

Hydraulic Hole Clamp

Model SFA Model SFC

Gripper expands and pulls workpiece down.

PAT.





Pulls and clamps in workpiece hole.

Hydraulic Hole Clamp Digest	Index Action Description	Model No. Indication	Specifications Performance Curve	External Dimensions	Layout Sample Circuit Reference	Cautions P.421	КК	DSMEK rmony in Innovation
Advantages								High-Power Series
								Pneumatic Series

• To Workpiece

- Zero interference with 5 faces except clamping face.
- Possible to use standard length tool which provides for better machining accuracy.
- Possible to enhance cutting parameters which leads to shorter cycle times.
- Elimination of multiple setups provides better machining process and zero setup time.

• To Machining Equipment

- Fixture could be extremely downsized.
- Turn-table could be downsized.
- The movement of tool could be shorten.
- For saving weight of fixture.
- Machining equipment could be more simple.
- Good design for easy flow of chips and reduction in coolant usage.



Hydraulic Series

Valve / Coupler

Hydraulic Unit

Manual Operation Accessories

Cautions / Others

Hole Clamp SFA SFC

Swing Clamp LHA

LHC

LHS

LHW

LG/LT

TLA-2 TLB-2

TLA-1

LKW LJ/LM TMA-2 TMA-1 Work Support LD LC

TNC TC

LLW

Linear Cylinder / Compact Cylinder

> LL LLR LLU

DP DR DS

Air Sensing Lift Cylinder

Link Clamp



<Before> Clamping around the Workpiece



<After> Using the Hole Clamps



<Before> Large Machining Centers and Long Machining Lines

• To Machining Line

- 5-face machining makes it possible to put process together.
- Machining line is kept small and simple.
- Possible to enhance cutting parameters which allows for shorter cycle times.



<After> Smaller Machining Centers and Shorter Machining Lines

			DT
			Block Cylinder DBA/DBC
		-	Centering Vise
			FVA
			FVD
			FVC
			Control Valve
	P.575	Model D1 C - P.597	BZL
	Double Action	Double Action	BZT
Classification	Standard Model	Offset Medel	BZX/JZG
	Standard Model	Offset Model	BZS
			Pallet Clamp
	Seating heights available in 5mm increments	Avoids interference with workpiece.	VS/VT
			Expansion Locating Pin VFL/VFM VFL/VFK
Features			Pull Stud Clamp
			FP
			FQ
			Customized
			Spring Cylinder
	L		DWA/DWB

More Flexible Fixture Design with NeW KOSMEK Hole Clamp

• Variable Mounting Dimensions to Suit the Process

Select appropriate mounting dimension according to the plate thickness.



• Seating Surface Height to Suit Variety of Work

Level the height in 5mm increments according to the phase of workpiece seating surface.



% The number of ($% 10^{-1}$) is referred to SFA3000.

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								High-Power Series
								Pneumatic Series

Hydraulic Series

Valve / Coupler Hydraulic Unit

Manual Operation Accessories

Cautions / Others

Hole Clamp

Swing Clamp LHA

> LHC LHS LHW LG/LT TLA-2 TLB-2

TLA-1

Link Clamp LKA LKC LKW LJ/LM TMA-2 TMA-1

Work Support

LD
LC
TNC
TC
Air Sensing
Lift Cylinder
LLW
Linear Cylinder /
Compact Cylinder
LLR
LLR

Hole Diameter to Suit Variety of Work

In order to suit different hole diameters and tolerances, hole diameters can be specified in 0.5mm increments.





Madal	Workpiece Hole Diameter (mm)																				
Model	б	6.5	7	7.	5	8 8.5	9	9.5	10	10.5	11	11.5	12	12.5	13	13.5	14	14.5	15	15.5	16
SFA/SFC1000		Bod	y S	Size	-	Туре	1														
SFA/SFC2000			ļ					l	Bod	y Siz	ze -	- Ту	pe 2	2							1
SFA/SFC3000							1								l	Body	/ Si	ze –	Ту	pe 3	3

% Max. operating pressure is 4MPa or 6MPa regarding to some of workpiece hole diameter.

More Powerful Clamping Force

Enables wider range of operating pressure by having more powerful clamping force.



* Max. operating pressure is 4MPa or 6MPa regarding to some of workpiece hole diameter.

ing Cylinder	
DWA/DWB	

Spr

DT

Block Cylinder DBA/DBC

More Safe Operation with NeW KOSMEK Hole Clamp

Cap Structure Available in Any Condition

% SFA/SFC1000 does not have the cap.



Minimum clearance between the cap and the gripper prevents cutting chips from entering inside the hole clamp.



Small clearance leads to effective purging. Even with a little air flow it prevents coolant from entering inside the hole clamp.



- Workpiece does not have contact with gripper.
 It makes loading-unloading smooth.
- Rough guide is not necessary on fixture.
 ※ It differs according to the loading speed.



High-Power Series

Pneumatic Series

Hydraulic Series

Valve / Coupler Hydraulic Unit

> Manual Operation Accessories

Cautions / Others

iole Clamp SFA SFC

Swing Clamp LHA

LHC LHS LHW LG/LT TLA-2 TLB-2 TLB-2 TLA-1 Link Clamp LKA LKC LKW LJ/LM TMA-2

TMA-1

Pursuing Good Design for Cutting Chips

Model No.

Indication

Index

Action Description

Hydraulic Hole Clamp

Digest

Having smaller seating surface and wide sweep area on the flange enables easy flow of cutting chips and reduction in coolant usage.

Specifications

Performance Curve

External

Dimensions

Layout Sample

Circuit Reference

Cautions

P.421



• Secure Clamp Action Out of Sight

Built-in spring grips workpiece strongly and pulls it in. There is no effect by the temperature and/or amount of oil.



Pulls on to seating surface.



Work Support LD LC TNC TC Air Sensing Lift Cylinder LLW Linear Cylinder / Compact Cylinder LL LLR LLU DP DR DS DT Block Cylinder DBA/DBC Centering Vise FVA FVD FVC Control Valve BZL BZT BZX/JZG BZS Pallet Clamp VS/VT Expansion Locating Pin VFL/VFN VFJ/VFK Pull Stud Clamp FΡ FQ Customized Spring Cylinder DWA/DWB

More Safe Operation with NeW KOSMEK Hole Clamp

Available for the Detection of Clamp Action

Lift-up function allows to check the movement of pulling and lifting off the workpiece. It can be used in automated line.



Abnormality Detection for Unpredictable Troubles

Anomaly detection for unpredictable trouble. It can be used in automated line.



The workpiece diameter with larger hole diameter than specification.



The workpiece is floated more than pulling stroke. (Seating Error)



Rod breakage due to transportation.

Hydraulic Hole Clamp Model No. Specifications Cautions Index External Layout Sample Digest Action Description Indication Circuit Reference P.421 Performance Curve Dimensions High-Power Series **Pneumatic Series Hydraulic Series Offset Model** Valve / Coupler Hydraulic Unit Manual Operation Accessories Cautions / Others Hole Clamp Hydraulic Hole Clamp Offset Model Model SFC Swing Clamp LHA The offset model allows for machining with no interference LHC LHS of workpieces, fixtures, tools, etc. when there is interference LHW LG/LT by using the standard SFA model. TLA-2 TLB-2 TLA-1 Link Clamp LKA LKC LKW LJ/LM TMA-2 TMA-1 Avoids interference with workpiece. Work Support \bigcirc LD LC TNC TC Air Sensing Lift Cylinder LLW F Linear Cylinder / Compact Cylinder A t LL LLR LLU DP DR DS H DT Block Cylinder 빒 Ľ DBA/DBC Centering Vise FVA Avoids tool interference FVD FVC for backside machining. Control Valve BZL BZT BZX/JZG

BZS Pallet Clamp VS/VT Expansion Locating Pin VFL/VFM VFJ/VFK Pull Stud Clamp FP FQ

PAT. Hydraulic Hole Clamp

Model SFA

Low Pressure (1.5~7MPa) Many Varieties



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Notes on Handling · Maintenance/Inspection · Warranty

Action Description





Released State

① Hydraulic pressure is supplied to the release port. ↓

⁽²⁾The rod is lifted up and the gripper retracts.

(For workpiece lifting option, there is a gap between workpiece bottom surface and seating surface.)

Hydraulic Pre	Seat Check Detection	
Release Pressure	Lock Pressure	(Air Sensor)
O N	OFF	OFF

Locked State

① Hydraulic pressure is supplied to the lock port. ↓

^②The rod descends and the gripper expands along the taper plane. (Since the gripper is lifted by spring force, it does not pull down.)

↓

③When pulling force exceeds the spring force for lift up, pulling force works after the gripper digs into workpiece. Then, it presses workpiece onto seating surface. (Clamping force = Pressing force onto seating surface.)

Hydraulic Pre	essure Switch	Seat Check Detection
Release Pressure	Lock Pressure	(Air Sensor)
OFF	O N	O N

E Centering Vise FVA FVD

FVC Control Valve

BZL

BZT BZX/JZG

BZS

VS/VT

VFL/VFM

VFJ/VFK

Pull Stud Clamp FΡ

FQ Customized Spring Cylinder DWA/DWB

Pallet Clamp

Expansion Locating Pin



Abnormality Detected State (Clamping without Workpiece)

The built-in check valve function and seating confirmation air pressure detect abnormal condition as follows.

- When clamping workpiece which has larger workpiece hole diameter or clamping without workpiece (In this state the gripper expands but the lifting spring does not have pulling force so the workpiece lifting surface does not descend.)
- When rod or gripper is broken.
- If the piston is fully stroked when it has to stop at the bottom.
- In the case workpiece is floated more than 1mm when setting it.

Hydraulic Pre	Seat Check Detection	
Release Pressure	(Air Sensor)	
OFF	O N	OFF

Hole	Clamp
	SFA
	SFC
Swin	g Clamp
	LHA
	LHC
	LHS
	LHW
	LG/LT
	TLA-2
	TLB-2
	TLA-1
Link	Clamp
	LKA
	IKC

High-Power

Pneumatic Series

Hydraulic Series Valve / Coupler Hydraulic Unit

Manual Operation

Cautions / Others

Accessories

Series

LKW LJ/LM TMA-2 TMA-1 Work Support LD LC TNC ТC Air Sensing Lift Cylinder LLW Linear Cylinder / Compact Cylinder LL

	LLR
	LLU
	DP
	DR
	DS
	DT
Block	Cylinder
	DBA/DBC

Model No. Indication (Workpiece Hole Shape : Straight)



1 Body Size * Please refer to the specifications, the performance curve and the external dimensions for details.

- **1** : Available in workpiece hole diameters between $\phi 6$ and $\phi 9$ (No Cap)
- **2** : Available in workpiece hole diameters between ϕ 9 and ϕ 13mm (With Cap)
- **3** : Available in workpiece hole diameters between ϕ 13 and ϕ 16mm (With Cap)





SFA2000/SFA3000 (With Cap)

2 Design No.

0 : Revision Number

3 Mounting Methods

- **G0** : Mounting Length 0mm
- M1 : Mounting Length 10mm
- M2 : Mounting Length 20mm



4 Workpiece Lifting Option

- A : With Lifting Function (Workpiece Lifting Option)
- N : Without Lifting Function

The lifting function lifts the workpiece 0.2mm up from the seating surface when the clamp is released.

Note : When using SFA with expansion locating pin(s) (model VFH, VFL, VFM, VFJ, VFK, VWH, VWM, VWK, VX), please choose **N** : Without Lifting Function.





With Lifting Function (Workpiece Lifting Option)

Without Lifting Function

Hydraulic Hol Diges	e Clamp it Acti	Inde> ion Desc	(riptio	n	Mode Indic	el No. atior	, 1	Spe Perfo	cifica rmanc	ition: e Curv	s ve	Ex Dim	terna ensio	l ns	Lay Circ	/out S cuit Re	Samp eferer	le ice	Ca	autio P.421	ns I		K	SMEK
																								High-Power Series
Pn														Pneumatic Series										
															Hydraulic Series									
																								Valve / Coupler Hydraulic Unit
																								Manual Operation Accessories
5 Work	piece H	lole D	Dian	nete	er (V	Vorl	kpie	ece	Hol	e Co	ode)												Cautions / Others
Work	piece Hole C	ode :	Work	piece	e Hol	e Dia	mete	er ø o	d + 0.7 - 0.3					Wor	kpiec	e Hole	Dian	neter ∍	φd+_	0.7 0.3				Hole Clamp
		*	Work	piece	hole	diame	eter s	hould	be sp	ecifie	ed in ().5mn	n											SFA
			incre	ment	s from	n the a	llowa	able ra	ange i	n the	table	belo	w.			F	-							SEC
																ſ	曲							Swing Clamp
														_				<u> </u>						
															<i></i>	$\sim -$		\sim						
Workpiece	Hole Code	060	065	070	075	080	085	000	005	100	105	110	115	120	125	130	125	1/10	1/15	150	155	160	0	LHW
Warksiegellah		000	005	7	75	000	005	090	095	100	105	11	11.5	120	125	12	12.5	14	145	150	155	100		LG/LT
workpiece Hole	2 Diam. φα <u>- 0.3</u> (mm) 0	0.5	/	7.5	ð	8.5	9	9.5	10	10.5	11	11.5	IZ	12.5	13	13.5	14	14.5	15	15.5	10)	TLA-2
SFA1000	No Cap			1	Allov	vableR	ange	1																TLB-2
SFA2000	With Can												Allow	able F	Range									TLA-1
SFA3000	with Cap																	Allov	/able R	lange				Link Clamp
: Мах. ор	erating pres	sure: 4	.0MPa	a in ca	ise of	▲ wo	rkpie	ce ho	le diar	neter														LKA
		6	.0MPa	a in ca	ise of	WO	rkpie	ce ho	le diar	meter	-													LKC
																								I KW

6 Seating Height Dimension

Blank	:Standard Height (\star part in the following table.)													
H Seating H	eight : Speci	fying Se	ati	ng	Hei	gh	t (Ir	n 5r	nm	ind	rer	nei	nts))
Model	Mounting				Se	eatir	ng H	eigł	nt H	(mr	n)			
Model	Methods	Standard Height	20	25	30	35	40	45	50	55	60	65	70	75
SEA 1000	G0	40					\star		H	F	Rang	je		
SEA 2000	M1	30			★ H Range									
51 A2000	M2	20	\star		H		Rang	je						
	G0	45						\star		Н	F	Rang	je	
SFA3000	M1	35				★		H		Rang	je			
	M2	25		*		K		Rang	je					



* ★ is standard height and seating height dimension code is [Blank].
 * Entry example when specifying non-standard seating height.

Seating Height 50mm : **H50**

7 Workpiece Hole (Gripper) Shape

Blank : With Serration (Workpiece Hole Shape: Straight)

Slope Angle

Less than 3°

Taper Hole

F : Without Serration (Workpiece Hole Shape: Straight)



Refer to P.377 ~ P.378 for the taper workpiece hole.

* Contact us when ordering the taper hole model.

Standard (Digs into and powerfully clamps a workpiece.)



Without Serration



LJ/LM TMA-2

TMA-1 Work Support

LD

LC

TNC TC

Compact Cylinder

LL

LLR

LLU

DP DR DS DT

Block Cylinder

Centering Vise FVA FVD FVC Control Valve

DBA/DBC

Air Sensing Lift Cylinder LLW Linear Cylinder /

VFL/VFM VFJ/VFK

Pull Stud Clamp FP FQ

Customized Spring Cylinder DWA/DWB

376

Model No. Indication (Workpiece Hole Shape : Tapered)



1 Body Size * Please refer to the specifications, the performance curve and the external dimensions for details.

- **1** : Available in workpiece hole mouth diameters between ϕ 6.5 and ϕ 9 (No Cap)
- **2** : Available in workpiece hole mouth diameters between ϕ 9 and ϕ 13mm (With Cap)
- **3** : Available in workpiece hole mouth diameters between ϕ 13 and ϕ 16mm (With Cap)





(With Cap)

2 Design No.

0 : Revision Number

3 Mounting Methods

- : Mounting Length 0mm **G0**
- M1 : Mounting Length 10mm
- M2 : Mounting Length 20mm



Mounting Length 0mm Mounting Length 10mm

Mounting Length 20mm

4 Workpiece Lifting Option

- A : With Lifting Function (Workpiece Lifting Option)
- N : Without Lifting Function

The lifting function lifts the workpiece 0.2mm up from the seating surface when the clamp is released.

Note : When using SFA with expansion locating pin(s) (model VFH, VFL, VFM, VFJ, VFK, VWH, VWM, VWK, VX), please choose **N** : Without Lifting Function.





With Lifting Function (Workpiece Lifting Option)

Without Lifting Function

	Hydraulic Hol Diges	e Clamp St	ا Action	Index Descripti	on	Mod Indi	el No. cation		Spe Perfo	ecifica rmano	ation: ce Cur	s ve	Ex Dim	terna ensic	l Ins	Lay Circ	vout S uit Re	Samp eferer	ole nce	C	autic P.42	ns 1			
																							-		High-Power
																									Series
	5 Work	piece	e Ho	le Mo	uth	Diar	nete	r (V	Vor	kpi	ece	Но	le C	ode	e)										Pneumatic Series
	Work	piece Hole	e Code	: Worl	piece	e Hole	Mout	h Di	ame	ter ¢	d						Но	le Mo	outh [Diame	eter ø	d			Hydraulic Series
				Wc inc	rkpiec	e hole	mouth	n diar Ilowa	neter	¢ds	should	d be s	pecifi wina t	ed in table	0.5mr	n			\leq						Valve / Coupler Hydraulic Unit
				* The dej	e allow pendin	able to g on t	oleranc he slop	e of the an	the h gle. R	ole m lefer t	outh o the	diame table	eter ¢ belov	d dif v.	fers										Manual Operation Accessories
																	-				~ ~				Cautions / Others
	Workpiece	e Hole Co	ode	(060) 06	5 070	075	080	085	090	095	100	105	110	115	120	125	130	135	140	145	150	155	160		
	SFA1000	No Car	o (mm)) – 0.		7.5 Al	lowable	Rang	e	9.5	10	10.5	11	11.5	TZ	12.5	15	15.5	14	14.5	15	15.5	10		Hole Clamp SFA
	SFA2000		- 							\wedge	\wedge				Allowa	able Ra	inge								SFC
	SFA3000	with C	ар.																Allo	wable	Range			_	Swing Clamp
	※ Max. op	perating	pressu	ire: 4.0M	Pa in c	ase of	▲ wor	kpie	ce ho	le dia	mete	r. 6.0N	/IPa in	case	of 🔳	workp	biece	hole	diam	eter.					LHA
	☆ Taper h	nole mod	del is r	not availa	ible fo	r Wor	kpiece	Hole	Cod	e:06	0.														LHS
																									LHW
	Workpie	ece Hol	le Slo	pe Ang	le an	d Allo	owabl	e To	lera	nce	of Ho	ole N	louth	n Dia	mete	er									TLA-2
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		Hole N	10uth [Diameter	φd			IVIO	odel l	NO. N	Norkp	ece Ho	ole Coo	le	Slop	e Ang		A	llowabl	le loler	ance of I	Hole Mo	uth Diam.		TLA-1
		noich	1		φu			SI	FA100	00	06	5~0	90			0 • •	≧ 2.5 <			4	va +0	.5		-	Link Clamp
															2.5 < 1 <		≧ 3 < 2			4	bd +0	.15			LKC
				ļ											$ \ge$	0 1	≧ 2 < 25			4	5 d ±0	.5			LKW
								S	FA 200	00		090			2 <		≟ 2.J < 2			4	5d = 0.	.15 .3			TMA-2
	C0.	5 or less	>					5	71201						2.J < 1 <		≓) <)5			4	50 0 50±0	.3			TMA-1
		/	->	Slope An	ale A						09	5~13	30		' ≓)5 <	A° 4	≓ 2.J < 3			4	5d +0.	3_			Work Support
				bioperai	gie o									-	1 <	A° <	= J < 25			4	5 d ±0	.15			LD
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								*	Plea	se co	ntact	us w	hen t	he slo	ope ar	ngle i	s less	than	1°.	4	v a _{=0.}	.15			TC
																									Air Sensing Lift Cylinder
	6 Seati	ing He	eigh	t Dim	ensi	on																			
	Diauli		C +	-ll-l			4 to 44				I= I =)		tų		ħ				_						Linear Cylinder / Compact Cylinder
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	H Seating	Height :	Speci	ifying Se	eating	Heig	ht (In :	5mn	n inc	reme	ents)		± %			-	H Seat				H [] Seating	A			LLU
Ī	Model	2 Mou	unting			Sea	ting He	ight ŀ	l (mm	ר)			ndard ting Heig				gHeight	Ø		00	ird g Height		J.		DP
	Model	Met	thods	Standard Height	20 25	5 30 3	40 4	15 50	55	60 65	5 70	75	8.8		m	Πŵ	Standa Seatin				Stando Seatin				DR
	SFA1000	M	11	30		+	×	Ban	n L K	ange				-	-	Ψ				L Y					DT
	SFA2000	M	12	20	*	HC	Range	}							60				M1				M2		Block Cylinder
I		G	0	45			,	*	H	Ran	ge			- jc c+-	ndard	hoiah	ntand	(Dotion	naba	aight -	limon	sion cr	nde is [Rlank]		DBA/DBC
	SFA3000	М	1	35		,	*	H	Range	e				ים יזרי יים יזרע	amnl	- whe	n sner	ifvin	, non	-stan	ard o	atina	height	_	Centering Vise
		M	12	25	*		H Ra	inge					Se	eating	Heigh	nt 50m	nm :	150		stand					FVA FVD
																									FVC
																									Control Valve
	7 Work	cpiece	e Ho	le (Gr	ippe	er) S	hape	č																	BZL
	т	• Tapa		o (with S	orrati													г							BZX/JZG
		• Tape				011)	<i>C</i> .											•							BZS
	When	ordering	g this r	model, pl	ease I	nform	us of t	the d	etaile	ed			\square	\square	Slor						With	n Serra	ition		Pallet Clamp
	almen	sions of	the wo	откріесе	noie.								>		≤ Less	than 3	s°			- Children	Stanc	lard (Dig	gs into and	_	VS/VT
															_						powe	ertully cl	amps a workpiece	e.)	Expansion Locating Pin
													Wo	rkpie	ce Hol	e Sha	pe : 1	aper	Hole	(with	Serra	tion)		-	VFL/VFM
															('No	Serra	tion'	s not	avail	lable.))				VFJ/VFK
																								_	Pull Stud Clamp
																									FP FO
																									Customized
						R	efer	to F	P.37	5 ~ I	P.37	6 fo	r th	e st	raig	ht w	ork	pied	ce h	ole.					Spring Cylinder
		Hole	Shane	e:Straigh	t																				DWA/DWB
		-1016	Snape																						
																									378

Specifications (Workpiece Hole Shape : Straight)

Applicable Model No.



		SFA1000-□□-□-□				SFA2000-□□-□-□				SFA3000-□□-□-□											
Model No.				SFA	1000)-□□]-[]-	□-F		S	FA20	00-]- F		SF/	4300	0-□□]-[]-[]-F	
	5 Workpiece Hole	Code	060	065	070	075	080	085	090	090 095	100 10	05 1 ⁻	10 115 12	0 125 13	0 130	135	140	145	150	155	160
Workpieco	Hole Diam. ϕ d $^{+0.7}_{-0.3}$	mm	6	6.5	7	7.5	8	8.5	9	9 9.5	10 10).5 1	1 11.5 1	2 12.5 13	8 13	13.5	14	14.5	15	15.5	16
workpiece	Hardness										HB	250	or less								
Allowable Offset (Floating	Clearance of Expanding Area) $^{st 1}$	¹ mm										\pm	0.5								
Full Stroke		mm										4	.2								
Workpiece Pul	ling Stroke	mm										1	.0								
Workpiece Lift	ing Stroke ^{**2}	mm										0	.2								
Workpiece Lift	ing Force ^{**2}	kN			0.09								0.23								
Cylinder Capacity	Release	cm ³		2.4						3.8								6.7			
(Empty Action)	Lock	cm ³				1.8				3.0								5.4			
Cylinder Inner	Diameter ^{※3}	mm				27				34						45					
Rod Diameter	*3	mm				14				16							20				
Max. Operating	g Pressure	MPa	4	.0			7.0			4.0	6.0		7.	0				7.0			
Min. Operating	g Pressure	MPa	1	.5			1.5			1.5	1.5		1.	5				1.5			
Withstanding	Pressure	MPa	6	.0			10.5			6.0	9.0		10	.5				10.5			
Recommended	Air Blow Pressure	MPa		0.4 ~ 0.5					0.2 ~ 0.3						0.2 ~ 0.3						
Operating Ten	nperature	°C										0~	- 70								
Usable Fluid								Ge	nera	al Hydra	aulic C	Dil E	quivale	nt to IS	D-VG	-32					
Weight					Please refer to the external dimensions for the product weight.																

Notes :

% 1. The clamping part is an adjusting structure and the clamping operation is done by locating the workpiece hole. The numerical value in the table shows the amount of tolerance value of single clamp. Please consider the center distance accuracy of each clamping installation part and each workpiece hole when used with another location clamp / location cylinder, or when using more than two of these products.

% 2. Workpiece lifting stroke and workpiece lifting force are functions only for lifting option.

** 3. Clamping force cannot be calculated from the cylinder inner diameter and the rod diameter. Please refer to the clamping force curve.



Blank

ΗC

Seating Height

5 Workpiece

Hole Diam.

Т

7 Workpiece Hole (Gripper) Shape

Pneumatic Series

Hydraulic Series

Valve / Coupler Hydraulic Unit

Manual Operation Accessories

Cautions / Others

Hole Clamp SFA SFC

																		Swing	Clamp
				SFA10	00		-□-T		SFA2	2000-00-0]- □-T		SFA30	00-🗆]-[]-	⊡-T		_	LHA
Model No.																		_	LHC
	5 Workpiece Hole	e Code	060	065 07	0	075 080	085	090	090 095 100	105 110 115	120 125 130	130	135 14	0 145	150	155	160	_	LHS
	Hole Mouth Diam. ϕ	d mm	_	6.5 7		7.5 8	8.5	9	9 9.5 10	10.5 11 11.5	12 12.5 13	13	3.5 14	14.5	15	15.5	16	_	LHW LG/LT
					_		Dies			Varlusianal		an D 3	70	1					TLA-2
Workpiece	Allowable Tolerance of Hole M	iouth Diam.	_	1			Pied	asere	eler to S v	vorkpiece r	iole Code	0N P.3	/ð.					_	TLB-2
	Hole Slope Angle		-							3° or less								_	TLA-1
	Hardness		_						F	B250 or les	SS							Link Cl	amp
Allowable Offset (Flo	hating Clearance of Expanding Area)	^{*4} mm	_	1	±0.5							_	LKA						
	adding creaturice of Expanding Area			1						0.5								_	
Full Stroke	2	mm	-							4.2									
Workpiece	e Pulling Stroke	mm	-		1.0							TMA-2	TMA-2						
Workpiece	e Lifting Stroke ^{**5}	mm	_							0.2									TMA-1
Workpiece	e Lifting Force ^{%6}	kN	_		0.09				0.15				0.23				Work S	upport	
Culinder Ca	pacity Poloaco	3		1	2.4				2.0				67				_	LD	
Cylinder Ca	pacity Release	Cm ³	_	1		2.4				0.7					_				
(Empty Act	ion) Lock	cm ³	-	1		1.8				3.0		5.4						TC	
Cylinder Ir	nner Diameter ^{%6}	mm	-	1		27				34				45				Air Sor	sing
Rod Diam	eter ^{%6}	mm	-	1		14				16				20				Lift Cy	linder
Max. Oper	ating Pressure	MPa	_	4.0			7.0		4.0	6.0	7.0	6.0		7.0	0				LLW
Min. Opera	ating Pressure	MPa	_	1.5			1.5		1.5	1.5	1.5	1.5		1.	5			Linear Compa	Cylinder / act Cylinder
Withstand	ling Pressure	MPa	_	6.0		1	0.5		6.0	9.0	10.5	9.0		10.	.5			_	LL
Recommen	ded Air Blow Pressure	MPa	_	(0.4 ~ 0.5				0.2 ~ 0.3			().2 ~ 0.	.3			_	LLK	
Operating	Temperature	°C	_		0~70						_	DP							
	id	C			_		6		ما المرابية ال		lant to 100		2					_	DR
Usable Flu	liu		_				G	enera	ai Hydraulio	C OII Equiva	lient to ISC	J-VG-3	2					_	
Weight		-	1		Pleas	e refe	er to	the externa	al dimensio	ns for the	produ	ct weig	ght.						

* 7 T: Taper hole option is not available for Workpiece Hole Code: 060.

Applicable Model No.

2 3

1 Body Size

00 0

SFA

G0

M1

M2

Mounting

Methods

Α

Ν

Workpiece

Lifting Option

Notes :

%4. The clamping part is an adjusting structure and the clamping operation is done by locating the workpiece hole. The numerical value in the table shows the amount of tolerance value of single clamp. Please consider the center distance accuracy of each clamping installation part and each workpiece hole when used with another location clamp / location cylinder, or when using more than two of these products.

%5. Workpiece lifting stroke and workpiece lifting force are functions only for lifting option.

%6. Clamping force cannot be calculated from the cylinder inner diameter and the rod diameter. Please refer to the clamping force curve.

LLR LLU DP DR DS DT Block Cylinder DBA/DBC Centering Vise FVA FVD FVC Control Valve BZL BZT BZX/JZG BZS Pallet Clamp VS/VT

Expansion Locating Pin VFL/VFM VFJ/VFK

Pull Stud Clamp FΡ FQ

Customized Spring Cylinder DWA/DWB

Clamping Force Curve (Workpiece Hole Shape : Straight)



7 Shape of Gripper (Workpiece Hole) : **Blank** (With Serration)

Model No.		SFA1000-□-□-□				SFA2000-□-□-□				SFA3000-□□-□-□			
MODELINO.	5 Workpiece Hole Code	060 065	070 075	080	085 090	090 095	100 105	110 115 1	20 125 130	130 135	140 14	5 150	155 160
	Hyd. Pressure 7 MPa	_		2.7		-	_	Z	1.5		8.2	2	
	Hyd. Pressure 6 MPa	_		2.3		-	3.9	3	3.9		7.0)	
Hyd. Pressure 5 MPa		_		1.9		-	3.2		3.2		5.8		
Clamping	Hyd. Pressure 4 MPa		1.5					2.5			4.6	5	
Force KN	Hyd. Pressure 3 MPa		1.1			1.9				3.4			
	Hyd. Pressure 2 MPa	0.7						1.2		2.2			
	Hyd. Pressure 1.5 MPa	0.5						0.9		1.6			
Clamping Force Calculation Formula $^{\otimes 1}$ kN		$F = 0.4 \times P - 0.1$			F = 0.67 × P - 0.15			.15	F = 1.21 × P - 0.24				
Max. Operating Pressure MPa		4.0	4.0 7.0			4.0 6.0 7.0			7.0	7.0			

Z Shape of Gripper (Workpiece Hole) : **F** (Without Serration)

Model No.		SFA1000-□□-□-□-F				FA2000	D-□□-□- - - F	SFA3000-□□-□-□-F			
	5 Workpiece Hole Code	060 065	070 075 080	085 090	090 095	100 105	110 115 120 125 130	130 135 140	145 150 155 160		
	Hyd. Pressure 7 MPa	_	0.75		-	-	1.3		2.3		
	Hyd. Pressure 6 MPa	_	0.65		-	1.1	1.1		2.0		
	Hyd. Pressure 5 MPa	-		-	0.90	0.90	1.6				
Clamping	Hyd. Pressure 4 MPa		0.40				0.70		1.3		
Force KIN	Hyd. Pressure 3 MPa		0.30	0.50			0.95				
	Hyd. Pressure 2 MPa					0.30	0.60				
	Hyd. Pressure 1.5 MPa		0.10			0.20	0.45				
Clamping Force Ca	alculation Formula *1 kN	F =	= 0.12 × P – 0	.05		F = 0.2	$P \times P - 0.1$	F = 0.34	4 × P − 0.07		
Max. Operating Pressure MPa		4.0	7.0	4.0 6.0 7.0			7.0				



Notes:

- 1. The table and graph show the relationship between clamping force (kN) and supply hydraulic pressure (MPa).
- 2. Clamping force shows a pressing force against the seating surface.
- 3. Thin wall around the workpiece hole can be deformed by clamping action, and the clamping force will not fill the specification.
- Clamping force of F: Without Serration shows the calculated value when the friction coefficient of workpiece and gripper is μ0.1.
- %1. F:Clamping Force (kN), P:Supply Hydraulic Pressure (MPa)



Z Shape of Gripper (Workpiece Hole) : **T** Taper Hole (With Serration)

Model No.			SFA100	0-□□-□- - -T	SFA2000-□-□-□-T				SFA3000-□□-□-T				
Model No.	5 Workpiece Hole Code	060	065 070	075 080 085 09	090 095 100	105 110 115	120 125 130	130	135 140 145 150 155 160				
	Hyd. Pressure 7 MPa	-	_	2.7	-	-	4.5	-	8.2				
	Hyd. Pressure 6 MPa	-	-	2.3	-	3.9	3.9		7.0				
Hyd. Pressure 5 MPa		-	-	1.9	-	3.2	3.2	5.8					
	Hyd. Pressure 4 MPa	-		1.5		2.5			4.6				
Force KIN	Hyd. Pressure 3 MPa	-		1.1		1.9		3.4					
	Hyd. Pressure 2 MPa	-		0.7		1.2		2.2					
Hyd. Pressure 1.5 MPa		-		0.5		0.9		1.6					
Clamping Force Calculation Formula $^{\otimes 2}$ kN		-	F =	$0.4 \times P - 0.1$	F =	0.67 × P –	0.15		$F = 1.21 \times P - 0.24$				
Max. Operatin	g Pressure MPa	-	4.0	7.0	4.0	6.0	7.0	6.0	7.0				

* 7 **T**: Taper hole option is not available for Workpiece Hole Code: **060**.



Notes:

- 1. The table and graph show the relationship between clamping force (kN) and supply hydraulic pressure (MPa).
- 2. Clamping force shows a pressing force against the seating surface.3. Thin wall around the workpiece hole can be deformed by clamping
- action, and the clamping force will not fill the specification. #2. F:Clamping Force (kN), P:Supply Hydraulic Pressure (MPa)

	Accessories
	Cautions / Others
	Hole Clamp
	SFA
	3FC
	Swing Clamp
	LHA
	LHS
	LHW
	LG/LT
	TLA-2
	TLB-2
	ILA-1
	Link Clamp
	LKA
	LKC
	TMA-2
	TMA-1
	Work Support
	LC
	TNC
	TC
	Air Sensing
	Lift Cylinder
	LLW
	Linear Cylinder /
	Compact Cylinder
	DP
	DR
	DS
	DT
	Block Cylinder
g	DBA/DBC
	Contoring Viso
	FVA
	FVD
	FVC
	Control Valve
	BZL
	BZT
	BZX/JZG
	BZS
	Pallet Clamp
	VS/VT
	Expansion
	Locating Pin
	VFL/VFM
	VFJ/VFK
	Pull Stud Clamp
	FP
	FQ
	Customized
	Spring Cylinder
	DWA/DWB

External Dimensions

%The drawing shows the released state of SFA1000-G0A- \square .





Notes:

* Expanding Area Detail

 Thin wall around the workpiece hole could be deformed by clamping action, and clamping force will not fill the specification.

Please make sure to test the clamping function before using and adjust to the appropriate supply of pressure.

**6. When the clamp head is sticking above the surface Y of the workpiece, please make sure there is no interference with the clamp cylinders during machining.

Hydraulic Hole Clamp DigestIndex Action DescriptionModel No.Specifications Performance CurveExternal DimensionsLayout Sample Circuit ReferenceCautions P.421	KOS Harmony in
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Machining Dimensions of Mounting Area



Notes :

- 1. There should be no burrs at the hole contact surface.
- %7. Please make a hydraulic release port within the range of

Model No. Indication



External Dimensions and Machining Dimensions for Mounting ,

-				-	•				(mm						
Model No.					SFA100	0-G0									
5	Workpiece	e Hole Code	060	065	070	075	080	085	090						
Workpiece Hole	e Diam. ϕ d	7 Blank , F ^{%10}	6 + 0.7	$6.5^{+0.7}_{-0.3}$	7 ^{+ 0.7} - 0.3	$7.5^{+0.7}_{-0.3}$	8 + 0.7	$8.5^{+0.7}_{-0.3}$	9 + 0.7						
Clamping	Released S	tate	5.5	6	6.5	7	7.5	8	8.5						
Diameter	Empty Ac	tion	7.2	7.7	8.2	8.7	9.2	9.7	10.2						
Allowable Offset (Flo	bating Clearance of	f Expanding Area) ^{%8}		±0.5											
Full Stroke				4.2											
Workpiece P	Pulling Strol	ke	1.0												
Workpiece L	ifting Strok	е ^{ж9}				0.2									
7 Change	fCrinner	G	9	9	9	10	10	10	10						
	i Gripper	S	5.5	5.5	5.5	6	6	6	6						
DIdlik, F		U	5.55	6.05	6.55	7.05	7.55	8.05	8.55						
7 Change of	f Cuimmon	G	-	9	9	9	10	10	10						
	Gripper	S	-	5.5	5.5	5.5	6	6	6						
I		U	-	5.45	5.95	6.45	6.9	7.4	7.9						
	8.5	9	9.5	10	10.5	11	11.5								
	12	13	13	14	14	15	15								

Notes : ** 8. The clamping part is an adjusting structure and the clamping operation is done by locating the workpiece hole. The numerical value in the table shows the amount of tolerance value of single clamp. Please consider the center distance accuracy of each clamping installation part and each workpiece hole when used with other location clamps / location cylinders, or when using more than two of these products. ** 9. Workpiece lifting stroke is the function only for lifting option.

** 10. For -T: Taper Hole option, the allowable tolerance of the hole mouth diameter differs depending on the slope angle. (Refer to P.378.)

								(mm	
6 Seating Height Dime	Standard Height Specifying Seating Height								
3 Mounting Method		Blank	H45	H50	H55	H60	H65	H70	
	Н	40	45	50	55	60	65	70	
In case of G0	AA	-	5.5	10.5	15.5	20.5	25.5	30.5	
	Weight kg	0.6	0.6	0.6	0.6	0.6	0.7	0.7	

1	Body Size (When selecting 1)
2	Design No.
3	Mounting Methods (When selecting G0)
4	Workpiece Lifting Option
5	Workpiece Hole Diameter (Workpiece Hole Code)
6	Seating Height Dimension

7	Shape of Gripper (Workpiece Hole)	

TMA-2	
TMA-1	
Work Support	
LD	
LC	
TNC	
TC	
Air Sensing Lift Cylinder	
LLW	
Linear Cylinder / Compact Cylinder	
LL	
LLR	
LLU	
DP	
DR	
DS	
DT	
Block Cylinder	
DBA/DBC	
Centering Vise	
FVA	
FVD	
FVC	
Control Valve	
BZL	
BZT	
BZX/JZG	
BZS	

AEK

High-Power

Pneumatic Series

Hydraulic Series

Valve / Coupler Hydraulic Unit

Accessories Cautions / Others

Hole Clamp

SFA SFC

Swing Clamp

LHA

LHC LHS LHW LG/LT TLA-2 TLB-2 TLA-1 Link Clamp LKA

> LKC LKW

LJ/LM

Manual Operation

Series

Pallet Clamp VS/VT Expansion Locating Pin VFL/VFM

VFJ/VFK Pull Stud Clamp FP

FQ

Customized Spring Cylinder DWA/DWB

External Dimensions

%The drawing shows the released state of SFA1000-M1A-□.



Workpiece (Pallet) Hole Dimensions





- ※1. The workpiece must be resting on all seating surfaces when clamping. If this is not done the workpiece can be deformed by the clamping force.
- ※2. Use jack bolts to remove the product, keeping it parallel to the mounting surface.
- ※3. The port names are marked on the product surface. (HYD:Hydraulic Lock Port, FC:Seating Confirmation Air Port, BLOW:Air Blow Port) Continuously supply air pressure to the air blow port and the seating confirmation air port.
- %4. The numerical value is only for the workpiece lifting option.
- %5. Refer to Seating Height: Standard for unlisted dimensions.
- %6. For **-T**: Taper Hole option, the first gripper ridge is the reference diameter.

Notes:

 Thin wall around the workpiece hole could be deformed by clamping action, and clamping force will not fill the specification.

Please make sure to test the clamping function before using and adjust to the appropriate supply of pressure.

**7. When the clamp head is sticking above the surface Y of the workpiece, please make sure there is no interference with the clamp cylinders during machining.

Hydraulic Hol Diges	e Clamp St A	Index ction Description	Model No Indicatio	n Perfo	ecification prmance Cur	ns rve Di	External imensio	l L ns C	.ayout Sa ircuit Refe	mple erence	Cautio P.421	ns I	K	KOSMEK Harmony in Innovation
Mach	ining	Dimonsion	e of Mou	ating A	*									High-Power
Wach	ining			1 ting A 1-M4×0.71	rea Thread Dept	oth 7 or m	nore							Series
Air Blow F	Port d 3													Pheumatic Series
All blow r		• TII	0 ¹⁸ 0 [−]	A A A A A A A A A A A A A A A A A A A										Hydraulic Series
	5.5 5.5			27										Valve / Coupler Hydraulic Unit
Seating Confirmation Air Port of Air Porto	tion $\phi 3$			Hydrau	lic Lock Por	rt d 3								Manual Operation Accessories
		22	22	Inyulau	ILC LOCK I OI	Notos :								Cautions / Others
		<i>ф</i> 34н8	+ 0.039	ore		1. Th	here shou	ıld be no	burrs at t	he hole o	contact sur	face.		Hole Clamp SFA
		Ξ	Rz 6.3	or m		2. Pl **8 Re	lease con [.] elease by	tact us w draulic p	hen addii	ng a spac In he sur	cer. Indied from	the side	or	SFC
		Rz 6.3		6	-	bo	ottom sui	rface.		in be sup	plicanom	the slat		Swing Clamp
			Ţ IŢ	* 0 ⁺	Ole	Ple	lease mak	ke a hydr	aulic relea	ise port v	within \blacklozenge are	ea in the	e case	LHA
			0.4	 ↓ □ ↓ 	10	SU	upplied fr	om the s	side.	so port i	within //	area i	a tha ca	LHS
	·					Pi Su	upplied fr	om the b	ounc relea	ise port V	///////////////////////////////////////	📶 area li	n une ca	LHW LG/LT
Hydraulic Relea	se Port ^{%8}	¢ 33.8	±0.1	s *9		%9. Ba	ase thickr	ness and	remaining	g depth o	of the lowe	r hole m	achinin	g TLA-2
		< _ _ _ _ _ _ _ _ _ _ _ _ _	>	r les:		(2	2.5mm) is	for wher	n the mate	erial is S5	0C.			TLA-1
				2.5 0										Link Clamp
C Mode	el No. I	ndication												LKA
										1 Body	v Size (Whe	n selecti	ing 1)	LKC
							B	lank		2 Desig	gn No.			LJ/LM
SE	A 1		M1 A			Blank				3 Mount	tina Methods	/Whon co		
						Diam				_	5	(when se	lecting M	1/M2) TMA-2
51	~ + '	00 <u>0</u> –	M2 N	- 08	80 -	H		T		4 Work	cpiece Liftin	ng Optic	lecting M on	1/M2) TMA-2 TMA-1
51		00 <u>0</u> –	M2 N	- 07	30 –	H	-	F		4 Work 5 Workpi	cpiece Liftin iece Hole Diame	ng Optic eter (Workp	lecting M on biece Hole	1/M2) TMA-2 TMA-1 Code) Work Support
01		00 0 -	M2 N	_ 08	<u>80</u> – [-	T F 7		4 Work 5 Workpi 6 Seati	xpiece Liftin iece Hole Diame ing Height	ng Optic eter (Workp Dimensi	lecting M on biece Hole ion	1/M2) TMA-2 TMA-1 Code) Work Support LD LC
01		2	M2 N	01	30 –		-	T F 7		4 Work5 Workpi6 Seati7 Shap	cpiece Liftin iece Hole Diame ing Height be of Grippe	ng Optic eter (Workp Dimensi er (Work	lecting M on biece Hole ion piece H	1/M2) TMA-2 TMA-1 Code) Work Support LD LC TNC TC
© Extern	nal Din	2 nensions ar	M2 N 3 4 ad Machini	ng Dim	BO –	H 6	ountir)	4 Work 5 Workpi 6 Seati 7 Shap	xpiece Liftin iece Hole Diame ing Height be of Grippe	(When se ng Optic eter (Workp Dimensi er (Work	lecting M on biece Hole ion piece H	1/M2) TMA-2 TMA-1 Code) Work Support LD LC TNC TC Air Sensing
© Extern	1 nal Din	2 nensions ar	M2 N 3 4 ad Machini	ng Dim	80 − 5 ensions	for M	ountir	T F 7)	 Work Workpi Seati Shap 	kpiece Liftin iece Hole Diame ing Height be of Grippe	(When se ng Optic eter (Workp Dimensi er (Work	lecting M on biece Hole ion piece H	TMA-2 TMA-1 Code) Work Support LD LC TNC TC Air Sensing Lift Cylinder
C Extern	nal Din	2 nensions ar	M 2 N 3 4 nd Machini	ng Dim SFA100 070 97 7 + 97	80 –	6 6 6	ountir	T F 7 ng (mm) 090)	 Work Workpi Seati Shap 	kpiece Liftin iece Hole Diame ing Height be of Grippe	eter (Workp Dimensi	lecting M on ioece Hole ion piece H	1/M2) TMA-2 TMA-1 Code) Work Support LD LC TNC TC Air Sensing Lift Cylinder LLW
Extern Model No. Workpiece Ho	1 nal Din 5 Workpie Die Diam. ϕ o Release	2 nensions ar ece Hole Code d 7 Blank, F *12 d State	M 2 N 3 4 ad Machini 060 065 6 ^{+0.7} 6.5 ⁺ 5.5 6	ng Dim 5FA100 070 0.3 7 + 0.3 6 5 6 5 6 5 6 5 6 5 6 5 6 5 6 5	80 – 5 ensions 00–M. – 0 7.5 + 0.7 7.5 + 0.7 7.5 + 0.7	6	- ountir	T F 7 19 (mm) 090 9 + 0.7 9 + 0.7 8 5)	4 Work 5 Workpi 6 Seati 7 Shap	cpiece Liftin iece Hole Diame ing Height be of Grippe	ng Optic eter (Workp Dimensi er (Work	lecting M on ior ion piece H	1/M2) TMA-2 TMA-1 Code) Work Support LD LC TNC TC Air Sensing Lift Cylinder LLW Linear Cylinder / Compact Cylinder
Extern Model No. Workpiece Ho Clamping Diameter	1 nal Din 5 Workpie ble Diam. \$ c Release Empty	2 nensions an ece Hole Code d 7 Blank, F **12 d State Action	M 2 N 3 4 4 6 6 6 6 -0.7 5.5 6 7.2 7.7	ng Dim 5FA100 0.77 + 0.3 6.5 8.2	80 – 5 ensions 00–M 075 7.5 ^{+0.7} 7 8.7	6 for Ma 080 8+0.7 7.5 9.2	085 8.5 ^{+0.7} 8	T F 7 19 (mm) 9 090 9 0 9 0 0 0 0 0 0 0 0		4 Work 5 Workpi 6 Seati 7 Shap	cpiece Liftin iece Hole Diame ing Height pe of Grippe	(Wilen sei ng Optic eter (Workp Dimensi er (Work	lecting M on ion piece H	1/M2) TMA-2 TMA-1 Code) Work Support LD LC TNC TC Air Sensing Lift Cylinder LLW Linear Cylinder / Compact Cylinder
Clamping Diameter	1 5 Workpin 6 Diam. ϕ of Released Empty Floating Clearan	2 nensions an ece Hole Code d 7 Blank, F **12 d State Action ce of Expanding Area)**10	M 2 N 3 4 4 6 Machini 6 + 0.7 5.5 6 7.2 7.7	ng Dim SFA100 5 070 0.3 7 ^{+0.7} 6.5 8.2	80 – 5 ensions 00–M – 0 7.5 + 0.7 7.5 + 0.7 8.7 ± 0.5	6 for M 080 8 ^{+0,3} 7.5 9.2	ountir 085 8.5 ^{+0.7} 8 9.7	7 7 7 9 (mm) 9 ±0.7 9 ±0.7 9 ±0.7 8 .5 10.2		4 Work 5 Workpi 6 Seati 7 Shap	cpiece Liftin iece Hole Diame ing Height pe of Grippe	(Wilen sei ng Optic eter (Work Dimensi er (Work	lecting M on biece Hole ion piece H	1/M2) TMA-2 TMA-1 Code) Work Support LD LC TNC TC Air Sensing Lift Cylinder LLW Linear Cylinder / Compact Cylinder LLR LLR LLU
Clamping Diameter Allowable Offset (Full Stroke	1 nal Din Workpi le Diam. ϕo Release Empty Ploating Clearance	2 nensions ar ece Hole Code d 7 Blank, F *12 d State Action ce of Expanding Area) *10	M 2 N 3 4 10 Machini 060 065 6 ^{+0.7} _{-0.3} 6.5 ⁺ 5.5 6 7.2 7.7	ng Dime SFA100 070 0.3 7+0.3 6.5 8.2	80 – 5 ensions 00–M0–– 7.5 + 0.7 7.5 + 0.7 7.5 + 0.7 8.7 ± 0.5 4.2	6 6 6 6 6 6 7.5 9.2	ountir 085 8.5 ^{+0.7} 8 9.7	7 7 7 7 7 7 7 7 7 7		4 Work 5 Workpi 6 Seati 7 Shap	cpiece Liftin iece Hole Diame ing Height pe of Grippe	(Wilen sei ng Optic eter (Workp Dimensi er (Work	lecting M on oiece Hole ion piece H	1/M2) TMA-2 TMA-1 Code) Work Support LD LC TNC TC Air Sensing Lift Cylinder LLW Linear Cylinder / Compact Cylinder / Compact Cylinder LLR LLR LLU DP
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 Extern Model No. Workpiece Ho Clamping Diameter Allowable Offset (IF Full Stroke Workpiece Shape of Blank, Shape of T Notes : %10 %11 		2 nensions an ece Hole Code d 7 Blank, F **12 d State Action ce of Expanding Area) **10 roke **11 r G r G r G r G r G r G r G r G r G r	M 2 N 3 4 060 065 6 + 0.3 6.5 + 5.5 6 7.2 7.7 9 9 5.5 5.55 5.55 6.09 - 9 9 9 5.5 6.09 - 5.48 8.5 9 12 13 adjusting struct pount of tolerance e hole when use is the function n, the allowable	9 5.5 5 6.55 9 5.5 5 5.55 5 5.95 9 5.5 5 5.95 9 5.5 5 5.95 9.55 13 ture and three value of seed with oth only for liftite tolerance	80 - ensions oo-M - oo-M - 	H 6 6 6 6 7.5 9.2 7.5 9.2 7.5 10 6 7.55 10 6 6.9 10.5 14 0peration p. Please clamps / emouth c	-	T F 7 10 090 9 $^+0.7$ 8.5 10.2 10 6 8.55 10.2 10 6 8.55 10 6 7.9 11.5 15 b y locat the cent cylinder differs do) ting the w ter distance s, or wher	 4 Work 5 Workpi 6 Seati 7 Shap orkpiece a accuration of the second second	e hole. The increase of Grippe	numeric clampin wo of the (Refer to	al value ig instal ese pro-	1/M2) TMA-2 TMA-1 TMA-1 Code) Work Support LD LD LC TNC TC Air Sensing Lift Cylinder LLW Linear Cylinder / Compact Cylinder LLR LLU DP DR DS DT Block Cylinder DS DT Block Cylinder Centering Vise FVA FVD FVC Control Valve BZL BZT BZX/JZG BZS Pallet Clamp VS/VT Expansion
 Extern Model No. Workpiece Ho Clamping Diameter Allowable Offset (Full Stroke Workpiece Shape of Blank, Shape of T Notes : % 10 % 11 % 12 Seating 		2 nensions ar ece Hole Code d Z Blank, F *12 d State Action ceof Expanding Area) *10 roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke roke r	M 2 N 3 4 060 065 6+0.3 6.5+ 5.5 6 7.2 7.7 9 9 5.5 6.05 5.5 6.05 - 9 9 9 5.5 6.05 - 5.5 5.55 6.05 - 9 9 9 5.5 6.05 - 5.5 5.55 6.05 - 9 12 13 adjusting structor 5 point of tolerance hole when used is the function in, the allowable Standard Height 5	P 070 0.7 070 0.3 7+0.3 6.5 8.2 0 5.5 5 6.55 9 5.5 5 5.95 93 5.5 5 5.95 91 5.5 5 5.95 93 13 ture and thick ed with oth only for lift et oll erance nt 0	80 - 80 - 70 - 100 -	H 6 6 6 6 7.5 9.2 7.5 9.2 7.5 10 6 6.9 10.5 14 operatio p. Please clamps / e mouth c Spece	-	T 7 090 9 ±0.7 8.5 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.5 15.5 10.5 15.5 10.5 15.5 10.5 15.5 10.5 15.5 10.5 15.5 10.5 15.5 10.5 15.5 15.5 15.5 10.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5 15.5) ting the w ter distance s, or wher epending	 4 Work 5 Workpi 6 Seati 7 Shap orkpiece ce accura a using m on the sl 	e hole. The i accy of each hore than two lope angle. (mm)	numeric clampin wo of the (Refer to	al value g instal ese prov o P.378.	1/M2) TMA-2 TMA-1 TMA-1 Code) Work Support LD LC TNC TC Air Sensing Lift Cylinder LLW Linear Cylinder / Compact Cylinder LLR LLR LLR LLR LLR LLU DP DR DS DT Block Cylinder Block Cylinder Centering Vise FVA FVD FVC Control Valve BZT BZT BZT BZS Pallet Clamp VS/VT Expansion Locating Pin VEL/VEM
 Extern Model No. Workpiece Ho Clamping Diameter Allowable Offset (Full Stroke Workpiece Shape G Blank, Shape G T Notes : %10 %11 %12 Seating Mountii 	1 nal Din Vorkpie Pulling St Control Grippe F of Grippe V V W 0. The clar the tabl part and 1. Workpie 2. For - T: Height Din ng Methor	2 nensions an ece Hole Code d 7 Blank, F *12 d State Action ceof Expanding Area) *10 roke roke *11 r G r G r G r G r G r G r G r G r G r	M 2 N 3 4 060 065 6 + 0.3 6.5 + 5.5 6 7.2 7.7 9 9 5.5 6.02 7.2 7.7 9 9 5.5 5.55 5.55 6.02 - 5.5 5.5 6.02 - 9 - 5.5 6.02 9 - 5.5 6.02 9 12 13 adjusting structor 5.44 8.5 9 12 13 adjusting structor 5.44 8.5 9 12 13 adjusting structor 5.54 9 12 13 3 3 4 3 3 3 4 5 6 5 6 6 5 6 7 5 7 <td< td=""><td>P 0 SFA100 0 SFA100 0 0.3 7 ± 0.3 0.3 7 ± 0.3 0.3 6.5 8.2 0 0 5.5 5 6.55 9 5.5 5 5.95 9.5 13 ture and there value of seed with oth only for liftice to lerance ed with oth only for liftice to lerance nt H25</td><td>80 - 5 Constant 7 7 7 8.7 ±0.5 4.2 1.0 0.2 1.0 0.2 1.0 0.2 1.0 0.2 1.0 0.2 1.0 0.2 1.0 0.2 1.0 0.2 1.0 0.2 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.1 1.0 1.1 1.0 1.1 1.0 1.1 1.0 1.1 1.0 1.1 1.0 1.1 1.0 1.1 1.0 1.1 1.0 1.1 1.0 1.1 1.0 1.1 1.0 1.1 1.0 1.1 1.0 1.1 1.0 1.1 1.0 1.1 1.0 1.1 1.0 1.0 1.1 1.0 1.1 1.0 1.1 1.0 1.1 1.0 1.1 1.0 1.1 1.0 1.1 1.0 1.1 1.0 1.1 1.0 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1</td><td>Image: Constraint of the second se</td><td>- 0 085 8 9.7 3 9.7 3 9.7 3 10 6 8.05 10 6 7.4 11 15 on is done consider / location diameter cifying Se H40</td><td>T 7 7 9 090 9 10 6 8.55 10.2 10 6 8.55 10 6 7.9 11.5 15 10 10 6 7.9 11.5 15 15 15 15 15 15 15 15 15 15 15 15 15 15 15 15 15 15 15 16 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 1</td><td>) ting the w ter distance rs, or wher epending</td><td> 4 Work 5 Workpi 6 Seati 7 Shap orkpiece ce accura n using m on the sl H55 </td><td>e hole. The in the of Grippe</td><td>numeric clampin wo of the (Refer to</td><td>al value g instal ese prof</td><td>1/M2) TMA-2 TMA-1 TMA-1 Code) Work Support LD LD LC TNC TC Air Sensing Lift Cylinder LLW Linear Cylinder / Compact Cylinder LLR LLR LLU DP DR DR DR DR DR DR DR DR DS DT Block Cylinder Expansion Locating Pin VFL/VFM VFJ/VFK</td></td<>	P 0 SFA100 0 SFA100 0 0.3 7 ± 0.3 0.3 7 ± 0.3 0.3 6.5 8.2 0 0 5.5 5 6.55 9 5.5 5 5.95 9.5 13 ture and there value of seed with oth only for liftice to lerance ed with oth only for liftice to lerance nt H25	80 - 5 Constant 7 7 7 8 .7 ±0.5 4 .2 1 .0 0.2 1 .0 0.2 1 .0 0 .2 1 .0 1 .1 1 .0 1 .0 1 .1 1 .1	Image: Constraint of the second se	- 0 085 8 9.7 3 9.7 3 9.7 3 10 6 8.05 10 6 7.4 11 15 on is done consider / location diameter cifying Se H40	T 7 7 9 090 9 10 6 8.55 10.2 10 6 8.55 10 6 7.9 11.5 15 10 10 6 7.9 11.5 15 15 15 15 15 15 15 15 15 15 15 15 15 15 15 15 15 15 15 16 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 1) ting the w ter distance rs, or wher epending	 4 Work 5 Workpi 6 Seati 7 Shap orkpiece ce accura n using m on the sl H55 	e hole. 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 Extern Model No. Workpiece Ho Clamping Diameter Allowable Offset (f Full Stroke Workpiece Workpiece Shape of Blank, Shape of T Notes : *10 *11 *12 Seating Mounting 	1 nal Dim 5 Workpin 1 Norkpin 1 Norkpin 2 Norkpin	2 nensions an ece Hole Code d 7 Blank, F *12 d State Action ceof Expanding Area)*10 roke roke *11 r G r G r G r G r G r G r G r G r G r	M 2 N 3 4 060 065 6 + 0.7 6.5 + 5.5 6 7.2 7.7 9 9 5.5 6.05 5.55 6.05 9 9 9 9 5.55 6.05 - 5.5 9 9 12 13 adjusting structor 50 012 13 adjusting structor 10 0 12 13 30 30 10	9 5.5 6.5 8.2 9 5.5 6.55 9 5.5 9 5.5 9 5.5 9.5 13 ture and thue ed with oth only for lift et olerance	80 - 1 5 80 - 1 5 8 8 1 1 1 1 1 1 1 1	H 6 6 6 080 8+0.7 7.5 9.2 10 6 6 7.55 10 6 6.9 10.5 14 0peratio p.Please clamps / e mouth c Speec H35 35	- 0 085 8.5 + 0.7 8.5 + 0.3 8 9.7 3 10 6 8.05 10 6 7.4 11 15 on is done consider / location diameter cifying See H40 40 40	T 7 7 9 090 9 090 9 090 9 090 9 090 9 0 0 10 0 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 11 15 15 15 15 15 15 15 15 15 15 15 15 15 15 15 15 15 15 15 15 10 16 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17) ting the w ter distance s, or wher epending	4 Work 5 Workpi 6 Seati 7 Shap orkpiece a accura a using m on the sl H55 55	e hole. The ingression of Gripped e hole	numeric clampin voor the (Refer to	lecting M on biece Hole I ion piece H piece H g instal ese proc	1/M2) TMA-2 TMA-1 TMA-1 Code) Work Support LD LD LC TNC TC Air Sensing Lift Cylinder LLW Linear Cylinder / Compact Cylinder LLW Linear Cylinder DP DR DS DT Block Cylinder DBA/DBC Centering Vise FVA FVD FVC Control Valve BZL BZT BZX/JZG BZS Pallet Clamp VS/VT Expansion Locating Pin VFL/VFK VFJ/VFK
 Extern Model No. Workpiece Ho Clamping Diameter Allowable Offset (Full Stroke Workpiece Shape of Blank, Shape of T Notes : *10 *11 *11 *11 *11 *11 	1 nal Dim 5 Workpin le Diam. \$ d Release Empty Floating Clearant Pulling St Lifting Str of Grippe F of Grippe V W 0. The clar the tabl part and 1. Workpie 2. For -T: Height Din ng Methor M1 math 120	2 nensions ar ece Hole Code d 2 Blank, F *12 d State Action ce of Expanding Area)*10 roke *11 r G r G r G r G r G r G r G r G r G r	M 2 N 3 4 060 065 6 + 0.3 6.5 + 5.5 6 7.2 7.7 9 9 5.5 6.05 5.55 6.05 5.55 6.05 - 9 9 9 5.5 6.05 - 5.5 6.02 7.7 - 9 9 9 5.55 6.02 - 9 - 5.5 6.02 - 9 9 12 13 adjusting structor 5.13 0 12 13 adjusting structor 5.5 5.5 9 12 12 13 30 13 30 30 30 10 10	P 0 SFA100 0 0.3 7 ± 0.3 0.3 7 ± 0.3 0.3 7 ± 0.3 0.3 7 ± 0.3 0.3 7 ± 0.3 0.3 7 ± 0.3 0.3 7 ± 0.3 0.3 7 ± 0.3 0.4 9 5.5 6.55 9 5.5 5.5 5.95 9.5 13 ture and thread with oth 13 ture and thread with oth 14 only for lift 15 ed with oth 15 only for lift 15 et olerance 16 14 125 15 12 16 12	80 - 80 - 80 - 9 - 075 - 7 - 7 - 8 - 7 - 8 - 10 - 11 - 11 - 11 -	H 6 6 6 080 8+0.7 7.5 9.2 10 6 7.55 10 6 6.9 10.5 14 0peration p. Please clamps / e e mouth c Spec 145 35 10	- 0 085 8.5 + 0.7 8.5 + 0.7 8 9.7 9 10 6 8.05 10 6 7.4 11 15 00 is done consider / location diameter cifying Se H40 40 10 10 10	T 7 9 090 9 ±0.7 8.5 10.2 10 6 8.55 10.2 10 6 8.55 10 10 6 8.55 10 10 6 8.55 10 10 6 8.55 10 10 6 8.55 10 10 6 8.55 10 10 6 8.55 10 11 .5 15 2 by locat the cent cylinder differs du ating He H45 45 10 10 11.5 15 15 15 15 15 15 15 16 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17) ting the w ter distances, or wher epending ight H50 50 10	4 Work 5 Workpi 6 Seati 7 Shap orkpiece e accura a using m on the sl H55 55 10	e hole. The i acy of Grippe e hole. The i acy of each hore than two lope angle. (mm) H60 60 10	numeric clampin wo of the (Refer to	lecting M on biece Hole I ion piece H piece H g instal ese prov	1/M2) TMA-2 TMA-1 TMA-1 Code) Work Support LD LD LC TNC TC Air Sensing Lift Cylinder LLW Linear Cylinder / Compact Cylinder LLW Linear Cylinder DP DR DS DT Block Cylinder DBA/DBC Centering Vise FVA FVD FVC Control Valve BZL BZT BZS Pallet Clamp VFL/VFM VFJ/VFK PUI Stud Clamp FP
 Extern Model No. Workpiece Ho Clamping Diameter Allowable Offset (I Full Stroke Workpiece Shape of Blank, Shape of T Notes : %10 %11 %12 Seating Mounting Logical 		2 nensions an ece Hole Code d 2 Blank, F *12 d State Action ce of Expanding Area)*10 roke roke *11 r G r G r G r G r G r G r G r G r G r	M 2 N 3 4 060 065 6 + 0.3 6.5 + 5.5 6 7.2 7.7 9 9 5.5 6.02 - 5.5 5.55 6.02 - 9 9 9 5.5 6.02 - 5.55 6.02 9 - 5.55 6.02 9 - 5.42 8.5 9 12 13 adjusting struction is the function is the function in, the allowable Standard Height 30 10 - - 0 - 0	P 070 073 7±0.3 0.3 7±0.3 0.3 7±0.3 0.3 7±0.3 0.3 7±0.3 0.5 8.2 0 9 5.5 6.55 9 5.5 5 5.95 9.5 13 ture and three value of seed with oth only for liftite tolerance 14 H25 - 0.1 - 0.1 - 0.1 - 0.1 - 0.1 - 0.1 - 0.1 - 0.1 -	80 - 80 - 80 - 80 - 80 - 80 - 90 - 10 - 1	H 6 6 6 6 7.5 9.2 7.5 9.2 7.5 9.2 7.5 10 6 7.55 10 6 6.9 10.5 14 0 operatio p. Please clamps / e mouth c Spect H35 35 10 5.5 0 5.5	- 085 8.5 ± 0.3 8 9.7 9 10 6 8.05 10 6 7.4 11 15 on is done consider / location diameter cifying Se H40 40 10 10 6	T F 7 9 9 10 6 8 .55 10.2 10 6 8 .55 10 10 6 8 .55 10 10 6 8 .55 10 10 6 8 .55 10 10 6 8 .55 10 10 6 8 .55 10 11 .5 15 15 15 15 15 15 15 15 15 15 15 15 15 15 15 15 15 15 15 15 15 15 16 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17	ting the w ter distance s, or where epending bight H50 50 10 20.5	4 Work 5 Workpi 6 Seati 7 Shap orkpiece ce accura a using m on the sl H55 55 10 25.5	e hole. The ing Height be of Gripped e choice that the of Gripped e choice that the ing the of Gripped e choice that the ing the of Gripped e choice that the ing the of the ing the of the ing the in	numeric clampin wo of the (Refer to	al value og instal ese proto o P.378.	1/M2) TMA-2 TMA-1 TMA-1 Code) Work Support LD LD LC TNC TC Air Sensing Lift Cylinder LLW Linear Cylinder / Compact Cylinder LLW LIR LLU DP DR DS DT Block Cylinder DS DT Block Cylinder Centering Vise FVA FVD FVC Control Valve BZL BZT BZT BZS Pallet Clamp VFL/VFM VFJ/VFK PU FVC Compact Cylinder DR DS DT Block Cylinder DR DS DT Block Cylinder Centering Vise FVA FVD FVC Control Valve BZL BZS Pallet Clamp VFL/VFM VFJ/VFK PUI Stud Clamp <u>FP</u> FQ
 Extern Model No. Workpiece Ho Clamping Diameter Allowable Offset (Full Stroke Workpiece Shape of Blank, Shape of T Notes : %10 %11 %12 Seating Mounting Le 		2 nensions an ece Hole Code d Z Blank, F *12 d State Action reof Expanding Area) *10 roke roke roke *11 r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G r G R H E D AA Weight kg H C C C C C C C C C	N N 3 4 060 065 6+0.3 6.5+ 5.5 6 7.2 7.7 9 9 5.5 6.05 5.5 6.05 - 9 9 9 5.5 5.55 6.05 - - 5.5 5.5 6.05 - 9 9 9 5.5 5.55 6.05 - 5.5 5.55 6.05 - 9 12 13 adjusting structor 5.13 out of tolerance hole when use is the function n, the allowable Standard Heigl Blank 30 10 - 0.5 0.5 20	P 070 0.7 070 0.3 7+0.3 6.5 8.2 0 5.5 5 6.55 9 5.5 5 5.95 9.55 13 ture and there value of sead with oth only for lifting ed	80 - 5 5 5 5 5 5 5 5 5 5 5 7 5 7 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 9 5 5 6 4 9 5 5 6 4 9 5 5 6 4 10 14 e clamping single clamping single clampingle clampingle single clamp	Image: Control of the second secon	-	T 7 7 7 7 7 7 7 7 7 7) ting the w ter distances, or where epending tight H50 50 10 20.5 0.6 50	4 Work 5 Workpi 6 Seati 7 Shap orkpiece ce accura a using m on the sl 55 10 25.5 0.6	e hole. The ing Height be of Gripped e hole. The ing Height be of Gripped e hole than two hore than	numeric clampin wo of the (Refer to	al value g instal ese pro-	1/M2) TMA-2 TMA-1 TMA-1 Code) Work Support LD LC TNC TC Air Sensing Lift Cylinder LLW Linear Cylinder / Compact Cylinder LLR LLR LLR LLR LLR LLU DP DR DS DT Block Cylinder Block Cylinder Centering Vise FVA FVD FVC Control Valve BZT BZT BZT BZT BZT BZT BZT BZT

(Mounting Length 20mm)

AA

Weight kg

5.5

0.5

-

0.5

10.5

0.5

15.5

0.5

20.5

0.5

25.5

0.5

30.5

0.6

386

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External Dimensions

%The drawing shows the released state of SFA2000-G0A- $\hfill \square$.

Workpiece Lifting Stroke *3 40 Trap Valve (Clearance from seating surface when releasing) (Check Valve) (Workpiece Lifting Surface) $\phi V^{\otimes 3}$ G Seating Surface Clamping Clamping Diam. Clamping Diam.^{**5} Ϋ́ Outer Diameter ϕ X Area (Released State) (Empty Action) 43.5 33 Seating Surface ט J (C) Inner Diameter ϕ W \oplus At Full Stroke 4-Mounting Bolt (Included) **Released State** (Empty Action) M5×0.8×30 Air Blow-out Hole for Seating Confirmation ϕ 1 Mx Seating Surface^{*1} Specifying Seating Height **4 Workpiece Hole (Gripper) Shape: T ט Seating Height: Standard Gripper (3 Grippers 120° Distance) φU (The direction of gripper is as indicated in this drawing. ф ¥ CD F H ±0.005 25 H ±0.005 29. 3-O-ring (Included) O-ring (Included) AS568-007(90°) AS568-029(90°) Hydraulic Release Port 25.5 25.5 Notes: Seating Confirmation Air Port *2 Hydraulic Lock Port *2 %1. The workpiece must be resting on all seating surfaces when clamping. If this is not done the workpiece can -0 be deformed by the clamping force. %2. The port names are marked on the product surface. Ø24

H

 $2-\phi$ 3 Spring Pin (Included)

* Expanding Area Detail

- *2. The port names are marked on the product surface. (HYD:Hydraulic Lock Port, FC:Seating Confirmation Air Port, BLOW: Air Blow Port) Continuously supply air pressure to the air blow port and the seating confirmation air port.
- %3. The numerical value is only for the workpiece lifting option.
- %4. Refer to Seating Height: Standard for unlisted dimensions.
- ※5. For -T:Taper Hole option, the first gripper ridge is the reference diameter.





Notes:

 Thin wall around the workpiece hole could be deformed by clamping action, and clamping force will not fill the specification.

Please make sure to test the clamping function before using and adjust to the appropriate supply of pressure.

**6. When the clamp head is sticking above the surface Y of the workpiece, please make sure there is no interference with the clamp cylinders during machining.

Air Blow Port *2

		Hydraulic Hole Clamp Digest	Index Action Description	Model No. Indication	Specifications Performance Curve	External Dimensions	Layout Sample Circuit Reference	Cautions P.421	
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Machining Dimensions of Mounting Area



%7. Please make a hydraulic release port within the range of 1 Body Size (When selecting 2) 2 Design No. Blank 3 Mounting Methods (When selecting G0) Blank F 4 Workpiece Lifting Option Т 5 Workpiece Hole Diameter (Workpiece Hole Code) 6 Seating Height Dimension 7

SFA 2 00 0 - G0

2

1. There should be no burrs at the hole contact surface.

Notes :

Model No. Indication

External Dimensions and Machining Dimensions for Mounting

4

- Extern				aeiiii				01 1110		9	(mm)		
Model No.			SFA2000-G0□-□-□										
5	Workpiece	e Hole Code	090	095	100	105	110	115	120	125	130		
Workpiece Hole	e Diam. Ø d	7 Blank, F ^{%10}	9 ^{+0.7} _{-0.3}	$9.5^{+0.7}_{-0.3}$	$10^{+0.7}_{-0.3}$	$10.5^{+0.7}_{-0.3}$	11 ^{+0.7} _{-0.3}	$11.5^{+0.7}_{-0.3}$	$12^{+0.7}_{-0.3}$	12.5 + 0.7	13 ^{+0.7} -0.3		
Clamping	Released S	tate	8.5	9	9.5	10	10.5	11	11.5	12	12.5		
Diameter	Empty Ac	tion	10.2	10.7	11.2	11.7	12.2	12.7	13.2	13.7	14.2		
Allowable Offset (Flo	bating Clearance of	f Expanding Area) ^{%8}					±0.5						
Full Stroke							4.2						
Workpiece P	ulling Strol	ke					1.0						
Workpiece L	ifting Strok	е ^{ж9}	0.2										
7 Shane o	fGrinner	G	10	10	10	11.5	11.5	11.5	11.5	11.5	11.5		
Blank F	Спррст	S	4.3	4.3	4.3	5.8	5.8	5.8	5.8	5.8	5.8		
Dialik, I		U	8.6	9.1	9.6	10.1	10.6	11.1	11.6	12.1	12.6		
	Crimmon	G	10	10	10	10	11.5	11.5	11.5	11.5	11.5		
	Gripper	S	4.3	4.3	4.3	4.3	5.8	5.8	5.8	5.8	5.8		
-		U	8.6	9	9.5	10	10.4	10.9	11.4	11.9	12.4		
	Mx		8	8	8	8	8	8.6	8.6	9.3	9.3		
	V		11.5	12	12.5	13	13.5	14	14.5	15	15.5		
	W		15	16	16	17	17	18	18	19	19		
	Х		24	24	24	24	24	25	25	26	26		
	Y		25	25	25	25	25	26	26	27	27		

5

Notes : * 8. The clamping part is an adjusting structure and the clamping operation is done by locating the workpiece hole. The numerical value in the table shows the amount of tolerance value of single clamp. Please consider the center distance accuracy of each clamping installation part and each workpiece hole when used with other location clamps / location cylinders, or when using more than two of these products. ※ 9. Workpiece lifting stroke is the function only for lifting option.

6

** 10. For -T: Taper Hole option, the allowable tolerance of the hole mouth diameter differs depending on the slope angle. (Refer to P.378.)

								(mm
6 Seating Height Dime	ension	Standard Height		Spe	cifying Se	eating He	ight	
3 Mounting Method		Blank	H45	H50	H55	H60	H65	H70
In second CO	Н	40	45	50	55	60	65	70
(Mounting Length (mm)	AA	-	5.5	10.5	15.5	20.5	25.5	30.5
(gengaronni)	Weight kg	0.8	0.8	0.8	0.8	0.9	0.9	0.9

DT Block Cylinder

DBA/DBC

High-Power

Pneumatic Series

Hydraulic Series

Valve / Coupler Hydraulic Unit

Manual Operation

Cautions / Others

Accessories

Hole Clamp

SFA SFC

Swing Clamp

LHA

LHC LHS LHW LG/LT TLA-2 TLB-2 TLA-1 Link Clamp LKA

LKC

LKW

LJ/LM

TMA-2

TMA-1

Work Support

LD

LC TNC

TC Air Sensing Lift Cylinder LLW Linear Cylinder / Compact Cylinder LL LLR LLU DP DR DS

7 Shape of Gripper (Workpiece Hole)

Series

Centering Vise FVA

> FVD FVC

Control Valve

BZL BZT BZX/JZG

BZS

Pallet Clamp VS/VT

Expansion Locating Pin VFL/VFM VFJ/VFK

Pull Stud Clamp FΡ FQ

Customized Spring Cylinder DWA/DWB Trap Valve

(Check Valve)

43.5 33

Gripper

Air Blow-out Hole for

(3 Grippers 120° Distance)

CD

H ±0.005

ш

Seating Confirmation Air Port *3

Air Blow Port *3

25

Ψ

29.1

Protrude Dimension at Full Stroke 0.5

Seating Confirmation ϕ 1

External Dimensions

*The drawing shows the released state of SFA2000-M1A-

* Expanding Area Detail Workpiece Lifting Stroke **4 40 (Clearance from seating surface when releasing) (Workpiece Lifting Surface) ϕV ^{*4} Seating Surface Outer Diameter ϕ X Œ Clamping Clamping Diam Clamping Diam \oplus Area (Released State) (Empty Action) Seating Surface ט J (C) Inner Diameter ϕ W Ф At Full Stroke **Released State** (Empty Action) Mx Seating Surface^{*1} Specifying Seating Height *5 Workpiece Hole (Gripper) Shape: T 0 Seating Height: Standard φU (The direction of gripper is as indicated in this drawing.) ф ¥ 4-Mounting Bolt (Included) H ±0.005 (Ŧ M5×0.8 24-E ШÌ \$\overlimits - 0.025 \overlimits 0.064 \overlimits - 0.064 \overlimits - 0.064 \overlimits 0.064 \over ш Protrude Dimension Cross Section ★ φ 40.5 at Full Stroke 0.5 3-O-ring (attached) O-ring (attached) AS568-007(90°) AS568-029(90°) Notes: 25.5 25.5 %1. The workpiece must be resting on all seating surfaces Hydraulic Lock Port **3 when clamping. If this is not done the workpiece can be deformed by the clamping force. (H %2. Use jack bolts to remove the product, keeping it parallel to the mounting surface. Ø25

*3. The port names are marked on the product surface. (HYD:Hydraulic Lock Port, FC:Seating Confirmation Air Port, BLOW: Air Blow Port) Continuously supply air pressure to the air blow port and the seating confirmation air port.

- %4. The numerical value is only for the workpiece lifting option.
- %5. Refer to Seating Height: Standard for unlisted dimensions.
- %6. For -T: Taper Hole option, the first gripper ridge is the reference diameter.





6

4-Hole for Jack Bolt M6×1^{**2}

Notes:

1. Thin wall around the workpiece hole could be deformed by clamping action, and clamping force will not fill the specification.

Please make sure to test the clamping function before using and adjust to the appropriate supply of pressure.

%7. When the clamp head is sticking above the surface Y of the workpiece, please make sure there is no interference with the clamp cylinders during machining.

Hydraulic Hole Clar Digest	mp Acti	Index on Description	Moc Indi	del No. ication	Spe Perfo	cificatio rmance Cu	ns urve	Externa Dimensio	al l ons C	Layout Sa Circuit Refe	imple erence	Cautions P.421		Mony in Innovation
Machini	ng Di	imension	s of M	lountir	ng Ar	ea								High-Power Series
		< 40		4-M5	×0.8 Tł	nread Dep	oth 7 or i	more						Pneumatic Series
Air Blow Port	<u>φ3</u>	0	25		1									Hydraulic Series
~	<u>↓</u>)- 0 - ;	33									Valve / Coupler Hydraulic Unit
Ating Confirmation a Port \$\phi\$ 3					v									Manual Operation Accessories
		25.5	25.5		Hydraul	ic Lock Po	ort Ø3							Cautions / Others
		d 41.00	+ 0.039	2.02			Notes	: The survey of the s			I I.			Hole Clamp
		φ41H8	0 /Pz 63	30° e			۱. ۲	There sho Please cou	uld be no	o burrs at 1 vhen addi	the hole	contact surface	2.	SFA
		7	× 102 0.5	or /			×8.	Release h	vdraulic r	pressure ca	an be sur	oplied from the	e side or	SFC
	TT	√ Rz 6.3		» الله الله	1 6	Ā		bottom si	urface.					Swing Clamp
	111		Ť		Le %			Please ma	ike a hyd	raulic relea	ase port	within 🔶 area ir	n the case	
		Rz 100	F	•			:	supplied f	rom the	side.	•			LHC
			0.4	j`			I	Please ma	ike a hyd	raulic relea	ase port	within 💋 a	rea in the case	LHW
	1					v	:	supplied f	from the	bottom.				LG/LT
Hydraulic Release Po	ort *8	6.10.8	±0.1		6		※9 .	Base thick	ness and	l remainin	g depth	of the lower ho	le machining	TLA-2
		< \	>	4	les			(2.5mm) i	s for whe	n the mat	erial is S5	50C.		TLB-2
					5 or									
					2.							<i>c</i> , (1,1)		
Model N	lo. In	dication									1 Body	y Size (When se	electing 2)	LKG
		_						_ [Blank		2 Desi	gn No.		LKW
			M1	Α		-	Blan	k '			3 Moun	iting Methods (Wh	en selecting M1/M2)	LJ/LM
SFA	20	0 0 -	M2	N T	- 11	5 -	HE	- I	F		4 Wor	kpiece Lifting C	Option	TMA-2
								-	Т		5 Workp	viece Hole Diameter (Workpiece Hole Code)	IMA-I
	1	2								I	6 Seat	ina Heiaht Dim	nension	Work Support
		2	3	4	5		6				7 Shar	of Grinner (V	Norkniece Hole)	LD
-													vontpiece noie)	TNC
External	l Dim	ensions a	and M	achini	ng Di	imens	ions	for Mo	untin	g	(mm)		TC
Model No.						SFA200	0-M	-0-0-0				_		Air Sensing
5 W	orkpiece	Hole Code	090	095	100	105	110	115	120	125	130			Lift Cylinder
Workpiece Hole Dia	am. Ød	7 Blank, F ** 12	9 ^{+0.7} _{-0.3}	$9.5^{+0.7}_{-0.3}$	$10^{+0.7}_{-0.3}$	10.5 + 0.7 - 0.3	$11^{+0.7}_{-0.3}$	$11.5^{+0.7}_{-0.3}$	$12^{+0.7}_{-0.3}$	12.5 + 0.7 - 0.3	$13^{+0.7}_{-0.3}$	_		
Clamping Re	eleased S	tate	8.5	9	9.5	10	10.5	11	11.5	12	12.5			Linear Cylinder / Compact Cylinder
Diameter Er	npty Ac	tion	10.2	10.7	11.2	11.7	12.2	12.7	13.2	13.7	14.2	-		LL
Allowable Offset (Floating	Clearance of	Expanding Area) ~ 10					±0.5							LLR
Full Stroke	ng Ctrol	(A)					4.2							LLU
Workpiece Pulli	ng Strok	e *11					0.2							DP
WORPIECE LITTI	Ig Stick	G	10	10	10	11.5	11.5	11.5	115	11.5	11.5			DS
Z Shape of G	ripper	S	43	43	43	5.8	5.8	5.8	5.8	5.8	5.8			DT
Blank, F			8.6	9.1	9.6	10.1	10.6	11 1	11.6	12.1	12.6			Block Cylinder
		G	10	10	10	10.1	11.5	11.5	11.5	11.5	11 5	_		DBA/DBC
Shape of Gi	ripper	S	43	4.3	43	4.3	5.8	5.8	5.8	5.8	5.8			Carta da Ni
т		U	8.6	9	9.5	10	10.4	10.9	11.4	11.9	12.4			Centering Vise
	Mx	-	8	8	8	8	8	8.6	8.6	9.3	9.3			FVD
	V		11.5	12	12.5	13	13.5	14	14.5	15	15.5	_		FVC
	W		15	16	16	17	17	18	18	19	19			Control Valve
	Х		24	24	24	24	24	25	25	26	26	-		BZL
	Y		25	25	25	25	25	26	26	27	27			BZT
Notes : ※10. Th	e clamp	ing part is an a	adjustina	structure	and the	clamping	g operat	ion is don	e by loca	iting the w	orkpiece	- e hole. The num	nerical value in	BZX/JZG
th	e table s	hows the amo	ount of to	lerance va	lue of si	ngle clan	np. Pleas	e conside	er the cen	iter distan	ce accura	acy of each clar	mping installation	BZS
ра	irt and e	ach workpiece	hole wh	en used w	ith othe	er locatior	n clamps	/ locatio	n cylinde	rs, or whei	n using n	nore than two o	of these products.	Pallet Clamp
≫11. W	orkpiece	e lifting stroke	is the fun	ction only	for liftin	ng option								VS/VT
%12. Fo	r - T: Tar	or Hole option	n tha alla		oronco d	of the hel	a mouth	diamata	r difforc d	lononding	on the s	lone angle (Re	for to P378)	
			n, the allo	wable tole	erance	of the nor	emouti	l'ulamete	rumersu	lepending	on the s	iope ungle. (ne	ier (0 r.370.)	Expansion
			n, the allo	wable tole	erance of		emouti	i ulamete	i uniers u	epending	on the s	(mm)	ier to F.376.)	Expansion Locating Pin

6 Seating Height Dime	ension	Standard Height	Specifying Seating Height								
3 Mounting Method		Blank	H25	H30	H35	H40	H45	H50	H55	H60	
	Н	30	-	-	35	40	45	50	55	60	
In case of M1	E	10	-	-	10	10	10	10	10	10	
(Mounting Length 10mm) AA		-	-	-	5.5	10.5	15.5	20.5	25.5	30.5	
	Weight kg	0.7	-	-	0.7	0.7	0.8	0.8	0.8	0.8	
	Н	20	25	30	35	40	45	50	-	-	
In case of M2	E	20	20	20	20	20	20	20	-	-	
(Mounting Length 20mm) AA		_	5.5	10.5	15.5	20.5	25.5	30.5	-	_	
	Weight kg	0.6	0.7	0.7	0.7	0.7	0.7	0.8	-	-	

Pull Stud Clamp FP FQ Customized Spring Cylinder DWA/DWB

External Dimensions

%The drawing shows the released state of SFA3000-G0A- \square .



6

φ 3 Spring Pin (Included)

(HYD: Hydraulic Lock Port, FC: Seating Confirmation Air Port, BLOW: Air Blow Port) Continuously supply air pressure to the air blow port and the seating confirmation air port.
3. The numerical value is only for the workpiece lifting option.

*4. Refer to Seating Height: Standard for unlisted dimensions.

%5. For -T:Taper Hole option, the first gripper ridge is the reference diameter.

Workpiece (Pallet) Hole Dimensions



Notes:

 Thin wall around the workpiece hole could be deformed by clamping action, and clamping force will not fill the specification.

Please make sure to test the clamping function before using and adjust to the appropriate supply of pressure.

**6. When the clamp head is sticking above the surface Y of the workpiece, please make sure there is no interference with the clamp cylinders during machining.

Air Blow Port *2

Hydraulic Hole ClampIndexModel No.SpecificationsExternalLayout SampleCautionsDigestAction DescriptionIndicationPerformance CurveDimensionsCircuit ReferenceP.421

Machining Dimensions of Mounting Area



Notes :

- 1. There should be no burrs at the hole contact surface.
- %7. Please make a hydraulic release port within the range of

Model No. Indication



External Dimensions and Machining Dimensions for Mounting

			-					- (1111),				
Model No.			SFA3000-G0									
5	Workpiece Hole Code	130	135	140	145	150	155	160				
Workpiece Hole	e Diam. ϕ d 7 Blank , F * 10	$13^{+0.7}_{-0.3}$	$13.5^{+0.7}_{-0.3}$	$14^{+0.7}_{-0.3}$	$14.5^{+0.7}_{-0.3}$	$15^{+0.7}_{-0.3}$	$15.5^{+0.7}_{-0.3}$	$16^{+0.7}_{-0.3}$				
Clamping	Released State	12.5	13	13.5	14	14.5	15	15.5				
Diameter	Empty Action	14.2	14.7	15.2	15.7	16.2	16.7	17.2				
Allowable Offset (Flo	bating Clearance of Expanding Area) ^{**8}				±0.5							
Full Stroke					4.2							
Workpiece P	Pulling Stroke		1.0									
Workpiece L	ifting Stroke ^{%9}		0.2									
	7 Blank, F	12.6	13.1	13.6	14.1	14.6	15.1	15.6				
0	7 T	12.4	12.9	13.4	13.9	14.4	14.9	15.4				
	Mx	8.8	8.8	8.8	8.8	8.8	9.6	9.6				
	V	15.5	16	16.5	17	17.5	18	18.5				
	19	20	20	21	21	22	22					
	Х	28	28	28	28	28	29	29				
	Y	29	29	29	29	29	30	30				

Notes: %8. The clamping part is an adjusting structure and the clamping operation is done by locating the workpiece hole. The numerical value in the table shows the amount of tolerance value of single clamp. Please consider the center distance accuracy of each clamping installation part and each workpiece hole when used with other location clamps / location cylinders, or when using more than two of these products.
 %9. Workpiece lifting stroke is the function only for lifting option.

*10. For -T: Taper Hole option, the allowable tolerance of the hole mouth diameter differs depending on the slope angle. (Refer to P.378.)

								(mm)
6 Seating Height Dime	ension	Standard Height		Spe	cifying Se	eating He	ight	
3 Mounting Method		Blank	H50	H55	H60	H65	H70	H75
	Н	45	50	55	60	65	70	75
(Mounting Length (mm)	AA	-	5.5	10.5	15.5	20.5	25.5	30.5
	Weight kg	1.3	1.3	1.4	1.4	1.4	1.4	1.5

1 Body Size (When selecting 3)
2 Design No.
3 Mounting Methods (When selecting G
4 Lifting Methods
5 Workpiece Hole Diameter (Workpiece Hole Cod

- 6 Seating Height Dimension
- 7 Shape of Gripper (Workpiece Hole)

-	
-	TLB-2
-	TLA-1
Link (lamp
	LKA
-	LKC
-	LKW
-	LJ/LM
-	TMA-2
_	TMA-1
Work	Support
	LD
-	LC
-	TNC
-	TC
-	
Air Se	nsing vlinder
Line o	1.1.14
-	LLVV
Linea Comp	r Cylinder / bact Cylinder
	LL
	LLR
-	LLU
-	DP
-	DR
-	DS
-	DT
Block	Cylinder
	DBA/DBC
-	
Cente	ering Vise
	FVA
	FVD
	FVC
Contr	ol Valve
	BZL
-	BZT
-	BZX/JZG

\EK

High-Power

Pneumatic Series

Hydraulic Series

Valve / Coupler Hydraulic Unit

Manual Operation

Cautions / Others

Accessories

<u>Hole Cl</u>amp

SFA SFC

Swing Clamp

LHA

LHC LHS LHW LG/LT TLA-2

Series

BZS						
Pallet Clamp						
VS/VT						
Expansion Locating Pin						
VFL/VFM						
VFJ/VFK						

Pull Stud Clamp FP

FQ

Customized Spring Cylinder DWA/DWB

External Dimensions

*The drawing shows the released state of SFA3000-M1A-.



Workpiece (Pallet) Hole Dimensions



Notes:

 Thin wall around the workpiece hole could be deformed by clamping action, and clamping force will not fill the specification.

Please make sure to test the clamping function before using and adjust to the appropriate supply of pressure.

**7. When the clamp head is sticking above the surface Y of the workpiece, please make sure there is no interference with the clamp cylinders during machining.

Hydraulic Hol Diges	e Clamp st Ac	Index tion Description	Mc n Inc	odel No. dication	Spe Perfo	ecificatio rmance Cu	ns urve [Externa Dimensio	I L ns C	.ayout Sa ircuit Refe	imple erence	Cautior P.421	ns		KOSMI Harmony in Innova	EK /ation
C Mach	ining [Dimensior	ns of I	Mounti	ing A	rea									High-Pow Series	ver
	5	<u>≺</u> 48	3	→ <u>4-M</u>	6×1 Thr	ead Dept	h 7 or ma	ore							Pneumati	ic Series
Air Blow P	Port Ø3	0		ф—											Hydraulic	c Series
	o [€		<u>_</u>	13										Valve / Co Hydraulic	oupler c Unit
Seating Confirmation Air Port ϕ 3	ation				7										Manual O Accessori	peration
		31.5	31.5		Hydraul	ic Lock Pc	ort ø3								Cautions /	Others
		ф 53н8	+ 0.046		al		Notes 1. 1	here shou	ıld be nc	burrs at t	the hole of	contact surf	ace.		Hole Clam	p
		2	Rz 6.3				2. F ※8. F	Please con Release hy	tact us w draulic p	vhen addi pressure ca	ng a spao an be sur	cer. oplied from	the side	or	SFC	-
	Т	√ Rz 6.3				1	k	ottom su	rface.			spired norm			Swing Clan	mp
	1				+ 0.2 8		F	Please mal	ke a hydr	aulic relea	ase port v	within 🔶 are	a in the	case	LHA	
		Rz 100) 0.4	_{F,0} ▲			S	upplied fr	om the s	side.				44.0.000	LHS	5
						, V	t S	upplied fr	om the b	oottom.	ase port v	within <u>//</u>	area in	the case	LHV LG/	LT
Hydraulic Relea	se Port **8 /	4529	+01		6*	_	※9. E	Base thick	ness and	remainin	g depth o	of the lower	hole ma	achining	TLA	-2
	¥	< φ 52.8	5 - 0.1	~	less		(2.5mm) is	for whe	n the mate	erial is S5	50C.			TLB	-2
					2.5or										Link Clamr	n
Mada		ndication													LKA	4
Widde	er 100. fr	nuication									1 Boo	dy Size (Whe	en select	ing 3)	LKC	-
		_						_			2 Des	sign No.			LKW	V I M
			M 1	A			Blank		Siank		3 Mou	Inting Method	s (When se	electing M	1/M2) TMA	A-2
SF	A <u>3</u> ()0 <u>0</u> –	М2	N	- 18	50 -	H	1 - 1	<u> </u>		4 Wo	rkpiece Lifti	ng Opti	on	TMA	A-1
									E							
								_	Г		5 Work	kpiece Hole Diam	eter (Work	piece Hole C	ode) Work Supp	oort
	1	2	2				6				5 Work 6 Sea	kpiece Hole Diam Iting Height	eter (Work Dimens	piece Hole C ion	iode) Work Supp	oort
	1	2	3	4		5	6		7		5 Work 6 Sea 7 Sha	kpiece Hole Diam Iting Height ape of Gripp	eter (Work Dimens er (Worl	piece Hole C ion cpiece Ho	ole) Work Supp	port
	1 nal Dim	2 ensions an	3 d Mac	4	Dime	5 nsions	6 for M		7		5 Work 6 Sea 7 Sha	kpiece Hole Diam ating Height ape of Gripp	eter (Work Dimens er (Worl	piece Hole C ion kpiece He	ole) Work Supp	port
© Exterr	1 nal Dim	2 ensions an	3 d Mac	4 :hining	Dime	5 nsions	6 for Me	ounting	7 7 0 _{(mm})	5 Work 6 Sea 7 Sha	kpiece Hole Diam hting Height hpe of Gripp	eter (Work Dimens er (Worl	piece Hole C ion kpiece Ho	ole) Work Supp	2 2 g
Extern Model No.	1 nal Dim	2 ensions an	3 d Mac	4 hining	Dime SFA300	nsions	6 for Me	ounting	7 7 0 _{(mm})	5 Work 6 Sea 7 Sha	kpiece Hole Diam ating Height ape of Gripp	eter (Work Dimens er (Worl	piece Hole C ion «piece Ho	Work Supp LD LC TNC TC Air Sensing Lift Cylinde I I W	g er /
C Extern	1 nal Dim 5 Workpie	2 ensions an ce Hole Code	3 d Mac 130	4 chining	Dime SFA300 140 14+07	5 nsions 10-M0- 145	6 for Me	55	7 7 (mm) 160)	5 Work 6 Sea 7 Sha	φiece Hole Diam tting Height ape of Gripp	eter (Work Dimens er (Worl	piece Hole C ion kpiece Ho	Work Supp LD LC TNC TC Air Sensing Lift Cylinde LLW	g er /
Extern Model No. Workpiece Ho Clamping	1 nal Dim 5 Workpie de Diam. ϕ d	2 ensions an ce Hole Code 7 Blank, F *12	3 d Mac 130 13 ^{+0.7} 125	4 chining 135 ^{+0.7} 13.5 ^{+0.7} 13.5	Dime SFA300 140 14 ^{+0.7} 13 ⁵	nsions 0-M 145 14.5 + 0.7 14.5 + 0.7 14.5 + 0.7	6 for Me 150 15 ^{+0.7} 145	155 15.5 ^{+0.7} 15.5 ^{+0.7}	7 7 160 16 ^{+0.7} 15 5)	5 Work 6 Sea 7 Sha	φiece Hole Diam ating Height ape of Gripp	eter (Work Dimens er (Worl	piece Hole C ion (piece Ho	ide) Work Supp LD LC TNC TC Air Sensing Lift Cylinde LLW Linear Cylii Compact C	g er V nder / ylinder
Extern Model No. Workpiece Ho Clamping Diameter	1 nal Dim 5 Workpie ble Diam. ϕ d Released Empty A	2 ensions an ce Hole Code 7 Blank, F **12 State	3 d Mac 130 13 ^{+0,7} 12.5 14.2	4 chining 13.5 ^{+0.7} / _{-0.3} 13 14.7	Dime SFA300 140 14 ^{+0.7} 13.5 15.2	nsions 0-M 145 14.5+0.7 14 157	6 for M (0 15 ^{+0.7} 15 ^{+0.7} 14 .5 16 .2	155 15.5 ^{+0.7} 15	7 7 160 16 ^{+0.7} 15 .5 17 2)	5 Work 6 Sea 7 Sha	φiece Hole Diam ating Height ape of Gripp	eter (Work Dimens er (Worl	oiece Hole C ion (piece Ho	ide) Work Supp LD LC TNC TC Air Sensing Lift Cylinde LLW Linear Cylii Compact C	g er V nder / Cylinder
Extern Model No. Vorkpiece Ho Clamping Diameter Allowable Offset (F	1 5 Workpie ole Diam. ϕ d Released Empty A	2 ensions an ce Hole Code 7 Blank, F *12 State Action e of Expanding Area) *10	3 d Mac 130 13 ^{+0.7} 12.5 14.2	4 135 13.5 ⁺ 0.3 13 14.7	Dime SFA300 140 14 ^{+0.7} 13.5 15.2	nsions 0-M 145 145 14 14 15.7 ±0.5	6 for Me 15+0.7 14.5 16.2	155 15.5+0.3 15 16.7	7 160 16 ^{+0.7} 15 .5 17 .2)	5 Work 6 Sea 7 Sha	φiece Hole Diam Iting Height ape of Gripp	eter (Work Dimens er (Worl	oiece Hole C ion kpiece Ho	ide) Work Supp LD LC TNC TC Air Sensing Lift Cylinde LLW Linear Cylin Compact C LLL LLL LLL	g er V Lylinder
Extern Model No. Workpiece Ho Clamping Diameter Allowable Offset (F Full Stroke	1 5 Workpie ole Diam. ϕ d Released Empty A Floating Clearance	2 ensions an ce Hole Code 7 Blank, F *12 State Action eof Expanding Area) **10	3 d Mac 130 13 ^{+0.7} 12.5 14.2	4 135 13.5 ^{+0.3} 13 14.7	Dime SFA300 140 14 ^{+0,7} 13.5 15.2	nsions 0-M 145 14.5 +0.3 14 15.7 ±0.5 4.2	6 150 15 15 14 .5 16 .2	155 15.5±0.3 15 16.7	7 7 160 16 ^{+0.7} 15 .5 17 .2		5 Work 6 Sea 7 Sha	φiece Hole Diam iting Height ape of Gripp	eter (Work Dimens er (Worl	oiece Hole C ion kpiece Ho	ide) Work Supp LD LC Ole) TNC TC Air Sensing Lift Cylinde LLW Linear Cylin Compact C LLL LLW DP	g er V Tylinder
Clamping Diameter Allowable Offset (F Full Stroke Workpiece	1 5 Workpie Je Diam. ϕ d Released Empty <i>A</i> Floating Clearance Pulling Str	2 ensions an ce Hole Code 7 Blank, F *12 I State Action e of Expanding Area) *10 oke	3 d Mac 130 13 ^{+0.7} 12.5 14.2	4 135 13.5 ^{+0.3} 13 14.7	Dime SFA300 14±0.7 13.5 15.2	nsions 0-M 14.5 14.5 14. 15.7 ±0.5 4.2 1.0	6 for M (15 ^{+0.7} 14 .5 16 .2	155 15.5 ^{+0.7} 15.7 ^{+0.7} 15 16.7	7 7 160 16^{+0.7} 15.5 17.2		5 Work	φiece Hole Diam iting Height ape of Gripp	eter (Work Dimens er (Worl	oiece Hole C ion «piece Ho	ide) Work Supp LD LC TNC TC Air Sensing Lift Cylinde LLW Linear Cylin Compact C LLR LLR LLR LLR LLR LLR LLR LL	g er V Lylinder
Clamping Diameter Allowable Offset (F Full Stroke Workpiece Workpiece	1 5 Workpie ble Diam. ϕ d Released Empty A Hoating Clearance Pulling Strr Lifting Stro	2 ensions an ce Hole Code 7 Blank, F *12 State Action e of Expanding Area)*10 oke oke *11	3 d Mac 13 ^{+0.7} 12.5 14.2	4 135 13.5 ^{+0.7} 13.5 ^{+0.7} 13 14.7	Dime SFA300 14±0.7 13.5 15.2	nsions 145 - 07 14.5 - 07 14 105 4.2 1.0 0.2	for M 15 +0.7 15 +0.7 14 .5 16 .2	155 15.5 ^{+0.7} 15 15.7 ^{+0.7} 15	7 7 160 16 ^{+0.7} 15 .5 17 .2		5 Work	φiece Hole Diam iting Height ape of Gripp	eter (Work Dimens er (Worl	oiece Hole C ion spiece Ho	ide) Work Supp LD LD LC TNC TC Air Sensing Lift Cylinde Linear Cylin Compact C LLW Linear Cylin Compact C LL LLR LLU DP DR DS DT	g er V Cylinder
Extern Model No. Workpiece Ho Clamping Diameter Allowable Offset (F Full Stroke Workpiece Workpiece	1 5 Workpie ole Diam. \$\phi d\$ Released Empty \$\Phi\$ Floating Clearance Pulling Str Lifting Stre Z Blan	2 ensions an ce Hole Code 7 Blank, F *12 State Action eofExpanding Area)*10 oke oke *11 oke	3 d Mac 13 ^{+0,7} 12.5 14.2 12.6	135 13.5 ^{+0.7} 13.5 ^{+0.7} 13 14.7	Dime SFA300 14 -0.3 13.5 15.2 13.6	nsions 145 145 145 14 157 ±0.5 4.2 1.0 0.2 14.1	6 for M (15 -0.7 15 -0.7 14 .5 16 .2	155 15.5+0.7 15.7 16.7	7 160 16 ^{+0.7} 15.5 17.2 15.6		5 Work	φiece Hole Diam	eter (Work Dimens er (Worl	oiece Hole C ion xpiece Ho	ide) Work Supp LD LD LC TNC TC Air Sensing Lift Cylinde LLW Linear Cylii Compact C LL LLR LLU DP DR DS DT	g er V Inder / Cylinder
Extern Model No. Workpiece Ho Clamping Diameter Allowable Offset (F Full Stroke Workpiece Workpiece U	1 5 Workpie ole Diam. ϕ d Released Empty A Hoating Clearance Pulling Strr Lifting Strc Z Blan Z T	2 ensions an ce Hole Code 7 Blank, F *12 State Action eof Expanding Area) *10 oke oke *11 ok, F	3 d Mac 13 ^{+0.3} 12.5 14.2 12.6 12.6 12.4	135 13.5 ^{+0.3} 13.5 ^{+0.3} 13 14.7 14.7	Dime SFA300 14-0.3 13.5 15.2 15.2 13.6 13.6	nsions 145 -0.3 14.5 -0.3 14 15.7 ±0.5 4.2 1.0 0.2 14.1 13.9	6 15 15 15 16 14 .5 16 .2 14 .6 14 .6 14 .4	155 15.5+0.3 15 16.7 15.1 16.7	7 7 160 16 ^{+0.3} 15.5 17.2 15.6 15.6 15.4		5 Work	φiece Hole Diam	eter (Work Dimens er (Worl	oiece Hole C ion xpiece Ho	ide) Work Supp LD LC TNC TC Air Sensing Lift Cylinde LINE Compact C LL LLR LLR LLR LLR DP DR DS DT Block Cylin	g er V Junder / Cylinder I Junder
Extern Model No. Workpiece Ho Clamping Diameter Allowable Offset (F Full Stroke Workpiece Workpiece U	1 5 Workpie Je Diam. ϕ d Released Empty A Floating Clearance Pulling Stro Lifting Stro Z Blar Z T Mx	2 ensions an ce Hole Code 7 Blank, F *12 State Action eof Expanding Area) *10 oke oke *11 ok, F	3 d Mac 13 ^{+0.3} 12.5 14.2 12.6 12.6 12.4 8.8	135 13.5 ^{+0.3} 13 13 14.7 13.1 12.9 8.8	Dime SFA300 14 ⁺ 0.3 13.5 15.2 13.6 13.6 13.4 8.8	nsions 145 ⁺⁰³ 14.5 ⁺⁰³ 14 15.7 ±0.5 4.2 1.0 0.2 14.1 13.9 8.8	6 15 -0-0 15 ^{+0.3} 14.5 16.2 14.6 14.4 8.8	155 15.5 ^{+0.3} 15 16.7 15.1 14.9 9.6	7 7 160 16 ^{+0.3} 15.5 17.2 15.6 15.6 15.4 9.6		5 Work	φiece Hole Diam iting Height ape of Gripp	eter (Work	oiece Hole C ion xpiece Ho	ide) Work Supp LD LD LC TNC TC Air Sensing Lift Cylinde LLW Linear Cylin Compact C LL LLR LLU DP DR DS DT Block Cylin	g er V Junder / Cylinder
Clamping Diameter Allowable Offset (F Full Stroke Workpiece U	1 5 Workpie Je Diam. ϕ d Released Empty A Floating Clearance Pulling Strr Lifting Strc 7 Blan 7 T Mx V	2 ensions an ce Hole Code 7 Blank, F*12 State Action eofExpanding Area)**10 oke oke **11 oke	3 d Mac 13 ^{+0.3} 12.5 14.2 12.6 12.6 12.4 8.8 15.5	4 135 13.5 ^{+0.3} 13 13.1 14.7 13.1 12.9 8.8 16	Dime SFA300 14 ⁺ 0.3 13.5 13.5 15.2 13.6 13.4 8.8 16.5	5 nsions 145 145 145 14 157 ±0.5 4.2 1.0 0.2 14.1 13.9 8.8 17	6 for M (15 ⁺ 0.3 14 .5 16 .2 14 .6 14 .6 14 .4 8 .8 17 .5	155 15.5±0.3 15 16.7 15.1 14.9 9.6 18	7 7 160 16 ^{+0.3} 15 .5 17 .2 15 .6 15 .4 9 .6 18 .5		5 Work	φiece Hole Diam iting Height ape of Gripp	eter (Work	oiece Hole C ion kpiece Ho	ide) Work Supp LD LD LC TNC TC Air Sensing Lift Cylinde LLW Linear Cylin Compact C LLR LLW DP DR DS DT Block Cylin DBA Centering	g er Nder / Cylinder I Nder A/DBC Vise
Clamping Diameter Allowable Offset (F Full Stroke Workpiece U	1 5 Workpie le Diam. ϕ d Released Empty A Totaling Clearance Pulling Strr Lifting Strr 7 Blan 7 T Mx V W	2 ensions an ce Hole Code 7 Blank, F *12 State Action eof Expanding Area) **10 oke oke **11 ok, F	3 d Mac 13 ⁺ 0.3 12.5 14.2 12.6 12.4 8.8 15.5 19	4 135 13.5 ^{+0.3} 13.1 14.7 13.1 12.9 8.8 16 20	Dime SFA300 14±0.3 13.5 15.2 13.6 13.6 13.4 8.8 16.5 20	nsions 145 ^{+0,3} 14.5 ^{+0,3} 14 15.7 ±0.5 4.2 1.0 0.2 14.1 13.9 8.8 17 21	6 for M (15 ⁺ 0.3 14.5 16.2 14.6 14.4 8.8 17.5 21	155 15.5±0.3 15 16.7 15.1 14.9 9.6 18 22	(mm) 160 16 ^{+0,7} 15.5 17.2 15.6 15.4 9.6 18.5 22		5 Work	φiece Hole Diam iting Height ape of Gripp	eter (Work	oiece Hole C ion kpiece Ho	ide) Work Supp LD LD LC TNC TC Air Sensing Lift Cylinde LLW Linear Cylin Compact C LLW LINEAR Cylin DP DR DS DT Block Cylin DBA Centering <u>FVA</u>	g ger V Inder / Cylinder Cylinder I I Vise Vise
Clamping Diameter Allowable Offset (F Full Stroke Workpiece U	1 S Workpie Verify A Verify A Ve	2 ensions an ce Hole Code 7 Blank, F *12 State Action eofExpanding Area) *10 oke oke *11 ok, F	3 d Mac 13 ^{+0.7} 12.5 14.2 12.6 12.6 12.4 8.8 15.5 19 28	4 135 13.5 +0.3 13.5 +0.3 13 14.7 13.1 14.7 13.1 12.9 8.8 16 20 28	Dime SFA300 14±0.3 13.5 13.5 15.2 13.6 13.4 8.8 16.5 20 28	nsions 0 -M 14 .5 ^{+0.3} 14 15.7 ±0.5 4.2 1.0 0.2 14.1 13.9 8.8 17 21 28	6 for Me 15 ^{+0.7} 14.5 16.2 14.6 14.4 8.8 17.5 21 28	155 15.5±0.7 15.1 15 16.7 15.1 14.9 9.6 18 22 29	7 160 16 ^{+0,7} 15.5 17.2 15.6 15.4 9.6 18.5 22 29		5 Work	φiece Hole Diam iting Height ape of Gripp	eter (Work	oiece Hole C ion spiece Ho	ide) Work Supp LD LD LD LC TNC TC Air Sensing Lift Cylinde LIN Linear Cylin Compact C LL LL LL LL DP DR DS DS DT Block Cylin DBA Centering FVA FVD	g er V Cylinder Cylinder I L A/DBC Vise
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(Mounting Length 20mm)

AA

Weight kg

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1.1

5.5

1.2

10.5

1.2

15.5

1.2

20.5

1.2

25.5

1.3

30.5

1.3

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Spring Cylinder DWA/DWB

C Layout Sample

% This drawing shows a combination layout sample of SFA (Hole Clamp) and VFM (Expansion Locating Pin).



Notes :

- 1. In order to prevent the clamping part from damage, please set up rough guide of 2 or more when detaching a workpiece. Please refer to the above drawing for the length of rough guide and the diameter gap.
- (Use of rough guides depends on the loading / unloading condition of the workpiece.)
- 2. When using a combination of VFM (Expansion Locating Pin) and SFA (Hole Clamp), please choose N: without lift function.



C Mounting Layout Sample

*This drawing shows a combination layout sample of SFC (Hole Clamp) and VFM (Expansion Locating Pin).



Notes :

- 1. In order to prevent the clamping part from damage, please set up rough guide of 2 or more when detaching a workpiece. Please refer to the above drawing for the length of rough guide and the diameter gap.
- (Use of rough guides depends on the loading / unloading condition of the workpiece.)
- 2. When using a combination of VFM (Expansion Locating Pin) and SFC (Hole Clamp), please choose N: without lift function.



Cautions 🔍

- Notes for Design
- 1) Check Specifications
- Please use each product according to the specifications.
- This product is hydraulic double-acting model which locks and releases with hydraulic pressure.
- 2) Working Reference Plate (Seating Surface) Z axis.
- The upper surface of the flange of this product is the seating surface of workpiece and locates in Z direction.



When clamping, make sure all seating surfaces touch a workpiece. When the workpiece is not touching the seating surface area, please refer to external dimension chart and calculate contacting pressure with clamping force and seating area not to deform the workpiece.

- 3) Seating Confirmation Mechanism
- It will be detected when a workpiece is pressed against the seating surface by locking (clamping) action.



With lifting function, when workpiece is set (before supplying lock hydraulic pressure), the workpiece is lifted up by built-in spring, and there will be a gap of 0.2mm between workpiece bottom surface and seating surface.

- 4) Clamp Installation
- The clamping part of this product has floating structure (±0.5mm). Please consider the center distance accuracy of each clamping installation part and each workpiece hole when used with other location clamps / location cylinders, or when using more than two of these products.
- 5) Clamping Force
- Clamping force shows a pressing force against the seating surface.

Make sure to conduct test clamping and adjust supply pressure accordingly. Insufficient clamping force and/or expanding force leads to workpiece detachment.

6) Workpiece hole size, slope angle and workpiece hardness should be within the range of the specification.

When workpiece hole diameter is larger than specification.	Expansion stroke is insufficient and the clamping force will not fill the specifications.
When using it with insufficient clamping force.	Leads to falling of the workpiece.
When workpiece hole diameter is smaller than specification.	Difficult to attach/detach the workpiece leading to damage.
When workpiece hole depth is shallow.	May lead to abnormal seating and damage.
When workpiece hole taper slope angle is larger than specification.	The load concentrates on the gripper point when clamping and could lead to damage.
When workpiece hole is harder than specified.	Gripper does not dig into the workpiece enough and it cannot clamp securely.

7) Wall Thickness around Workpiece Hole

Thin wall around the workpiece hole could be deformed by clamping action, and clamping force does not fill the specification. Make sure to conduct test clamping and adjust supply pressure accordingly. Insufficient clamping force leads to workpiece detachment.



- 8) Air Blow Port and Seating Confirmation Port
- Continuously supply air pressure to the air blow port and the seating confirmation port.

If air supply is shut off during operation, contaminants enter into the clamp leading to malfunctions.

Hydraulic Hole Clamp Digest P.365	Index Action Description	Model No. Indication	Specifications Performance Curve	External Dimensions	Layout Sample Circuit Reference	Cautions	

High-Power Series

Pneumatic Series

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Hydraulic Series

Valve / Coupler Hydraulic Unit

Manual Operation Accessories

Cautions / Others



- 9) Release Action
- When releasing, it lifts up a workpiece which is normal.
 When using in a horizontal application, it is recommended to install a fall prevention of workpiece for temporal tacking.



- 10) Horizontal Locating
- When a workpiece is set, please make sure there is no lifting or slope of the workpiece. If the clamping operation is done with lifting or slope of the workpiece, it will lead to possible damage of a clamp and deformation of the workpiece hole.
- 11) Please detach a workpiece with all clamps fully released.
- When a workpiece is detached during lock or release operation, it will lead to damage of clamp or fall of workpiece.
- 12) Please set up rough guides.
- When detaching a workpiece with slope it may cause damage of clamp or fall of workpiece.





When using the product with other location clamps / cylinders, please set rough guides considering the center distance accuracy of each mounting hole and workpiece hole of location clamp / cylinders.

Cautions 🔍

- Installation Notes
- 1) Check the Usable Fluid
- Please use the appropriate fluid by referring to the Hydraulic Fluid List (P. 1355).
- 2) Installation / Removal of Hole Clamp
- Use four hexagonal socket bolts for mounting (with tensile strength of 12.9) and tighten them with the torque shown in the table below.
 Tighten them evenly to prevent twisting or jamming.

Model No.	Thread Size	Tightening Torque (N·m)
SFA1001/SFC1000	M4×0.7	3.2
SFA1001/SFC2000	M5×0.8	6.3
SFA1001/SFC3000	M6×1	10.0

When removing a hole clamp of mounting length 10mm/20mm, use thread for jack bolt (SFA : 4 mounting bolt holes, SFC : 2 mounting bolt holes), in order not to damage the installation tap. The following shows the case in which the parallel pin (hollow set) is set in the tapped hole so that the installation tap will not be damaged.



- 3) Port Position of the Hole Clamp
- The port names are marked on the product surface.
 Be careful of installation direction.
 (HYD : Hydraulic Lock Port, FC : Seating Confirmation Port, BLOW : Air Blow Port)
 Release pressure is supplied from the bottom of cylinder.
- Use air piping with outer diameter φ 6 (inner diameter φ 4) or larger for air blow.
- In order to conduct an effective air blow, it is recommended to use air piping with outer diameter \$\phi 6\$ (inner diameter \$\phi 4\$) or larger.
- 5) Restarting at Hydraulic Pressure OFF (Neutral) State. It is recommended to supply hydraulic pressure from the release side at the first hydraulic supply after installing a clamp, or when restarting at both lock and release hydraulic pressure OFF (neutral) state. When supplying hydraulic pressure from the lock side, a small amount of oil may leak from the clamping part for a moment, but this is not a functional problem.

Maintenance and Inspection

- 1) Please refer to P.1357 for general maintenance.
- 2) Regularly clean the clamping part and the seating surface.
- There is an air blow mechanism in this product, and cutting chips and coolant can be removed. However, as it may be hard to remove clinging cutting chips, sludge, etc., please confirm there are no contaminants when a workpiece is set. If operating with dirt adhering to the clamping part, it will lead to a workpiece fall due to insufficient clamping force, defective operation, and air leakage etc.





Even with general cleaning on exterior of hole clamp, there may be contaminants within internal parts of the component. If necessary, please call us for repair.

If repair or modifications are carried out by anyone other than Kosmek, or without our approval or confirmation, it will void warranty.

 Clamping force will be decreased by friction of a gripper surface due to repeated operation.

Replacement period differs depending on operating air pressure, workpiece material and shape of hole. When you find friction on gripper surface, the gripper needs to be replaced. Please contact us for replacement.

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High-Power Series

Pneumatic Series

Hydraulic Series

Valve / Coupler Hydraulic Unit

Manual Operation Accessories

Cautions / Others

Hole Clamp						
	SFA					
	SFC					
Swin	g Clamp					
LHA						
	LHC					
	LHS					

LHW LG/LT TLA-2 TLB-2 TLA-1

Link Clamp LKA LKC

LKW LJ/LM TMA-2 TMA-1 Work Support

LD

LC TNC TC

Air Sensing Lift Cylinder

LLW

Linear Cylinder / Compact Cylinder

LL LLR LLU DP DR

DS DT

Block Cylinder

DBA/DBC Centering Vise

FVA FVD

FVC

Control Valve
BZL
BZT

BZX/JZG BZS

Pallet Clamp

VS/VT

Expansion Locating Pin VFL/VFM VFJ/VFK

Pull Stud Clamp FP

FQ

Customized Spring Cylinder DWA/DWB