

# DIAPHRAGM VALVE TYPE 14

- NEAR-LINEAR FLOW CHARACTERISTICS
- A NEW TYPE OF RUBBER HAVING A HIGH RELIABILITY IN LEAKAGE PREVENTION IS USED FOR THE DIAPHRAGM AND CUSHION.
- THE ORIGINAL DESIGN ACHIEVES HIGH SEALING PERFORMANCE WITH LOW TORQUE.
- BAYONET STRUCTURE ALLOWING QUICK DIAPHRAGM REPLACEMENT
- EQUIPPED WITH A BOTTOM STAND ALLOWING EASY AND SECURE REPLACEMENT (See P. 69 for details.)

**BASIC SPECIFICATIONS**

**VALVE TYPE** ————— **DIAPHRAGM VALVE TYPE 14**

**SIZE** ————— **15 mm–100 mm (1/2 inch–4 inch)**

**BODY MATERIAL** ————— **U-PVC C-PVC PP PVDF**

**SEAL MATERIAL / DIAPHRAGM** ————— **EPDM PTFE FKM etc.**

**CONNECTION / FLANGED** ————— **JIS10K, DIN PN10, ANSI CLASS150**

	FLUID TEMPERATURE	MAXIMUM WORKING PRESSURE (NORMAL TEMPERATURE) MPa(kgf/cm <sup>2</sup> )	CONNECTION METHOD
			FLANGED
<b>U-PVC</b>	0°C ~ 60°C	1.0 {10.2}	○
<b>C-PVC</b>	0°C ~ 90°C	1.0 {10.2}	○
<b>PP</b>	-20°C ~ 90°C	1.0 {10.2}	○
<b>PVDF</b>	-40°C ~ 120°C	1.0 {10.2}	○

**NOTE** The maximum working pressure is the value including the water hammer pressure. Be careful that the maximum working pressure is not exceeded during use.  
 \* Concerning the allowable pressure for each temperature and material, see the technical documents at the end of this catalog.  
 \* The diaphragm may become loose due to temperature changes during long storage, operation stop or while in use. Check the conditions and then retighten the bolts and nuts between the bonnet and the body to the "bonnet tightening torque". (Failure to do so may cause fluid leakage.)

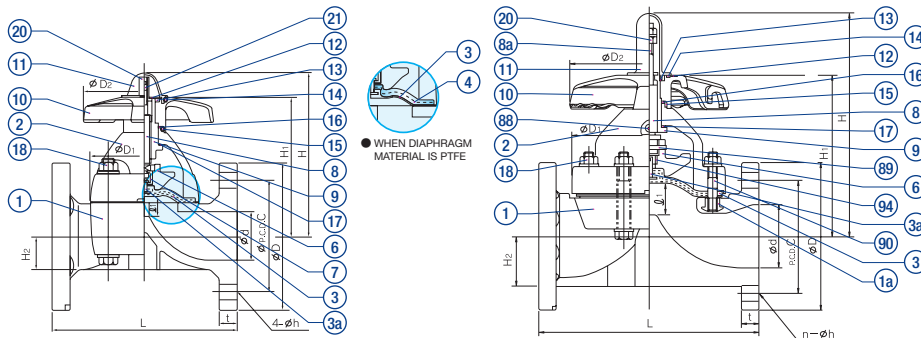
MANUAL



AUTOMATIC



**PARTS LIST** **MANUAL**



PART NO. / NAME	QTY	MATERIAL	PART NO. / NAME	QTY	MATERIAL	PART NO. / NAME	QTY	MATERIAL
① BODY	1	BODY — BONNET U-PVC — U-PVC C-PVC — PP PP — PP PVDF — PVDF	⑧ STEM	1	C3604	⑰ THRUST RING (B)	1	UHMWPE
② BONNET	1		⑧a DISPLAY LOT <sup>(4)</sup>	1	SUS304	⑱ BOLT/NUT (A)	4	SUS304
③ DIAPHRAGM	1	EPDM, PTFE, etc.	⑨ SLEEVE	1	C3604	⑳ STOPPER	1	C3604 <sup>(3)</sup> , SUS304 <sup>(4)</sup>
③a EMBEDDED DIAPHRAGM FITTING	1	SUS304	⑩ HANDLE	1	PP	㉑ SCREW <sup>(3)</sup>	1	SUS304
④ CUSHION <sup>(2)</sup>	1	EPDM	⑪ GAUGE COVER	1	PC	㉒ GREASE NIPPLE <sup>(4)</sup>	1	C3604
⑤ COMPRESSOR	1	PVDF	⑫ NAMEPLATE	1	U-PVC	㉓ COMPRESSOR PIN <sup>(4)</sup>	1	SUS304
⑦ JOINT FITTING <sup>(3)</sup>	1	SUS304	⑬ C-SHAPED STOP RING	1	SUS304	㉔ STUD BOLT/NUT <sup>(4)</sup>	4	SUS304
			⑭ O-RING (A)	1	EPDM	㉕ COMPRESSOR	1	SUS304
			⑮ O-RING (B)	1	EPDM	⑲ STUD NUT <sup>(4)</sup>	4	C3604 <sup>(5)</sup> , SUS304 <sup>(6)</sup>
			⑯ THRUST RING (A)	1	UHMWPE			

**NOTE** (1) Bonnet PPG 15 – 100 mm: black. 125 – 250 mm: ivory. (2) is used when the diaphragm material is PTFE. (3) is used for sizes of 50 mm or less. (4) is used for sizes of 65 mm or more. (5) is used when the body material is U-PVC, C-PVC or PP. (6) is used when the body material is PVDF.

**HANDLE ROTATION [FULL OPEN (ROTATION/LIFT) FULL CLOSE]** **MANUAL**

SIZE	ROTATION	SIZE	ROTATION
15mm ( 1/2inch)	3.3	50mm ( 2inch)	6.0
20mm ( 3/4inch)	3.3	65mm (2 1/2inch)	9.0
25mm ( 1inch)	4.0	80mm ( 3inch)	10.0
32mm (1 1/4inch)	4.0	100mm ( 4inch)	10.0
40mm (1 1/2inch)	5.0		

**COMPATIBLE ACTUATOR** **AUTOMATIC**

<b>PNEUMATIC</b>	<b>TYPE AN</b>	For detailed specifications, see <b>P.117</b>	<b>ELECTRIC</b>	<b>TYPE H</b>	For detailed specifications, see <b>P.125</b>
<b>PNEUMATIC</b>	<b>TYPE AV</b>	For detailed specifications, see <b>P.118</b>	<b>ELECTRIC</b>	<b>TYPE M</b>	For detailed specifications, see <b>P.127</b>

**PRODUCT MODEL CODE LIST**  
**MANUAL**

ACTUATION	TYPE	OPERATING SYSTEM	BODY MATERIAL	SEAL MATERIAL	CONNECTION	STANDARD	SIZE				
V	14	MH	*	*	F	*	***				
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮				
V	MANUAL VALVE	14	TYPE 14	MH	ROUND HANDLE	U U-PVC C C-PVC P PP F PVDF G PVDF+PPG	E EPDM T PTFE	F	FLANGED	1 10K D DIN A ANSI	015 15mm 100 100mm

**PRODUCT MODEL CODE LIST**  
**AUTOMATIC**

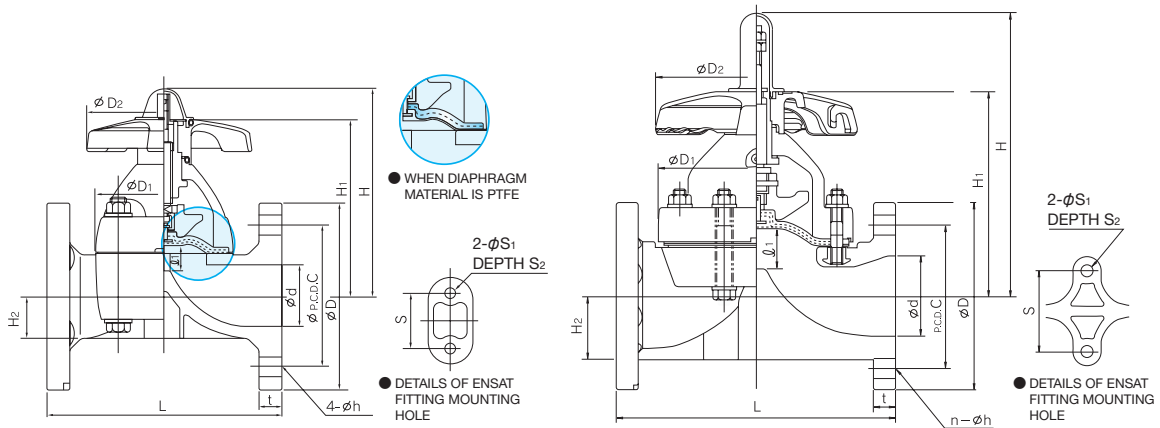
ACTUATION	TYPE	ACTUATOR TYPE	ACTION / POWER SOURCE	BODY MATERIAL	SEAL MATERIAL	CONNECTION	STANDARD	SIZE			
A	14	*	*	*	*	F	*	***			
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮			
A	AUTOMATIC VALVE	14	TYPE 14	<b>PNEUMATIC</b> N TYPE AN V TYPE AV <b>ELECTRIC</b> H TYPE H M TYPE M	<b>PNEUMATIC</b> F DOUBLE ACTING G AIR TO OPEN S AIR TO CLOSE <b>ELECTRIC</b> 1 Single-Phase 100V 2 Single-Phase 200V	U U-PVC C C-PVC P PP F PVDF	E EPDM T PTFE	F	FLANGED	1 JIS10K D DIN A ANSI	015 15mm 100 100mm

MANUAL

## DIAPHRAGM VALVE TYPE 14

TYPE—V14MH

CONNECTION / FLANGED—JIS, DIN, ANSI



■ JIS, DIN (Unit: mm)

mm	d	D1	D2	ℓ1	H	H1	H2	S	S1	S2	JIS10K						DIN PN10							
											D	C	n	h	L	t	U-PVC	C-PVC	PP	PVDF	D	C	n	h
15	16	54×66	100	10	104	86	19.5	25	7	13	95	70	4	15	110	12	12	95	65	4	14	130	12	12
20	20	54×66	100	10	106	88	17.5	25	7	13	100	75	4	15	120	13	13	105	75	4	14	150	13	13
25	25	67×80	100	12	111	93	18.5	25	7	13	125	90	4	19	130	13	13	115	85	4	14	160	13	13
32	32	67×80	100	12	116	97	22.5	25	7	13	135	100	4	19	142	16	16	140	100	4	18	180	16	16
40	40	108×108	156	21	177	144	27.5	45	9	15	140	105	4	19	180	16	16	150	110	4	18	200	20	20
50	52	123×123	156	25	191	158	36.0	45	9	15	155	120	4	19	210	20	20	165	125	4	18	230	22	22
65	67	175	220	34	266	188	61	85	11	20	175	140	4	19	250	22	23	185	145	4	18	290	22	22
80	78	201	220	42	280	202	63	100	15	28	185	150	8	19	280	22	23	200	160	8	18	310	24	24
100	100	241	257	50	329	241	78	120	15	28	210	175	8	19	340	22	24	220	180	8	18	350	24	26

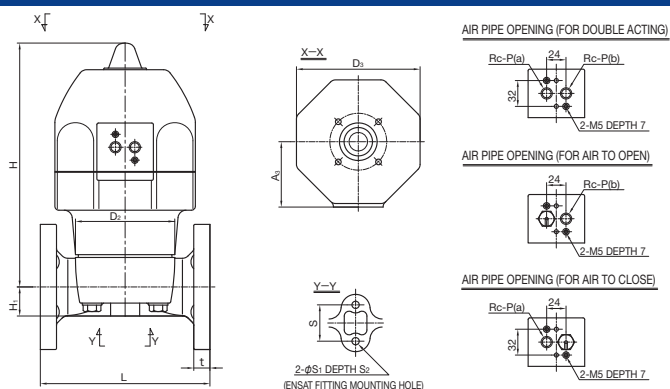
■ ANSI (Unit: inch)

inch	mm	d	D1	D2	ℓ1	H	H1	H2	S	S1	S2	ANSI CLASS150									
												D	C	n	h	L	t	GRINNELL STANDARD	AV STANDARD	U-PVC C-PVC	PP
1/2	15	0.63	2.13×2.60	3.94	0.39	4.09	3.39	0.77	0.98	0.28	0.51	3.50	2.38	4	0.62	4.25	4.33	0.43	0.43		
3/4	20	0.79	2.13×2.60	3.94	0.39	4.17	3.46	0.69	0.98	0.28	0.51	3.88	2.75	4	0.62	5.88	4.72	0.51	0.51		
1	25	0.98	2.64×3.15	3.94	0.47	4.37	3.66	0.73	0.98	0.28	0.51	4.25	3.12	4	0.62	5.88	5.12	0.59	0.59		
1 1/4	32	1.26	2.64×3.15	3.94	0.47	4.57	3.82	0.89	0.98	0.28	0.51	4.62	3.50	4	0.62	6.38	-	0.63	0.63		
1 1/2	40	1.57	4.25×4.25	6.14	0.83	6.97	5.67	1.08	1.77	0.35	0.59	5.00	3.88	4	0.62	6.94	7.09	0.63	0.63		
2	50	2.05	4.84×4.84	6.14	0.98	7.52	6.22	1.42	1.77	0.35	0.59	6.00	4.75	4	0.75	7.94	8.27	0.79	0.79		
2 1/2	65	2.64	6.89	8.66	1.34	10.47	7.40	2.40	3.35	0.43	0.79	7.00	5.50	4	0.75	-	9.84	0.87	0.91		
3	80	3.07	7.91	8.66	1.65	11.02	7.95	2.48	3.94	0.59	1.10	7.50	6.00	4	0.75	10.37	11.02	0.87	0.91		
4	100	3.94	9.49	10.12	1.97	12.95	9.49	3.07	4.72	0.59	1.10	9.00	7.50	8	0.75	12.93	13.39	0.87	0.94		

**AUTOMATIC PNEUMATIC TYPE AN**  
 DOUBLE ACTING  
 AIR TO OPEN  
 AIR TO CLOSE

# DIAPHRAGM VALVE TYPE 14

TYPE—A14N  
 CONNECTION / FLANGED—JIS, DIN, ANSI



ACTUATOR SELECTION CHART

SIZE	ACTUATOR TYPE		
	DOUBLE ACTING	AIR TO OPEN	AIR TO CLOSE
15mm ( 1/2inch)	AN-1DA	AN-1AO	AN-1AS
20mm ( 3/4inch)	AN-2DA	AN-2AO	AN-2AS
25mm ( 1inch)	AN-3DA	AN-3AO	AN-3AS
32mm (1 1/4inch)	AN-4DA	AN-4AO	AN-4AS
40mm (1 1/2inch)			
50mm ( 2inch)			

For detailed specifications, see P.117

JIS, DIN (Unit: mm)

mm	D <sub>2</sub>	D <sub>3</sub>	H	H <sub>1</sub>	A <sub>3</sub>	S	S <sub>1</sub>	S <sub>2</sub>	P	JIS10K		DIN PN10	
										L	t	L	t
15	54×66	130	186	19.5	68	25	7	13	1/4	110	12	130	12
20	54×66	130	188	17.5	68	25	7	13	1/4	120	13	150	13
25	67×80	130	193	18.5	68	25	7	13	1/4	130	13	160	13
32	67×80	130	197	22.5	68	25	7	13	1/4	142	16	180	16
40	108×108	174	293	27.5	92	45	9	15	1/4	180	16	200	20
50	123×123	174	302	36	92	45	9	15	1/4	210	20	230	22

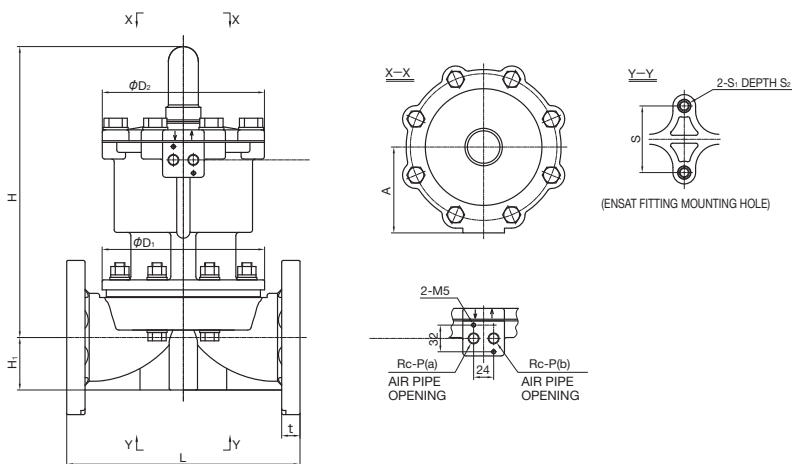
ANSI (Unit: inch)

inch	mm	D <sub>2</sub>	D <sub>3</sub>	H	H <sub>1</sub>	A <sub>3</sub>	S	S <sub>1</sub>	S <sub>2</sub>	P	ANSI CLASS150		
											L	AV STANDARD	t
1/2	15	2.13×2.60	5.12	7.32	0.77	2.68	0.98	0.28	0.51	1/4	4.25	4.33	0.43
3/4	20	2.13×2.60	5.12	7.40	0.69	2.68	0.98	0.28	0.51	1/4	5.88	4.72	0.51
1	25	2.64×3.15	5.12	7.60	0.73	2.68	0.98	0.28	0.51	1/4	5.88	5.12	0.59
1 1/4	32	2.64×3.15	5.12	7.76	0.89	2.68	0.98	0.28	0.51	1/4	6.38	-	0.63
1 1/2	40	4.25×4.25	6.85	11.54	1.08	3.62	1.77	0.35	0.59	1/4	6.94	7.09	0.63
2	50	4.84×4.84	6.85	11.89	1.42	3.62	1.77	0.35	0.59	1/4	7.94	8.27	0.79

**AUTOMATIC PNEUMATIC TYPE AV**  
 DOUBLE ACTING  
 AIR TO OPEN  
 AIR TO CLOSE

# DIAPHRAGM VALVE TYPE 14

TYPE—A14V  
 CONNECTION / FLANGED—JIS, DIN, ANSI



ACTUATOR SELECTION CHART

SIZE	ACTUATOR TYPE
65mm (2 1/2inch)	AV-1DA
80mm ( 3inch)	AV-2DA
100mm ( 4inch)	AV-3DA

For detailed specifications, see P.118

JIS, DIN (Unit: mm)

mm	D <sub>1</sub>	D <sub>2</sub>	A	H	H <sub>1</sub>	S	S <sub>1</sub>	S <sub>2</sub>	P	JIS10K			DIN PN10		
										L	U-PVC C-PVC	PP PVDF	L	U-PVC C-PVC	PP PVDF
65	171	208	103	323	61	85	M8	15	1/4	250	22	23	290	22	22
80	195	208	103	354	63	100	M12	22	1/4	280	22	23	310	24	24
100	235	250	120	417	78	120	M12	22	1/4	340	22	24	350	24	26

ANSI (Unit: inch)

inch	mm	D <sub>1</sub>	D <sub>2</sub>	A	H	H <sub>1</sub>	S	S <sub>1</sub>	S <sub>2</sub>	P	ANSI CLASS150			
											L	AV STANDARD	U-PVC C-PVC	PP PVDF
2 1/2	65	6.73	8.19	4.06	12.72	2.40	3.35	M8	0.59	1/4	-	9.84	0.87	0.91
3	80	7.68	8.19	4.06	13.94	2.48	3.94	M12	0.87	1/4	10.37	11.02	0.87	0.91
4	100	9.25	9.84	4.72	16.42	3.07	4.72	M12	0.87	1/4	12.93	13.39	0.87	0.94

AUTOMATIC

PNEUMATIC

TYPE AV

DOUBLE ACTING

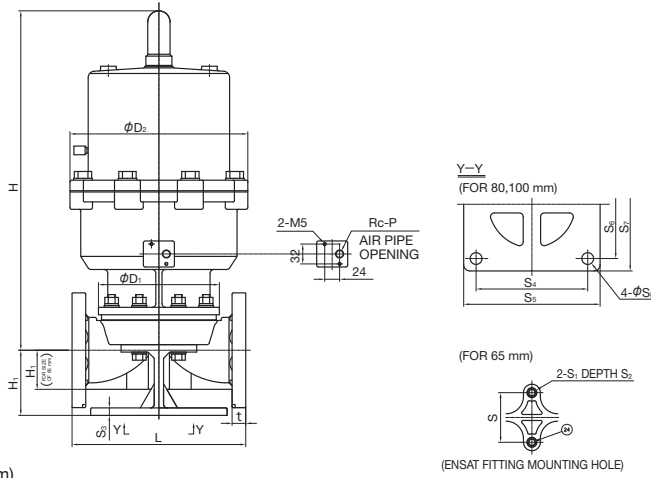
AIR TO OPEN

AIR TO CLOSE

# DIAPHRAGM VALVE TYPE 14

TYPE—A14V

CONNECTION / FLANGED—JIS, DIN, ANSI



### ACTUATOR SELECTION CHART

SIZE	ACTUATOR TYPE
65mm (2 1/2inch)	AV-1AO
80mm ( 3inch)	AV-2AO
100mm ( 4inch)	AV-3AO

For detailed specifications, see **P.118**

■ JIS, DIN (Unit: mm)

mm	D <sub>1</sub>	D <sub>2</sub>	H	H <sub>1</sub>	S	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	S <sub>5</sub>	S <sub>6</sub>	S <sub>7</sub>	S <sub>8</sub>	P	JIS10K			DIN PN10		
															L	t	U-PVC C-PVC	PP PVDF	L	t
65	171	280	473	61	85	M8	15	-	-	-	-	-	-	1/4	250	22	23	290	22	22
80	195	305	550	109	-	-	-	12	180	220	175	215	19	1/4	280	22	23	310	24	24
100	235	385	601	119	-	-	-	15	230	270	220	260	19	1/4	340	22	24	350	24	26

■ ANSI (Unit: inch)

inch	mm	D <sub>1</sub>	D <sub>2</sub>	H	H <sub>1</sub>	S	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	S <sub>5</sub>	S <sub>6</sub>	S <sub>7</sub>	S <sub>8</sub>	P	ANSI CLASS150				
																L	t	GRINNELL STANDARD	AV STANDARD	U-PVC C-PVC
2 1/2	65	6.73	11.02	18.62	2.40	3.35	M8	0.59	-	-	-	-	-	-	1/4	-	-	9.84	0.87	0.91
3	80	7.68	12.01	21.65	4.29	-	-	-	0.47	7.09	8.66	6.89	8.46	0.75	1/4	10.37	11.02	0.87	0.91	
4	100	9.25	15.16	23.66	4.69	-	-	-	0.59	9.06	10.63	8.66	10.24	0.75	1/4	12.93	13.39	0.87	0.94	

AUTOMATIC

PNEUMATIC

TYPE AV

DOUBLE ACTING

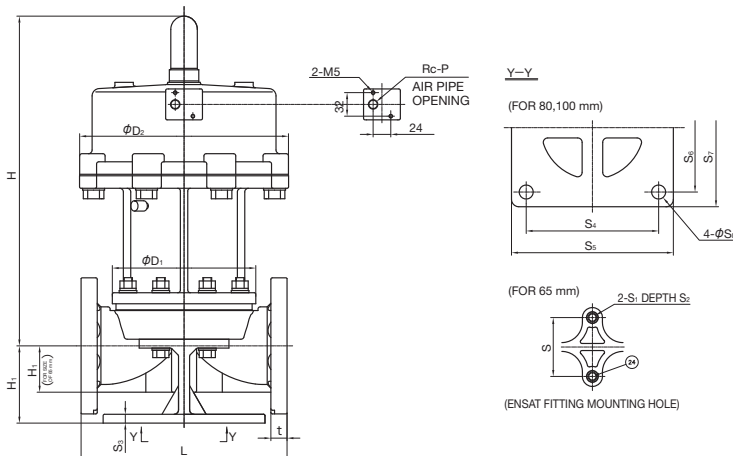
AIR TO OPEN

AIR TO CLOSE

# DIAPHRAGM VALVE TYPE 14

TYPE—A14V

CONNECTION / FLANGED—JIS, DIN, ANSI



### ACTUATOR SELECTION CHART

SIZE	ACTUATOR TYPE
65mm (2 1/2inch)	AV-1AS
80mm ( 3inch)	AV-2AS
100mm ( 4inch)	AV-3AS

For detailed specifications, see **P.118**

■ JIS, DIN (Unit: mm)

mm	D <sub>1</sub>	D <sub>2</sub>	H	H <sub>1</sub>	S	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	S <sub>5</sub>	S <sub>6</sub>	S <sub>7</sub>	S <sub>8</sub>	P	JIS10K			DIN PN10		
															L	t	U-PVC C-PVC	PP PVDF	L	t
65	171	280	423	61	85	M8	15	-	-	-	-	-	-	1/4	250	22	23	290	22	22
80	195	305	455	109	-	-	-	12	180	220	175	215	19	1/4	280	22	23	310	24	24
100	235	385	582	119	-	-	-	15	230	270	220	260	19	1/4	340	22	24	350	24	26

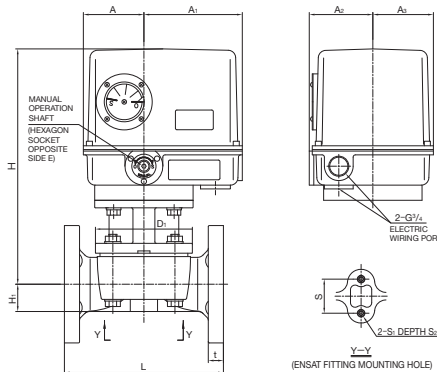
■ ANSI (Unit: inch)

inch	mm	D <sub>1</sub>	D <sub>2</sub>	H	H <sub>1</sub>	S	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	S <sub>5</sub>	S <sub>6</sub>	S <sub>7</sub>	S <sub>8</sub>	P	ANSI CLASS150				
																L	t	GRINNELL STANDARD	AV STANDARD	U-PVC C-PVC
2 1/2	65	6.73	11.02	16.65	2.40	3.35	M8	0.59	-	-	-	-	-	-	1/4	-	-	9.84	0.87	0.91
3	80	7.68	12.01	17.91	4.29	-	-	-	0.47	7.09	8.66	6.89	8.46	0.75	1/4	10.37	11.02	0.87	0.91	
4	100	9.25	15.16	22.91	4.69	-	-	-	0.59	9.06	10.63	8.66	10.24	0.75	1/4	12.93	13.39	0.87	0.94	

**AUTOMATIC** **ELECTRIC** **TYPE H** Single-Phase 100V  
Single-Phase 200V

# DIAPHRAGM VALVE TYPE 14

TYPE—A14H  
CONNECTION / FLANGED—JIS, DIN, ANSI



### ACTUATOR SELECTION CHART

SIZE	ACTUATOR TYPE
15mm ( 1/2inch)	ED-11H
20mm ( 3/4inch)	
25mm ( 1inch)	
32mm (1 1/4inch)	
40mm (1 1/2inch)	
50mm ( 2inch)	

For detailed specifications, see **P.125**

■ JIS, DIN (Unit: mm)

mm	D1	H	H1	A	A1	A2	A3	S	S1	S2	E	JIS10K		DIN PN10	
												L	t	L	t
15	54×66	284	19.5	80	130	84	80	25	M5	10	5	110	12	130	12
20	54×66	286	17.5	80	130	84	80	25	M5	10	5	120	13	150	13
25	67×80	291	18.5	80	130	84	80	25	M5	10	5	130	13	160	13
32	67×80	294.5	22.5	80	130	84	80	25	M5	10	5	142	16	180	16
40	110×110	302.2	27.5	80	130	84	80	45	M6	14	5	180	16	200	20
50	128×128	311.2	36	80	130	84	80	45	M6	14	5	210	20	230	22

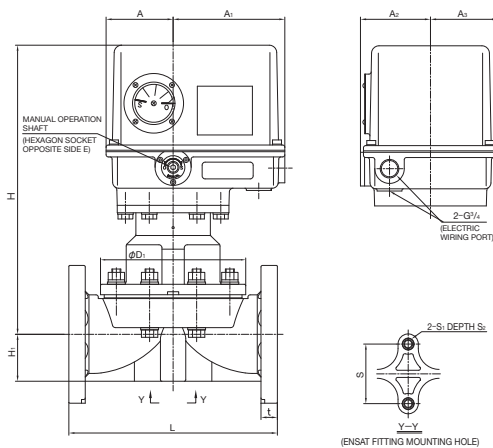
■ ANSI (Unit: inch)

inch	mm	D1	H	H1	A	A1	A2	A3	S	S1	S2	E	ANSI CLASS150			
													L	AV	t	
1/2	15	2.13×2.60	11.18	0.77	3.15	5.12	3.31	3.15	0.98	M5	0.39	0.20	GRINNELL STANDARD	4.25	4.33	0.43
3/4	20	2.13×2.60	11.26	0.69	3.15	5.12	3.31	3.15	0.98	M5	0.39	0.20	AV STANDARD	5.88	4.72	0.51
1	25	2.64×3.15	11.46	0.73	3.15	5.12	3.31	3.15	0.98	M5	0.39	0.20	GRINNELL STANDARD	5.88	5.12	0.59
1 1/4	32	2.64×3.15	11.59	0.89	3.15	5.12	3.31	3.15	0.98	M5	0.39	0.20	AV STANDARD	6.38	-	0.63
1 1/2	40	4.25×4.25	11.90	1.08	3.15	5.12	3.31	3.15	1.77	M5	0.55	0.20	GRINNELL STANDARD	6.94	7.09	0.63
2	50	4.84×4.84	12.25	1.42	3.15	5.12	3.31	3.15	1.77	M5	0.55	0.20	AV STANDARD	7.94	8.27	0.79

**AUTOMATIC** **ELECTRIC** **TYPE H** Single-Phase 100V  
Single-Phase 200V

# DIAPHRAGM VALVE TYPE 14

TYPE—A14H  
CONNECTION / FLANGED—JIS, DIN, ANSI



### ACTUATOR SELECTION CHART

SIZE	ACTUATOR TYPE
65mm (2 1/2inch)	ED-21H
80mm ( 3inch)	
100mm ( 4inch)	

For detailed specifications, see **P.125**

■ JIS, DIN (Unit: mm)

mm	D1	H	H1	A	A1	A2	A3	S	S1	S2	E	JIS10K			DIN PN10		
												L	U-PVC C-PVC	PP PVDF	L	U-PVC C-PVC	PP PVDF
65	175	371	61	90	150	94	90	85	M8	15	5	250	22	23	290	22	22
80	199	388	63	90	150	94	90	100	M12	22	5	280	22	23	310	24	24
100	239	418	78	90	150	94	90	120	M12	22	5	340	22	24	350	24	26

■ ANSI (Unit: inch)

inch	mm	D1	H	H1	A	A1	A2	A3	S	S1	S2	E	ANSI CLASS150			
													L	AV STANDARD	U-PVC C-PVC	PP PVDF
2 1/2	65	6.89	14.61	2.40	3.54	5.91	3.70	3.54	3.35	M8	0.59	0.20	-	9.84	0.87	0.91
3	80	7.83	15.28	2.48	3.54	5.91	3.70	3.54	3.94	M12	0.87	0.20	10.37	11.02	0.87	0.91
4	100	9.41	16.46	3.07	3.54	5.91	3.70	3.54	4.72	M12	0.87	0.20	12.93	13.39	0.87	0.94

AUTOMATIC

ELECTRIC

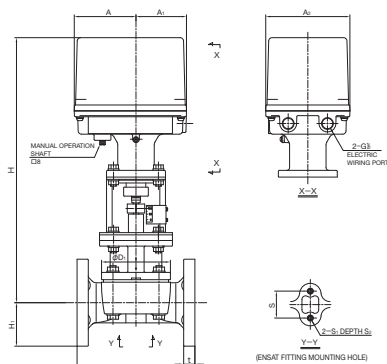
TYPE M

Single-Phase 100V  
Single-Phase 200V

# DIAPHRAGM VALVE TYPE 14

TYPE—A14M

CONNECTION / FLANGED—JIS, DIN, ANSI



### ACTUATOR SELECTION CHART

SIZE	ACTUATOR TYPE
15mm ( 1/2inch)	PSN1
20mm ( 3/4inch)	
25mm ( 1inch)	
32mm (1 1/4inch)	
40mm (1 1/2inch)	PSN3
50mm ( 2inch)	

For detailed specifications, see **P.127**

■ JIS, DIN (Unit: mm)

mm	D <sub>1</sub>	H	H <sub>1</sub>	A	A <sub>1</sub>	A <sub>2</sub>	S	S <sub>1</sub>	S <sub>2</sub>	JIS10K		DIN PN10	
										L	t	L	t
15	54×66	406	19.5	101	81	140	25	M5	10	110	12	130	12
20	54×66	408	17.5	101	81	140	25	M5	10	120	13	150	13
25	67×80	413	18.5	101	81	140	25	M5	10	130	13	160	13
32	67×80	416	22.5	101	81	140	25	M5	10	142	16	180	16
40	110×110	464	27.5	110	90	150	45	M6	14	180	16	200	20
50	123×123	473	36	110	90	150	45	M6	14	210	20	230	22

■ ANSI (Unit: inch)

inch	mm	D <sub>1</sub>	H	H <sub>1</sub>	A	A <sub>1</sub>	A <sub>2</sub>	S	S <sub>1</sub>	S <sub>2</sub>	ANSI CLASS150			
											L	t	U-PVC C-PVC	PP PVDF
1/2	15	2.13×2.60	15.98	0.77	3.98	3.19	5.51	0.98	M5	0.39	4.25	4.33	0.43	0.43
3/4	20	2.13×2.60	16.06	0.69	3.98	3.19	5.51	0.98	M5	0.39	5.88	4.72	0.51	0.51
1	25	2.64×3.15	16.26	0.73	3.98	3.19	5.51	0.98	M5	0.39	5.88	5.12	0.59	0.59
1 1/4	32	2.64×3.15	16.38	0.89	3.98	3.19	5.51	0.98	M5	0.39	6.38	-	0.63	0.63
1 1/2	40	4.25×4.25	18.27	1.08	4.33	3.54	5.91	1.77	M6	0.55	6.94	7.09	0.63	0.63
2	50	4.84×4.84	18.62	1.42	4.33	3.54	5.91	1.77	M6	0.55	7.94	8.27	0.79	0.79

AUTOMATIC

ELECTRIC

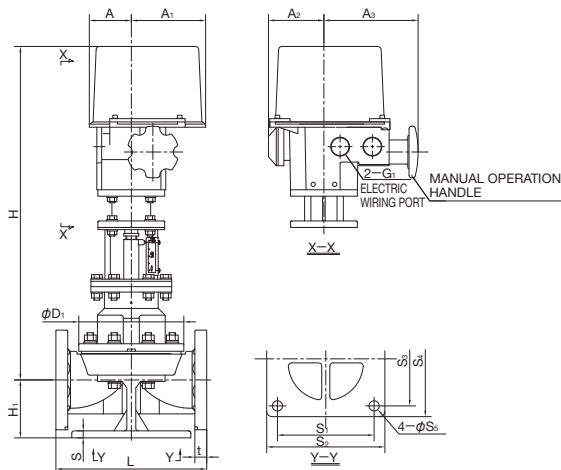
TYPE M

Single-Phase 100V  
Single-Phase 200V

# DIAPHRAGM VALVE TYPE 14

TYPE—A14M

CONNECTION / FLANGED—JIS, DIN, ANSI



### ACTUATOR SELECTION CHART

SIZE	ACTUATOR TYPE
65mm (2 1/2inch)	CSP471
80mm ( 3inch)	CSP771
100mm ( 4inch)	

For detailed specifications, see **P.127**

■ JIS, DIN (Unit: mm)

mm	D <sub>1</sub>	H	H <sub>1</sub>	A	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	S	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	S <sub>5</sub>	JIS10K			DIN PN10		
														L	U-PVC C-PVC	PP PVDF	L	U-PVC C-PVC	PP PVDF
65	175	608	98	79	137	103	177	12	155	190	160	190	19	250	22	23	290	22	22
80	199	625	109	79	137	103	177	12	180	220	175	215	19	280	22	23	310	24	24
100	239	655	119	79	137	103	177	15	230	270	220	260	19	340	22	24	350	24	26

■ ANSI (Unit: inch)

inch	mm	D <sub>1</sub>	H	H <sub>1</sub>	A	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	S	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	S <sub>5</sub>	ANSI CLASS150			
															L	t	U-PVC C-PVC	PP PVDF
2 1/2	65	6.89	23.94	3.86	3.11	5.39	4.06	6.97	0.47	6.10	7.48	6.30	7.48	0.75	-	9.84	0.87	0.91
3	80	7.83	24.61	4.29	3.11	5.39	4.06	6.97	0.47	7.09	8.66	6.89	8.46	0.75	10.37	11.02	0.87	0.91
4	100	9.41	25.79	4.69	3.11	5.39	4.06	6.97	0.59	9.06	10.63	8.66	10.24	0.75	12.93	13.39	0.87	0.94

# TRUE UNION DIAPHRAGM VALVE TYPE 14

- NEAR-LINEAR FLOW CHARACTERISTICS
- NEWLY EQUIPPED WITH BOTTOM STAND WITH INSERT HOLE TO ENSURE EASY AND SECURE INSTALLATION.
- THE VALVE BODY CAN BE REMOVED FROM THE LINE.

## BASIC SPECIFICATIONS

**VALVE TYPE** — TRUE UNION DIAPHRAGM VALVE TYPE 14

**SIZE** — 15 mm–50 mm (1/2 inch–2 inch)

**BODY MATERIAL** — U-PVC C-PVC PP PVDF

**SEAL MATERIAL / DIAPHRAGM** — EPDM PTFE

**O-RING** — EPDM FKM

**CONNECTION / SOCKET** — JIS, DIN, ANSI, BS  
\* For BS, contact us.

**THREADED** — Rc, Rp, NPT

	FLUID TEMPERATURE	MAXIMUM WORKING PRESSURE (NORMAL TEMPERATURE) MPa(kgf/cm <sup>2</sup> )	CONNECTION METHOD	
			SOCKET	THREADED
U-PVC	0°C ~ 50°C	1.0 {10.2}	○	○
C-PVC	0°C ~ 90°C	1.0 {10.2}	○	○
PP	-20°C ~ 80°C	1.0 {10.2}	○	○
PVDF	-20°C ~ 100°C	1.0 {10.2}	○	○

**NOTE** The maximum working pressure is the value including the water hammer pressure. Be careful that the maximum working pressure is not exceeded during use.  
\* Concerning the allowable pressure for each temperature, material and actuator type, see the technical documents at the end of this catalog.  
\* The diaphragm may become loose due to temperature changes during long storage, operation stop or while in use. Check the conditions and then retighten the bolts and nuts between the bonnet and the body to the "bonnet tightening torque". (Failure to do so may cause fluid leakage.)

MANUAL

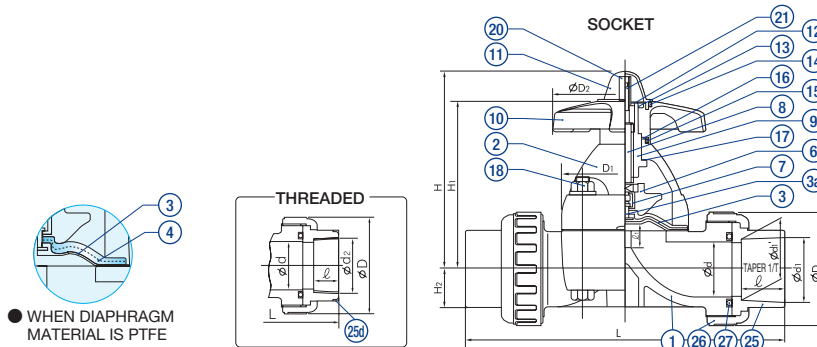


AUTOMATIC



## PARTS LIST

MANUAL



PART NO. / NAME	QTY	MATERIAL	PART NO. / NAME	QTY	MATERIAL	PART NO. / NAME	QTY	MATERIAL
① BODY	1	BODY END CONNECTOR — BONNET UNION NUT	④ CUSHION <sup>(2)</sup>	1	EPDM	⑭ O-RING (A)	1	EPDM
② BONNET	1	U-PVC — U-PVC C-PVC — PP PP — PP PVDF — PPG <sup>(1)</sup> PVDF — PVDF	⑥ COMPRESSOR	1	PVDF	⑮ O-RING (B)	1	EPDM
⑫ END CONNECTOR	2		⑦ JOINT FITTING	1	SUS304	⑯ THRUST RING (A)	1	UHMWPE
⑫ UNION NUT	2		⑧ STEM	1	C3604	⑰ THRUST RING (B)	1	UHMWPE
⑬ DIAPHRAGM	1	EPDM, PTFE, etc.	⑨ SLEEVE	1	C3604	⑱ BOLT/NUT (A)	4	SUS304
⑬a EMBEDDED DIAPHRAGM FITTING	1	SUS304	⑩ HANDLE	1	PP	⑳ STOPPER	1	C3604
			⑪ GAUGE COVER	1	PC	㉑ SCREW	1	SUS304
			⑫ NAMEPLATE	1	U-PVC	㉒ RING <sup>(3)</sup>	2	SUS304
			⑬ C-SHAPED STOP RING	1	SUS304	㉓ O-RING (C)	2	EPDM, etc.

**NOTE** (1) Bonnet PPG 15 – 100 mm: black. 125 – 250 mm: ivory. (2) is used when the diaphragm material is PTFE.  
(3) is used when the threaded end connector is made of C-PVC and the size is 15 to 25 mm.

## COMPATIBLE ACTUATOR

AUTOMATIC

**PNEUMATIC TYPE AN** For detailed specifications, see P.117

**ELECTRIC TYPE H** For detailed specifications, see P.125

**ELECTRIC TYPE M** For detailed specifications, see P.127

PRODUCT MODEL CODE LIST

MANUAL

ACTUATION	TYPE	OPERATING SYSTEM	BODY MATERIAL	SEAL MATERIAL	CONNECTION	STANDARD	SIZE			
V	T1	MH	*	*	*	*	***			
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮			
V	MANUAL VALVE	T1	TRUE UNION	MH	ROUND HANDLE	U U-PVC C C-PVC P PP F PVDF G PVDF+PPG	E EPDM 1 PTFE+EPDM 2 PTFE+FKM	S SOCKET N THREADED P SPIGOT	J JIS D DIN A ANSI	015 15mm } 050 50mm

PRODUCT MODEL CODE LIST

AUTOMATIC

ACTUATION	TYPE	ACTUATOR TYPE	ACTION / POWER SOURCE	BODY MATERIAL	SEAL MATERIAL	CONNECTION	STANDARD	SIZE		
A	T1	*	*	*	*	*	*	***		
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮		
A	AUTOMATIC VALVE	T1	TRUE UNION	<p>PNEUMATIC</p> <p>N TYPE AN</p> <p>ELECTRIC</p> <p>H TYPE H</p> <p>M TYPE M</p>	<p>PNEUMATIC</p> <p>F DOUBLE ACTING</p> <p>G AIR TO OPEN</p> <p>S AIR TO CLOSE</p> <p>ELECTRIC</p> <p>1 Single-Phase 100V</p> <p>2 Single-Phase 200V</p> <p>D DC24V</p>	U U-PVC C C-PVC P PP F PVDF	E EPDM 1 PTFE+EPDM 2 PTFE+FKM	S SOCKET N THREADED P SPIGOT	J JIS D DIN A ANSI	015 15mm } 050 50mm

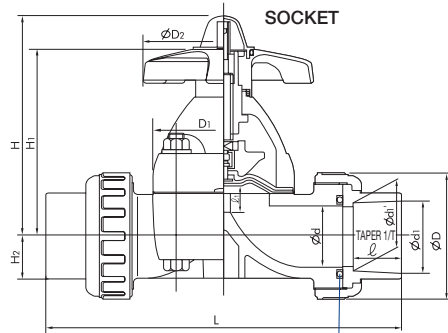
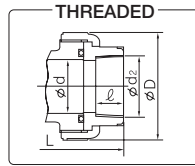
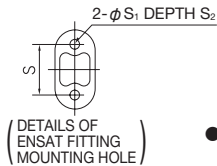
NOTE (1) PP and PVDF sockets are weld type. Note, however, that JIS PP 32-mm socket type is not produced. (2) U-PVC and U-PVC sockets are of JIS type only. PVDF sockets are of DIN type only.

MANUAL

# TRUE UNION DIAPHRAGM VALVE TYPE 14

TYPE—VT1MH

CONNECTION / SOCKET—JIS, DIN, ANSI THREADED—Rc, Rp, NPT



■ JIS, DIN (Unit: mm)

mm	d	D	D <sub>1</sub>	D <sub>2</sub>	ℓ <sub>1</sub>	H	H <sub>1</sub>	H <sub>2</sub>	S	S <sub>1</sub>	S <sub>2</sub>	JIS											
												SOCKET						THREADED					
												d <sub>1</sub>	ℓ	1/T	L	d <sub>1</sub>	d <sub>1</sub> '	ℓ	L	d <sub>2</sub>	ℓ	U-PVC C-PVC	PP PVDF
15	16	48	54×66	100	10	104	86	19.5	25	7	13	22.11	20	1/34	134	21.2	20.2	20	134	Rc1/2	15	128	128
20	20	60	54×66	100	10	106	88	17.5	25	7	13	26.13	24	1/34	156	26.2	25.2	23	154	Rc3/4	17	148	148
25	25	70	67×80	100	12	111	93	18.5	25	7	13	32.16	27	1/34	186	33.0	32.0	25	182	Rc1	20	172	172
32	32	82	67×80	100	12	116	97	22.5	25	7	13	38.19	30	1/34	200	-	-	-	-	Rc1 1/4	22	188	188
40	40	100	108×108	156	21	177	144	27.5	45	9	15	48.21	37	1/37	271	47.0	46.0	28	253	Rc1 1/2	25	245	245
50	52	106	123×123	156	25	191	158	36	45	9	15	60.25	42	1/37	303	59.0	58.0	28	275	Rc2	28	281	278

mm	DIN												SPIGOT											
	SOCKET				THREADED				U-PVC C-PVC				PP PVDF				U-PVC C-PVC				PP PVDF			
	d <sub>1</sub>	ℓ	L	d <sub>1</sub>	d <sub>1</sub> '	ℓ	L	d <sub>1</sub>	ℓ	U-PVC C-PVC	PP PVDF	d <sub>1</sub>	ℓ	L	d <sub>1</sub>	ℓ	L	d <sub>1</sub>	ℓ	L	t			
15	20	16	128	19.5	19.3	14.5	125	Rc1/2	15	128	128	20	18.5	150	20	18.5	150	2.5	1.9					
20	25	19	147	24.5	24.3	16	141	Rc3/4	17	148	148	25	24	172	25	22	172	2.7	1.9					
25	32	22	172	31.5	31.3	18	164	Rc1	20	172	172	32	24.5	195	32	22.5	195	3.0	2.4					
32	40	26	188	39.45	39.2	20.5	177	Rc1 1/4	22	188	188	40	28	212	40	26	212	3.7	2.4					
40	50	31	246	49.45	49.2	23.5	231	Rc1 1/2	25	245	245	50	34	276	50	32	276	4.6	3.0					
50	63	38	294	62.5	62.1	27.5	274	Rc2	28	281	278	63	38.5	308	63	36.0	307	5.8	3.0					

■ ANSI (Unit: inch)

inch	mm	d	D	D <sub>1</sub>	D <sub>2</sub>	C	H	H <sub>1</sub>	H <sub>2</sub>	S	S <sub>1</sub>	S <sub>2</sub>	ANSI											
													SOCKET						THREADED					
													ASTM SCH80			ANS/ASME B1 20.1			U-PVC C-PVC			PP PVDF		
1/2	15	0.63	1.89	2.13×2.60	3.94	0.39	4.09	3.39	0.77	0.98	0.28	0.51	0.848	0.836	0.875	5.47	0.83	0.87	5.43	1/2-14NPT	0.59	5.04	5.04	
3/4	20	0.79	2.36	2.13×2.60	3.94	0.39	4.17	3.46	0.69	0.98	0.28	0.51	1.058	1.046	1.000	6.18	1.03	1.00	6.09	3/4-14NPT	0.67	5.83	5.83	
1	25	0.98	2.76	2.64×3.15	3.94	0.47	4.37	3.66	0.79	0.98	0.28	0.51	1.325	1.310	1.125	7.32	1.30	1.13	7.24	1-11 1/2NPT	0.79	6.77	6.77	
1 1/4	32	1.26	3.23	2.64×3.15	3.94	0.47	4.57	3.82	0.89	0.98	0.28	0.51	1.670	1.655	1.250	7.95	1.65	1.25	7.80	1 1/4-11 1/2NPT	0.87	7.40	7.40	
1 1/2	40	1.57	3.94	4.25×4.25	6.14	0.83	6.97	5.67	1.08	1.77	0.35	0.59	1.912	1.894	1.375	10.47	1.89	1.37	10.28	1 1/2-11 1/2NPT	0.98	9.65	9.65	
2	50	2.05	4.17	4.84×4.84	6.14	0.98	7.52	6.22	1.42	1.77	0.35	0.59	2.387	2.369	1.500	11.54	2.36	1.50	11.54	2-11 1/2NPT	1.10	11.06	10.95	

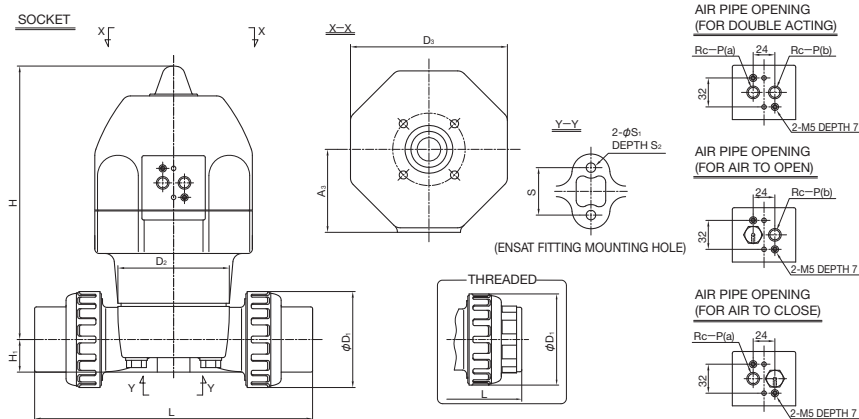


**AUTOMATIC PNEUMATIC TYPE AN**

DOUBLE ACTING
AIR TO OPEN
AIR TO CLOSE

# TRUE UNION DIAPHRAGM VALVE TYPE 14

TYPE—AT1N  
 CONNECTION / SOCKET, THREADED—JIS, DIN, ANSI



ACTUATOR SELECTION CHART

SIZE	ACTUATOR TYPE		
	DOUBLE ACTING	AIR TO OPEN	AIR TO CLOSE
15mm ( 1/2inch)	AN-1DA	AN-1AO	AN-1AS
20mm ( 3/4inch)	AN-2DA	AN-2AO	AN-2AS
25mm ( 1inch)	AN-3DA	AN-3AO	AN-3AS
32mm (1 1/4inch)	AN-4DA	AN-4AO	AN-4AS
40mm (1 1/2inch)	AN-3DA	AN-3AO	AN-3AS
50mm ( 2inch)	AN-4DA	AN-4AO	AN-4AS

For detailed specifications, see **P.117**

■ JIS, DIN (Unit: mm)

mm	D1	D2	D3	H	H1	A3	S	S1	S2	P	JIS				DIN							
											SOCKET		THREADED		SOCKET		THREADED		SPIGOT			
											L	PP	L	PP	L	PP	L	PP	L	PP	L	PP
15	48	54x66	130	186	19.5	68	25	7	13	1/4	134	134	128	128	128	125	128	128	150	150	2.5	1.9
20	60	54x66	130	188	17.5	68	25	7	13	1/4	156	154	148	148	147	141	148	148	172	172	2.7	1.9
25	70	67x80	130	193	18.5	68	25	7	13	1/4	186	182	172	172	172	164	172	172	195	195	3.0	2.4
32	82	67x80	130	197	22.5	68	25	7	13	1/4	200	-	188	188	188	177	188	188	212	212	3.7	2.4
40	100	108x108	174	293	27.5	92	45	9	15	1/4	271	253	245	245	246	231	245	245	276	276	4.6	3.0
50	106	123x123	174	302	36	92	45	9	15	1/4	303	275	281	278	294	274	281	278	308	307	5.8	3.0

■ ANSI (Unit: inch)

inch	mm	D1	D2	D3	H	H1	A3	S	S1	S2	P	ANSI			
												SOCKET		THREADED	
												L	PP	L	PP
1/2	15	1.89	2.13x2.60	5.12	7.32	0.77	2.68	0.98	0.28	0.51	1/4	5.47	5.43	5.04	5.04
3/4	20	2.36	2.13x2.60	5.12	7.40	0.69	2.68	0.98	0.28	0.51	1/4	6.18	6.09	5.83	5.83
1	25	2.76	2.64x3.15	5.12	7.60	0.73	2.68	0.98	0.28	0.51	1/4	7.32	7.24	6.77	6.77
1 1/4	32	3.23	2.64x3.15	5.12	7.76	0.89	2.68	0.98	0.28	0.51	1/4	7.95	7.80	7.40	7.40
1 1/2	40	3.94	4.25x4.25	6.85	11.54	1.08	3.62	1.77	0.35	0.59	1/4	10.47	10.28	9.65	9.65
2	50	4.17	4.84x4.84	6.85	11.89	1.42	3.62	1.77	0.35	0.59	1/4	11.54	11.54	11.06	10.95

AUTOMATIC

ELECTRIC

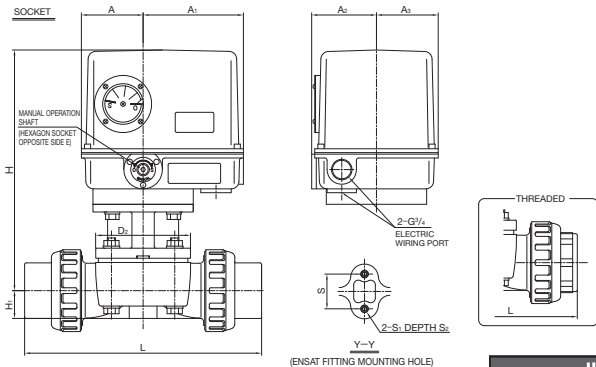
TYPE H

Single-Phase 100V  
Single-Phase 200V

# TRUE UNION DIAPHRAGM VALVE TYPE 14

TYPE—AT1H

CONNECTION / SOCKET, THREADED—JIS, DIN, ANSI



### ACTUATOR SELECTION CHART

SIZE	ACTUATOR TYPE
15mm ( 1/2inch)	ED-11H
20mm ( 3/4inch)	
25mm ( 1inch)	
32mm (1 1/4inch)	
40mm (1 1/2inch)	
50mm ( 2inch)	

For detailed specifications, see P.125

■ JIS, DIN (Unit: mm)

mm	D <sub>2</sub>	H	H <sub>1</sub>	A	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	S	S <sub>1</sub>	S <sub>2</sub>	E	JIS				DIN							
												SOCKET		THREADED		SOCKET		THREADED		SPIGOT			
												U-PVC C-PVC	PP	U-PVC C-PVC	PP PVDF	U-PVC C-PVC	PP PVDF	U-PVC C-PVC	PP PVDF	U-PVC C-PVC	PP PVDF	PP	PVDF
15	54×66	284	19.5	80	130	84	80	25	M5	10	5	134	134	128	128	128	125	128	128	150	2.5	1.9	150
20	54×66	286	17.5	80	130	84	80	25	M5	10	5	156	154	148	148	147	141	148	148	172	2.7	1.9	172
25	67×80	291	18.5	80	130	84	80	25	M5	10	5	186	182	172	172	172	164	172	172	195	3.0	2.4	195
32	67×80	294.5	22.5	80	130	84	80	25	M5	10	5	200	-	188	188	188	177	188	188	212	3.7	2.4	212
40	110×110	302.2	27.5	80	130	84	80	45	M6	14	5	271	253	245	245	246	231	245	245	276	4.6	3.0	276
50	123×123	311.2	36	80	130	84	80	45	M6	14	5	303	275	281	278	294	274	281	278	308	5.8	3.0	307

■ ANSI (Unit: inch)

inch	mm	D <sub>2</sub>	H	H <sub>1</sub>	A	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	S	S <sub>1</sub>	S <sub>2</sub>	E	ANSI			
													SOCKET		THREADED	
													U-PVC C-PVC	PP PVDF	U-PVC C-PVC	PP PVDF
1/2	15	2.13×2.60	11.59	0.80	3.27	5.31	3.43	3.27	1.02	M5	0.41	0.20	5.47	5.43	5.04	5.04
3/4	20	2.13×2.60	11.67	0.71	3.27	5.31	3.43	3.27	1.02	M5	0.41	0.20	6.18	6.09	5.83	5.83
1	25	2.64×3.15	11.88	0.76	3.27	5.31	3.43	3.27	1.02	M5	0.41	0.20	7.32	7.24	6.77	6.77
1 1/4	32	2.64×3.15	12.02	0.92	3.27	5.31	3.43	3.27	1.02	M5	0.41	0.20	7.95	7.80	7.40	7.40
1 1/2	40	4.25×4.25	12.33	1.12	3.27	5.31	3.43	3.27	1.84	M6	0.57	0.20	10.47	10.28	9.65	9.65
2	50	4.84×4.84	12.70	1.47	3.27	5.31	3.43	3.27	1.84	M6	0.57	0.20	11.54	11.54	11.06	10.95

AUTOMATIC

ELECTRIC

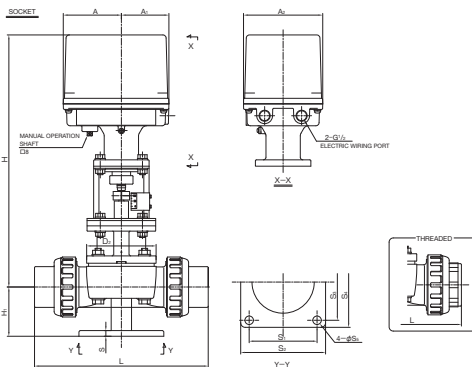
TYPE M

Single-Phase 100V  
Single-Phase 200V

# TRUE UNION DIAPHRAGM VALVE TYPE 14

TYPE—AT1M

CONNECTION / SOCKET, THREADED—JIS, DIN, ANSI



### ACTUATOR SELECTION CHART

SIZE	ACTUATOR TYPE
15mm ( 1/2inch)	PSN1
20mm ( 3/4inch)	
25mm ( 1inch)	
32mm (1 1/4inch)	PSN3
40mm (1 1/2inch)	
50mm ( 2inch)	

For detailed specifications, see P.127

■ JIS, DIN (Unit: mm)

mm	D <sub>2</sub>	H	H <sub>1</sub>	A	A <sub>1</sub>	A <sub>2</sub>	S	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	S <sub>5</sub>	JIS			
													SOCKET		THREADED	
													U-PVC C-PVC	PP	U-PVC C-PVC	PP PVDF
15	54×66	406	57	101	81	140	8	50	70	60	80	12	134	134	128	128
20	54×66	408	62	101	81	140	8	60	80	65	85	12	156	154	148	148
25	67×80	413	75	101	81	140	8	65	90	70	95	15	186	182	172	172
32	67×80	416	79	101	81	140	10	90	115	110	135	15	200	-	188	188
40	110×110	464	79	110	90	150	10	90	115	110	135	15	271	253	245	245
50	123×123	473	87	110	90	150	10	120	150	135	160	15	303	275	281	278

■ ANSI (Unit: inch)

inch	mm	D <sub>2</sub>	H	H <sub>1</sub>	A	A <sub>1</sub>	A <sub>2</sub>	S	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	S <sub>5</sub>	ANSI			
														SOCKET		THREADED	
														U-PVC C-PVC	PP PVDF	U-PVC C-PVC	PP PVDF
1/2	15	2.13×2.60	15.98	2.24	3.98	3.19	5.51	0.31	1.97	2.76	2.36	3.15	0.47	5.47	5.43	5.04	5.04
3/4	20	2.13×2.60	16.06	2.44	3.98	3.19	5.51	0.31	2.36	3.15	2.56	3.35	0.47	6.18	6.09	5.83	5.83
1	25	2.64×3.15	16.26	2.95	3.98	3.19	5.51	0.31	2.56	3.54	2.76	3.74	0.59	7.32	7.24	6.77	6.77
1 1/4	32	2.64×3.15	16.38	3.11	3.98	3.19	5.51	0.39	3.54	4.53	4.33	5.31	0.59	7.95	7.80	7.40	7.40
1 1/2	40	4.25×4.25	18.27	3.11	4.33	3.54	5.91	0.39	3.54	4.53	4.33	5.31	0.59	10.47	10.28	9.65	9.65
2	50	4.84×4.84	18.62	3.43	4.33	3.54	5.91	0.39	4.72	5.91	5.31	6.30	0.59	11.54	11.54	11.06	10.95