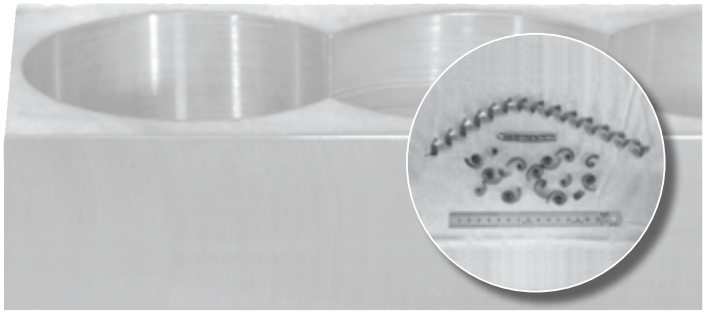
Large diameter indexable drill

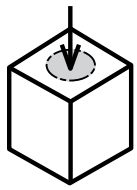
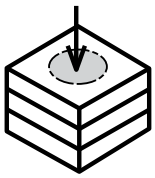
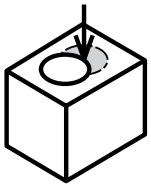
MagicDrill DRW

Sharp cutting and enhanced chip evacuation.
Superior fracture resistance and long tool life with MEGACOAT NANO PR1535 grade.

Applicable diameter: ø60~ø100 mm
Drilling depth: 1D, 2D, 3D
Use single type of insert.

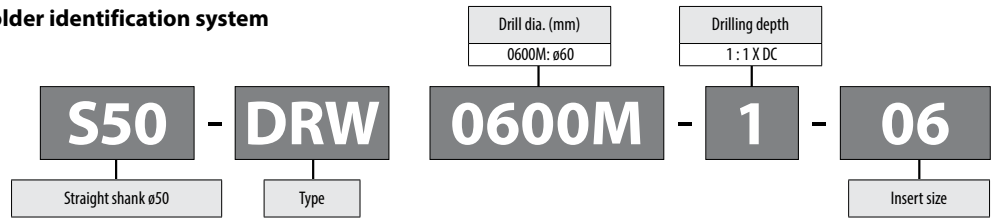


Applicable workpiece

Plain surface	Stacked plates	Hole expansion	Slant surface
			

* Hole expansion: Overlap amount of through hole must be 0.2 x DC or less.
Expansion of blind holes is not possible because chips are built up in the next hole and will cause chip biting.

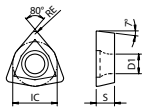
Toolholder identification system



DRW custom-order item (Applicable drill diameter: ø22~ø200 mm)

 BT integral arbor type is also available.	 Max. ø200 is applicable	**Standard item**  Straight shank (1D~3D)

WCMT

			Carbon steel / Alloy steel			●		P
			Mold and die steel			●		P
			Stainless steel	●			○	M
			Cast iron			●		K
			Non-ferrous metals					N
Insert		Description	No. of edges	Dimension (mm)				Carbide			Applicable toolholder ⇒ K102~K105
				IC	S	D1	RE	CVD	PVD		
								CA6535	PR1230	PR1535	
		WCMT 050308	3	7.94	3.18	3.2	0.8		●		-
		WCMT 06T308	3	9.525	3.97	3.7	0.8	●	●	●	K102S50-DRW...-06

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DRW

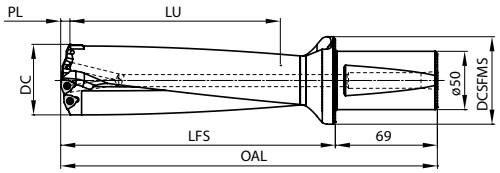


Fig. 1

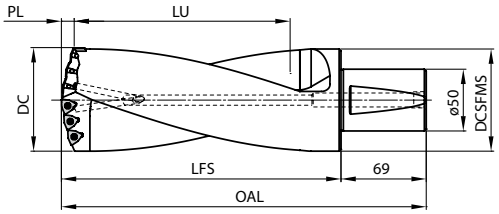


Fig. 2

Toolholder dimensions (Drilling depth : 1 x DC)

Description		Availability	No. of inserts	Dimension (mm)						Coolant hole	Fig.	Spare parts		Applicable inserts K101
				DC	OAL	LFS	LU	DCSFMS	PL			Screw	Wrench	
S50-	DRW0600M-1-06	MTO	4	60	175	106	60	63	7.6	Yes	1	SB-3592TR	DT-10	WCMT06T308
	DRW0610M-1-06	MTO		61	176	107	61		7.7		1			
	DRW0620M-1-06	MTO		62	178	109	62		7.8		1			
	DRW0630M-1-06	MTO		63	179	110	63		7.9		1			
	DRW0640M-1-06	MTO		64	182	113	64		8		1			
	DRW0650M-1-06	MTO		65	184	115	65		8.2		2			
	DRW0660M-1-06	MTO		66	185	116	66	64	8.3		2			
	DRW0670M-1-06	MTO		67	187	118	67	65	8.4		2			
	DRW0680M-1-06	MTO		68	189	120	68	66	8.5		2			
	DRW0690M-1-06	MTO		69	190	121	69	67	8.6		2			
	DRW0700M-1-06	MTO		70	192	123	70	68	8.7		2			
	DRW0710M-1-06	MTO		71	193	124	71	69	8.8		2			
	DRW0720M-1-06	MTO		72	195	126	72	70	9		2			
	DRW0730M-1-06	MTO		73	198	129	73	71	9.1		2			
	DRW0740M-1-06	MTO		74	199	130	74	72	9.2		2			
S50-	DRW0750M-1-06	MTO	6	75	201	132	75	73	9.3	Yes	2	SB-3592TR	DT-10	WCMT06T308
	DRW0760M-1-06	MTO		76	203	134	76	74	9.4		2			
	DRW0770M-1-06	MTO		77	204	135	77	75	9.5		2			
	DRW0780M-1-06	MTO		78	206	137	78	76	9.7		2			
	DRW0790M-1-06	MTO		79	207	138	79	77	9.8		2			
	DRW0800M-1-06	MTO		80			80	78			2			
	DRW0810M-1-06	MTO		81	208	139	81	79			2			
	DRW0820M-1-06	MTO		82	210	141	82	80	9.9		2			
	DRW0830M-1-06	MTO		83			83	81			2			
	DRW0840M-1-06	MTO		84			84	82			2			

Offset Drilling
Offset for DRW should be 0 ~ +0.15 mm in radius (0 ~ +0.3 mm in diameter).
Do not set it to a negative value to make the diameter smaller.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MTO : Made to order

Toolholder dimensions (Drilling depth : 1 x DC)

Description		Availability	No. of inserts	Dimension (mm)						Coolant hole	Fig.	Spare parts		Applicable inserts K101
				DC	OAL	LFS	LU	DCSFMS	PL			Screw	Wrench	
														
S50-	DRW0850M-1-06	MTO	6	85	211	142	85	83	10.5	Yes	2	SB-3592TR	DT-10	WCMT06T308
	DRW0860M-1-06	MTO		86	213	144	86	84						
	DRW0870M-1-06	MTO		87	215	146	87	85						
	DRW0880M-1-06	MTO		88	216	147	88	86						
	DRW0890M-1-06	MTO		89	218	149	89	87						
	DRW0900M-1-06	MTO		90	219	150	90	88	11					
	DRW0910M-1-06	MTO		91	220	151	91	89						
	DRW0920M-1-06	MTO		92	222	153	92	90						
	DRW0930M-1-06	MTO		93	223	154	93	91						
	DRW0940M-1-06	MTO		94	225	156	94	92						
	DRW0950M-1-06	MTO		95	226	157	95	93	11.6					
	DRW0960M-1-06	MTO		96	228	159	96	94						
	DRW0970M-1-06	MTO		97			97	95						
	DRW0980M-1-06	MTO		98	230	161	98	96						
	DRW0990M-1-06	MTO		99	231	162	99	97						
	DRW1000M-1-06	MTO		100	232	163	100	98	12.2					

Offset Drilling
Offset for DRW should be 0 ~ +0.15 mm in radius (0 ~ +0.3 mm in diameter).
Do not set it to a negative value to make the diameter smaller.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MTO : Made to order

Toolholder dimensions (Drilling depth : 2 x DC)

Description		Availability	No. of inserts	Dimension (mm)						Coolant hole	Fig.	Spare parts		Applicable inserts K101
				DC	OAL	LFS	LU	DCSFMS	PL			Screw	Wrench	
S50-	DRW0600M-2-06	●	4	60	235	166	120	63	7.6	Yes	1	SB-3592TR	DT-10	WCMT06T308
	DRW0610M-2-06	MTO		61	237	168	122		7.7		1			
	DRW0620M-2-06	MTO		62	240	171	124		7.8		1			
	DRW0630M-2-06	MTO		63	242	173	126		7.9		1			
	DRW0640M-2-06	MTO		64	246	177	128		8		1			
	DRW0650M-2-06	●		65	249	180	130		8.2		2			
	DRW0660M-2-06	MTO		66	251	182	132	64	8.3		2			
	DRW0670M-2-06	MTO		67	254	185	134	65	8.4		2			
	DRW0680M-2-06	MTO		68	257	188	136	66	8.5		2			
	DRW0690M-2-06	MTO		69	259	190	138	67	8.6		2			
	DRW0700M-2-06	●		70	262	193	140	68	8.7		2			
	DRW0710M-2-06	MTO		71	264	195	142	69	8.8		2			
	DRW0720M-2-06	MTO		72	267	198	144	70	9		2			
	DRW0730M-2-06	MTO		73	271	202	146	71	9.1		2			
	DRW0740M-2-06	●		74	273	204	148	72	9.2		2			
S50-	DRW0750M-2-06	●	6	75	276	207	150	73	9.3	Yes	2	SB-3592TR	DT-10	WCMT06T308
	DRW0760M-2-06	MTO		76	279	210	152	74	9.4		2			
	DRW0770M-2-06	MTO		77	281	212	154	75	9.5		2			
	DRW0780M-2-06	MTO		78	284	215	156	76	9.7		2			
	DRW0790M-2-06	MTO		79	286	217	158	77	9.8		2			
	DRW0800M-2-06	●		80	287	218	160	78	9.9		2			
	DRW0810M-2-06	MTO		81	289	220	162	79			2			
	DRW0820M-2-06	MTO		82	292	223	164	80			2			
	DRW0830M-2-06	MTO		83	293	224	166	81			2			
	DRW0840M-2-06	MTO		84	294	225	168	82			2			
	DRW0850M-2-06	●		85	296	227	170	83	10.5		2			
	DRW0860M-2-06	MTO		86	299	230	172	84			2			
	DRW0870M-2-06	MTO		87	302	233	174	85			2			
	DRW0880M-2-06	MTO		88	304	235	176	86			2			
	DRW0890M-2-06	MTO		89	307	238	178	87			2			
	DRW0900M-2-06	●		90	309	240	180	88	11		2			
	DRW0910M-2-06	MTO		91	311	242	182	89			2			
	DRW0920M-2-06	MTO		92	314	245	184	90			2			
	DRW0930M-2-06	MTO		93	316	247	186	91			2			
	DRW0940M-2-06	●		94	319	250	188	92			2			
	DRW0950M-2-06	●		95	321	252	190	93	11.6		2			
	DRW0960M-2-06	MTO		96	324	255	192	94			2			
	DRW0970M-2-06	MTO		97	325	256	194	95			2			
	DRW0980M-2-06	MTO		98	328	259	196	96			2			
	DRW0990M-2-06	MTO		99	330	261	198	97			2			
	DRW1000M-2-06	●		100	332	263	200	98	12.2		2			

Offset Drilling
Offset for DRW should be 0 ~ +0.15 mm in radius (0 ~ +0.3 mm in diameter).
Do not set it to a negative value to make the diameter smaller.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MTO : Made to order

Toolholder dimensions (Drilling depth : 3 x DC)

Description		Availability	No. of inserts	Dimension (mm)						Coolant hole	Fig.	Spare parts		Applicable inserts K101
				DC	OAL	LFS	LU	DCSFMS	PL			Screw	Wrench	
S50-	DRW0600M-3-06	●	4	60	295	226	180	63	7.6	Yes	1	SB-3592TR	DT-10	WCMT06T308
	DRW0610M-3-06	MTO		61	298	229	183		7.7		1			
	DRW0620M-3-06	MTO		62	302	233	186		7.8		1			
	DRW0630M-3-06	MTO		63	305	236	189		7.9		1			
	DRW0640M-3-06	MTO		64	310	241	192		8		1			
	DRW0650M-3-06	●		65	314	245	195		8.2		2			
	DRW0660M-3-06	MTO		66	317	248	198	64	8.3		2			
	DRW0670M-3-06	MTO		67	321	252	201	65	8.4		2			
	DRW0680M-3-06	MTO		68	325	256	204	66	8.5		2			
	DRW0690M-3-06	MTO		69	328	259	207	67	8.6		2			
	DRW0700M-3-06	●		70	332	263	210	68	8.7		2			
	DRW0710M-3-06	MTO		71	335	266	213	69	8.9		2			
	DRW0720M-3-06	MTO		72	339	270	216	70	9		2			
	DRW0730M-3-06	MTO		73	344	275	219	71	9.1		2			
	DRW0740M-3-06	●		74	347	278	222	72	9.2		2			
S50-	DRW0750M-3-06	●	6	75	351	282	225	73	9.3	Yes	2	SB-3592TR	DT-10	WCMT06T308
	DRW0760M-3-06	MTO		76	355	286	228	74	9.4		2			
	DRW0770M-3-06	MTO		77	358	289	231	75	9.5		2			
	DRW0780M-3-06	MTO		78	362	293	234	76	9.7		2			
	DRW0790M-3-06	MTO		79	365	296	237	77	9.8		2			
	DRW0800M-3-06	●		80	367	298	240	78			2			
	DRW0810M-3-06	MTO		81	370	301	243	79			2			
	DRW0820M-3-06	MTO		82	374	305	246	80	9.9		2			
	DRW0830M-3-06	MTO		83	376	307	249	81			2			
	DRW0840M-3-06	MTO		84	378	309	252	82			2			
	DRW0850M-3-06	●		85	381	312	255	83			2			
	DRW0860M-3-06	MTO		86	385	316	258	84			2			
	DRW0870M-3-06	MTO		87	389	320	261	85	10.5		2			
	DRW0880M-3-06	MTO		88	392	323	264	86			2			
	DRW0890M-3-06	MTO		89	396	327	267	87			2			
	DRW0900M-3-06	●		90	399	330	270	88			2			
	DRW0910M-3-06	MTO		91	402	333	273	89			2			
	DRW0920M-3-06	MTO		92	406	337	276	90	11		2			
	DRW0930M-3-06	MTO		93	409	340	279	91			2			
	DRW0940M-3-06	●		94	413	344	282	92			2			
	DRW0950M-3-06	●		95	416	347	285	93			2			
	DRW0960M-3-06	MTO		96	420	351	288	94			2			
	DRW0970M-3-06	MTO		97	422	353	291	95	11.6		2			
	DRW0980M-3-06	MTO		98	426	357	294	96			2			
	DRW0990M-3-06	MTO		99	429	360	297	97			2			
	DRW1000M-3-06	●		100	432	363	300	98	12.2		2			

Offset Drilling
Offset for DRW should be 0 ~ +0.15 mm in radius (0 ~ +0.3 mm in diameter).
Do not set it to a negative value to make the diameter smaller.

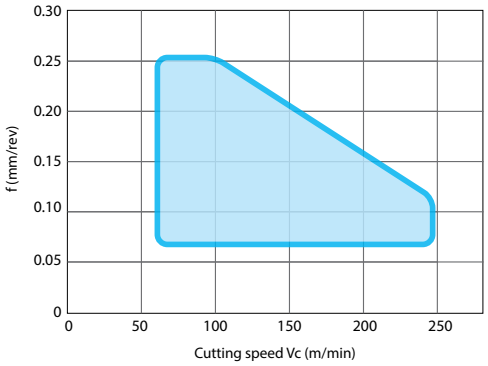
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MTO : Made to order

Recommended cutting conditions

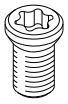
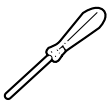
Workpiece material	Vc (m/min)	f (mm/rev)
Carbon steel	80~200	0.07~0.25
Alloy steel	80~160	0.07~0.25
Mold steel	70~150	0.06~0.20
Gray cast iron	100~240	0.07~0.30
Nodular cast iron	80~150	0.07~0.25

· Apply enough amount of coolant (Internal supply).
· Feed rate should be calculated as single insert.

Application map (Carbon steel / Alloy steel)



Spare parts

Description	Clamp screw	Wrench
		
S50-DRW. . .-06	SB-3592TR	DT-10

Hole dia. tolerance

DC	Hole diameter tolerance (mm)
ø60~ø100	0~+0.4

* Above is numeric guideline.
It may vary depending on machines / workpieces / clamping status / cutting conditions.

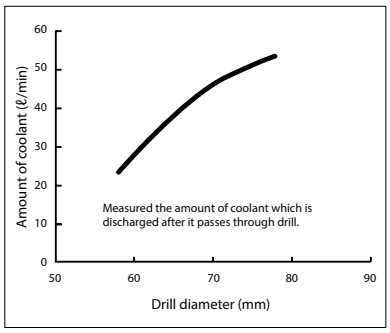
Offset drilling

Offset for DRW should be 0~+0.15 mm in radius
(0~+0.3mm in diameter).
Do not set it to a negative value to make the diameter smaller.

External coolant is not recommended because the amount of chips will be enormous.
Use internal coolant.
See the graph of "Drill diameter and coolant amount".

Higher output is preferable.
What is important is enough torque rather than high spindle rate.
See the examples of required power as below.

Drill diameter and coolant amount



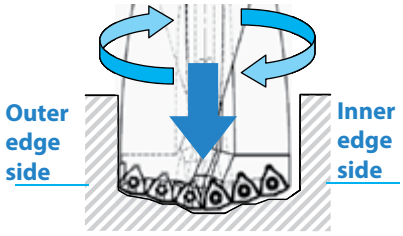
Drill dia.	Workpiece material	Machine	Cutting conditions	Spindle power	*Required power
ø75 (2D)	15CrMo4	M/C	Vc=130m/min (n=550min^{-1}) f=0.12mm/rev (Vf=66mm/min)	22kW	60%
ø85 (2D)	Alloy steel	M/C	Vc=150m/min (n=560min^{-1}) f=0.1mm/rev (Vf=56mm/min)	30kW	85%
ø94 (2D)	C45	NC lathe	Vc=120m/min (n=410min^{-1}) f=0.1mm/rev (Vf=41mm/min)	20kW	100%
ø94 (2D)	X5CrNi18 10	NC lathe	Vc=80m/min (n=270min^{-1}) f=0.2mm/rev (Vf=54mm/min)	20kW	40%

* The required power was read on the load meter.

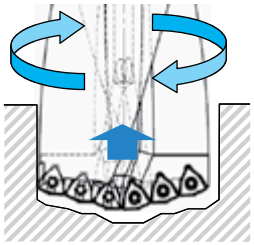
During processing, force of deflection is applied to the center of the drill.
If the drill is just pulled out from the position where processing is finished, tool markings will be made.
To prevent tool markings, perform offset before pulling out the drill.

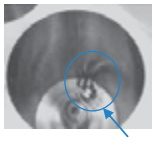
How to prevent tool markings

1. Drilling the hole (The spindle revolves)



2. Turn back approximately 0.5 mm (The spindle revolves)

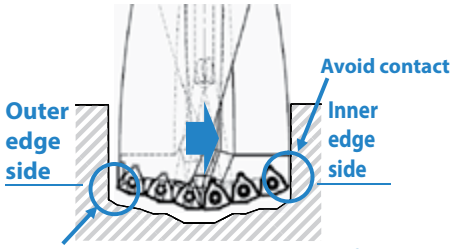




Chips are adhering to the bottom when drilling stops.

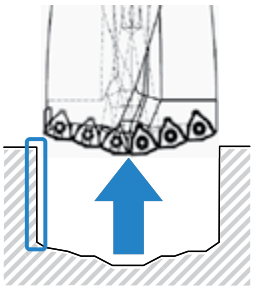
- Without turning back, chips remains adhering to the bottom.
- If offset (3) is performed without turning back, the bottom of drill contacts with the inner surface of hole.
- Turning back is necessary for blind holes but not for through holes.

3. Stop revolution and perform offset (The spindle stops)



Make a clearance to prevent the tool from contacting when pulling out. (Approximately 0.1~0.2 mm)

4. Pull out the drill



Tool markings are not made (or are only slight even if made).

Example of drilling program

```
G90G54G0G43X0Y0Z100.0H10
S477M03
Z2.5M8
G01Z -80.0F48
Z-79.5M19   ← The spindle stops at the specified position
X0.2Y0.2
Z100.0M9
```

* The M code and X and Y moving directions are unique to the equipment.