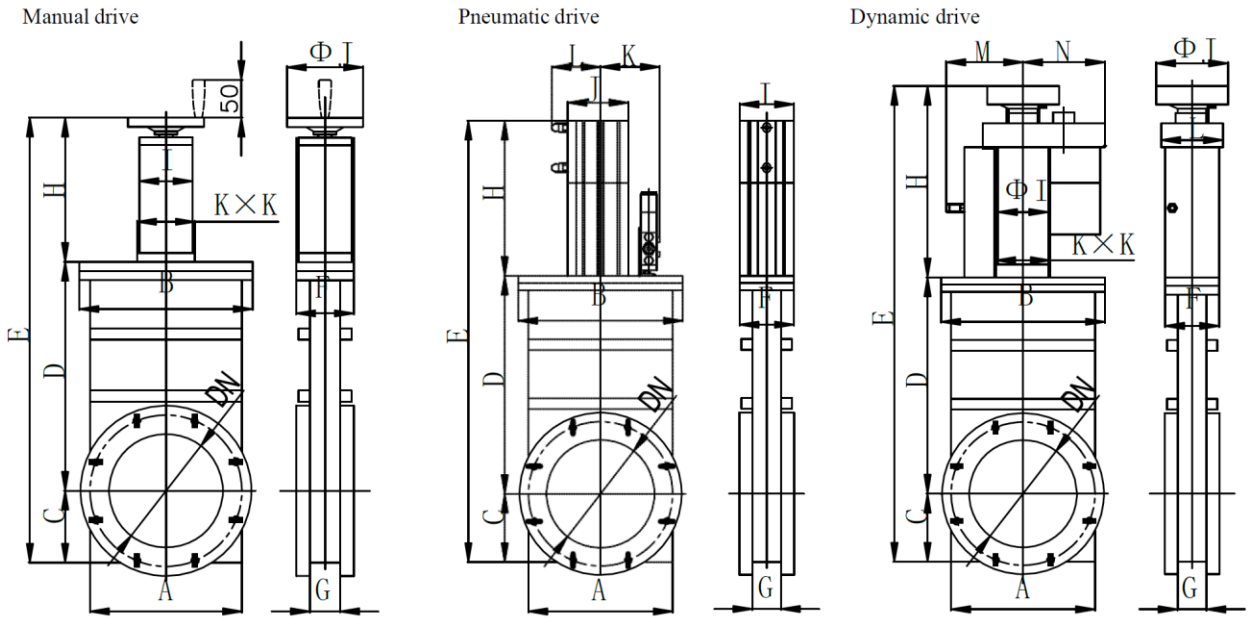


Photo 1 boundary dimension of the valve

Manual drive

Flange dimension

specifications	DN	Boundary Dimension										
		A	B	C	D	E	F	G	H	I	J	K
	63	110	130	52	173	378	64	34	153	56	100	64
	80	130	140	57	228	462	75	36	177	69	100	75
	100	151	178	74.5	228	486.5	75	36	184	69	100	75
	150	201	228	95.5	302	604.5	75	41	207	69	100	75
	200	248	276	120	380	714	75	42	214	69	125	75
	250	310	342	146	463	875	80	48	266	70	125	80

Pneumatic drive

Flange dimension

specifications	DN	boundary dimension											
		A	B	C	D	E	F	G	H	I	J	K	L
	63	110	130	52	173	365.5	64	34	140.5	64	72	64	61
	80	130	140	57	228	447	75	36	162	77	84	73	67.5
	100	151	178	74.5	228	481.5	75	36	179	77	84	73	67.5
	150	201	228	95.5	302	612.5	75	41	215	77	84	83	67.5
	200	248	276	120	380	729.5	75	42	229.5	98	104	93	77
	250	310	342	146	463	811.5	80	48	202.5	117	123.5	98	86

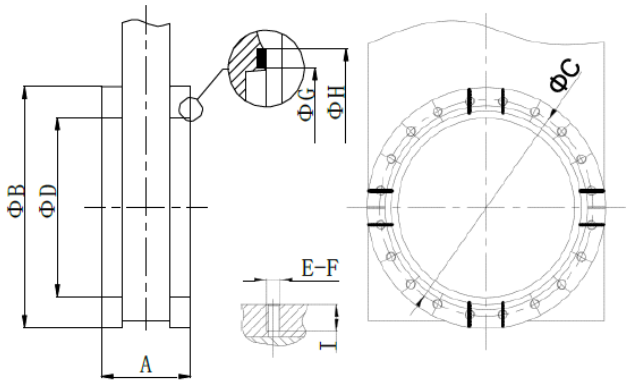
Motor drive

Flange dimension

specifications	DN	boundary dimension												
		A	B	C	D	E	F	G	H	I	J	K	L	M	N
	100	151	178	74.5	228	537.5	75	36	235	69	100	75	86	108	105
	150	201	228	95.5	302	658	75	41	260.5	70	100	75	86	108	114
	200	248	276	120	380	771	75	42	271	69	100	75	92	108	119
	250	310	342	146	463	880	80	48	271	69	100	80	92	110	119

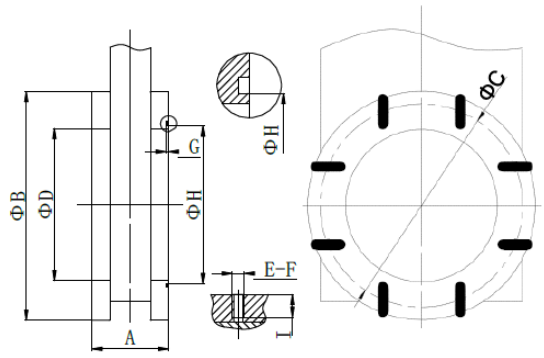
Flange dimension

CF Flange DN63-250



DN	63	80	100	160	200	250
A	64	70	66	76	80	91
B	114	130	152	202	253	305
C	92.2	110	130.3	181.1	231.9	284
D	63	80	100	150	200	250
E	8	16	16	20	24	32
F	M8	M8	M8	M8	M8	M8
G	77	93	115	166	217	267
H	82.4	99	120.6	171.4	222.1	273.1
I	12	12	12	15	15	15

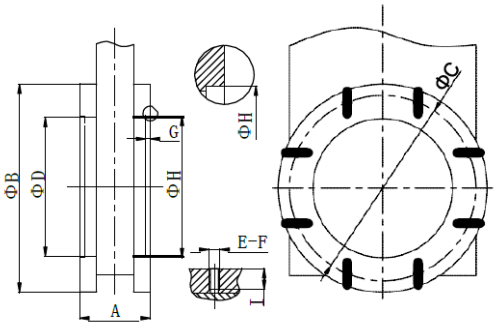
GB-ISO-K Flange DN63-250



DN	63	80	100	160	200	250
A	88	90	96	101	102	108
B	95	110	130	180	240	290
C	70.2	83.2	102.2	153.2	213.2	261.2
D	63	80	100	150	200	250
E	3	3	3	3	3	3
F	92	107	127	175	235	285
G	1.5	1.5	2.5	2.5	2.5	2.5
H	12	12	12	12	12	12
I	27	27	30	30	30	30

P.S. The “O-ring” in table 1 is optional components.

ISO-F Flange DN63-250

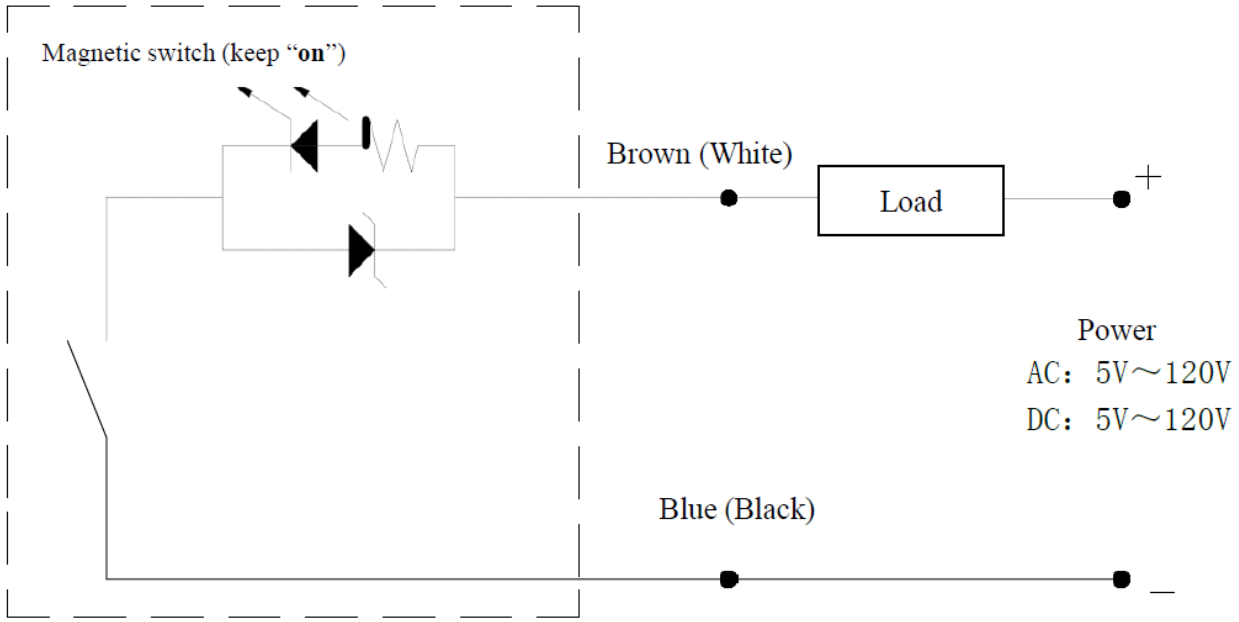


DN	63	80	100	160	200	250
A	58	59	59	72	74	84
B	130	145	165	225	285	335
C	110	125	145	200	260	310
D	63	80	100	150	200	250
E	4	8	8	8	12	12
F	M8	M8	M8	M10	M10	M10
G	3	3	3	3	3	3
H	70.2	83.2	102.2	153.2	213.2	261.2
I	10	10	10	13	13	15

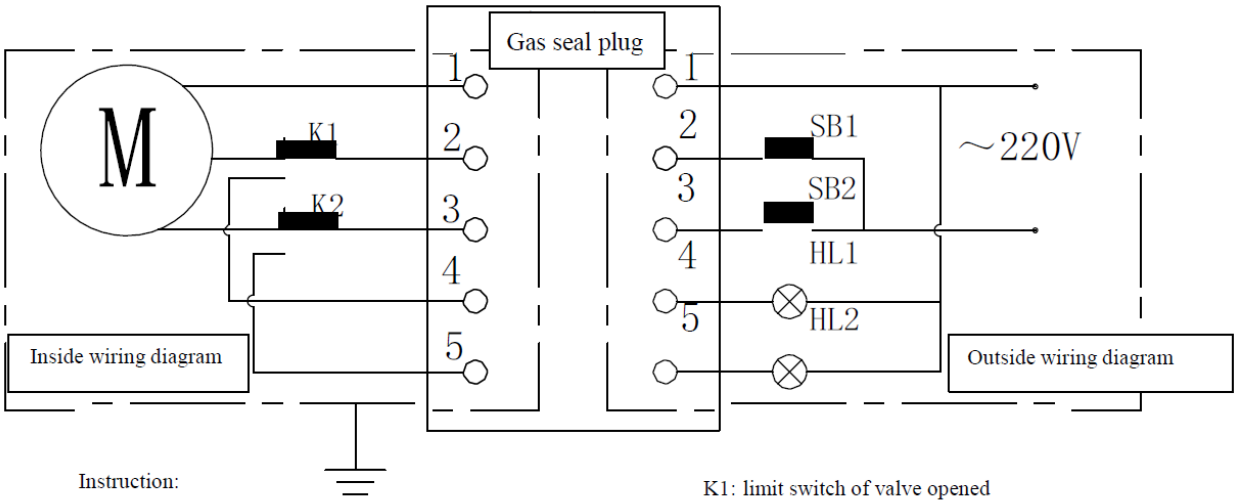
Install Wiring Method

1. Magnetic switch wiring diagram of Pneumatic valve

Magnetic Switch Wiring Diagram



2. Switch wiring diagram of Dynamic drive valve



Instruction:

1. Public input wiring
2. Valve open input wiring
3. Valve close input wiring
4. Valve open signal output(220V)
5. Valve close signal output(220V)

K1: limit switch of valve opened
K2: limit switch of Valve closed
SB1: the opened switch locked with SB2
SB2: the closed switch locked with SB1
HL1: indicator light of valve opened
HL2: indicator light of valve closed

3. The possibility of fault and eliminating methods

Fault	Reason	Eliminating Methods
Weak sealed	Seal face with oil	Clean the oil spot
	Seal face has been nicked	Polish the nick with polishing paper or the machine
	Rubber sealing ring has been damaged	Change rubber sealing ring
	Bellow has been damaged	Change or weld the bellow
Can no open/close (pneumatic)	Insufficient supply pressure	Raise the supply pressure to standard level
	Throttle valve with a wrong position	Reset to initial state
	Air pressure unbalanced	Adjust to be balanced
Reversing valve uncontrolled	Insufficient supply pressure	Raise the supply pressure
	Reversing valve without power	Power on
	Reversing valve has been damaged	Change the reversing valve

Can not open/close (Dynamic)	Power supply voltage is beyond the scope of use	Adjust the power supply voltage in the range of use
	Micro switch has been damaged	Change the micro switch
	Gas seal plug not be connected	Weld the gas seal plug
Wrong direction of open or close	Wrong wiring connected	Connect the wiring by instruction

4. Use Attention

1. This valve is with a so thin shell that cannot be subjected to external pressure or impact ,neither cannot be a bearing body while it is being installed .It is for avoiding shell deformation what will cause the result of leakage of the valve seal or can't be opened.

2. It is possible that the valve is difficult to start again after being placed for a long time. Because for a longtime unused, the sealing ring and sealing surface will be glued together. It happens to the pneumatic valve particularly. If so, keep the electromagnetic directional valve on, and then it will be opened after tapping the valve plate from the front lightly. And then the valve can be used in the system.

3. The valve should be opened when the differential pressure is 3000pa (or less) on both sides of the valve plate, otherwise it will not be opened. It is easy to damage the sealing ring and the transmission mechanism while open the valve by force.

4. It is easy to change the operation mode between Dynamic and manual-- press the hand wheel and twirl (anticlockwise) the nut in the middle to the correct location, and then pull the hand wheel and regulate the nut upward to complete the manual operation mode. It is the same of dynamic operation mode except for twirling the nut clockwise.

5. The output of Power supply voltage is 220 limited. It is NOT allowed to connect external power source when connected the indicator light or the valve switch. Otherwise, it will be short circuit.

Complete Sets of Instrument

Item	Name	Qty	Unit	Ref.
1	Ultra High Vacuum Gate Valve	1	piece	
2	Instruction Manual	1	/	
3	Inspection certificate	1	/	
4	Cover	2	/	