

# MOTORSPINDLES FOR AUTOMATIC TOOL CHANGE

PRECISION. SPEED. POWER.





**Precision.**



**Speed.**



**Power.**

# IN THE WORLD MARKET

## AN INDEPENDENT LEADER

### **Extensive range**

FISCHER offers well-designed motor spindles specially for automated, unsupervised production on CNC machines. They feature standardized tool holders, as well as robust infeed and clamping systems. This means they guarantee rapid, reliable tool change with automatic changing systems. Our spindles stand out thanks to high power density. Thanks to high-torque motors, they work highly dynamically with extremely short acceleration and deceleration times.

A wide range of models with diameters from 60 to 360 mm, up to 90,000 rpm with drive power up to 250 kW and torque of up to 1,000 Nm are available, making high-quality motor spindles from FISCHER suitable for a broad spectrum of applications. Such applications include productive roughing and highly precise finish-machining, heavy-duty machining with high torque values as well as precision micro-milling and micro-drilling at maximum speeds.

### **Staying cool at maximum load**

We equip select models of our motor spindles with the unique Compact Shaft Cooling system (CSC). This internal cooling system for the spindle shaft has several outstanding benefits. Even at maximum load and at high speeds, the spindle shaft only warms up slightly and therefore only expands a minimal amount. Even when there are changing loads, speeds and torques, the spindle shaft consistently remains thermally stable, which considerably increases the level of machining accuracy on the tool. It is possible to consistently machine with a high degree of repeat accuracy under changing conditions. The controlled spindle cooling system also reduces the amount of time between spindle start-up and thermal constancy, which thereby opens up time that can be put to productive use. With motor spindles that feature the well-engineered CSC cooling system, manufacturing companies can operate in a much more cost-efficient and flexible manner.

### **Universal coolant-through-unit for internal coolant supply**

High-quality coolant-through-units are optionally available for our motor spindles. These units enable modern machining tools to be supplied with coolant through the center of the spindle shaft (internal coolant supply) – even at maximum speeds. Our coolant-through-units are universally suitable for minimal quantities, aerosols, emulsions, oil and air. They feature a wear-free sealing system, which keeps the system tightly sealed up to a pressure of 80 bar without any problems. And if an internal coolant supply is not needed, our coolant-through-units also reliably run completely dry.

# SMALL, HIGH-SPEED SPINDLES WITH HSK-20 TO HSK-40 TOOL INTERFACES

The spindles feature high speeds and impressive torques for the housing size. In this series, efficient bearing, flange, motor and shaft cooling systems are critical to maximum manufacturing precision.

- Precise, high-speed spindles with an outer diameter of 60–100 mm
- Grease-lubricated bearings with speeds up to 80,000 rpm

## Milling spindles

MODEL		MFW-650	MFW-650	MFW-660	MFW-665	MFW-665	MFW-680
Outer diameter	D [mm]	61.91	61.91	60 / 61.91	60	60	60 / 61.91
Tool interface		HSK-E25	HSK-E25	DS / SK10	HSK-E20	HSK-E20	DS
Max. speed	n <sub>max</sub> [min <sup>-1</sup> ]	50'000	50'000	60'000	65'000	65'000	80'000
Lubrication		Grease	Grease	Grease	Grease	Grease	Grease
Direction of rotation		left & right					
Power S1/S6 40%	P [kW]	1.2 / 1.8	2.3 / 3.45	1.2 / 1.8	1.2 / 1.8	2.0 / 3.0	1.0 / 1.5
Torque S1/S6 40%	M [Nm]	0.29 / 0.43	0.55 / 0.82	0.19 / 0.29	0.19 / 0.29	0.3 / 0.48	0.12 / 0.18
Nominal speed	n <sub>N</sub> [min <sup>-1</sup> ]	40'000	40'000	60'000	60'000	60'000	80'000
Motor frequency	[Hz]	834	834	1'000	1'083	1'083	1'333
Motor technology		ASYN	SYN	ASYN	ASYN	SYN	ASYN
Voltage	[V]	220	270	200	200	209	200
Current S1	[A]	5.5	7.0	5.0	5.2	7.3	4.7
Length	L [mm]	356	356	297	289	289	266
Weight	[kg]	5.0	7.5	4.5	4.5	4.5	4.8
Shaft cooling system		–	–	–	–	–	–
Coolant Through Unit		–	–	–	–	–	–
Encoder		Yes	Yes	–	Yes	Yes	Yes
<b>Options</b>							
Displacement Measuring Device		Yes	Yes	–	–	Yes	–
Vibration sensor		–	–	–	–	–	–

ASYN = Asynchronous  
SYN = Synchronous motor  
DLS = Direct Lubrication System

### Options

The **DMD** (Displacement Measuring Device) is a length measuring sensor integrated into the spindle which permits compensation in the tool direction.

The **vibration sensor** integrated to the spindle can be used for imbalance detection and provides important signals for SmartVision's process and spindle monitoring function.



<b>MFW-850</b>	<b>MFW-850</b>	<b>MFW-825</b>	<b>MFW-1032</b>	<b>MFW-1040</b>	<b>MODEL</b>	
80	80	80	100	100	D [mm]	Outer diameter
HSK-E25	HSK-E25	HSK-E32	HSK-E32 HSK-E40 HSK-F40	HSK-E32 HSK-A32		Tool interface
50'000	50'000	25'000	32'000	40'000	nmax [min <sup>-1</sup> ]	Max. speed
Grease	Grease	Grease	Grease	Grease		Lubrication
left & right						Direction of rotation
3.4 / 5.1	6.0 / 9.0	7.5 / 11.25	9.0 / 13.5	6.3 / 9.45	P [kW]	Power S1/S6 40%
0.81 / 1.22	1.59 / 2.15	4.0 / 5.97	3.5 / 5.22	2.0 / 3.0	M [Nm]	Torque S1/S6 40%
40'000	40'000	18'000	24'700	30'000	nN [min <sup>-1</sup> ]	Nominal speed
1'667	1'667	833	1'067	1'333	[Hz]	Motor frequency
ASYN	SYN	SYN	ASYN	ASYN		Motor technology
380	380	380	350	350	[V]	Voltage
10.0	15.0	17.0	28.0	18.0	[A]	Current S1
375	375	410	433	413	L [mm]	Length
11.2	11.2	11.2	15.0	13.5	[kg]	Weight
-	-	-	-	-		Shaft cooling system
Yes	Yes	Yes	Yes	-		Coolant Through Unit
Yes	Yes	Yes	Yes	Yes		Encoder
						<b>Options</b>
Yes	Yes	Yes	Yes	Yes		Displacement Measuring Device
-	-	-	-	-		Vibration sensor

# SMALL, HIGH-SPEED SPINDLES WITH HSK-20 TO HSK-40 TOOL INTERFACES

- Precise and high-speed spindles with an outer diameter of 100–140 mm
- Oil-air-lubricated bearings with speeds of up to 90,000 rpm

## Milling spindles

MODEL		MFW-1045	MFW-1045	MFW-1060/90	MFW-1030/70	MFW-1024/50	MFW-1028
Outer diameter	D [mm]	100	100	100	100	100	100
Tool interface		HSK-E25	HSK-E25	HSK-E20	HSK-E25	HSK-E32	HSK-A40
Max. speed	n <sub>max</sub> [min <sup>-1</sup> ]	45'000	45'000	90'000	70'000	50'000	28'000
Lubrication		Grease	Grease	DLS	DLS	DLS	Grease
Direction of rotation		left & right					
Power S1/S6 40%	P [kW]	3.5 / 5.25	6.3 / 9.45	3.0 / 3.8	4.0 / 5.0	6.0 / 7.5	14.0 / 18.5
Torque S1/S6 40%	M [Nm]	1.4 / 2.0	2.0 / 3.0	0.5 / 0.6	1.2 / 1.5	2.4 / 3.0	9.0 / 11.8
Nominal speed	n <sub>N</sub> [min <sup>-1</sup> ]	25'000	30'000	60'000	32'000	24'000	15'000
Motor frequency	[Hz]	1'500	1'500	1'500	1'170	1'667	1'400
Motor technology		ASYN	SYN	ASYN	ASYN	ASYN	SYN
Voltage	[V]	350	355	370	350	350	444
Current S1	[A]	11.0	17.0	7.0	12.5	21.8	31.0
Length	L [mm]	245	245	330	360	400	442
Weight	[kg]	7.0	7.6	13.0	15.0	17.0	13.5
Shaft cooling system		-	-	-	-	-	-
Coolant Through Unit		-	-	-	-	-	Yes
Encoder		Yes	Yes	Yes	Yes	Yes	Yes
<b>Options</b>							
Displacement Measuring Device		Yes	Yes	Yes	Yes	Yes	Yes
Vibration sensor		-	-	-	-	-	-

ASYN = Asynchronous  
SYN = Synchronous motor  
DLS = Direct Lubrication System

### Options

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MFV-1230/70	MFV-1240/60	MFV-1224/60	MFV-1260	MFV-1224/42	MFV-1224/45	MFV-1412/40	MODEL	
120	120	120	120	120	120	140	D [mm]	Outer diameter
HSK-E25	HSK-E32	HSK-E32	HSK-E32	HSK-E32 HSK-E40	HSK-E40 HSK-T40	HSK-E40		Tool interface
70'000	60'000	60'000	60'000	42'000	45'000	40'000	nmax [min <sup>-1</sup> ]	Max. speed
DLS	DLS	DLS	DLS	DLS	DLS	DLS		Lubrication
left & right								Direction of rotation
4.0 / 5.0	8.0 / 10.4	9.0 / 11.0	11.0 / 15.0	15.0 / 18.5	15.0 / 20.0	15.0 / 19.0	P [kW]	Power S1/S6 40%
1.3 / 1.6	1.9 / 2.5	3.0 / 4.0	1.75 / 2.4	6.0 / 8.0	6.0 / 8.0	12.0 / 16.0	M [Nm]	Torque S1/S6 40%
30'000	40'000	24'000	60'000	24'000	24'000	12'000	nN [min <sup>-1</sup> ]	Nominal speed
1'170	1'000	2'000	1'000	1'400	1'500	1'333	[Hz]	Motor frequency
ASYN	ASYN	ASYN	ASYN	ASYN	SYN	ASYN		Motor technology
200	380	350	330	380	458	350	[V]	Voltage
20	20	22	25	38	28	59	[A]	Current S1
341	365	365	365	383	383	463	L [mm]	Length
19.0	21.0	21.0	21.0	24.0	25.0	36.0	[kg]	Weight
-	-	-	-	-	Yes	Yes		<a href="#">Shaft cooling system</a>
Yes	Yes	Yes	Yes	Yes	Yes	Yes		Coolant Through Unit
Yes	Yes	Yes	Yes	Yes	Yes	Yes		Encoder
<b>Options</b>								
Yes	Yes	Yes	Yes	Yes	Yes	Yes		Displacement Measuring Device
Yes	Yes	Yes	Yes	Yes	Yes	Yes		Vibration sensor

# COMPACT SPINDLES WITH HSK-50 TO HSK-63 TOOL INTERFACES

- Compact spindles with an outer diameter of 140–190 mm
- Oil-air-lubricated bearings with speeds of up to 40,000 rpm
- Grease-lubricated bearings with speeds of up to 24,000 rpm

## Milling spindles

MODEL		MFW-1406/24	MFW-1412/36	MFW-1412/40	MFW-1708/15	MFW-1709/24	MFW-1709/24	MFW-1709/30
Outer diameter	D [mm]	140	140	140	170	170	170	170
Tool interface		HSK-E50	HSK-E50	HSK-E50	HSK-A63	HSK-A63	HSK-A63	HSK-A63
Max. speed	n <sub>max</sub> [min <sup>-1</sup> ]	24'000	36'000	40'000	15'000	24'000	24'000	30'000
Lubrication		Grease	DLS	DLS	Grease	Grease	Grease	DLS
Direction of rotation		left & right						

Power S1/S6 40%	P [kW]	15.0 / 19.0	15.0 / 19.0	15.0 / 19.0	44.0 / 49.0	20.0 / 25.0	34.0 / 40.0	20.0 / 25.0
Torque S1/S6 40%	M [Nm]	23.0 / 29.0	12.0 / 16.0	12.0 / 16.0	50.0 / 60.0	21.0 / 27.0	39.0 / 49.0	21.0 / 27.0
Nominal speed	n <sub>N</sub> [min <sup>-1</sup> ]	6'200	12'000	12'000	8'400	9'000	9'000	9'000
Motor frequency	[Hz]	800	1'200	1'333	500	800	800	1'000
Motor technology		SYN	ASYN	ASYN	SYN	ASYN	SYN	ASYN
Voltage	[V]	490	350	350	439	525	525	612
Current S1	[A]	60	59	59	79	83	83	83

Length	L [mm]	465	455	463	515	423	423	423
Weight	[kg]	38.0	38.0	36.0	65.0	53.0	53.0	53.0

Shaft cooling system		-	-	Yes	-	-	-	-
Coolant Through Unit		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Encoder		Yes	Yes	Yes	Yes	Yes	Yes	Yes

Options								
Displacement Measuring Device		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vibration sensor		Yes	Yes	Yes	Yes	Yes	Yes	Yes

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### Options

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<b>MFW-1709/30</b>	<b>MFW-1718/30</b>	<b>MFW-1912/24</b>	<b>MFW-1906/18</b>	<b>MFW-1906/24</b>	<b>MFW-1906/28</b>	<b>MODEL</b>	
170	170	190	190	190	190	D [mm]	Outer diameter
HSK-A63	HSK-A63	HSK-A63	HSK-A63	HSK-A63	HSK-A63		Tool interface
30'000	18'000	15'000	18'000	24'000	28'000	nmax [min <sup>-1</sup> ]	Max. speed
DLS	DLS	Grease	Grease	DLS	DLS		Lubrication
left & right							Direction of rotation
34.0 / 40.0	42.0 / 50.0	39.0 / 52.0	25.0 / 31.0	42.0 / 50.0	25.0 / 31.0	P [kW]	Power S1/S6 40%
39.0 / 49.0	22.0 / 26.0	32.0 / 43.0	40.0 / 50.0	67.0 / 84.0	40.0 / 50.0	M [Nm]	Torque S1/S6 40%
9'000	18'000	12'000	5'970	6'000	6'000	nN [min <sup>-1</sup> ]	Nominal speed
1'000	1'000	800	900	1'200	1'400	[Hz]	Motor frequency
SYN	ASYN	ASYN	ASYN	SYN	ASYN		Motor technology
612	350	350	420	420	420	[V]	Voltage
83	101	110	75	108	60	[A]	Current S1
423	423	498	488	489	510	L [mm]	Length
53.0	53.0	68.0	76.0	68.0	76.0	[kg]	Weight
-	-	-	-	Yes	Yes		<a href="#">Shaft cooling system</a>
Yes	Yes	Yes	Yes	Yes	Yes		Coolant Through Unit
Yes	Yes	Yes	Yes	Yes	Yes		Encoder
							<b>Options</b>
Yes	Yes	Yes	Yes	Yes	Yes		Displacement Measuring Device
Yes	Yes	Yes	Yes	Yes	Yes		Vibration sensor

# ROBUST AND POWERFUL SPINDLES WITH HSK-63 TO HSK-100 TOOL INTERFACES

- Compact spindles with an outer diameter of 190–230 mm
- Oil-air-lubricated bearings with speeds of up to 30,000 rpm
- Grease-lubricated bearings with speeds of up to 24,000 rpm

## Milling spindles

TYP		MFW-1920/30	MFW-2102/20	MFW-2106/20	MFW-2104/24	MFW-2203/22	MFW-2310/24
Outer diameter	D [mm]	190	210	210	210	220	230
Tool interface		HSK-A63	HSK-A63	HSK-A63	HSK-A63	HSK-A63	HSK-A63 HSK-F80
Max. speed	n <sub>max</sub> [min <sup>-1</sup> ]	30'000	20'000	20'000	24'000	22'000	24'000
Lubrication		DLS	DLS	DLS	DLS	DLS	DLS
Direction of rotation		left & right					

Power S1/S6 40%	P [kW]	63.0 / 81.0	25.0 / 31.0	54.0 / 68.0	29.0 / 38.0	26.0 / 34.0	70.0 / 91.0
Torque S1/S6 40%	M [Nm]	30.0 / 39.0	119.0 / 148.0	85.0 / 108.0	69.0 / 90.0	101.0 / 135.0	62.0 / 80.0
Nominal speed	n <sub>N</sub> [min <sup>-1</sup> ]	20'000	2'000	6'010	4'000	3'000	11'000
Motor frequency	[Hz]	1'000	1'000	1'000	800	1'467	800
Motor technology		ASYN	SYN	ASYN	ASYN	ASYN	ASYN
Voltage	[V]	380	814	420	350	360	350
Current S1	[A]	128	131	118	66	63	183

Length	L [mm]	489	501	501	543	600	598
Weight	[kg]	68.0	100.0	95.0	95.0	120.0	120.0

Shaft cooling system		-	-	-	Yes	-	-
Coolant Through Unit		Yes	Yes	Yes	Yes	Yes	Yes
Encoder		Yes	Yes	Yes	Yes	Yes	Yes

Options							
Displacement Measuring Device		Yes	Yes	Yes	Yes	Yes	Yes
Vibration sensor		Yes	Yes	Yes	Yes	Yes	Yes

ASYN = Asynchronous  
SYN = Synchronous motor  
DLS = Direct Lubrication System

### Options

The **DMD** (Displacement Measuring Device) is a length measuring sensor integrated into the spindle which permits compensation in the tool direction.

The **vibration sensor** integrated to the spindle can be used for imbalance detection and provides important signals for SmartVision's process and spindle monitoring function.

MFW-2309/30	MFW-2318/30	MFW-2303/10	MFW-2304/15	MFW-2309/20	MFW-2314/20	MODEL	
230	230	230	230	230	230	D [mm]	Outer diameter
HSK-A63 HSK-F80	HSK-A63 HSK-F80	HSK-A100	HSK-A100	HSK-A100	HSK-A100		Tool interface
30'000	30'000	10'000	15'000	20'000	30'000	nmax [min <sup>-1</sup> ]	Max. speed
DLS	DLS	DLS	DLS	DLS	DLS		Lubrication
left & right							Direction of rotation
75.0 / 80.0	125.0 / 156.0	63.0 / 73.0	70.0 / 87.0	85.0 / 91.0	125.0 / 156.0	P [kW]	Power S1/S6 40%
75.0 / 93.0	66.0 / 83.0	200.0 / 250.0	167.0 / 207.0	85.0 / 106.0	85.0 / 106.0	M [Nm]	Torque S1/S6 40%
9'000	18'000	3'000	4'000	9'600	14'000	nN [min <sup>-1</sup> ]	Nominal speed
1'000	1'000	667	750	667	667	[Hz]	Motor frequency
SYN	SYN	SYN	SYN	SYN	SYN		Motor technology
420	528	588	438	438	530	[V]	Voltage
179	219	187	149	200	200	[A]	Current S1
573	573	573	598	598	598	L [mm]	Length
123.0	123.0	123.0	152.0	152.0	152.0	[kg]	Weight
-	-	-	-	-	-		Shaft cooling system
Yes	Yes	Yes	Yes	Yes	Yes		Coolant Through Unit
Yes	Yes	Yes	Yes	Yes	Yes		Encoder
							<b>Options</b>
Yes	Yes	Yes	Yes	Yes	Yes		Displacement Measuring Device
Yes	Yes	Yes	Yes	Yes	Yes		Vibration sensor

# ROBUST AND POWERFUL SPINDLES WITH HSK-63 TO HSK-125 TOOL INTERFACES

- Robust and powerful spindles with an outer diameter of 240–360 mm
- Power up to 150kW and torque up to 1'000 Nm

## Milling spindles

MODEL		MFW-2401/15	MFW-2401/18	MFW-2401/20	MFW-2612/18	MFW-2702/08
Outer diameter	D [mm]	240	240	240	260	275
Tool interface		HSK-A63 HSK-A80	HSK-A63 HSK-A80	HSK-A63 HSK-A80	HSK-A100	HSK-A100 HSK-T100 BIG PLUS ISO-50
Max. speed	n <sub>max</sub> [min <sup>-1</sup> ]	15'000	18'000	20'000	18'000	8'000
Lubrication		Grease	DLS	DLS	DLS	DLS
Direction of rotation		left & right				

Power S1/S6 40%	P [kW]	20.0 / 25.0	20.0 / 25.0	20.0 / 25.0	90.0 / 120.0	93.0 / 103.0
Torque S1/S6 40%	M [Nm]	166.0 / 182.0	166.0 / 182.0	166.0 / 182.0	72.0 / 96.0	445.0 / 600.0
Nominal speed	n <sub>N</sub> [min <sup>-1</sup> ]	1'000	1'000	1'000	12'000	2'000
Motor frequency	[Hz]	500	600	667	600	667
Motor technology		ASYN	ASYN	ASYN	ASYN	SYN
Voltage	[V]	380	380	380	350	400
Current S1	[A]	116	116	116	199	185

Length	L [mm]	874	874	874	600	675
Weight	[kg]	185.0	185.0	185.0	180.0	239.0

Shaft cooling system		–	–	–	–	–
Coolant Through Unit		Yes	Yes	Yes	Yes	Yes
Encoder		Yes	Yes	Yes	Yes	Yes

Options						
Displacement Measuring Device		Yes	Yes	Yes	Yes	Yes
Vibration sensor		Yes	Yes	Yes	Yes	Yes

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<b>MFW-2701/15</b>	<b>MFW-2715/20</b>	<b>MFW-2702/20</b>	<b>MFW-2801/14</b>	<b>MFW-3601/08</b>	<b>TYP</b>	
275	275	275	285	360	D [mm]	Outer diameter
HSK-A100	HSK-A100	HSK-A100	HSK-A100	HSK-A100 HSK-A125 BIG PLUS ISO-50		Tool interface
15'000	20'000	20'000	14'000	8'000	nmax [min <sup>-1</sup> ]	Max. speed
DLS	DLS	DLS	DLS	DLS		Lubrication
left & right						Direction of rotation
63.0 / 82.0	150.0 / 187.0	50.0 / 60.0	32.0 / 39.0	100.0 / 113.0	P [kW]	Power S1/S6 40%
300.0 / 391.0	96.0 / 119.0	249.0 / 300.0	305.0 / 373.0	1'000.0 / 1'155.0	M [Nm]	Torque S1/S6 40%
1'000	15'000	2'000	1'000	780	nN [min <sup>-1</sup> ]	Nominal speed
1'000	667	1'333	700	533	[Hz]	Motor frequency
ASYN	SYN	ASYN	ASYN	ASYN		Motor technology
400	450	380	420	420	[V]	Voltage
172	228	133	84	172	[A]	Current S1
675	573	707	870	930	L [mm]	Length
239.0	180.0	193.0	290.0	500.0	[kg]	Weight
-	-	Yes	-	-		<a href="#">Shaft cooling system</a>
Yes	Yes	Yes	Yes	Yes		Coolant Through Unit
Yes	Yes	Yes	Yes	Yes		Encoder
						<b>Options</b>
Yes	Yes	Yes	Yes	Yes		Displacement Measuring Device
Yes	Yes	Yes	Yes	Yes		Vibration sensor



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