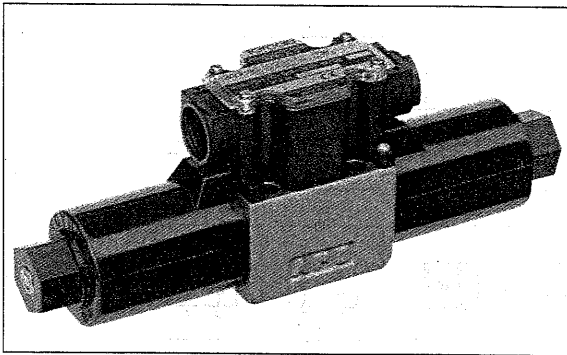


# PRESENT MODEL

## SOLENOID VALVE (HD\*-WY\*) SIZE 025 / 03



### FEATURES

#### HD3 Series (for 25 MPa)

1. Compact
2. High pressure and large capacity
3. Increased rated flow rate
4. Increased permissible back pressure
5. Dust- and water-proof to IEC IP65
6. Lamp and grounding terminal are standard.
7. Surge killer is standard.

#### HD1 Series (for 7 MPa)

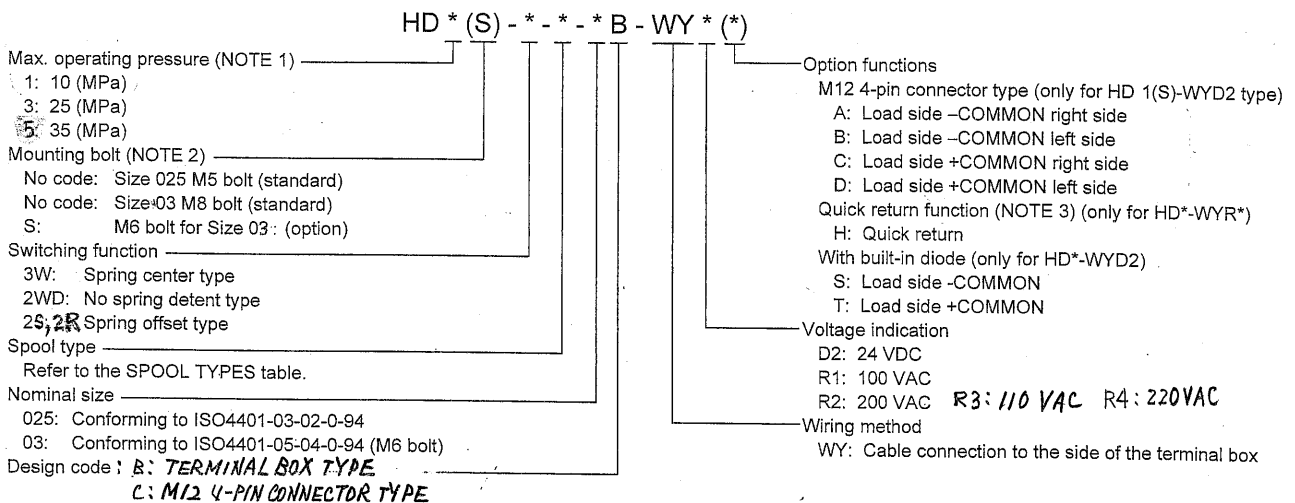
1. Directly controllable by a programmable controller since the valve operates at low power. (Refer to the solenoid characteristics).

### ⚠ Cautions on Use

Please read the Instruction Manual carefully to ensure correct usage.

- The piping must be arranged so that the R port is always filled with fluid to make the most of the features of the oil-immersed type valve.
- When installing a no-spring type valve, install it so as to set the spool horizontally.
- Finish the mounting faces to the same quality as the valve faces (3.2 μmRz).
- Using a valve with the R port plugged can cause operation failure.
- For valves with detent, to hold the spool position without supplying power to the solenoid the back pressure must be 5 MPa or lower for the HD3 series or 2 MPa or lower for the HD1 series.

### MODEL DESIGNATION



**NOTE 1:** A solenoid valve of 35 MPa operating pressure is available only for the 025B series.

**NOTE 2:** Model with "S" designation is available only for the 03B series.

**NOTE 3:** The valve with quick return function provides faster response for switching to OFF.

### SERIES SELECTION TABLE

	Series	Power Source		Low Voltage	Surge Absorber	M12 4-pin Connector	Quick Return	Compatibility to DeviceNet
		DC	AC					
Low-pressure Type	HD1(S)-WYD*	○		○	CR + Varistor			
	HD1(S)-WYD* (A to D)	○		○	Diode	○		○
	HD1(S)-WYD* (S or T)	○		○	Diode			○
	HD1(S)-WYR*		○	○	Rectifier			
	HD1(S)-WYR*H		○	○	Rectifier		○	
High-pressure Type	HD3 / HD5(S)-WYD*	○			CR + Varistor			
	HD3 / HD5(S)-WYD* (S or T)	○			Diode			○ (NOTE)
	HD3 / HD5(S)-WYD*		○		Rectifier			
	HD3 / HD5(S)-WYD*H		○		Rectifier		○	

**NOTE:** Select the slave unit carefully since the solenoid current value is high.

## VALVE SPECIFICATIONS

Size		Size 025			Size 03	
Series		HD1	HD3	HD5	HD1	HD3
Max. operating pressure	(MPa)	10	25	35	10	25
Max. flow (NOTE 1)	(L/min)	40	80	80	60	120
Permissible back pressure at T port (NOTE 2)	(MPa)	10(2)	16(5)	16(5)	10(2)	16(5)
Switching frequency	(CYCLE/s)	2 or lower				
Permissible voltage variation range		Rated voltage $\pm 10\%$ V				
Protection structure class		IEC529 IP65				
Operating fluid (recommendation)		ISO VG22, 32, 46				
Viscosity	(mm <sup>2</sup> /s)	15 to 400				
Fluid temperature	(°C)	0 to 65				
Ambient temperature	(°C)	-10 to 50				
Tightening torque	(N·m)	6 to 8		8 to 9	M6: 10 to 12 M8: 13 to 15	
Mass	(kg)	3W, 2WD: 2.5 2S: 1.8			3W, 2WD: 4.8 2S: 3.5	

**NOTE 1:** For details, refer to the operation limit.

**NOTE 2:** Values in parentheses are for the detent type.

## SOLENOID SPECIFICATIONS

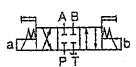
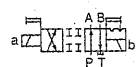
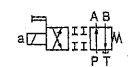
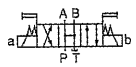
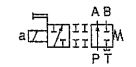
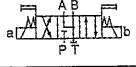
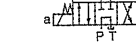
### ● HD1 Series

Valve Size	Size 025			Size 03		
Solenoid model	SLH1-025B-D2	SLH1-025B-R1	SLH1-025B-R2	SLH1-03B-D2	SLH1-03B-R1	SLH1-03B-R2
Rated voltage	24 VDC	100 VAC	200 VAC	24 VDC	100 VAC	200 VAC
Frequency	—	50/60 Hz	50/60 Hz	—	50/60 Hz	50/60 Hz
Holding current	0.2 A	0.07 A	0.05 A	0.2 A	0.06 A	0.03 A
Power consumption	4.8 W	6.5 W	8.1 W	4.8 W	5.8 W	6.6 W
Voltage variation range	$\pm 10\%$ V					

### ● HD3 / HD5 Series

Valve Size	Size 025			Size 03		
Solenoid model	SLH5-025B-D2	SLH5-025B-R1	SLH5-025B-R2	SLH5-03B-D2	SLH5-03B-R1	SLH5-03B-R2
Rated voltage	24 VDC	100 VAC	200 VAC	24 VDC	100 VAC	200 VAC
Frequency	—	50/60 Hz	50/60 Hz	—	50/60 Hz	50/60 Hz
Holding current	1.2 A	0.35 A	0.19 A	1.5 A	0.46 A	0.25 A
Power consumption	29 W	31 W	33 W	36 W	40 W	44 W
Voltage variation range	$\pm 10\%$ V					

## SPOOL TYPES

Type	Spring Center	No Spring Detent	Spring Offset
Model	HD*-3W-*-B-WY*	HD*-2WD-*-B-WY*	HD*-2S-*-B-WY*
Spool Type	3W-BCA 	2WD-BcA 	2S-BcA 
	3W-BDA 		2S-KcP 
	3WBGA 		
	3W-AEB (NOTE) 		

**NOTE 1:** Spool type 3W-AEB is available only for the HD3 and HD5 series.

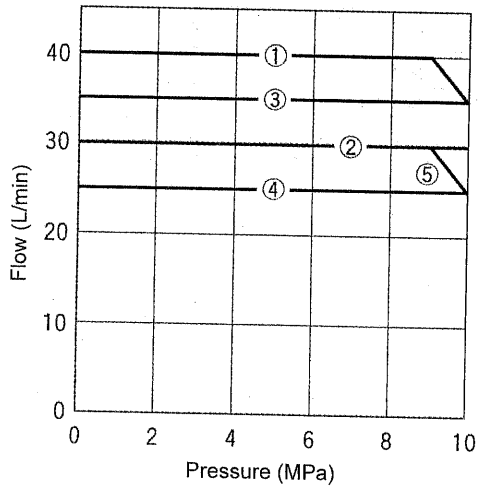
**NOTE 2:** For spool types not shown above, please consult us.

# VALVE PERFORMANCE

Operation Limit (Dynamic Viscosity: 33 mm<sup>2</sup>/sec)

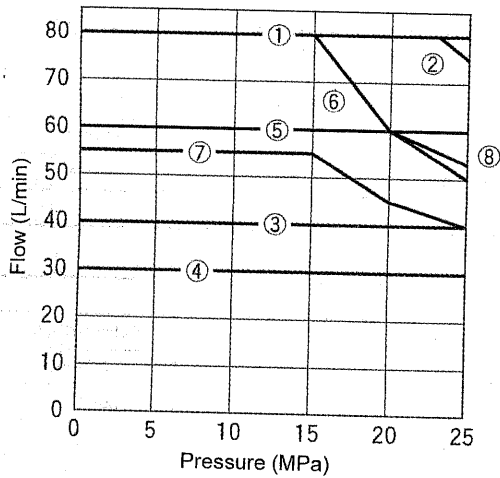
The performance will vary slightly depending on the circuit conditions and the operation conditions (voltage, pressure, flow, viscosity, etc.). The flow rate value in the performance graphs includes surge flow.

## ● HD1-025B Series



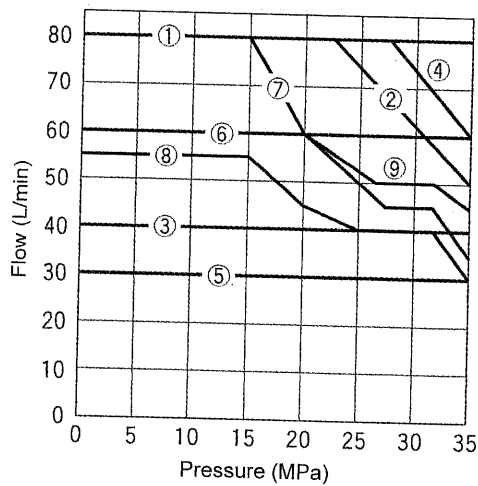
Circuit	Cylinder circuit	A port blocked	B port blocked
Spool Type			
3W-BCA	①	②	②
3W-BDA	②	②	②
3W-BGA	①	②	②
2WD-BcA	②	①	①
2S-BcA	③	④	①
2S-KcP	—	⑤	①

## ● HD3-025B Series



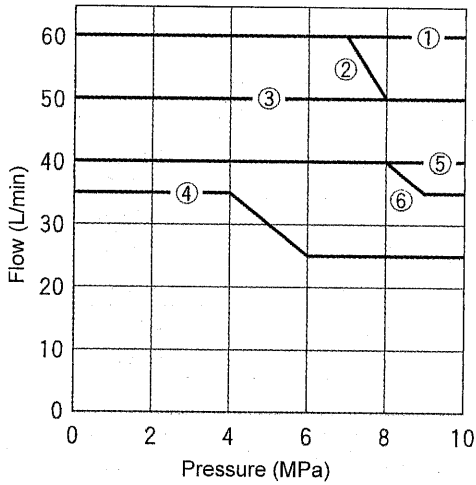
Circuit	Cylinder circuit	A port blocked	B port blocked
Spool Type			
3W-BCA	①	②	②
3W-BDA	③	③	③
3W-BGA	①	②	②
3W-AEB	④	④	④
2WD-BcA	⑤	③	③
2S-BcA	④	⑥	⑦
2S-KcP	—	⑥	⑧

## ● HD5-025B Series



Circuit	Cylinder circuit	A port blocked	B port blocked
Spool Type			
3W-BCA	①	②	②
3W-BDA	③	③	③
3W-BGA	④	②	②
3W-AEB	⑤	⑤	⑤
2WD-BcA	⑥	③	③
2S-BcA	⑥	⑦	⑧
2S-KcP	—	⑦	⑨

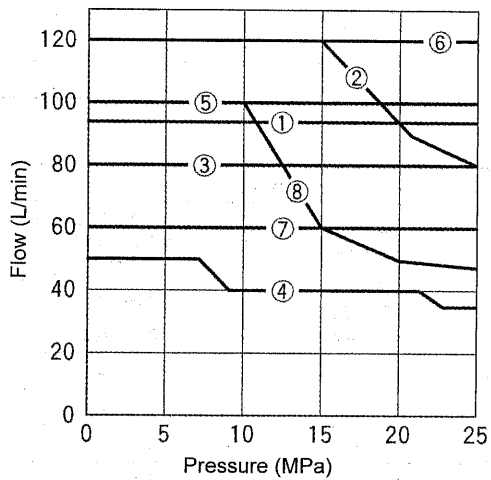
● HD1-03B Series



Circuit	Cylinder circuit	A port blocked	B port blocked
Spool Type			
3W-BCA	①	②	②
3W-BDA	③	③	④
3W-BGA	①	②	②
2WD-BcA	⑤ (③)	③	⑤
2S-BcA	③	①	⑥
2S-KcP	—	②	④

**NOTE:** ( ): Indicates the operation limit when used at the cylinder stroke end.

● HD3-03B Series



Circuit	Cylinder circuit	A port blocked	B port blocked
Spool Type			
3W-BCA	①	②	②
3W-BDA	③	③	④
3W-BGA	⑤	②	②
3W-AEB	⑦	⑦	⑦
2WD-BcA	① (⑤)	③	③
2S-BcA	③	⑥	⑦
2S-KcP	—	①	⑧

**NOTE:** ( ): Indicates the operation limit when used at the cylinder stroke end.

**Switching Response Time (Dynamic Viscosity: 33 mm<sup>2</sup>/sec)**

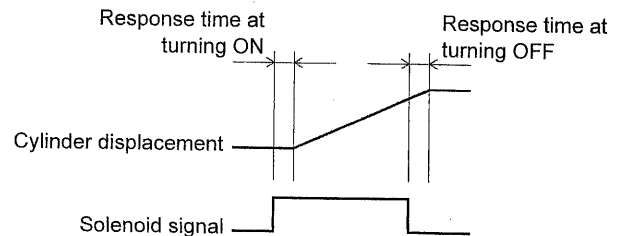
The switching response time will vary slightly depending on the circuit conditions and the operation conditions (voltage, pressure, flow, viscosity, etc.).

● 025B Series

Spool Type	Solenoid Signal	HD1		HD3 / HD5	
		WYD* WYR*H	WYD* (A / B / C / D) WYD* (S / T) WYR*	WYD* WYR*H	WYD* (A / B / C / D) WYD* (S / T) WYR*
3W-BCA	ON	0.05 (sec)	0.05 (sec)	0.015 (sec)	0.015 (sec)
	OFF	0.02 (sec)	0.11 (sec)	0.02 (sec)	0.11 (sec)
3W-BDA	ON	0.03 (sec)	0.03 (sec)	0.03 (sec)	0.03 (sec)
	OFF	0.03 (sec)	0.13 (sec)	0.03 (sec)	0.13 (sec)
3W-BGA	ON	0.07 (sec)	0.07 (sec)	0.04 (sec)	0.04 (sec)
	OFF	0.03 (sec)	0.13 (sec)	0.04 (sec)	0.13 (sec)
3W-AEB	ON	—	—	0.025 (sec)	0.025 (sec)
	OFF	—	—	0.02 (sec)	0.08 (sec)
2WD-BcA	ON	0.09 (sec)	0.09 (sec)	0.04 (sec)	0.04 (sec)
	OFF	—	—	—	—
2S-BcA	ON	0.11 (sec)	0.11 (sec)	0.02 (sec)	0.02 (sec)
	OFF	0.03 (sec)	0.11 (sec)	0.02 (sec)	0.08 (sec)
2S-KcP	ON	—	—	—	—
	OFF	—	—	—	—

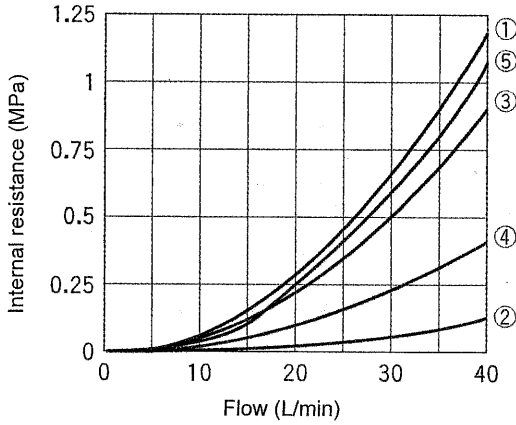
● 03B Series

Spool Type	Solenoid Signal	HD1		HD3 / HD5	
		WYD* WYR*H	WYD* (A / B / C / D) WYD* (S / T) WYR*	WYD* WYR*H	WYD* (A / B / C / D) WYD* (S / T) WYR*
3W-BCA	ON	0.09 (sec)	0.09 (sec)	0.04 (sec)	0.04 (sec)
	OFF	0.06 (sec)	0.23 (sec)	0.02 (sec)	0.18 (sec)
3W-BDA	ON	0.07 (sec)	0.07 (sec)	0.04 (sec)	0.04 (sec)
	OFF	0.05 (sec)	0.22 (sec)	0.03 (sec)	0.16 (sec)
3W-BGA	ON	0.10 (sec)	0.10 (sec)	0.05 (sec)	0.05 (sec)
	OFF	0.06 (sec)	0.25 (sec)	0.03 (sec)	0.15 (sec)
3W-AEB	ON	—	—	0.05 (sec)	0.05 (sec)
	OFF	—	—	0.02 (sec)	0.10 (sec)
2WD-BcA	ON	0.13 (sec)	0.13 (sec)	0.06 (sec)	0.06 (sec)
	OFF	—	—	—	—
2S-BcA	ON	0.07 (sec)	0.07 (sec)	0.04 (sec)	0.04 (sec)
	OFF	0.06 (sec)	0.21 (sec)	0.04 (sec)	0.16 (sec)
2S-KcP	ON	—	—	—	—
	OFF	—	—	—	—



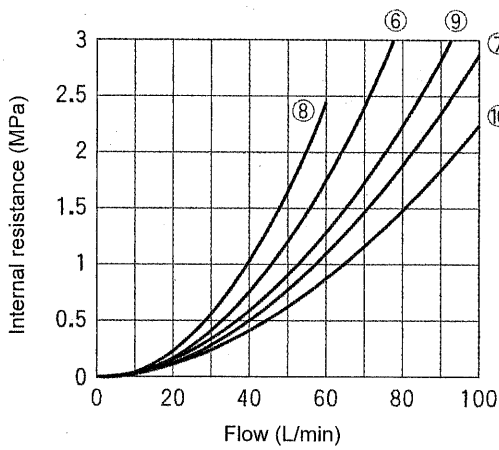
**Internal Resistance (Dynamic Viscosity: 33 mm<sup>2</sup>/sec)**

● HD1-025B Series



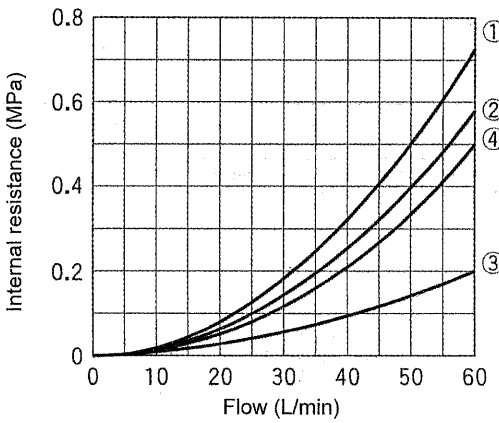
Direction Of Flow \ Spool Type	3W			2WD	2S	
	BCA	BDA	BGA	BcA	BcA	KcP
P → A or B	①	②	①	①	①	①
A or B → P	③	②	④	③	⑤	
P → T	—	②	—	—	—	—

● HD3 / HD5-025B Series



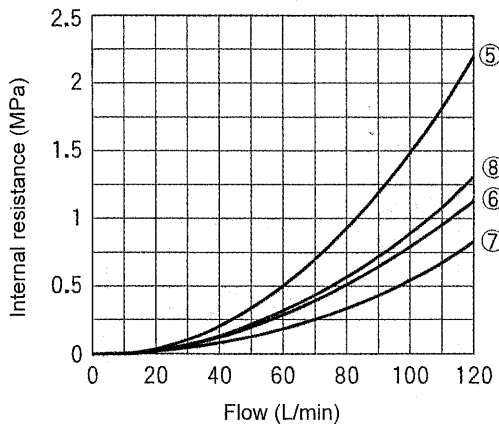
Direction Of Flow \ Spool Type	3W				2WD	2S	
	BCA	BDA	BGA	AEB	BcA	BcA	KcP
P → A or B	⑥	⑦	⑥	⑦	⑧	⑥	⑥
A or B → P	⑨	⑦	⑩	⑦	⑧	⑥	
P → T	—	⑨	—	⑥	—	—	—

● HD1-03B Series



Direction Of Flow \ Spool Type	3W			2WD	2S	
	BCA	BDA	BGA	BcA	BcA	KcP
P → A or B	BCA	BDA	BGA	BcA	BcA	KcP
A or B → P	①	②	①	①	①	①
P → T	①	③	④	②	①	

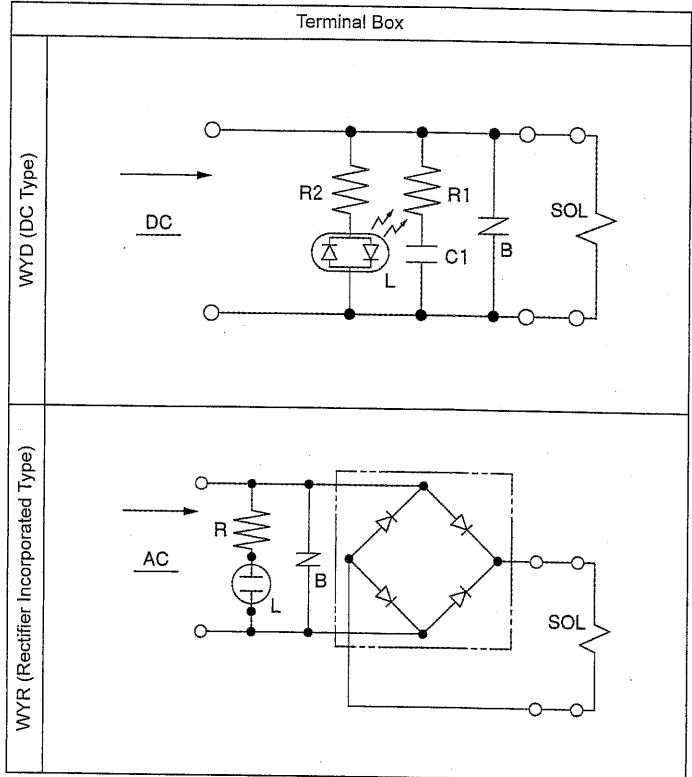
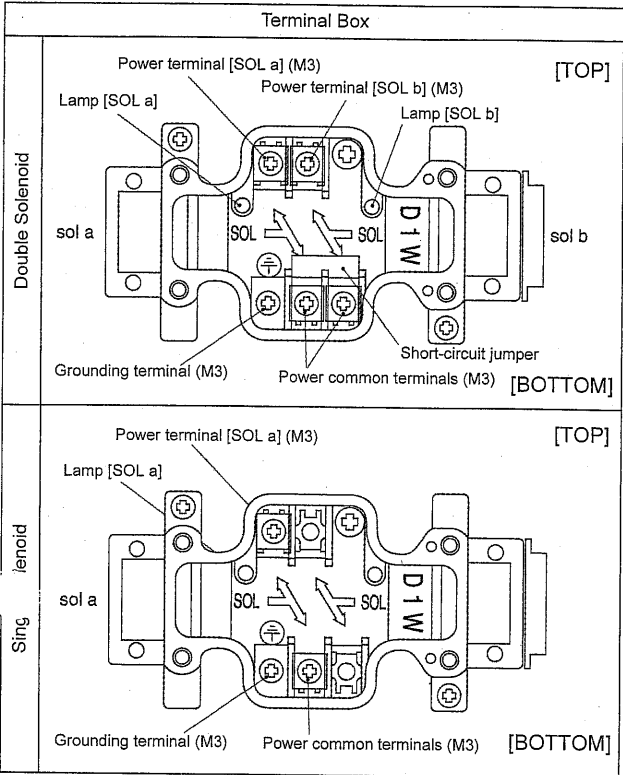
● HD3-03B Series



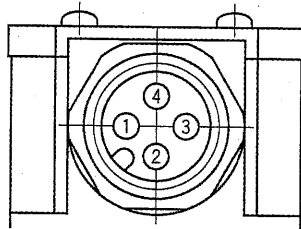
Direction Of Flow \ Spool Type	3W				2WD	2S	
	BCA	BDA	BGA	AEB	BcA	BcA	KcP
P → A or B	⑤	⑤	⑤	⑤	⑤	⑤	⑤
A or B → P	⑥	⑦	⑦	⑤	⑥	⑤	
P → T	—	⑤	—	⑧	—	—	—

# WIRING METHODS

When attaching a lid after connecting cables, be sure to attach it correctly.



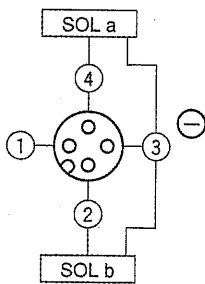
M12 4-pin Connector Pin Configuration



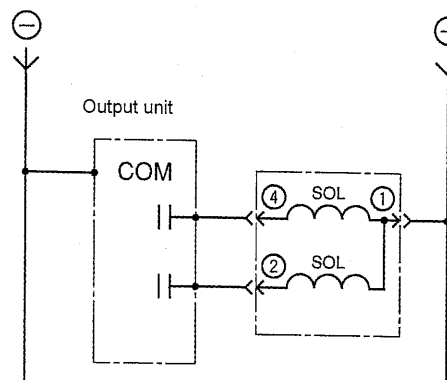
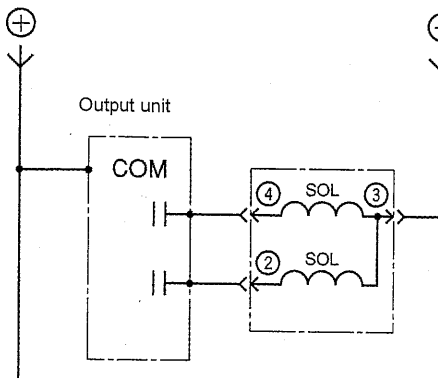
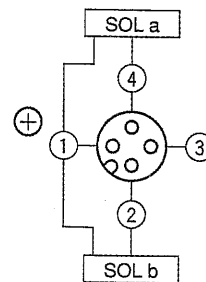
- 1: 24 VDC
- 2: SOL b
- 3: 0 V
- 4: SOL a

Connector Wiring Drawing

When connecting a device: Load side -COM



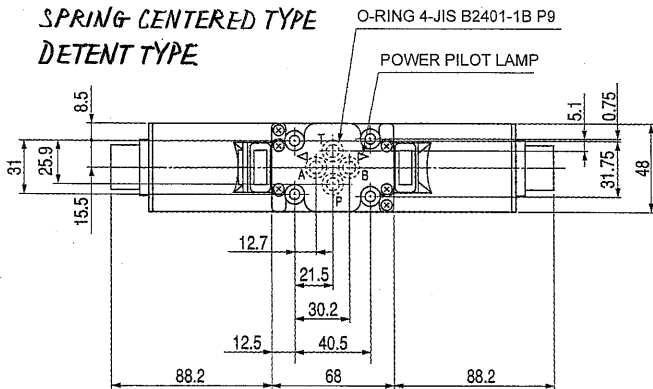
When connecting a device: Load side +COM



**EXTERNAL DIMENSIONS**

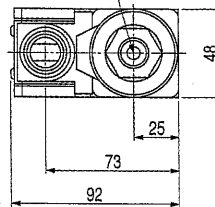
● **SIZE 025 SERIES**

*SPRING CENTERED TYPE*  
*DETENT TYPE*



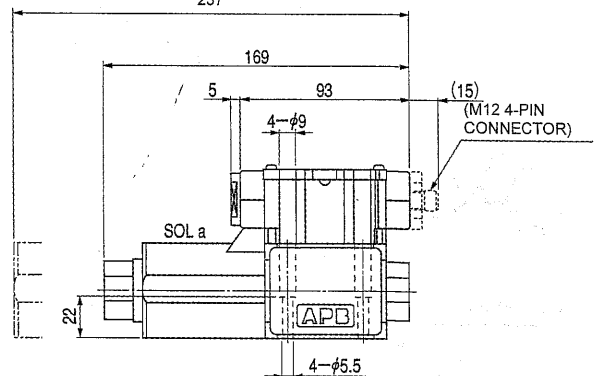
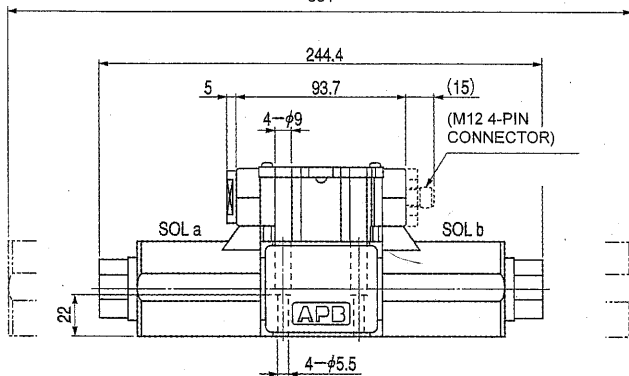
CLEARANCE REQUIRED TO REMOVE SOLENOID  
381

MANUAL OPERATION HOLE



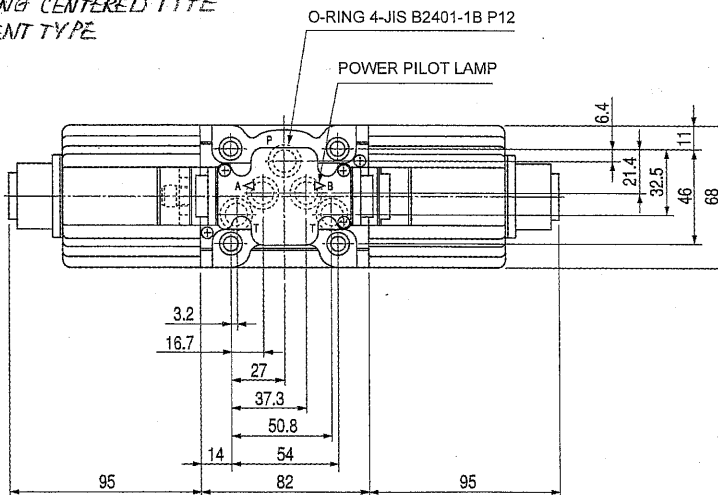
*SPRING OFFSET TYPE*

CLEARANCE REQUIRED TO REMOVE SOLENOID  
237

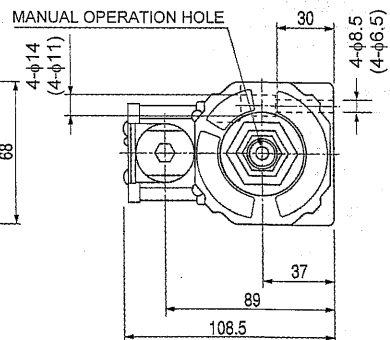


● **SIZE 03 SERIES**

*SPRING CENTERED TYPE*  
*DETENT TYPE*



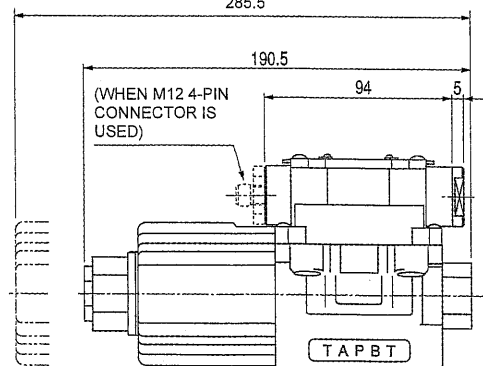
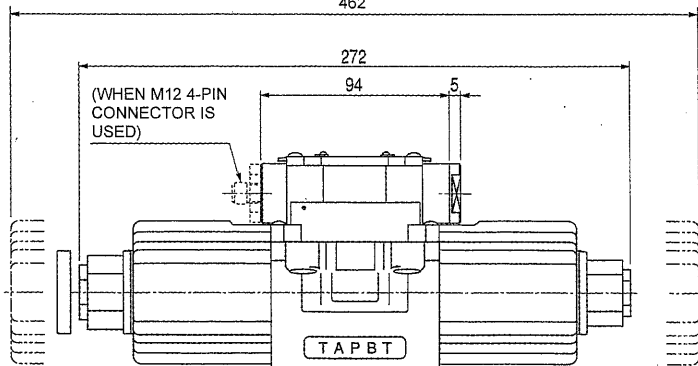
CLEARANCE REQUIRED TO REMOVE SOLENOID  
462



( ): Indicates the size of HD3S (M6).

*HD\*-2S-\*\*\*-03B-WY\*\**  
*SPRING OFFSET TYPE*

CLEARANCE REQUIRED TO REMOVE SOLENOID  
285.5



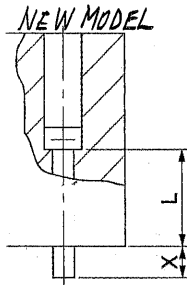


## MOUNTING BOLTS

Mounting bolts are not supplied with valves and should be ordered separately.

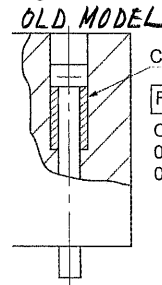
Since the mounting bolt seat height of new type valves differs from that of conventional valves, please order the adjusting collars or mounting bolts for a new type valve when replacing a valve in a circuit where stack valves are used.

For the 03B series with M6 type mounting bolts, please order the mounting bolts for a new type valve.



Unit: mm

Series	X	L
025B	8	22
03B	10	30



COLLAR

FOR REPLACING CONVENTIONAL VALVE

Collar Model  
025: HH-00200 (4 bolts)  
03: HH-00271 (4 bolts)

### 025B Series Mounting Bolts for the HY-TEGRA System

#### ● Hexagon socket head bolt

No. of Stack Levels	Bolt Type
1	JIS B 1176 M5 × 30
2	HKS-NA-5 × 65
3	HKS-NA-5 × 100
4	HKS-NA-5 × 135
5	HKS-NA-5 × 170

#### ● Stud bolt

No. of Stack Levels	Bolt Type
1	—
2	HKS-NC-5 × 71
3	HKS-NC-5 × 106
4	HKS-NC-5 × 141
5	HKS-NC-5 × 176

### 03B Series Mounting Bolts for the HY-TEGRA System

#### ● M6 hexagon socket head bolt

No. of Stack Levels	Bolt Type
1	JIS B 1176 M6 × 40
2	HKS-NA-6 × 95
3	HKS-NA-6 × 150
4	HKS-NA-6 × 205
5	HKS-NA-6 × 260

#### ● M6 stud bolt

No. of Stack Levels	Bolt Type
1	—
2	HKS-NC-6 × 106
3	HKS-NC-6 × 161
4	HKS-NC-6 × 216
5	HKS-NC-6 × 271

#### ● M8 hexagon socket head bolt

No. of Stack Levels	Bolt Type
1	JIS B 1176 M8 × 40
2	HKS-NA-8 × 95
3	HKS-NA-8 × 150
4	HKS-NA-8 × 205
5	HKS-NA-8 × 260

#### ● M8 stud bolt

No. of Stack Levels	Bolt Type
1	—
2	HKS-NC-8 × 106
3	HKS-NC-8 × 161
4	HKS-NC-8 × 216
5	HKS-NC-8 × 271

**NOTE 1:** Use mounting bolts of the strength category class 12.9.

**NOTE 2:** Stud bolts are supplied with nuts.

**NOTE 3:** If an M6 type solenoid valve is used for the 03B series, also use an M6 type (H\*3HS) HY-TEGRA valve.

## COMPATIBILITY WITH STANDARDS

#### ● CE

All types of valves in the catalogs conform to "CE marking" directives.  
Directive: 73/23EEC, 93/68/EEC Low Voltage Directive (VDE 0580:200)

#### ● UL

Please consult us.

#### ● CCC

Not compatible as of April of 2004.