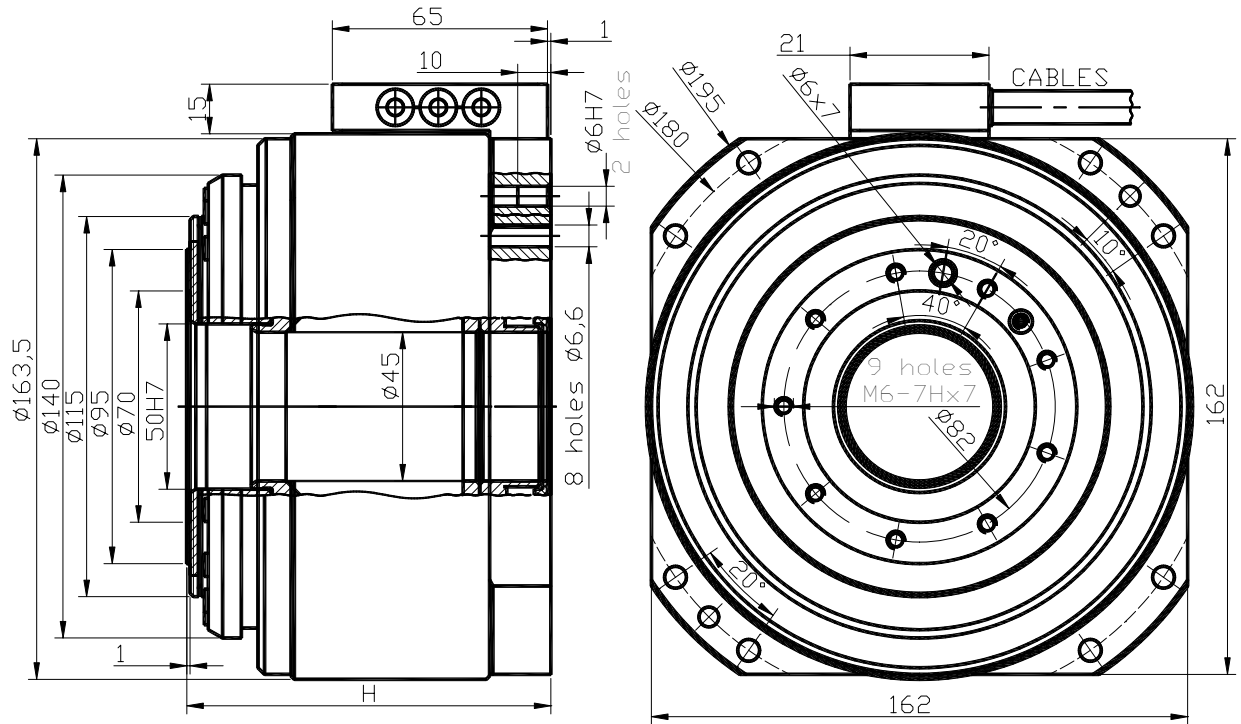


# TORQUE MOTOR RSM-T-24-92-HH



## FEATURES:

- Iron-core three-phase rotary synchronous motor with rare-earth magnets for high force density.
- Direct drive (no gear, no backlash), low profile, with hollow shaft ( $\varnothing 45$  mm).
- Built-in precision cross-roller bearing, sine optical encoder, thermistors for overheating protection.
- High precision, repeatability and resolution, low cogging, smooth movement.
- High motor stiffness and large bandwidth by position regulator with encoder feedback.

## APPLICATIONS:

Pick and place machines, indexing tables.

## CONSTRUCTION:

Motor consist of a fixed lamination stack with windings (stator) and rotated steel ring with glued permanent magnets (rotor). Windings are encapsulated in thermally conductive epoxy. The smoothness of movement is achieved by sinusoidal commutation of motor phases currents.

SPECIFICATIONS RSM-T24-92x		25		50		75	
		GS	GT	GS	GT	GS	GT
Motor height <b>H</b> (see drawing above)	mm	85		110		135	
Number of poles pairs <b>P</b>		12					
Peak torque <b>Mp</b>	Nm	22		44		67	
Continuous torque <b>Ma</b>	Nm	7.5		15		22	
Bearing friction torque <b>Mb</b>	Nm	0.5					
Cogging (detent) torque <b>Mc</b>	Nm	0.2		0.4		0.6	
Peak current at <b>Mp</b>	Arms	6.7	12	15	26	15	26
Continuous current at <b>Ma</b>	Arms	2.2	3.8	5.6	10.5	4.9	8.4
Inductance <b>L</b>	mH	49	16	20	7	30	10
Resistance <b>R</b>	Ohm	10	3.5	3.3	1.1	4.6	1.5
Supply voltage <b>Vs</b>	V	~3x220					
Maximum velocity <b>Np</b> at <b>Vs</b> and <b>Mp</b>	Rpm	360	690	430	800	270	510
Maximum velocity <b>Na</b> at <b>Vs</b> and <b>Ma</b>	Rpm	700	1200	800	1300	520	900
Maximum velocity <b>Nb</b> at <b>Vs</b> and <b>Mb</b>	Rpm	900	1500	1000	1700	660	1100
Maximum bearing velocity (short time < 5s)	Rpm	1000					
Rotor moment inertia	Kg•m <sup>2</sup>	0.001		0.002		0.003	
Motor weight	Kg	7		9		11	
Maximal allowable axial / radial payload	kg	65					
Maximal allowable tilting payload torque	Nm	30					
Axial / radial runout	micron	15/30					
Number of encoder lines (sin, cos 1Vpp)		2048					
Position accuracy	arc.sec.	±30					
Repeatability	arc.sec.	5					
Resolution	arc.sec.	1					

Order example: RSM-T-24-92-75-C-GT-IK-NE-1000XX (1000 mm cable)

Where RSM-T-24-92 is type, 25 or 50 or 75 are magnet heights, C – air cooling (only), G – winding wire code, S or T – internal star or triangle connection, IK-bearing code, NE-encoder code, 1000-cable length mm, XX-without motor connector (flying leads)

**ADDITIONAL IMPORTANT INFORMATION:**

Motor is designed for indexing table applications, i.e. fast movements in start-stop mode. Used cross-roller bearing has high stiffness, but limited velocity by consistent grease, given above. It is allowed to use the motor for fast rotating at speed about 1000 rpm for short time about 5 seconds, but continuous long time rotating with high speeds must be prevented.

**Pin assignment for Encoder RIK4-2C-64/2048-C0-WZ D-Sub-15M plug**

*P2 15 pin D-Sub Encoder Male Connector, Front view*

	Ground	<i>GND</i>	<b>09</b>	⊙	<b>01</b>		
			<b>10</b>	⊙	<b>02</b>		
			<b>11</b>	⊙	<b>03</b>		
	Positive reference output	<i>RXP</i>	<b>12</b>	⊙	<b>04</b>	<i>RXM</i>	Negative reference output
	Positive cosinus output	<i>BXP</i>	<b>13</b>	⊙	<b>05</b>	<i>BXM</i>	Negative cosinus output
	Positive sinus output	<i>AXP</i>	<b>14</b>	⊙	<b>06</b>	<i>AXM</i>	Negative sinus output
			<b>15</b>	⊙	<b>07</b>	+5V	Supply voltage +5V
				⊙	<b>08</b>	+5V	Supply voltage +5V

Cable screen is connected to metal plug housing.

All sin, cos, ref voltages are differential 1V<sub>ptp</sub> (point to point) voltages of encoder with return GND. Voltage range of sin, cos, ref differential inputs is 2.5V +/- 0.5V (from 2 to 3V). Use twisted pair screened cable, screen connection to connector's case.

**Wire assignment for Motor Cable KAWEFLEX 4270 C-PVC SERVO 4G0,75+2x(2x0,34), Ø11,0mm**

Wire number	Wire color	Cross Section	Description	Connection
<b>01</b>	Black	0.75 qmm	<i>U</i>	Motor phase U
<b>02</b>	Black	0.75 qmm	<i>V</i>	Motor phase V
<b>03</b>	Black	0.75 qmm	<i>W</i>	Motor phase W
	Yellow-Green	0.75 qmm	<i>GND</i>	Motor case, ground
	Yellow	0.34 qmm	<i>PTC1</i>	PTC pin 1
	Green	0.34 qmm	<i>PTC2</i>	PTC pin 2
	White	0.34 qmm	<i>KTY1</i>	KTY pin 1
	Brown	0.34 qmm	<i>KTY2</i>	KTY pin 2

PTC is non-linear positive temperature coefficient thermistor correspondent to DIN-44081 norm. Three serial connected PTC are mounted in motor windings and changes resistance from approx. 150 Ohm at 115 C° to more that 12 KOhm at 125 C°. PTC can be used in servo-amplifier for motor overheating protection.

KTY is linear positive temperature coefficient thermistor with resistance approx 1 KOhm at 20 C° and temperature coefficient 0.61%/K. It is mounted in motor case. KTY can be used in servo-amplifier for motor temperature measurement and overheating warning.