

MURATA TOOL, LTD.

MURATA TURRET PUNCH PRESS TOOLING GUIDEBOOK

MURATEC WIEDEMANN TOOLING

VERSION 2.03

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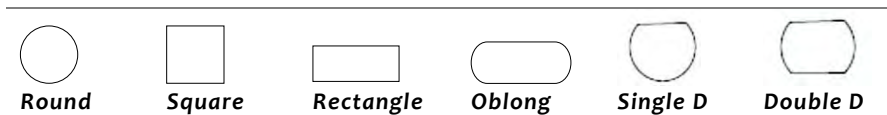
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I BASIC INFORMATION

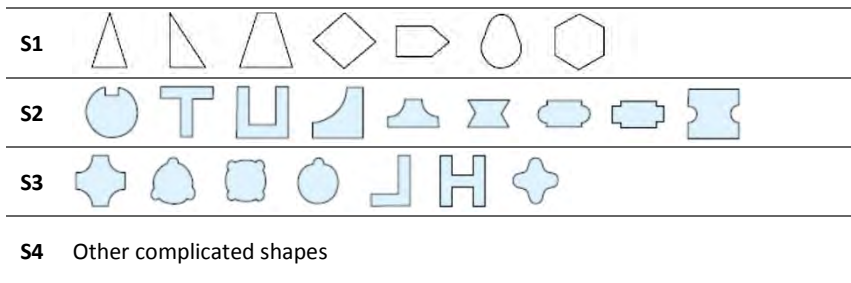
Materials and coatings

TYPES	ITEM	STAINLESS	MILD STEEL	ALUMINUM	FEATURES
SKD	Punch/Die	-	-	-	Harder, tougher, better abrasion-resistant than SKD11.
SKH	Punch	-	-	-	Tensile strength is better than SHK51
UHP	Punch	✓	✓✓	✓✓	Better machinability than SHK51.
UGP	Punch	✓✓	✓✓✓	✓✓	Tougher surface than UHP - longer life, preventing build-up edge (SKH Punches only)
TIN COATING	Punch	✓✓	-	✓✓	Finalized in gold. Titanium nitride coating reduces sliding resistance.
TICN COATING	Punch	✓✓✓	✓✓✓	✓✓✓	Finalized in gray. Coated with titanium carbide and titanium nitride - tougher and better abrasion resistance than TIN.

Standard shapes



Special shapes



Die clearance – Servo models

CLEARANCE	MILD STEEL	STAINLESS	ALUMINUM
0.2	~ 0.6	~ 0.5	~ 0.8
0.2	0.8	0.6	1
0.2	1	0.8	1.2
0.25	1.2	1 ~ 1.2	1.5
0.35	1.6	1.5	2
0.5	2.3	2	3
0.7	3.2	3	4
0.9	4.5	4	5
1.2	6	-	6
TO THICKNESS	20~25%	25~30%	20~25%

(mm)

- Minimum clearance varies among models.
- The listed clearance assume the fastest punching speed.
- For a slow mode, clearance should be larger by 2-5% than the listed.


Die clearance – Mechanical models

CLEARANCE	MILD STEEL	STAINLESS	ALUMINUM
0.2	~ 0.8	~ 0.6	~ 0.8
0.2	1	0.8	1
0.2	1.2	0.8	1.2
0.25	1.6	1.2	1.5
0.35	2.3	1.5	2
0.4	-	2	-
0.5	3.2	3	3
0.6	-	-	4
0.75	4.5	4	5
1.0	6	-	-
TO THICKNESS	15~20%	20~25%	15~20%

(mm)

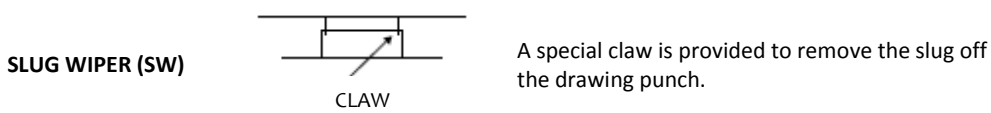
I BASIC INFORMATION

Standard shear angles

Station	Cutting shapes and sizes	Shear angle
X, A, B, C, VARITOOL	ROUND $\phi 38$ mm or smaller Standard shapes	No shear
D, E, F, G, H, J	Standard shape in X, A, B or VARI size	Roof top
	Standard shape in D, E, F, G, H, J	Concave
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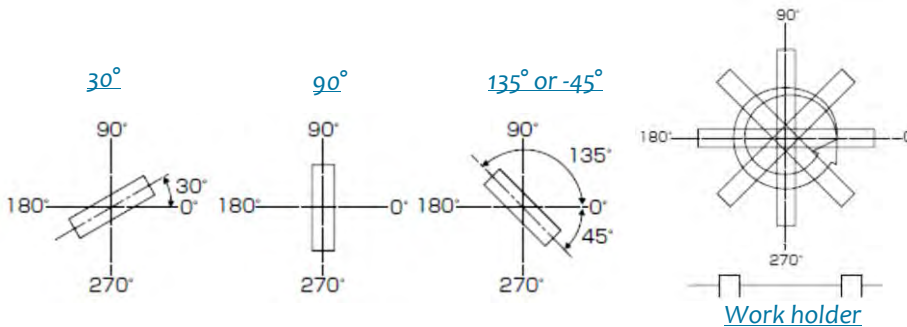
A punch provided with shear is basically 2.4mm longer than those without shear. Shear height varies among the cutting shape and size.

Slug Wiper die (SW) – optional



Angles

- The below defines the angles of the shape when the processed work is seen from the top.
- A rectangle at 0 degree refers to the one laying horizontally.
- For additional angle(s), visual information is preferred to prevent from being occurred mutual misunderstanding.



Angles available with MURATA items

	0°	45°	90°	135°	180°	225°	270°	315°
114 PUNCH HOLDER	✓							
VULCAN PUNCH HOLDER	✓							
114 DIE HOLDER B~D	✓		✓		✓		✓	
114 DIE HOLDER E~	✓	✓	✓					
SLIDE IN DIE HOLDER B~D	✓		✓	✓	✓	✓	✓	
SLIDE IN DIE HOLDER E~	✓	✓	✓		✓		✓	✓
114 PUNCH B~C	✓		✓		✓		✓	
114 PUNCH D~	✓		✓					
VULCAN PUNCH	✓							
114 DIE	✓							
VARITOOL PUNCH & DIE	✓							
VULCAN STRIPPER B~F	✓	✓	✓	✓	✓	✓	✓	✓
VULCAN STRIPPER GHJ	✓		✓		✓		✓	

I BASIC INFORMATION

Station compatibility

		X	A, IA	B	INDEX FB	C	INDEX FC	D	INDEX D	E	F	INDEX F	G	H	J
114	Punch holder	-	-	-	-	-	-	-	-	✓	✓	-	✓	✓	-
	Punch	✓		✓		✓		✓		✓			✓		
	Urethane stripper	-	-	✓		✓		✓		-	✓		-	-	-
VULCAN	Punch holder	-	✓		-	-	-	-	-	✓		-	✓		
	Punch	-	✓			✓		✓		✓			✓		
	Metal stripper	-	✓			✓		✓		-	-	-	-	-	-
114	Die	✓				✓		✓		-	✓		-	-	-

Contact us for further information.

VULCANTOOL Guideline

GUIDED METAL STRIPPER

Guide-type of metal stripper is provided to 6.0mm wide or narrower standard shapes. Special shapes (see page 3) are exceptional.

GREASE APPLIED TO METAL STRIPPER

If your turret punch press is a grease model, metal strippers shall be covered with a grease.

VULCAN SIZE LIMIT BY SHEET THICKNESS

Cutting size with VULCANTOOL is limited by sheet material and thickness. For some metal sheets, tool shall be larger than the pre-determined.

(mm)

Mild steel	Stainless		X	AB	C	D	EF	GHJ
~ 2.3	~ 1.0	Diameter	12.7	25.0	38.0	50.0	75.0	120.0
		Perimeter	39.9	78.5	119.0	157.0	235.5	376.8
~ 3.2	~ 1.5	Diameter	12.7	20.4	38.0	50.0	70.0	111.0
		Perimeter	39.9	64.0	119.0	157.0	219.8	348.5
~ 4.5	~ 2.0	Diameter	9.5	16.1	31.0	44.0	55.0	86.0
		Perimeter	29.8	50.5	97.0	138.0	172.7	270.0
~ 6.0	~ 3.0	Diameter	6.5	12.7	25.0	35.0	44.0	70.0
		Perimeter	20.0	39.9	78.5	110.0	138.0	219.8

The values above is based on an unused punch and die with a recommended clearance. Except mentioned above, contact us for further information.

I BASIC INFORMATION

Punching tonnage

Tonnage of punching is determined by the perimeter of the shape to cut, as well as the thickness and the shearing resistance of the object to be processed. Shear angles (see page 4) help tonnage reduces.

WITHOUT SHEAR ON PUNCH

$$\text{Tonnage (kN)} = \frac{\text{Perimeter (mm)} \times \text{Thickness (mm)} \times \text{Shearing Resistance} \left(\frac{\text{N}}{\text{mm}^2}\right)}{1000}$$

WITH SHEAR ON PUNCH

$$\text{Tonnage (kN)} = \frac{\text{Perimeter (mm)} \times \text{Thickness (mm)} \times \text{Shearing Resistance} \left(\frac{\text{N}}{\text{mm}^2}\right) \times \text{Shear coefficient}}{1000}$$

Shearing resistance

Mild Steel (SPCC)	260 N/mm ² as minimum (350 Nmm ²)
Stainless steel	520~560 N/mm ²
Aluminum (anti-corrosive)	150~220 N/mm ²
Brass	220~400 N/mm ²
Silicon steel	450~560 N/mm ²
Hard Steel (SS4400)	420 N/mm ²

Shear coefficient

MURATA cutting shears are applied to D and larger punches. Shear height is 2.4mm unless otherwise required. Shearing coefficient is determined by its depth as well as worksheet thickness. The coefficient below is based on a shear of 2.4mm.

THICKNESS (MM)	1.2	1.6	2.0	2.3	3.0	3.2	1.0	4.5	6.3	9.5
COEFFICIENT	0.50	0.50	0.50	0.50	0.61	0.63	0.71	0.75	0.83	0.90

Example)

What is the punching tonnage for Φ50 with a 2.4mm shear punch to process SPCC t3.2?

The shearing resistance is 350 N/mm and the coefficient is 0.63.


$$\text{Punching Tonnage} = (50 \times \pi \times 3.2 \times 350 \times 0.63) / 1000 = 110 \text{ (kN)}$$

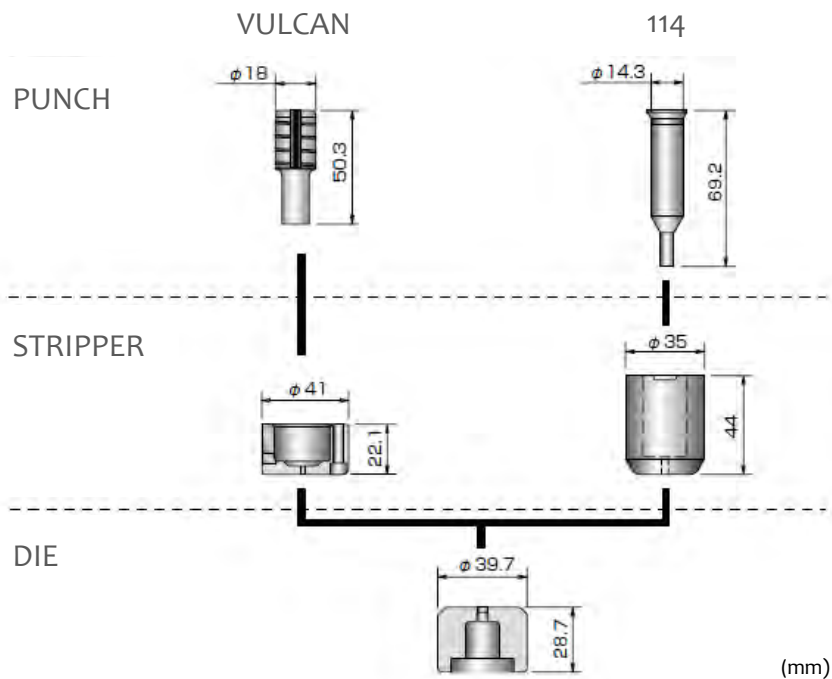
II PUNCH, DIE & STRIPPER

STATION

X

NARROW

			
ROUND ~ 3.2 mm	SQUARE	RECTANGLE	OBLONG



Round only

		Basic	Option	Coating (See page 3)
VULCAN	PUNCH	SKH	-	UHP, UGP, TIN, TICN
	STRIPPER	METAL	-	-
114	PUNCH	SKD	SKH	UHP, UGP, TIN, TICN
	STRIPPER	URATHANE 4XXA	-	-
114	DIE		SW, SA	-

SKH = High speed steel

SKD = Die steel


SA = Slug away

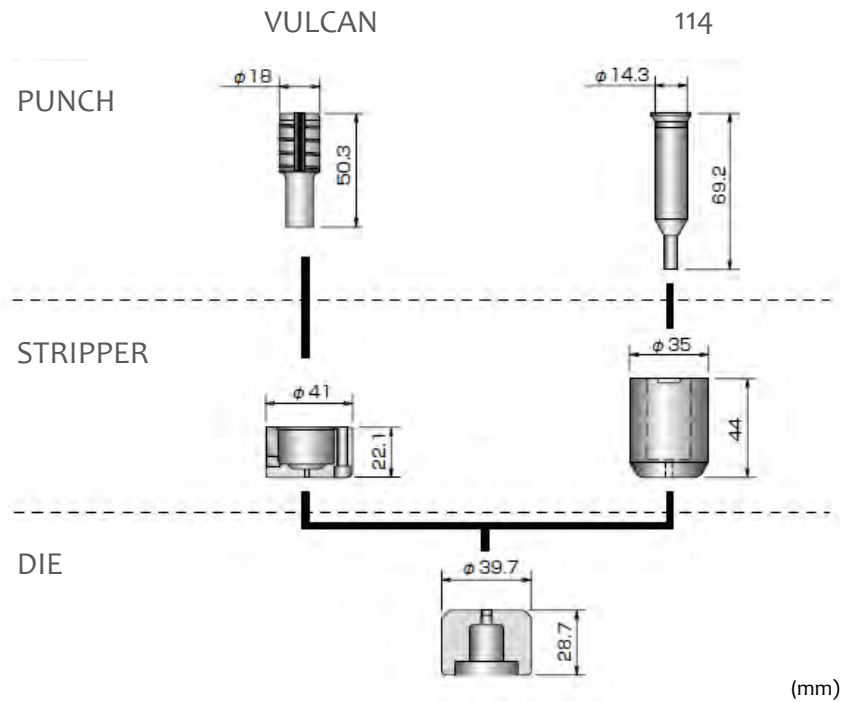
SW = Slug wiper (See page 4.)

II PUNCH, DIE & STRIPPER

STATION

X

			
ROUND 3.2 ~ 12.7 mm	SQUARE	RECTANGLE	OBLONG



Round only

		Basic	Option	Coating (See page 3)
VULCAN	PUNCH	SKH	-	UHP, UGP, TIN, TICN
	STRIPPER	METAL	-	-
114	PUNCH	SKD	SKH	UHP, UGP, TIN, TICN
	STRIPPER	URATHANE 4XXA	-	-
114	DIE		SW, SA	-


SKH = High speed steel
 SKD = Die steel
 SA = Slug away
 SW = Slug wiper (See page 4)

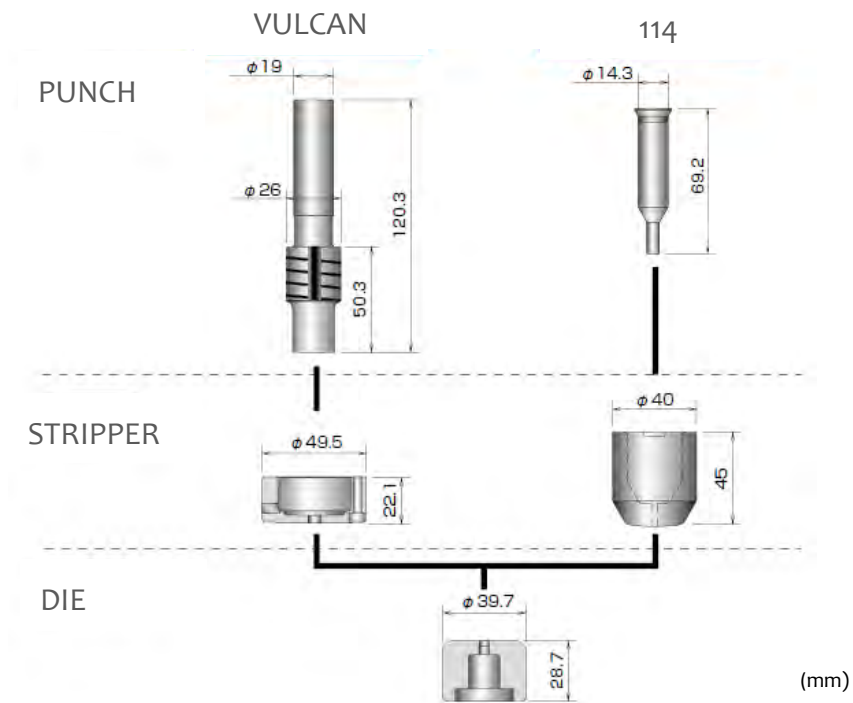
II PUNCH, DIE & STRIPPER

STATION

A

NARROW

			
ROUND ~ 3.2 mm	SQUARE	RECTANGLE	OBLONG



Round only


		Basic	Option	Coating (See page 3)
VULCAN	PUNCH	SKH	-	UHP, UGP, TIN, TICN
	STRIPPER	METAL	-	-
114	PUNCH	SKD	SKH	UHP, UGP, TIN, TICN
	STRIPPER	URATHANE 4A	-	-
114	DIE		SW, SA	-

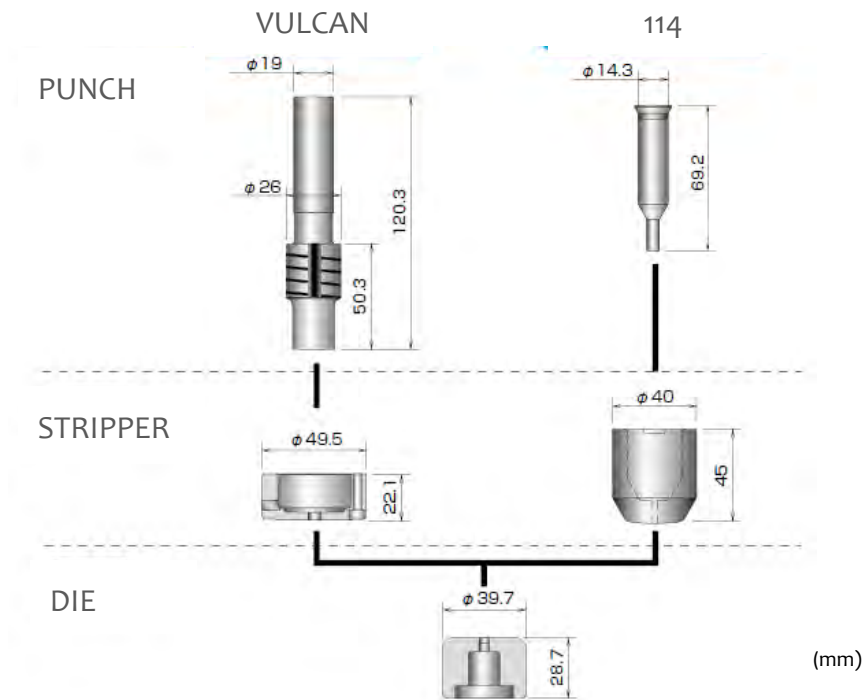
SKH = High speed steel
 SKD = Die steel
 SA = Slug away
 SW = Slug wiper (See page 4)

II PUNCH, DIE & STRIPPER

STATION

A

			
ROUND	SQUARE	RECTANGLE	OBLONG
3.2 ~ 12.7 mm			



Round only



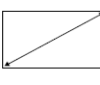

		Basic	Option	Coating (See page 3)
VULCAN	PUNCH	SKH	-	UHP, UGP, TIN, TICN
	STRIPPER	METAL	-	-
114	PUNCH	SKD	SKH	UHP, UGP, TIN, TICN
	STRIPPER	URATHANE 4A	-	-
114	DIE		SW, SA	-

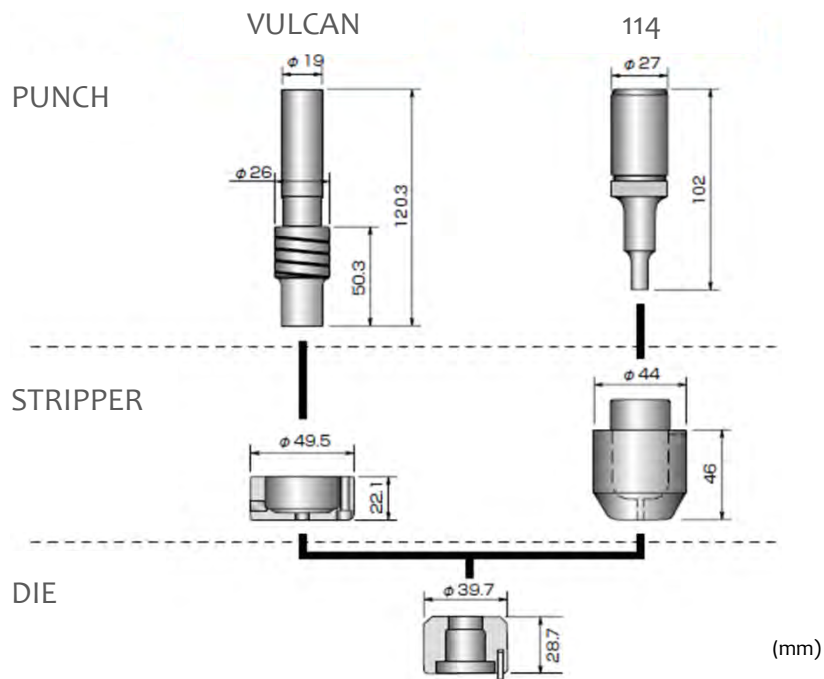
SKH = High speed steel
 SKD = Die steel
 SA = Slug away
 SW = Slug wiper (See page 4)

II PUNCH, DIE & STRIPPER

STATION

B

			
ROUND ~ 25 mm	SQUARE ~ 16 mm	RECTANGLE ~ 22 mm	OBLONG ~ 25mm





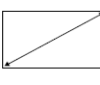

		Basic	Option	Coating (See page 3)	0°	90°	45°
VULCAN	PUNCH	SKH	-	UHP, UGP, TIN, TICN	✓	✓	
	STRIPPER	METAL	-	-	✓	✓	✓
114	PUNCH	SKD	SKH	UHP, UGP, TIN, TICN	✓	✓	
	STRIPPER	URATHANE 4B	-	-	✓	✓	
114	DIE		SW, SA	-	✓	✓	

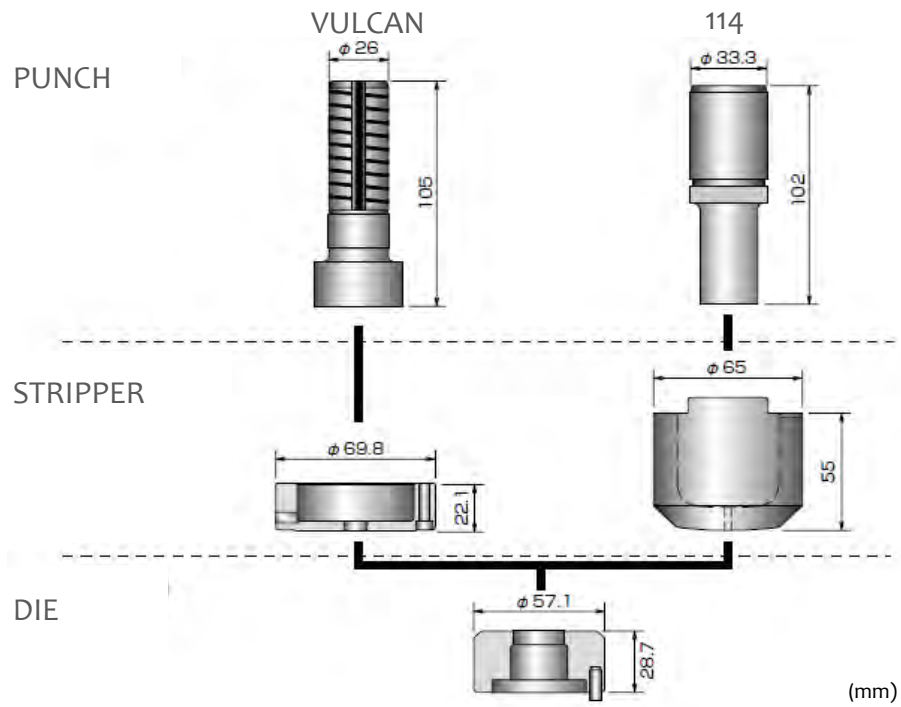
SKH = High speed steel
 SKD = Die steel
 SA = Slug away
 SW = Slug wiper (See page 4)
 Rounded corners are possible.

II PUNCH, DIE & STRIPPER

STATION

C

			
ROUND	SQUARE	RECTANGLE	OBLONG
~ 38 mm	~ 22 mm	~ 32 mm	~ 38 mm





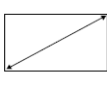
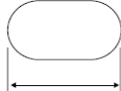
		Basic	Option	Coating (See page 3)	0°	90°	45°
VULCAN	PUNCH	SKH	-	UHP, UGP, TIN, TICN	✓	✓	
	STRIPPER	METAL	-	-	✓	✓	✓
114	PUNCH	SKD	SKH	UHP, UGP, TIN, TICN	✓	✓	
	STRIPPER	URATHANE 4C	-	-	✓	✓	
114	DIE		SW, SA	-	✓	✓	

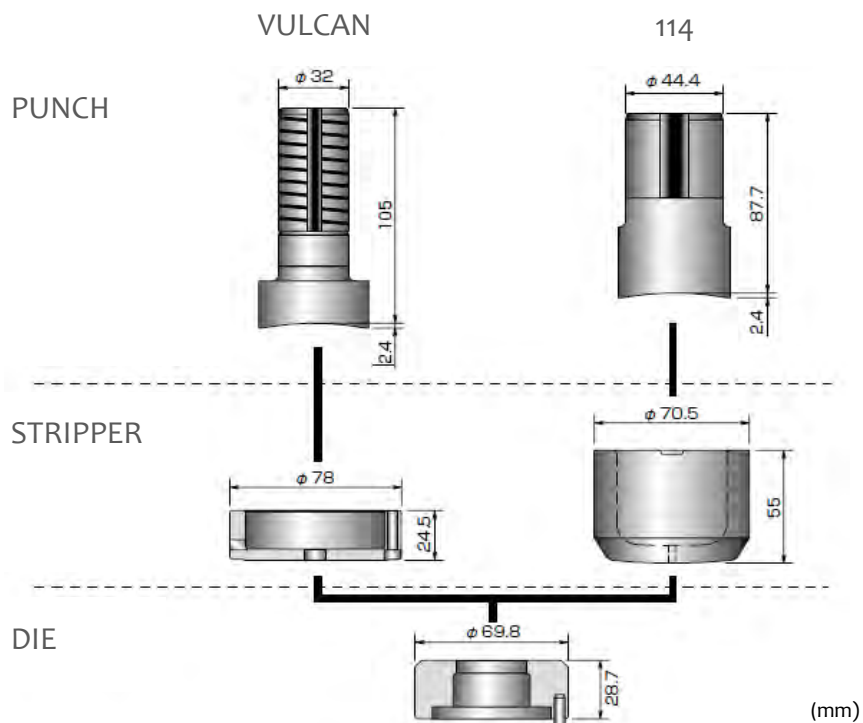
SKH = High speed steel
 SKD = Die steel
 SA = Slug away
 SW = Slug wiper (See page 4)
 Rounded corners are possible.

II PUNCH, DIE & STRIPPER

STATION

D, INDEX D

			
ROUND ~ 50 mm	SQUARE ~ 32 mm	RECTANGLE ~ 44 mm	OBLONG ~ 50 mm



		Basic	Option	Coating (See page 3)	0°	90°	45°
VULCAN	PUNCH	SKH	-	UHP, UGP, TIN, TICN	✓	✓	
	STRIPPER	METAL	-	-	✓	✓	✓
114	PUNCH	SKD	SKH	UHP, UGP, TIN, TICN	✓	✓	
	STRIPPER	URATHANE 4D, 4DR*	-	-	✓	✓	
114	DIE		SW, SA	-	✓	✓	

SKH = High speed steel

SKD = Die steel

SA = Slug away

SW = Slug wiper (See page 4)



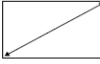

Rounded corners are possible.

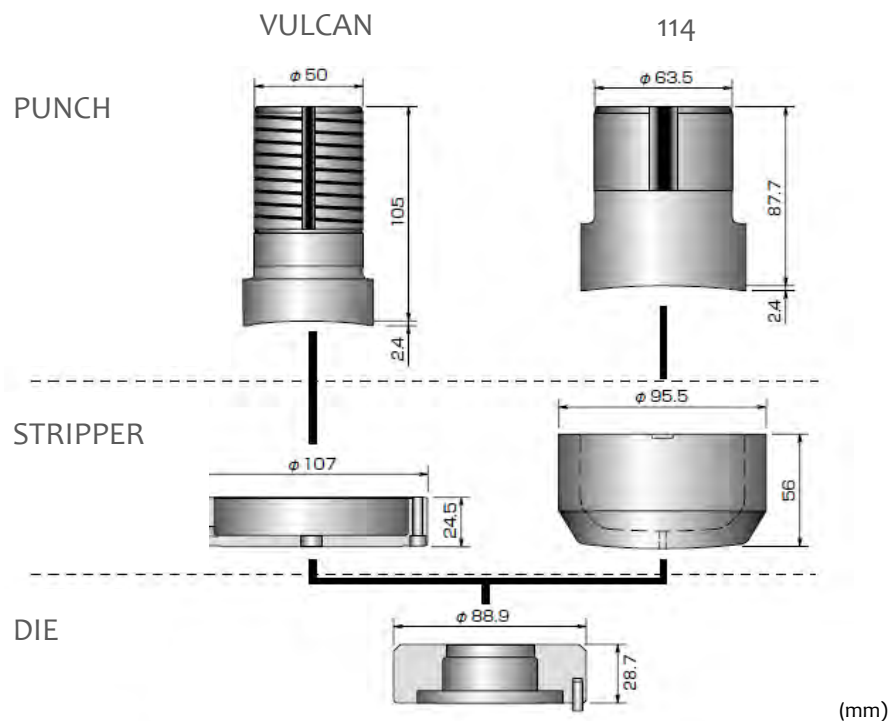
*Ribbed stripper is for 16mm or narrower shapes only

II PUNCH, DIE & STRIPPER

STATION

E

			
ROUND ~ 64 mm	SQUARE ~ 41 mm	RECTANGLE ~ 57 mm	OBLONG ~ 64 mm



		Basic	Option	Coating (See page 3)	0°	90°	45°
VULCAN	PUNCH	SKH	-	UHP, UGP, TIN, TICN	✓	✓	
	STRIPPER	METAL	-	-	✓	✓	✓
114	PUNCH	SKD	SKH	UHP, UGP, TIN, TICN	✓	✓	
	STRIPPER	URATHANE 4E, 4ER*	-	-	✓	✓	
114	DIE		SW, SA	-	✓	✓	

SKH = High speed steel

SKD = Die steel

SA = Slug away

SW = Slug wiper (See page 4)



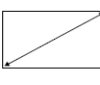

Rounded corners are possible.

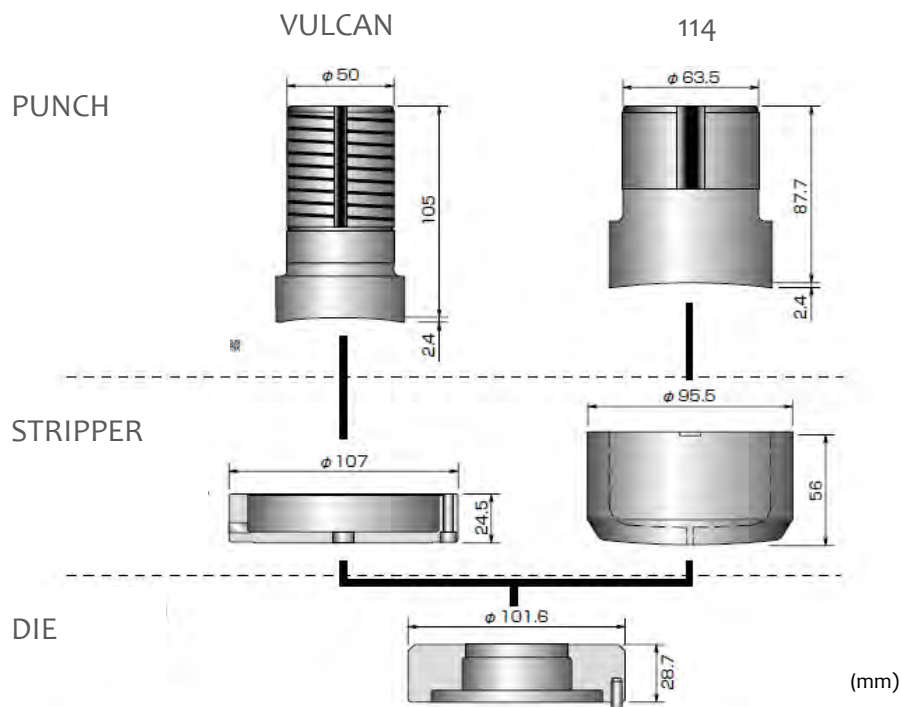
*Ribbed stripper is for 16mm or narrower shapes only

II PUNCH, DIE & STRIPPER

STATION

F

			
ROUND ~ 75 mm	SQUARE ~ 48 mm	RECTANGLE ~ 67 mm	OBLONG ~ 75 mm



		Basic	Option	Coating (See page 3)	0°	90°	45°
VULCAN	PUNCH	SKH	-	UHP, UGP, TIN, TICN	✓	✓	
	STRIPPER	METAL	-	-	✓	✓	✓
114	PUNCH	SKD	SKH	UHP, UGP, TIN, TICN	✓	✓	
	STRIPPER	URATHANE 4F, 4FR*	-	-	✓	✓	
114	DIE		SW, SA	-	✓	✓	

SKH = High speed steel
 SKD = Die steel
 SA = Slug away
 SW = Slug wiper (See page 4)



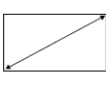
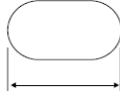
Rounded corners are possible.

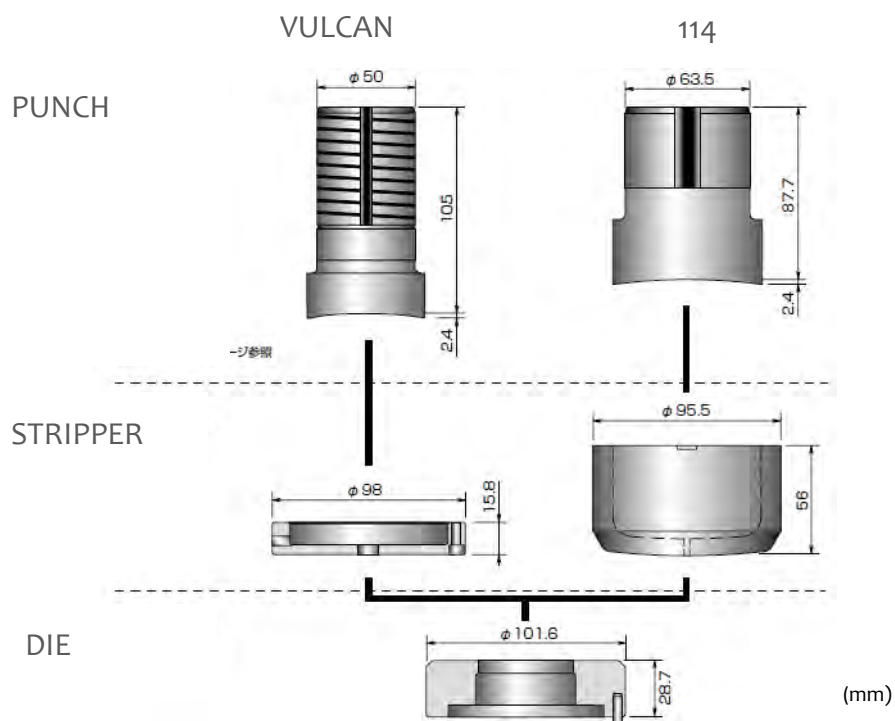
*Ribbed stripper is for 16mm or narrower shapes only

II PUNCH, DIE & STRIPPER

STATION

INDEX F

			
ROUND ~ 75 mm	SQUARE ~ 48 mm	RECTANGLE ~ 67 mm	OBLONG ~ 75 mm



		Basic	Option	Coating (See page 3)	0°	90°	45°
VULCAN	PUNCH	SKH	-	UHP, UGP, TIN, TICN	✓	✓	
	STRIPPER	METAL	-	-	✓	✓	✓
114	PUNCH	SKD	SKH	UHP, UGP, TIN, TICN	✓	✓	
	STRIPPER	URATHANE 4F, 4FR*	-	-	✓	✓	
114	DIE		SW, SA	-	✓	✓	

SKH = High speed steel

SKD = Die steel

SA = Slug away

SW = Slug wiper (See page 4)



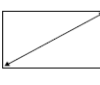

Rounded corners are possible.

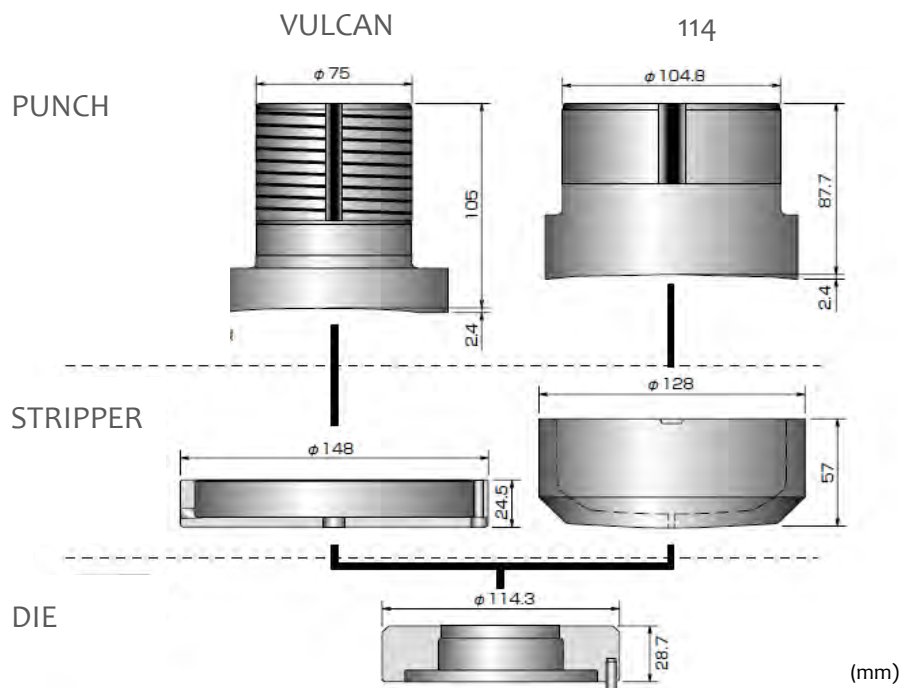
*Ribbed stripper is for 16mm or narrower shapes only.

II PUNCH, DIE & STRIPPER

STATION

G

			
ROUND ~ 89 mm	SQUARE ~ 57 mm	RECTANGLE ~ 79 mm	OBLONG ~ 89 mm



		Basic	Option	Coating (See page 3)	0°	90°	45°
VULCAN	PUNCH	SKH	-	UHP, UGP, TIN, TICN	✓	✓	
	STRIPPER	METAL	-	-	✓	✓	✓
114	PUNCH	SKD	SKH	UHP, UGP, TIN, TICN	✓	✓	
	STRIPPER	URATHANE 4G, 4GR*, 4G5	-	-	✓	✓	
114	DIE		SW, SA	-	✓	✓	

SKH = High speed steel
 SKD = Die steel
 SA = Slug away
 SW = Slug wiper (See page 4)



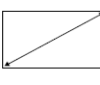

Rounded corners are possible.

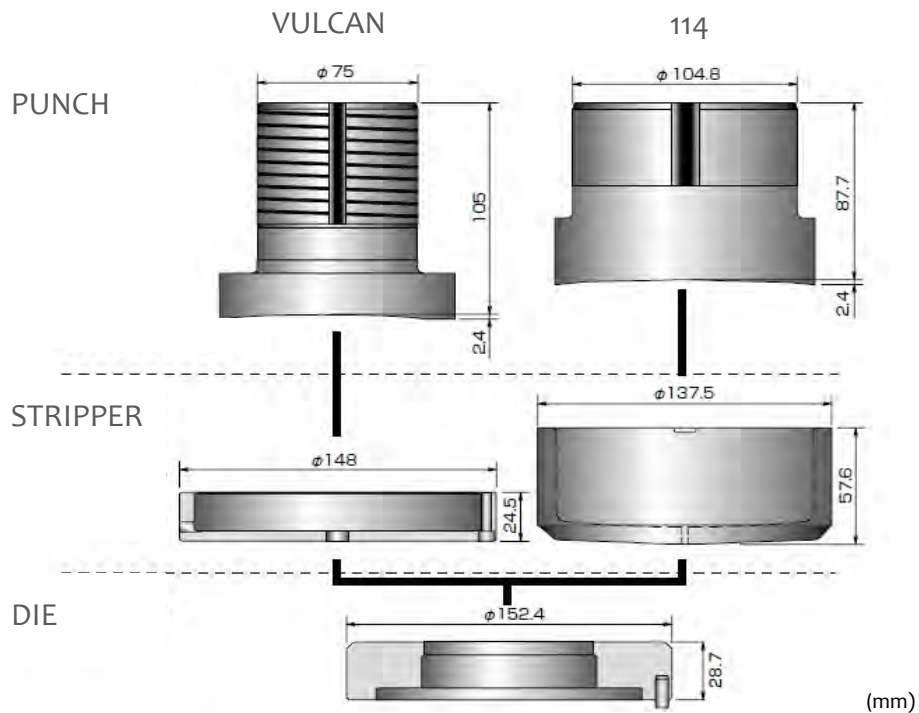
*Ribbed stripper is for 16mm or narrower shapes only.

II PUNCH, DIE & STRIPPER

STATION

J

			
ROUND	SQUARE	RECTANGLE	OBLONG
~ 120 mm	~ 79 mm	~ 113 mm	~ 120 mm



		Basic	Option	Coating (See page 3)	0°	90°	45°
VULCAN	PUNCH	SKH	-	UHP, UGP, TIN, TICN	✓	✓	
	STRIPPER	METAL	-	-	✓	✓	✓
114	PUNCH	SKD	SKH	UHP, UGP, TIN, TICN	✓	✓	
	STRIPPER	URATHANE 4J, 4JR*	-	-	✓	✓	
114	DIE		SW, SA	-	✓	✓	

SKH = High speed steel
 SKD = Die steel
 SA = Slug away
 SW = Slug wiper (See page 4)

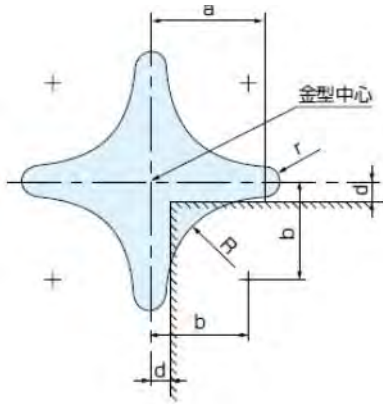
Rounded corners are possible.

*Ribbed stripper is for 16mm or narrower shapes only.

II PUNCH, DIE & STRIPPER

OTHER SHAPES

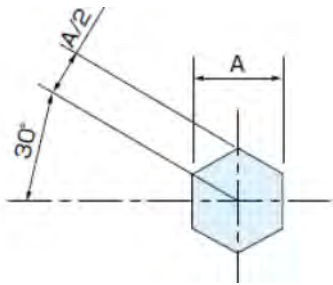
1. 4 WAY



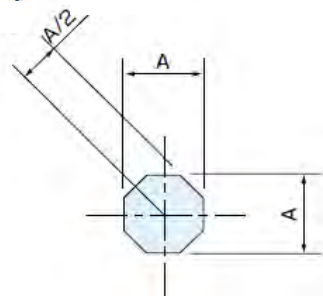
	R	a	b	r	d
B	2	6	4	1.59	2
	3	7	5	1.58	2
	4	8	6	1.56	2
	5	9	7.5	2.13	2.5
	6	10	8	1.53	2
C	8	12	10	1.5	2
	10	14.5	12.5	1.96	2.5
	13	17	15	1.43	2

(mm)

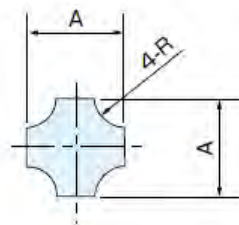
2. HEXAGON



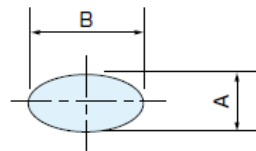
3. OCTAGON



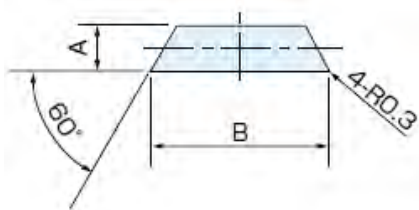
4. CORNER RADIUS



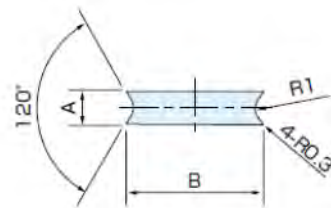
5. ELLIPSE



6. TRAPEZOID

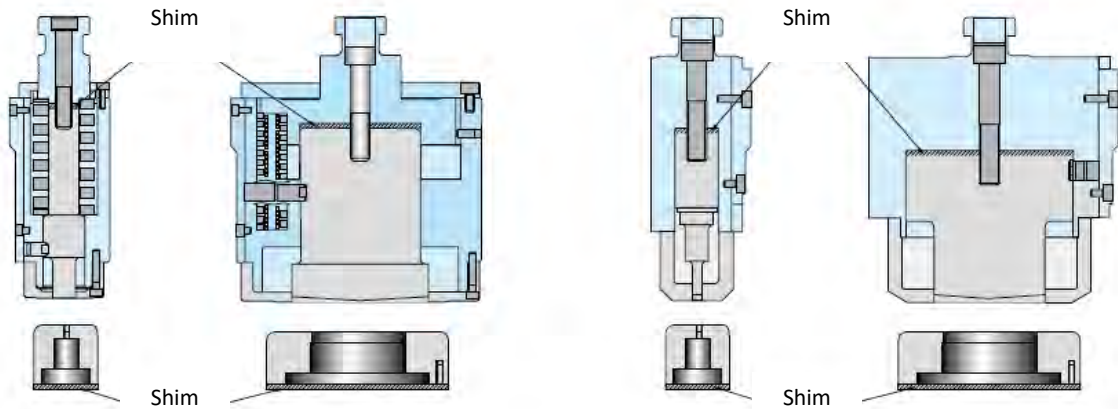


7. DIAMOND JOINT



II PUNCH, DIE & STRIPPER

SHIMS



VULCAN PUNCH		
X	t0.3	P52YA26360A
	t0.5	P52YA26360B
	t1.0	P52YA26360C
	t1.5	P52YA26360D
AB	t0.3	P52YA26460A
	t0.5	P52YA26460B
	t1.0	P52YA26460C
	t1.5	P52YA26460D
C	t0.3	P52YA26560A
	t0.5	P52YA26560B
	t1.0	P52YA26560C
	t1.5	P52YA26560D
D	t0.3	P52YA26660A
	t0.5	P52YA26660B
	t1.0	P52YA26660C
	t1.5	P52YA26660D
EF	t0.3	P52YA26760A
	t0.5	P52YA26760B
	t1.0	P52YA26760C
	t1.5	P52YA26760D
GHJ	t0.3	P52YA26860A
	t0.5	P52YA26860B
	t1.0	P52YA26860C
	t1.5	P52YA26860D

114 PUNCH		
XA	t0.3	P52YA07360A
	t0.5	P52YA07360B
	t1.0	P52YA07360C
	t1.5	P52YA07360D
B	t0.3	P52YA07460A
	t0.5	P52YA07460B
	t1.0	P52YA07460C
	t1.5	P52YA07460D
C	t0.3	P52YA07560A
	t0.5	P52YA07560B
	t1.0	P52YA07560C
	t1.5	P52YA07560D
D	t0.3	P52YA07660A
	t0.5	P52YA07660B
	t1.0	P52YA07660C
	t1.5	P52YA07660D
EF	t0.3	P52YA07760A
	t0.5	P52YA07760B
	t1.0	P52YA07760C
	t1.5	P52YA07760D
GHJ	t0.3	P52YA07860A
	t0.5	P52YA07860B
	t1.0	P52YA07860C
	t1.5	P52YA07860D

114 DIE		
X,A,B	t0.3	P52YA07960A
	t0.5	P52YA07960B
	t1.0	P52YA07960C
C	t0.3	P52YA08060A
	t0.5	P52YA08060B
	t1.0	P52YA08060C
D	t0.3	P52YA08160A
	t0.5	P52YA08160B
	t1.0	P52YA08160C
E	t0.3	P52YA08260A
	t0.5	P52YA08260B
	t1.0	P52YA08260C
F	t0.3	P52YA08360A
	t0.5	P52YA08360B
	t1.0	P52YA08360C
G	t0.3	P52YA08460A
	t0.5	P52YA08460B
	t1.0	P52YA08460C
H	t0.3	P52YA08560A
	t0.5	P52YA08560B
	t1.0	P52YA08560C
J	t0.3	P52YA08660A
	t0.5	P52YA08660B
	t1.0	P52YA08660C

(mm)

III HOLDERS

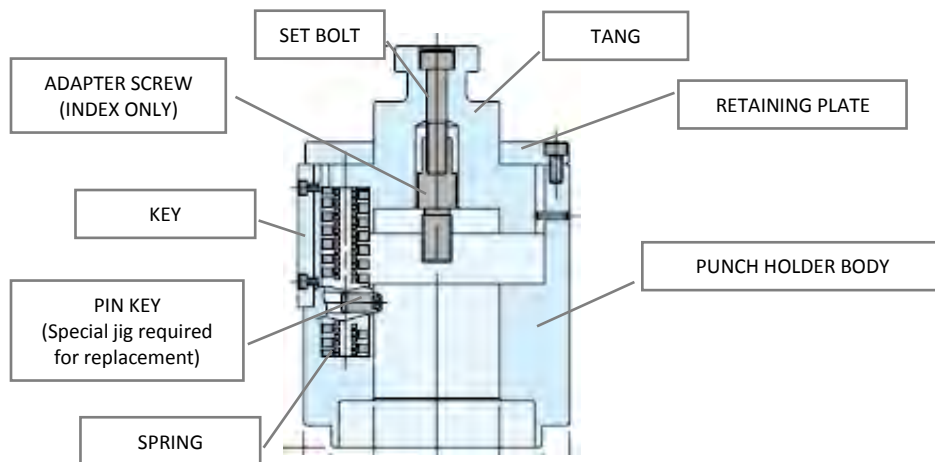
MACHINE AND HOLDERS

M/C		PUNCH HOLDER			DIE HOLDER	
		VULCAN PH	114 PH	114 PH INDEX	114	
C2000		C2	C2	C2	C2	6
C2500		C2	C2	C2	C2	6
C3000	40ST Single	C3	C3	P36	C3S - C3V3	7
	54ST Double	C3	C3	P36	C3W	10
C3500	40ST Single	C3	C3	P36	C3S - C3V3	7
	54ST Double	C3	C3	P36	C3W	10
FL1544		C3	C3	C3	C2	6
M1250		C3	C3	C3	C2	6
M2033	ETP BUSH D=19	C3	C3	C3	SLIDE IN 2 M2	3
	ETP BUSH D=15	C3	C3	C3	SLIDE IN 1 M2	5
M2034	ETP BUSH D=19	C3	C3	C3	SLIDE IN 2 M2	3
	ETP BUSH D=15	C3	C3	C3	SLIDE IN 1 M2	5
M2044		C3	C3	C3	SLIDE IN 2 M2	3
M2044EZ		C3	C3	C3	C2	6
M2044TC		C3	C3	C3	C2	6
M2044TS		C3	C3	C3	SLIDE IN 2 W	2
M2044UT		C3	C3	C3	SLIDE IN 2 W	2
M2048		C3	C3	C3	SLIDE IN 2 M2	3
M2048HL		C3	C3	C3	SLIDE IN 2 S	1
M2048HYB		C3	C3	C3	SLIDE IN 2 S	1
M2048LT		C3	C3	C3	SLIDE IN 2 W	2
	56ST	C3	C3	C3	SLIDE IN 2 M2	2
M2048ST		C3	C3	C3	C3S M2TE	8
M2048TE		C3	C3	C3	C3S M2TE	8
M2048TS		C3	C3	C3	SLIDE IN 2 W	2
M2048UT		C3	C3	C3	SLIDE IN 2 W	2
M2125		C3	C3	P36	C3S - M2125	9
M2125HYB		C3	C3	P36	C3S - M2125	9
M2544		C3	C3	C3	SLIDE IN 2 W	2
M2544TS		C3	C3	C3	SLIDE IN 2 W	2
M2548		C3	C3	C3	SLIDE IN 2 W	2
M2548TS		C3	C3	C3	SLIDE IN 2 W	2
M2558		C3	C3	C3	SLIDE IN 2 W	2
M2558HL		C3	C3	C3	SLIDE IN 2 W	2
M2558HYB		C3	C3	C3	SLIDE IN 2 W	2
M2558TS		C3	C3	C3	SLIDE IN 2 W	2
M3048TG		C3	C3	C3	SLIDE IN 2 W	2
M3058TG		C3	C3	C3	SLIDE IN 2 W	2
M5000		C3	C3	P36	C3W	10
M5000HYB		C3	C3	P36	C3W	10
V3000	40ST Single	C3	C3	P36	C3S - C3V3	7
	54ST Double	C3	C3	P36	C3W	10
V3000α	ETP BUSH D=19	C3	C3	C3	SLIDE IN 2 W	2
	ETP BUSH D=15	C3	C3	C3	SLIDE IN 1 V3α	4
V3046α	ETP BUSH D=19	C3	C3	C3	SLIDE IN 2 W	2
	ETP BUSH D=15	C3	C3	C3	SLIDE IN 1 V3α	4
V3046β		C3	C3	C3	SLIDE IN 2 W	2
V3056α		C3	C3	C3	SLIDE IN 2 W	2
V5000		C3	C3	P36	C3W	10
V5058		C3	C3	P36	C3W	10
W4560	40ST Single	C3	C3	P36	Contact us.	
	54ST Double	C3	C3	P36		

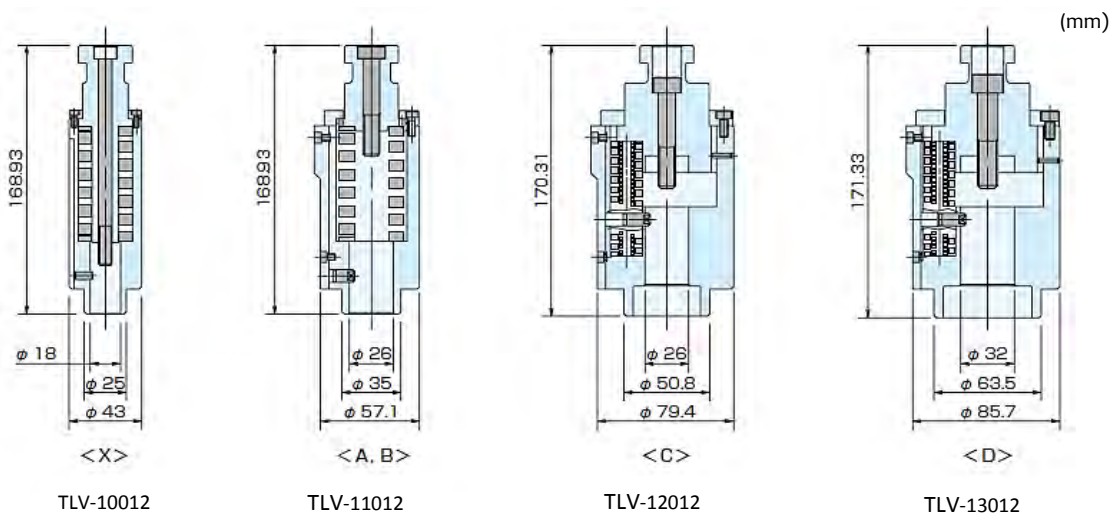
III HOLDERS

VULCANTOOL PUNCH HOLDER C₃ Series

C3000, C3500, FL1544, M1250, M2033, M2034, M2044, M2044EZ, M2044TC, M2044TS, M2044UT, M2048, M2048HL, M2048HYB, M2048LT, M2048ST, M2048TE, M2048TS, M2048UT, M2125, M2125HYB, M2544, M2544TS, M2548, M2548TS, M2558, M2558HL, M2558HYB, M2558TS, M3048TG, M3058TG, M5000, M5000HYB, V3000, V3000 α , V3046 α , V3046 β , V3056 α , V5000, V5058, W4560



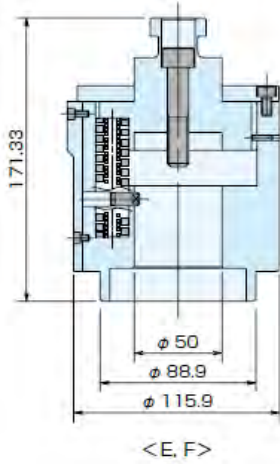
C₃ SERIES: X ~ D



III HOLDERS

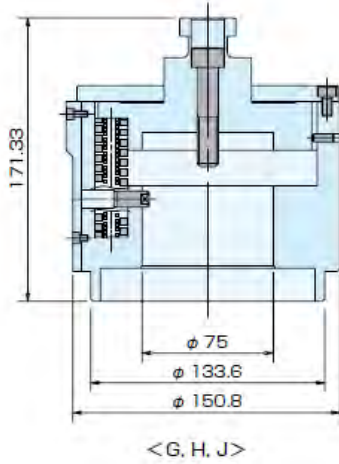
C3 SERIES: EF ~ INDEX

(mm)



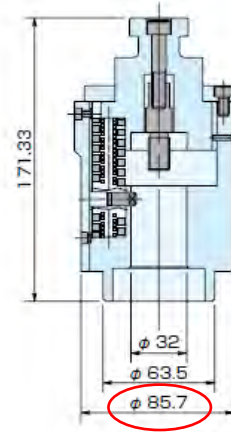
<E, F>

TLV-14012



<G, H, J>

TLV-15012

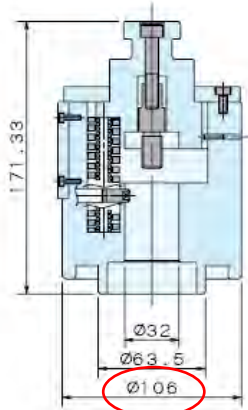


<INDEX D>

NON-VARI COMATIBLE

TLV-17012 (54ST)

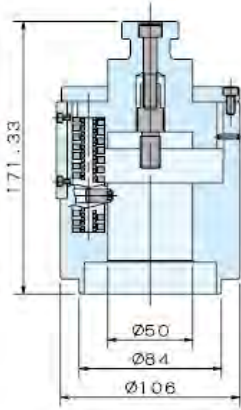
TLV-17600 (40ST)



<INDEX D>

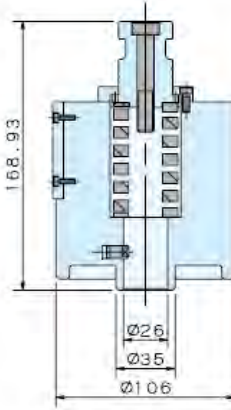
VARI COMPATIBLE

TLV-17412



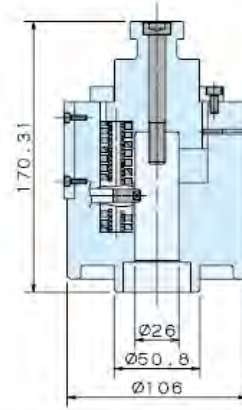
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TLV-18012



<INDEX FB>

TLV-17212



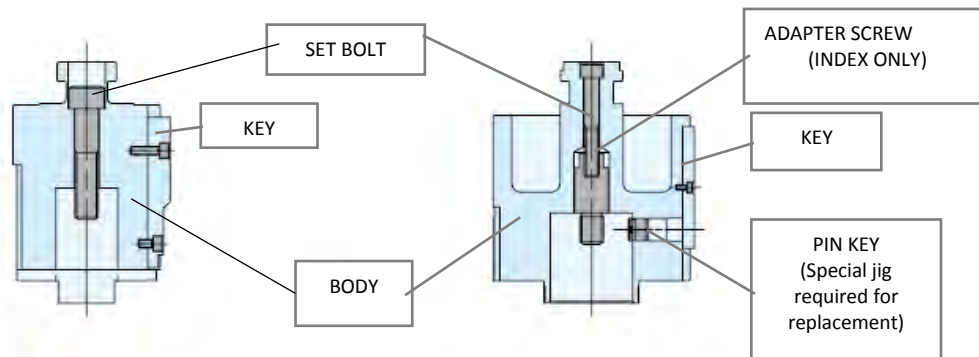
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TLV-17312

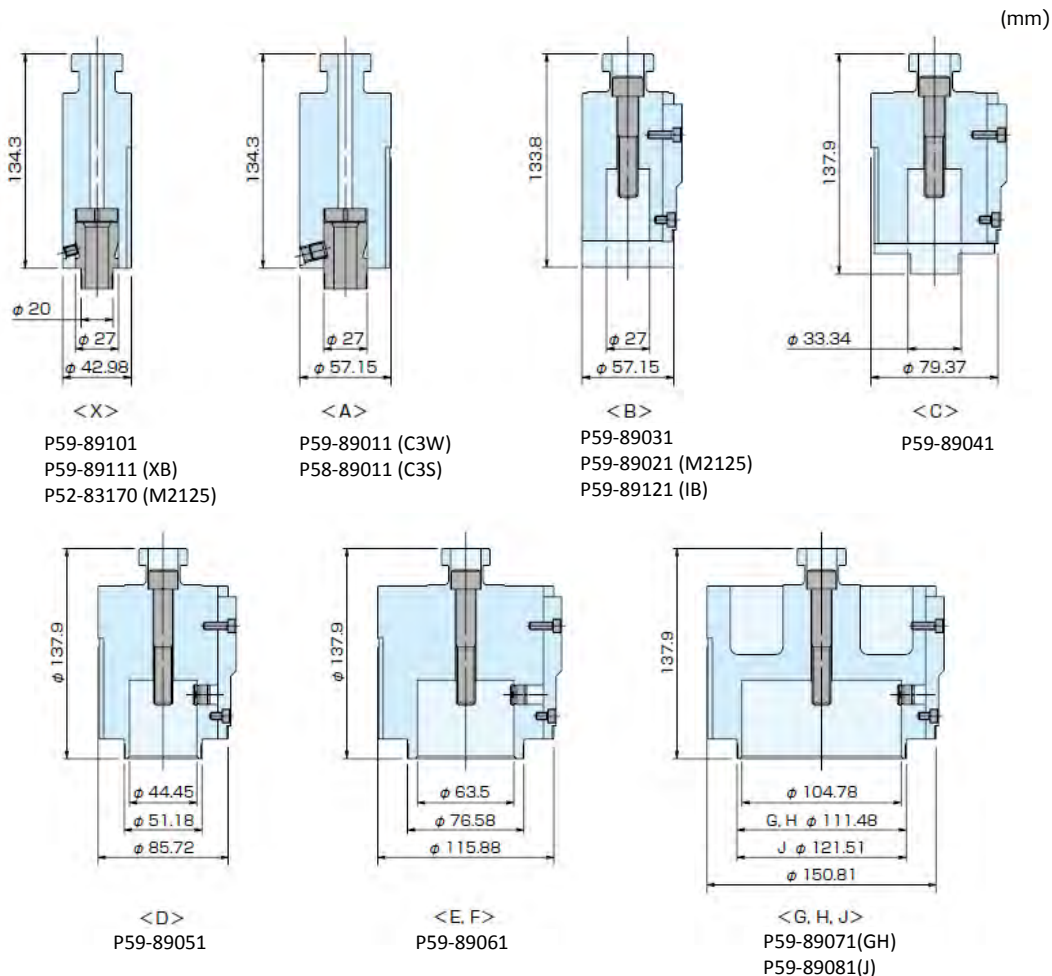
III HOLDERS

STYLE 114 PUNCH HOLDER C₃ Series

C3000, C3500, FL1544, M1250, M2033, M2034, M2044, M2044EZ, M2044TC, M2044TS, M2044UT, M2048, M2048HL, M2048HYB, M2048LT, M2048ST, M2048TE, M2048TS, M2048UT, M2125, M2125HYB, M2544, M2544TS, M2548, M2548TS, M2558, M2558HL, M2558HYB, M2558TS, M3048TG, M3058TG, M5000, M5000HYB, V3000, V3000α, V3046α, V3046β, V3056α, V5000, V5058, W4560



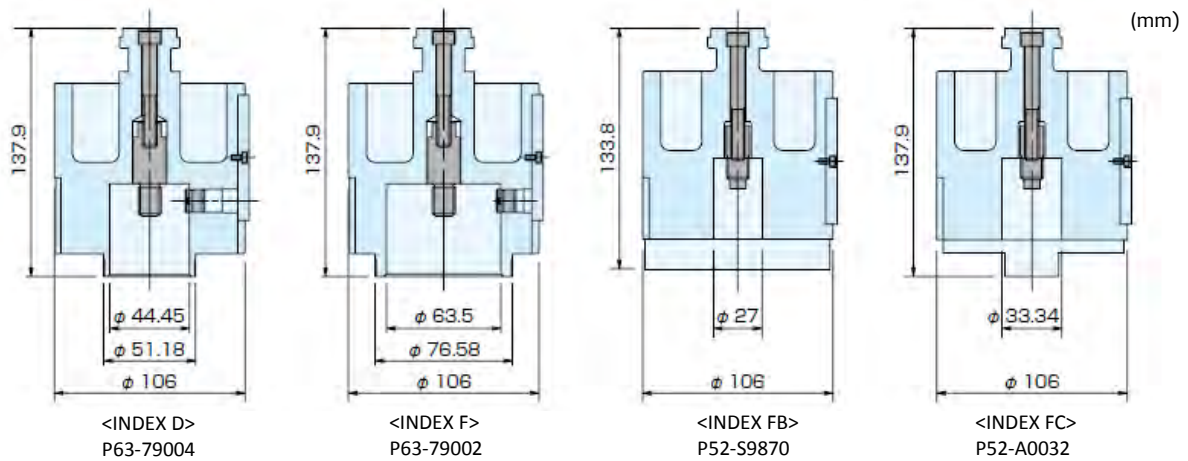
C₃ SERIES X ~ GHJ



III HOLDERS

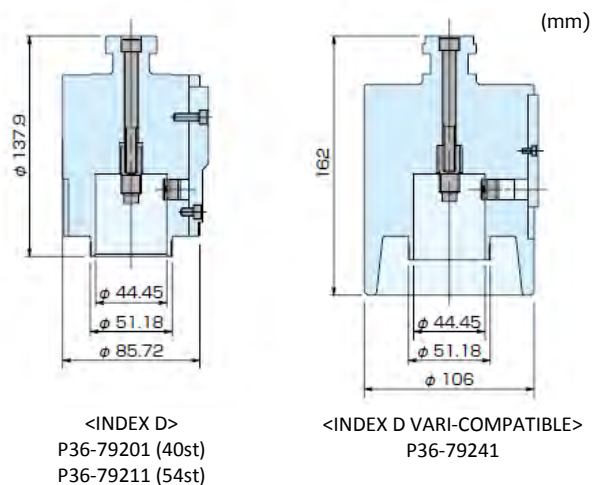
STYLE 114 INDEX PUNCH HOLDER C₃ Series

FL1544, M2044TC, M2048LT, M2125HYB, M2558HL, V3046 α , M1250, M2044TS, M2048ST, M2544, M2558HYB, V3046 β , M2033, M2044UT, M2048TE, M2544TS, M2558TS, M2034, M2048, M2048TS, M2548, M3048TG, M2044, M2048HL, M2048UT, M2548TS, M3058TG, M2044EZ, M2048HYB, M2125, M2558, V3000 α



STYLE 114 INDEX PUNCH HOLDER P₃₆ Series

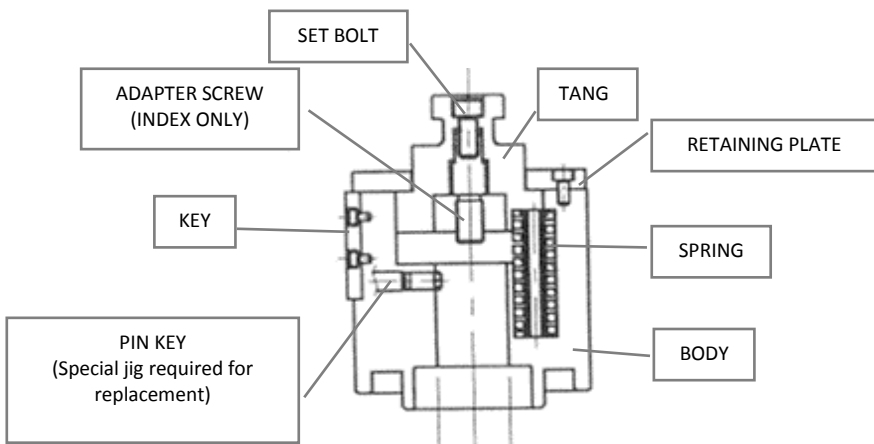
C3000, C3500, M2125, M2125HYB, M5000HYB, M5000, V3000, V5000, V5000 α , V5058, W4560



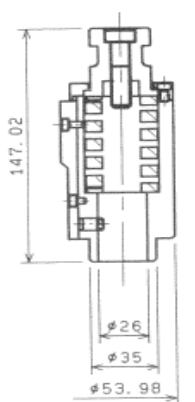
III HOLDERS

VULCANTOOL PUNCH HOLDER C2 Series

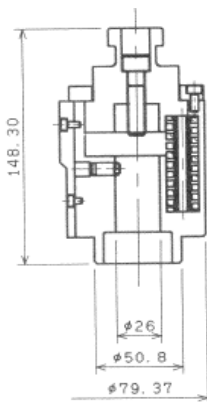
C2000, C2500



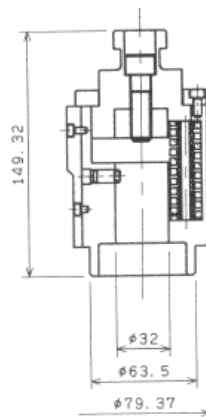
(mm)



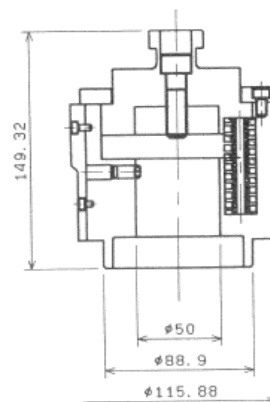
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TLV-21012



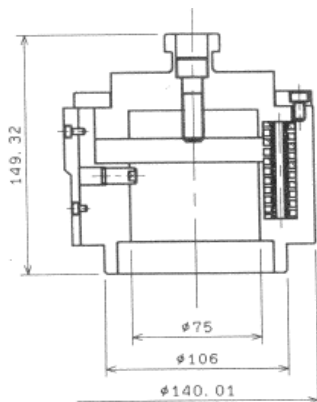
<C>
TLV-22012



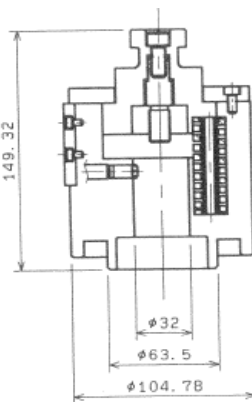
<D>
TLV-23012



<EF>
TLV-24012



<G>
TLV-25012

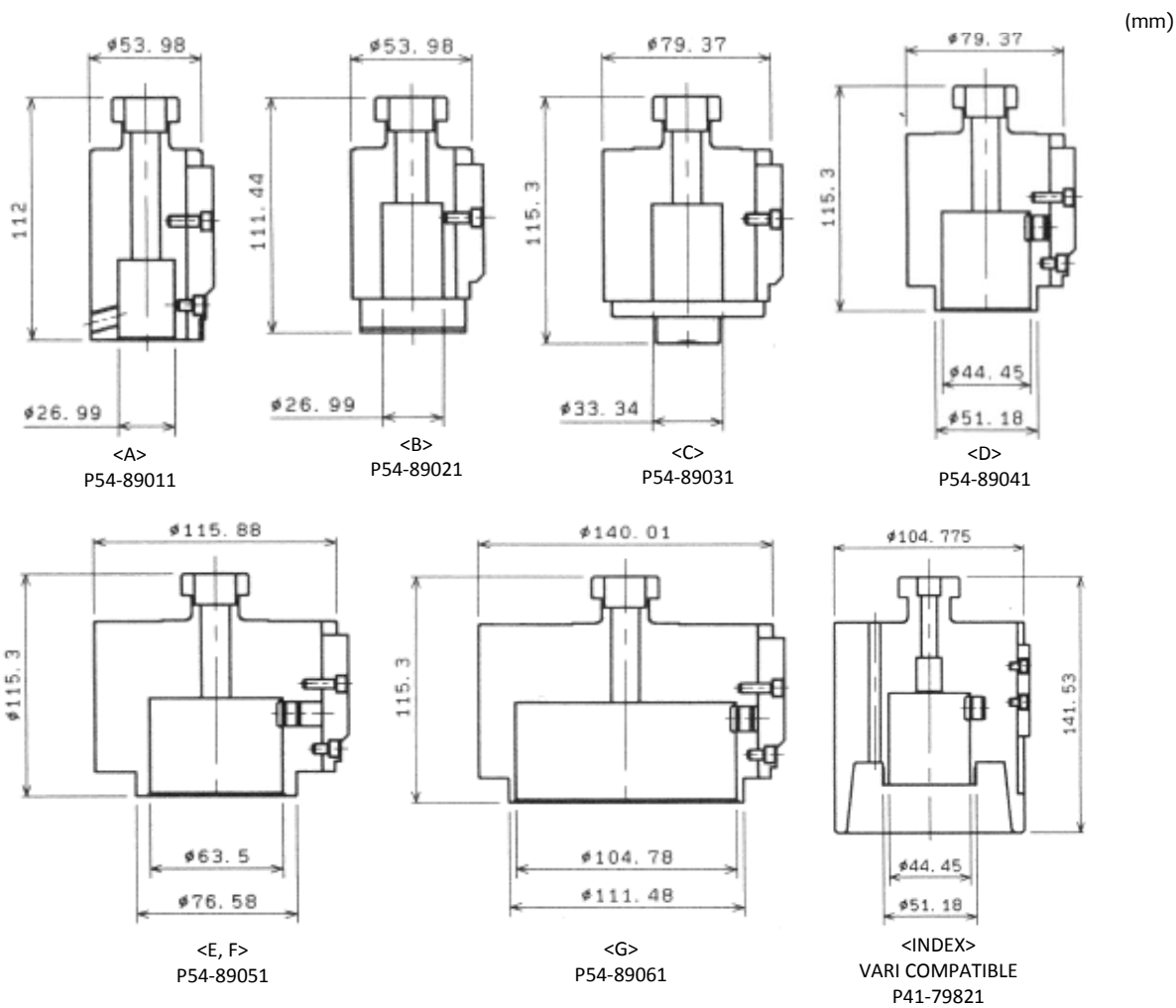
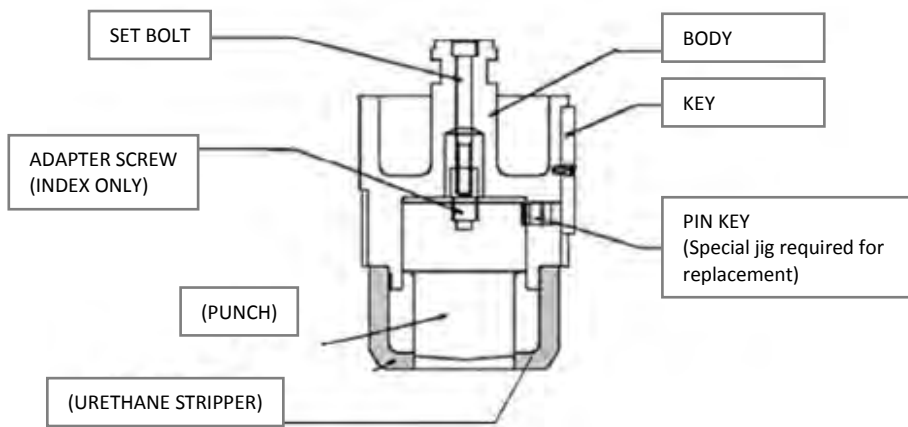


<INDEX D>
VARI COMPATIBLE
TLV-27412

III HOLDERS

STYLE 114 PUNCH HOLDER C2 Series

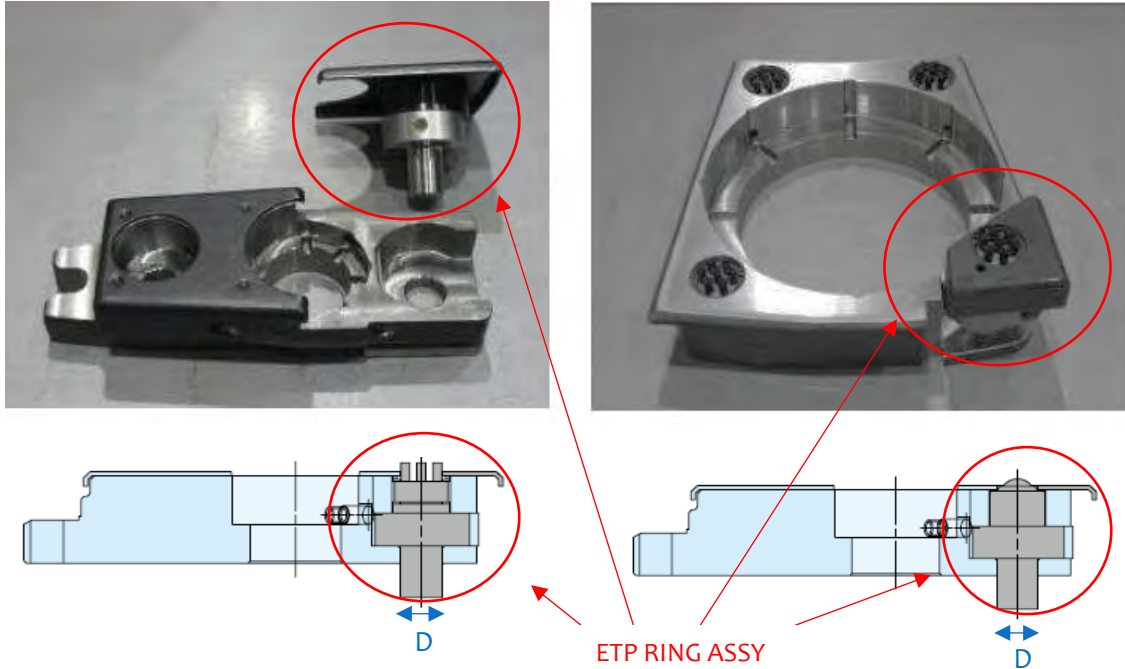
C2000, C2500



III HOLDERS

SLIDE IN DIE HOLDER (STYLE 114)

BRUSH / STEEL BALL / URETHANE BALL



SELECTION

Complete assembly:

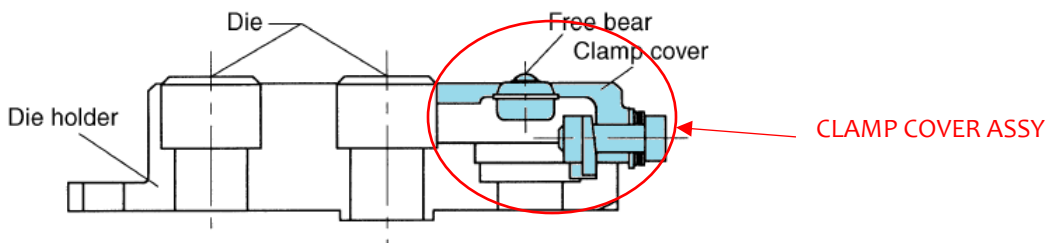
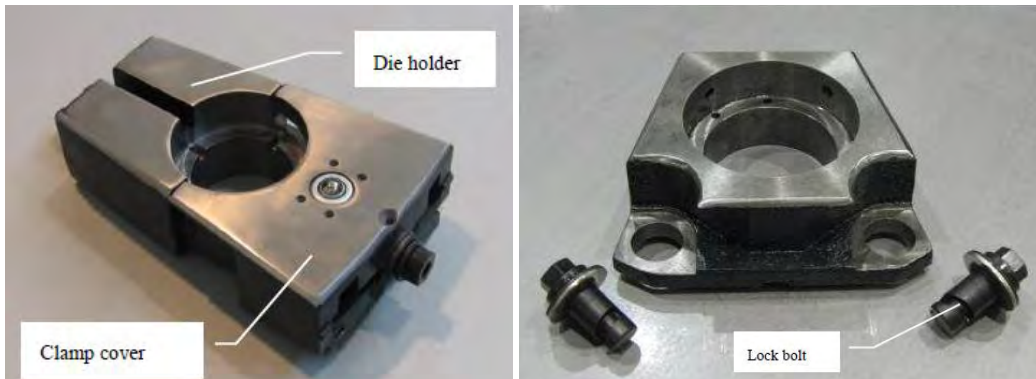
	1	2	3	4	5
	SLIDE IN 2 S	SLIDE IN 2 W	SLIDE IN 2 M2	SLIDE IN 1 V3α D=15.0 mm	SLIDE IN 1 M2 D=15.0 mm
B	P52-86310	P52-86010	P52-86011	P52-85010	P52-86011
C	P52-86320	P52-86020	P52-86090	P52-85020	P52-85090
D	P52-86330	P52-86030	P52-86100	P52-85030	P52-85100
E		P52-86040	P52-86130	P52-85040	
F		P52-86050	P52-86140	P52-85050	
G		P52-86060	P52-86120	P52-85060	P52-85110
GE			P52-86130		
GF			P52-86140		
H		P52-86070		P52-85070	
J		P52-86080		P52-85080	
Note	BRUSH ONLY				
	M2048HL, M2048HYB	M2044TS, 2044UT, M2048LT, M2048TS, M2048UT, M2544, M2544TS, M2548, M2548TS, M2558, M2558HL, M2558HYB, M2558TS, M3048TG, M3058TG, V3000α, V3046α, V3048α	M2033, M2034, M2044	V3000α, V3046α, V3048α	M2033, M2034,

For 56ST turret table, the above is not applicable – contact us.

III HOLDERS

DIE HOLDER (STYLE 114)

STEEL BALL / URETHANE BALL



SELECTION

Complete assembly:

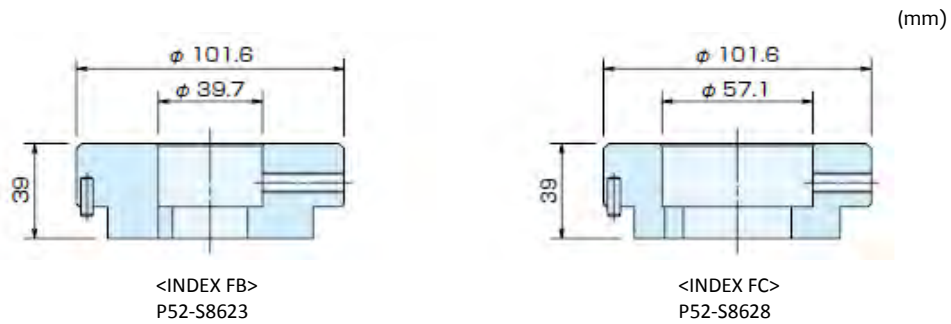
	6	7	8	9	10
	C2	C3S – C3V3S	C3S – M2TE	C3S – M2125	C3W
AB	P54-83020	P52-83010	P52-83011	P52-83190	P59-85011
C	P54-83030	P52-83020	P52-83021	P52-83150	P59-85031
D	P54-83040	P52-83030	P52-83031	P52-83160	P59-85051
E	P54-83050	P52-83040	P52-83040	P52-83040	P59-85061
F	P54-83060	P52-83050	P52-83050	P52-83050	P59-85071
G	P54-83140	P52-83060	P52-83060		P59-85081
H		P52-83070	P52-83070		P59-85091
J		P52-83080	P52-83080		P59-85101
Note	Brush only				
	C2000, C2500	C3000S, C3500S, V3000S	M2048ST, M2048UT	M2125, M2125HYB	C3000W, C3500W, M5000, M5000HYB, V5000, V5058

III HOLDERS

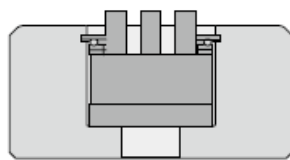
STYLE 114 INDEX DIE HOLDER

Inform us of your machine's KX number, or your machine's name and how many stations the table has.

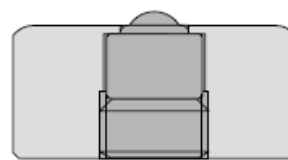
STYLE 114 DIE ADAPTER



DIE HOLDER ACCESSARIES



Brush Die



STEEL BALL/ URETHANE BALL

III HOLDERS

VARITool 12Z / VARITool 12S



VARITool 12Z

- PUNCH HOLDER
- DIE HOLDER
- PUNCH
- DIE
- STRIPPER



VARITool 12S

- PUNCH HOLDER
- STEM ASSY
- DIE HOLDER
- PUNCH
- DIE
- STRIPPER

PUNCH		DIE
VARITool 12Z	VARITool 12S	

VARITool 12z/12s PUNCH is made of SKH.

(mm)

ROUND ~ 12.7 mm	SQUARE ~ 7.7 mm	RECTANGLE ~ 11.0 mm	OBLONG ~ 12.7 mm

TONNAGE: ~ 4.5 TONS
MILD STEEL: ~3.2mm
STAINLESS STEEL: ~2.0mm

III HOLDERS

MARKING TOOL



SELECTION

	Letter size	Sheet (t)	Note
20 LETTERS	L5.0xW3.2	0.8 ~6.3	For some thickness, shims are required.
40 LETTERS	L3.2xW2.1	0.8 ~6.3	For some thickness, shims are required.

(mm)

STANDARD LETTERS TO CHOOSE:

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

0 1 2 3 4 5 6 7 8 9

+ - / ,

Other characters are selectable.

FOR INTRODUCTION

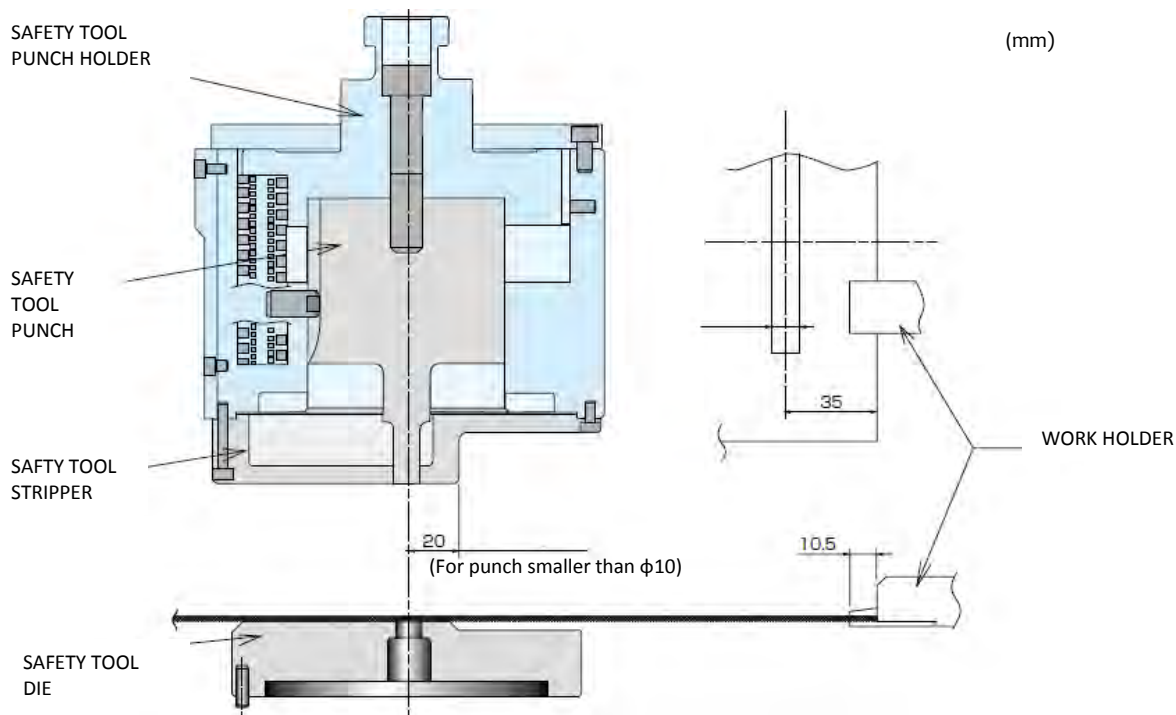
Contact Murata Machinery first for machine settings.

NOTE

MARKING TOOL is usable in MOTORUM and VECTRUM series. CENTRUM with VARI compatible also accept the option. C2000 and C2500 could take 40 letters only.

III HOLDERS

WORK HOLDER SAFETY TOOL (VULCANTOOL only)



NOTE

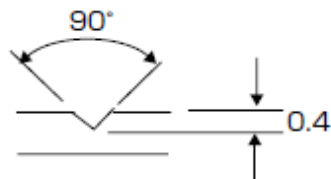
Program settings are necessary.

SELECTION

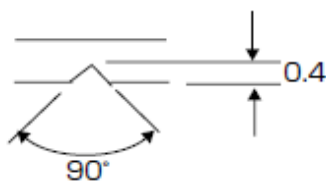
Model	Station	Unit	Code	Other
SAFETY TOOL (VULCAN)	D	Whole set (see above) or part to be replaced	N.P.N	Your machine name or KX number. Punch size, die size and clearance.
	E			
	F			
	G			
	H			
	J			
	INDEX D			
INDEX F				

IV FORMING TOOL

CENTER PUNCH



TOP MARKING



BOTTOM MARKING

(mm)

- Both direction OK
- Punch holder is included.

MODEL SELECTION

1. STANDARD

MTL's basic center point tool. There are two options in the height of the lower part for bottom marking.

	Lower	Sheet	Unit	114 X	114 AB C2	114 AB C3S	114 AB C3W	114 AB L10
TOP Marking	Flat	t1.0~t6.3	Set	P52-HX014	P54-HA055	P52-HA145	P58-HA148	-
BTM Marking	Normal	t1.0~t3.2	Set	P52-HX015	P54-HA143	P52-HA147	P58-HA151	L10-HA130
		t2.4~t6.3	Set	P52-HX051	-	P52-HA562	P52-HA528	-
	Short	t1.0~t2.3	Set	P52-HX026	P54-HA461	P52-HA463	P52-HA464	L10-HA466

(mm)

2. ADJUSTABLE

The level of pin is changeable as long as 1.5mm in projection. Short-type lower part only:

	Lower	Sheet	Unit	114 X	114 AB C2	114 AB C3S	114 AB C3W	114 AB L10
TOP Marking	Flat	t1.0~t6.3	Set	P5Y-HX007	-	-	P5Y-HA036	-
BTM Marking	Short	t1.0~t2.3	Set	P5Y-HX006	-	-	P5Y-HA034	-

(mm)

3. CROSS POINTER

A cross is marked. There are two options in the height of the lower part for bottom marking.

	Lower	Sheet	Unit	114 X	114 AB C2	114 AB C3S	114 AB C3W	114 AB L10
TOP Marking	Flat	t1.0~t6.3	Set	-	P54-HB075	P52-HB076	P58-HB077	-
BTM Marking	Short	t1.0~t2.3	Set	-	P54-HB460	P52-HB462	P58-HB463	-
	Normal	t1.0~t3.2	Set	-	P54-HB072	P58-HB074	P58-HB073	-

(mm)

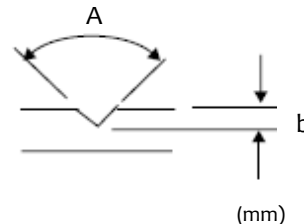
IV FORMING TOOL

CENTER PUNCH - CONTINUED

FOR FURTHER REQUIREMENT(S)

Let us know the following:

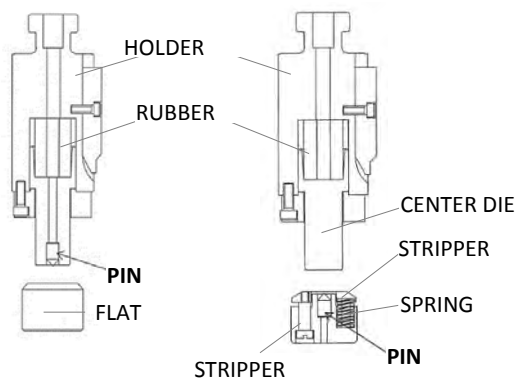
- ✓ Point dimensions
- ✓ Process direction; i.e. top marking or bottom marking
- ✓ Sheet material and thickness to be processed
- ✓ Machine's KX number
- ✓ Other requests: i.e. lower height, etc.



FOR REPLACEMENT

Let us know the following:

- ✓ Part name (see the right)
- ✓ Assembly code (engraved on the surface)

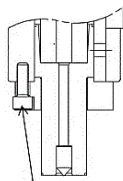
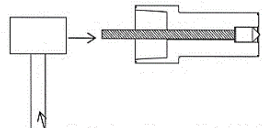
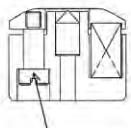
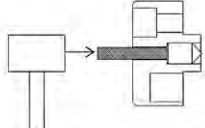


TOP MARKING

BOTTOM MARKING

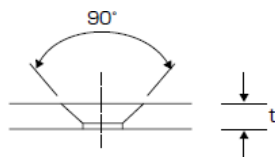
TIPS

The pin is replaceable.

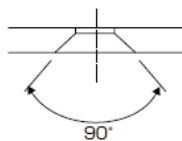
TOP MARKING	BOTTOM MARKING
 <p>Loosen the fixtures.</p>  <p>Hammer with a brass smaller than $\phi 4.5$.</p>	 <p>Loosen the fixtures.</p>  <p>Hammer with a brass smaller than $\phi 4.5$.</p>

IV FORMING TOOL

COINED COUNTERSINK



TOP PUNCHING



BOTTOM PUNCHING

(mm)

- Both direction OK
- No punch holder is included.
- Pilot hole is needed.

SELECTION

TOP PUNCHING

D	BOLT	PILOT	SHEET	114X	114A	114B	VUL X	VUL B
5	M2.5	4.7	t 1.2	P52-ZX062	P52-ZA776	P52-ZBE64	P52-ZX017	P52-ZB243
		4.5	t 1.6	P52-ZX063	P52-ZA780	P52-ZBE66	P52-ZX020	P52-ZB245
		4.2	t 2.0	P52-ZX064	P52-ZA784	P52-ZBE68	P52-ZX022	P52-ZB247
		4	t 2.3	P52-ZX065	P52-ZA788	P52-ZBE70	P52-ZX024	P52-ZB249
6	M3	5.7	t 1.2	P52-ZX067	P52-ZA792	P52-ZBE72	P52-ZX026	P52-ZB251
		5.3	t 1.6	P52-ZX068	P52-ZA794	P52-ZBE74	P52-ZX029	P52-ZB253
		5	t 2.0	P52-ZX069	P52-ZA693	P52-ZBE76	P52-ZX031	P52-ZB255
		4.7	t 2.3	P52-ZX070	P52-ZA798	P52-ZBE78	P52-ZX033	P52-ZB257
8	M4	7.7	t 1.2	P52-ZX072	P52-ZA802	P52-ZBE80	P52-ZX035	P52-ZB259
		7.3	t 1.6	P52-ZX073	P52-ZA716	P52-ZBE82	P52-ZX038	P52-ZB261
		6.8	t 2.0	P52-ZX074	P52-ZA808	P52-ZBE84	P52-ZX040	P52-ZB263
		6.5	t 2.3	P52-ZX075	P52-ZA812	P52-ZBE86	P52-ZX042	P52-ZB265
10	M5	9.6	t 1.2	P52-ZX077	P52-ZA816	P52-ZBE88	P52-ZX044	P52-ZB267
		9.2	t 1.6	P52-ZX078	P52-ZA713	P52-ZBE90	P52-ZX047	P52-ZB269
		8.7	t 2.0	P52-ZX079	P52-ZA822	P52-ZBE92	P52-ZX049	P52-ZB271
		8.4	t 2.3	P52-ZX080	P52-ZA826	P52-ZBE94	P52-ZX051	P52-ZB273
12	M6	11.5	t 1.2	P52-ZX082	P52-ZA953	P52-ZBE96	P52-ZX053	P52-ZB275
		11.1	t 1.6	P52-ZX083	P52-ZA955	P52-ZBE98	P52-ZX056	P52-ZB277
		10.6	t 2.0	P52-ZX084	P52-ZA957	P52-ZBF01	P52-ZX058	P52-ZB279
		10.3	t 2.3	P52-ZX085	P52-ZA959	P52-ZBF03	P52-ZX060	P52-ZB281

(mm)

BOTTOM PUNCHING

Inform us of the following:

- ✓ Bolt size or size D
- ✓ Sheet material and thickness to be processed
- ✓ Machine's KX number



(mm)

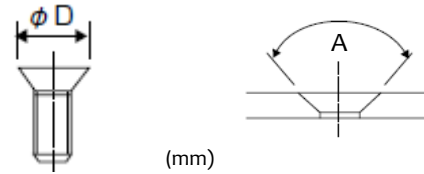
IV FORMING TOOL

COINED COUNTERSINK – CONTINUED

FOR FURTHER REQUIREMENT

Inform us of the following:

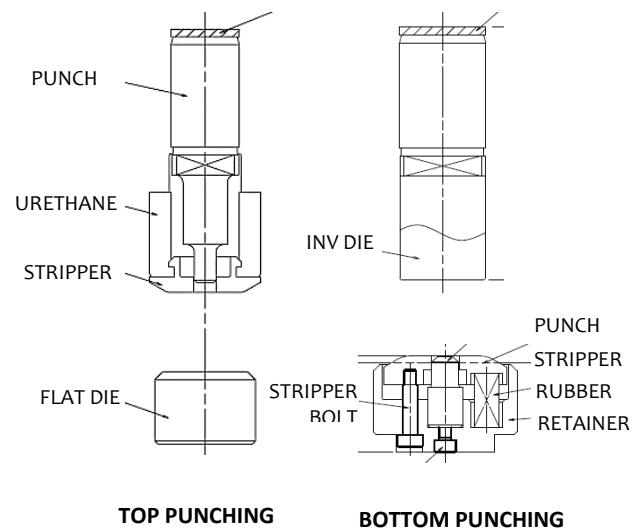
- ✓ Bolt size or size D
- ✓ Open angle A
- ✓ Side
- ✓ Sheet material and thickness to be processed
- ✓ Machine's KX number
- ✓ Other requests



FOR REPLACEMENT

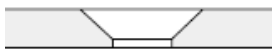
Inform us of the following:

- ✓ Part name (see the previous page)
- ✓ Assembly code (engraved on the surface)



TIPS

A pilot hole and a result



Pilot hole is OK.



Pilot hole is too large.



Pilot hole is too small.

IV FORMING TOOL

BURRING / EXTRUDED HOLE



- Both side is OK.
- No punch holder is included.
- Pilot hole is needed.

SELECTION

UPWARD PROCESS

	SHEET	Tap to cut			Tap to form	
		114B	114C	114D	114C	114D
M3	t0.6 - t1.0	P52-FB277	P52-FC095	P52-FD819	P52-FC205	P52-FD602
	t1.2 - t1.6	P52-FB278	P52-FC096	P52-FD417	P52-FC870	P52-FD732
M4	t0.8 - t1.0	P52-FB279	P52-FC097	P52-FD418	P52-FC206	P52-FD603
	t1.2 - t1.6	P52-FB280	P52-FC098	P52-FD419	P52-FC869	P52-FD733
	t2.0 - t2.3		P52-FC099	P52-FD420	P52-FC592	P52-FD735
M5	(t0.8) t1.0		P52-FC100	P52-FD421	P52-FC207	P52-FD604
	t1.2 - t1.6		P52-FC101	P52-FD422	P52-FC208	P52-FD605
	t2.0 - t2.3		P52-FC102	P52-FD423	P52-FC595	P52-FD736
M6	t1.0		P52-FC103	P52-FD424	P52-FC209	P52-FD606
	t1.2 - t1.6		P52-FC104	P52-FD436	P52-FC210	P52-FD607
	t2.0 - t2.3		P52-FC105	P52-FD437	P52-FC630	P52-FD737
M8	t1.6			P52-FD439		
	t2.0 - t2.3			P52-FD440		
	t3.2			P52-FD441		

(mm)

For mild steels, 114C is recommended: For stainless steels, 114 D is recommended.

IV FORMING TOOL

BURRING - CONTINUED

DOWNWARD PROCESS

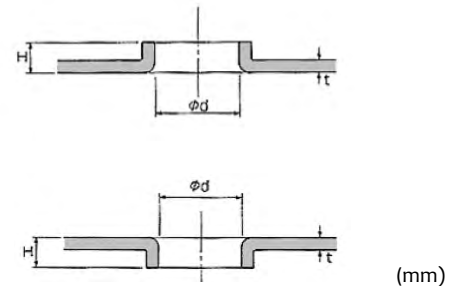
	SHEET	Tap to cut				Tap to form			
		114X	114A	114B	VUL AB	114X	114A	114B	VUL AB
M3	0.6-1.0	P52-FX007	P52-FA581	P52-FB608	P52-FB049	P52-FX019	P52-FA313	P52-FB628	P52-FB120
	1.2-1.6	P52-FX008	P52-FA189	P52-FB609	P52-FB117	P52-FX020	P52-FA582	P52-FB629	P52-FB121
M4	0.8-1.0	P52-FX009	P52-FA190	P52-FB610	P52-FB066	P52-FX021	P52-FA314	P52-FB630	P52-FB122
	1.2-1.6	P52-FX010	P52-FA191	P52-FB611	P52-FB058	P52-FX022	P52-FA315	P52-FB631	P52-FB123
	2.0-2.3	P52-FX011	P52-FA192	P52-FB612	P52-FB118	P52-FX023	P52-FA316	P52-FB632	P52-FB124
M5	(0.8) 1.0	P52-FX012	P52-FA193	P52-FB613	P52-FB067	P52-FX024	P52-FA317	P52-FB633	P52-FB125
	1.2-1.6	P52-FX013	P52-FA194	P52-FB614	P52-FB062	P52-FX025	P52-FA318	P52-FB634	P52-FB126
	2.0-2.3	P52-FX014	P52-FA195	P52-FB615	P52-FB068	P52-FX026	P52-FA583	P52-FB635	P52-FB127
M6	1.0	P52-FX015	P52-FA196	P52-FB616	P52-FB119	P52-FX027	P52-FA584	P52-FB636	P52-FB128
	1.2-1.6	P52-FX016	P52-FA197	P52-FB617	P52-FB069	P52-FX028	P52-FA319	P52-FB637	P52-FB129
	2.0-2.3	P52-FX017	P52-FA198	P52-FB618	P52-FB070	P52-FX029	P52-FA320	P52-FB638	P52-FB130

(mm)

FOR FURTHER REQUIREMENT

Inform us of the following:

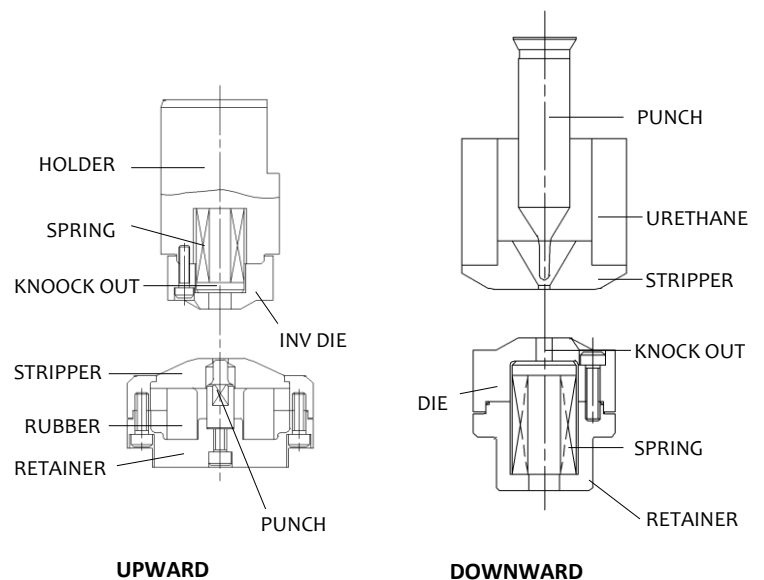
- ✓ Hole dimensions
- ✓ Side
- ✓ Sheet material and thickness to be processed
- ✓ Machine's KX number
- ✓ Other requests; i.e. up/down (upward only), etc.



FOR REPLACEMENT

Inform us of the following:

- ✓ Part name (see the previous page)
- ✓ Assembly code (engraved on the surface)



IV FORMING TOOL

BURRING - CONTINUED

BURRING AND PILOT HOLE

TAP TO CUT

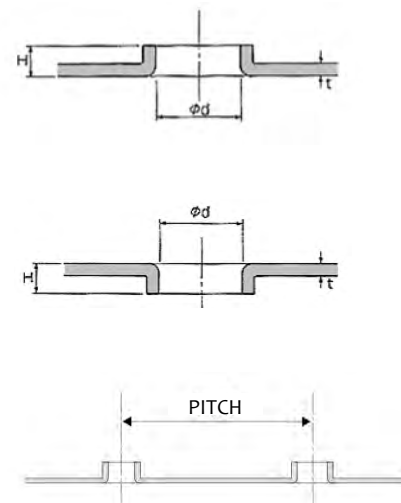
	t	PILOT	d	PITCH
M3	0.5-0.6	1.0	2.44	12
	0.8-1.0	1.2		
	1.2-1.6	1.4		
M4	0.5~0.6	1.0	3.33	14
	0.8	1.2		
	1.0	1.4		
	1.2	1.7		
	1.5-1.6	1.9		
	2.0-2.3	2.2		
M5	(0.8)	1.4	4.17	14
	1.0	1.6		
	1.2-1.4	2.0		
	1.5-1.6	2.2		
	2.0	2.6		
	2.3	3		
M6	(1.0) SUS 1.0	1.8	5.08	15
	1.2-1.4	2.0		
	1.5	2.4		
	1.6	2.6		
	2	3		
	2.3	3.6		

(mm)

TAP TO FORM

	t	PILOT	d	PITCH
M3	0.5-0.8	1.2	2.81	13
	1.0-1.6	1.4		
M4	0.5-1.0	1.4	3.7	15
	SUS 1.0	1.9		
	1.2-1.4	1.9		
	1.5-1.6	1.9		
	SUS 1.5	1.9		
	2.0-2.3	2.2		
	SUS 2.0	2.2		
M5	(0.8)-1.2	2.1	4.66	15
	SUS 1.0	2.3		
	1.4-1.6	2.5		
	SUS 1.5	2.6		
	2.0	2.8		
	2.3	3.3		
M6	(1.0)-1.4	2.4	5.57	16
	1.5-1.6	2.6		
	2.0	3.3		
	2.3	3.8		

(mm)

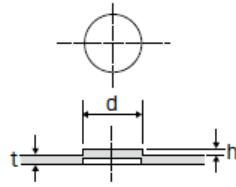


NOTE

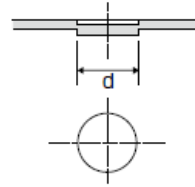
- A 0.1-0.2 difference in pilot hole size does not affect the height of an extrusion.
- More attention shall be paid to downward setting.
- Pitch is limited by sheet thickness and ϕd .
- Too large pilot hole for stainless steel may cause stripping failure.

IV FORMING TOOL

LOCATER POINT



UPWARD



DOWNWARD

(mm)

- Both direction OK
- No punch holder is included.

MTL STOCK

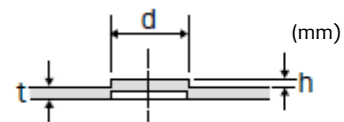
		Unit	3.0	4.0	5.0	NOTE
UPWARD	114 B	Set	P52-JBN30	P52-JBN31	P52-JBN32	Mild steel ~t2.3; Stainless ~t2.0
DOWNWARD	114 A	Set	P52-JA474	P52-JA475	P52-JA476	Mild steel ~t2.3; Stainless ~t2.0
DOWNWARD	114 B	Set	P52-JBP17	P52-JBP18	P52-JBP19	Mild steel ~t3.2; Stainless ~t2.0

(mm)

FOR CUSTOMIZATION

Inform us of the following:

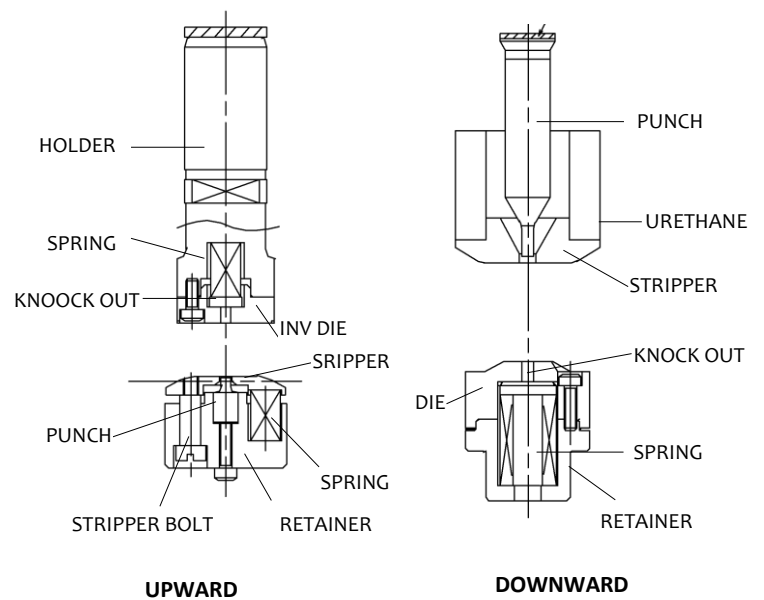
- ✓ Required dimensions (h shall be half of t : see above)
- ✓ Side
- ✓ Sheet material and thickness to be processed
- ✓ Machine's KX number
- ✓ Other requests; i.e. up/down, station, etc.
 - h shall be half of t or shorter.



FOR REPLACEMENT

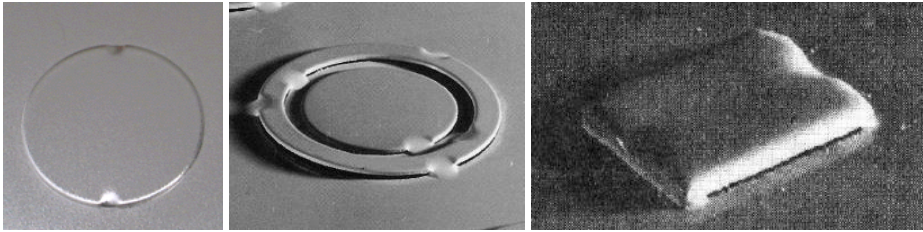
Inform us of the following:

- ✓ Part name (see the previous page)
- ✓ Assembly code (engraved on the surface)



IV FORMING TOOL

KNOCK OUT



- Make to order
- Upward only, Style 114 only
- No punch holder included.

SIZE LIMIT

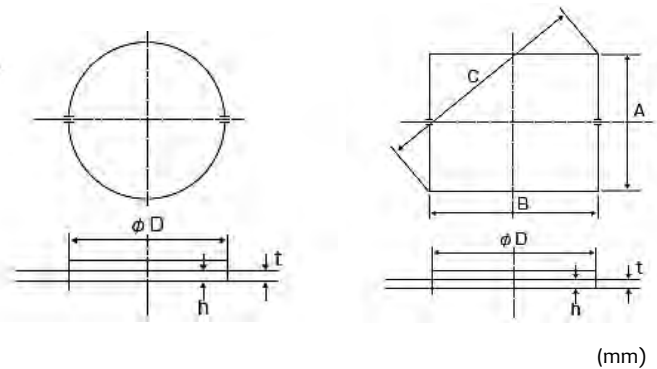
STATION	ROUND Φ	SQUARE	RECTANGULAR
B	8		
C	14	13X13	5X18
D	23	17X17	10X20
E	29	20X20	15X44
D	33	23X23	17X55
G	55	38X38	17X64
H	64	45X45	22X77
J	74	52X52	24X92

(mm)

FOR CUSTEMIZATION

Inform us of the following:

- ✓ Dimensions (see right)
- ✓ Sheet material and thickness
- ✓ Machine's KX number
- ✓ Number of connections
- ✓ Other preferences; i.e. Station, up/down, etc.

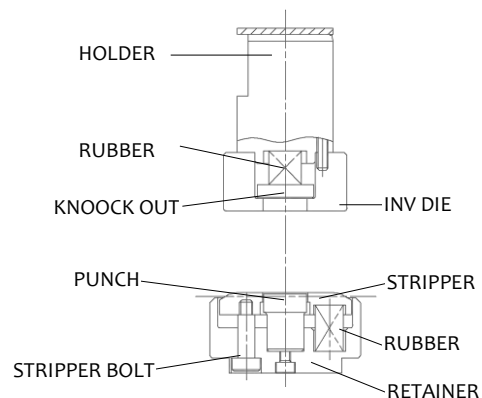


(mm)

FOR REPLACEMENT

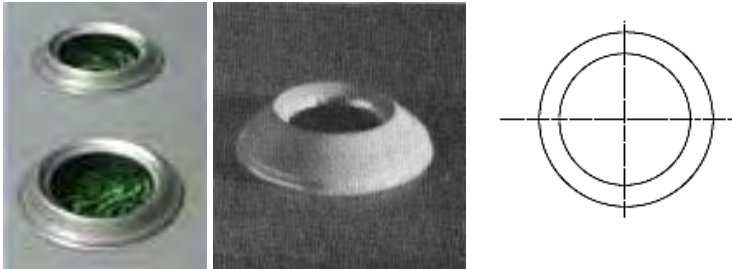
Inform us of the following:

- ✓ Part name (see the previous page)
- ✓ Assembly code (engraved on the surface)



IV FORMING TOOL

COUNTERSINK (EMBOSS TYPE)

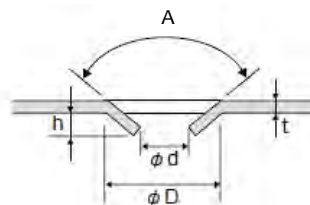
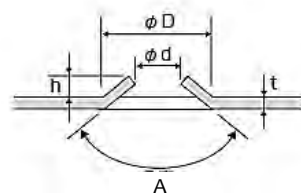


- Make to order
- Both direction OK
- A pilot hole is needed.
- No punch holder is not included.

SIZE LIMIT

STATION	UPWARD ΦD	DOWNWARD ΦD
X		8
A		8
B		8
C	14	
D	23	
E	29	
D	33	
G	55	
H	64	
J	74	

(mm)



FOR CUSTOMIZATION

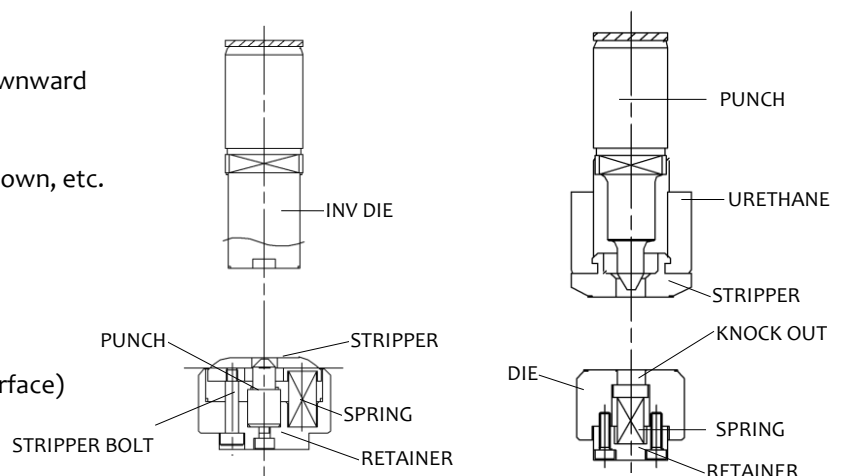
Inform us of the following:

- ✓ Dimensions (see above)
- ✓ Process direction; i.e. upward or downward
- ✓ Sheet material and thickness
- ✓ Machine's KX number
- ✓ Other preferences; i.e. Station, up/down, etc.

FOR REPLACEMENT

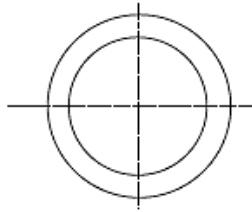
Inform us of the following:

- ✓ Part name (see right)
- ✓ Assembly code (engraved on the surface)



IV FORMING TOOL

EMBOSS ROUND

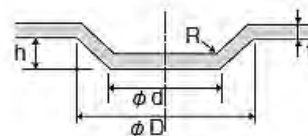
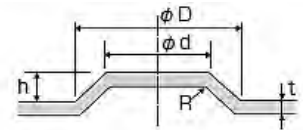


- Make to order
- Both direction OK
- No punch holder is included.

SIZE LIMIT

STATION	UPWARD ΦD	DOWNWARD ΦD
X		8
A		8
B		8
C	14	
D	23	
E	29	
D	33	
G	55	
H	64	
J	74	

(mm)



FOR CUSTEMIZATION

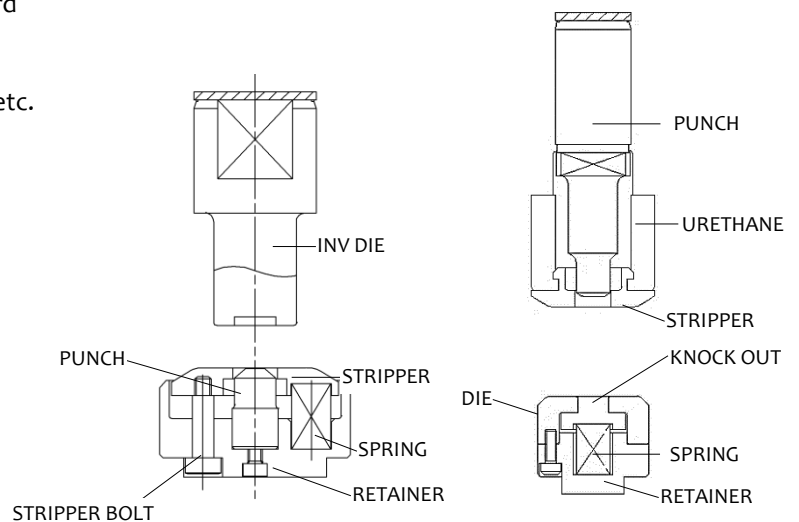
Inform us of the following:

- ✓ Dimensions (see above)
- ✓ Process direction; i.e. upward or downward
- ✓ Sheet material and thickness
- ✓ Machine's KX number
- ✓ Other preferences; i.e. Station, up/down, etc.

FOR REPLACEMENT

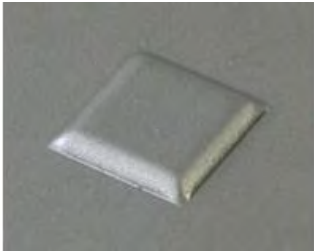
Inform us of the following:

- ✓ Part name (see the right)
- ✓ Assembly code (engraved on the surface)



IV FORMING TOOL

EMBOSS SQUARE



- Make to order
- Upward / Style 114 only
- No punch holder is included.

SIZE LIMIT

STATION	C	RECTANGLE
C	13	5X18
D	17	10X20
E	20	15X44
D	23	17X55
G	38	17X64
H	45	22X77
J	52	24X92

(mm)

FOR CUSTOMIZATION

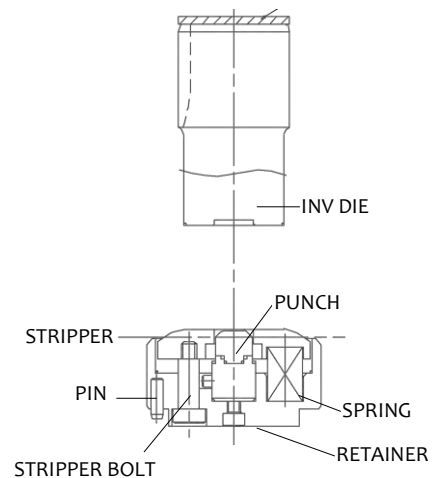
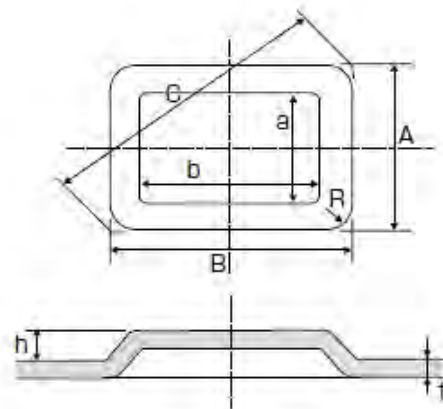
Inform us of the following:

- ✓ Dimensions (see above)
- ✓ Process direction; i.e. upward or downward
- ✓ Sheet material and thickness
- ✓ Machine's KX number
- ✓ Other preferences; i.e. Station, up/down, etc.

FOR REPLACEMENT

Inform us of the following:

- ✓ Part name (see right)
- ✓ Assembly code (engraved on the surface)



IV FORMING TOOL

BRIDGE

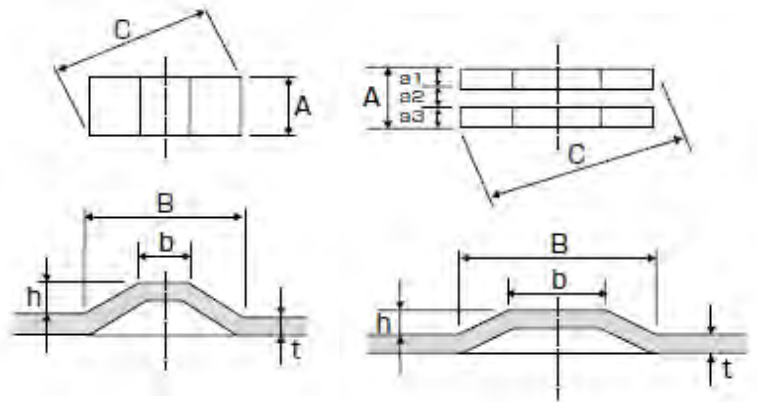


- Make to order
- Upward / Style 114 only
- No punch holder is included.

SIZE LIMIT

STATION	SINGLE C	DOUBLE C
C	5X12	5X12
D	7X23	7X23

(mm)



FOR CUSTOMIZATION

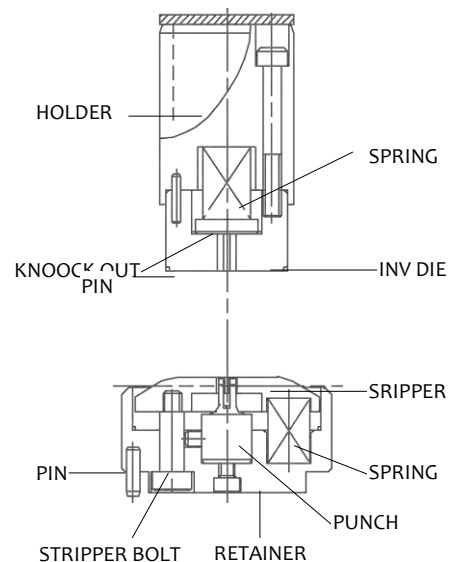
Inform us of the following:

- ✓ Dimensions (see above)
- ✓ Sheet material and thickness
- ✓ Machine's KX number
- ✓ Other preferences; i.e. Station, up/down, etc.

FOR REPLACEMENT

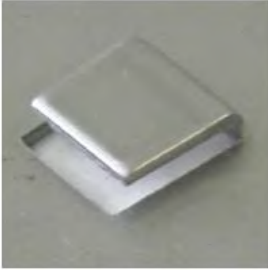
Inform us of the following:

- ✓ Part name (see the right)
- ✓ Assembly code (engraved on the surface)



IV FORMING TOOL

LANCE

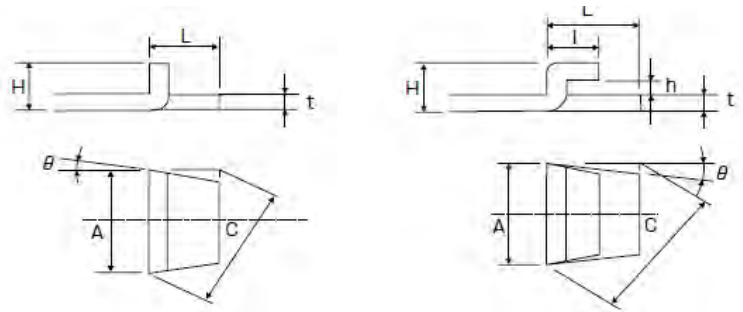


- Make to order
- Upward / Style 114 only
- No punch holder is included.

SIZE LIMIT

STATION	SINGLE C
D	10X22
E	15X44
F	17X55
G	17X64
H	20X77
J	20X100

(mm)



FOR CUSTOMIZATION

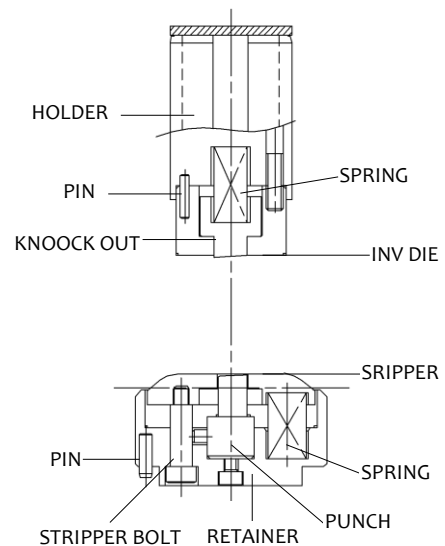
Inform us of the following:

- ✓ Dimensions (see above)
- ✓ Sheet material and thickness
- ✓ Machine's KX number
- ✓ Other preferences; i.e. Station, up/down, etc.

FOR REPLACEMENT

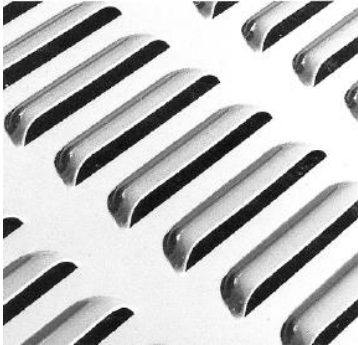
Inform us of the following:

- ✓ Part name (see the right)
- ✓ Assembly code (engraved on the surface)



IV FORMING TOOL

LOUVER



- Make to order
- Upward / Style 114 only
- No punch holder is included.

SIZE LIMIT

STATION	SINGLE C
D	10X22
E	15X44
F	17X55
G	17X64
H	20X77
J	20X100

(mm)

FOR CUSTOMIZATION

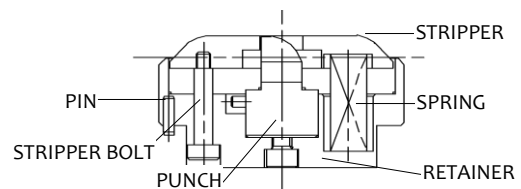
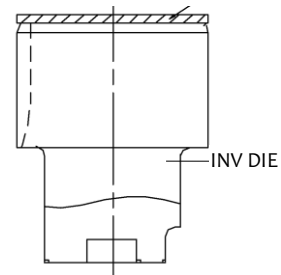
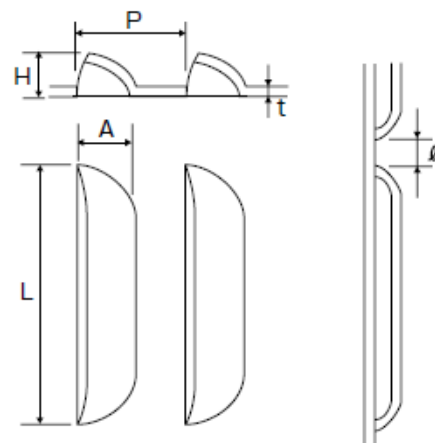
Inform us of the following:

- ✓ Dimensions (see above)
- ✓ Sheet material and thickness
- ✓ Machine's KX number
- ✓ Other preferences; i.e. Station, up/down, etc.

FOR REPLACEMENT

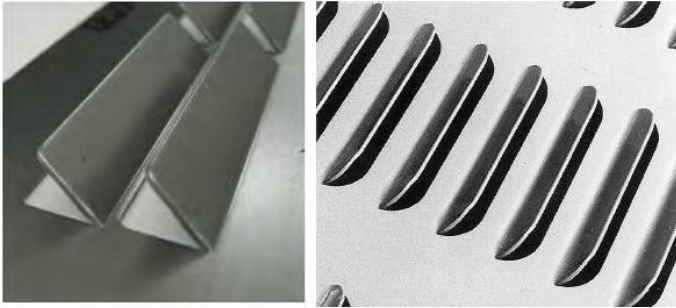
Inform us of the following:

- ✓ Part name (see the right)
- ✓ Assembly code (engraved on the surface)



IV FORMING TOOL

HOOP



- Make to order
- Upward / Style 114 only
- No punch holder is included.

SIZE LIMIT

STATION	SINGLE C
D	10X22
E	15X44
F	17X55
G	17X64
H	20X77
J	20X100

(mm)

FOR CUSTOMIZATION

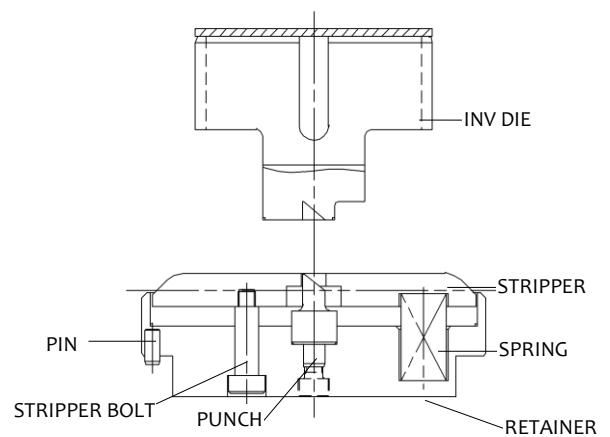
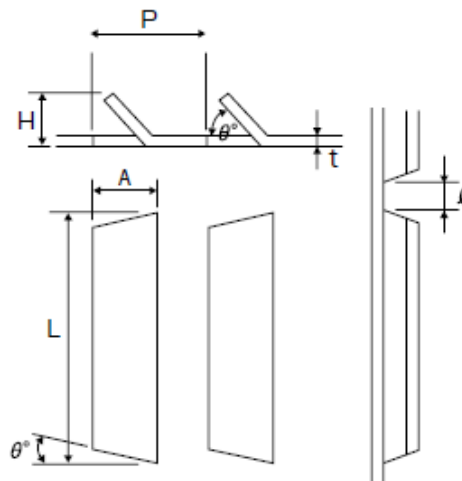
Inform us of the following:

- ✓ Dimensions (see above)
- ✓ Sheet material and thickness
- ✓ Machine's KX number
- ✓ Other preferences; i.e. Station, up/down, etc.

FOR REPLACEMENT

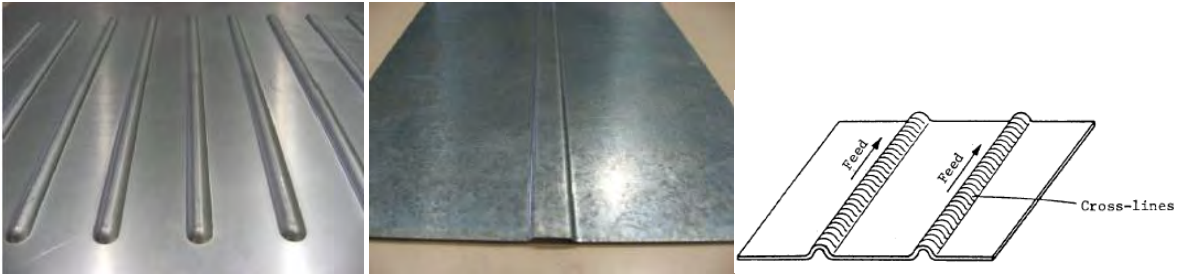
Inform us of the following:

- ✓ Part name (see the right)
- ✓ Assembly code (engraved on the surface)



IV FORMING TOOL

BEAD

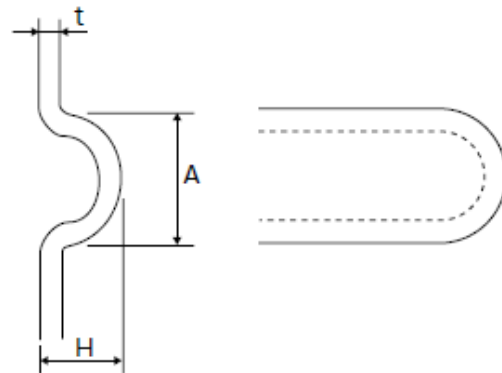


- Make to order
- Upward / Style 114 only
- No punch holder is included.

SIZE LIMIT

STATION	A	H
C	6	A/5
D	10	
E	16	
F	20	
G	26	
H	32	
J	40	

(mm)



FOR CUSTOMIZATION

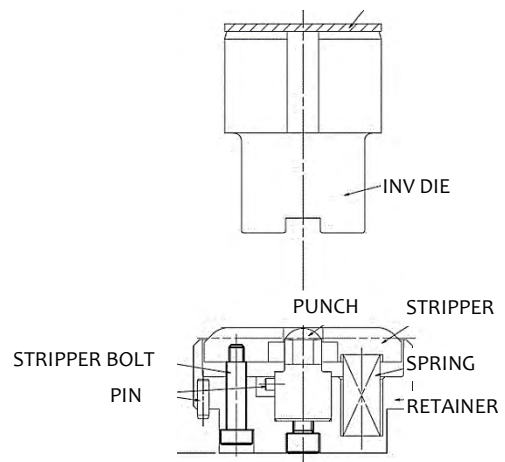
Inform us of the following:

- ✓ Dimensions (see above)
- ✓ Sheet material and thickness
- ✓ Machine's KX number
- ✓ Other preferences; i.e. Station, up/down, etc.

For replacement

Inform us of the following:

- ✓ Part name (see the right)
- ✓ Assembly code (engraved on the surface)



IV FORMING TOOL

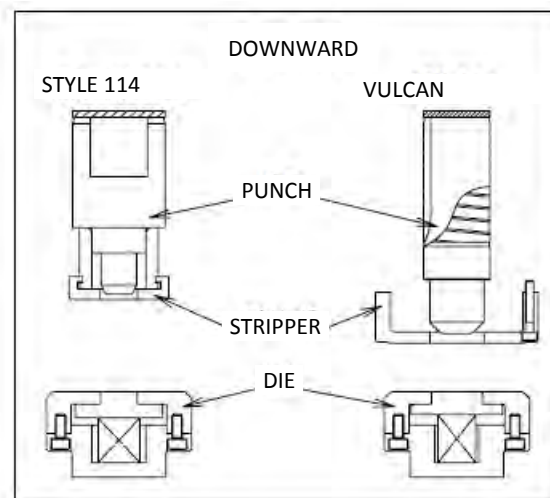
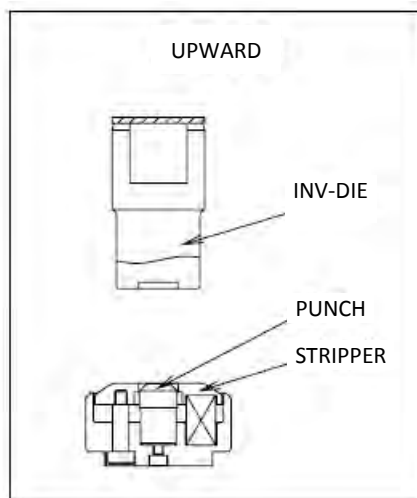
FORMING TOOL BASIC CONSTRUCTION

UPWARD

- Forming upper part fits in 114 PUNCH HOLDER.
- Most of non-UP/DOWN forming lower part fit in 114 DIE HOLDER except some special cases.
- Forming punch (pin) in the lower part is replaceable. The part can be sharpened.
- Non-UP/DOWN lower part is higher than the remaining surface.

DOWNWARD

- Forming upper part is selectable from VULCANTOOL or STYLE 114.
- Non-UP/DOWN lower part fits in 114 DIE HOLDER except some special cases.
- Lower part pushes up the sheet when the punch withdraws.
- Lower tool is as high as the surrounding surface, unlike upward tool, except some special cases.



IV FORMING TOOL

UP/DOWN (RETRACTABLE) MODEL – Optional

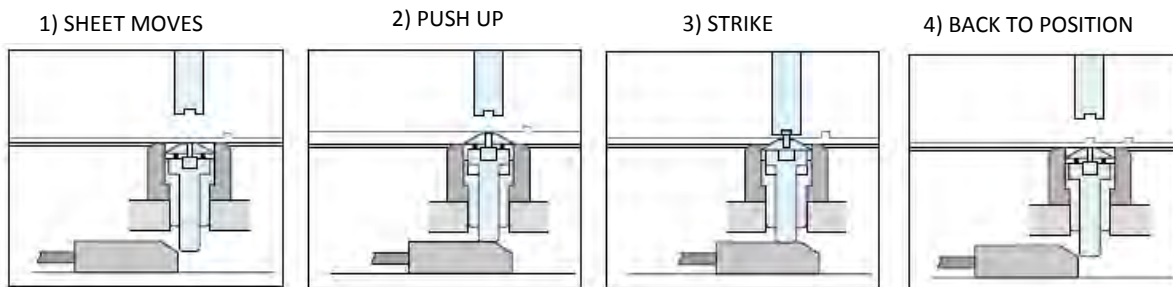
UP/DOWN FORMING TOOL is designed to be retractable when necessary. While a work is traversing, the lower part stays flush with the surrounding surface and pops up only when the punch strikes. There is less friction between the work and the part, and thus, less scratches are found on the backside of the sheet.

NOTE: Your machine must be ready for this option. Contact Murata Machinery for confirmation.

GOOD

- ✓ Fewer scratches on a metal sheet
- ✓ A metal sheet does not bend when punching takes place near the forming area.
- ✓ No limitation in table speed
- ✓ No interference with the work holder

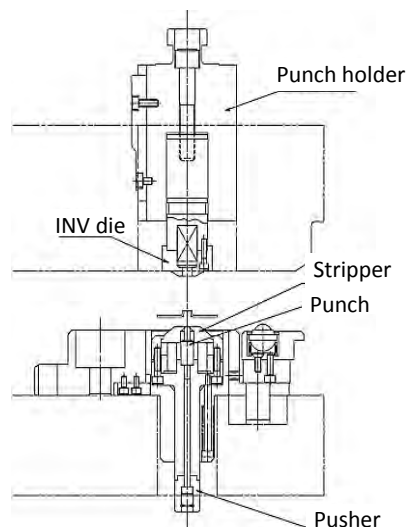
MECHANIZM



1. The sheet comes to position.
2. The machine's cylinder pushes the cam and the cam raises the lower part at the bottom.
3. Forming takes place.
4. The tools return to their position.

NOTE

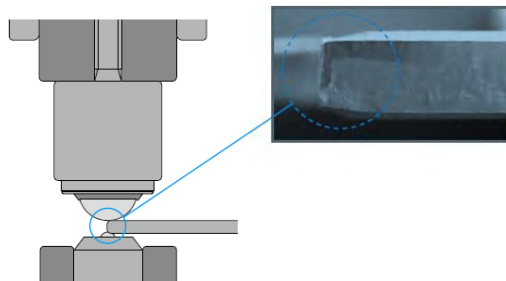
- The first setting of NC parameters shall be done by MURATA engineer.
- Die holder is special to UP/DOWN.
- UP/DOWN operation must be done in outer-track only.
- Put the lower part through the upper turret for mounting.
- Keep a sufficient distance between two UP/DOWN operations.
- Do not use two UP/DOWN tool next to each other.
- The length of the lower part varies among machines. For sharing a tool among several machines, the pusher may be changed. Contact us for further information.



V MTL RECOMMENDABLE

BALL TOOL BT-III (114 A)

BALL TOOL BT-III is MTL's original deburring tool. By rolling over the jagged surface, the balls constricts the slits on the both side and makes the cut surface milder and smoother. BT-III is an improved tool, more reachable even where the precedent model of 1-INCH BALL TOOL could not.



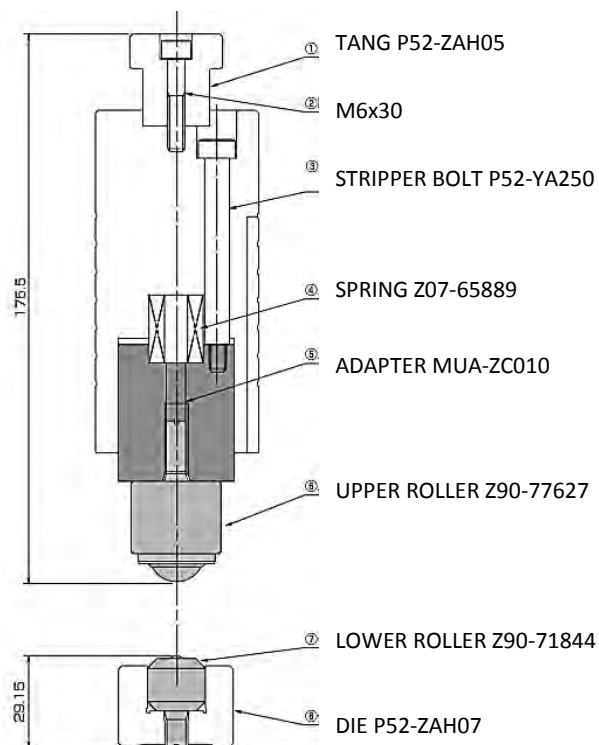
Sheet	Thick t
Mild steel	0.8 ~ 4.5
Stainless steel	0.8 ~ 3.0
Aluminum	0.8 ~ 3.0

(mm)

FOR INTRODUCTION

Contact Murata Machinery first for software preparation.

Model	Station	Unit	Code
BT-III	114 A	Whole set (see right)	P52-ZAL29

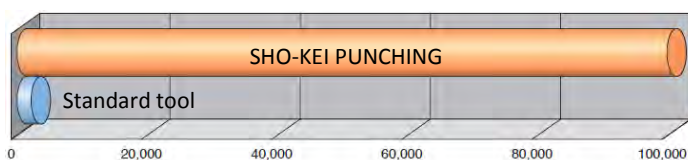


V MTL RECOMMENDABLE

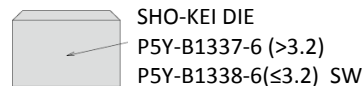
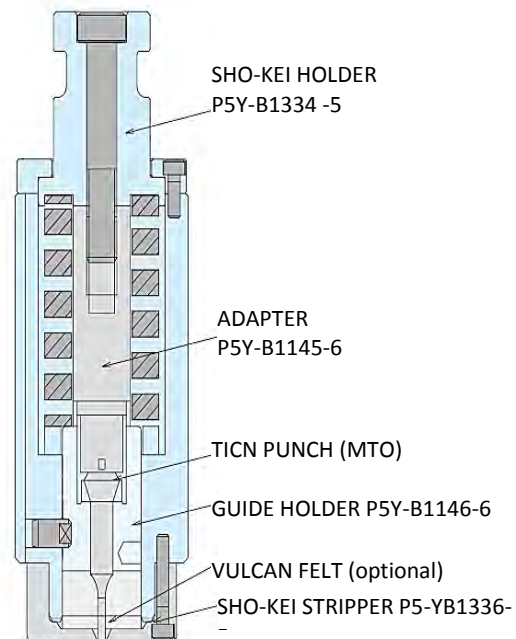
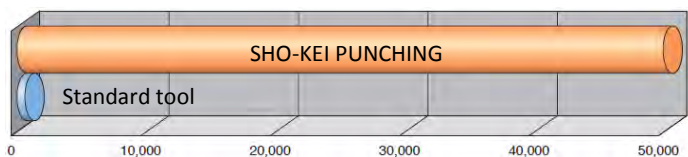
SHO-KEI PUNCHING SET (VULCANTOOL B)

The tool is good at piercing an extremely small hole or a too-small-against-the-thickness hole, which so often breaks your punches. The SHO-KEI punch is made of stronger HSS steel and every other part is specially designed to help the fine cutting head penetrate a metal sheet safely.

Pierce $\phi 3.6$ on SPHC $t 6.0$ with CL1.2 – over 100,000 hit successful!



Pierce $\phi 3.3$ on SUS304 $t 3.0$ with CL0.7 – over 50,000 hit successful!



NOTE

- Do not use for nibbling.
- TICN PUNCH cannot be sharpened.
- VULCAN FELT and FELT OIL recommendable.

Sheet	Thick t	Hole size	Punch range	CL minimum	CL recommended
Mild steel	~ 6.0	$t \times 0.6 \sim$	$\Phi 1.6 \sim 6.0$	0.5	$t \times 0.2 \sim 0.25$
stainless steel	~ 6.0	$t \times 1.1 \sim$	$\Phi 2.2 \sim 6.0$	0.5	$t \times 0.25 \sim 0.3$
aluminum	~ 6.0	$t \times 0.6 \sim$	$\Phi 1.6 \sim 6.0$	0.5	$t \times 0.2 \sim 0.25$

(mm)

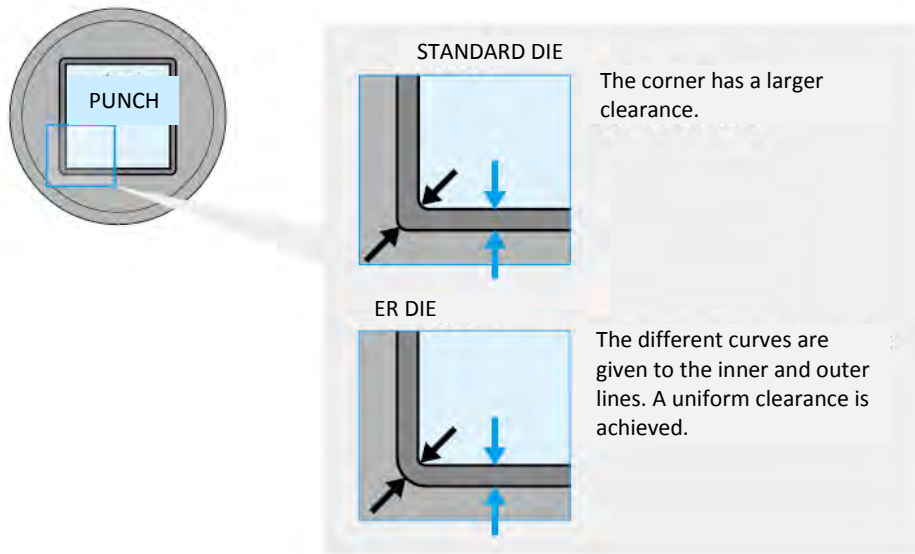
Model	Station	Unit	Code	Other
SHO-KEI PUNCHING	VULCAN AB	Whole set (see above)	P5Y-B1335	Punch and die size, clearance

V MTL RECOMMENDABLE

ER DIE

ER DIE has specially designed corners, in a way which a punch is surrounded by a perfectly even clearance. Even clearance reduces unwanted material effects during nibbling like burrs or projections on the backside of a sheet.

- Effective in nibbling operation
- To be used with MTL standard punches
- No additional cost



FOR ORDERING

Just add *ER* to your die requirement.

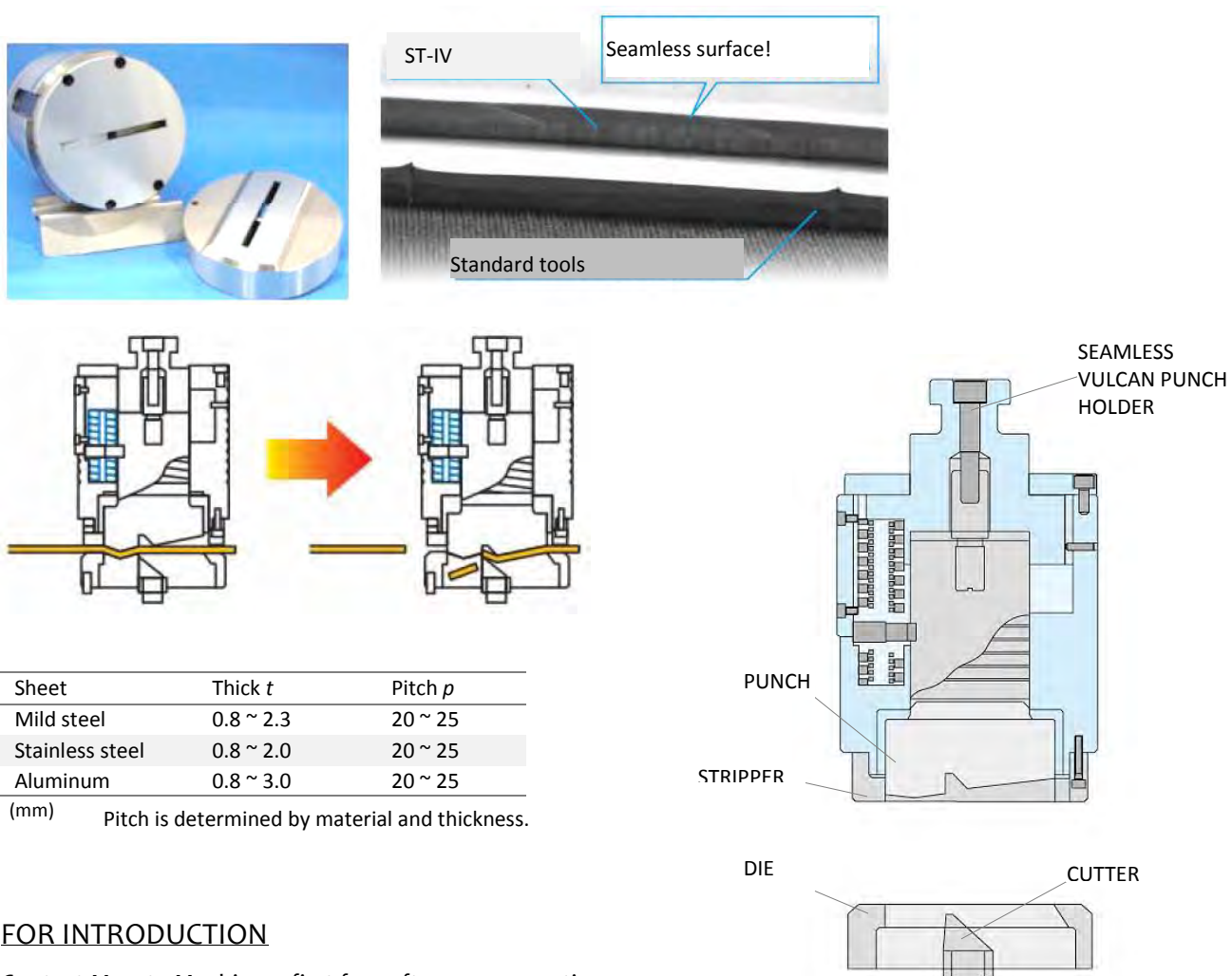
Example: 114 B DIE 5x5 RECT +CLo.25 **ER**

V MTL RECOMMENDABLE

SEAMLESS TOOL ST-IV (VULCANTOOL F or INDEX F)

ST-IV is good for a smooth, seamless cutting surface in nibbling operation. For the first installation, contact your MURATA sales person for software preparation.

Machine operational: M2048TS, M2548TS, M2558TS, M3048TG, M3058TS, M2048HL, M2558HL



Sheet	Thick t	Pitch p
Mild steel	0.8 ~ 2.3	20 ~ 25
Stainless steel	0.8 ~ 2.0	20 ~ 25
Aluminum	0.8 ~ 3.0	20 ~ 25

(mm) Pitch is determined by material and thickness.

FOR INTRODUCTION

Contact Murata Machinery first for software preparation.

Model	Station	Punch*	Unit	Code	Other
SEAMLESS TOOL ST-IV	VULCAN F, INDEX F	5x70 10x70	Whole set (see above)	N.P.N	Sheet material and thickness (to determine clearance and pitch)

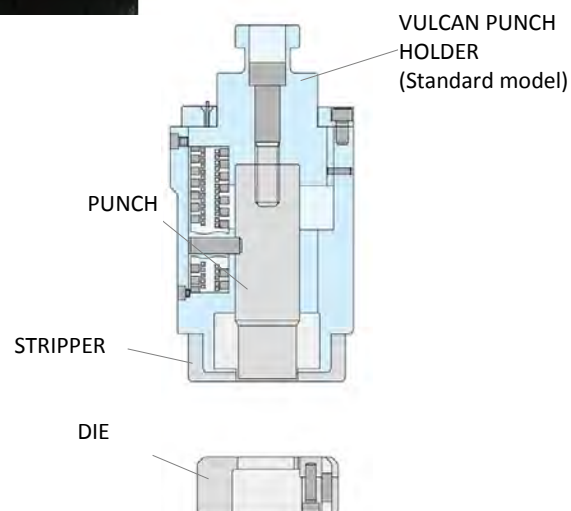
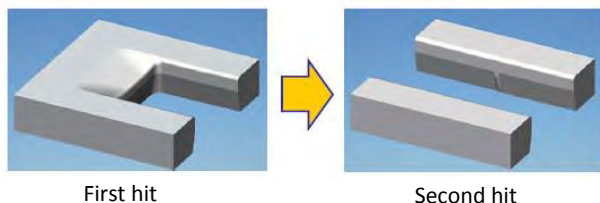
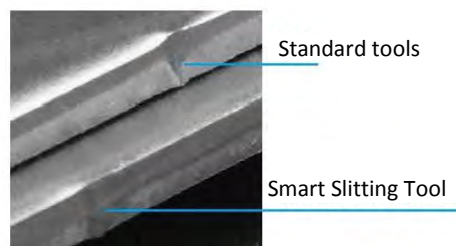
(mm)

* For other sizes, contact us.

V MTL RECOMMENDABLE

SMART SLITTING TOOL (VULCANTOOL D or larger)

SMART SLITTING TOOL is another solution for a smoother cut line after nibbling operation. This model is usable in standard holders and in all MURATA machines. Stations are selectable (see below).



Sheet	Thick t	CL to t	D	E	F, INDEX F	G	H	J
Mild steel	0.8 ~ 2.3	15% ~ 20%						
Stainless steel	0.8 ~ 2.0	20% ~ 25%	6X30	6X40	6X60	6X70	6X80	6X90
Aluminum	0.8 ~ 3.0	15% ~ 20%						

(mm)

Sheet	Thick t	CL	D	E	F, INDEX F	G	H	J
Mild steel	0.8 ~ 6.0	15% ~ 20%						
Stainless steel	0.8 ~ 4.0	20% ~ 25%	10X30	10X40	10X60	10X70	10X80	10X90
Aluminum	0.8 ~ 6.0	15% ~ 20%						

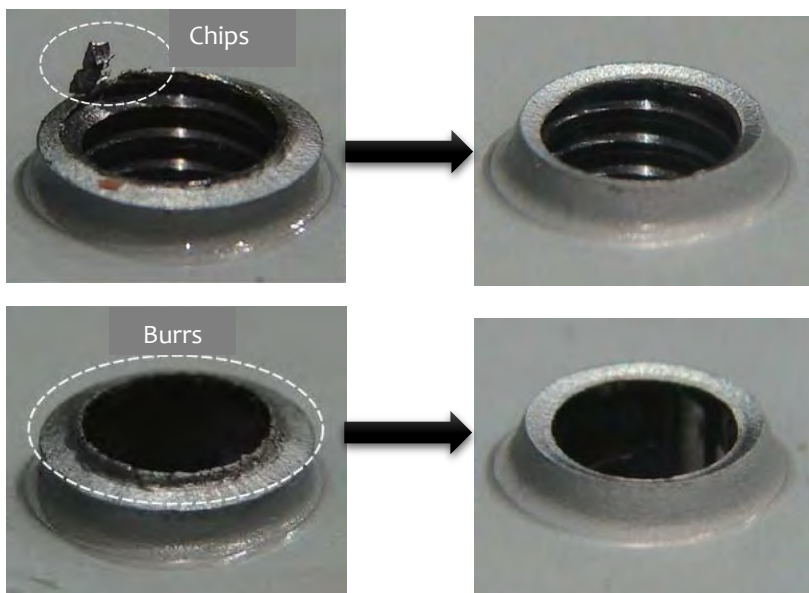
(mm)

Model	Unit	Station	Size
SMART SLITTING TOOL	VULCAN Punch	See above	Pick up a size from the above and determine a die clearance.
	VULCAN Stripper		
	Style 114 Die		

V MTL RECOMMENDABLE

HQ BARRING (EXTRUDED HOLE)

HQ BARRING is a higher quality of burring tool, which is designed to solve unfavorable byproducts after tapping – like chips and burrs. The surface of the tapped end is beautifully smooth.



- Make to order
- No punch holder is included.
- Pilot hole is needed.

SELECTION

MILD STEEL UPWARD

Mild steel: 0.8~2.3; Aluminum: 0.8~2.0

	Sheet t	Tap to cut		Tap to form		Unit
		114C	114D	114C	114D	
M3	0.8 - 1.0	P5Y-FC014	P5Y-FD003	P5Y-FC022	P5Y-FD016	
	1.2 - 1.6	P5Y-FC015	P5Y-FD004	P5Y-FC023	P5Y-FD017	
M4	0.8 - 1.0	P5Y-FC016	P5Y-FD005	P5Y-FC024	P5Y-FD018	
	1.2 - 1.6	P5Y-FC017	P5Y-FD006	P5Y-FC025	P5Y-FD019	
	2.0-2.3		P5Y-FD007		P5Y-FD020	
M5	0.8 - 1.0	P5Y-FC018	P5Y-FD008	P5Y-FC026	P5Y-FD021	
	1.2 - 1.6	P5Y-FC019	P5Y-FD009	P5Y-FC027	P5Y-FD022	
	2.0-2.3		P5Y-FD010		P5Y-FD023	
M6	0.8 - 1.0	P5Y-FC020	P5Y-FD011	P5Y-FC028	P5Y-FD024	
	1.2 - 1.6	P5Y-FC021	P5Y-FD012	P5Y-FC029	P5Y-FD025	
	2.0-2.3		P5Y-FD013		P5Y-FD026	

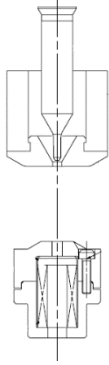
(mm)

V MTL RECOMMENDABLE

HQ BURRING - CONTINUED

MILD STEEL DOWNWARD

Mild steel: 0.8~2.3; Aluminum: 0.8~2.0

	Sheet (t)	Tap to cut		Tap to form		Unit
		114 A	VULCAN AB	114 A	VULCAN AB	
M3	0.8 - 1.0	P5Y-FA003	P5Y-FB005	P5Y-FA014	P5Y-FB016	
	1.2 - 1.6	P5Y-FA004	P5Y-FB006	P5Y-FA015	P5Y-FB017	
M4	0.8 - 1.0	P5Y-FA005	P5Y-FB007	P5Y-FA016	P5Y-FB018	
	1.2 - 1.6	P5Y-FA006	P5Y-FB008	P5Y-FA017	P5Y-FB019	
	2.0-2.3	P5Y-FA007	P5Y-FB009	P5Y-FA018	P5Y-FB020	
M5	0.8 - 1.0	P5Y-FA008	P5Y-FB010	P5Y-FA019	P5Y-FB021	
	1.2 - 1.6	P5Y-FA009	P5Y-FB011	P5Y-FA020	P5Y-FB022	
	2.0-2.3	P5Y-FA010	P5Y-FB012	P5Y-FA021	P5Y-FB023	
M6	0.8 - 1.0	P5Y-FA011	P5Y-FB013	P5Y-FA022	P5Y-FB024	
	1.2 - 1.6	P5Y-FA012	P5Y-FB014	P5Y-FA023	P5Y-FB025	
	2.0-2.3	P5Y-FA013	P5Y-FB015	P5Y-FA024	P5Y-FB026	

(mm)

FOR STAINLESS STEEL

Contact us.

TOOLING SPECIFICATION

MILD STEEL, ALUMINIUM

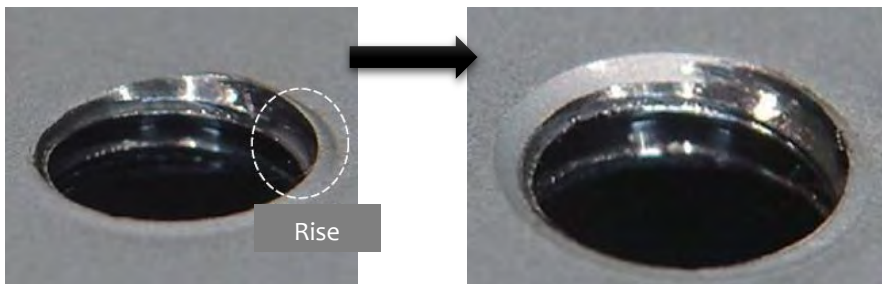
	Sheet (t)	Tap to cut				Tap to steel			
		Pilot	Punch	Die	Pitch	Pilot	Punch	Die	Pitch
M3	0.8 - 1.0	1.6	2.44	3.9	12~	1.9	2.81	4.1	13~
	1.2 - 1.6	1.9	2.44	4.3	12~	2.2	2.81	4.9	13~
M4	0.8 - 1.0	1.9	3.33	4.7	14~	2.4	3.7	4.7	15~
	1.2 - 1.6	2.4	3.33	5.1	14~	2.8	3.7	5.3	15~
	2.0-2.3	2.7	3.33	5.7	14~	2.8	3.7	6.1	15~
M5	0.8 - 1.0	2.2	4.17	5.5	14~	2.8	4.66	5.9	15~
	1.2 - 1.6	2.7	4.17	5.9	14~	2.9	4.66	6.5	15~
	2.0-2.3	3.2	4.17	6.7	14~	3.3	4.66	7.3	15~
M6	0.8 - 1.0	2.4	5.08	6.5	15~	3.0	5.57	7.1	16~
	1.2	2.7	5.08	6.9	6.9~	3.6	5.57	7.3	16~
	1.6	3.2	5.08	6.9	6.9~	3.6	5.57	7.3	16~
	2.0	3.4	5.08	7.9	7.9~	4.0	5.57	8.3	16~
	2.3	3.6	5.08	7.9	7.9~	4.0	5.57	8.3	16~

(mm)

V MTL RECOMMENDABLE

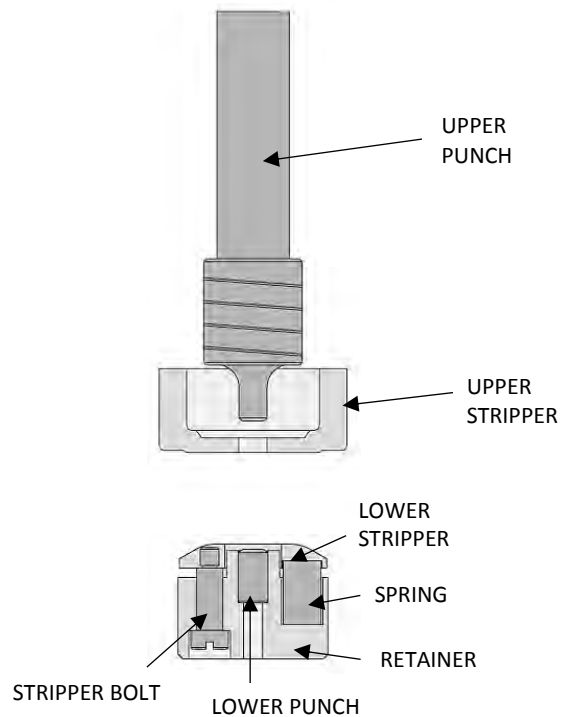
CHAMFER TOOL

CHAMFER TOOL prevents the rise of the material when a thread being formed. This is effective for a non-extruded tapping.



Sheet	Thick t
Mild steel	0.8 ~ 3.2
Stainless steel	0.8 ~ 2.0
Aluminum	0.8 ~ 3.0

(mm)



SELECTION

	VULCAN X	VULCAN AB	Unit	Hole
CHAMFER TOOL M3	P5Y-ZX003	P5Y-ZB025	Set (see above)	φ2.81
CHAMFER TOOL M4	P5Y-ZX004	P5Y-ZB026	Set (see above)	φ3.7
CHAMFER TOOL M5	P5Y-ZX005	P5Y-ZB027	Set (see above)	φ4.66
CHAMFER TOOL M6	P5Y-ZX006	P5Y-ZB028	Set (see above)	φ5.57

(mm)

V MTL RECOMMENDABLE

MR STICKER (VULCANTOOL)

Have you troubled with punching traces? MR STICKER helps you.



NOTE

For Aluminum, a special care shall be necessary to keep the surface clean. Even a tiny amount of waste may affect.

SELECTION

Station	Code	MOQ pcs.
X	P52-YX001-60X	10
AB	P52-YB010-60B	10
C	P52-YC017-60C	5
D	P52-YD063-60D	3
E	P52-YE012-60E	3
F	P52-YF045-60F	3
G	P52-YG018-60G	3
H	P52-YH011-60H	2
J	P52-YJ045-60J	2

V MTL RECOMMENDABLE

VULCAN FELT (VULCANTOOL)

VULCAN FELT is one of the solutions for a longer tooling life. The felt serves as a protective cushion as well as a lubricant between VULCAN PUNCH and STRIPPER.



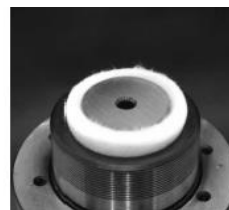
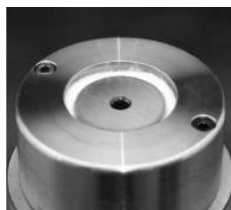
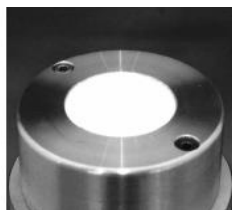
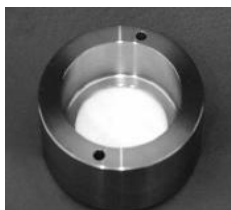
VULCAN FELT



VULCAN FELT STRIPPER





VULCAN FELT OIL



EXPECTED RESULT

- ✓ Longer punch life
- ✓ Fewer stripping failure
- ✓ Less contamination of a sheet metal with the grease
- ✓ More cut size accuracy
- ✓ Fewer intrusion s of foreign objects inside the stripper

SELECTION

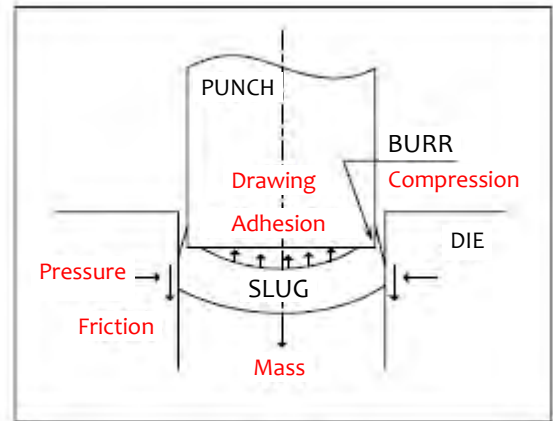
	VULCAN FELT CODE	VULCAN FELT MOQ pcs.	VULCAN FELT STRIPPER CODE	 mm	 mm
X	P52-YX002-60X	10	P52-WA177-60	~12.7	-
B	P52-YB011-60B	10	P5Y-B0207-60	~20	~20
C	P52-YC018-60C	10	P52-WA038-60	~32	~30
D	P52-YD064-60D	10	P52-WA039-60	~45	~40
EF	P52-YF046-60F	10	P52-WA039-60	~70	~65
INDEX F			P52-WA042-60		
GHJ	P52-YJ046-60J	5	P52-WA053-60	~115	~110

VI TROUBLES

SLUG TROUBLE

WHAT CAUSES SLUG TROUBLE?

1. The slug has burrs.
 - a. The cutting head is not sharp enough.
 - b. The clearance is too large.
 - c. The punching speed is not fast enough.
2. The punch fails to insert the die sufficiently.
3. The punch is magnetized.
 - a. Degaussing is skipped or not completed after the punch sharpened.
4. The physical force which incurs when the punch is drawing takes the slug.
5. Oil-related attaching
6. Improper positioning of replacements
 - a. Individual part has an allowed tolerance. Unfortunate combination of these deviation would result in reducing the necessary abrasion between the die and the slug, or in creating the burrs on the slug.



HOW TO SHOP SLUG TROUBLE?

1. Punch
 - a. Add SLUG EJECTER
MTL standard punches larger than 6.0mm are provided with small urethane piece(s) which is called SLUG EJECTER on the top, which pushes away the processed object. Larger square or rectangle over 25mm are given four ejectors. The number is determined by size based on MURATA standard, but could be increased if desired.
 - b. Special Shearing
If the punch is smaller than 6.0mm, try a top-roof cutting shear. The curve deforms the slug when striking. The slug spring backs and take off the punch. However, this solution may create a dull edge around a hole, particularly with aluminum sheet. If appearance is important, this may not be a good choice.
2. Die
 - a. Try SLUG WIPER
SLUG WIPER die has a slightly tapered hole inside for constriction with a special claw attached to the land. The claw stops and takes the slug away from the punch. This solution works very well with 2.3mm or thinner sheet, but is not very effective in nibbling operation.
 - b. Try SHO-KEI SLUG WIDER DIE
The claw given to SHO-KEI DIE is specially designed to be suitable for every thickness of the sheet. This solution is effective with 3.2mm or thicker sheet in particular, with punching sizes of $\phi 4.5\sim 9.0$.
 - c. Review the die clearance

VI TROUBLES

3. Tool Maintenance
 - a. Sharpen a punch and a die constantly. Tool condition is important to prevent slug burrs.
 - b. Remember to degauss after every sharpening.
 - c. Complement the lost height after sharpened with shims. Make sure that the cutting head achieves an adequate insertion into the die.
4. Punching speed
 - a. The faster the punch moves, the less burr on the slug is generated.

SCRATCHES

1. What causes scratches over the sheet surface?
 - a. The die holder's urethane ball has been damaged, or been covered with waste.
 - b. The die holder's brush has been worn or damaged.
 - c. The forming tool's lower part is higher than the surrounding surface.
2. How to reduce scratches?
 - a. Replace the defective free-bearing part (urethane ball or brush).
 - b. Apply TIC coating to the lower surface of the forming tool.
 - c. Choose a *Short* model of forming lower tool if available.
 - d. Choose a retractable model (UP/DOWN) if available.

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