MULTI FUNCTIONAL MILLING

Roughing

Including Flat faces

ARX

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron			Hardened Steel

- 15° positive, high tolerance M-class insert.
- Effective for various machining applications.
- With through air & coolant holes.

Fig.1

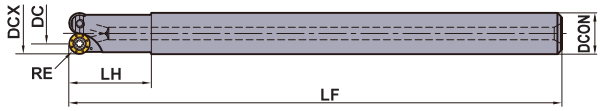


Fig.2 (Center Cutting Edge Type)

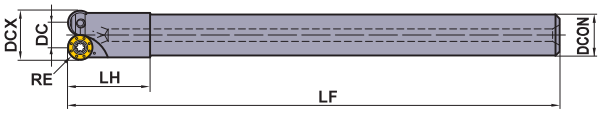
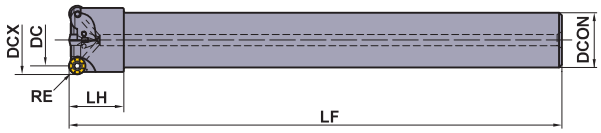


Fig.3 (Non-center Cutting Edge Type (Multi-tooth))



STEEL SHANK TYPE

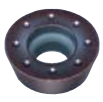
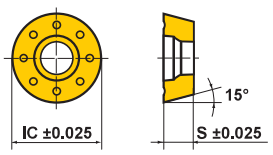
Right hand tool holder only.

Type	Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm)						Type (Fig.)	* Clamp Screw	Wrench	Insert
		R			RE	DCX	DCON	DC	LF	LH				
Center Cutting	**ARX25R102SA10S**	●	○	2	2.5	10	10	5	120	20	1	TPS20	TIP06F	RDMW0517M0E
	ARX**30R122SA10S**	●	○	2	3.0	12	10	6	120	20	2	TPS22S	TIP07FS	RDMW0620M0E
	ARX**35R142SA12S**	●	○	2	3.5	14	12	7	140	20	2	TPS22	TIP07FS	RDMW0724M0E
Non-center Cutting (Multi-tooth)	**ARX25R122SA10S**	●	○	2	2.5	12	10	7	120	20	3	TPS20	TIP06F	RDMW0517M0E
	ARX**25R163SA16S**	●	○	3	2.5	16	16	11	180	20	1	TPS20	TIP06F	RDMW0517M0E
	ARX**30R163SA16S**	●	○	3	3.0	16	16	10	180	20	1	TPS22	TIP07FS	RDMW0620M0E
	ARX**25R173SA16S**	●	○	3	2.5	17	16	12	180	20	1	TPS20	TIP06F	RDMW0517M0E
	ARX**30R173SA16S**	●	○	3	3.0	17	16	11	180	20	1	TPS22	TIP07FS	RDMW0620M0E
	ARX**25R204SA20S**	●	○	4	2.5	20	20	15	180	20	1	TPS20	TIP06F	RDMW0517M0E
	ARX**30R203SA20S**	●	○	3	3.0	20	20	14	180	20	1	TPS22	TIP07FS	RDMW0620M0E
	ARX**25R224SA20S**	●	○	4	2.5	22	20	17	180	20	3	TPS20	TIP06F	RDMW0517M0E
	ARX**30R224SA20S**	●	○	4	3.0	22	20	16	180	20	3	TPS22	TIP07FS	RDMW0620M0E
	ARX**25R255SA20S**	●	○	5	2.5	25	20	20	180	20	3	TPS20	TIP06F	RDMW0517M0E
	ARX**30R254SA20S**	●	○	4	3.0	25	20	19	180	20	3	TPS22	TIP07FS	RDMW0620M0E

* Clamp Torque (N • m) : TPS20=0.6, TPS22S=0.6, TPS22=0.6

MILLING

INSERTS

Shape	Order Number	Coated MP8010	Coated VP15TF	Dimensions (mm) IC	Dimensions (mm) S	Geometry
	**RDMW0517M0E**	●	●	5.0	1.70	
	RDMW**0620M0E**	●	●	6.0	1.99	
	RDMW**0724M0E**	●	●	7.0	2.38	

● : Inventory maintained in Japan. (10 inserts in one case)

Fig.1

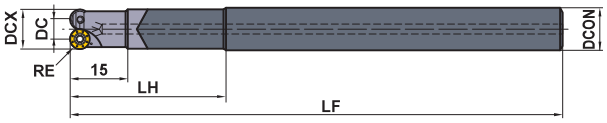


Fig.2

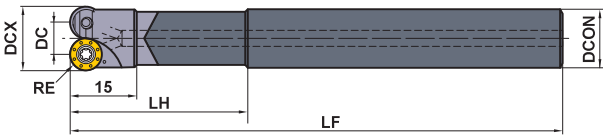
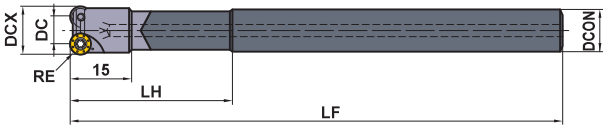


Fig.3

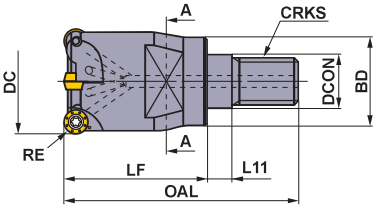


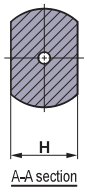
CARBIDE SHANK TYPE

Right hand tool holder only.

Type	Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm)						Type (Fig.)	* Clamp Screw	Wrench	Insert
		R			RE	DCX	DCON	DC	LF	LH				
Center Cutting	ARX25R102SA10LW	●	○	2	2.5	10	10	5	150	40	1	TPS20	TIP06F	RDMW0517M0E
	ARX30R122SA10LW	●	○	2	3.0	12	10	6	150	40	2	TPS22S	TIP07FS	RDMW0620M0E
	ARX35R142SA12LW	●	○	2	3.5	14	12	7	170	40	2	TPS22	TIP07FS	RDMW0724M0E
Non-center Cutting (Multi-tooth)	ARX25R122SA10LW	●	○	2	2.5	12	10	7	150	40	3	TPS20	TIP06F	RDMW0517M0E

* Clamp Torque (N • m) : TPS20=0.6, TPS22S=0.6, TPS22=0.6





SCREW-IN TYPE

Right hand tool holder only.

Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm)									*2 WT (kg)	*1 Clamp Screw	Wrench	Insert
	R			RE	DC	DCON	BD	OAL	LF	L11	H	CRKS				
ARX25R163M08A30	●	○	3	2.5	16	8.5	14.7	48	30	6	10	M8	0.1	TPS20	TIP06F	RDMW0517M0E
ARX25R173M08A30	●	○	3	2.5	17	8.5	14.5	48	30	6	10	M8	0.1	TPS20	TIP06F	RDMW0517M0E
ARX25R204M10A30	●	○	4	2.5	20	10.5	18.6	49	30	6	14	M10	0.2	TPS20	TIP06F	RDMW0517M0E
ARX25R224M10A30	●	○	4	2.5	22	10.5	18.5	49	30	6	14	M10	0.2	TPS20	TIP06F	RDMW0517M0E
ARX25R255M12A35	●	○	5	2.5	25	12.5	23.6	57	35	6	19	M12	0.2	TPS20	TIP06F	RDMW0517M0E
ARX30R163M08A30	●	○	3	3.0	16	8.5	14.6	48	30	6	10	M8	0.1	TPS22	TIP07FS	RDMW0620M0E
ARX30R173M08A30	●	○	3	3.0	17	8.5	14.5	48	30	6	10	M8	0.1	TPS22	TIP07FS	RDMW0620M0E
ARX30R203M10A30	●	○	3	3.0	20	10.5	18.5	49	30	6	14	M10	0.2	TPS22	TIP07FS	RDMW0620M0E
ARX30R224M10A30	●	○	4	3.0	22	10.5	18.5	49	30	6	14	M10	0.2	TPS22	TIP07FS	RDMW0620M0E
ARX30R254M12A35	●	○	4	3.0	25	12.5	23.4	57	35	6	19	M12	0.2	TPS22	TIP07FS	RDMW0620M0E

(Note) For screw-in type arbors, refer to page L145—L146.

*1 Clamp Torque (N • m) : TPS20=0.6, TPS22=0.6

*2 WT : Tool Weight

SCREW-IN ARBORS ➤ L145
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

RECOMMENDED CUTTING CONDITIONS

* The cutting conditions below are a guide only.Please make adjustments according to the machining conditions.
* Please note the follows when machining the hardened steel by using MP8010.
  - Please shorten the overhang length as much as possible.
  - Use with carbide shank recommended.
  - Please note the setting of the depth of cut especially to prevent the fracture.
  - The first recommended grade when machining hardened steel of less than 50HRC is VP15TF.

SHOULDER MILLING • POCKET MILLING • RAMPING • COPYING

	Work Material	Hardness	Grade	Cutting Speed vc (m/min)	ARX25R□□SA□□S ARX25R□□M□□A□□		ARX30R□□SA□□S ARX30R□□M□□A□□		ARX35R□□SA□□S	
					Depth of Cut ap (mm)	Feed per Tooth fz (mm/t.)	Depth of Cut ap (mm)	Feed per Tooth fz (mm/t.)	Depth of Cut ap (mm)	Feed per Tooth fz (mm/t.)
P	Mild Steel	≤180HB	VP15TF	180 (150—220)	≤1.0	≤0.5	≤1.2	≤0.5	≤1.5	≤0.5
	Carbon Steel • Alloy Steel	180—350HB	VP15TF	160 (120—200)	≤0.7	≤0.3	≤0.9	≤0.3	≤1.2	≤0.3
M	Stainless Steel	≤270HB	VP15TF	150 (120—180)	≤0.7	≤0.3	≤0.9	≤0.3	≤1.2	≤0.3
K	Gray Cast Iron	Tensile Strength≤350MPa	VP15TF	180 (150—220)	≤1.0	≤0.5	≤1.2	≤0.5	≤1.5	≤0.5
	Ductile Cast Iron	Tensile Strength≤800MPa	VP15TF	120 (80—160)	≤1.0	≤0.5	≤1.2	≤0.5	≤1.5	≤0.5
H	Hardened Steel	<50HRC	VP15TF	80 (50—120)	≤0.5	≤0.2	≤0.7	≤0.2	≤1.0	≤0.2
		≥50HRC	MP8010	80 (50—120)	≤0.3	≤0.2	≤0.4	≤0.2	≤0.5	≤0.2

(Note) For ramping, refer to the maximum capacities on page L101.

SLOT MILLING

	Work Material	Hardness	Grade	Cutting Speed vc (m/min)	ARX25R□□SA□□S ARX25R□□M□□A□□		ARX30R□□SA□□S ARX30R□□M□□A□□		ARX35R□□SA□□S	
					Depth of Cut ap (mm)	Feed per Tooth fz (mm/t.)	Depth of Cut ap (mm)	Feed per Tooth fz (mm/t.)	Depth of Cut ap (mm)	Feed per Tooth fz (mm/t.)
P	Mild Steel	≤180HB	VP15TF	180 (150—220)	≤1.0	≤0.4	≤1.2	≤0.4	≤1.5	≤0.4
	Carbon Steel • Alloy Steel	180—350HB	VP15TF	160 (120—200)	≤0.7	≤0.2	≤0.9	≤0.2	≤1.2	≤0.2
M	Stainless Steel	≤270HB	VP15TF	150 (120—180)	≤0.7	≤0.2	≤0.9	≤0.2	≤1.2	≤0.2
K	Gray Cast Iron	Tensile Strength≤350MPa	VP15TF	180 (150—220)	≤1.0	≤0.4	≤1.2	≤0.4	≤1.5	≤0.4
	Ductile Cast Iron	Tensile Strength≤800MPa	VP15TF	120 (80—160)	≤1.0	≤0.4	≤1.2	≤0.4	≤1.5	≤0.4
H	Hardened Steel	<50HRC	VP15TF	80 (50—120)	≤0.5	≤0.1	≤0.7	≤0.1	≤1.0	≤0.1
		≥50HRC	MP8010	80 (50—120)	≤0.3	≤0.1	≤0.4	≤0.1	≤0.5	≤0.1

PLUNGING

	Work Material	Hardness	Grade	Cutting Speed vc (m/min)	ARX25R□□SA□□S ARX25R□□M□□A□□		ARX30R□□SA□□S ARX30R□□M□□A□□		ARX35R□□SA□□S	
					Cutting Width ae (mm)	Feed per Tooth fz (mm/t.)	Cutting Width ae (mm)	Feed per Tooth fz (mm/t.)	Cutting Width ae (mm)	Feed per Tooth fz (mm/t.)
P	Mild Steel	≤180HB	VP15TF	180 (150—220)	≤2.5	≤0.3	≤3.0	≤0.3	≤3.5	≤0.3
	Carbon Steel • Alloy Steel	180—350HB	VP15TF	160 (120—200)	≤2.5	≤0.2	≤3.0	≤0.2	≤3.5	≤0.2
M	Stainless Steel	≤270HB	VP15TF	150 (120—180)	≤2.5	≤0.2	≤3.0	≤0.2	≤3.5	≤0.2
K	Gray Cast Iron	Tensile Strength≤350MPa	VP15TF	180 (150—220)	≤2.5	≤0.3	≤3.0	≤0.3	≤3.5	≤0.3
	Ductile Cast Iron	Tensile Strength≤800MPa	VP15TF	120 (80—160)	≤2.5	≤0.3	≤3.0	≤0.3	≤3.5	≤0.3
H	Hardened Steel	<50HRC	VP15TF	80 (50—120)	≤2.5	≤0.1	≤3.0	≤0.1	≤3.5	≤0.1
		≥50HRC	MP8010	80 (50—120)	≤2.5	≤0.1	≤3.0	≤0.1	≤3.5	≤0.1

HELICAL DRILLING

	Work Material	Hardness	Grade	Cutting Speed vc (m/min)	ARX25R□□SA□□S ARX25R□□M□□A□□		ARX30R□□SA□□S ARX30R□□M□□A□□		ARX35R□□SA□□S	
					DOC/pass ap (mm/pass)	Feed per Tooth fz (mm/t.)	DOC/pass ap (mm/pass)	Feed per Tooth fz (mm/t.)	DOC/pass ap (mm/pass)	Feed per Tooth fz (mm/t.)
P	Mild Steel	≤180HB	VP15TF	180 (150—220)	≤1.0	≤0.3	≤1.0	≤0.3	≤1.0	≤0.3
	Carbon Steel • Alloy Steel	180—350HB	VP15TF	160 (120—200)	≤0.7	≤0.2	≤0.9	≤0.2	≤1.0	≤0.2
M	Stainless Steel	≤270HB	VP15TF	150 (120—180)	≤0.7	≤0.2	≤0.9	≤0.2	≤1.0	≤0.2
K	Gray Cast Iron	Tensile Strength≤350MPa	VP15TF	180 (150—220)	≤1.0	≤0.3	≤1.0	≤0.3	≤1.0	≤0.3
	Ductile Cast Iron	Tensile Strength≤800MPa	VP15TF	120 (80—160)	≤1.0	≤0.3	≤1.0	≤0.3	≤1.0	≤0.3
H	Hardened Steel	<50HRC	VP15TF	80 (50—120)	≤0.5	≤0.1	≤0.7	≤0.1	≤1.0	≤0.1
		≥50HRC	MP8010	80 (50—120)	≤0.3	≤0.1	≤0.4	≤0.1	≤0.5	≤0.1

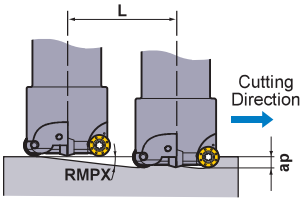
(Note) For helical drilling, refer to the maximum capacities on page L101.

CUTTING MODE MAXIMUM CAPACITIES

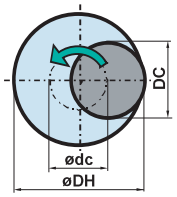
RAMPING

Finding a cutters' distance moved **"L"** when depth of cut reaches **"ap"** at a ramping angle of **"α°"**.

L=ap/tan α (mm)



HELICAL DRILLING



- How to derive a locus of the center of the tool.

ødc = øDH - DC

Locus of the center of the tool | Desired hole diameter | Cutting edge diameter

- For the depth of cut per cycle, refer to the cutting conditions for helical drilling on L100.
- Set the machine spindle revolution so that the tool is rotating and cutting in a down cut direction.

Type	Order Number	Tool Diameter **DC** (mm)	Corner **RE** (mm)	Number of Teeth	Ramping			Helical Drilling	
					RMPX ★1	**APMX** (mm) ★2	Distance L at Depth of Cut of **ap** L (mm)	Min. Hole Diameter **DH min.** (mm)	Max. Hole Diameter **DH max.** (mm)
Center Cutting	**ARX25R102SA10S**	10	2.5	2	90°	2.5	0	15	19
	ARX**25R102SA10LW**	10	2.5	2	90°	2.5	0	15	19
	ARX**30R122SA10S**	12	3.0	2	90°	3.0	0	18	23
	ARX**30R122SA10LW**	12	3.0	2	90°	3.0	0	18	23
	ARX**35R142SA12S**	14	3.5	2	90°	3.5	0	21	27
	ARX**35R142SA12LW**	14	3.5	2	90°	3.5	0	21	27
Non-center Cutting (Multi-tooth)	**ARX25R122SA10S**	12	2.5	2	27.17°	2.5	4.87	19	23
	ARX**25R122SA10LW**	12	2.5	2	27.17°	2.5	4.87	19	23
	ARX**25R163M08A30**	16	2.5	3	13.70°	2.5	10.76	27	31
	ARX**25R163SA16S**	16	2.5	3	13.70°	2.5	10.26	27	31
	ARX**30R163M08A30**	16	3.0	3	21.25	3.0	7.71	26	31
	ARX**30R163SA16S**	16	3.0	3	21.25°	3.0	7.71	26	31
	ARX**25R173M08A30**	17	2.5	3	12.22°	2.5	11.54	29	33
	ARX**25R173SA16S**	17	2.5	3	12.22°	2.5	11.54	29	33
	ARX**30R173M08A30**	17	3.0	3	18.42°	3.0	9.01	28	33
	ARX**30R173SA16S**	17	3.0	3	18.42°	3.0	9.01	28	33
	ARX**30R203M10A30**	20	3.0	3	13.21°	3.0	12.78	34	39
	ARX**30R203SA20S**	20	3.0	3	13.21°	3.0	12.78	34	39
	ARX**25R204M10A30**	20	2.5	4	9.23°	2.5	15.38	35	39
	ARX**25R204SA20S**	20	2.5	4	9.23°	2.5	15.38	35	39
	ARX**25R224M10A30**	22	2.5	4	7.94°	2.5	17.92	39	43
	ARX**25R224SA20S**	22	2.5	4	7.94°	2.5	17.92	39	43
	ARX**30R224M10A30**	22	3.0	4	11.13°	3.0	15.25	38	43
	ARX**30R224SA20S**	22	3.0	4	11.13°	3.0	15.25	38	43
	ARX**30R254M12A35**	25	3.0	4	9.01°	3.0	18.92	44	49
	ARX**30R254SA20S**	25	3.0	4	9.01°	3.0	18.92	44	49
	ARX**25R255M12A35**	25	2.5	5	6.57°	2.5	21.71	45	49
	ARX**25R255SA20S**	25	2.5	5	6.57°	2.5	21.71	45	49

★1 RMPX : Max.Ramping Angle

★2 APMX : Max. Depth of Cut

SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001