

Drilling data

φ2.0 drilling on electromagnetic soft iron

Comparison between conventional drilling and coolant through drilling

Drilling method	Work material	Tool diameter (mm)	Hole depth (mm)	L/D	Cutting speed (m/min)	Rotational speed (min ⁻¹)	Feed rate (mm/rev)	Feed speed (mm/min)	Coolant	Peck drilling cycle	Processing time (sec)
Conventional drilling (Automatic lathe rotation tool)	ELCH2 (Electromagnetic soft iron)	2.0	19 Through hole	10	40	6,400	0.03	192	External	Front 3.5 mm × 2 times Back 4.0 mm × 3 times	13.0
Coolant through drilling (CTS-2630)			20 Through hole		188	30,000	0.04	1,200	Internal	No pecking	1.0

92%
reduced

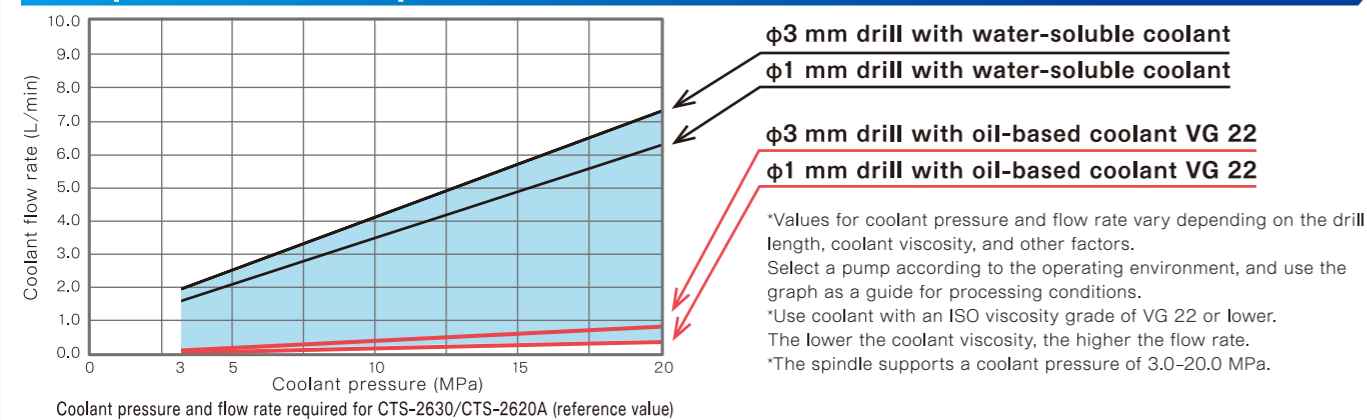
Drilling on other work materials

Common conditions: No pecking, coolant pressure 20 MPa, coolant viscosity VG 7

Work material	Tool diameter (mm)	Hole depth (mm)	L/D	Cutting speed (m/min)	Rotational speed (min ⁻¹)	Feed rate (mm/rev)	Feed speed (mm/min)	Processing time (sec)
A6061 (Aluminum)	1.0	20 Through hole	20	94	30,000	0.07	2,100	0.6
	1.5		13	141	30,000	0.06	1,800	0.7
	2.0		10	188	30,000	0.04	1,200	1.0
C2801 (Brass)	1.0	20 Through hole	20	94	30,000	0.03	900	1.3
	1.5		13	141	30,000	0.02	700	1.7
	2.0		10	188	30,000	0.02	700	1.7
S50C/SCM440 (Carbon steel/Alloy Steel)	1.0	20 Through hole	20	94	30,000	0.03	900	1.3
	1.5		13	118	25,000	0.03	850	1.4
	2.0		10	119	19,000	0.03	570	2.1
SUS304 (Stainless)	1.0	20 Through hole	20	60	19,000	0.02	350	3.4
	1.5		13	75	16,000	0.03	400	3.0
	2.0		10	94	15,000	0.03	400	3.0

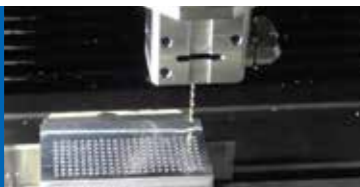
*Drilling conditions depend on various factors such as work material, drill length, coolant, and others.

Graph of coolant pressure vs. flow rate



S50C drilling example

Tool diameter φ2.0
Depth 20 mm
No peck



Lathe installation image

When connected to the EM-3030T-J motor



Coolant through spindle

CTS-2630 CTS-2620A



Coolant Through Spindles CTS-2630/CTS-2620A

Drastically Reduce Cycle Times

Small Diameter ($\leq \phi 3.0$) + Deep Hole (L/D=20) + No Pecking

Advantages of coolant through spindle

Improved chip discharge

- By delivering coolant through the drill and injecting it from the tip of the drill, the drill chips are minimized to short pieces to achieve a higher level of chip discharging.

Extended tool life

- The CTS-2630/CTS-2620A enable cooling of the drill tip, which was difficult with the coolant on the outside, thereby improving tool durability.
- Chip jamming is less likely to occur due to improved chip evacuation, which minimizes the risk of tool damage.

Reduced processing time

- Drilling efficiency is improved by non-peck drilling.

High precision

- Drilling a through-hole from both sides can result in unevenness and gaps. However, non-peck drilling from one side achieves good hole quality without any issues.

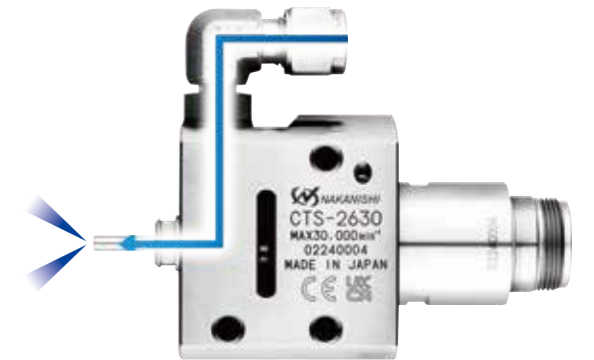
Problem solved by CTS-2630/CTS-2620A

High coolant pressure is required when using a small-diameter oil hole drill. However, there was no high-speed spindle capable of high-pressure coolant flow.

▶ CTS-2630/CTS-2620A are capable of 20 MPa high-pressure coolant.

Result achieved by CTS-2630/CTS-2620A

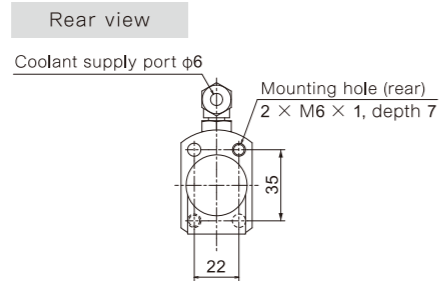
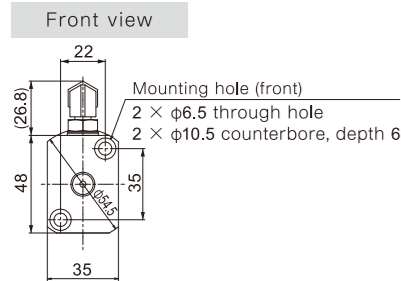
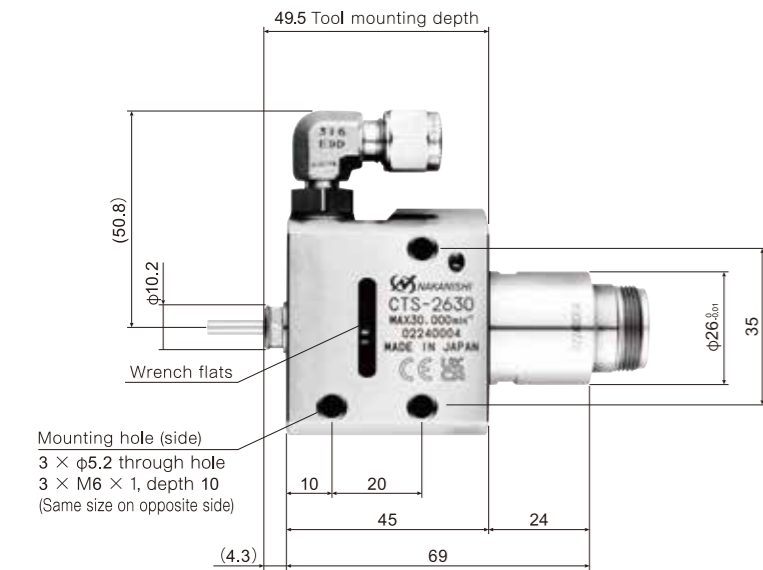
By utilizing high-pressure coolant of 20 MPa, it is now possible to perform non-peck drilling with a diameter of 3.0 mm or less and L/D=20. In addition, the coolant can be discharged even with a minimum diameter of 0.5 mm, which was previously impossible!



Specifications

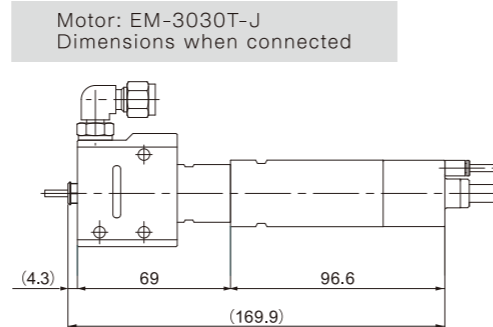
Code No.: 7907

Model: CTS-2630



Allowable rotational speed	30,000 min ⁻¹
Spindle accuracy	Within 1 μm
Net weight	570 g
Coolant pressure	3.0-20.0 MPa
Coolant filter	Filtration accuracy 5 μm or less
Shank diameter of corresponding tool	3.0, 3.175, 4.0 mm
Standard equipment and accessories	Wrench (8 × 5), (9 × 11), (20 × 24): 1 pc. each

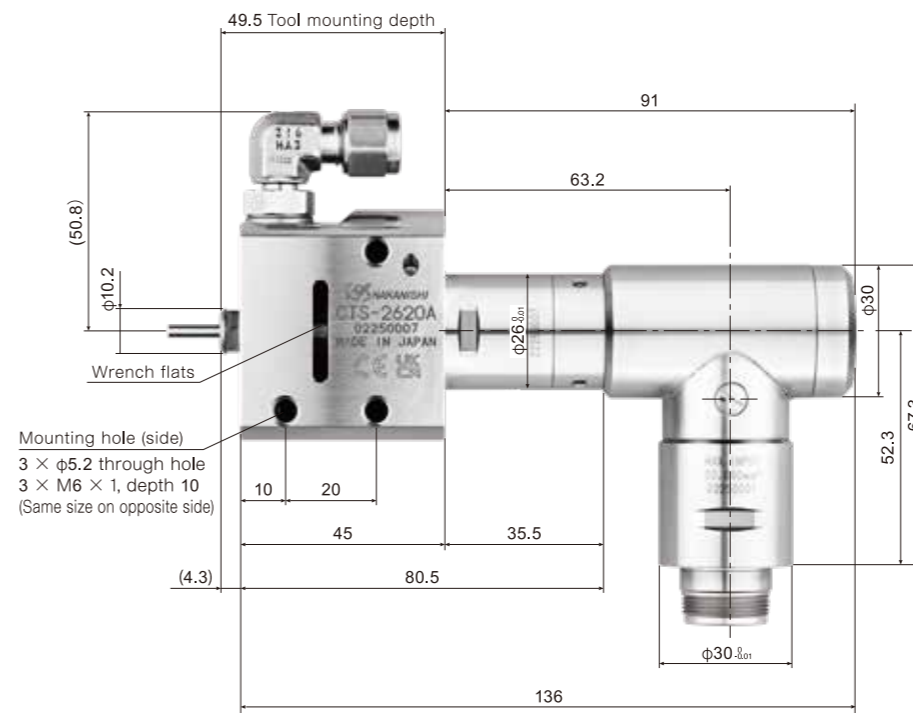
*The collet and the collet nut are sold separately. Please match the collet and the collet nut size.



Motor: EM-3030T-J
Dimensions when connected

Code No.: 7908

Model: CTS-2620A

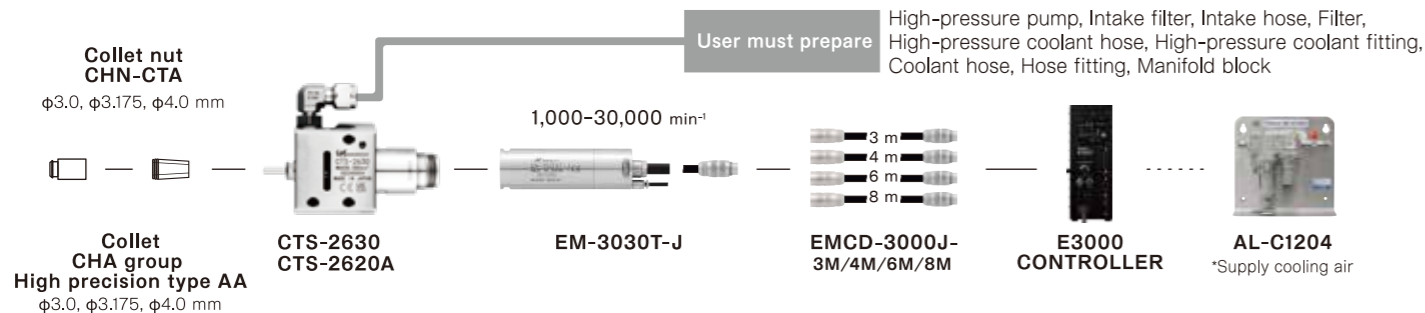


Mounting hole (side)
3 × φ5.2 through hole
3 × M6 × 1, depth 10
(Same size on opposite side)

Max. speed at the cutting tool	20,000 min ⁻¹
Reduction ratio	1/1.5
Max. allowable motor speed	30,000 min ⁻¹
Spindle accuracy	Within 1 μm
Net weight	1,000 g
Coolant pressure	3.0-20.0 MPa
Coolant filter	Filtration accuracy 5 μm or less
Shank diameter of corresponding tool	3.0, 3.175, 4.0 mm
Standard equipment and accessories	Wrench (8 × 5), (9 × 11), (22 × 27): 1 pc. each
	Allen wrench (1.5 mm): 1 pc.
	Grease dispenser (10 mL): 1 pc. Grease nipple: 1 pc.

*The collet and the collet nut are sold separately. Please match the collet and the collet nut size.

Combination example



Option (Collet and collet nut)

Shank diameter of corresponding tool	φ3.0 mm	φ3.175 mm	φ4.0 mm
Collet	CHA-3.0AA (Code No. 91494)	CHA-3.175AA (Code No. 91496)	CHA-4.0AA (Code No. 91495)
Collet nut	CHN-CTA-3.0 (Code No. 7798)	CHN-CTA-3.175 (Code No. 7799)	CHN-CTA-4.0 (Code No. 7800)

December 19, 2023

Coolant Through Spindle CTS-2630/2620A

[ELCH2 $\phi 2 \times 20$ mm Drilling Application]

<https://youtu.be/oa61AasCy-s?si=PMPW7yZSnyivvJeG>

[SCM440 $\phi 2 \times 20$ mm Drilling Application]

<https://youtu.be/o6btbphuLD4?si=guLs8cn-UqRFVC4C>

[SUS304 $\phi 1 \times 20$ mm reduces drilling time]

<https://youtu.be/CJ5de5sfH9Y?si=ZAfzWrPsmijjaqoM>



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