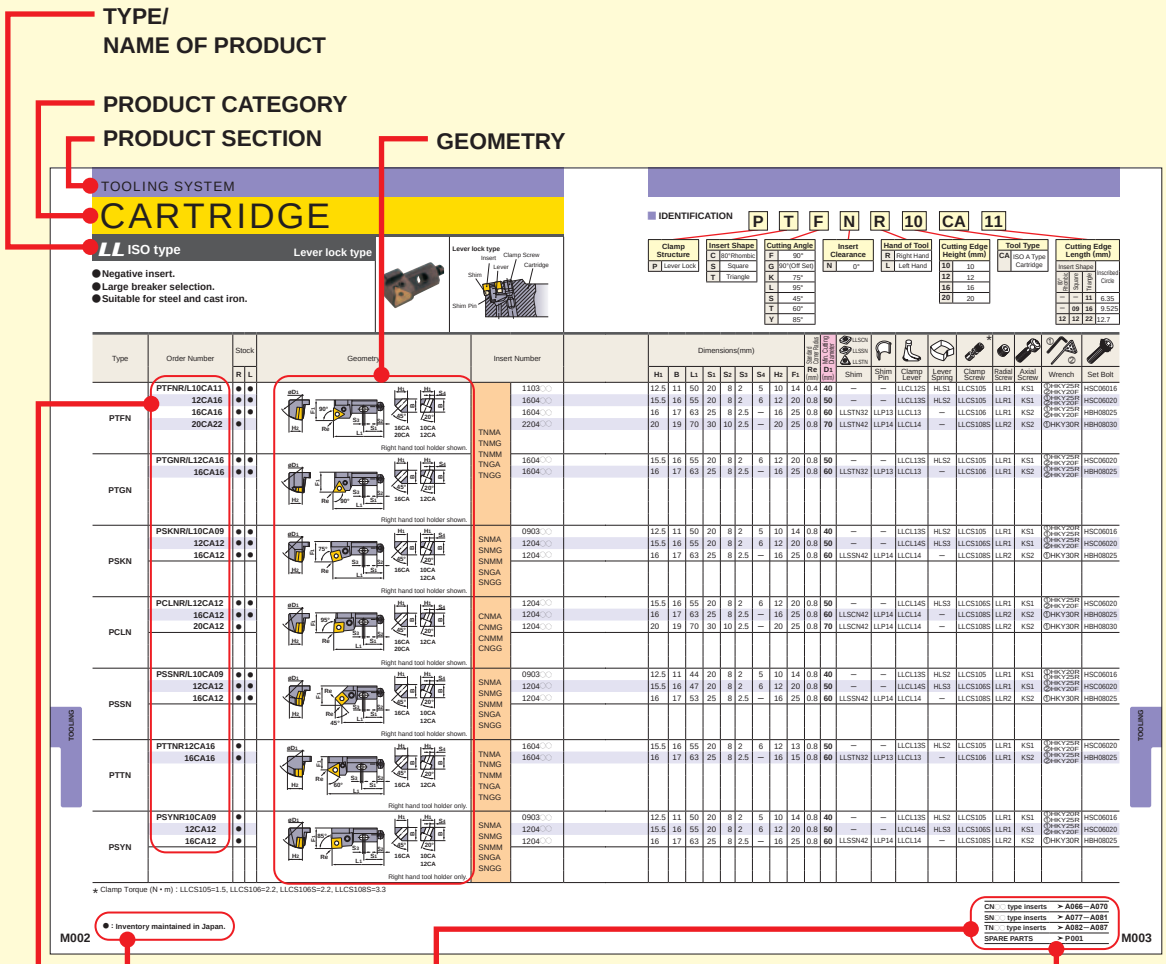
HOW TO READ THE STANDARD OF TOOLING SYSTEM

●How this section page is organized

①Organized by product series. (Refer to the index on the next page.)



LEGEND FOR STOCK STATUS MARK is shown on the left hand page of each double-page spread.

REFERENCE PAGE FOR APPLICABLE INSERTS indicates reference pages for details of inserts that are applicable to the title product.

PAGE REFERENCE ·SPARE PARTS indicates reference pages, including the above, on the right hand page of each double-page spread.

PRODUCT STANDARDS indicates order numbers, stock status (per right/left hand), applicable inserts, dimensions, minimum cutting diameters, standard corner radius, and spare parts.

●To Order : Please specify

①order number and hand of tool (right/left).

MILLING TOOLS

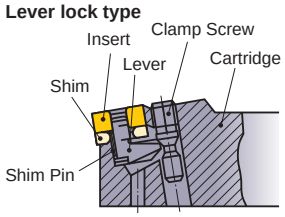
TOOLING SYSTEM

★Arranged by Alphabetical order

CARTRIDGE

LL ISO type — Lever lock type

- Negative insert.
- Large breaker selection.
- Suitable for steel and cast iron.



Type	Order Number	Stock R	Stock L	Geometry	Insert Number	
PTFN	PTFNR/L10CA11	●	●	Right hand tool holder shown.	TNMA TNMG TNMM TNGA TNGG	1103○○
	12CA16	●	●			1604○○
	16CA16	●	●			1604○○
	20CA22	●				2204○○
PTGN	PTGNR/L12CA16	●	●	Right hand tool holder shown.		1604○○
	16CA16	●	●			1604○○
PSKN	PSKNR/L10CA09	●	●	Right hand tool holder shown.	SNMA SNMG SNMM SNGA SNGG	0903○○
	12CA12	●	●			1204○○
	16CA12	●	●			1204○○
PCLN	PCLNR/L12CA12	●	●	Right hand tool holder shown.	CNMA CNMG CNMM CNGG	1204○○
	16CA12	●	●			1204○○
	20CA12	●				1204○○
PSSN	PSSNR/L10CA09	●	●	Right hand tool holder shown.	SNMA SNMG SNMM SNGA SNGG	0903○○
	12CA12	●	●			1204○○
	16CA12	●	●			1204○○
PTTN	PTTNR12CA16	●		Right hand tool holder only.	TNMA TNMG TNMM TNGA TNGG	1604○○
	16CA16	●				1604○○
PSYN	PSYNR10CA09	●		Right hand tool holder only.	SNMA SNMG SNMM SNGA SNGG	0903○○
	12CA12	●				1204○○
	16CA12	●				1204○○

∗ Clamp Torque (N • m) : LLCS105=1.5, LLCS106=2.2, LLCS106S=2.2, LLCS108S=3.3

● : Inventory maintained in Japan.

IDENTIFICATION

P T F N R 10 CA 11

Clamp Structure	
P	Lever Lock

Insert Shape	
C	80°Rhombic
S	Square
T	Triangle

Cutting Angle	
F	90°
G	90°(Off Set)
K	75°
L	95°
S	45°
T	60°
Y	85°

Insert Clearance	
N	0°

Hand of Tool	
R	Right Hand
L	Left Hand

Cutting Edge Height (mm)	
10	10
12	12
16	16
20	20

Tool Type	
CA	ISO A Type Cartridge

Cutting Edge Length (mm)			
Insert Shape			Inscribed Circle
80° Rhombic	Square	Triangle	
—	—	11	6.35
—	09	16	9.525
12	12	22	12.7

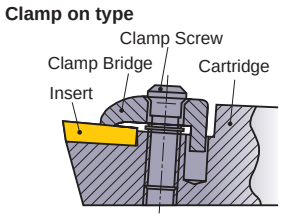
Dimensions(mm)									Standard Corner Radius	Min. Cutting Diameter	LLSCN LLSSN LLSTN								
H_1	B	L_1	S_1	S_2	S_3	S_4	H_2	F_1	Re (mm)	D_1 (mm)	Shim	Shim Pin	Clamp Lever	Lever Spring	Clamp Screw *	Radial Screw	Axial Screw	Wrench	Set Bolt
12.5	11	50	20	8	2	5	10	14	0.4	**40**	—	—	LLCL12S	HLS1	LLCS105	LLR1	KS1	①HKY25R ②HKY20F	HSC06016
15.5	16	55	20	8	2	6	12	20	0.8	**50**	—	—	LLCL13S	HLS2	LLCS105	LLR1	KS1	①HKY25R ②HKY20F	HSC06020
16	17	63	25	8	2.5	—	16	25	0.8	**60**	LLSTN32	LLP13	LLCL13	—	LLCS106	LLR1	KS2	①HKY25R ②HKY20F	HBH08025
20	19	70	30	10	2.5	—	20	25	0.8	**70**	LLSTN42	LLP14	LLCL14	—	LLCS108S	LLR2	KS2	①HKY30R	HBH08030
15.5	16	55	20	8	2	6	12	20	0.8	**50**	—	—	LLCL13S	HLS2	LLCS105	LLR1	KS1	①HKY25R ②HKY20F	HSC06020
16	17	63	25	8	2.5	—	16	25	0.8	**60**	LLSTN32	LLP13	LLCL13	—	LLCS106	LLR1	KS2	①HKY25R ②HKY20F	HBH08025
12.5	11	50	20	8	2	5	10	14	0.8	**40**	—	—	LLCL13S	HLS2	LLCS105	LLR1	KS1	①HKY20R ①HKY25R	HSC06016
15.5	16	55	20	8	2	6	12	20	0.8	**50**	—	—	LLCL14S	HLS3	LLCS106S	LLR1	KS1	①HKY25R ②HKY20F	HSC06020
16	17	63	25	8	2.5	—	16	25	0.8	**60**	LLSSN42	LLP14	LLCL14	—	LLCS108S	LLR2	KS2	①HKY30R	HBH08025
15.5	16	55	20	8	2	6	12	20	0.8	**50**	—	—	LLCL14S	HLS3	LLCS106S	LLR1	KS1	①HKY25R ②HKY20F	HSC06020
16	17	63	25	8	2.5	—	16	25	0.8	**60**	LLSCN42	LLP14	LLCL14	—	LLCS108S	LLR2	KS2	①HKY30R	HBH08025
20	19	70	30	10	2.5	—	20	25	0.8	**70**	LLSCN42	LLP14	LLCL14	—	LLCS108S	LLR2	KS2	①HKY30R	HBH08030
12.5	11	44	20	8	2	5	10	14	0.8	**40**	—	—	LLCL13S	HLS2	LLCS105	LLR1	KS1	①HKY20R ①HKY25R	HSC06016
15.5	16	47	20	8	2	6	12	20	0.8	**50**	—	—	LLCL14S	HLS3	LLCS106S	LLR1	KS1	①HKY25R ②HKY20F	HSC06020
16	17	53	25	8	2.5	—	16	25	0.8	**60**	LLSSN42	LLP14	LLCL14	—	LLCS108S	LLR2	KS2	①HKY30R	HBH08025
15.5	16	55	20	8	2	6	12	13	0.8	**50**	—	—	LLCL13S	HLS2	LLCS105	LLR1	KS1	①HKY25R ②HKY20F	HSC06020
16	17	63	25	8	2.5	—	16	15	0.8	**60**	LLSTN32	LLP13	LLCL13	—	LLCS106	LLR1	KS2	①HKY25R ②HKY20F	HBH08025
12.5	11	50	20	8	2	5	10	14	0.8	**40**	—	—	LLCL13S	HLS2	LLCS105	LLR1	KS1	①HKY20R ①HKY25R	HSC06016
15.5	16	55	20	8	2	6	12	20	0.8	**50**	—	—	LLCL14S	HLS3	LLCS106S	LLR1	KS1	①HKY25R ②HKY20F	HSC06020
16	17	63	25	8	2.5	—	16	25	0.8	**60**	LLSSN42	LLP14	LLCL14	—	LLCS108S	LLR2	KS2	①HKY30R	HBH08025

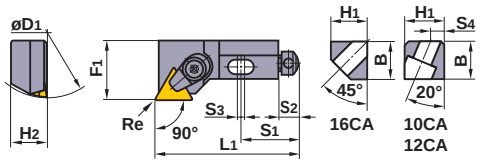
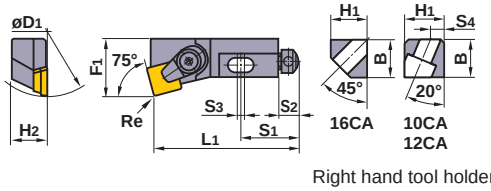
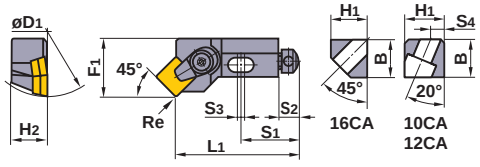
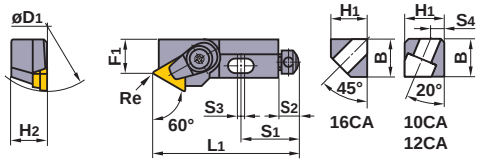
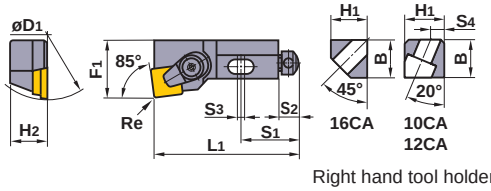
CN□□ type inserts ➤ A066—A070
SN□□ type inserts ➤ A077—A081
TN□□ type inserts ➤ A082—A087
SPARE PARTS ➤ P001

CARTRIDGE

BC ISO type — Clamp on type

- 11°positive insert.
- Suitable for steel, cast iron, aluminium alloys and copper alloys.



Type	Order Number	Stock R	Stock L	Geometry	Insert Number	
CTGP	CTGPR10CA11	●		 Right hand tool holder only.	TPMN TPMR TPGN	1103○○
	12CA16	●				1603○○
	16CA16	●				1603○○
CSKP	CSKPR10CA09	●		 Right hand tool holder only.	SPMN SPMR SPGN	0903○○
	12CA12	▲				1203○○
	16CA12	●				1203○○
CSSP	CSSPR10CA09	●		 Right hand tool holder only.		0903○○
	12CA12	▲				1203○○
	16CA12	▲				1203○○
CTTP	CTTPR10CA11	▲		 Right hand tool holder only.	TPMN TPMR TPGN	1103○○
	12CA16	▲				1603○○
	16CA16	▲				1603○○
CSYP	CSYPR10CA09	▲		 Right hand tool holder only.	SPMN SPMR SPGN	0903○○
	12CA12	▲				1203○○
	16CA12	▲				1203○○

16CA 10CA 12CA

∗ Clamp Torque (N • m) : BC4=2.5, BC4L=2.5, BC5=5.0, BC6=5.0

● : Inventory maintained in Japan.
▲ : Inventory maintained in Japan. To be replaced by new products.

IDENTIFICATION

C T G P R 10 CA 11

Clamp Structure	
C	Clamp On

Insert Shape	
S	Square
T	Triangle

Cutting Angle	
F	90°
G	90°(Off Set)
K	75°
S	45°
T	60°
Y	85°

Insert Clearance	
P	11°

Hand of Tool	
R	Right Hand
L	Left Hand

Cutting Edge Height (mm)	
10	10
12	12
16	16

Tool Type	
CA	ISO A Type Cartridge

Cutting Edge Length (mm)		
Insert Shape		Inscribed Circle
Square	Triangle	
–	11	6.35
09	16	9.525
12	22	12.7

Dimensions(mm)									Standard Corner Radius	Min. Cutting Diameter	PS / PT				*		
H_1	B	L_1	S_1	S_2	S_3	S_4	H_2	F_1	Re (mm)	D_1 (mm)	Shim	Shim Pin	Radial Screw	Axial Screw	Clamp Set	Wrench	Set Bolt
12.5	11	50	20	8	2	5	10	14	0.4	**38**	–	–	TSS05006	KS1	BC4	TKY10R	HSC06016
15.5	16	55	20	8	2	6	12	20	0.8	**50**	–	–	TSS06010	KS1	BC5	TKY20R	HSC06020
16	17	63	25	8	2	–	16	25	0.8	**55**	PT32	BCP201	TSS06010	KS2	BC6	TKY20R	HBH08025
12.5	11	50	20	8	2	5	10	14	0.8	**38**	–	–	TSS05006	KS1	BC4L	TKY10R	HSC06016
15.5	16	55	20	8	2	6	12	20	0.8	**50**	–	–	TSS06010	KS1	BC5	TKY20R	HSC06020
16	17	63	25	8	2	–	16	25	0.8	**55**	PS42	BCP251	TSS06010	KS2	BC6	TKY20R	HBH08025
12.5	11	44	20	8	2	5	10	14	0.8	**38**	–	–	TSS05006	KS1	BC4L	TKY10R	HSC06016
15.5	16	47	20	8	2	6	12	20	0.8	**50**	–	–	TSS06010	KS1	BC5	TKY20R	HSC06020
16	17	53	25	8	2	–	16	25	0.8	**55**	PS42	BCP251	TSS06010	KS2	BC6	TKY20R	HBH08025
12.5	11	50	20	8	2	5	10	9	0.4	**38**	–	–	TSS05006	KS1	BC4	TKY10R	HSC06016
15.5	16	55	20	8	2	6	12	13	0.8	**50**	–	–	TSS06010	KS1	BC5	TKY20R	HSC06020
16	17	63	25	8	2	–	16	15	0.8	**55**	PT32	BCP201	TSS06010	KS2	BC6	TKY20R	HBH08025
12.5	11	50	20	8	2	5	10	14	0.8	**38**	–	–	TSS05006	KS1	BC4L	TKY10R	HSC06016
15.5	16	55	20	8	2	6	12	20	0.8	**50**	–	–	TSS06010	KS1	BC5	TKY20R	HSC06020
16	17	63	25	8	2	–	16	25	0.8	**55**	PS42	BCP251	TSS06010	KS2	BC6	TKY20R	HBH08025

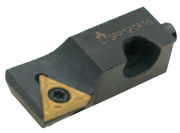
TOOLING

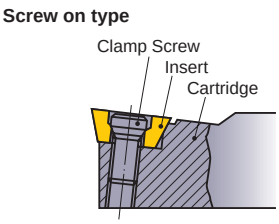
SP○○ type inserts ➤ A131
TP○○ type inserts ➤ A133
SPARE PARTS ➤ P001

CARTRIDGE

SS ISO type — Screw on type

- 11°positive insert.
- Suitable for steel, cast iron, aluminium alloys and copper alloys.





Type	Order Number	Stock R	Stock L	Geometry	Insert Number	
STFP	STFPR/L10CA11	●	●	øD1, H2, F1 90°, Re, S3, S2, S1, L1, H1, S4, B, 20° — Right hand tool holder shown.	TPMX TPGX	1103○○
	12CA16	●	●		TPMT TPGX	1603○○
STGP	STGPR10CA11	●		øD1, H2, F1, Re, 90°, S3, S2, S1, L1, H1, S4, B, 45°, 20°, 16CA, 10CA 12CA — Right hand tool holder only.	TPMX TPGX	1103○○
	12CA16	●			TPMT TPGX	1603○○
	16CA16	●				1603○○
SSKP	SSKPR10CA09	●		øD1, H2, F1 75°, Re, S3, S2, S1, L1, H1, S4, B, 20° — Right hand tool holder only.	SPMT SPGX	0903○○
	12CA12	●				1203○○
SSSP	SSSPR10CA09	●		øD1, H2, F1 45°, Re, S3, S2, S1, L1, H1, S4, B, 20° — Right hand tool holder only.		0903○○
	12CA12	●				1203○○
STTP	STTPR10CA11	●		øD1, H2, F1, Re, 60°, S3, S2, S1, L1, H1, S4, B, 45°, 20°, 16CA, 10CA 12CA — Right hand tool holder only.	TPMX TPGX	1103○○
	12CA16	●			TPMT TPGX	1603○○
	16CA16	●				1603○○
SSYP	SSYPR10CA09	●		øD1, H2, F1 85°, Re, S3, S2, S1, L1, H1, S4, B, 20° — Right hand tool holder only.	SPMT SPGX	0903○○
	12CA12	●				1203○○

⁎ Clamp Torque (N • m) : CS300890T=1.0, TS4=3.5, TS5=7.5

● : Inventory maintained in Japan.

IDENTIFICATION

S T F P R 10 CA 11

Clamp Structure	
S	Screw On

Insert Shape	
S	Square
T	Triangle

Cutting Angle	
F	90°
G	90°(Off Set)
K	75°
S	45°
T	60°
Y	85°

Insert Clearance	
P	11°

Hand of Tool	
R	Right Hand
L	Left Hand

Cutting Edge Height (mm)	
10	10
12	12
16	16

Tool Type	
CA	ISO A Type Cartridge

Cutting Edge Length (mm)		
Insert Shape		Inscribed Circle
Square	Triangle	
–	11	6.35
09	16	9.525
12	22	12.7

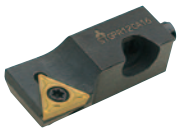
Dimensions(mm)									Standard Corner Radius	Min. Cutting Diameter	*				
H_1	B	L_1	S_1	S_2	S_3	S_4	H_2	F_1	Re (mm)	D_1 (mm)	Clamp Screw	Radial Screw	Axial Screw	Wrench	Set Bolt
12.5	11	50	20	8	2	5	10	14	0.4	35	CS300890T	TSS05006	KS1	TKY08F TKY10F	HSC06016
15.5	16	55	20	8	2	6	12	20	0.8	50	TS4	TSS06010	KS1	TKY15F TKY20F	HSC06020
12.5	11	50	20	8	2	5	10	14	0.4	35	CS300890T	TSS05006	KS1	TKY08F TKY10F	HSC06016
15.5	16	55	20	8	2	6	12	20	0.8	50	TS4	TSS06010	KS1	TKY15F TKY20F	HSC06020
16	17	63	25	8	2	–	16	25	0.8	55	TS4	TSS06012	KS2	TKY15F TKY20F	HBH08025
12.5	11	50	20	8	2	5	10	14	0.8	35	TS4	TSS05006	KS1	TKY10F TKY15F	HSC06016
15.5	16	55	20	8	2	6	12	20	0.8	50	TS5	TSS06010	KS1	TKY20F TKY25F	HSC06020
12.5	11	44	20	8	2	5	10	14	0.8	35	TS4	TSS05006	KS1	TKY10F TKY15F	HSC06016
15.5	16	47	20	8	2	6	12	20	0.8	50	TS5	TSS06010	KS1	TKY20F TKY25F	HSC06020
12.5	11	50	20	8	2	5	10	9	0.4	35	CS300890T	TSS05006	KS1	TKY08F TKY10F	HSC06016
15.5	16	55	20	8	2	6	12	13	0.8	50	TS4	TSS06010	KS1	TKY15F TKY20F	HSC06020
16	17	63	25	8	2	–	16	15	0.8	55	TS4	TSS06012	KS2	TKY15F TKY20F	HBH08025
12.5	11	50	20	8	2	5	10	14	0.8	35	TS4	TSS05006	KS1	TKY10F TKY15F	HSC06016
15.5	16	55	20	8	2	6	12	20	0.8	50	TS5	TSS06010	KS1	TKY20F TKY25F	HSC06020

SP○○ type inserts ➤ A112
TP○○ type inserts ➤ A117, A118
SPARE PARTS ➤ P001

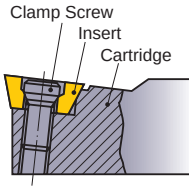
CARTRIDGE

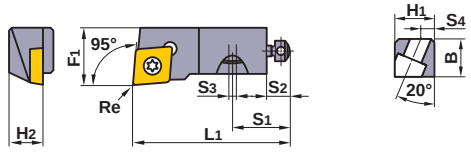
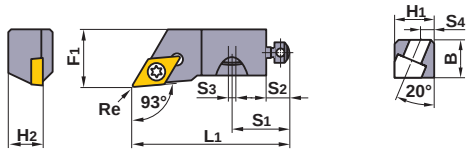
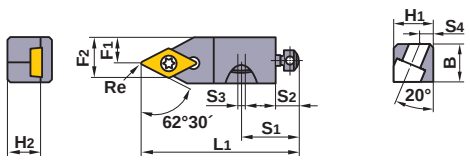
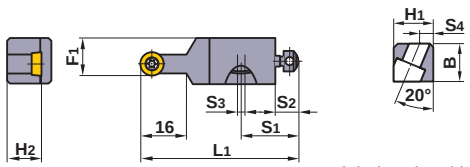
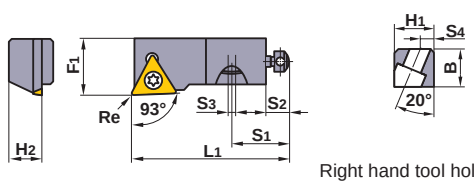
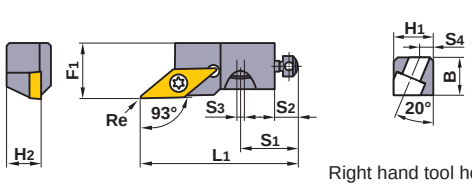
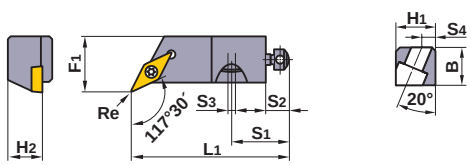
Screw-on type cartridge ISO type

- 11°positive insert.
- Suitable for steel, cast iron, aluminium alloys and copper alloys.



Screw on type



Type	Order Number	Stock R	Geometry	Insert Number	
SCLC	SCLCR12CA12	▲	 Right hand tool holder only.	CCMT CCMW	1204○○
SDJC	SDJCR12CA11	▲	 Right hand tool holder only.	DCMT DCMW	11T3○○
SDNC	SDNCR12CA11	▲	 Right hand tool holder only.		11T3○○
SRDC	SRDCR12CA08	▲	 Right hand tool holder only.	RCMT	0803M0
STJP	STJPR12CA16	▲	 Right hand tool holder only.	TPGX	1603○○
SVJC	SVJCR12CA16	▲	 Right hand tool holder only.	VCMT VCMW	1604○○
SVPCR	SVPCR12CA11	▲	 Right hand tool holder only.		1103○○

⁎ Clamp Torque (N • m) : TS25=1.0, TS3=1.0, TS4=3.5, TS43=3.5, TS5=7.5

▲ : Inventory maintained in Japan. To be replaced by new products.

IDENTIFICATION

S C L C R 12 CA 12

Clamp Structure	
S	Screw On

Insert Shape	
C	80°Rhombic
D	55°Rhombic
R	Round
T	Triangle
V	35°Rhombic

Cutting Angle	
L	95°
J	93°
N	62°30′
P	117°30′
D	—

Insert Clearance	
C	7°
P	11°

Hand of Tool	
R	Right Hand
L	Left Hand

Cutting Edge Height (mm)	
12	12

Tool Type	
CA	ISO A Type Cartridge

Cutting Edge Length (mm)					
Insert Shape					Inscribed Circle
Round	35° Rhombic	55° Rhombic	80° Rhombic	Triangle	
08	—	—	—	—	8.0
—	16	11	—	16	9.525
—	—	—	12	—	12.7

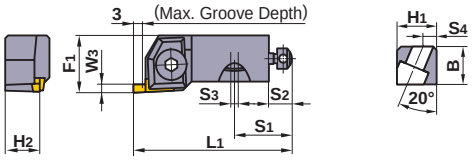
Dimensions(mm)									Standard Corner Radius	*					
H1	B	L1	S1	S2	S3	S4	H2	F1	Re (mm)	Clamp Screw	Radial Screw	Axial Screw	Insert Wrench	Adjust Screw Wrench	Set Bolt
15.5	16	55	20	8	2	6	12	20	0.8	TS5	TSS06010	KS1	TKY25R	TKY20F	HSC06020
15.5	16	55	20	8	2	6	12	20	0.8	TS43	TSS06010	KS1	TKY15R	TKY20F	HSC06020
15.5	16	55	20	8	2	6	12	20	0.8	TS43	TSS06010	KS1	TKY15R	TKY20F	HSC06020
15.5	16	55	20	8	2	6	12	13	0.8	TS3	TSS06010	KS1	TKY08R	TKY20F	HSC06020
15.5	16	55	20	8	2	6	12	20	0.8	TS4	TSS06010	KS1	TKY15R	TKY20F	HSC06020
15.5	16	55	20	8	2	6	12	20	0.4	TS43	TSS06010	KS1	TKY15R	TKY20F	HSC06020
15.5	16	55	20	8	2	6	12	20	0.4	TS25	TSS06010	KS1	TKY08R	TKY20F	HSC06020

TOOLING

CC□□ type inserts ➤ A097, A101
DC□□ type inserts ➤ A103—A106
RC□□ type inserts ➤ A109
VC□□ type inserts ➤ A122, A123
TP□□ type inserts ➤ A117, A118
SPARE PARTS ➤ P001

CARTRIDGE

Cartridge for grooving

Type	Order Number	Stock	Geometry	Insert Number		
		R				
MGHR	**MGHR12CA3323**	▲		MGTR	33○○	

⁎ Clamp Torque (N • m) : SETS51=3.5, HBH06018=7.0

▲ : Inventory maintained in Japan. To be replaced by new products.

	Dimensions(mm)									Thread Pitch	Insert Width	*				
	H_1	B	L_1	S_1	S_2	S_3	S_4	H_2	F_1	(mm)	W_3 (mm)	Clamp Screw	Clamp Bridge	Axial Screw	Set Screw	Wrench
	15.5	16	55	20	8	2	6	12	20	–	2.3 | 3.3	HBH06018	MTK1R	KS1	HSC06020	TKY10R

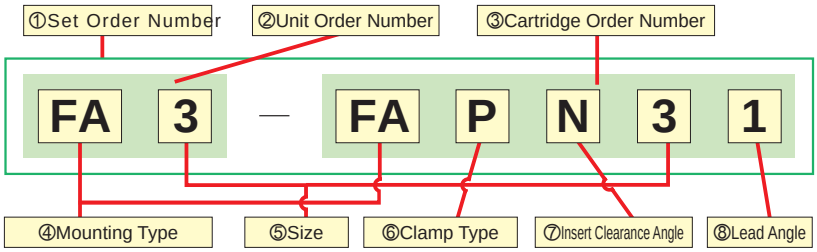
TOOLING

BORING UNIT

FA,FV

- Precision finish boring unit.
- Facilitates precision adjustment.
- High accuracy.

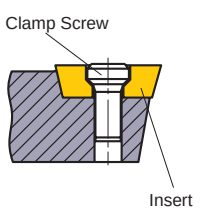
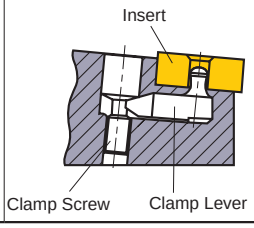
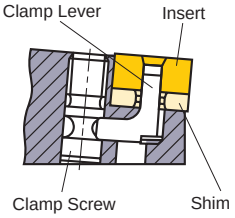
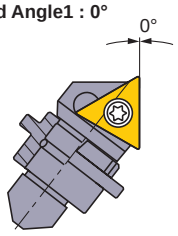
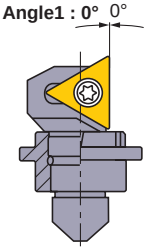
IDENTIFICATION



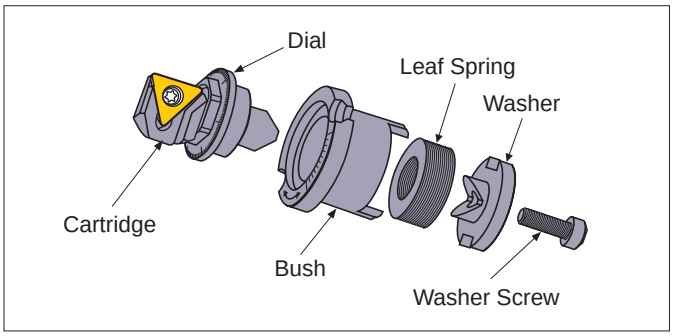
⁎ Sets are delivered with unit and cartridge assembled.

④Mounting Type	Cutting Mode	①Set Order Number ⁎	Stock	②Unit Order Number	Stock	③Cartridge Order Number	Stock	⑤Size		⑥Clamp Type		⑦Insert Clearance Angle	
								Symbol	Min. Cutting Diameter (mm)	Symbol	Type	Symbol	Angle
FA Type (Angular Type)		FA0-FASC01	●	FA0	●	FASC01	●	0	19	S	Screw On	C	7
		FA0-FASC01S	●	FA0	●	FASC01S	●	0	19	S	Screw On	C	7
		FA1-FASP11	●	FA1	●	FASP11	●	1	25	S	Screw On	P	11
		FA1-FASP11S	●	FA1	●	FASP11S	●	1	25	S	Screw On	P	11
		FA2-FASP21	●	FA2	●	FASP21	●	2	36	S	Screw On	P	11
		FA2-FASP21S	●	FA2	●	FASP21S	●	2	36	S	Screw On	P	11
		FA2-FAPN21	●	FA2	●	FAPN21	●	2	36	P	Lever Lock	N	0
		FA2-FAPN21S	▲	FA2	●	FAPN21S	▲	2	36	P	Lever Lock	N	0
		FA3-FASP31	●	FA3	●	FASP31	●	3	47	S	Screw On	P	11
		FA3-FASP31S	●	FA3	●	FASP31S	▲	3	47	S	Screw On	P	11
		FA3-FAPN31	●	FA3	●	FAPN31	●	3	47	P	Lever Lock	N	0
		FA3-FAPN31S	▲	FA3	●	FAPN31S	●	3	47	P	Lever Lock	N	0
		FA4-FAPN41	●	FA4	●	FAPN41	●	4	73	P	Lever Lock	N	0
		FA4-FAPN41S	▲	FA4	●	FAPN41S	▲	4	73	P	Lever Lock	N	0
FV Type (Vertical Type)		FV0-FVSC01	●	FV0	●	FVSC01	●	0	19	S	Screw On	C	7
		FV0-FVSC01S	●	FV0	●	FVSC01S	●	0	19	S	Screw On	C	7
		FV1-FVSP11	●	FV1	●	FVSP11	●	1	25	S	Screw On	P	11
		FV1-FVSP11S	●	FV1	●	FVSP11S	●	1	25	S	Screw On	P	11
		FV2-FVSP21	●	FV2	●	FVSP21	●	2	36	S	Screw On	P	11
		FV2-FVSP21S	●	FV2	●	FVSP21S	●	2	36	S	Screw On	P	11
		FV2-FVPN21	●	FV2	●	FVPN21	●	2	36	P	Lever Lock	N	0
		FV2-FVPN21S	▲	FV2	●	FVPN21S	▲	2	36	P	Lever Lock	N	0
		FV3-FVSP31	●	FV3	●	FVSP31	●	3	47	S	Screw On	P	11
		FV3-FVSP31S	▲	FV3	●	FVSP31S	●	3	47	S	Screw On	P	11
		FV3-FVPN31	●	FV3	●	FVPN31	●	3	47	P	Lever Lock	N	0
		FV3-FVPN31S	●	FV3	●	FVPN31S	▲	3	47	P	Lever Lock	N	0
		FV4-FVPN41	●	FV4	●	FVPN41	●	4	73	P	Lever Lock	N	0
		FV4-FVPN41S	▲	FV4	●	FVPN41S	▲	4	73	P	Lever Lock	N	0

⁎ "S" at the end of the order number indicates left hand tool.

⑥Cartridge Clamp Structure			⑧Lead Angle	
S (Screw-on Type)	**P** (Lever Lock Type)	**P** (Lever Lock Type with Shim)	**FA**	**FV**
Applicable Size : 0,1,2,3	**Applicable Size : 2,3**	**Applicable Size : 4**	**Lead Angle1 : 0°**	**Lead Angle1 : 0°**
				

● : Inventory maintained in Japan.
▲ : Inventory maintained in Japan. To be replaced by new products.



BORING UNIT SPARE PARTS

Unit Order Number	Washer Screw	Unit Screw	Wrench	Bush	Washer	Leaf Spring
FA0	HSC02006	S1	HKY15R			
FV0	HSC02006	S1	HKY15R			
FA1	HSC02506	HY-A1	HKY20R			
FV1	HSC02506	HY-V1	HKY20R			
FA2	HSC03010	HY2	HKY20R,HKY25R			
FV2	HSC03010	HY2	HS-N2,HKY25R			
FA3	HSC04012	HY3	HKY20R,HKY30R			
FV3	HSC04012	HY3	HKY20R,HKY30R			
FA4	HSC05016	HY4	HKY30R,HKY40R			
FV4	HSC05016	HY4	HKY30R,HKY40R			

The parts above are not sold separately as accuracy can only be guaranteed by having the complete set. Please contact us for questions about parts replacement.

CARTRIDGE SPARE PARTS

Cartridge ⋆1	Clamp Lever	Clamp Screw ⋆3	Shim	Shim Pin	Spanner ⋆2	Wrench	Applicable Insert	
FASC01(S)	–	① TS2	–	–	HR00	① TKY06F	TCGT..L-F TCGW	060102 060104
FVSC01(S)	–	① TS2	–	–	HR00	① TKY06F		
FASP11(S)	–	① CS250T	–	–	HR12	① TKY08F	TPGX TPGX..L/R TPMX..L/R	090204 110304 110308
FVSP11(S)	–	① CS250T	–	–	HR12	① TKY08F		
FASP21(S)	–	① CS300890T	–	–	HR12	① TKY08F		
FVSP21(S)	–	① CS300890T	–	–	HR12	① TKY08F		
FAPN21(S)	LLCL12S	② LLCS103	–	–	HR12	② HKY20F	TNGA TNGG..L/R	110304 110308
FVPN21(S)	LLCL12S	② LLCS103	–	–	HR12	② HKY20F		
FASP31(S)	–	① CS300890T	–	–	HR34	① TKY08F	TPGX TPGX..L/R TPMX..L/R	110304 110308
FVSP31(S)	–	① CS300890T	–	–	HR34	① TKY08F		
FAPN31(S)	LLCL12S	② LLCS103	–	–	HR34	② HKY20F	TNGA TNGG..L/R	110304 110308 160404 160408 160412
FVPN31(S)	LLCL12S	② LLCS103	–	–	HR34	② HKY20F		
FAPN41(S)	LLCL13	② LLCS106	LLSTN32	LLP13	HR34	② HKY25F		
FVPN41(S)	LLCL13	② LLCS106	LLSTN32	LLP13	HR34	② HKY25F		

(Note) Use left hand inserts in the cartridge for right hand cutting and right hand inserts in the cartridge for left hand cutting.

⋆1 "S" at the end of the cartridge number indicates left hand.

⋆2 A spanner is only provided when ordered with a set.

⋆3 Clamp Torque (N • m) : TS2=0.6, CS250T=1.0, CS300890T=1.0, LLCS103=1.5, LLCS106=2.2

INSERTS

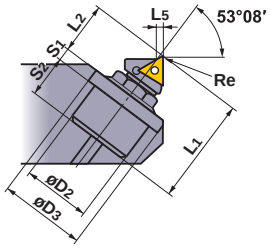
Finish Cutting			Medium Cutting	Flat Top	
TCGT..L/R-F	TPGX..L/R	TPMX..L	TNGG..L/R	TPGX	TNGA
(06) ➲A113	(09,11) ➲A117	(09,11) ➲A117	(11,16) ➲A086	(09,11) ➲A118	(11,16) ➲A087

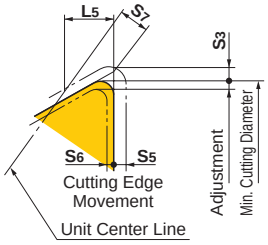
TOOLING

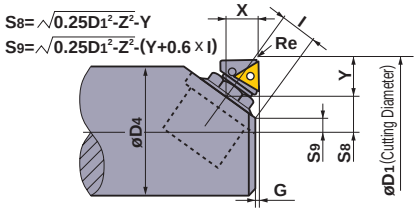
BORING UNIT

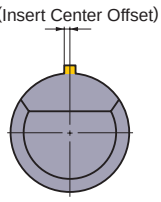
MAIN DIMENSIONS

●FA TYPE (ANGULAR TYPE)





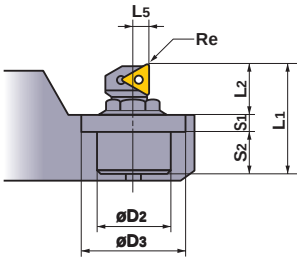


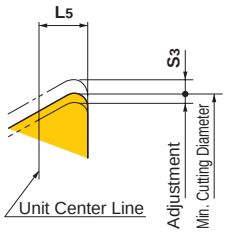


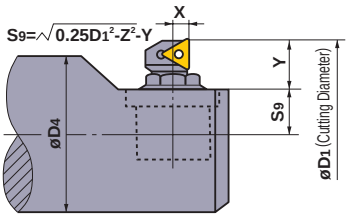
Clockwise (right hand) tool shown.
Minimum cutting diameters correspond to Re0.2 (0 type) and Re0.4 (1—4 type).
Unit : mm

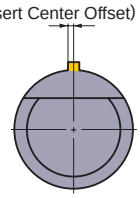
Set Order Number *	Re	Min. Cutting Diameter	Adjustment S3	Adjustment S4	L2	L1	S5	S6	L5	D2	D3	S1	S2	S7	Z	X	Y	G	I	D4 Max.
FA0-FASC01(S)	0.2	19	0.32	0.16	9.0	19.9	0.30	0.12	1.5	11.11	15.06	2.7	8.2	1.11	1.2	6.4	6.5	1.0	6.8	D1-2
	0.4	19	0.32	0.16	8.8	19.7	0.30	0.12	1.6	11.11	15.06	2.7	8.2	1.11	1.2	6.4	6.4	1.0	6.8	D1-2
FA1-FASP11(S)	0.4	25	0.5	0.3	11.7	23.9	0.38	0.23	0.8	15.08	19.05	3.2	9.0	0.46	1.0	7.6	9.1	0.9	8.4	D1-2
FA2-FASP21(S)	0.4	36	0.7	0.4	14.9	33.4	0.53	0.30	1.1	19.05	24.58	4.0	14.5	0.7	1.2	9.7	11.5	0.8	11.1	D1-2
	0.8	36	0.7	0.4	14.5	33.0	0.53	0.30	1.3	19.05	24.58	4.0	14.5	0.7	1.2	9.7	11.2	0.8	11.1	D1-2
FA2-FAPN21(S)	0.4	36	0.7	0.4	14.9	33.4	0.53	0.30	1.1	19.05	24.58	4.0	14.5	0.7	2.75	9.7	11.5	0.8	11.1	D1-2
	0.8	36	0.7	0.4	14.5	33.0	0.53	0.30	1.3	19.05	24.58	4.0	14.5	0.7	2.75	9.7	11.2	0.8	11.1	D1-2
FA3-FASP31(S)	0.4	47	1.0	0.6	18.35	42.85	0.75	0.45	0.9	22.225	31.75	4.8	19.7	0.54	1.9	11.7	14.4	1.2	13.1	D1-3
	0.8	47	1.0	0.6	17.95	42.45	0.75	0.45	1.1	22.225	31.75	4.8	19.7	0.54	1.9	11.7	14.1	1.2	13.1	D1-3
FA3-FAPN31(S)	0.4	47	1.0	0.6	18.35	42.85	0.75	0.45	0.9	22.225	31.75	4.8	19.7	0.54	3.21	11.7	14.4	1.2	13.1	D1-3
	0.8	47	1.0	0.6	17.95	42.45	0.75	0.45	1.1	22.225	31.75	4.8	19.7	0.54	3.21	11.7	14.1	1.2	13.1	D1-3
FA4-FAPN41(S)	0.4	73	1.5	0.7	28.0	65.4	1.13	0.53	1.3	31.75	46.02	6.4	31.0	0.86	5.2	17.7	21.9	1.3	20.5	D1-3
	0.8	73	1.5	0.7	27.6	65.0	1.13	0.53	1.5	31.75	46.02	6.4	31.0	0.86	5.2	17.7	21.6	1.3	20.5	D1-3
	1.2	73	1.5	0.7	27.2	64.6	1.13	0.53	1.7	31.75	46.02	6.4	31.0	0.86	5.2	17.7	21.3	1.3	20.5	D1-3

●FV TYPE (VERTICAL TYPE)









Clockwise (right hand) tool shown.
Minimum cutting diameters correspond to Re0.2 (0 type) and Re0.4 (1—4 type).
Unit : mm

Set Order Number *	Re	Min. Cutting Diameter	Adjustment S3	Adjustment S4	L2	L1	L5	D2	D3	S1	S2	Z	X	Y	D4 Max.
FV0-FVSC01(S)	0.2	19	0.4	0.2	7.6	18.5	2.6	11.11	15.06	2.7	8.2	1.2	2.6	7.6	D1-2
	0.4	19	0.4	0.2	7.4	18.3	2.6	11.11	15.06	2.7	8.2	1.2	2.6	7.4	D1-2
FV1-FVSP11(S)	0.4	25	0.7	0.3	10.8	23.0	3.6	15.08	20.62	3.2	9.0	1.0	3.6	10.8	D1-2
FV2-FVSP21(S)	0.4	36	0.8	0.6	13.8	32.3	4.0	19.05	24.58	4.0	14.5	1.2	4.0	13.8	D1-2
	0.8	36	0.8	0.6	13.5	32.0	4.0	19.05	24.58	4.0	14.5	1.2	4.0	13.5	D1-2
FV2-FVPN21(S)	0.4	36	0.8	0.6	13.8	32.3	4.0	19.05	24.58	4.0	14.5	2.1	4.0	13.8	D1-2
	0.8	36	0.8	0.6	13.5	32.0	4.0	19.05	24.58	4.0	14.5	2.1	4.0	13.5	D1-2
FV3-FVSP31(S)	0.4	47	1.3	0.7	16.7	41.2	4.8	22.225	31.75	4.8	19.7	1.9	4.8	16.7	D1-3
	0.8	47	1.3	0.7	16.4	40.9	4.8	22.225	31.75	4.8	19.7	1.9	4.8	16.4	D1-3
FV3-FVPN31(S)	0.4	47	1.3	0.7	16.7	41.2	4.8	22.225	31.75	4.8	19.7	3.21	4.8	16.7	D1-3
	0.8	47	1.3	0.7	16.4	40.9	4.8	22.225	31.75	4.8	19.7	3.21	4.8	16.4	D1-3
FV4-FVPN41(S)	0.4	73	1.8	1.0	25.0	62.4	7.1	31.75	46.02	6.4	31.0	5.2	7.1	25.0	D1-3
	0.8	73	1.8	1.0	24.7	62.1	7.1	31.75	46.02	6.4	31.0	5.2	7.1	24.7	D1-3
	1.2	73	1.8	1.0	24.4	61.8	7.1	31.75	46.02	6.4	31.0	5.2	7.1	24.4	D1-3

* "S" at the end of the order number indicates left hand tool.

MI TYPE BORING BARS

IDENTIFICATION

S	B	R	1	08
①	②	③	④	⑤

①Clamp Type

S	Screw On Type

②Boring Bar Name

③Shank Shape

R	Round Shank

④Lead Angle

1	0°
3	30°
4	45°
6	90°

⑤Shank Size (mm)

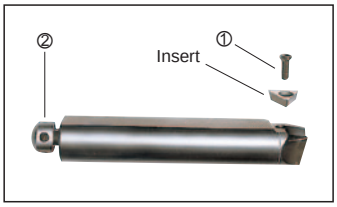
08	8
10	10
12	12
16	16

STANDARD HOLDER

Geometry	Order Number	Stock (For Clockwise)	∗ Insert Number		Dimensions (mm) H1	B	L1	L3	S2	H2	F1	Standard Corner Radius Re (mm)
SBR1	SBR108	●	TPGX TPGX...L TPMX...L	0802○○	7	8	35	9	—	7	3.5	0.4
	110	●		0902○○	9	10	50	11	—	8	4.5	0.4
	112	●		1103○○	10	12	60	12	7	10	5.0	0.4
SBR3	SBR308	●	TPGX TPGX...L TPMX...L	0802○○	7	8	35	10	—	7	0.7	0.4
	310	●		0902○○	9	10	50	12	—	8	1.0	0.4
	312	●		1103○○	10	12	60	13	7	10	1.0	0.4
SBR4	SBR408	●	TPGX TPGX...L TPMX...L	0802○○	7	8	35	10	—	7	0.5	0.4
	410	●		0902○○	9	10	50	12	—	8	1.0	0.4
	412	●		1103○○	10	12	80	13	7	10	1.0	0.4
	416	●		1103○○	14	16	80	13	9	14	0	0.8
SBR6	SBR608	●	TPGX TPGX...L TPMX...L	0802○○	7	8	35	8.5	—	7	—	0.4
	610	●		0902○○	8	10	50	10	—	8	—	0.4
	612	●		1103○○	10	12	60	11	7	10	—	0.4

(Note) When using an insert with a breaker, please use a left hand insert.

SPARE PARTS



Order Number		①Clamp Screw	②Pre-Set Screw	Wrench
SBR1 – SBR6	08	CS200T	—	TKY06F
	10	CS250T	—	TKY08F
	12	CS300890T	KS1S	TKY08F
	16	CS300890T	KS2S	TKY08F

∗ Clamp Torque (N • m) : CS200T=0.6, CS250T=1.0, CS300890T=1.0

● : Inventory maintained in Japan.

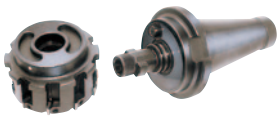
TP○○ type inserts ➤ A117, A118
SPARE PARTS ➤ P 001

CLASSIFICATION OF QUICK CHANGE MODULAR TOOLING SYSTEM

Mitsubishi's quick change system is a must for improving efficiency in mass production lines.

- Shorten tool change times and increase machine efficiency.
- Reduce tool weight. Thus, tool change is safer and easier.
- Improve cutting edge accuracy.

QF1000 (Two Piece)



QF2000 (Small Diameter)

QF2000 (Large Diameter)

QC TYPE ADAPTER FOR PIN MILLING CUTTER

QS2000 (Arbor for Side Cutter)

Face Mill and Pin Milling Cutter

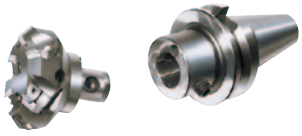
QB2000 • QB3000

QB4000

Boring Tool

MITSUBISHI's QUICK CHANGE SYSTEM

Connecting System



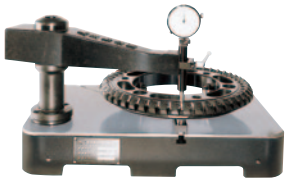
ABS License KOMET®

HSK

Special Tooling

SPQH (Spring)

SPQS (Spring+Oil pressure)



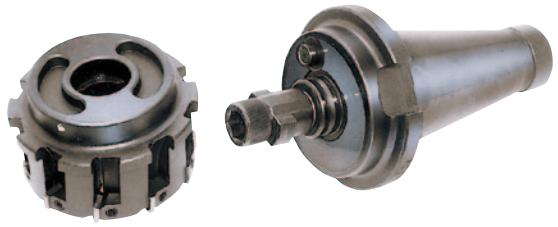
Setting Fixture

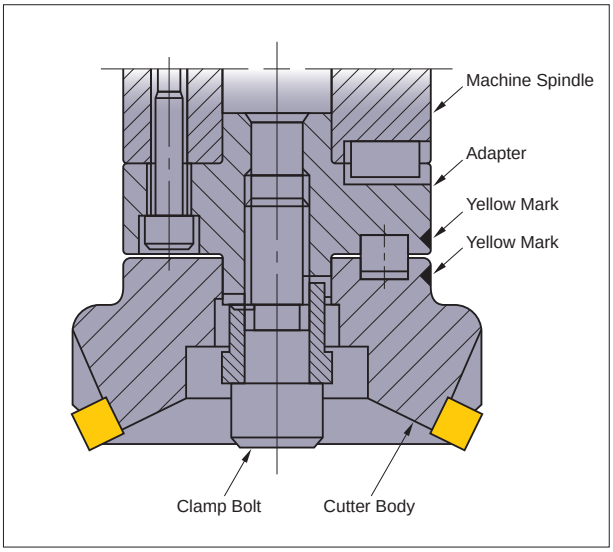
Setting Gauge

FACE MILL

QF2000 (SINGLE BOLT MOUNTING TYPE)

One Piece Type (≤ϕ160)

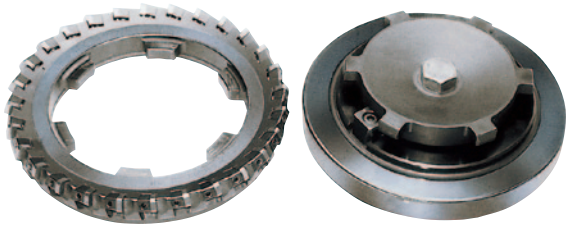


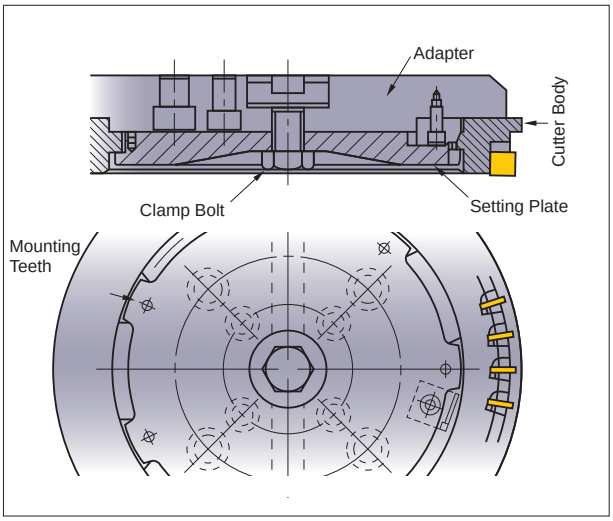


FEATURES

1. Simply turning a clamp bolt fixed to the adapter a few times enables cutter exchange.
2. The cutter needs to be turned 90° before removal. This prevents the cutter from falling free.
3. Applicable to both face milling and boring tools.
4. Cutter exchange time is less than 1 min.

Two Piece Type (≥ϕ200)



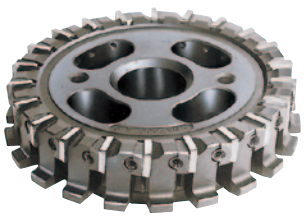


FEATURES

1. Internal diameter of the cutter body has 4—6 mounting teeth. The adapter has the same mounting teeth and a single clamp bolt for installation.
2. The cutter needs to be turned 15° before removal. This prevents the cutter from falling free.
3. Cutter exchange time is less than 1 min.

QF1000 (GOURD SHAPED HOLE TYPE)

One Piece Type (O Type ϕ200)



Two Piece Type (T Type ≥ϕ250)

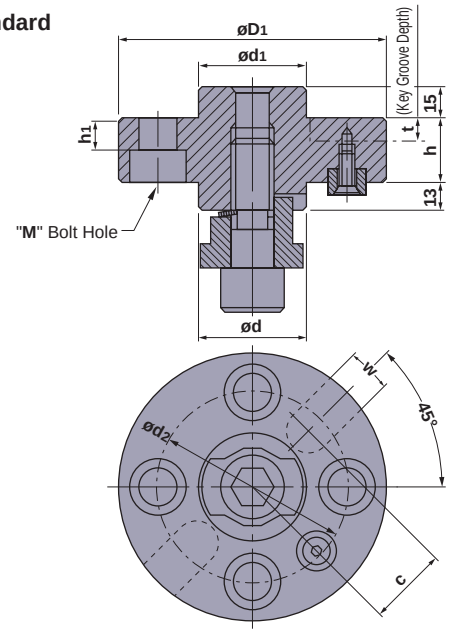
FEATURES

1. Gourd shaped hole type is employed. Turning 4—6 bolts enables cutter exchange.
2. The cutter needs to be turned 15° before removal. This prevents the cutter from falling free.
3. Cutters with ≥Ø250 are made up of 2 parts. Thus, weight at the time of installation is reduced and safety is improved.
4. Standard adapters facilitate installation of cutters with the same diameter and different insert shapes.
5. Cutter exchange time is less than 3—5 min.

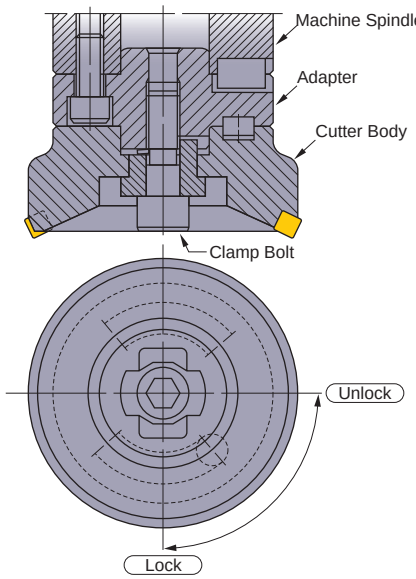
FACE MILLING ADAPTER

Q TYPE (SINGLE BOLT TYPE) ϕ80—ϕ160

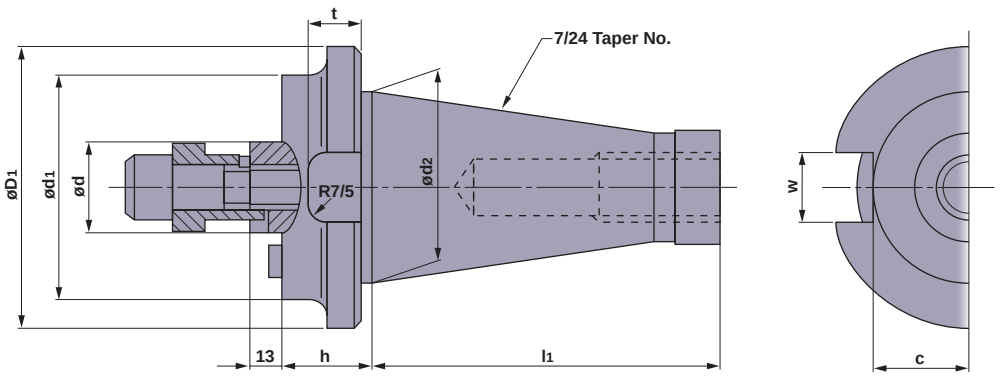
Standard



Installed Condition



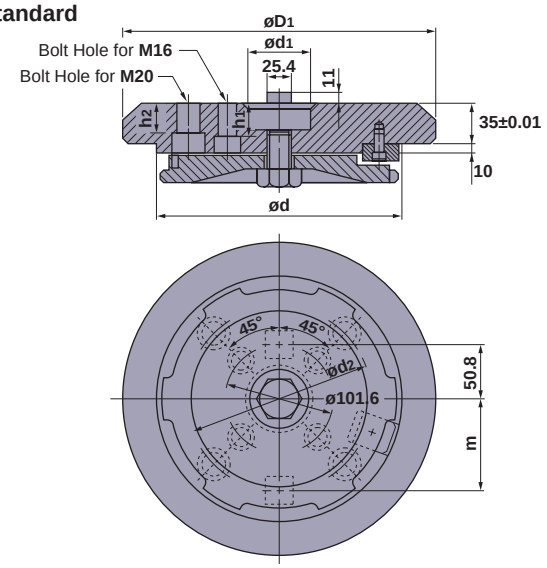
Order Number	Cutter Diameter (D)	Cutter Dimensions (mm)			Machine Dimensions (mm)							Tool Weight (kg)
		D1	d	h	d1	d2	h1	M	w	t	c	
QFA08025BCR/L	80	70	25.4	25	25.4	45	14	M12	9.5	7	18.4	0.8
10025BDR/L	100	80	31.75	25	31.75	55	14	M16	12.7	8	23.2	1.2
12530BER/L	125	100	38.1	30	38.1	70	17	M20	15.9	10	28	2.1
16030BFR/L	160	125	50.8	30	50.8	85	13	M20	19	11	36	3.2



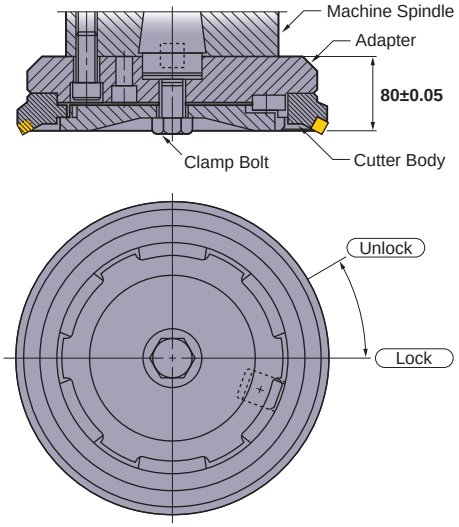
Order Number	Cutter Diameter (D)	Cutter Dimensions (mm)			Machine Dimensions (mm)							Tool Weight (kg)
		d1	d	h	D1	No.	d2	l1	w	t	c	
QFA08025N4R/L	80	70	25.4	25	70	40	44.45	93.4	16.1	16	22.5	1.4
10025N4R/L	100	80	31.75	25	80	40	44.45	93.4	16.1	16	22.5	1.7
12530N4R/L	125	100	38.1	30	100	40	44.45	93.4	16.1	16	22.5	2.7
16030N4R/L	160	125	50.8	30	125	40	44.45	93.4	16.1	16	22.5	3.8
QFA08025N5R/L	80	70	25.4	25	100	50	69.85	126.8	25.7	19	35.3	3.2
10025N5R/L	100	80	31.75	25	100	50	69.85	126.8	25.7	19	35.3	3.4
12530N5R/L	125	100	38.1	30	100	50	69.85	126.8	25.7	19	35.3	4.0
16030N5R/L	160	125	50.8	30	125	50	69.85	126.8	25.7	19	35.3	5.1

Q TYPE (SINGLE BOLT TYPE) ϕ200—ϕ500

Standard



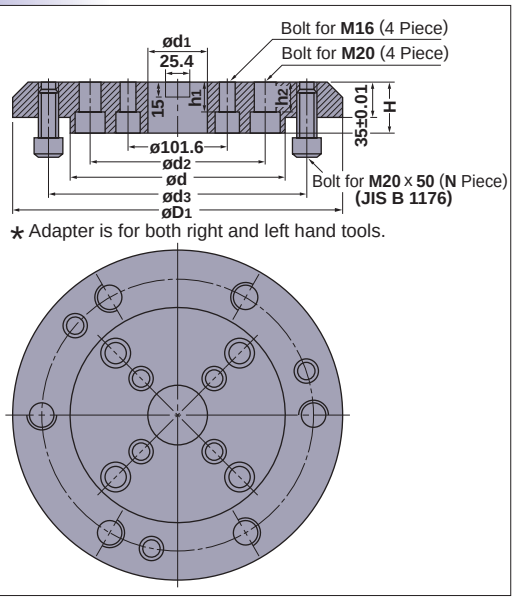
Installed Condition



Order Number	Cutter Diameter (D)	Cutter Dimensions (mm)		Machine Dimensions (mm)					Tool Weight (kg)
		d	D1	d1	d2	h1	h2	m	
QFB20035KR/L	200	125	190	47.625	—	18	—	—	9
25035KR/L	250	175	240	47.625	—	28	—	—	16
31535PR/L	315	240	305	47.625	177.8	28	24	88.9	28
35535PR/L	355	280	345	47.625	177.8	28	24	88.9	37
40035PR/L	400	325	390	47.625	177.8	28	24	88.9	49
50035PR/L	500	425	490	47.625	177.8	28	24	88.9	83

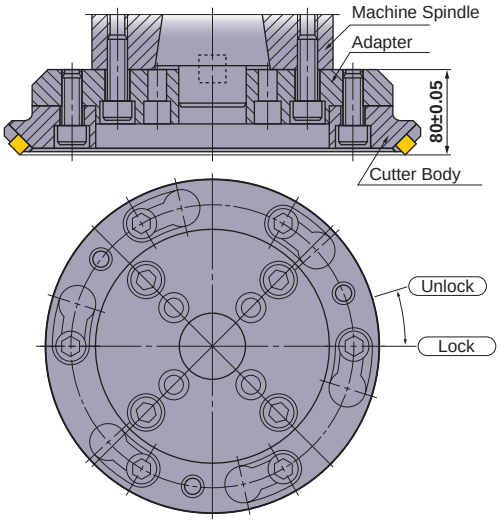
T TYPE (SIX BOLT TYPE) ϕ250—ϕ400

Standard



* Adapter is for both right and left hand tools.

Installed Condition



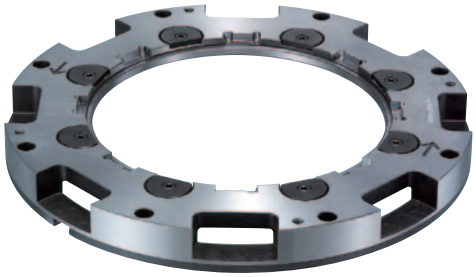
Order Number	Cutter Diameter (D)	Cutter Dimensions (mm)					Machine Dimensions (mm)				Tool Weight (kg)
		d	d3	D1	H	N	d1	d2	h1	h2	
QFA25035K	250	110	155	230	45	4	47.625	—	18	—	9
31535P	315	175	220	295	50	6	47.625	155	30	14	16
35535P	355	215	260	335	50	6	47.625	177.8	30	30	22
40035P	400	260	305	380	50	6	47.625	177.8	30	30	29

SIDE CUTTER

QC TYPE ADAPTER FOR PIN MILLING CUTTER

Cutter Body

Adapter Body



FEATURES

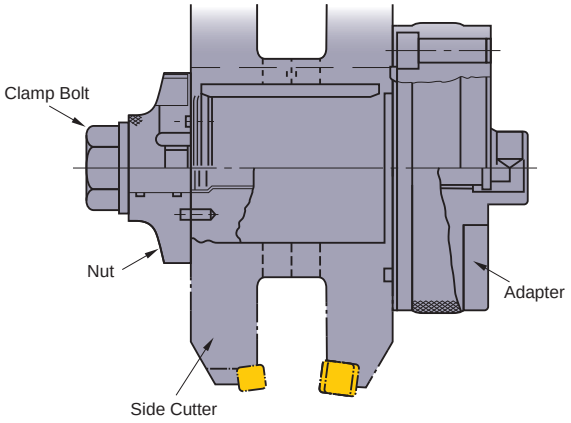
1. Makes installation of Pin millng cutter easy, quick, and accurate.
2. Clamping the entire periphery of the cutter body improves rigidity and lateral run-out of the cutting edges.
3. Facilitates stable heavy cutting such as counter weight cutting and prevents sudden insert fracture.

QS2000 (INSTALLATION METHOD FOR SIDE CUTTER)

Appearance

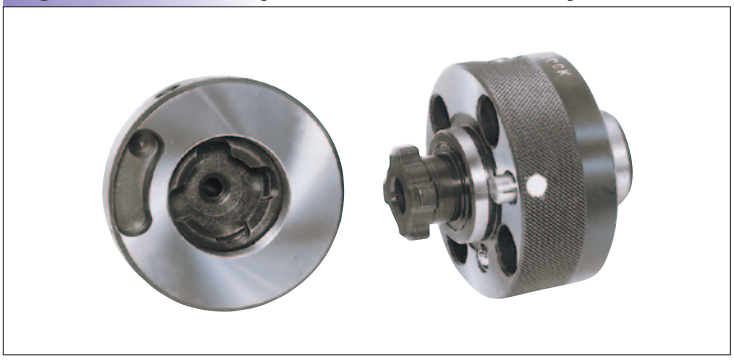
FEATURES

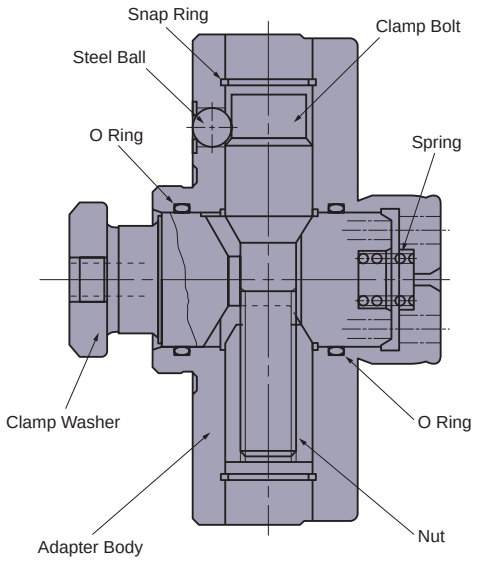
1. Turning the bolt a few times turns nut 45° and enables installation and detachment of the cutter.
2. Installation and detachment of the cutter is possible without taking the bolt and nut off the adapter.
3. The cutter is a solid type. Thus, the rigidity is high.
4. Cutter exchange time is less than 1 min.



BORING TOOL

QB4000 TYPE (SIDE CLAMP TYPE)

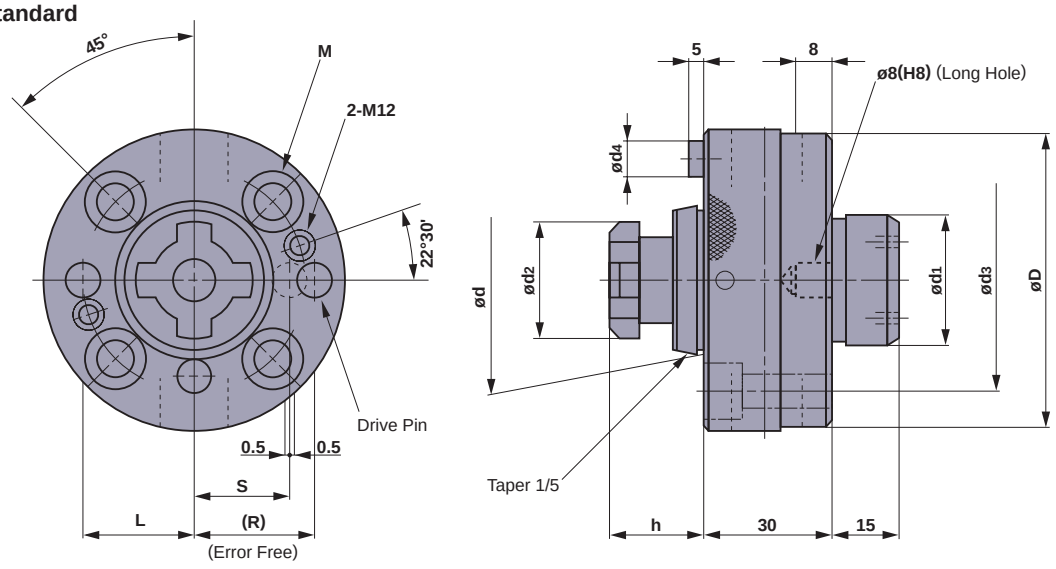




FEATURES

1. Tightening the clamp bolt (or clamp nut) draws the clamp washer in and securely holds the boring head.
2. The clamp washer has mounting teeth at the end. Turning the clamp washer 45° enables installation and detachment of the boring head.
3. Both 1/5 taper and cutter locating faces support the boring head. Thus, clamp rigidity and installation repeatability accuracy are high (2–3μm).
4. A side clamp structure is employed. Thus, a spindle turning stopper is unnecessary. This structure prevents the boring head from falling free.
5. Insert location close to the adapter body allows for convenient head exchange.
6. Suitable for a wide range of boring, from small to large diameters.
7. Head exchange time is less than 1 min.

Installation Standard



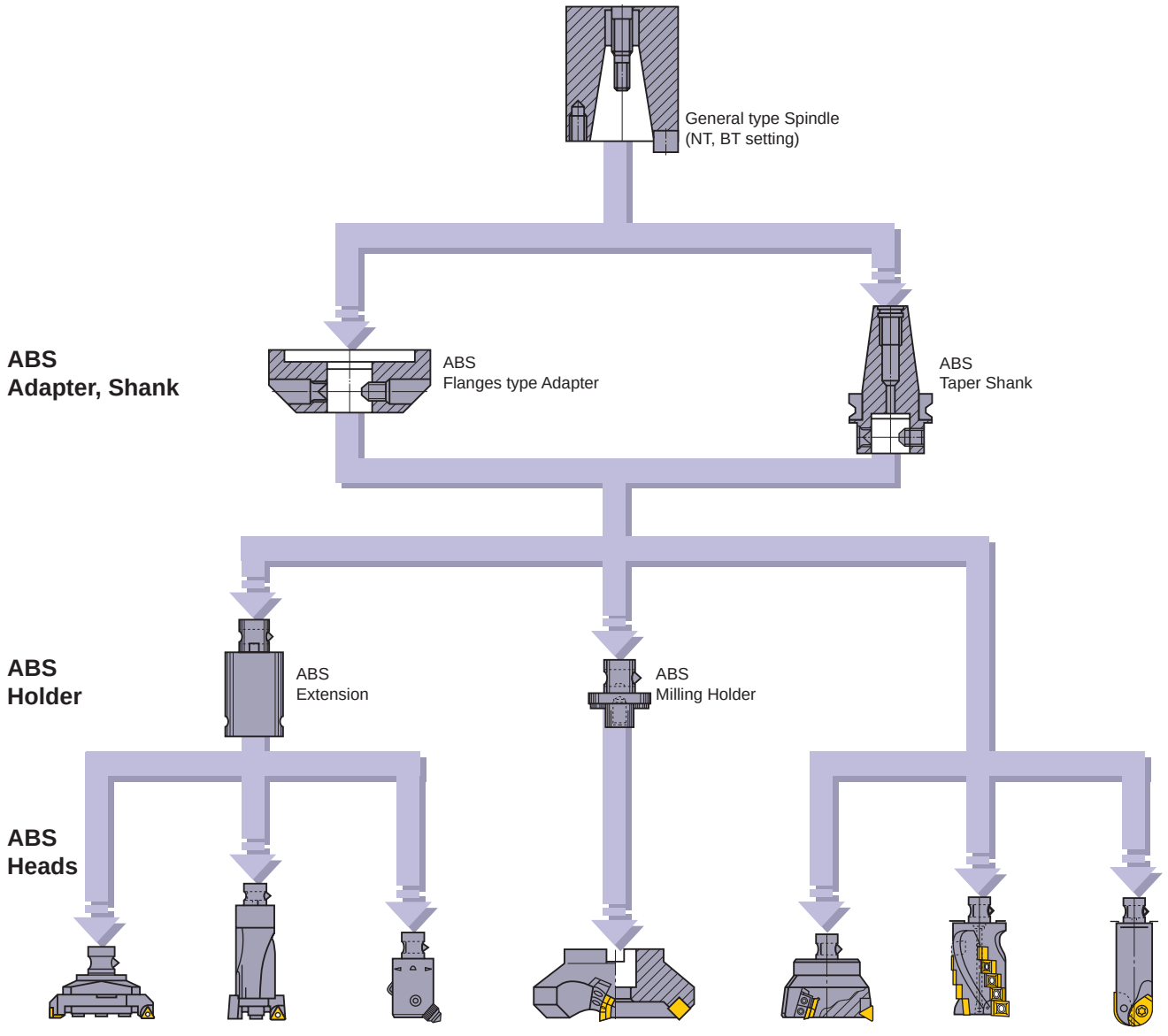
Order Number	d	d1	D	d2	d3	M	h	d4	(R)	L	S
QB4350070	35	30	70	28	52	M8	22	8	28	25	25
4350088	35	30	88	28	70	M8	22	8	35	32	35
4400098	40	30	98	34	80	M8	24	8	40	37	40
4400118	40	30	118	34	90	M10	24	10	45	42	45
4500138	50	40	138	42	110	M12	30	12	55	52	50

ABS® License KOMET®

ABS SYSTEM CHARACTERISTIC

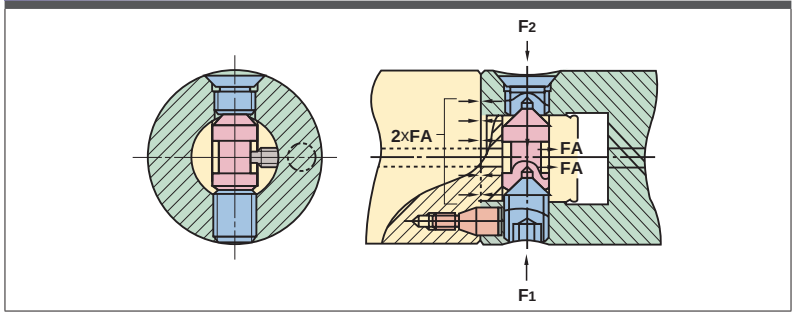
- High rigidity and high coupling strength.
  The taper wedge effects produced by the clamping screw, the taper screw, and the slide pin enable strong and firm coupling between the head and the adapter.
- As the cutting torque acts as torsion force on the axis, 50%—80% improvement is achieved for the clamping strength in the coupled portion axis direction.
- High accuracy is guaranteed.
  An attachment repeat accuracy of 2—3μm is constantly maintained in the coupled portion.
- From small (ϕ20) diameter to large diameter (ϕ200), a wide range of tooling is possible.
- Internal passage of the coolant (air) is possible without modifications to standard machinary.
- Tool head extensions are easy through the use of extension pieces.
- Through the use of reducers, tool head diameters are easily set.

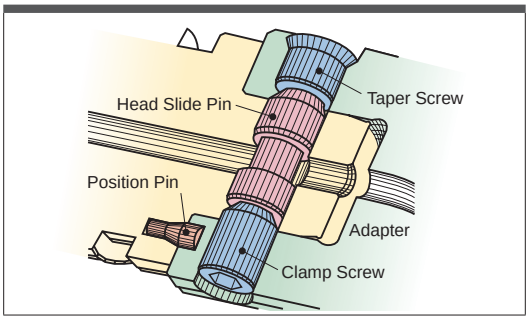
ABS SYSTEM MECHANISM



(Note) The above chart also indicates the KOMET® standard.

ABS SYSTEM COMPONENT

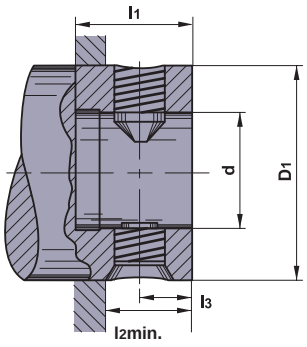




When the force F_1 presses on the clamping screw, the slide pin moves in the radial direction and impinges on the taper screw, generation the reaction force F_2. Since the centers of the clamping screw, the taper screw, and the slide pin are eccentric, a taper connection is made at sites separated by a 180° phase, with the clamping screw and the slide pin on the taper right impingement portion, and the slide pin and taper pin on the taper left impingement portion. The result is that, a vector analysis of those forces shows, as depicted in the diagram above, that the slides move in an identical direction, and the coupling force FA is doubled and transmitted accordingly. Further, cutting resistance generated during cutting becomes torsion stress and is transmitted accordingly. The forces F_1 and F_2 generated with the clamping screw and taper screw are expanded, and the coupling (jointing) force FA becomes as even greater force, and is generated accordingly.

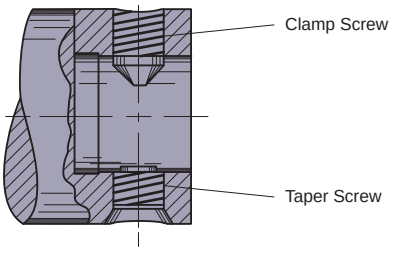
∗ This system is licensed from KOMET© of Germany. (JP Patent NO.1328669)

ABS SYSTEM SETTING STANDARDS Adapter Dimensions



Order Number	Dimensions(mm)				
	D1	d	l1	l2	l3
ABS25W	25	13	22	13	8.3
32W	32	16	25	16	10.3
40W	40	20	30	18.5	11.3
50W	50	28	34	22	13.3
63W	63	34	41	28	17.4
80W	80	46	48	34	20.4
100W	100	56	58	40.5	24.4
125W	125	70	76	51	30.5

Parts for Adapter

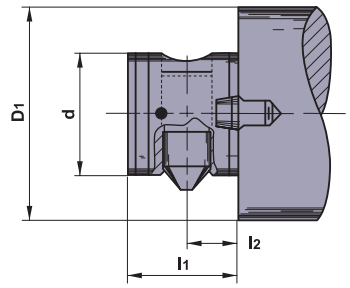


Pack Order Number ∗	Stock	Clamp Screw	Taper Screw
ABS25-FS-W	●	ABS25-F1	ABS25-F2
32-FS-W	●	32-F1	32-F2
40-FS-W	●	40-F1	40-F2
50-FS-W	●	50-F1	50-F2
63-FS-W	●	63-F1	63-F2
80-FS-W	●	80-F1	80-F2
100-FS-W	●	100-F1	100-F2
125-FS-W	●	125-F1	125-F2

∗ An order of the above type of screw and pin needs to be included in the set. Please use a "Pack Order Number" for your order.

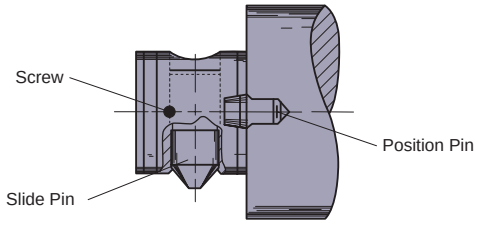
● : Inventory maintained in Japan.

Head Dimensions



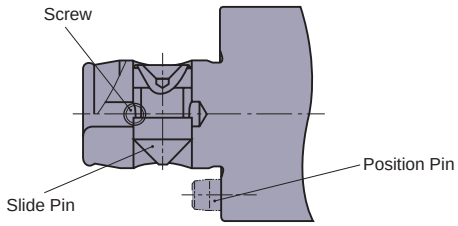
Order Number	Dimensions(mm)			
	D1	d	l1	l2
ABS25M	25	13	20	8
32M	32	16	23	10
40M	40	20	26	11
50M	50	28	31	13
63M	63	34	38	17
80M	80	46	43	20
100M	100	56	55	24
125M	125	70	70	30

Parts for Head



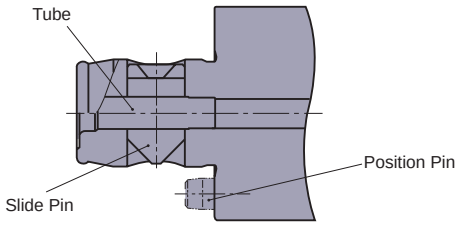
Pack Order Number *	Stock	Slide Pin	Position Pin	Screw
ABS25-ES-M	●	ABS25-E3	ABS25-E4	ABS25-E5
32-ES-M	●	32-E3	32-E4	32-E5
40-ES-M	●	40-E3	40-E4	40-E5
50-ES-M	●	50-E3	50-E4	50-E5
63-ES-M	●	63-E3	63-E4	63-E5
80-ES-M	●	80-E3	80-E4	80-E5
100-ES-M	●	100-E3	100-E4	100-E5
125-ES-M	●	125-E3	125-E4	125-E5

Parts for Head [For Fine Boring]



Pack Order Number *	Stock	Slide Pin	Position Pin	Screw
ABS25-ES-M1	●	ABS25-E3	ABS25-E4.1	ABS25-E5
32-ES-M1	●	32-E3	32-E4.1	32-E5
40-ES-M1	●	40-E3	40-E4.1	40-E5
50-ES-M1	●	50-E3	50-E4.1	50-E5
63-ES-M1	●	63-E3	63-E4.1	63-E5
80-ES-M1	●	80-E3	80-E4.1	80-E5
100-ES-M1	●	100-E3	100-E4.1	100-E5
125-ES-M1	●	125-E3	125-E4.1	125-E5

Parts for Head [For Coolant Hole Type]

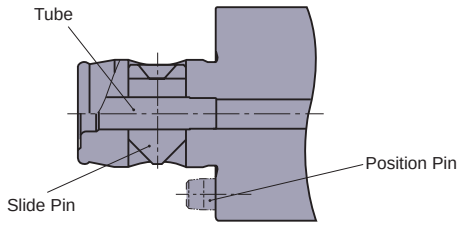


Pack Order Number *	Stock	Slide Pin	Position Pin	Tube
ABS25-ES-M3	●	ABS25-E3.2	ABS25-E4	ABS25-E6
32-ES-M3	●	32-E3.2	32-E4	32-E6
40-ES-M3	●	40-E3.2	40-E4	40-E6
50-ES-M3	●	50-E3.2	50-E4	50-E6
63-ES-M3	●	63-E3.2	63-E4	63-E6
80-ES-M3	●	80-E3.2	80-E4	80-E6
100-ES-M3	●	100-E3.2	100-E4	100-E6
125-ES-M3	●	125-E3.2	125-E4	125-E6

* An order of the above type of screw, pin and tube needs to be included in the set. Please use a "Pack Order Number" for your order.

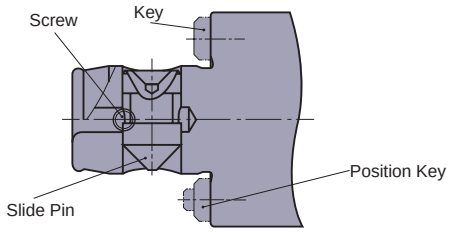
● : **Inventory maintained in Japan.**

Parts for Head [For Fine Boring with Coolant Hole]



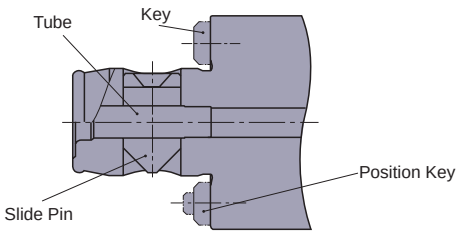
Pack Order Number *	Stock	Slide Pin	Position Pin	Tube
ABS25-ES-M4	●	ABS25-E3.2	ABS25-E4.1	ABS25-E6
32-ES-M4	●	32-E3.2	32-E4.1	32-E6
40-ES-M4	●	40-E3.2	40-E4.1	40-E6
50-ES-M4	●	50-E3.2	50-E4.1	50-E6
63-ES-M4	●	63-E3.2	63-E4.1	63-E6
80-ES-M4	●	80-E3.2	80-E4.1	80-E6
100-ES-M4	●	100-E3.2	100-E4.1	100-E6
125-ES-M4	●	125-E3.2	125-E4.1	125-E6

Parts for Head [For Key Type]



Pack Order Number *	Stock	Slide Pin	Key	Position Key	Screw
SBA25-ES-M	●	ABS25-E3	SBA25-E4	SBA25-E4.1	ABS25-E5
32-ES-M	●	32-E3	32-E4	32-E4.1	32-E5
40-ES-M	●	40-E3	40-E4	40-E4.1	40-E5
50-ES-M	●	50-E3	50-E4	50-E4.1	50-E5
63-ES-M	●	63-E3	63-E4	63-E4.1	63-E5
80-ES-M	●	80-E3	80-E4	80-E4.1	80-E5
100-ES-M	●	100-E3	100-E4	100-E4.1	100-E5
125-ES-M	●	125-E3	125-E4	125-E4.1	125-E5

Parts for Head [For Key Type with Coolant Hole]



Pack Order Number *	Stock	Slide Pin	Key	Position Key	Tube
SBA25-ES-M1	●	ABS25-E3.2	SBA25-E4	SBA25-E4.1	ABS25-E6
32-ES-M1	●	32-E3.2	32-E4	32-E4.1	32-E6
40-ES-M1	●	40-E3.2	40-E4	40-E4.1	40-E6
50-ES-M1	●	50-E3.2	50-E4	50-E4.1	50-E6
63-ES-M1	●	63-E3.2	63-E4	63-E4.1	63-E6
80-ES-M1	●	80-E3.2	80-E4	80-E4.1	80-E6
100-ES-M1	●	100-E3.2	100-E4	100-E4.1	100-E6
125-ES-M1	●	125-E3.2	125-E4	125-E4.1	125-E6

* An order of the above type of screw, pin and tube needs to be included in the set. Please use a "Pack Order Number" for your order.

HSK SYSTEM

FEATURES OF THE HSK SYSTEM

●Suitable for high speed machining.

When the taper hole is slightly seperated during high speed machining due to centrifugal force, the taper axis is continuously in contact with the taper hole because of elastic deformation. Thus, 2 face holding is maintained.

●Guaranteed high accuracy.

Installation repeatability of 2μm is guaranteed.

●High rigidity.

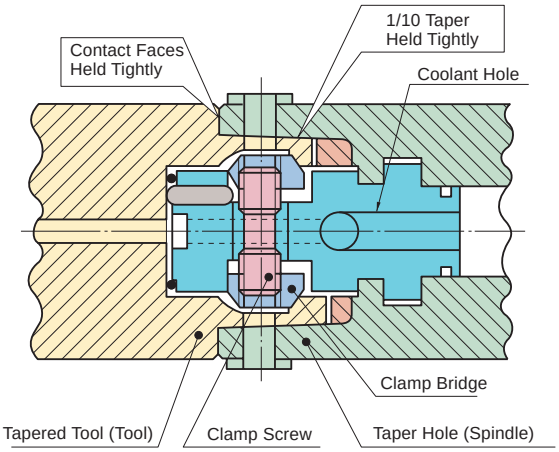
High rigidity in the radial and thrust direction due to the 2 face holding system.

●Easy installation.

Detachable support structure ensures separation of the tool even when the tool has undergone thermal expansion.

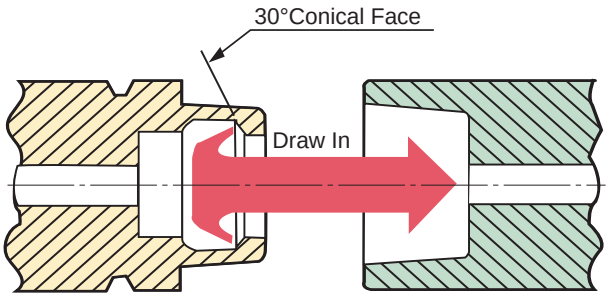
●Coolant system selection.

Center coolant and anglar flow coolant type.



∗ HSK stands for Hole (Hollow) Schaft (axis) Kegel (taper) in German.

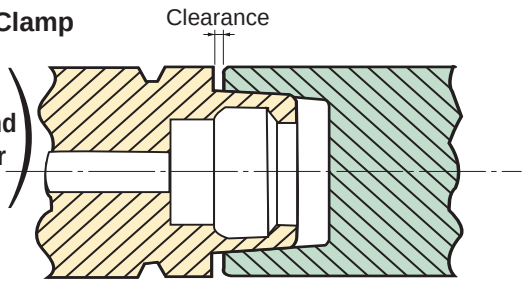
HSK CLAMPING METHOD



●The 30°conical face of the taper axis is pulled in the direction of the tapered hole to clamp.

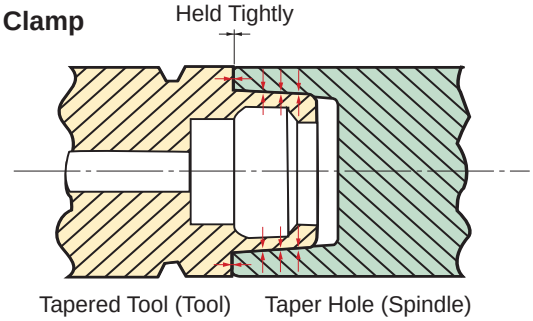
●Temporary Clamp Position

(The spindle taper face and the tool taper face contact.)



●Temporary clamp position has a clearance between the spindle and the tool contact faces.
●Taper clamping force increases as the diameter increases.

●Permanent Clamp Position



●Hollow thin taper axis holds the taper faces and the contact faces tightly due to pressurized elastic deformation.

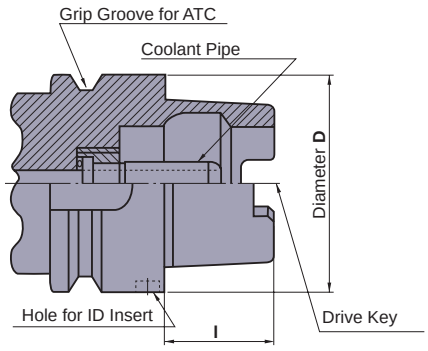
HSK SYSTEM FORM

There are various HSK types.
Mitsubishi Materials produces A, B, C, and D types of taper axis (tool size) and C and D types (manual operation) of taper hole (spindle side).

Type	Application	Tapered Tool (Tool)	Tapered Hole (Spindle)
A Type	Automatic tool change (ATC), center coolant (mainly milling tools)	□	
B Type	Automatic tool change (ATC), angular flow coolant (mainly turning tools)	□	
C Type	Manual tool change, center coolant (mainly milling tools)	□	□
D Type	Manual tool change, angular flow coolant (mainly turing tools)	□	□

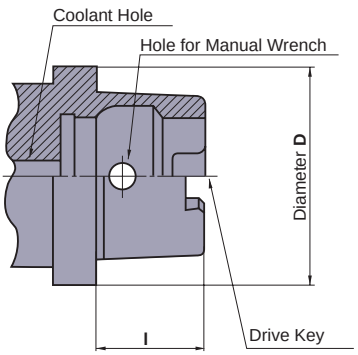
□ **: Non stock, produced to order only.**

Automatic Tool Change — **A Type** (Center Coolant Type) — Milling Tool



Order Number	Dimensions (mm)	
	D	**l**
HSK-A32M	32	16
-A40M	40	20
-A50M	50	25
-A63M	63	32
-A80M	80	40
-A100M	100	50

Manual Tool Change — **C Type** (Center Coolant Type) — Milling Tool



Order Number	Dimensions (mm)	
	D	**l**
HSK-C32M	32	16
-C40M	40	20
-C50M	50	25
-C63M	63	32
-C80M	80	40
-C100M	100	50