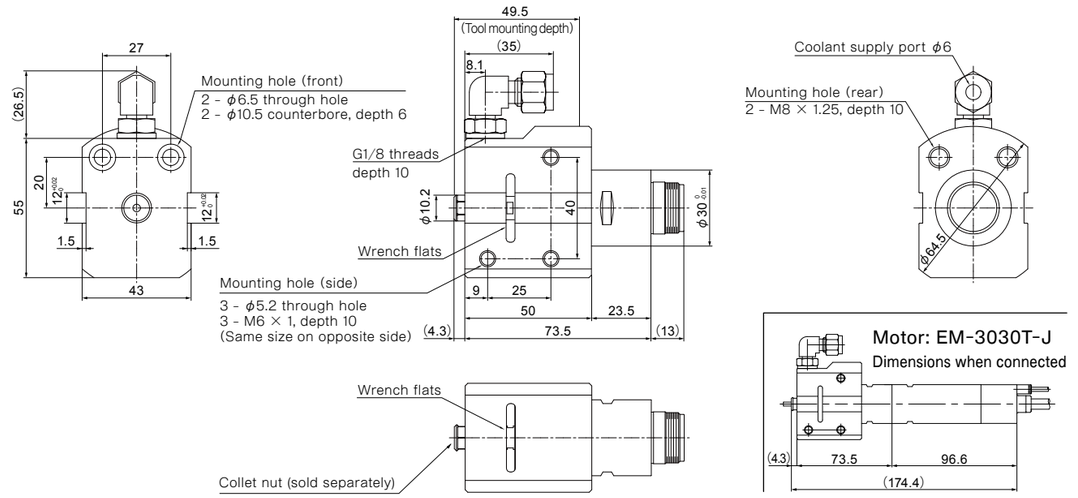
CTS-3030

Coolant Through Spindle - 3030

NAKANISHI

Outside View



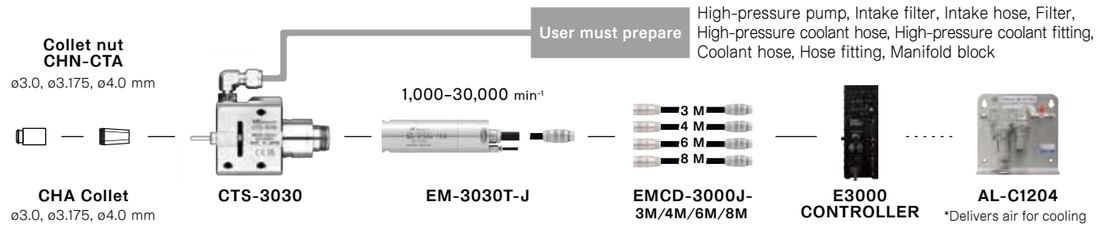
Specifications

Code No.: 7797		Model: CTS-3030	
Allowable rotational speed	30,000 min^{-1}	Shank diameter of corresponding tool	ϕ3.0, ϕ3.175, ϕ4.0 mm
Spindle accuracy	Within 1 μm	Net weight	885 g
Coolant pressure	3.0–20.0 MPa	Coolant filter	Filtration accuracy 5 μm or less
Standard accessories	Wrench (8 × 5), (9 × 11), (22 × 27): 1 pc. each		

Options*				
	Collet size	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)

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

Example of Recommended Combination



Collet nut + Collet + Spindle + Motor + Motor cord + Controller

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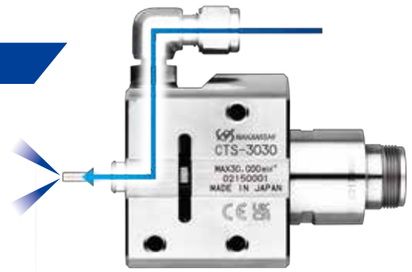
CTS-3030 Coolant Through Spindle

Drastically Reduces Cycle Time

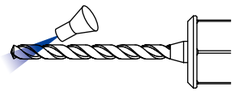
Small Diameter (ϕ3.0) + Deep Hole (L/D=20) + No Pecking + High Speed!

What is a "Coolant Through Spindle"?

A spindle that uses an oil hole drill to inject coolant from it's tool tip for drilling.
There are several advantages, such as improved discharging of chips, reduced drilling time, extended tool life, and high precision when performing deep hole drilling with a Coolant Through Drill.



External Coolant vs Through Coolant

System	Method	Image	Tools
External Coolant	The coolant is applied to the drill tip and flutes.		Conventional drill 
Through Coolant	The coolant is provided through the drill center and injected to the tip of the drill.		Oil hole drill 

Images provided by Mitsubishi Materials Corporation

Advantages of the Internal Coolant

Improved Chip Discharge

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

Extended Tool Life

- The CTS-3030 enables cooling of the drill tip, which was difficult with the coolant on the outside, thereby improving tool tip durability.
- Chip jamming is less likely to occur because of the improved level of chip evacuation, which minimizes the chance of tool damage.

Reduced Drilling Time

- Drilling efficiency is improved by non-peck drilling.

High Precision

- Since it is not possible to drill a deep through-hole at once with drilling on both sides, unevenness and gaps easily occur.
  However, non-peck drilling from one side does not lead to unevenness and achieves good hole quality.

Problem Solved by CTS-3030

High coolant pressure is required when using a small diameter oil hole drill. However, a high-speed spindle capable of high pressure coolant through did not exist.

CTS-3030 is the Solution!
Capable of handling 20 MPa of high pressure coolant

Results Achieved using CTS-3030

Using 20 MPa of high pressure coolant, straight drilling with a ϕ3.0, 20 X Diameter Drill is possible.
Coolant can now be injected through a minimum diameter ϕ0.5 drill, which was very difficult to perform.

Drilling Data

Electromagnetic soft iron ϕ2.0 drilling (Comparison between conventional drilling and coolant through drilling)

Drilling method	Work material	Tool diameter (mm)	Hole depth (mm)	L/D	Cutting speed (m/min)	Spindle speed (min⁻¹)	Feed rate (mm/rev)	Feed speed (mm/min)	Coolant	Peck Drilling Cycle	Drilling time (sec)
Conventional Drilling (Automatic lathe rotation tool)	ELCH2 (Electro-magnetic soft iron)	ϕ2.0	19 (Through hole)	10	40	6,400	0.03	192	External Coolant	Front 3.5 mm × 2 times Back 4.0 mm × 3 times	13.0
Coolant through Drilling (CTS-3030)			20 (Through hole)		188	30,000	0.04	1,200	Internal Coolant	**No Pecking**	**1.0**

92% Cut

Drilling using CTS-3030 on other work materials (No Pecking)

Work material	Tool diameter (mm)	Hole depth (mm)	L/D	Cutting speed (m/min)	Spindle speed (min⁻¹)	Feed rate (mm/rev)	Feed speed (mm/min)	Drilling 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