

SPINJET

HIGH PRESSURE COOLANT

Robust, Compact High-Speed Spindles Powered by High Pressure Coolant up to 70 bar, for Machining Applications Using Small Diameter Cutting Tools

Highlights

- **Robust, compact high-speed spindles for increased rotational velocity on machine tools with HPC**
- **Reliable spindle mount with three bearings**
- **Secure shaft lock mechanism**
- **High power output – up to 1.5 Kw**
- **Rotational velocity output: 25,000 to 45,000 RPM**
- **Ideal for finishing / semi-finishing applications using small diameter cutting tools**

ISCAR is expanding the advantageous SPINJET family with the introduction of the **HPC** line of compact, high-speed spindles for small diameter tools, driven by the coolant supply system of the machine tool.

The main feature of HPC, which sets it apart from other compact spindles in the SPINJET family, is its coolant pressure operating range. The new spindles are powered by the coolant supply at high pressure, (up to 70 bar).

The new HPC design enables application of the SPINJET technology to machine tools with high pressure coolant (HPC) flow, and with limited rotational velocity. In addition, it is also able to utilize the increased flow of HPC to provide higher power, making it suitable for increased-load machining operations compared to other SPINJET models.

General Data

Operating Data	Values
Operating range of coolant pressure [bar]	40-70
Operating range of coolant flow rate [l/min]	16-22
Rotational spindle speed [rpm]*	25,000-45,000
Optimum cutting tool diameter [mm]	Drilling: 0.5 - 3.0
	Milling: 1.0 - 4.0
Maximum tool shank diameter [mm]	7

Table 1. – General operating parameters

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THE NEED: High Pressure + High Speed

- SPINJET-HPC LINE spindles introduce high speed capabilities for both new machines with built-in high pressure coolant systems and existing machines upgraded with a high pressure coolant pump.
- The number of machines with high pressure coolant systems is growing in the market, due to the fact that they enable more efficient machining processes and better results.
- Smart manufacturers are becoming aware of the need for high-pressure coolant delivery to increase efficiency of CNC machine tools, especially in difficult-to-machine materials.

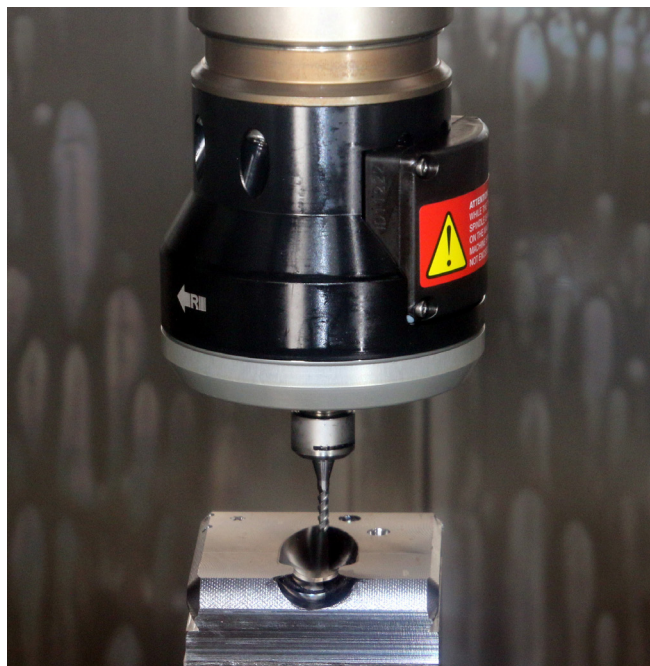


Fig. 1. – TJS HPC in operation

SPINJET-HPC LINE SPINDLES – Special Features

Rotational speed monitoring and display

- SPINJET-HPC LINE spindles are equipped with a real-time, wireless speed display system, cutting tool rotational speed monitor, programmable spindle parameters, and warning/alarm alerts during spindle operation.
- 2.4 GHz radio frequency transmission
- Speed monitoring range of up to 10 meters
- Externally powered display can read multiple SPINJET-HPC LINE spindles mounted on the machine



Fig. 2. – Rotational speed monitoring display

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SPINJET-HPC ER32 LINE - Adaptation Options

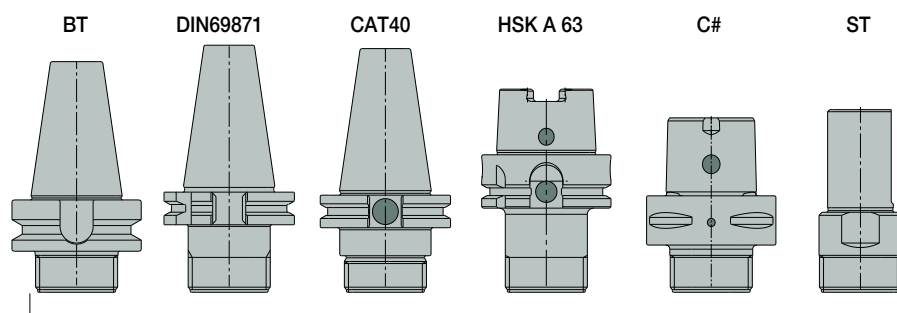
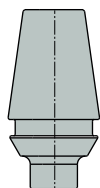
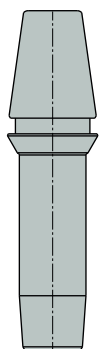


Fig. 3. – HPC adaptation types

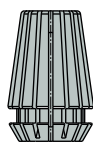
MM ER11 T04/T05



ER11 SRK



ER11 SPR



SPINJET-HPC LINE Spindle – Tool Holding & Mounting

Required:

Pull stud with coolant- through hole



Fig. 7. – Pull Stud

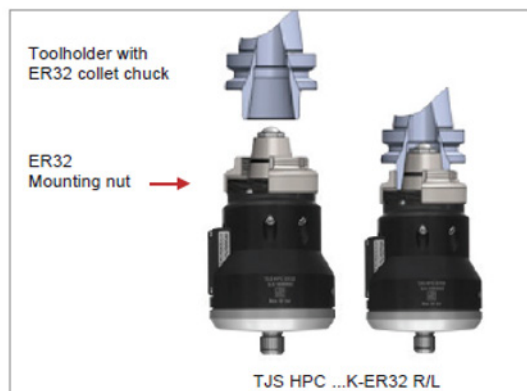


Fig. 8. – Mounting tool holder

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Keeping the main spindle stationary

When the HPC Spindle is mounted on the machine, the CNC machine spindle should be stationary, except for tool checks.

To avoid CNC machine spindle rotation during the HPC Spindle operation, use the correct M code to lock spindle orientation, e.g. "M19" code locks the spindle in a defined angle position.

Machine tool requirements for using SPINJET-HPC LINE:

1. Coolant flow through the machine spindle
2. Minimum coolant pressure at main machine spindle outlet: 40 bar
3. Maximum coolant pressure at main machine spindle outlet: 70 bar
4. Moderate flow rate of 16-22 l/min
5. Use with water-based emulsion or cutting oil; viscosity up to 20(cP)
6. Minimum coolant filtration level: 100 µm
7. Active mist collector
8. With emulsion coolant, use an anti-foaming agent additive to prevent foaming
9. With oil coolant, high pressure increases the amount of oil fumes:
 - a. Use appropriate means of fire protection and extinguishant
 - b. Use anti-dissolution additive suitable for oil

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SPINJET-HPC LINE Spindle - Tool Installation

First assemble the ER 11 collet and tool.

1. Insert nut for tightening. Align flat sides of the shaft with the positioning slot on the spindle cover.
2. Position shaft lock flat key over the nut. Black dot fits into the positioning slot underneath.
3. Slide shaft lock flat key to the left to secure it in place.
4. Insert ER11 wrench into the grooves on the nut.
5. Turn ER11 wrench clockwise to tighten.

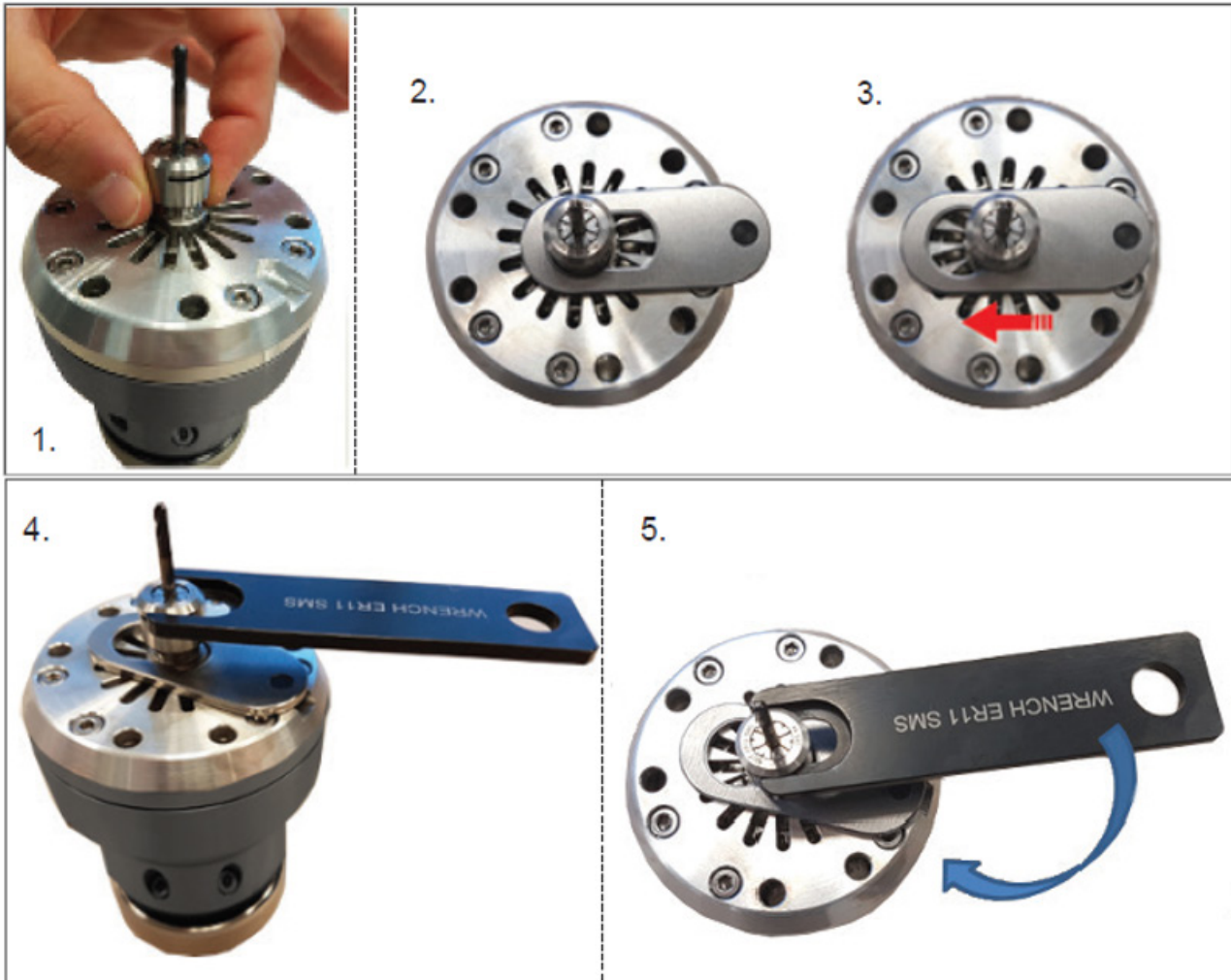


Fig. 9. – Tool Installation

To remove the tool

1. Slide the shaft lock flat key to the right to unlock.
2. Insert the wrench and turn counter-clockwise to loosen the nut (this may take a few turns).
3. Keep the shaft lock in the secure position if you wish to insert a new tool.

NOTE: ISCAR's solid carbide endmills, threading endmills and drills are recommended for use on the new HPC high speed spindles.

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Operating Tips

1. When operating the **SPINJET-HPC LINE** spindles, monitoring rotational speed is critical. A correctly set rotational speed ensures optimal machining conditions and avoids damaging the spindle.
2. Cutting speed depends on workpiece material and its hardness, the shape of a machined surface, a machining strategy and cutting tool geometry. Refer to cutting tool manufacturer's documentation.
3. Dramatic fluctuations of the rotational speed (rpm) operation can indicate problems such as an inadequate coolant pressure or a broken cutting tool.

Using Precision ER11 Collets

When using ER11 spring collets, it is recommended to use only high quality precise collets that are engineered for maximum accuracy and tool life.



Max. collet runout (TIR) - 5 µm

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To maximize SPINJET-HPC LINE spindle tool life, we recommend following the “10% rule”:

The working rotational speed (rpm) should drop by up to 10% of the rotational speed (rpm), which is registered at ‘idle speed’.

Keeping this rule ensures reducing axial and radial load on the internal mechanism.

To register idle rotational speed:

1. Install the **SPINJET-HPC LINE** spindle carrying a cutting tool into the machine.
2. Start spindle rotation by turning on the fluid supply at required pressure and find the idle RPM speed by reading the display monitor of the spindle.

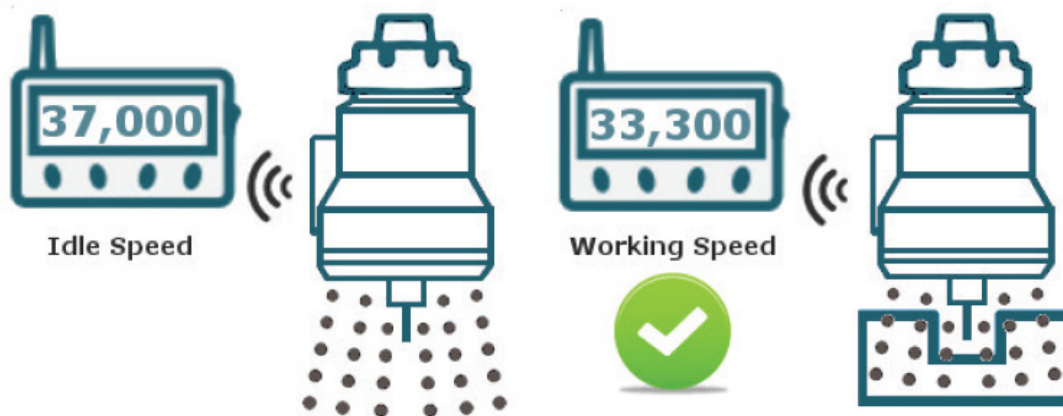


Fig.3. Example illustrating “10% rule”

SPINJET-HPC LINE Spindle Operating Guidelines

Cutting Conditions

1. Monitoring RPMs during the SPINJET-HPC LINE spindle operation is critical to ensure optimum machining conditions and to avoid damage.
2. Cutting speed may be influenced by material hardness, work piece topography and /or cutting tool geometry.
3. Dramatic RPM fluctuations during the SPINJET-HPC LINE spindle operation may indicate insufficient coolant pressure or a broken cutting tool.

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Spindle Case Contents	Display Case Contents
	
<ol style="list-style-type: none"> 1. TJS SHAFT LOCK KEY HPC 2. WRENCH ER11 SMS 3. BATTERY - LITHIUM METAL NON-RECHARGEABLE, CR2 TYPE 4. HW2.0: HEX (ALLEN) KEY 	<p>For Europe:</p> <ol style="list-style-type: none"> 1. TJS TSD display EUR - wireless RPM display 2. TJS DISP. power supply EUR - AC/DC 5V <p>For USA/Japan:</p> <ol style="list-style-type: none"> 1. TJS TSD display - USA 2. TJS DISP. power supply - USA - AC/DC 5V
 <p>Shaft lock flat key and wrench</p>	

SPINJET-HPC LINE Spindle Applications

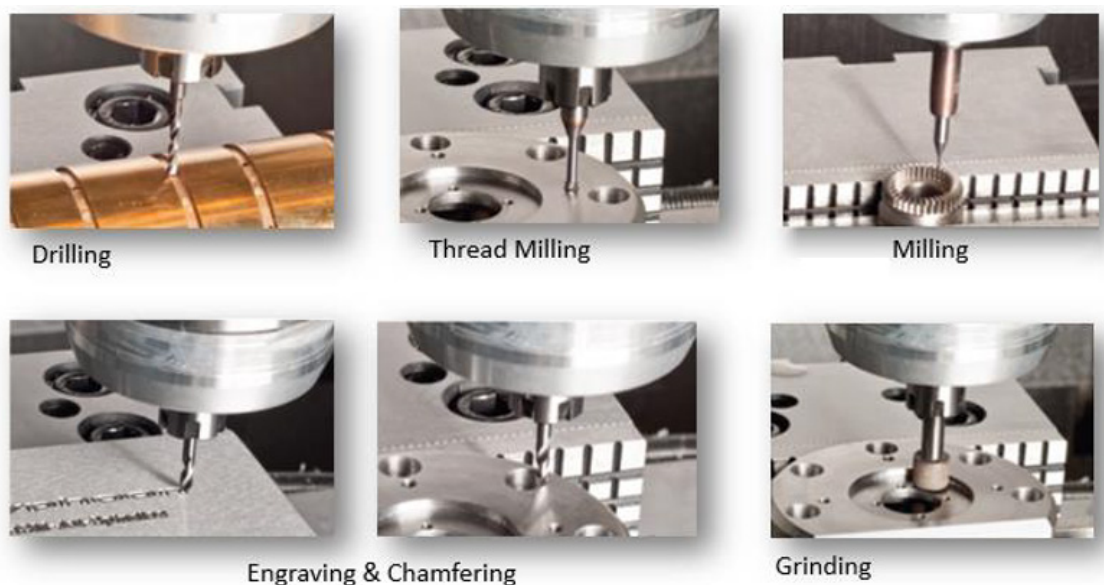


Fig. 6. – Applications

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SPINJET-HPC LINE Spindle Storage

The HPC is free from periodic maintenance, however before storage it is recommended to:

- Clean the HPC by air blowing for 10-15 seconds
- Max. air pressure for cleaning: (2 bar / 30 psi) DO NOT EXCEED 60,000 RPM
- Disconnect the HPC from the display device
- Place the HPC back in its case

Availability

- TJS HPC ER32: in stock
- TJS HPC BT40: in stock
- TJS HPC HSK A 63: in stock
- TJS HPC C5,C6: End of February
- TJS HPC ST20: End of February

Sincerely,



Kobi Kisos

Chief Technical Officer,
Marketing Division
ISCAR Headquarters

Sincerely,



Ziv Grunwald

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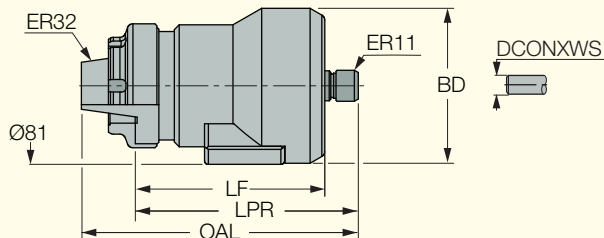
Assistant Product Manager,
Tooling & Boring Systems
ISCAR Headquarters

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TJS HPC ER

High Pressure Coolant Driven HSM Spindle with ER32 Shank
for Small Diameter Cutting Tools



G2.5	
60,000 RPM U<1.0 gmm	

For ER-SPR collets use "AA" type only

Designation	SS	DCONXWS	LF	LPR	OAL	BD	
TJS HPC ER32	ER32	7.00	99.00	116.00	144.00	80.00	1.70

• Coolant pressure 40-70 bar and flow rate 16-22 l/min • RPM range 35,000-50,000 RPM • The spindle provides only external strong coolant jet around the tool

Spare Parts

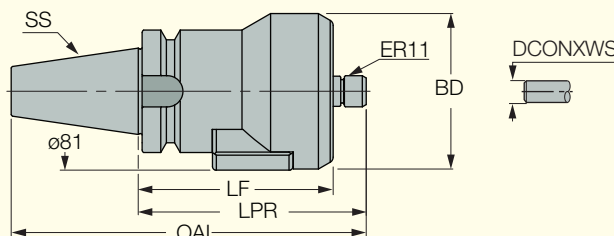


Designation	Display	Mini ER Nut	ER Wrench	Key
TJS HPC ER	TJS TSD DISPLAY*	NUT ER11 GHS	WRENCH ER11 SMS	HW 2.0

* Optional, should be ordered separately

TJS HPC BT

High Pressure Coolant Driven HSM Spindle with BT Shank for Small Diameter Cutting Tools



G2.5	
60,000 RPM U<1.0 gmm	

For ER-SPR collets use "AA" type only

Designation	SS	LF	LPR	DCONXWS	OAL	BD	
TJS HPC BT40	BT40	100.00	117.00	7.00	183.00	80.00	1.90

• Coolant pressure 40-70 bar and flow rate 16-22 l/min • RPM range 35,000-50,000 RPM • The spindle provides only external strong coolant jet around the tool

Spare Parts



Designation	Display	Mini ER Nut	ER Wrench	Key
TJS HPC BT	TJS TSD DISPLAY*	NUT ER11 GHS	WRENCH ER11 SMS	HW 2.0

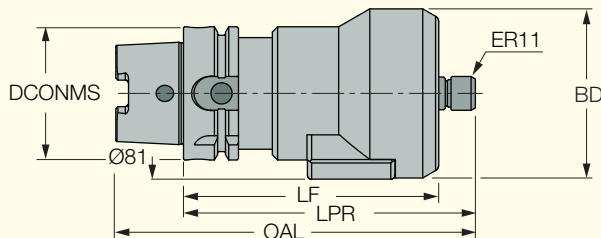
* Optional, should be ordered separately

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TJS HPC HSK

High Pressure Coolant Driven HSM Spindle with HSK Shank
for Small Diameter Cutting Tools



G2.5	
60,000 RPM U<1.0 gmm	

For ER-SPR collets use "AA" type only

Designation	DCONMS	DCONXWS	LF	LPR	OAL	BD	
TJS HPC HSK A63	63.00	7.00	121.00	138.00	170.00	80.00	2.00

• Coolant pressure 40-70 bar and flow rate 16-22 l/min • RPM range 35,000-50,000 RPM • The spindle provides only external strong coolant jet around the tool

Spare Parts

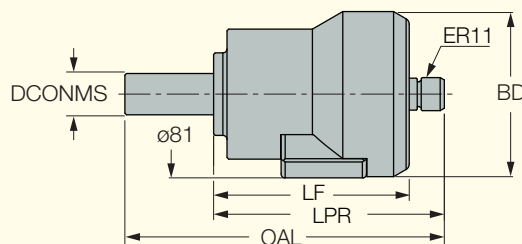


Designation	Display	Mini ER Nut	ER Wrench	Key
TJS HPC HSK	TJS TSD DISPLAY*	NUT ER11 GHS	WRENCH ER11 SMS	HW 2.0

* Optional, should be ordered separately

TJS HPC ST

High Pressure Coolant Driven HSM Spindle with Straight Shank
for Small Diameter Cutting Tools



For ER-SPR collets use "AA" type only

Designation	DCONMS	LF	LPR	BD	DCONXWS	OAL	
TJS HPC ST20	20.00	95.00	112.00	80.00	7.00	155.00	1.50

• Coolant pressure 40-70 bar and flow rate 16-22 l/min • RPM range 35,000-50,000 RPM • The spindle provides only external strong coolant jet around the tool

Spare Parts



Designation	Mini ER Nut	ER Wrench	Display	Key
TJS HPC ST	NUT ER11 GHS	WRENCH ER11 SMS	TJS TSD DISPLAY*	HW 2.0

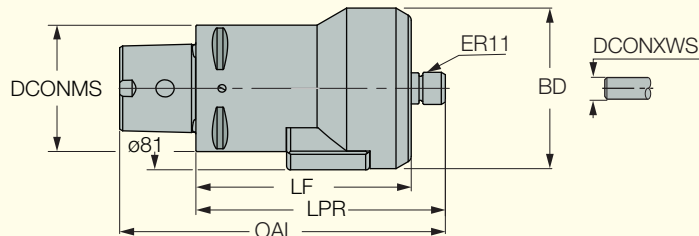
* Optional, should be ordered separately

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TJS HPC C#

High Pressure Coolant Driven HSM Spindle with CAMFIX Shank
for Small Diameter Cutting Tools



For ER-SPR collets use "AA" type only

Designation	DCONMS	LF	LPR	DCONXWS	OAL	BD	
TJS HPC C6	63.00	107.00	124.00	7.00	162.00	80.00	2.00

• Coolant pressure 40-70 bar and flow rate 16-22 l/min • RPM range 35,000-50,000 RPM • The spindle provides only external strong coolant jet around the tool

Spare Parts



Designation	Mini ER Nut	ER Wrench	Display	Key
TJS HPC C#	NUT ER11 GHS	WRENCH ER11 SMS	TJS TSD DISPLAY*	HW 2.0

* Optional, should be ordered separately

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Activating Spindle Warranty

Registration:

Each IMC office / dealer will get a dedicated “dash board” for their SPINJET product line (similar to My Matrix) with a full view of their customers and product history, providing a fast response to inquiries, plus top quality product service and repairs.

The product management interface includes:

- Number of units
- Serial numbers
- To whom the product was sold
- Sale date
- Warranty (active / not active)
- Service history

Registration for Customers:

When the product is officially registered, it not only activates the warranty but also entitles the end user to receive many important product support features:

- Product ATP
- Online Training & Documentation
- Product Management Interface
- Help & Technical Support Services

The warranty can be activated easily either by registering online at reg.colibri-jet.com or by scanning the QR code.

