



TYPHOON[®]HSM
HIGH SPEED COMPACT SPINDLE GREENJET TJS GJET



**New Generation of
High Speed Compact Spindles**



Product Overview

Following the success of **Typhoon** products - coolant driven high speed compact spindles for small diameter tools - INGERSOLL is introducing the **TyphoonHSM** TJS GJET series of high speed spindles.

The new family is a step ahead in developing advanced small-sized spindles operated by the coolant supply system of a machine tool.



Product Features

- A broad range of output rotational speed: 35000 - 55000 rpm
- A new improved bearing system:
 - New bearing system design
 - Optimized storage: 3 bearings inside vs. 2 compared to TYPHOON TJS 20K, 30K and 40K spindles
 - New bearing seal
 - New bearing lubricant featuring greater viscosity and additive agents
- A new shaft lock mechanism

Operating Data	Model: TyphoonHSM TJS GJET
Operating range of coolant pressure [bar]:	20 - 40
Operating range of coolant flow rate [l/min]:	10 - 20
Rotational spindle speed [rpm]*:	35000 - 55000
Optimum cutting tool diameter [mm]:	Drilling: 0.5 - 2
	Milling: 1.5 - 3.5
Maximum tool shank diameter [mm]	7

Notes:

- Rotational spindle speed is based on coolant pressure and flow rate.
- Coolant pressure is measured from the spindle inlet.

Technical Advantages

Due to the new design features, **TyphoonHSM** TJS GJET spindles ensure the following advantages:

- Rotational speed range meets most required values
- Bearing system design minimizes risk of overload and fluid penetration to considerably increase spindle reliability, resulting in significantly improved tool life
- New shaft lock mechanism enables a simple and secure way of mounting a cutting tool in the spindle

■ Strategic Advantages

Cutting Tools:

- Small cutting tools (dia. 0.5 – 3.5 mm)
- Small cutting tools at high speeds enable precision while reducing tool wear

Applications

- Milling, drilling, thread milling, engraving, chamfering, deburring, fine radial grinding
- Operation: Finishing and semi-finishing operations

Flexibilities:

- CNC machines: milling centers / turning / turn mills / tap mills
- Suitable for most adaptor types + lathe turret mounting

■ Economical Advantages

- Upgrades existing CNC machine to a high speed milling (HSM) performer at a fraction of the cost of dedicated high speed machines
- Boosts productivity - shortens production time and cuts costs
- Quick ROI
- Simple and easy to integrate - no pre-installation or external feed lines
- Compact – no size restriction due to added parts or power feeds, fits ATC or turret
- Cuts utility costs such as compressed air and electricity
- Uses the machine's own coolant as a pressurized power source

■ Industrial Sectors

Serves important industries worldwide:

- Die and mold
- Medical
- Energy
- Automotive
- Aerospace
- 3D printing
- General industry



New Shaft Lock Mechanism

Shaft lock flag key has been replaced by a "GJET" shaft lock key



Fig.1. Shaft lock in old **Typhoon** spindle

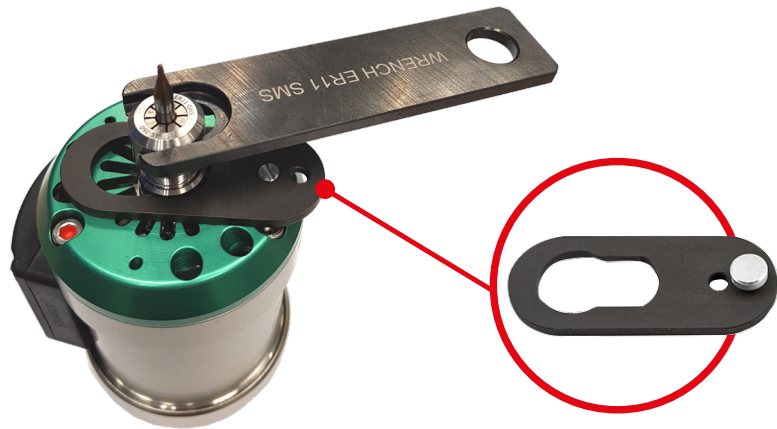


Fig.2. Shaft lock in new **TyphoonHSM TJS GJET**

Machine Tool Requirements

Machine tool requirements for using **TyphoonHSM** TJS GJET spindles:

1. Coolant flow through the machine spindle
2. Min. coolant pressure at the spindle outlet: 20 bar (290 psi).
3. Max. coolant pressure at the spindle outlet: 40 bar (580 psi).
4. Min. flow rate: 12 l/min (3.17 gal/min.).
5. Coolant filtration level: max. 100 μ m.

Operating Tips

1. When operating the **TyphoonHSM** TJS GJET 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 μ m

■ Example for Cutting Feeds

Application	Material	Cutting Tool Diameter [mm]	Z [no. teeth]	ap Depth of Cut [mm]	ae Width of Cut [mm]	RPM	fz per tooth [mm]
Milling Full Slot	Aluminum SI 9% 30 HB	End Mill Ø 2.0	2	0.3	2.0	40,000	0.01
Milling Shoulder	(H13 (40-42Hrc	End mill Ø 1.5	2	1.0	0.3	35,000	0.008
	(St 52-3 (A 36	End mill Ø 1.0	2	0.5	0.1	40,000	0.005

■ "10% Rule"

To maximize **TyphoonHSM** TJS GJET 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 **TyphoonHSM** spindle carrying a cutting tool into the machine.
2. Start the 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.

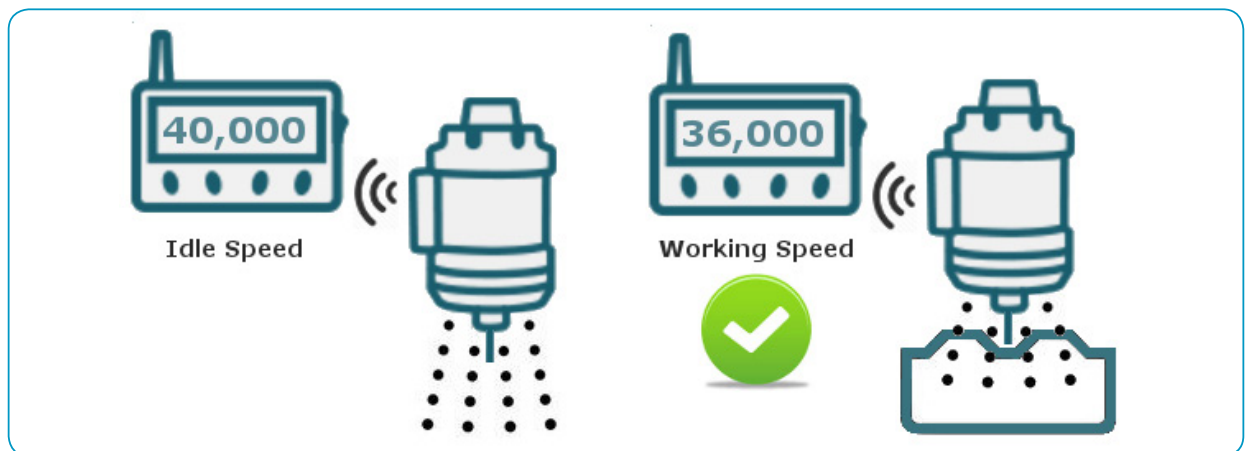




Fig.3. Example illustrating "10% rule"

■ General Instructions for Storage

The **TyphoonHSM** spindles do not require specific periodic maintenance; however the following instructions should be followed before storing a spindle:

1. Clean the spindle by air blowing for 10-15 seconds.
2. Max. air pressure for cleaning is 2 bar (30 psi). The rotational speed during cleaning must not exceed 50000 rpm.
3. After cleaning, disconnect the spindle from the display device.
4. Place the spindle in its original packaging box and store it in the appropriate place.

Case Contents

Spindle Case Contents	Display Case Contents
	
<ol style="list-style-type: none"> 1. TJS SHAFT LOCK KEY GJET 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>Shaft lock flat key and wrench</p>	

Warranty

*** New Warranty Policy

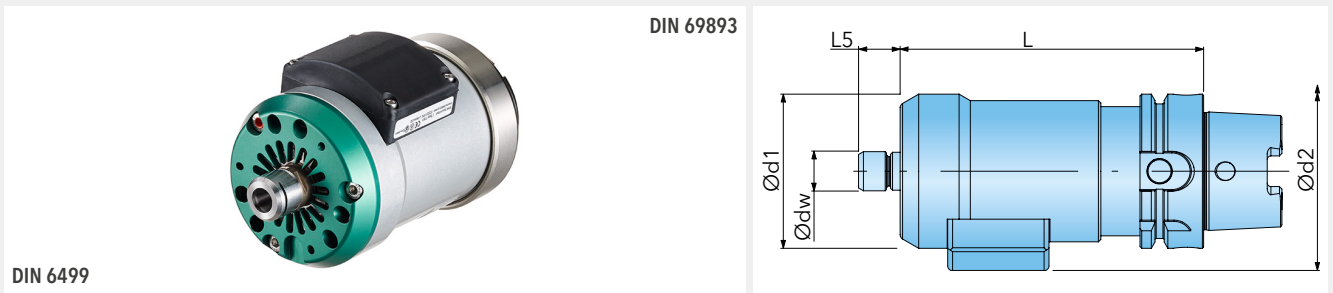
Warranty policy for new **TyphoonHSM TJS GJET** spindles:

At least 300 hours of use or 12 months from the date of invoice, whichever comes first.

Warranty policy for repaired / refurbished **TyphoonHSM TJS GJET** spindles:

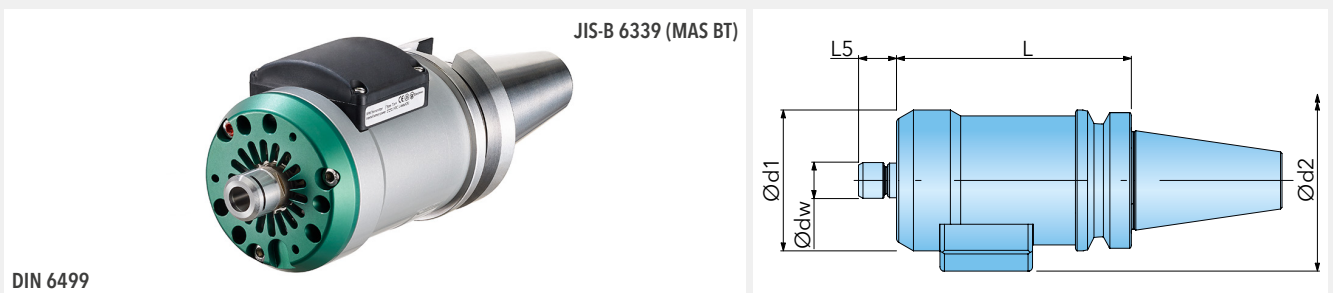
At least 200 hours of use or 6 months from the date of invoice, whichever comes first.

TYPHOON[®]HSM[™] HIGH SPEED SPINDLE TJS GJET HSK A



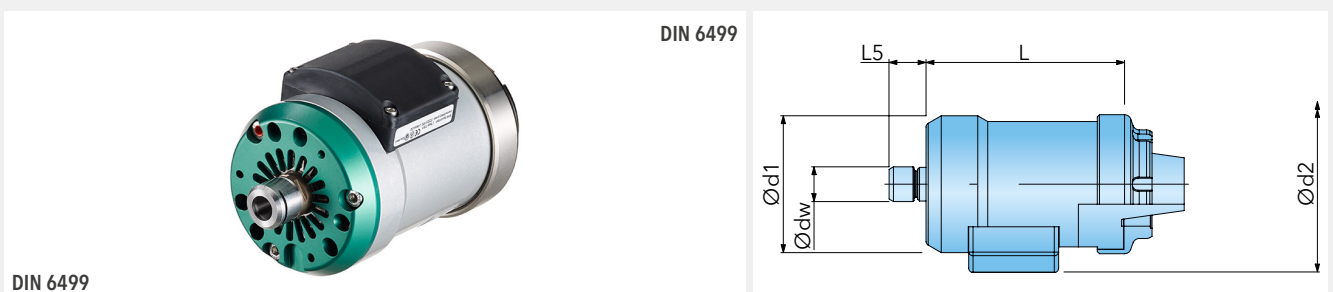
Designation	D max.	dw	d1	d2	L	L5	HSK-A	kg
TJS GJET HSK A63	3,5	ER11	63	81	124	17	63	1,8

TYPHOON[®]HSM[™] HIGH SPEED SPINDLE TJS GJET BT



Designation	D max.	dw	d1	d2	L	L1	BT	kg
TJS GJET BT30	3,5	ER11	63	81	122	17	30	1,6
TJS GJET BT40	3,5	ER11	63	81	105	17	40	1,8

TYPHOON[®]HSM[™] HIGH SPEED SPINDLE TJS GJET ER

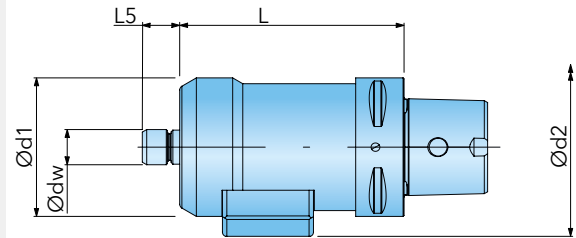


Designation	D max.	dw	d1	d2	L	L5	ER	kg
TJS GJET ER32	3,5	ER11	63	81	92	17	32	1,3


TYPHOON[®]HSM[™] HIGH SPEED SPINDLE TJS GJET C#



ISO 26623-1



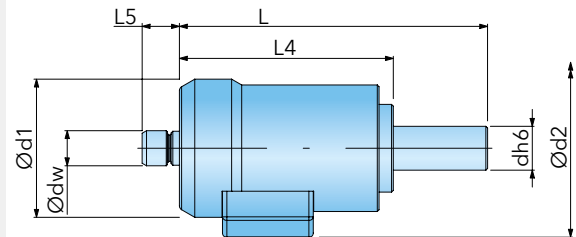
DIN 6499

Designation	D max.	dw	d1	d2	L	L5	PSK	
TJS GJET C5	3,5	ER11	63	81	112	17	5	1,5
TJS GJET C6	3,5	ER11	63	81	102	17	6	1,6


TYPHOON[®]HSM[™] HIGH SPEED SPINDLE TJS GJET ST



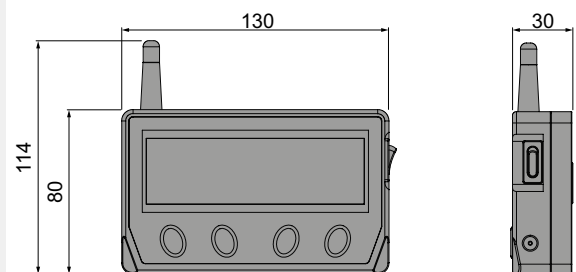
Special




DIN 6499

Designation	D max.	dh6	dw	d1	d2	L	L4	L5	
TJS GJET ST20	3,5	20	ER11	63	81	141	98	17	1,2

TYPHOON[®]HSM[™] TJS TSD DISPLAY



Designation	Holder	
TJS TSD DISPLAY	TJS -*	1,000
speed display for Typhoon high speed spindles		

Ingersoll Werkzeuge GmbH

Main Office:
Kalteiche-Ring 21-25 • D-35708 Haiger
Tel.: +49 (0)2773-742-0 • info@ingersoll-imc.de

Office South:
Florianstraße 13-17 • D-71665 Vaihingen-Horrheim
Tel.: +49 (0)7042-8316-0 • horrheim@ingersoll-imc.de

Office Wulften:
Steinstraße 11 • D-37199 Wulften
Tel.: +49 (0)556-99 55 98-0 • wulften@ingersoll-imc.de