SKH

Shock absorbing valve

4SA/B0 4SA/B1 4GA/B MN4GA/B 4GA/B

(master) MN3S0/ MN4S0

4TB

4L2-4/ LMF0

4KA/B

4F ______ PV5/

CMF

3MA/B0

3PA/B

P/M/B

4F**0E

NP/NAP/

HMV/ HSV

Uniwire

system

PCD/ FS/FD

Overview

This SKH shock absorbing valve unit prevents impact at cylinder stroke end and realizes soft stop.Applicable cylinder bore size up to 125mm.

Features

Soft stop

Cushioning adjusted by pressure eliminates bound phenomenon. Deceleration G is variable from slow stop to immediate stop according to cushion stroke setting.

Multi-functions and compact.

Using air cylinder thrust enables absorbing big kinetic energy with a valve. Less heat generation at absorbing energy eliminates the limit of cycle rate.

Easy installation

Additional piping work according to expansion of cushion devices is not required. (5 port piping of P/R/A/B) Sequence program change according to expansion of cushion devices is simply completed by external signal input to switchover a solenoid valve which drives a cylinder.

Easy maintenance

Easy replacement just performed by three bolts for solenoid valve and spacer relief valve. DIN terminal type enables easy replacement.



CONTENTS								
	С	\bigcirc	Ν	Т	F	Ν	Т	5
		\mathbf{U}						

Series variation	858
Basic operational principles/cushioning principles	859
A Precautions	860
Shock absorbing valve (SKH)	862
Technical data	873
Q&A	876
CAD Electric catalog file list	878

Series variation

SKH series

Model No.		el No.	Cylinder bore size	Appearance	Circuit construction figure	PLC I/O	Pipe	Page
able speed unit	9	SKH- 320 SKH- 420	25 to 50mm 40 to 80mm	High speed solenoid valve Deceleration solenoid valve Relief valve		IN 4 point (sensor) OUT 4 point	1) The circuit for deceleration and solenoid valve for control are integrated. Cylinder can be operated by a single unit.	862
Varia	Ş	SKH- 520	63 to 125mm	Manifold		(valve)	2) Piping man- hours is as same level as normal cylinder drive circuit.	
	decelerating	SKH- 328	25 to 50mm	Deceleration solenoid valve		IN 2 point (sensor)	The circuit for deceleration is completed just by additional	862
tion unit Both ends de	Both ends	SKH- 428	40 to 80mm	Relief valve Valve sub-base		OUT 2 point (valve)	piping to solenoid valve circuit.	862
Decelera Single decelerating	celerating	SKH- 318	25 to 50mm	Deceleration solenoid valve		IN 1 point (sensor)	 The circuit for deceleration is completed just by additional piping to solenoid valve 	000
	Single dec	SKH- 418	40 to 80mm	Relief valve Valve sub-base		OUT 1 point (valve)	 solenoid valve circuit. 2) Due to single decelerating unit, install the unit close to cylinder port. 	δ02

SKH Series Operation principle

Basic operation principle

When the air cylinder starts moving, the high-speed solenoid valve is opened. The cylinder moves at a high-speed while discharging exhaust air into the atmosphere.

When the intermediate sensor (SW2) for the cushion operation is activated, the high-speed solenoid valve closes. The flow of exhaust air is controlled by the relief valve and operation decelerates

As the piston moves, exhaust pressure P gradually increases to the pressure set by the relief valve spring. Air brakes are applied in reverse of thrust and the air cylinder stops while softly decelerating.



w



• Principle of cushion

(Pressure control method) When the cylinder moves in the direction shown at right is considered here

The cylinder starts moving when the solenoid valve switches and the supply side pressure and exhaust side pressure change as shown in Fig. 2. Thrust is applied on the same direction as the operation direction due to the difference in supply and exhaust pressure while the cylinder is moving

At "L1" just before stroke end, the flow of exhaust air is changed by the external signal (proximity switch, etc.), and exhaust pressure is controlled.

(With this unit, exhaust pressure is controlled by using a relief valve.) As cylinder displacement nears the end as shown in Fig. 2, exhaust pressure rises and the difference in pressure with the supply side changes, causing the cylinder thrust to change, and cylinder movement gradually decelerates to a stop.

When making adjustments, if cushion stroke range "L1" is set to a longer range, the cylinder deceleration distance will increase and the cylinder will stop smoothly. (In this case, cushion time "T' increase.)



Operation direction

w

Shock absorbing valve



Pneumatic components



Please carefully read this before starting use. Refer to Page 47 on the introduction about general precautions for valves.

Shock absorbing valve SKH Series

1 Installation positions and types of deceleration command switches

Install this switch at least 350mm away from the cylinder end. If installed closer, cylinder exhaust pressure may not rise, and the cylinder could contact the end with great impact, damaging the cylinder or component. When this command switch is used for the cylinder switch, there may be cases when input cannot be detected with the programmable controller. In this case, use the off delay type cylinder switch, etc., and check that the switch signal is output long enough to be detected by the programmable controller.

2 Setting the relief valve

Do not lower the relief valve setting pressure before adjusting. Exhaust pressure may not rise, and the cylinder could contact the

Wiring & Installation

3 Installing a regulator

Pressure is controlled with exhaust pressure to achieve a cushion effect. Install a regulator so supply pressure does not fluctuation, and create an air circuit with stable pressure.

4 Fixing the relief valve dial

After adjusting the relief valve, lock the dial on the relief valve. If the dial is not locked, the dial could loosen, and the set pressure value could change, damaging the cylinder or component.

end with a great impact, damaging the cylinder or component.

During use & Maintenance

1 Braking

Do not brake with the SKH330, 430, 530, 338, or 438 for a long time or popping out phenomenon could occur when operation is restarted, causing a hazardous situation.

2 Handling in energized state

Do not disconnect the DIN terminal while the solenoid valve is energized. Failure to observe this could lead to a short-circuit or electrical shock.



Shock absorbing valve SKH Series

• Applicable cylinder bore size: 25 to 125mm CAD CAD DATA AVAILABLE.

Common specifications	Speed variable unit fications Solenoid values to drive an air cylinder and to decelerate, and relief value are integrated. This enables simple and smooth deceleration and stop.			Deceleration un Adding this unit to the circuit enables smooth the end of stroke during	it existing air cylinder drive deceleration and stop at high speed operation.	Single decelerating unit Decelerating solenoid valve and relief valve are integrated into a unit to control speed at the single end of stroke in the existing air cylinder drive circuits. This enables smooth deceleration and stoo.		
Descriptions	2 SKH330 5	2 SKH430 5	2 SKH530 5	2 SKH338 5	2 SKH438 5	SKH318	SKH418	
Working fluid				Compressed air				
Operating method		Pilot (soft spool)						
Base solenoid valve	4KB3	4KB3 4KB4			4KB4	4KB3	4KB4	
Working pressure MPa				0.3 to 0.7				
Withstanding pressure MPa				1.0	1.0			
Effective sectional area mm ²	24	45	80	24	45	24	45	
Ambient temperature (Note 1) °C		-5 to 50 (to be unfrozen)						
Fluid temperature °C	5 to 50							
Lubrication	Not required							
Mass g	1950	3250	4230	660	1030	500	810	

Note 1: Ambient temperature means the temperature when the product is reserved or installed. This temperature is different from the working fluid temperature during operation.

Other specifications (please consult with CKD about details.)

Descriptions Copper and PTFE free

* * -[Voltage]-P6

Model

Electrical specifications

Descriptions			2 SKH330 5	2 SKH430 5	2 SKH530 5	2 SKH338 5	2 SKH438 5	SKH318	SKH418		
Rated vol	ltage	AC				100,200(50/60Hz)				
	V	DC				24					
Rated voltage	fluctua	tion range				±10%					
Starting	1	100V	0.092	/0.084	0.138/0.126		0.046/0.042				
current	AC	200V	0.046	/0.042	0.069/0.063		0.023/0.021				
A	DC	24V	0.	15	0.225		0.0	75			
		1001/	High speed: 0.0	46/0.042	High speed: 0.069/0.063		0.022	/0.021			
Holding current	1	100 v	Low speed: 0.023/0.021		Low speed: 0.023/0.021		0.023/0.021				
		200V	High speed: 0.028/0.022		High speed: 0.042/0.033		0.014/0.011				
			Low speed: 0.014/0.011		Low speed: 0.014/0.011						
А		241/	High speed: 0.15		High speed: 0.225		0.075				
		24 V	Low speed: 0.0	75	Low speed: 0.075		075				
		1001/	High speed: 3.6	5/3.0	High speed: 5.4/4.5		1.0	/4 E			
Power	1	100V	Low speed: 1.8	/1.5	Low speed: 1.8/1.5		1.0	/1.5			
consumption		2001/	High speed: 3.6	6/3.0	High speed: 5.4/4.5		1.8/1.5				
		2000	Low speed: 1.8	/1.5	Low speed: 1.8/1.5						
W		241/	High speed: 4.0	1	High speed: 6.0		2	0			
		24 V	Low speed: 2.0		Low speed: 2.0		2	.0			
Temperature rise °C					30						
Insulation class				B (molded coil)							
Surge sup	opres	sor		Provided as standard							
Indicator					Р	rovided as standa	ird				



How to order shock absorbing valve





Symbol Model	A	Effective sectional area	B Port size		
Speed variable unit	3	24mm ²	10	Rc3/8	
32 SKH 430	4	45mm ²	15	Rc1/2	
55	5	80mm ²	15	Rc1/2	
Deceleration unit	2	24 2	08	Rc1/4	
_2	3	24mm-	10	Rc3/8	
SKH-438	4	4 45mm ²	10	Rc3/8	
'5	4		15	Rc1/2	
Single decelerating unit	2	0.1 2	08	Rc1/4	
	3	3 24mm ²	10	Rc3/8	
SKH- ³ 18	4	452	10	Rc3/8	
4	4	45MM ²	15	Rc1/2	

• 2: Please refer to "Example of connecting port and time chart" (Page 874) about air circuits.

4F**0E

NP/NAP/

NVP

HMV/ HSV

PCD/

Discrete

Internal structure and parts list





No.	Parts name	Material	Qty	Remarks
1	Solenoid valve	4KB329-00	1	Deceleration
2	Solenoid valve	4KB339-00	1	High speed
3	Side plate	A6063	1	Aluminum material
4	Spacer relief valve	SKH-3-SR	1	Relief valve assembly
5	Sub base	A6063	1	Aluminum material



Main parts list

No.	Parts name	Material	Qty	Remarks
1	Solenoid valve	4KB429-00	1	Deceleration
2	Solenoid valve	4KB439-00	1	High speed
3	Side plate	A6063	1	Aluminum material
4	Spacer relief valve	SKH-4-SR	1	Relief valve assembly
5	Sub base	A6063	1	Aluminum material



Main parts list

No.	Parts name	Material	Qty	Remarks
1	Solenoid valve	4KB429-00	1	Deceleration
2	Solenoid valve	4KB439-00	2	High speed
3	Side plate	A2017	1	Aluminum material
4	Spacer relief valve	SKH-4-SR	1	Relief valve assembly
5	Sub base	A6063	1	Aluminum material

SKH-328





No. 1

SKH-428

Main parts list

No.	Parts name	Material	Qty	Remarks
1	Solenoid valve	4KB329-00	1	Deceleration
2	Spacer relief valve	SKH-3-SR	1	Relief valve assembly
3	Sub base	ADC	1	Aluminum die casting

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Main parts list							
No.	Parts name	Material	Qty	Remark			
1	Solenoid valve	4KB429-00	1	Decelerati			
2	Spacer relief valve	SKH-4-SR	1	Relief valve asse			

5	Oub buse	,		radininani die dasting	-	<u></u>			
3	Sub base	ADC	1	Aluminum die casting	_		SKH-3S-SR-A	·	
2	Spacer relief valve	SKH-4-SR	1	Relief valve assembly	2	Note 2 Spacer relief valve	SKH-3S-SR	1	Relief valve assembl
1	Solenoid valve	4KB429-00	1	Deceleration	1	Solenoid valve	4KB319-00	1	Deceleratior
No.	Parts name	Material	Qty	Remarks	No.	Parts name	Material	Qty	Remarks

SKH-318







ADC

Main parts list

3 Sub base



2

Main parts list

Qty	Remarks	No.	Parts name	Material	Qty	Remarks
1	Deceleration	1	Solenoid valve	4KB419-00	1	Deceleration
1	Relief valve assembly	2	Note 2 Spacer relief valve	SKH-4S-SR SKH-4S-SR-A	1	Relief valve assembly
1	Aluminum die casting	3	Sub base	ADC	1	Aluminum die casting
					-	

Note 1) Appearances indicated are SKH-318 and SKH- 418 types (relief valve connected to Port B.) Note 2) Spacer relief valve placed on the upper row for SKH-318 and SKH-418 (relief valve connected to Port B), while one at the lower row for SKH-318-A and SKH-418-A (relief valve connected to Port A).



- Above part indicates (SKH-³/₄-SR) unit for both sides deceleration.
 For single decelerating, SKH-³/₄S- SR means relief valve on the L side (② to ③), while SKH-³/₄S-SR- A means relief valve on the R side. (② to ④)

Main parts list

No.	Parts name	Material	Quantity
1	Spacer	A6063BE	1
2	Valve retainer	AW-01	2
3	O ring	NBR	2
4	O ring	NBR	2
5	Cover	A2011	2
6	Coil spring	SWPB	2
7	Spring disk	S35C	2
8	Stop nut	SUS303	2
9	Adjusting screw	C3604	2
es-	Gasket	NBR	1
Acc sori	Hexagon socket head cap screw	SCM435	3

• When fixing $4KB_4^3$ valve, spacer and sub base, accessories are used.

Repair parts list

Repair parts	Soleno	id valve	Relief valve		
Series	High speed solenoid valve	Decelerating solenoid valve		Spacer relief valve	Maintenance kit
	4KB339-00-LS-	4KB3 * 9-00-LS-	Note 3	SKH-3S-SR	
	- AC200V	- AC200V	Single decelerating	SKH-3S-SR-A	5KH-35-5KK
SKH-3	— AC100V	- AC100V	Poth sides desclaration		
	└─ DC24V	L DC24V		3KH-3-3K	SKH-S-SKK
4KB439-00-LS- 4KB4 * 9-00-LS	4KB4 * 9-00-LS-	Note 3	SKH-4S-SR		
3NU-4	- AC200V	- AC200V	Single decelerating	SKH-4S-SR-A	3NT-43-3KN
	- AC100V	- AC100V	Both sides deceloration	SKH-1-SP	SKH-1-SBK
31/1-3	DC24V	DC24V	DUIT SILLES DECERTATION	0111-4-01	5111-4-5111

Note 1) maintenance kit is **2**+**3**+**4**+**5**+**6**+**7**.

Note 2) Spacer relief valve is (1+2)+(3+3)+(3+

Note 3) Spacer relief valve for single decelerating on the upper row is used for SKH-³/₄18 (connected to Port B),

while one on the lower row is used for SKH- $^{3}_{4}$ 18-A (connected to Port A).

4SA/B0
4SA/B1
4GA/B
MN4GA/B
4GA/B (master)
MN3S0/ MN4S0
4TB
4L2-4/ LMF0
4KA/B
4F
PV5/ CMF
3MA/B0
3PA/B
P/M/B
NP/NAP/ NVP
4F**0E
HMV/ HSV
Uniwire system
sкн
PCD/ FS/FD
Shock absorbing valve

Dimensions







Note) For Port P/R, ports are provided at the opposite side, while for Port A/B, ports are only provided on this side.



SKH-3³₅0 (File name: Page 878 or Ending 26)







Note) For Port P/R, ports are provided at the opposite side, while for Port A/B, ports are only provided on this side.

Dimensions



867

Dimensions



57.5

Dimensions





Model	R
SKH-328-08	Rc 1/4
SKH-328-10	Rc 3/8

SKH-3³58

(File name: Page 878 or Ending 26)



Model	R
SKH-3 ³ 58-08	Rc 1/4
SKH-3 ³ 58-10	Rc 3/8



4SA/B0
4SA/B1
4GA/B
MN4GA/B
4GA/B (master)
MN3S0/ MN4S0
4TB
4L2-4/ LMF0
4KA/B
4F
PV5/ CMF
3MA/B0
3PA/B
P/M/B
NP/NAP/ NVP
4F**0E
HMV/ HSV

Uniwire system

ѕкн

PCD/ FS/FD Shock absorbing valve Discrete

Dimensions





Model	R
SKH-428-10	Rc 3/8
SKH-428-15	Rc 1/2

SKH- 4_5^3 8 (File name: Page 878 or Ending 26)



Model	R
SKH-4 ³ ₅ 8-10	Rc 3/8
SKH-4 ³ ₅ 8-15	Rc 1/2



SKH-318

(Relief valve connected to Port B)





Model	R
SKH-318-08	Rc 1/4
SKH-318-10	Rc 3/8

SKH-418	
(Relief valve connected to Port B)



Model	R
SKH-418-10	Rc 3/8
SKH-418-15	Rc 1/2



4SA/B1
4GA/B
MN4GA/B
4GA/B (master)
MN3S0/ MN4S0
4TB
4L2-4/ LMF0
4KA/B
4F
PV5/ CMF
3MA/B0
3PA/B
P/M/B
NP/NAP/ NVP
4F**0E

4SA/B0

HMV/ HSV

Uniwire system

SKH PCD/ FS/FD

Shock absorbing valve

Dimensions

SKH-318-A

(Relief valve connected to Port A)





Model	R
SKH-318-08	Rc 1/4
SKH-318-10	Rc 3/8

SKH-418-A

(Relief valve connected to Port A)



Model	R
SKH-418-10	Rc 3/8
SKH-418-15	Rc 1/2



24



SKH Series



Technical data 2)

Example of porting and time chart.

• Control sequence circuit should be provided according to the following time chart.



Example of porting and time chart.

• Control sequence circuit should be provided according to the following time chart.



Note) • This relief valve is connected to Port A.

• In this circuit, relief valve can be used at PUSH status.