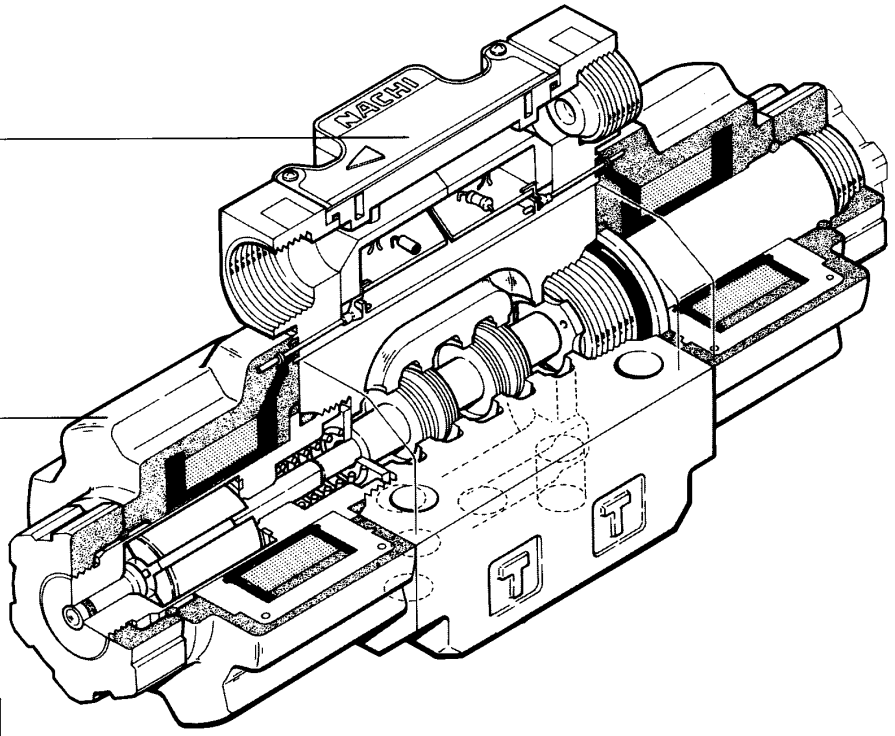
NACHI

SS-GO3 High Flow Series

High Reliability and Long Life at High Pressure, High Flow Capacity and Low Pressure Loss.

High pressure: 320 kgf/cm² (4570 psi), High capacity: AC: 130ℓ/min. (34.3 gpm) and DC: 160ℓ/min. (42.3 gpm), Low pressure loss: 3 kgf/cm² (43 psi) at 70ℓ/min (18.5 gpm), and High permissible back pressure: 160 kgf/cm² (2290 psi).



Wiring Box

- Large Wiring Space
- Easy Disassembly and Assembly
- Water Proof Construction Equivalent to JIS D0203 R2)
- Surgeless and Quick Return Models Available (option G, Q)
- Indicator

Wet Type Solenoid

- Unique Magnetic Path Circuit from which Powerful Pulling Force is Provided
- Commonly Used for 50 and 60 Hz
- Smooth, Long life Wet Type

Features

High pressure, High flow capacity and Small pressure loss.

Fluid reaction force compensation and low pressure loss design. Valve allows high pressure 320 kgf/cm² (4570 psi) high flow capacity 160 ℓ/min (42.3 ℓ/min) and low pressure loss 3 kgf/cm² (43 psi) at 70 ℓ/min (18.5 gpm). In addition, high pulling force and powerful spring provide high shift-over allowance, providing stable operation in high pressure and high flow capacity circuits.

Advantage of wet type further improved, and quiet and long life.

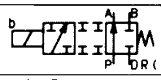
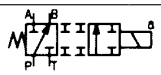
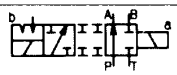
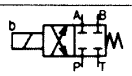
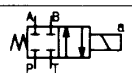
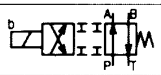
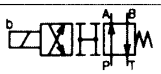
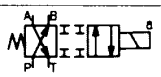
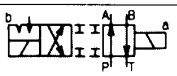
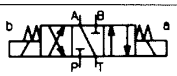
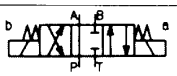
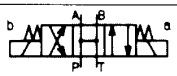
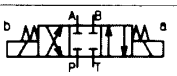
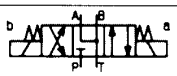
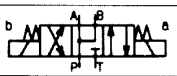
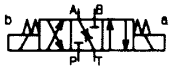
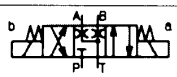
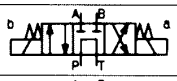
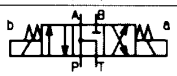
This new type is the latest product produced by NACHI-FUJIKOSHI CORP., based on our integrated and extensive engineering experience.
New wet type series with lower shift-over noise and longer life due to the unique magnetic path structure.
Shockless and surgeless types are also available.

Easy wiring and maintenance and easy to use.

Special-purpose box, common terminal and indicator lamp simplify wiring and maintenance.
Also since ISO standard applies to mounting of the valve, it is interchangeable with conventional ones, and the valve can be simply attached without changing the subplate.

SS-GO3 High Flow Series

Model

Model		Standard type				Shockless type	
		With AC solenoid		With DC solenoid (including rectifier built-in type)		With DC solenoid (including rectifier built-in type)	
JIS symbol	Valve spool type	Rated flow Max. flow ℓ/min (gpm)	Max. operating pressure kgf/cm² (psi)	Rated flow Max. flow ℓ/min (gpm)	Max. operating pressure kgf/cm² (psi)	Rated flow Max. flow ℓ/min (gpm)	Max. operating pressure kgf/cm² (psi)
	–A2X–	15 – 15 (4.0 – 4.0)	320 (4570)	20 – 20 (5.3 – 5.3)	320 (4570)	20 – 20 (5.3 – 5.3)	250 (3570)
	–H2X–						
	–E2X–	35 – 35 (9.2 – 9.2)		35 – 35 (9.2 – 9.2)		35 – 35 (9.2 – 9.2)	
	–A5–	70 – 130 (18.5 – 34.3)		70 – 160 (18.5 – 42.3)		70 – 130 (18.5 – 34.3)	
	–H5–						
	–A3X–						
	–A3Z–						
	–H3X–						
	–H3Z–						
	–E3X–						
	–E3Z–						
	–C1–						
	–C2–						
	–C4–						
	–C5–						
	–C6–						
	–C9–						
	–C1S–						
	–C6S–						
	–C7Y–	40 — 70 (10.6 — 18.5)	250 (3570)	40 — 100 (10.6 — 26.4) however E※is 40 — 55 (10.6 — 14.5)	250 (3570)	40 — 85 (10.6 — 22.5) however E※is 40 — 55 (10.6 — 14.5)	
	–C8–						

Note) The max. flow of each valve differs depending on the pressure. For details, refer to Page DV-30.

SS-GO3 High Flow Series

Notes

Designing

- Keep surge pressure below the maximum permissible back pressure at the T port.
- When using a 4-way valve for a 2-way or 1-way valve application by blocking the unnecessary ports, the maximum flow is limitted.
- When using fire-resistant hydraulic fluid, please consult us.
- If the shift-over position is kept under high pressure for an extended period, malfunctions may occur due to hydraulic lock.
  Please consult us when you have such an application.

Assembly and Maintenance

- In order to fully utilize the features of the wet type solenoid valve, provide piping so that the T(DR) port is always full of oil.
- Always keep hydraulic oil clean. (NAS grade 12 or better is recommendable)
- For petroleum hydraulic fluid, use equivalend to Class 1 or Class 2 of JIS K2213.
- Provide drain piping from the Tank port of valve, when valve spool types are A2X, H2X and E2X.
- Note that resistance force against the manual override pin varies depending on the back pressure of the tank line.

Electricity

- Do not exceed permissible voltage range of the coil used.
- When the detent-type (E2X, E3X, E3Z) is used, we recommend that the electric power supply be continuously held in order that the shift-over position may be firmly maintained.
- Do not supply electric power to the AC solenoid unless the coil is mounted to the valve.

Specifications

Terminal Box Type (SS series)

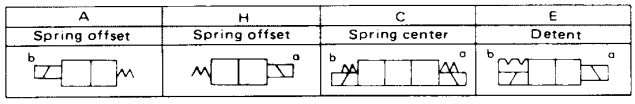
Model		Standard type			Shockless type	
		SS-G03-※※※-R-※※-※20			SS-G03-※※※-FR-※※-※20	
Max. operating pressure	P, A, B port	320 kgf/cm² (4570 psi)			250 kgf/cm² (3570 psi)	
Max. permissible back pressure	T port	160 kgf/cm² (2290 psi)				
Shift-over frequency (times/min)		300	120	240	120	120
Type of solenoid		AC solenoid	Rectifier built-in type	DC solenoid	Rectifier built-in type	DC solenoid
		C※	E※	D※	E※	D※
Standard	Indicator light	R				
Option	Shockless	–	–		F	
	Surgeless	G	–	G	–	G
	With manual pushbutton	N				
	Quick return	–	Q	–	Q	–
Weight kg (lbs)	Double solenoids	4.2 (9.3)	5.5 (12.1)			
	Single solenoid	3.5 (7.7)	4.1 (9.0)			
Recommendable operating conditions	Operating temperature range	5 ~ 60°C (41 ~ 140°F)				
	Operating viscosity	15 ~ 300cSt (80 ~ 1400 sus)				
	Viscosity index	90 or more				
	Filtration	25 micron or less				
Bolts	Mounting bolts	Design No. 20: M6x70 4 pcs J20: M8x70 4 pcs E20: 1/4-20UNC-3Ax2-3/4 4 pcs				
	Recommendable torque	M6: 100 ~ 130 kgf-cm (87 ~ 113 lbs-in) (M8: 200 ~ 250 kgf-cm (174 ~ 217 lbs-in)				

SS-GO3 High Flow Series

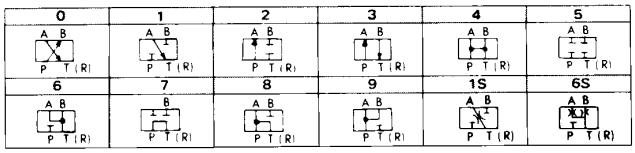
Model Code

SS - GO3 - A3Z - ※R - C230 - E20

- SS series wet type solenoid operated directional control valve
- Gasket mounting
- Valve size 03: Size 03
- Spring arrangement

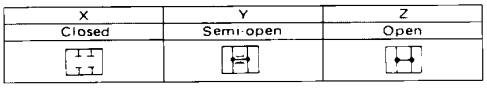


- Position type at neutral



Note: P pressure port, A and B cylinder ports, T(R) tank port.

- Flow passage condition during transition



- Standard function R: Indicator light
- Optional function (can be combined in the alphabetical order)
  - F: Hydraulic shockless type (Electric power D※or E※)
  - G: Electrical surge control (Electric power D※)
  - N: With push pin for manual operation(See page DV-31)
  - Q: Quick return type (Electric power E※)
- Electric power source indication
  - C: AC C1 = AC100V 50/60 Hz, C2 = AC 200V 50/60 Hz
    C115 = AC 110V 50 Hz/AC115V 60 Hz
    C230 = AC 220V 50 Hz/AC230V 60 Hz
  - D: DC D1 = DC12V, D2 = DC 24V
  - E: Rectifier built-in type, common to 50/60 Hz
    E1 = AC100V, E2 = AC200V, E115 = AC115V, E230 = AC 230V
- Mounting bolt
  - No code: Metric thread M8
  - J: Metric thread M6
  - E: Unified thread
- Design No. 20

Solenoid Assembly Specifications

Solenoid classification		AC solenoid											
Power source		C1			C115			C2			C230		
Voltage (V)		AC100		AC110	AC110		AC115	AC200		AC220	AC220		AC230
Cycle (Hz)		50	60	60	50	60	60	50	60	60	50	60	60
Size 03	Solenoid coil type	ECB64-C1			ECB64-C115			ECB64-C2			ECB64-C230		
	Starting current (A)	5.4	4.6	5.0	5.0	4.2	4.6	2.7	2.3	2.5	2.5	2.1	2.3
	Holding current (A)	0.92	0.62	0.78	0.85	0.57	0.72	0.46	0.31	0.39	0.42	0.29	0.36
	Holding electric power (W)	36.0	34.0	42.0	36.0	34.0	42.0	36.0	34.0	42.0	36.0	34.0	42.0
	Permissible voltage range (V)	80 ~ 110	90 ~ 120		90 ~ 120	100 ~ 130		160 ~ 220	180 ~ 240		180 ~ 240	200 ~ 260	
	Permissible back pressure	160 kgf/cm² (2250 psi)											
	Insulation resistance (MΩ)	100 or above (500V)											

NACHI

SS-GO3 High Flow Series

Solenoid classification		DC solenoid							
		Built-in rectifier							
Power source		E1	E115		E2	E230		D1	D2
Voltage (V)		AC100	AC110	AC115	AC200	AC220	AC230	DC12	DC24
Cycle (Hz)		50/60	50/60	50/60	50/60	50/60	50/60	–	–
Size 03	Solenoid coil type	ECB64-E1	ECB64-E115		ECB64-E2	ECB64-E230		ECB64-D1	ECB64-D2
	Starting current (A)	0.40	0.33	0.34	0.22	0.16	0.17	2.6	1.5
	Holding current (A)								
	Holding electric power(W)	34.0	31.0	34.0	37.0	30.0	33.0	31.0	36.0
	Permissible voltage range (V)	90~110	100 ~ 125		180~220	200 ~ 250		10.8~13.2	21.6~26.4
	Permissible back pressure	160 kgf/cm² (2250 psi)							
	Insulation resistance (MΩ)	100 or above (500V)							

ECB64 - C1

- C1: Electric power source
- ECB64: Solenoid coil

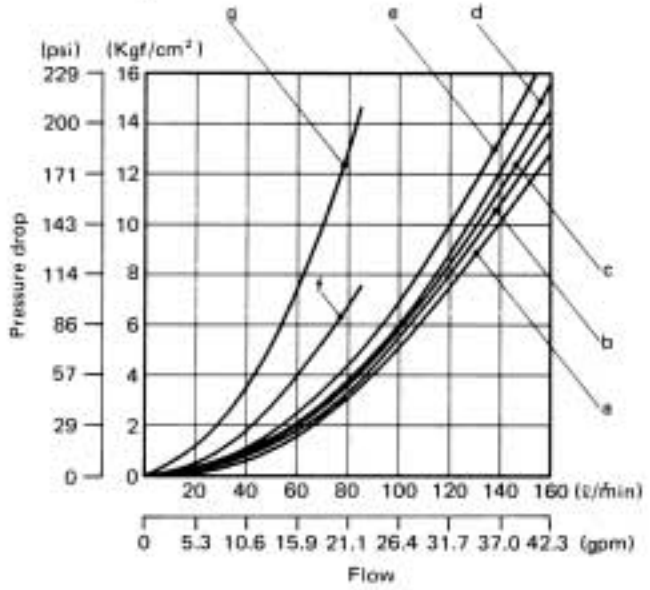
Note 1) DC solenoid has no coil burning because the starting current is the same as the holding current, and therefore can be turned shockless by providing with a shift-over speed regulator.

Note 2) DC solenoid surge absorption circuit prevents malfunctions of the high sensitivity relay and IC circuit to extend the life of the contact much. (applied to power source D*, option: G)

Note 3) DC solenoid RAC type (power source E*) extends the life of the contact by eliminating the arcs at the relay contact without changing the sequence circuit in an AC line. It can be commonly used for both 50 and 60 Hz.

Performance Curve

Pressure drop characteristics



Viscosity 32cSt (150 sus)

Valve spool type	P → A	P → B	A → T	B → T	P → T
A2X, H2X, E2X	e	e	–	–	–
A5	–	c	c	–	–
H5	c	–	–	c	–
A3X, H3X, E3X	c	c	d	d	–
A3Z, H3Z	a	a	d	d	–
E3Z	b	b	a	a	–
C1	c	c	a	c	–
C2	a	c	c	c	–
C4	a	a	a	a	a
C5, C15, C65	c	c	c	c	–
C6	c	c	a	a	–
C7Y	g	g	g	g	f
C8	a	g	a	g	a
C9	a	a	c	c	–

Note: When viscosity of hydraulic fluid has changed, use the following expression to convert.

$\Delta P_2 = (\nu_2/32)^{1/4} \Delta P_1$

ΔP_1: Pressure drop at a viscosity of 32cST (150 SUS)

ΔP_2: Pressure drop at a viscosity of ν_2 cST

Shift-over response time

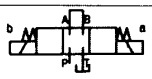
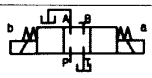
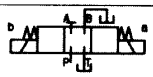
Model	Response time (sec)		Testing condition
	Solenoid ON	Spring return	
SS-G03-**-(G)R-C*-*20	0.01 ~ 0.02	0.02 ~ 0.03	140 Kgf/cm² (2000 psi) 70 ℓ/min (18.5 gpm)
SS-G03-**-(G)R-D*-*20	0.06 ~ 0.09	0.03 ~ 0.05	
SS-G03-**-R-E*-*20	0.07 ~ 0.10	0.10 ~ 0.15	
SS-G03-**-F(G)R-D*-*20	0.13 ~ 0.15	0.08 ~ 0.15	
SS-G03-**-FR-E*-*20	0.13 ~ 0.15	0.15 ~ 0.20	

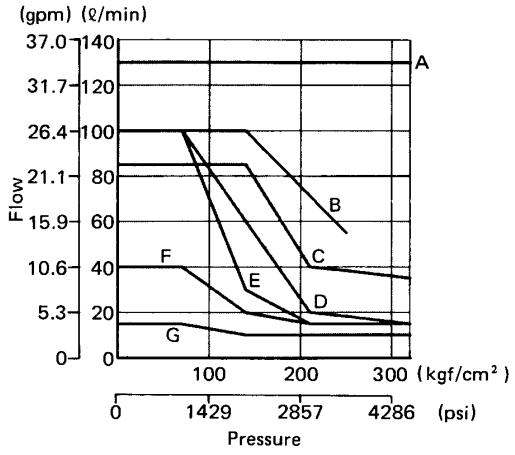
Note 1) Shift-over response time will be changed a little with the conditions of pressure, flow, viscosity, etc.

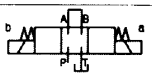
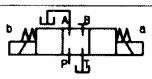
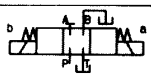
Note 2) By using quick return model (Option "Q"), spring return time of the electric power E* (Rectifier built-in type) becomes same as that of electric power D*.

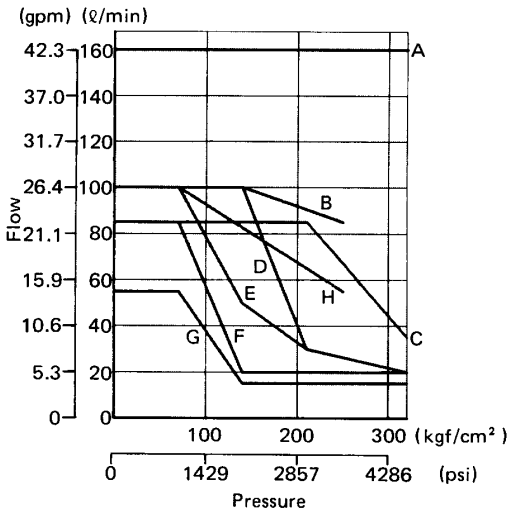
SS-GO3 High Flow Series

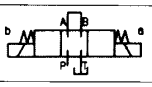
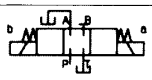
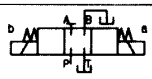
Pressure-flow characteristics

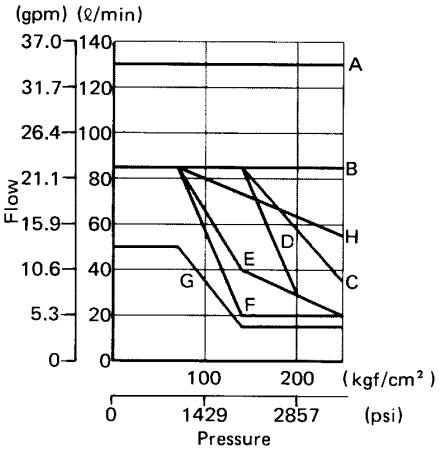
Model	Standard type with AC solenoid		
Circuit / Spool type			
A2X	–	F	E
H2X	–	E	F
E2X	–	C	C
A3X	A	E	E
H3X	A	E	E
A3Z	A	A	C
H3Z	A	C	A
E3X, E3Z	A	C	C
A5	A	–	D
H5	A	D	–
C1, C1S, C5, C6, C6S	A	D	D
C2	A	G	D
C4	A	A	A
C9	A	G	G
C7Y, C8	B	B	B



Model	Standard type with DC solenoid		
Circuit / Spool type			
A2X	–	E	F
H2X	–	F	E
E2X	–	C	C
A3X	A	D	F
H3X	A	F	D
A3Z	A	C	C
H3Z	A	C	C
E3X, E3Z	A	C	C
A5	A	–	E
H5	A	E	–
C1, C1S, C5, C6, C6S	A	E	E
C2	A	G	E
C4	A	A	A
C9	A	G	G
C7Y, C8	B(H)	B(H)	B(H)



Model	Shockless type with DC solenoid		
Circuit / Spool type			
A2X	–	E	F
H2X	–	F	E
E2X	–	C	C
A3X	A	D	F
H3X	A	F	D
A3Z	A	C	C
H3Z	A	C	C
E3X, E3Z	A	C	C
A5	A	–	E
H5	A	E	–
C1, C1S, C5, C6, C6S	A	E	E
C2	A	G	E
C4	A	A	A
C9	A	G	G
C7Y, C8	B(H)	B(H)	B(H)



Note 1) ( ) indicates rectifier built-in type.
Note 2) Since shockless type AC solenoid (C※) is not available, use the rectifier built-in type solenoid (E※) when shockless is required for AC power source.
Note 3) The max. flow indicates a value when a voltage 90% the rating (frequency of 60 Hz for AC) is supplied after the solenoid temperature rises.
Note 4) The max. flow indicates permissible ones for each port.