## S Couplers KK/KKH Series



### Variations

### KK Series 215 to 223

maie unice	male uncud type								
0		Port size							
Series	M5	R1/8	R1/4	R3/8	R1/2	R3/4			
KK2	0	0							
KK3		0	0	0					
KK4		0	0	0	0				
KK6				0	0	0			

#### Female thread type

Carles	Port size							
Series	M5	Rc1/8	Rc1/4	Rc3/8	Rc1/2			
KK2	0							
KK3		0	0	0				
KK4			0	0				
KK6				0	0			

Nut fitting type (for fiber reinforced urethane hose)

0	Applicable hose I.D./O.D. mn					
Series	5/8	6/9	6.5/10	8/12	8.5/12.5	11/16
KK3	0	0	0			
KK4	0	0	0	0	0	
KK6				0	0	0

#### One-touch fitting type (Straight/Elbow/Bulkhead)

0	Applicable tubing O.D. mm						
Series	ø <b>3.2</b>	ø4	ø6	ø <b>8</b>	ø10	ø12	ø16
KK2	0	0	0				
KK3		0	0	0	0		
KK4			0	0	0	0	
KK6						0	0

# 

KK3/4/6 Series



### 

#### Male thread type

0	Port size					
Series	R1/8	R1/4	R3/8	R1/2		
KKH3	0	0	0			
KKH4	0	0	0	0		

#### Female thread type

0	Port size					
Series	Rc1/8	Rc1/4	Rc3/8			
KKH3	0	0	0			
KKH4		0	0			

Nut fitting type (for fiber reinforced urethane hose)

Carles	Applicable hose I.D./O.D. mm							
Series	5/8	6/9	6.5/10	8/12	8.5/12.5			
KKH3	0	0	0					
KKH4	0	0	0	0	0			

ype

κκΔ	Sorios	Stainless steel t
	301103	Stanness steer t

Male/Fei	nale thread	type							
0		Port size						R	
Series	R-Rc1/8	R·Rc1/4	R·Rc3/8	R·Rc1/2	R·Rc3/4	R-Rc1	R-Rc1 1/4	R-Rc1 1/2	Annual and a second second
KKA3	0	0	0						
KKA4		0	0	0					
KKA6			0	0	0				
KKA7				0	0	0			
KKA8					0	0	0		
KKA9						0	0	0	- <u>-</u>

214

**SMC** 



Plu	ig (P)		
Male thread type			
	Body size	Port size	Part no.
	M5	M5 x 0.8	KK2P-M5M
	1415	R 1/8	-01MS
	1/0	R 1/8	KK3P-01MS
	1/8	H 1/4	-02MS
(f) ( ( ) ) ( ) ( ) ( ) ( ) ( ) ( ) ( )		R 1/9	-USINS
		B 1/4	-02MS
	1/4	R 3/8	-03MS
-		R 1/2	-04MS
		R 3/8	KK6P-03MS
	1/2	R 1/2	-04MS
		R 3/4	-06MS
Female thread type			
	Body size	Port size	Part no.
	M5	M5 x 0.8	KK2P-M5F
	1/0	Rc 1/8	KK3P-01F
	1/8	HC 1/4	-02F
······································		Bc 1/4	-03F KK4P-02F
	1/4	Bc 3/8	-03F
	1/0	Rc 3/8	KK6P-03F
	1/2	Rc 1/2	-04F
Nut fitting type (for fiber reinforced u	rethane hos	e)	
	Body size	Applicable hose	Part no.
	,	5/8	KK3P-50N
	1/8	6/9	-60N
		6.5/10	-65N
		5/8	KK4P-50N
		6/9	-60N
	1/4	6.5/10	-65N
		8/12 9.5/12.5	-80N
	-	8/12	KK6P-80N
	1/2	8.5/12.5	-85N
		11/16	-110N
Straight type with One-touch fitting			
<u> </u>	Body size	Applicable tubing Q D mm	Part no.
		3.2	KK2P-23H
	M5	4	-04H
		6	-06H
		4	KK3P-04H
	1/8	6	-06H
And a local division of the Annual Division o		8	-08H
		10	
		8	-08H
	1/4	10	-10H
		12	-12H
	1/0	12	KK6P-12H
	1/2	16	-16H
Elbow type with One-touch fitting			
	Body size	Applicable tubing O.D. mm	Part no.
		3.2	KK2P-23L
	M5	4	-04L
The second se		6	-06L
		4	KK3P-04L
	1/8	6	-06L
The second		10	-UoL
		6	KK4P-06I
		8	-08L
	1/4	10	-10L
		12	-12L
	1/2	12	KK6P-12L
	1/2	16	-16L
Bulkhead type with One-touch fitting	J		
	Body size	Applicable tubing O.D. mm	Part no.
		3.2	KK2P-23E
	M5	4	-04E
-		6	-06E
		4	KK3P-04E
Constants and a summer of	1/8	6	-06E
		10	-06E
		6	KK4P-06E
		8	-08E
	1/4	10	-10E
		12	-12E
	1/2	12	KK6P-12E
	1/2	16	-16E

### Socket (S)

Male thread type



Body size	Port size	Part no.
ME	M5 x 0.8	KK2S-M5M
IVID	R 1/8	-01MS
	R 1/8	KK3S-01MS
1/8	R 1/4	-02MS
	R 3/8	-03MS
	R 1/8	KK4S-01MS
4/4	R 1/4	-02MS
1/4	R 3/8	-03MS
	R 1/2	-04MS
	R 3/8	KK6S-03MS
1/2	R 1/2	-04MS
	R 3/4	-06MS

Female thread type



Body size	Port size	Part no.
M5	M5 x 0.8	KK2S-M5F
	Rc 1/8	KK3S-01F
1/8	Rc 1/4	-02F
	Rc 3/8	-03F
1/4	Rc 1/4	KK4S-02F
1/4	Rc 3/8	-03F
1/0	Rc 3/8	KK6S-03F
1/2	Do 1/0	04E

#### Nut fitting type (for fiber reinforced urethane hose)



Body size	1.D./O.D. mm	Part no.
	5/8	KK3S-50N
1/8	6/9	-60N
	6.5/10	-65N
	5/8	KK4S-50N
	6/9	-60N
1/4	6.5/10	-65N
	8/12	-80N
	8.5/12.5	-85N
	8/12	KK6S-80N
1/2	8.5/12.5	-85N
	11/16	-110N

Straight type with One-touch fitting



Body size	Applicable tubing O.D. mm	Part no.
	3.2	KK2S-23H
M5	4	-04H
	6	-06H
	4	KK3S-04H
1/0	6	-06H
1/8	8	-08H
	10	-10H
	6	KK4S-06H
	8	-08H
1/4	10	-10H
	12	-12H
1/0	12	KK6S-12H
1/2	16	-16H

Elbow type with One-touch fitting



Body size	Applicable tubing O.D. mm	Part no.
	3.2	KK2S-23L
Body size ub/878 80% m M5 32 1/8 6 1/8 6 1/4 8 10 10 10 10 10 10	-04L	
	6	-06L
	4	KK3S-04L
1/0	y size ww87658 mm 3.2 k 4 M5 6 6 4 1/8 6 10 8 10 10 10 12 1/2 12 16	-06L
M5 1/8 1/4 1/2	8	-08L
	10	-10L
	6	KK4S-06L
4/4	8	-08L
1/4	10	-10L
	12	-12L
1/0	12	KK6S-12L
1/2	16	-16L

#### Bulkhead type with One-touch fitting

	Body size	tubing O.D. mm	Part no.
		3.2	KK2S-23E
	M5	4	-04E
		6	-06E
		4	KK3S-04E
	1/8 6 8 10	-06E	
		8	-08E
		-10E	
Automation and Automation		6	KK4S-06E
	4/4	6 KK4S-06 8 -08	-08E
	1/4	10	-10E
		12	-12E
	1/0	12	KK6S-12E
	1/2	16	-16E

**SMC** 

# S Couplers **KK Series**



KK3/4/6 Series



		K
ecifications		K
Fluid	Air, Water	K
Operating Note)	KK2: -100 kPa to 1 MPa KK3: -90 kPa to 1 MPa	K
	KK4/6: 0 to 1 MPa	K
Ambient and	Air: -5 to 40°C	N
fluid temperature	(No freezing)	

### Performance

Plug and socket connection	One-touch connection and release
Check valve	Socket: Built-in check valve (standard)
Sleeve lock mechanism Note)	Manual locking type (standard)

Note) KK2 series is not provided with lock mechanism.

### **Effective Area**

Body size	Plug	Socket	Effective area mm <sup>2</sup>	KR
M5	KK2P-M5M	KK2S-M5M	3.8	V A
1/8	KK3P-01MS	KK3S-01MS	20	RA
1/4	KK4P-02MS	KK4S-02MS	39	KUC2
1/2	KK6P-04MS	KK6S-04MS	82	NQUL

How to Order

M

		KK	4	S	5 -	0	2
	в	ody siz	e •				
ĺ	2	M5		- 1			
ĺ	3	1/8		- 1			
ĺ	4	1/4		- 1			
ſ	6	1/2		- 1			

Socket/Plug designation

3	SUCKEL
Ρ	Plug

With	sealant	male	thread
• ••••	Sealant	Inale	un cau

#### Connection type

Symbol	Туре	
M	Male thread	
F	Female thread	
N	With nut fitting	
н	Straight with One-touch fitting	
L	Elbow with One-touch fitting	
E	Bulkhead with One-touch fitting	

### Piping port size variation

Male/Female thread type		One-tou	ch fitting ty	
Symbol	Thread size		Symbol	Applicable tubing
M5	M5 x 0.8		23	ø3.2
01	R, Rc 1/8	1	04	ø4
02	R, Rc 1/4		06	ø6
03	R, Rc 3/8	1	08	ø8
04	R, Rc 1/2		10	ø10
06	R, Rc 3/4		12	ø12
			16	ø16

 Symbol
 Applicable hose ID/0.0. mm

 50
 5/8

 60
 6/9

 65
 6.5/10

 80
 8/12

 85
 8.5/12.5

 110
 11/16

O.D. mr

217



KK

KK130

DM

KDM

KB

KG

KFG2

MS Kka Kp

LQ

MQR T IDK

### **Flow Rate Characteristics**



### S Couplers **KK** Series



### Dimensions/Plug (P)

### Male thread type



### Female thread type

	Body size	Model	T Connection port size	H Width across flats	Lı	L2	Min. bore size	Effective area mm <sup>2</sup>	Weight g
	M5	KK2P-M5F	M5 x 0.8	8	17.6	12.3	3.4	8.1	2.6
		KK3P-01F	Rc 1/8	14	28.3				10.4
5	1/8	-02F	Rc 1/4	17	33.5	18.4	6.0	22.6	20.8
		-03F	Rc 3/8	19	35.3				23.2
	1/4	KK4P-02F	Rc 1/4	17	37.2	05.0	0.0	50.0	23.9
	1/4	-03F	De 2/0	10	39.8	25.2	9.0	50.9	24.6
	1/0	KK6P-03F	HC 3/6	19	43.3	01.0	12.0	106.2	28.6
	1/2	-04F	Rc 1/2	24	50.2	31.0	13.0	100.2	43.9

#### Nut fitting type (for fiber reinforced urethane hose)





L 1

(mm)

(mm)





Applicable tubing

ğ

(mm)

ØD1

(mm)

KQ2

KQB2

KS KX

КΜ KF M H/DL L/LL KC KK

KK130 DM

KDM KB

### Straight type with One-touch fitting

Body	Model	Applicable	۵D1	αD2	11	12	м	Min.	m	ve area m²	Weight
size	model	O.D.		0.02				size	Urethane tubing	Nylon tubing	g
	KK2P-23H	ø3.2		7.0	00.7		10.7	2.5	3.7	4.4	3.3
M5	-04H	ø4	10.0	8.0	23.7	12.3	12.7	0.4	0.1	0.1	3.4
	-06H	ø6		10.0	26.7		13.5	3.4	0.1	0.1	4.0
	KK3P-04H	ø4	12.0	10.0	25.4		16.0	3.2	3.9	5.6	7.9
1/0	-06H	ø6	14.0	12.0	33.4	18/	17.0	4.7	10.1	12.8	9.1
1/0	-08H	ø8	16.0	14.0	38.6	10.4	18.5	60	15.7	00.6	13.2
	-10H	ø10	19.0	17.0	39.7		21.0	0.0	22.6	22.0	17.6
	KK4P-06H	ø6	14.0	12.0			17.0	4.7	10.1	12.8	22.3
1/4	-08H	ø8	16.0	14.0	46.2	25.2	18.5	6.2	19.8	22.6	23.0
1/4	-10H	ø10	19.0	17.0		20.2	21.0	7.7	27.6	35.3	27.1
	-12H	~10	01.0	40.0	47.5		00.0	9.0	40.2	50.0	30.0
1/2	KK6P-12H	210	21.0	19.0	56.1	31.0	22.0	9.2	41.2	50.9	44.4
1/2	-16H	ø16	26.0	23.8	50.1	51.0	25.0	13.0	_	106.2	50.7

Elbow type with One-touch fitting

Body	Mardal	Applicable	_	_					Min.	Effecti m	ve area m²	Weight
size	Model	O.D.	ØU1	ØU2	L1	L2	L3	IVI	size	Urethane tubing	Nylon tubing	g
	KK2P-23L	ø3.2					10.5	10.7	0.5		4.0	5.0
M5	-04L	ø4		9.3	24.0	12.3	10.5	12.7	2.5	3.6	4.3	5.8
	-06L	ø6	10.0	11.6	25.1		16.6	13.5	3.4	7.8	7.8	6.4
	KK3P-04L	ø4		10.4	31.6		18.0	16.0	3.0	3.7	5.3	7.2
4/0	-06L	ø6		12.8	32.8		20.0	17.0	4.5	10.1	11.4	8.0
1/8	-08L	ø8	12.0	15.2	34.0	18.4	23.0	18.5		15.0	16.8	9.7
	-10L	ø10	17.0	18.5	36.0		26.5	21.0	6.0	18.0	18.5	23.0
	KK4P-06L	ø6	14.0	12.8	40.2		20.0	17.0	4.5	10.1	11.4	19.6
	-08L	ø8	14.0	15.2	41.4	25.2	23.0	18.5	6.0	17.5	19.8	21.3
1/4	-10L	- 10	17.0	18.5	42.8		26.5	21.0	7.5	24.7	27.5	25.7
	-12L	ØIU	17.0	00.0	44.0		00.5	00.0		29.0	29.6	28.0
1/0	KK6P-12L	ø12	19.0	20.9	49.9	31.0	20.5	22.0	9.0	38.1	39.7	40.3
1/2	-16L	ø16	21.0	26.5	53.5		34.0	25.0	13.0	_	58.7	48.7
	Body           M5           1/8           1/4           1/2	Body size         Model           Model         -04L           -06L         -06L           -10L         -06L           -10L         -06L           -10L         -10L           -10L         -10L           -10L         -10L           -10L         -10L	Body bis         Model         Applicable tubing O.D.           KK2P-201         03.2           -04L         04.2           -04L         04           -06L         06           4         04           -06L         06           -10L         010           -10L         010           -10L         010           -10L         010           -10L         010           -10L         010	Body         Applicable U.D.         applicable U.D.         applicable U.D.           KK2P-23L         0.3.2         0.4           -04L         0.4         0.4           -06L         0.6         10.0           AK3P-04L         0.4         0.4           -06L         0.6         10.0           100         -06L         0.6           -10L         0.0         1.0           100         0.0         1.0           100         0.0         1.0           100         0.0         1.0           100         0.0         1.0           100         0.0         1.0           100         0.0         1.0           100         0.0         1.0           100         0.0         1.0           100         0.0         1.0           101         0.0         1.0           102         0.0         0.0           103         0.0         1.0           104         0.0         0.0           105         0.0         1.0	Body bis         Model         Applicable Ubin (O.D.)         oD1         oD2           Model         03.2         03.4         9.3           -04         04         9.3           -06         06         10.4           -06         06         10.4           -06         06         12.8           -06         06         17.0         18.8           -100         010         17.0         12.8           -100         040         17.0         12.8           -101         010         17.0         12.8           -102         010         17.0         12.8           -101         010         17.0         12.8           -102         010         17.0         15.2           -102         -101         17.0         15.2           -102         -102         17.0         16.9           -102         -102         10.9         20.9           -102         012         19.0         20.9	Body Size         Model         Applicable UD.         old Size         old Size	Bodel         Applicable UDS, O.D.         o.D.         o.D.         o.D.         L.1           K42P-24         03.2         0.4	$\begin{array}{ c c c c c } \hline \begin{tabular}{ c c } \hline \hline \begin{tabular}{ c c } \hline \hline \begin{tabular}{ c c } \hline \hline \ \begin{tabular}{ c c } \hline \hline \begin{tabular}{ c c } \hline \hline \ell \ell \\ \hline \begin{tabular}{ c c } \hline \hline \ell \\ \hline \bell \\ \hline \begin{tabular}{ c c } \hline \hline \ell \\ \hline $	Body         Model         Applicable UDS $oDL$ $oDL$ $oDL$ $LL$ </th <th>Body Bis         Model         Applicable UD, D.         of D1         of D2         L1         L2         L3         Min. bis         Min. bis           M         KK2P-23L         0.32         <math>  -</math></th> <th>Base         Applicable bill         Applicable bill         <math>\alpha</math> PD         <math>\alpha</math> PD        <math>\alpha</math> PD        <math>\alpha</math> PD</th> <th>Regime         Applicable D.D.         <math>_{0}</math>D1         <math>_{0}</math>D2         <math>_{1}</math>L         <math>_{1}</math>L</th>	Body Bis         Model         Applicable UD, D.         of D1         of D2         L1         L2         L3         Min. bis         Min. bis           M         KK2P-23L         0.32 $  -$	Base         Applicable bill         Applicable bill $\alpha$ PD	Regime         Applicable D.D. $_{0}$ D1 $_{0}$ D2 $_{1}$ L

H1 H2

### Bulkhead type with One-touch fitting



Body	Model	Applicable	_ T _	Width	Width	14	12	12	м	Min.	mm <sup>2</sup>		Weight
size	Woder	O.D.	Threads	across flats	across flats		Lź	L3	NI	size	Urethane tubing	Nylon tubing	g
	KK2P-23E	ø3.2	M8 x 0.75	10	10	00.0		10.5	10.7	2.5	3.7	4.4	6.0
M5	-04E	ø4	M9 x 0.75	10	11	20.3	12.3	12.5	12.7	24	0.1	0.1	6.6
	-06E	ø6	M11 x 0.75	14	14	28.6		12.7	13.5	3.4	0.1	0.1	9.7
	KK3P-04E	ø4	M12 x 1	14	14	39.3		16.9	16.0	3.2	3.9	5.6	16.6
1/8	-06E	ø6	M14 x 1	17	17	40.2	18.4	16.8	17.0	4.7	10.1	12.8	22.3
1/0	-08E	ø8	M16 x 1	17	19	43.4	10.4	20.0	18.5		15.7		30.2
	-10E	ø10	M20 x 1	22	24	46.4		22.0	21.0	0.0	22.6	22.6	54.7
	KK4P-06E	ø6	M14 x 1	17	17	47.0		16.8	17.0	4.7	10.1	12.8	30.6
1/4	-08E	ø8	M16 x 1	17	19	50.2	25.2	20.0	18.5	6.2	19.8	22.6	38.2
1/4	-10E	ø10	M20 x 1	22	24	53.2	20.2	22.0	21.0	7.7	27.6	35.3	61.4
	-12E	012	M00 v 1	24	07	54.2		22.0	00.0	9.0	40.2	50.0	75.2
1/0	KK6P-12E	012	W22 X 1	24	21	60.1	31.0	23.0	22.0	9.2	41.2	50.9	86.1
1/2	-16E	ø16	M28 x 1.5	30	32	62.6	51.0	24.5	25.0	13.0		106.2	125.0





Effective area







(mm)





IDK

Click here for applicable color caps.

**SMC** 

### **Dimensions/Socket (S)**

#### Male thread type

KK2

KK3/4/6

	Body size	Model	T Connection port size	H Width across flats	øD	Lı	L2 When connected	<b>A</b> 1*	A2* When connected	Min. bore size	Effective area mm <sup>2</sup>	Weight g
	145	KK2S-M5M	M5 x 0.8	8	10.0	24.7	26.2	01.7	23.7	2.5	3.8	6.1
There	IVI5	-01MS	R 1/8	10	10.0	24.4	25.9	21.7	22.8	4.7	5.8	9.1
a state		KK3S-01MS	R 1/8	14		36.6	39.1	33.5	36.0	6.0	20.4	20.1
	1/8	-02MS	R 1/4	14	20.2	37.0	39.5	31.5	34.0	0.0	01.1	19.2
		-03MS	R 3/8	17		37.6	40.1	32.2	34.5	9.0	21.1	29.0
		KK4S-01MS	R 1/8			49.5	53.2	46.4	50.1	6.0	22.9	47.5
	1/4	-02MS	R 1/4	19	20 0	50.5	54.2	45.0	48.7	9.0	38.9	44.1
H H	1/4	-03MS	R 3/8		20.0	48.9	52.6	43.5	47.2	11.0	40.4	50.9
		-04MS	R 1/2	22		48.8	52.5	41.7	45.4	13.0	42.7	61.2
		KK6S-03MS	R 3/8	24		59.1	64.4	53.7	59.0	11.0	71.7	87.9
	1/2	-04MS	R 1/2	24	31.6	59.3	64.6	52.2	57.5	13.0	82.3	90.1
		-06MS	R 3/4	27		60.2	65.5	50.7	56.0	15.0	83.8	113.3
						* Refe	erence d	imensio	n for R t	hreads	after inst	allation.





#### Female thread type

KK2	Body size	Model	T Connection port size	H Width across flats	øD	Lı	L2 When connected	Min. bore size	Effective area mm <sup>2</sup>	Weight g
pertrapping and	M5	KK2S-M5F	M5 x 0.8	8	10.0	25.3	26.8	4.2	5.4	6.4
		KK3S-01F	Rc 1/8	14		36.0	38.5		20.6	23.6
	1/8	-02F	Rc 1/4	17	20.2	40.1	42.6	8.2	01.1	34.4
KK3/4/6		-03F	Rc 3/8			41.9	44.4		21.1	38.8
	1/4	KK4S-02F	Rc 1/4	19	20 0	50.4	54.1	10.9	39.6	56.9
and a second sec	1/4	-03F	Po 2/9		20.0	51.1	54.8	14.4	42.7	46.2
Z Z Z	1/0	KK6S-03F	nc 3/0	04	01.0	58.6	63.9	14.4	83.1	93.6
	1/2	-04F	Rc 1/2	24	31.0	61.0	66.3	18.0	83.8	87.4

### т KK2 ő ١. L2



### Nut fitting type (for fiber reinforced urethane hose)



**SMC** Courtesy of Steven Engineering, Inc - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com

(mm)

(mm)



(mm)

KQ2

KQB2 KX KM KF

M H/DL L/LL KC

DM KDM KB KR

KA

KQG2 Kg KFG2

MS Kka

KP LQ

MQR

IDK

Т

(mm) (KK130

≥ຼ

Ø**D**2

]́≥[ <u>\_</u>

### Straight type with One-touch fitting

	Body	Medel	Applicable	~D4	~ Do	1.	L2		Min.	Effection	ve area m²	Weight	KK2
	size	Model	O.D.	ØD1	ØD2	LI	connected	м	size	Urethane tubing	Nylon tubing	g	Applicable tubing
KK2		KK2S-23H	ø3.2		7.0	33.8	35.3	10.7	2.5	3.8	4.6	6.4	
	M5	-04H	ø4	10.0	8.0	33.6	35.1	12.7	3.4	4.0	4.8	6.5	ē, <del>1</del>
		-06H	ø6		10.0	33.9	35.4	13.5	4.7	5.8	5.8	7.9	
		KK3S-04H	ø4		10.0	46.6	49.1	16.0	3.2	3.8	5.8	22.5	
	1/0	-06H	ø6	20.2	12.0	47.1	49.6	17.0	4.7	10.4	13.4	24.4	
KK3/4/6	1/0	-08H	ø8	20.2	14.0	48.9	51.4	18.5	6.2	16.8	18.9	27.3	
		-10H	ø10		17.0	49.9	52.4	21.0	7.7	19.1	19.1	37.1	KK3/4/6
		KK4S-06H	ø6		12.0	58.2	61.9	17.0	4.7	10.4	13.4	51.4	Applicable tubing
	1/4	-08H	ø8	20 0	14.0	60.1	63.8	18.5	6.2	18.3	21.8	51.3	
	1/4	-10H	ø10	20.0	17.0	61.5	65.2	21.0	7.7	27.0	29.4	54.8	ō + \$ - + E=== #₽
		-12H	~10		40.0	62.5	66.2	22.0	0.2	30.5	32.0	59.4	▝▁ੵ▋▋▎▆▋▁▎▎▁▀▌▕
	1/2	KK6S-12H	210	21.6	19.0	70.1	75.4	22.0	3.2	42.7	48.8	84.1	
	1/2	-16H	ø16	31.0	25.7	72.3	77.6	25.0	13.2	53.4	62.5	99.9	L2

### Elbow type with One-touch fitting

	Body	Madal	Applicable	~ D.4	«Do		L2 When	1.0		Min.	m	m²	Weight	кк2	ØD2
КК2 —	size	Model	0.D.	ØUI	002	-	connected	L3		size	Urethane tubing	Nylon tubing	g	Applicable tubing	h
		KK2S-23L	ø3.2				07.5	10.5	10.7	0.5	0.7		0.7		AT I
	M5	-04L	ø4	10.0	9.3	26.0	27.5	10.5	12.7	2.5	3.7	4.4	6.7		L
		-06L	ø6		11.6	27.2	28.3	16.6	13.5	4.5	5.6	5.6	7.2	ē +	-+
		KK3S-04L	ø4		10.4	41.7	44.2	18.0	16.0	3.0	3.7	5.3	23.2		
	1/0	-06L	ø6	00.0	12.8	42.9	45.4	20.0	17.0	4.5	10.1	11.4	24.0	- L1 - L2	
	1/0	-08L	ø8	20.2	15.2	43.1	45.6	23.0	18.5	6.0	15.0	16.8	25.0	-	
KK3/4/6		-10L	ø10		18.5	42.9	45.4	26.5	21.0	7.5	18.0	18.5	34.4	KK3/4/6	
		KK4S-06L	ø6		12.8	54.3	58.0	20.0	17.0	4.5	10.1	11.4	53.5		
	1/4	-08L	ø8	00.0	15.2	55.5	59.2	23.0	18.5	6.0	17.5	19.8	53.1	Applicable tubing	-f.
	1/4	-10L	ø10	20.0	18.5	54.2	57.9	26.5	21.0	7.5	24.7	27.5	54.7		- 8
		-12L	~10		00.0	55.4	59.1	20 E	22.0	9.0	29.0	29.6	57.0	ā	F
	1/2	KK6S-12L	012	21.6	20.9	66.3	71.6	20.5	22.0	13.0	38.1	39.7	91.4		<u>µ</u>
	1/2	-16L	ø16	31.0	26.5	66.9	72.2	34.0	25.0	13.0	50.3	58.7	93.5	- <u>L1</u>	

### Bulkhead type with One-touch fitting

	Body	Madal	Applicable	т	H1 Width	H2 Width			L2 When			Min.	Effectiv	/e area m²	Weight	KK2
	size	Woder	O.D.	Threads	across flats	across flats	ØU	LI	conne- cted	L3	IVI	size	Urethane tubing	Nyrlon tubing	g	Mounting plate
KK2		KK2S-23E	ø3.2	M8 x 0.75	10	10		33.8	35.3	12.0	10.7	2.5	3.8	4.6	9.6	
	M5	-04E	ø4	M9 x 0.75	10	11	10.0	33.5	35.0	13.0	12.7	3.4	4.0	4.8	9.1	
		-06E	ø6	M11 x 0.75	14	14		33.9	35.4	13.1	13.5	4.7	5.8	5.8	12.6	° .
		KK3S-04E	ø4	M12 x 1	14	14		46.6	49.1	16.9	16.0	3.2	3.8	5.8	29.0	
	1/0	-06E	ø6	M14 x 1	17	17		47.1	49.6	16.8	17.0	4.7	10.4	13.4	39.4	
	1/0	-08E	ø8	M16 x 1		19	20.2	49.0	51.5	20.0	18.5	6.2	16.8	18.9	43.4	
KK3/4/6		-10E	ø10	M20 x 1	22	24		49.9	52.4	22.0	21.0	7.7	19.1	19.1	68.3	
		KK4S-06E	ø6	M14 x 1	10	17		58.2	61.9	16.8	17.0	4.7	10.4	13.4	57.2	KK3/4/6
	1/4	-08E	ø8	M16 x 1	19	19		60.1	63.8	20.0	18.5	6.2	18.3	21.8	60.6	Mounting pla
	1/4	-10E	ø10	M20 x 1	22	24	28.0	61.7	65.4	22.0	21.0	7.7	27.0	29.4	86.8	thickness 7 r
		-12E	a10	M00 - 1	04	07		62.7	66.4	23.0	22.0		30.5	32.0	105.7	
	1/0	KK6S-12E	012	1V122 X 1	24	21		70.1	75.4	04.5	05.0	9.2	42.7	48.8	116.0	
	1/2	-16E	ø16	M28 x 1.5	30	32	31.6	72.5	77.8	24.5	25.0	13.2	53.4	62.5	183.2	°∖¦∎∐





Click here for applicable color caps.

**SMC** 

### **S** Couplers



(equivalent to impact energy of 0.5 J). The pulling strength for the plugs and sockets has been improved. Twice as strong as the current models.



### Sleeve cover (Rubber)

Plug (P)

### Male thread type

•		
Body size	Connection port size	Part no.
	R 1/8	KK3P-01MS
1/8	R 1/4	-02MS
	R 3/8	-03MS
	R 1/8	KK4P-01MS
1/4	R 1/4	-02MS
1/4	R 3/8	-03MS
	R 1/2	-04MS

#### Female thread type

Body size	Connection port size	Part no.
	Rc 1/8	KK3P-01F
1/8	Rc 1/4	-02F
	Rc 3/8	-03F
 	Rc 1/4	KK4P-02F
1/4	Rc 3/8	-03F

### Nut fitting type (for fiber reinforced urethane hose)

Body size	Applicable hose I.D./O.D. mm	Part no.
	5/8	KK3P-50N
1/8	6/9	-60N
	6.5/10	-65N
	5/8	KK4P-50N
	6/9	-60N
1/4	6.5/10	-65N
	8/12	-80N
	8.5/12.5	-85N

KKH series are only available as sockets. KK series should be used as plugs.

224

# Same effective sectional area

### as that of KK series.

### Socket (S)

#### Male thread type

	Body size	Connection port size	Part no.
		R 1/8	KKH3S-01MS
	1/8	R 1/4	-02MS
		R 3/8	-03MS
		R 1/8	KKH4S-01MS
Mill Internet	1/4	R 1/4	-02MS
	1/4	R 3/8	-03MS
		B 1/2	-04MS

#### Female thread type

	Body size	Connection port size	Part no.
		Rc 1/8	KKH3S-01F
it is a	1/8	Rc 1/4	-02F
		Rc 3/8	-03F
		Rc 1/4	KKH4S-02F
		Rc 3/8	-03F

### Nut fitting type (for fiber reinforced urethane hose)

Body size	Applicable hose I.D./O.D. mm	Part no.
	5/8	KKH3S-50N
1/8	6/9	-60N
	6.5/10	-65N
	5/8	KKH4S-50N
	6/9	-60N
1/4	6.5/10	-65N
	8/12	-80N
	8.5/12.5	-85N

**SMC** 

# **S** Couplers KKH Series



Symbol



Specifications		KOB2						
		Ve						
Fluid	Air, Water	KX						
Operating Note) pressure range	KKH3: -90 kPa to 1 MPa KKH4: 0 to 1 MPa	KM						
Proof pressure	1.5 MPa	KF						
Ambient and fluid temperature	Air: -5 to 60°C Water: 5 to 40°C (No freezing)	М						
Plating, Sealant	ant Electroless nickel plated (copper-free and fluorine-free application), With male thread sealant							
Connection plug	KK series plug							
Note) Do not use the S couplers with	a leak tester or for vacuum retention because they are not guaranteed for zero leakage.	KC						

### Performance

Plug and socket connection	One-touch connection and release
Check valve	Socket: Built-in check valve (standard)
Sleeve lock mechanism	

### Effective Area

Body size	Plug	Socket	Effective area mm <sup>2</sup>	KR
1/8	KK3P-01MS	KKH3S-01MS	20	1/ 4
1/4	KK4P-02MS	KKH4S-02MS	39	KA
			 ]	KQG2

The flow rate characteristics are the same as those of KK series. Please refer to page 218.

How to Order

### KKH <u>4 S-02 M S</u>

Body size

Socket/Plug designation S Socket

1/8

1/4

3

4

•	With	sealant	(male	thread)
---	------	---------	-------	---------

Connection type

Symbol	Туре
М	Male thread
F	Female thread
N	With nut fitting

### Piping port size variation

Male/Fe	emale thread type	1	Nut fitti	ng type	
Symbol	Connection port size	[	Symbol	Hose I.D./O.D.	mn
01	R, Rc 1/8		50	5/8	
02	R, Rc 1/4		60	6/9	
03	R, Rc 3/8		65	6.5/10	
04	R, Rc 1/2		80	8/12	
			85	8 5/12 5	

n

RoHS

KQ2

KK

KK130

DM

KDM

KB

KG KFG2

MS

KKA

KP

LQ

MQR

Т IDK

### **Dimensions/Socket (S)**

#### Male thread type



Body size	Model	T Connection port size	H Width across flats	øD	Lı	L2 When connected	<b>A</b> 1*	A2* When connected	Min. bore size	Effective area mm <sup>2</sup>	Weight g
	KKH3S-01MS	R 1/8	14		36.6	39.1	33.5	36.0	6.0	20.4	20.3
1/8	-02MS	R 1/4	14	20.2	37.0	39.5	31.5	34.0	9.0		19.4
	-03MS	R 3/8	17		37.6	40.1	32.2	34.5	9.0	21.1	27.7
	KKH4S-01MS	R 1/8			49.5	53.2	46.4	50.1	6.0	22.9	48.7
1/4	-02MS	R 1/4	19		50.5	54.2	45.0	48.7	9.0	38.9	45.3
1/4	-03MS	R 3/8		20.0	48.9	52.6	43.5	47.2	11.0	40.4	52.1
	-04MS	R 1/2	22		48.8	52.5	41.7	45.4	13.0	42.7	62.4



\* Reference dimension for R threads after installation.

### Female thread type

ре									(mm)
Body size	Model	T Connection port size	H Width across flats	øD	L1	L2 When connected	Min. bore size	Effective area mm <sup>2</sup>	Weight g
	KKH3S-01F	Rc 1/8	14		36.0	38.5		20.6	23.8
1/8	-02F	Rc 1/4	17	20.2	40.1	42.4	8.2	21.1	33.1
	-03F	Rc 3/8	19		41.9	44.3			37.1
1/4	KKH4S-02F	Rc 1/4	10	28.0	50.4	54.1	10.9	39.6	58.1
1/4	-03F	Rc 3/8	19		51.1	54.8	14.4	42.7	47.4



### Nut fitting type (for fiber reinforced urethane hose)

ut fitting type (for fiber reinforced urethane hose) (mm)													
	Body size	Model	Applicable hose I.D./O.D.	H1 Width across flats	H2 Width across flats	øD	L1	L2 When connected	М	Min. bore size	Effective area mm <sup>2</sup>	Weight g	Applicable hose
		KKH3S-50N	5/8	14	14		42.6	45.1	13.7	4.5	12.2	32.3	<u>H1</u> <u>H2</u> /
	1/8	-60N	6/9	17	17	20.2	44.4 46.9	46.9 16.5	5.4	18.3	48.9		
		-65N	6.5/10	17	17				10.5	5.9	19.2	46.6	
		KKH4S-50N	5/8		14		54.1	57.8	13.7	4.5	12.2	57.0	
		-60N	6/9		17		50.0	00.5	60.5 16.5	5.4	20.4	70.5	
	1/4	-65N	6.5/10	19	17	28.0	56.8	60.5		5.9	24.1	68.0	L2
		-80N	8/12		40					7.4	35.1	69.7	
		-85N	8.5/12.5		19		55.4	59.1	17.4	7.8	36.6	72.3	

KKH series are only available as sockets. KK series should be used as plugs. For dimensions, please refer to page 220.



Be sure to read this before handling the products. Refer to back page 50 for Safety Instructions and pages 13 to 17 for Fittings and Tubing Precautions.

#### Selection

### \land Warning

- Make sure to confirm the specifications. Please do not use with pressures or temperatures outside the range of specifications, as this may result in damage and malfunction (Refer to specifications). SMC takes no responsibility for damage incurred by use in excess of the specification range.
- Prohibition of disassembly and modification Do not disassemble or modify (including additional machining) the main body.
   False use may cause an injury or accident.
- Confirm that PTFE can be used in application. Thread sealant contains PTFE (polytetrafluoroethylene) powder. Confirm if the use of it may cause any adverse effect in the system.
- 4. Cannot be used as a stop valve that requires zero leakage. A certain amount of leakage is allowed during operation.
- 5. KK series and KKH series cannot be connected with KKA series. Also, SMC's S coupler cannot be connected with quick couplers of other brands. This will cause leakage, damage, and disconnection of the plug. With KK13 series manufactured by RECTUS AG verify.

With KK13 series, manufactured by RECTUS AG, verify the manufacturer of applicable couplers before use.

- Do not couple or uncouple the S coupler during pressurization or while residual pressure remains. The coupler may shoot out under the influence of the pressure.
- Never apply pressure to an S coupler without check valve when it is uncoupled. The piping may move violently and cause danger.
- 8. An S coupler without check valve experiences leakage of fluid inside piping when it is uncoupled. Pay special attention in using fluid that can cause danger such as fluid of a high temperature and pressure. Additional use of a stop valve is recommended.
- The S coupler is heated when used at a high temperature. Take precautions not to touch it since touching it can cause burns.

### **A**Caution

- For a plug and socket connection, select a plug and socket with the same body size. If their body sizes are different, they cannot be connected. This will cause leakage, damage, and disconnection of the plug. Inserting a plug other than the specialized plug into the socket may result in equipment damage.
- Do not use in locations where the connecting threads and tubing connection will slide or rotate. The connecting threads and tubing connection will come apart under these conditions.
- Do not use couplers with flammable, explosive, or toxic substances, such as gas, gas fuel, and refrigerant. They may leak from inside the tubing to the outside.
- 4. Operate with a surge pressure of no more than the maximum operating pressure. If the surge pressure exceeds the maximum operating pressure, it will cause damage to couplers and tubing.
- Do not use the S coupler with steam. Corrosion of the metal material and deterioration of the sealing material may result from long-term use with steam.

#### Mounting

### \land Warning

- Mount and operate the product after reading the operation manual carefully and understanding its contents. Also, keep the manual where it can be referred to as necessary.
- Ensure sufficient space for maintenance. Be sure to allow the space required for maintenance and inspection.

 Tightening torque When installing the products, please tighten the screw with the recommended tightening torque.

- 4. During use, tube deterioration or damage to fitting can result in disconnection of the tube from the fitting and uncontrollable behavior of the tube. To stop the tube from going out of control, use a protective cover or fix the tube in place.
- 5. Do not use couplers where rotation normally occurs. The couplers may be damaged.
- 6. Avoid applications in which vibration or shock is directly applied to the fittings.
- Fittings with sleeve lock mechanism must be locked during operation in order to prevent sudden disconnection.
- Install a stop valve at the supply pressure side of the socket. Emergency shutdown may not be possible without it.

### A Caution

threads

- Preparation before piping Before piping is connected, it should be thoroughly blown out by air (flushed) or washed to eliminate cutting chips, cutting oil, and other debris from inside the pipe.
- Winding of sealant tape When screwing in the pipes or fittings, make sure to prevent cutting chips or the sealing material on the threaded portion of the pipe from entering the piping. Also, if sealant tape is used, leave about 1 thread ridges exposed at the end of the



- Before mounting confirm the model and size, etc. Also, confirm that there are no blemishes, nicks or cracks in the product.
- When connecting a tube, consider factors such as changes in the tubing length due to pressure, and allow sufficient leeway.
- Mount so that couplers and tubing are not subjected to twisting, pulling or moment loads. This can cause damage to couplers and flattening, bursting or disconnection of tubing, etc.
- Mount so that tubing is not damaged due to tangling and abrasion. This can cause flattening, bursting or disconnection of tubing, etc.



KQ2

LQ MQR T

IDK



Be sure to read this before handling the products. Refer to back page 50 for Safety Instructions and pages 13 to 17 for Fittings and Tubing Precautions.

#### Air Supply

### **Warning**

#### 1. Excessive drainage

Compressed air containing large amounts of drainage can cause malfunction of pneumatic equipment. As a countermeasure, install an air dryer or drain catch before the filter.

2. Drain flushing

If the drain removal from air filter is missed, drain will be flown out to the outlet side and may result in a malfunction of the pneumatic equipment. When removing drain is difficult, use of a filter with an auto drain is recommended.

Refer to SMC's "Air Cleaning Equipment" catalog for further details on compressed air quality.

3. Use clean air.

If the compressed air includes chemicals, synthetic oils containing organic solvents, salt or corrosive gases, etc., it can cause damage or malfunctions in the system.

### **A** Caution

 Install an air filter. Install an air filter upstream, near the valve. Select an air filter with a filtration degree of 5 μm or finer.

- Compressed air containing large amounts of drainage can cause malfunction of pneumatic equipment. As a countermeasure, install an aftercooler, air dryer or drain catch.
- 3. Ensure that the fluid and ambient temperature are within the specified range.

If the fluid temperature is 5°C or below, the moisture in the circuit could freeze, causing damage to the seals and leading to equipment malfunction. Therefore, take appropriate measures to prevent freezing.

Refer to SMC's "Air Cleaning Equipment" catalog for further details on compressed air quality.

### **Operating Environment**

### A Warning

- Do not use in atmospheres of corrosive gases, chemicals, salt water, water, steam, or where there is direct contact with any of these.
- 2. Do not use in direct sunlight.
- 3. In locations near heat sources, protect against radiated heat.
- Do not use in locations where static electric charges will be a problem. Consult with SMC regarding use in this kind of environment.
- 5. Do not use in locations where spatter occurs. There is a danger of spatter causing a fire. Consult with SMC regarding use in this kind of environment.

### **Operating Environment**

### A Warning

- 6. Do not use in environments where there is direct contact with liquids such as cutting oil, lubricating oil or coolant oil, etc. Consult SMC regarding use in environments where there will be direct contact with cutting oil, lubricating oil or coolant oil, etc.
- Do not use in locations influenced by vibrations or impacts. This may cause air leakage and fitting damage. Consult SMC regarding use in this kind of environment.
- Do not use in places or environments where foreign matter sticks to the product or gets inside the product. It may cause air leakage or tube release.

### Maintenance

### **▲** Caution

- Follow the procedures given in the operation manual to perform a maintenance inspection. Improper handling could lead to malfunction or damage the machinery and equipment.
- 2. Maintenance work

If handled improperly, compressed air can be dangerous. Assembly, handling, repair and element replacement of pneumatic systems should be performed by qualified personnel only.

- 3. Drain flushing Remove drainage from air filters regularly.
- 4. Removal of equipment, and supply/exhaust of compressed air

When components are removed, first confirm that measures are in place to prevent workpieces from dropping, run-away equipment, etc. Then, cut the supply pressure and power, and exhaust all compressed air from the system using the residual pressure release function.

When machinery is restarted, proceed with caution after confirming that appropriate measures are in place to prevent cylinders from sudden movement.

- 5. Be absolutely sure to wear safety glasses when conducting periodic inspections.
- 6. Check for the following during regular maintenance, and replace components as necessary.
  - a) Scratches, gouges, abrasion, corrosion
  - b) Leakage
  - c) Twisting, flattening or distortion of tubing
  - d) Hardening, deterioration or softness of tubing
- 7. Do not repair or patch the replaced tubing or couplers for reuse.

Do not disassemble the S coupler.



Be sure to read this before handling the products. Refer to back page 50 for Safety Instructions and pages 13 to 17 for Fittings and Tubing Precautions.

#### Handling

### **A** Caution

- When connecting the plug, hold the plug securely. The plug may be uncoupled due to reaction at the time of connection.
- When connecting a plug, insert it securely until a click sound is heard from the socket. After the connection, gently pull the plug to see whether it will release. If not securely inserted, the plug may pop out due to the

pressure. Also, do not touch the sleeve until the plug is securely inserted.

Otherwise, it may lead to a malfunction.

- When connecting the plug, insert it straight into the socket. If not inserted straight, the socket and/or plug may be damaged or cause a malfunction.
- 4. When releasing the plug, hold it securely. The connection pipe may move due to reacting stress and/or residual pressure on the plug side.
- 5. Do not press the inside of the socket with an incompatible plug and/or with a stick. The internal fluid may be ejected and cause a dangerous situation. Also, the ejecting internal fluid may cause the sealings to come apart resulting in the product not functioning.

### **Plug Insertion Force in Pressurized Condition**

### Insertion Force of KK series



#### Insertion Force of KKA series



#### Handling of One-touch Fittings

### ▲ Caution

1. Tube attachment/detachment for One-touch fittings

- 1) Attaching of tubing
  - (1) Take a tube having no flaws on its periphery and cut it off at a right angle. When cutting the tubing, use tubing cutters TK-1, 2 or 3. Do not use pinchers, nippers or scissors, etc. If cutting is done with tools other than tubing cutters, the tubing may be cut diagonally or become flattened, etc. This can make a secure installation impossible, and cause problems such as the tubing pulling out after installation or air leakage. Allow some extra length in the tubing.
  - (2) Outside diameter of polyurethane tubing is swelled by applying internal pressure. As such, it may be that the tubing cannot be re-inserted into a one-touch fittings. Make sure to confirm the tubing outside diameter, and when the accuracy of the outside diameter is more than + 0.15, insert into a one-touch fitting again, not cutting the tubing to use it. When tubing is re-inserted into a one-touch fitting, make sure to confirm that the tubing was able to go through the release bushing smoothly.
  - (3) Grasp the tubing, slowly push it straight (0 to 5°) into the One-touch fitting until it comes to a stop.
  - (4) After inserting the tubing, pull on it lightly to confirm that it will not come out. If it is not installed securely all the way into the fitting, this can cause problems such as air leakage or the tubing pulling out.
  - (5) When attaching tubes, resin plugs, metal rods, etc., do not push the release button while attaching.

Also, do not push the release button before attaching. This may cause releasing.

- 2) Detaching of tubing
  - (1) Push in the release bushing sufficiently. When doing this, push the collar evenly.
  - (2) Pull out the tubing while holding down the release bushing so that it does not come out. If the release bushing is not pressed down sufficiently, there will be increased bite on the tubing and it will become more difficult to pull it out.
  - (3) When the removed tubing is to be used again, cut off the portion which has been chewed before reusing it. If the chewed portion of the tubing is used as is, this can cause trouble such as air leakage or difficulty in removing the tubing.
- When attaching resin plugs or metal rods to the tube, do not push the release button while attaching. This may cause releasing.
- 4) Connecting products with attached metal rods
  - (1) After attaching products with attached metal rods such as the KC series, to the one-touch fitting, please do not use tubes, resin plugs, or reducers, etc. This may cause releasing.



Be sure to read this before handling the products. Refer to back page 50 for Safety Instructions and pages 13 to 17 for Fittings and Tubing Precautions.

#### **Recommended piping conditions**

 When installing piping in the one-touch fitting, please make sure there is sufficient slack to the tube length as per the recommended piping conditions shown in Figure 1. Also, when binding pipes together with a unifying band, etc., make sure piping is carried out without receiving external force (See Fig. 2).



#### Fig. 1 Recommended piping

				Offic. Hill
Tubing size	Mounting pitch A			Ctroight agotion
	Nylon tube	Soft nylon tube	Polyurethane tube	Straight section
ø3.2, 1/8"	44 or more	29 or more	25 or more	16 or more
ø4, 5/32"	56 or more	30 or more	26 or more	20 or more
ø3/16"	67 or more	38 or more	38 or more	24 or more
ø6	84 or more	39 or more	39 or more	30 or more
ø1/4"	89 or more	56 or more	57 or more	32 or more
ø8, 5/16"	112 or more	58 or more	52 or more	40 or more
ø10	140 or more	70 or more	69 or more	50 or more
ø3/8"	134 or more	76 or more	69 or more	48 or more
ø12	168 or more	82 or more	88 or more	60 or more
ø1/2"	178 or more	118 or more	93 or more	64 or more
ø16	224 or more	144 or more	114 or more	80 or more



Fig. 2 When using a unifying band to bind together the pipes

### Handling of Barb Fittings and Nut Fittings

### **A** Caution

- When using a nut fitting, insert the hose all the way to the end and securely tighten it with the nut. When the insertion of the hose or the tightening of the nut are not sufficient, the hose may slip out.
- Disconnection may occur depending on the material or the O.D. accuracy of the hose; therefore be sure to confirm the applicability of the hose.

#### Handling of Fittings

### \land Caution

- 1. Tightening of the M5-size connection threads
  - 1) Tighten it by hand, then give it an additional 1/6 turn with a wrench. As a guideline, the tightening torque should be 1 to 1.5 N·m.
  - 2) Over tightening can cause damage to the threads and/or air leakage due to deformation of the gasket.
  - Insufficient tightening can cause the threads to loosen and/or air to leak out.
- 2. Tightening of the fittings with a sealant
  - Tighten fittings with sealant using the proper tightening torques in the table below. As a rule, they should be tightened 2 to 3 turns with a tool after first tightening by hand.

Connection thread size	Proper tightening torque N·m	
NPT, R 1/8	3 to 5	
NPT, R 1/4	8 to 12	
NPT, R 3/8	5 to 10	
NPT, R 1/2	20 to 25	
NPT, R 3/4	28 to 30	
NPT, R 1	36 to 38	
NPT, R 1 1/4	40 to 42	
NPT, R 1 1/2	48 to 50	

- When a fitting is over tightened, more of the sealant material is squeezed out. Remove the squeezed out sealant material.
- 3) When tightening is not sufficient, it will cause sealant failure or a loose fitting.
- 4) Re-using
  - (1) Normally, a fitting with sealant can be re-used 2 to 3 times.
  - (2) Remove the sealant material that is separated and adhering to a removed fitting with air blow, etc. If the separated sealant enters into nearby equipment, it will cause air leakage or malfunction.
  - (3) When the sealant is no longer effective, wrap sealant tape over the sealant material and re-use the fitting. Do not use a sealant material other than sealant tape.
- In cases where positioning is required, turning the fitting in the reverse direction after tightening will cause air leakage.

### Precautions on Other Tubing Brands

### \land Caution

- When using tubing brands other than SMC, confirm that the tubing outside diameter tolerances satisfy the following specifications.
  - 1) Nylon tubing within ±0.1 mm
  - 2) Soft nylon tubing within ±0.1 mm
  - 3) Polyurethane tubing within +0.15 mm

within –0.2 mm

When the tube O.D. accuracy is not satisfactory and measurement of the internal diameter dimensions does not match the dimensions provided by SMC, do not use. The tube may not connect, or leaks, tube disconnection, or damage to fittings may occur.

**SMC**