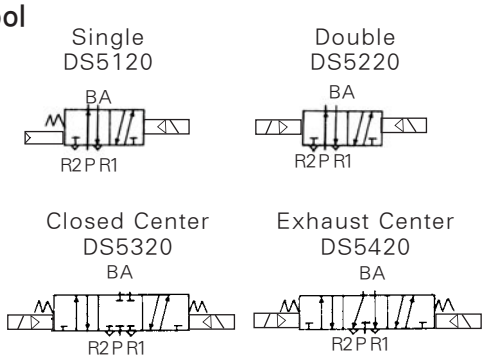
Series DS5000

Rubber Seal 5 Port Pilot Type • Body Ported Type

- COMPACT SIZE AND LIGHT WEIGHT
- LARGE FLOW CAPACITY
- LOW POWER CONSUMPTION
- DESIGNED FOR NON-LUBRICATED SERVICE

Symbol



How to Order

U DS5 1 2 0 — 1 G ○ — ○ 0 3 - ○

1 2 3 4 5 6 7 8 9 10

1 DS5000 Series
- Blank : Metric(PT)
- U : NPT(UNF)

2 Type of Actuation
- 1 : 2 Position Single Solenoid
- 2 : 2 Position Double Solenoid
- 3 : 3 Position Closed Center
- 4 : 3 Position Exhaust Center

3 Body Type
- 2 : For 20 Type Manifold, Body Ported

4 Body Option
- 0 : Standard
- 3 : Common Exhaust for Main valve and Pliot valve

5 Voltage
- 1 : AC100V, 50/60Hz
- 2 : AC200V, 50/60Hz
- 3 : AC120V, 50/60Hz
- 4 : AC240V, 50/60Hz
- 5 : DC24V
- 6 : DC12V
- 7 : DC6V

6 Electrical Entry/Indicator Light and Surge Suppressor
- G : Grommet(Lead wire length 12 inch)
- DZ : DIN Connector With Indicator light and Surge suppressor
- D : DIN Connector

7 Manual Override
- Blank : Non-locking Push type
- C : Knob locking type

8 Thread
- Blank : Rc(PT)
- G : Rc(PF)

9 Port Size(SUP., CYL')
- 02 : 1/4″
- 03 : 3/8″
- 04 : 1/2″
- (Exhaust Port 3/8″)

10 Special Option
- Blank : Standard type
- XC16 : Copper-free

Pilot Valve Assembly

SC2 — 1 G ○ — 50 — ○

1 2 3 4 5

1 For DS5000 series Valve Ass'y

2 Voltage
- 1 : AC100V, 50/60Hz
- 2 : AC200V, 50/60Hz
- 3 : AC120V, 50/60Hz
- 4 : AC240V, 50/60Hz
- 5 : DC24V
- 6 : DC12V
- 7 : DC6V
- 8 : AC24V, 50/60Hz
- 9 : Other

3 Electrical Entry/Indicator Light and Surge Suppression
- G : Grommet (Lead wire length 12 inch)
- DZ : DIN Connector With Indicator light and Surge suppressor
- D : DIN Connector

4 Manual Override
- Blank : Non - locking Push type
- C : Knob locking type

5 Special Option
- Blank : Standard type
- XC16 : Copper-free

DS Terminal Box How to Order

DS3130-61-2005

1 Symbol

Symbol	Voltage
1	AC 100V
2	AC 200V
3	AC 120V
4	AC 240V
5	DC 24V
6	DC 12V
7	DC 6V
8	Others (DV100V/AC24V)

⚠ Precautions.

Be sure to read before handling. Refer to (Page. B-62) for safety instruction and common.

Specifications

Fluid		Air
Operating Pressure Range	2 Position Single/3 Position	0.15~0.9 MPa(21~128 PSI)
	2 Position Double	0.1~0.9 MPa(14~128 PSI)
Ambient and Fluid Temperature		Max. 50℃(122℉)
Response Time	2 Position Single/Double	40ms or less {0.5 MPa}
	3 Position	50ms or less {0.5 MPa}
Max. Operea-ting Frequency	2 Position Single/Double	5 C/S
	3 Position	3 C/S
Lubrication		Not required
Manual Override		Non-Locking Push Type, Knob locking type
Mounting Position		Free
Impact/Vibration Resistance		30G/5G(8.3~2000Hz)
Enclosure		Dust Proof(IP67)

Electrical entry			Grommet, DIN Connector
Coil Voltages	AC 50/60Hz		100 VAC, 200 VAC, 120 VAC, 240 VAC, AC24V
	DC		6 VDC, 12 VDC, 24 VDC
Allowable Voltage			-15~+10% of Rated Voltage
Power consumption	AC	Inrush	5.6VA(50Hz), 5.0VA(60Hz)
		Holding	3.4VA(50Hz), 2.3VA(60Hz)
	DC		1.8W/2W(With LED)
Indicator Light/Surge Suppressor Circuit	AC		LED, Varistor
	DC		LED, Varistor

※ If provided, use Turbine Oil 0.1(ISO VG #32)

Model

inch(mm)

Piping	Type	Position Solenoid	(1)Port size Rc(PT)/NPT (SUP,CYL.)	Effective orifice inch²(Cv factor) 3/8″	Effective orifice inch²(Cv factor) 1/2″	(2)Weight · kgf(lbs) 3/8″	(2)Weight · kgf(lbs) 1/2″
Body ported	DS5120-○○-03/04	2/Single	1/4″ 3/8″ · 1/2″	0.08(2.8)	0.09(3.2)	0.38(0.84)	0.37(0.82)
	DS5220-○○-03/04	2/Double		0.08(2.8)	0.09(3.2)	0.38(0.84)	0.47(1.04)
	DS5320-○○-03/04	3/Closed Center		0.06(2.2)	0.07(2.5)	0.48(1.06)	0.58(1.28)
	DS5420-○○-03/04	3/Exhaust Center		0.07(2.4)	0.08(2.7)	0.59(1.30)	0.58(1.28)

(1) Body Ported Valve can be mounted directly on (Manifold, type/B, Common exhaust)
(2) Exhaust Port is only 3/8″
(3) In case of Body Ported type. Exhaust Port is only 3/8″

Model for Manifold

Model	Type		Exhaust	A, B(CYL')Port
DS5○20-○○-03/04	B Mount	20	Common	Valve

Manifold

DSM5-20-051

Manifold Specifications

inch(mm)

Manifold type	B Mount
Exhaust	Common Exhaust
Maximum Stations	10 Stations

Manifold Type	Model	Exhaust Port	Piping/Port location			Port Size Rc(PT)/NPT			Applicable Valve
			P	R	A,B	P	R	A,B	
B Mount	DSM5-20	Common	Side	Side	Top	3/8″	3/8″	3/8″, 1/2″	DS5◯20
			Base	Base	Valve	1/2″			

How to Order Manifold Base

U DSM5 — 20 — ◯ 05 1

1 2 3 4 5

1 Manifold for DS5000 series
Blank : Metric(PT)
U : NPT(UNF)

2 Manifold Specifications
Code : 20 - For Body Ported Valve
Port location for CYL' port : Valve
Port size for EXH.
P : 1/2″
R : 3/8″
Applicable : DS5◯20

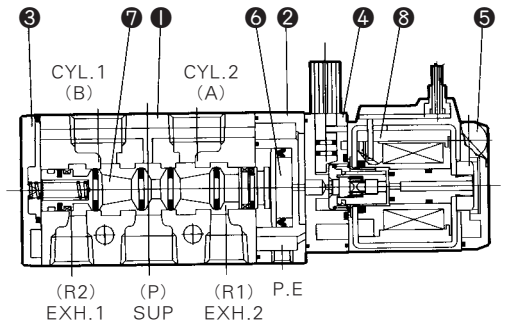
3 Thread
Blank : Rc(PT)
G : Rc(PF)

4 Stations
02 : 2 Stations
⋮ ⋮
10 : 10 Stations

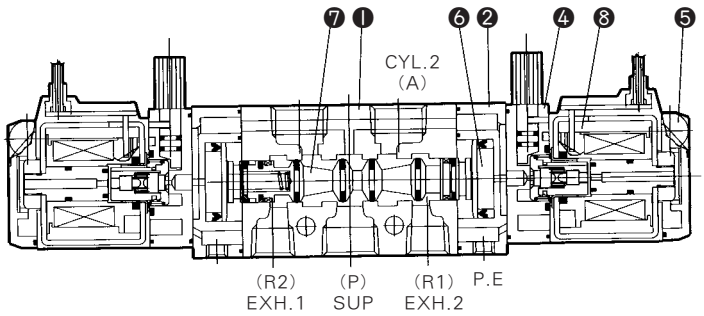
5 Component Symbol
Code : 1
Passage
P(SUP) : Common
P(EXH) : Common
Piping
A,B(CYL') : Top
Applicable manifold type : 20

Construction/Parts List

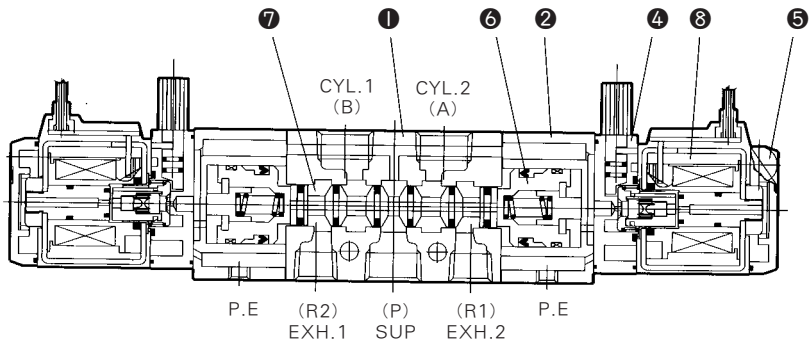
Single Solenoid



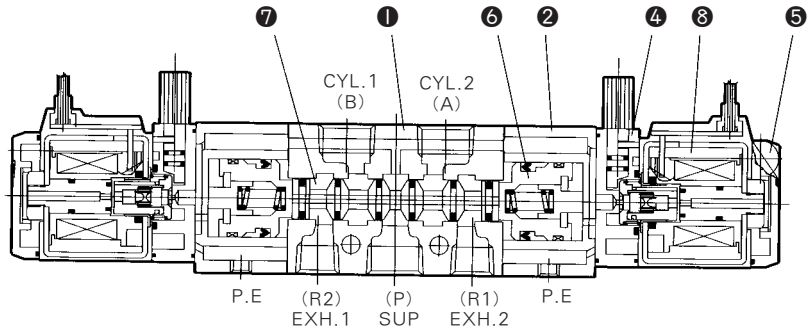
Double Solenoid



3 Position Closed Center



3 Position Exhaust Center



Main Parts

No.	Description	Material	Notes
❶	Body	Aluminum Die Casting	Metallic Paint
❷	Adapter Piate	Aluminum Die Casting	Black Paint
❸	End Cover	Aluminum Die Casting	Black Paint
❹	Pilot Body	Polyacetal	
❺	Pilot Cover	Polyacetal	
❻	Piston	(※)Polyacetal	
❼	Spool	Aluminum · NBR	

※ 3 Position : Aluminum

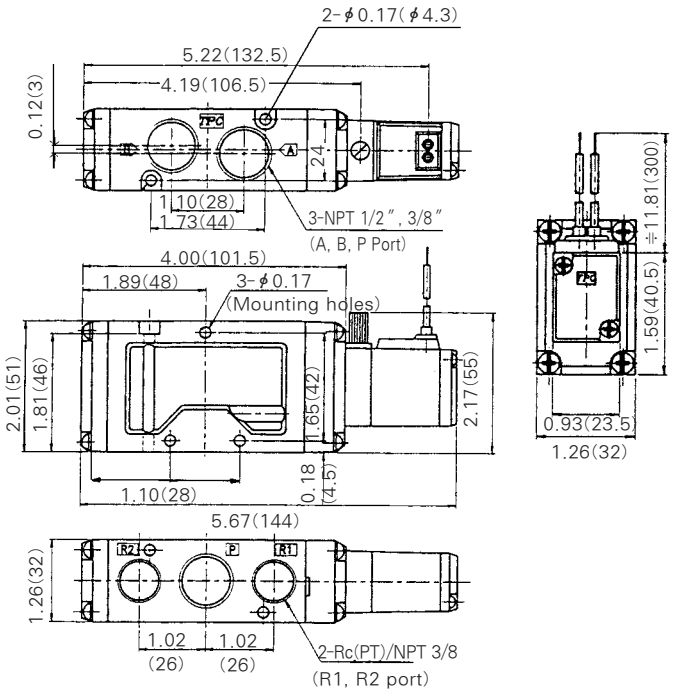
Spare Parts

No.	Description	Material	Notes
❽	Pilot Valve Ass'y	–	

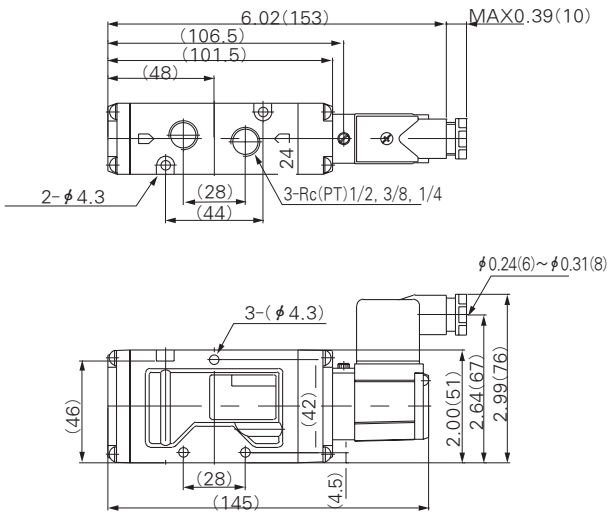
Body ported/2 Position Single Solenoid

inch(mm)

Grommet/DS512 ◯ - ◯ GC



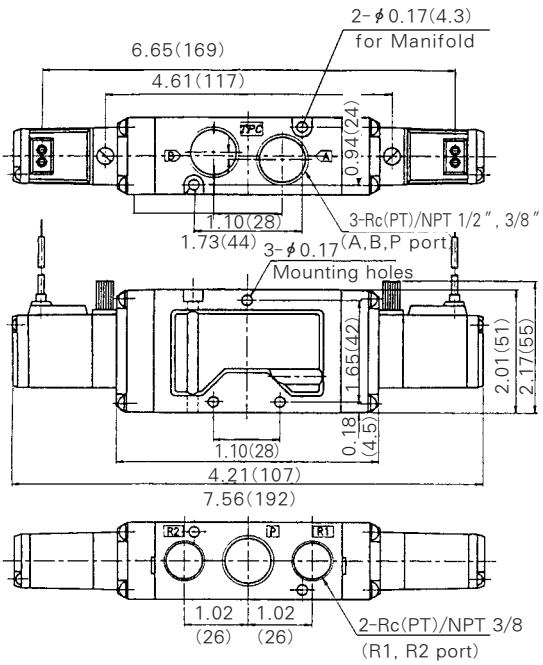
DIN Connector/UDS512 ◯ - ◯ DZ



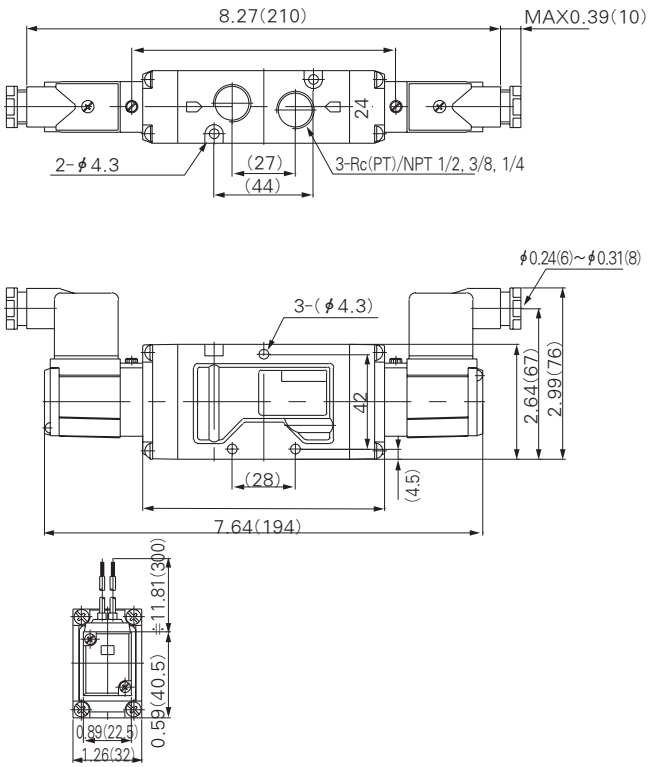
Body ported/2 Position Double Solenoid

inch(mm)

Grommet/DS5 22 ◯ - ◯ G



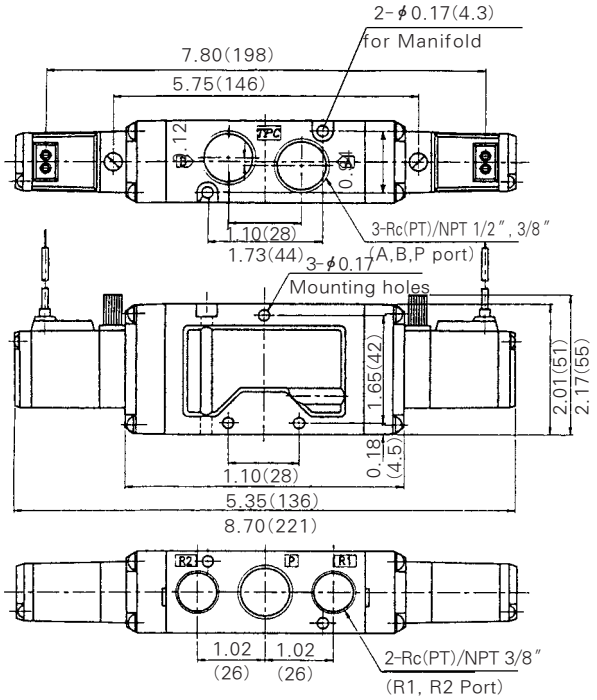
DIN Connector/UDS 5220 - ◯ DZ



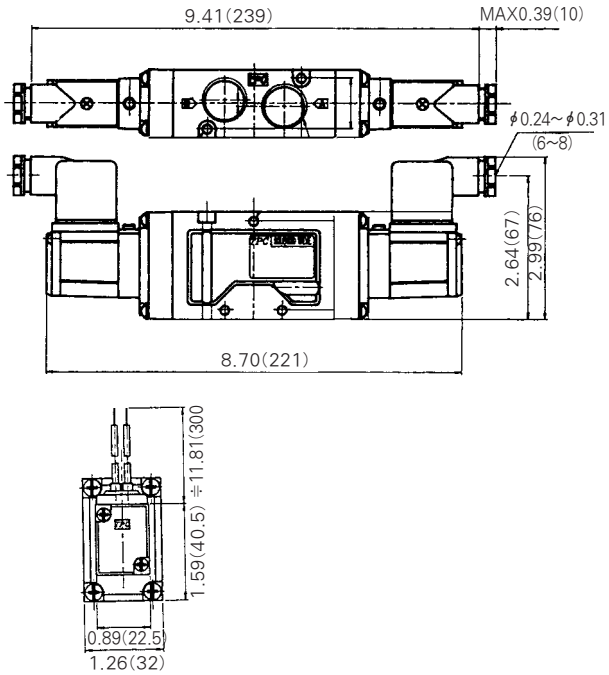
Body ported/3 Position Double Solenoid

inch(mm)

Grommet/DS 5320 - ◯G, UDS5420-◯G



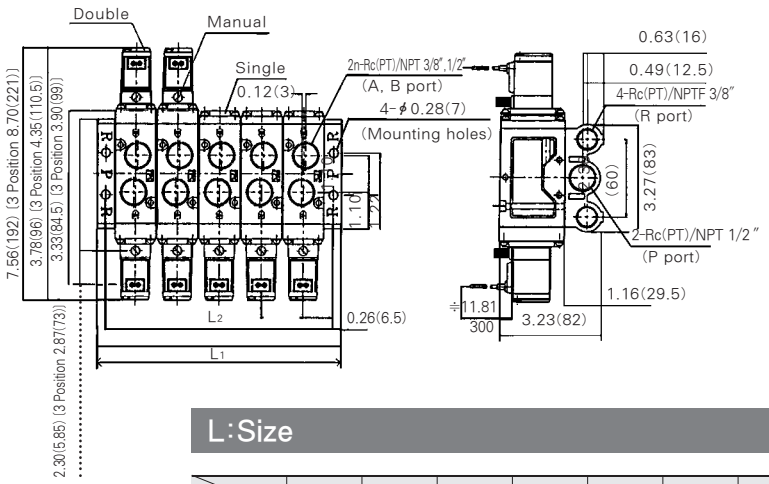
Din Connector / DS5320 - ◯DZ
DS5420 - ◯DZ



B Mount Type/Manifold Dimensions DSM5-30

inch(mm)

Common Exhaust/DSM5 - 20 - ◯◯1



inch(mm)

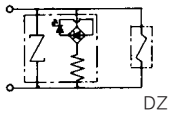
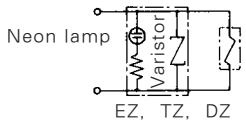
L:Size

n :station NO.

L \ n	2	3	4	5	6	7	8	9	10
L1	3.66(93)	4.96(126)	6.26(159)	7.56(192)	8.86(225)	10.16(258)	11.46(291)	12.76(324)	14.06(357)
L2	3.15(80)	4.45(113)	5.75(146)	7.05(179)	8.35(212)	9.65(245)	10.94(278)	12.24(311)	13.54(344)

⚠ Precautions

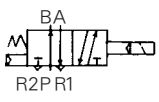
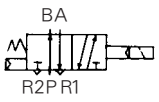
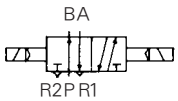
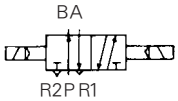
Indicator light / Surge Voltage Suppressor

Rating Voltage	AC, DC
24V less than	
200V less than	

(1) Grommet(G) : with out lamp
(2) ZNR is called Varistor and it is surge voltage suppressor element

Use as a 3 port Valve

Plugging one of the cylinder ports (A or B) enables use as a 3 port Valve. It should not be used in special applications such as a non-leakage valve. Make sure the exhaust port is open if used as a 3 port valve.

plug		B port (CYL.1port)	A port (CYL.2port)
Function		N.C	N.O
Solenoid	Single	(X)plug 	(X)plug 
	Double	(X)plug 	(X)plug 

Quality Of Fluid

① Filtration to 5 Microns is sufficient.
② Large quantity of drainage causes incorrect operation of pneumatic products as well as environmental contamination.
③ When there is a large amount of carbon powder from the compressor, please change the compressor oil or install a mist separator.

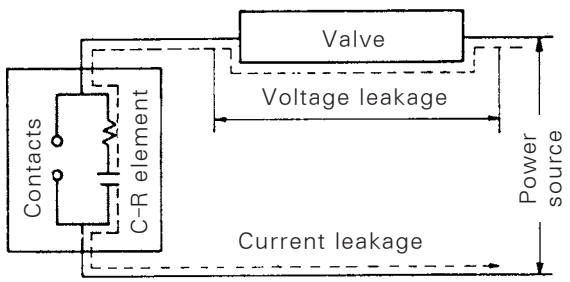
Piping

① Make sure to clean up chips, cutting oil, dust, etc., before piping.
② When installing piping of fitting into a port, ensure that sealant material does not enter the port inside. When using seal tape, leave 1.5 to 2 threads exposed on the end of piping / fitting.
③ In case of manifold type, be sure to confirm. Because manifold type does not include at PE port by some possibility.
④ Tightening torgue

Therad	Appropriate tightening Psi(N · m)	Material
M3	44.08~55.46(0.31~0.39)	Polyacetal
	66.83~83.90(0.47~0.59)	Aluminum
M4	106.7~135.1(0.75~0.95)	Polyacetal
	163.5~206.2(1.15~1.45)	Aluminum
M5	213.3~284.4(1.5~2)	Polyacetal
Rc(PT)/NPT 1/8	995.4~1279.8(7~9)	Aluminum
Rc(PT)/NPT 1/4	1706.4~1990.8(12~14)	

Leakage Voltage

① For the leakage current, residual leakage voltage of AC coil must be less than 20% of the rated voltage, and leakage voltage of DC coil must be less than 3% of the rated voltage when the switch is off.
② When using a C-R element, it will increase the leakage voltage.



Operating Environment

⚠ Warning

① Do not use in atmospheres where the valve is in direct contact with corrosive gases, chemicals, salt water, water or steam.
② If using in atmosphere where there is possible contact with water drop-lets, oil, weld spatter, etc., take suitable preventative measures.
③ Do not use in a place subject to heavy vibrations and/or shocks. Check the specifications for each series.

Use at Low Temperature

Available for use under 14°F(-10°C), however care should be taken to protect against freezing moisture.

Momentary Energizing

When using a Double Solenoid type with momentary energizing, make sure the energizing time is more than 0.05 seconds.

Long periods of continuous energization

Contact TPC when the valve is to be continuously energized for a long periods.

How to Calculate Flow Rate (At an temperature 20°C)

① Subsonic flow : $P_1+0.1013 < 1.89(P_2+0.1013)$

$$Q=226S\sqrt{\triangle P(P_2+0.1013)}$$

Subsonic flow : $P_1+0.1013 \geqq 1.89(P_2+0.1013)$

$$Q=113S\sqrt{\triangle P(P_1+0.1013)}$$

Q : Flow rate [ℓ/min(ANR)]
S : Effective area(mm^2)
△P : Pressure differential(P_1-P_2)[MPa]
P_1 : Upstream pressure[MPa]
P_2 : Downstream pressure[MPa]

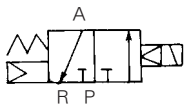
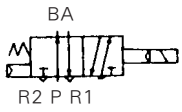
• When the air temperature is different, multiply the flow rate calculated with the above formula by the following coefficient for compensation.

Air temperature(°C)	-20	-10	0	10	30	40	50	60
Coeff, for compensation	1.08	1.06	1.04	1.02	0.98	0.97	0.95	0.94

Lubrication

① The valve has heen lubricated for life at manufacture, and does not require lubrication in service.
② If a lubricant is used in the system, use turbine oil class 1(ISO VG32).
If other lubricant oil is used, it may canse malfunction.
contact us for suggested twrbine oil class 2(ISO VG32).

Remark

Port	DS300	DS3000, DS5000
Supply	P(SUP)	
Cylinder	A(CYL)	A(CYL.2), 및 B(CYL.1)
Exhaust	R(EXH)	R1(EXH2), 및 R2(EXH1)
Symbol (Single Solenoid)		
	S:P(SUP)	