

NP/NAP/NVP

Large flow rate 3-port valve

Pilot operated solenoid valve/external pilot operated air drive poppet valve

Overview

Large flow rate 3-way valve with sealing strength enabled by its poppet structure. NP Series, internal pilot suitable for cylinder driving up to $\phi 400$. NAP/NVP Series, external pilot compatible with both positive pressure and negative pressure (vacuum). Two types are available to suit the application.

Features

Two types available

- Internal pilot NP Series
 - NC,
 - NO
- External pilot NAP, NVP Series
 - Universal

Large flow rate with compact and lightweight body

Effective cross-sectional area: $\sim 630 \text{ mm}^2$

Able to operate with no lubrication

Unrestricted mounting orientation

External pilot is compatible with both positive and negative pressures

Poppet structure



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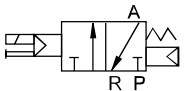

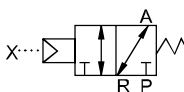

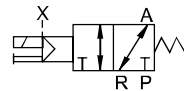
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Large flow rate 3-port valve	
● Internal pilot 3-port solenoid valve NC/NO (NP13/14)	1626
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4GA/B
M4GA/B
MN4GA/B
4GA/B (mastr)
4GD/E
M4GD/E
MN4GD/E
4GA4/B4
MN3E MN4E
W4GA/B2
W4GB4
4TB
4L2-4/ LMF0
MN3S0 MN4S0
4SA/B0
4KA/B
4KA/B (mastr)
4F
4F (mastr)
PV5G GMF
PV5 GMF
PV5S-0
3QR 3QB
MV3QR
3MA/B0
3PA/B
P/M/B
NP/NAP/ NVP
4F*0EX
4F*0E
HMV HSV
2QV 3QV
SKH
PCD
Silencer
TotAirSys (Total Air)
TotAirSys (Gamma)
Ending

Series variation

NP/NAP/NVP Series

- 4GA/B
- M4GA/B
- MN4GA/B
- 4GA/B (mastr)
- 4GD/E
- M4GD/E
- MN4GD/E
- 4GA4/B4
- MN3E
MN4E
- W4GA/B2
- W4GB4
- 4TB
- 4L2-4/
LMF0
- MN3S0
MN4S0
- 4SA/B0
- 4KA/B
- 4KA/B (mastr)
- 4F
- 4F (mastr)
- PV5G
GMF
- PV5S-0
- 3QR
3QB
- MV3QR
- 3MA/B0
- 3PA/B
- P/M/B
- NP/NAP/
NVP
- 4F*0EX
- 4F*0E
- HMV
HSV
- 2QV
3QV
- SKH
- PCD
- Silencer
- TotAirSys
(Total Air)
- TotAirSys
(Gamma)
- Ending

Series external appearance	Model No.	JIS symbol	Flow characteristics			Voltage (V)
			C [dm ³ /(s·bar)]	b	S (mm ²)	
			*1			
(NC/NO) Internal pilot with solenoid valve 	NP13/NP14	NC 	P→A			100 AC 200 AC 24 DC Custom order 110 AC 220 AC
			NP13	10A to 20A 15 to 35	10A to 20A 0.27 to 0.31	
		NO	R→A			
			NP14	10A to 20A 15 to 41	10A to 20A 0.21 to 0.31	
(Universal) Air operated 	NAP11		P→A			
			NAP11	10A to 20A 15 to 35	10A to 20A 0.27 to 0.31	25A to 50A 200 to 660
(Universal) Pneumatic, solenoid valve 	NVP11		P→A			100 AC 200 AC 24 DC
			NVP11	10A to 20A 15 to 35	10A to 20A 0.27 to 0.31	25A to 50A 200 to 660

*1: Effective cross-sectional area S and sonic conductance C are converted as $S \approx 5.0 \times C$.

	Port size of port A/P							Coil housing					Page
	Female thread							Grommet coil	DIN terminal box (Pg thread)	DIN terminal box with lamp (Pg thread)	With T type terminal box (G1/2)	T type terminal box with lamp (G1/2)	
	Rc3/8	Rc1/2	Rc3/4	Rc1	Rc1 1/4	Rc1 1/2	Rc2						
	●	●	●	●	●	●	●	●	●	●	●	●	1626
	●	●	●	●	●	●	●	●	●	●	●	●	
	●	●	●	●	●	●	●						1632
	●	●	●	●	●	●	●	●	●	●	●	●	1636

Electric connection circuit diagram

Option	Wiring circuit		Coil housing
	AC	DC	
-			Grommet coil (2C) DIN terminal box (2G) T type terminal box (3T)
With indicator lamp			DIN terminal box (2H) T type terminal box (3R)
With surge suppressor			Grommet coil (2CS, Rc1 1/4 to Rc2) DIN terminal box (2GS) T type terminal box (3TS)
with surge suppressor and indicator lamp			DIN terminal box (2HS) T type terminal box (3RS)
Surge suppressor attached			Grommet coil (2CS, Rc3/8 to Rc1)

4GA/B
M4GA/B
MN4GA/B
4GA/B (mastr)
4GD/E
M4GD/E
MN4GD/E
4GA4/B4
MN3E
MN4E
W4GA/B2
W4GB4
4TB
4L2-4/LMF0
MN3S0
MN4S0
4SA/B0
4KA/B
4KA/B (mastr)
4F
4F (mastr)
PV5G
GMF
PV5
GMF
PV5S-0
3QR
3QB
MV3QR
3MA/B0
3PA/B
P/M/B
NP/NAP/NVP
4F*0EX
4F*0E
HMV
HSV
2QV
3QV
SKH
PCD
Silencer
TotAirSys (Total Air)
TotAirSys (Gamma)
Ending



Air operated 3-port valve

NAP11 Series

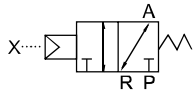
- Universal
- Port size: Rc3/8 to Rc2



- 4GA/B
- M4GA/B
- MN4GA/B
- 4GA/B (mastr)
- 4GD/E
- M4GD/E
- MN4GD/E
- 4GA4/B4
- MN3E
MN4E
- W4GA/B2
- W4GB4
- 4TB
- 4L2-4/
LMF0
- MN3S0
MN4S0
- 4SA/B0
- 4KA/B
- 4KA/B (mastr)
- 4F
- 4F (mastr)
- PV5G
GMF
- PV5
GMF
- PV5S-0
- 3QR
3QB
- MV3QR
- 3MA/B0
- 3PA/B
- P/M/B
- NP/NAP/
NVP
- 4F*0EX
- 4F*0E
- HMV
HSV
- 2QV
3QV
- SKH
- PCD
- Silencer
- TotAirSys
(Total Air)
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(Gamma)
- Ending

JIS symbol

- Universal



Common specifications

1 MPa = 10 bar

Item	NAP11	
Actuation	Universal	
Working fluid	Compressed air, low vacuum	
Proof pressure MPa	1.2 (≈170 psi, 12 bar)	
Working pressure MPa	0 (≈0 psi) to 0.8 (≈120 psi) (1.3 x 10 ² to 8 x 10 ⁵ Pa (abs) when used in vacuum)	
Fluid temperature °C	5 (41°F) to 60 (140°F)	
Ambient temperature °C	-5 (23°F) to 60 (140°F)	
Lubrication	No lubrication (use turbine oil Class 1 ISO VG32 for lubrication)	
Valve seat leakage cm ³ /min	1 or less (at pneumatic pressure 0.02 (≈2.9 psi) to 0.8 MPa (≈120 psi))	
Valve structure	External pilot balance poppet structure	
Mounting orientation	Unrestricted	
Pilot fluid	Air	
Pilot pressure MPa	0.35 (≈51 psi, 3.5 bar) to 0.7 (≈100 psi, 7 bar)	
Pilot port size (port X)	Rc1/8	

Individual specifications

Item Model No.	Port size		Orifice size (mm)	Response time (ms)	Weight (kg)
	P, A port	R port			
NAP11-10A	Rc3/8	Rc1/2	14.8 or equiv.	30 or less (*1)	0.6
NAP11-15A	Rc1/2				
NAP11-20A	Rc3/4	Rc1	25.4 or equiv.	60 or less (*1)	1.4
NAP11-25A	Rc1				
NAP11-32A	Rc1 1/4	Rc2	41.4 or equiv.	120 or less (*1)	4.2
NAP11-40A	Rc1 1/2				
NAP11-50A	Rc2				

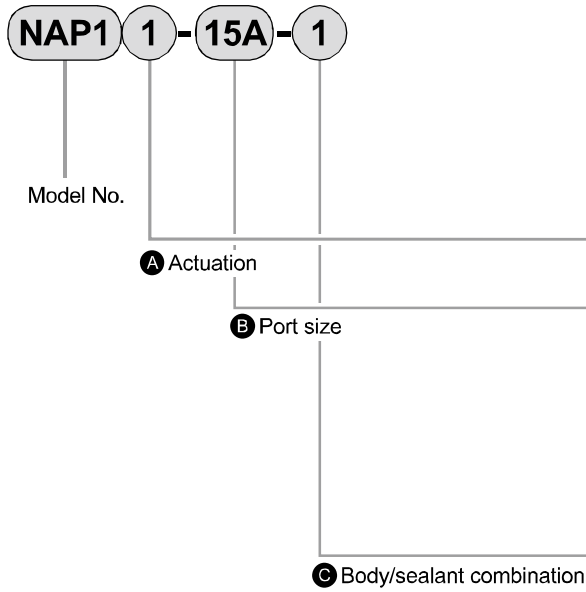
*1: The response time is the value at 0.5 MPa supply pressure, with no lubrication, and with the power ON. It depends on the pressure and the lubricant quality.

Flow characteristics

Model No.	P→A				A→R			
	C[dm ³ /(s·bar)]	b	Cv	S(mm ²)	C[dm ³ /(s·bar)]	b	Cv	S(mm ²)
NAP11-10A	15	0.31	3.4	-	16	0.28	3.4	-
NAP11-15A	18	0.29	3.6	-	17	0.26	3.6	-
NAP11-20A	35	0.27	8.4	-	41	0.21	8.6	-
NAP11-25A	-	-	8.6	200	-	-	9.0	210
NAP11-32A	-	-	25.8	600	-	-	26.2	610
NAP11-40A	-	-	27.0	630	-	-	26.6	620
NAP11-50A	-	-	28.2	660	-	-	27.0	630

*1: Effective cross-sectional area S and sonic conductance C are converted as S ≈ 5.0 x C.

How to order



[Example of model No.]

NAP11-15A-1

Model: NAP

- A** Actuation : Universal
- B** Port size : Rc1/2
- C** Body/sealant combination : Body/aluminum, sealant/nitrile rubber

Code	Content	
A Actuation		
1	Universal	
B Port size		
10A	Rc3/8	
15A	Rc1/2	
20A	Rc3/4	
25A	Rc1	
32A	Rc1 1/4	
40A	Rc1 1/2	
50A	Rc2	
C Body/sealant combination		
	Body	Sealant
1	Aluminum	Nitrile rubber

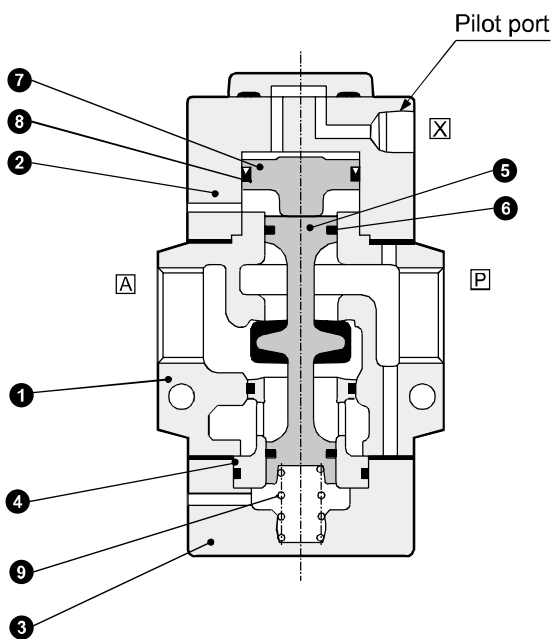
4GA/B
M4GA/B
MN4GA/B
4GA/B (mastr)
4GD/E
M4GD/E
MN4GD/E
4GA4/B4
MN3E
MN4E
W4GA/B2
W4GB4
4TB
4L2-4/LMF0
MN3S0
MN4S0
4SA/B0
4KA/B
4KA/B (mastr)
4F
4F (mastr)
PV5G
GMF
PV5
GMF
PV5S-0
3QR
3QB
MV3QR
3MA/B0
3PA/B
P/M/B
NP/NAP/NVP
4F*0EX
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HMV
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Ending

NAP11 Series

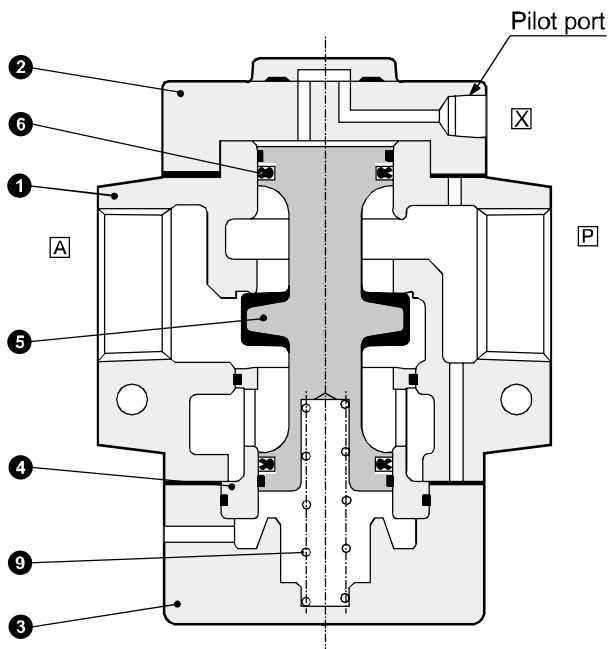
- 4GA/B
- M4GA/B
- MN4GA/B
- 4GA/B (mastr)
- 4GD/E
- M4GD/E
- MN4GD/E
- 4GA4/B4
- MN3E
MN4E
- W4GA/B2
- W4GB4
- 4TB
- 4L2-4/
LMF0
- MN3S0
MN4S0
- 4SA/B0
- 4KA/B
- 4KA/B (mastr)
- 4F
- 4F (mastr)
- PV5G
GMF
- PV5
GMF
- PV5S-0
- 3QR
3QB
- MV3QR
- 3MA/B0
- 3PA/B
- P/M/B
- NP/NAP/
NVP
- 4F*0EX
- 4F*0E
- HMV
HSV
- 2QV
3QV
- SKH
- PCD
- Silencer
- TotAirSys
(Total Air)
- TotAirSys
(Gamma)
- Ending

Internal structure and parts list

● NAP11-10A/15A



● NAP11-20A/25A/32A/40A/50A



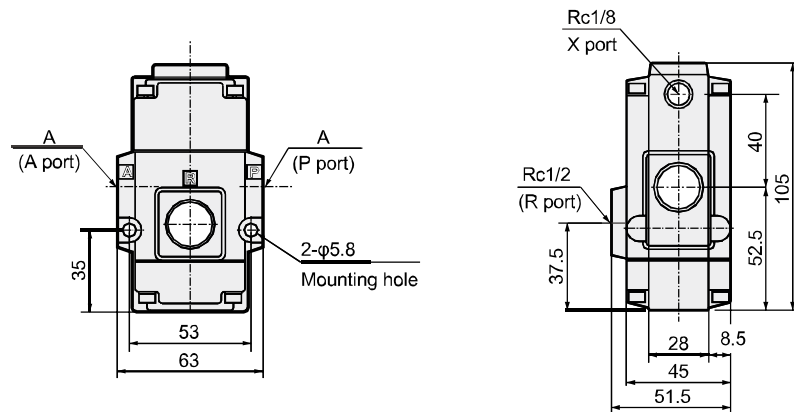
No.	Part name	Material	No.	Part name	Material
1	Body	AC4C Aluminum casting	6	Packing	NBR Nitrile rubber
2	Body	AC4C Aluminum casting	7	Piston	POM Acetal resin
3	Cap	AC4C Aluminum casting	8	MY packing	NBR Nitrile rubber
4	Valve seat	C3604 Copper alloy	9	Spring	SWP Piano wire
5	Valve stem	NBR, A2017			

NAP11 Series

Air operated valve (universal)

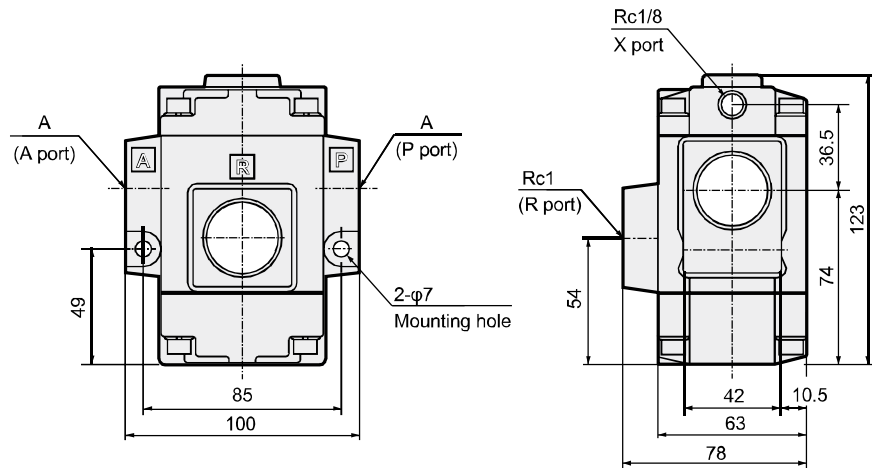
Dimensions

● NAP11-10A/15A-1



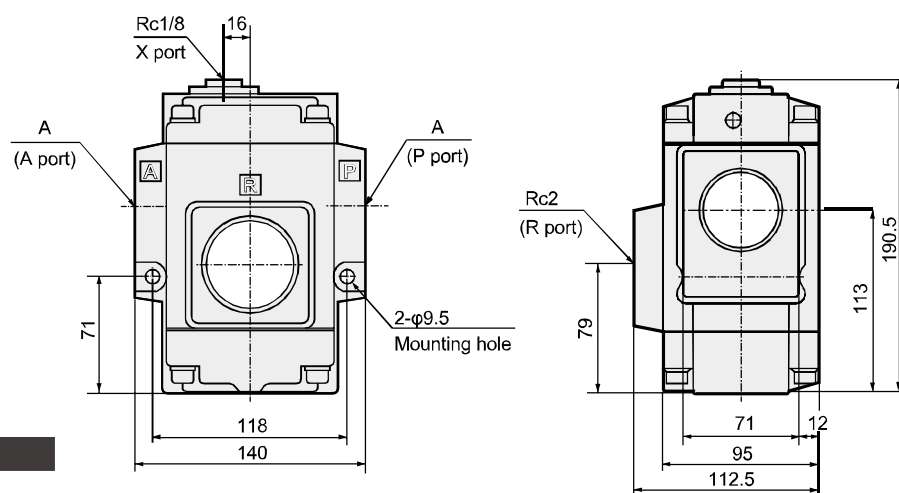
Model No.	A
NAP11-10A-1	Rc3/8
NAP11-15A-1	Rc1/2

● NAP11-20A/25A-1



Model No.	A
NAP11-20A-1	Rc3/4
NAP11-25A-1	Rc1

● NAP11-32A/40A/50A-1



Model No.	A
NAP11-32A-1	Rc1 1/4
NAP11-40A-1	Rc1 1/2
NAP11-50A-1	Rc2

4GA/B
M4GA/B
MN4GA/B
4GA/B (mastr)
4GD/E
M4GD/E
MN4GD/E
4GA4/B4
MN3E MN4E
W4GA/B2
W4GB4
4TB
4L2-4/ LMF0
MN3S0 MN4S0
4SA/B0
4KA/B
4KA/B (mastr)
4F
4F (mastr)
PV5G GMF
PV5 GMF
PV5S-0
3QR 3QB
MV3QR
3MA/B0
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