

Motor Rollers - Overview

Motor Rollers

Selection Method

① Calculate the required tangential force

- ◆ Formula for the Required Tangential Force

$$\text{Required Tangential Force (N)} = 9.8 \text{ (Constant Value)} \times \text{Object (kg)} \times \text{Rolling Friction Coefficient}$$

- ◆ Rolling Friction Coefficient Table

Wood	Metal	Cardboard	Plastic	Rubber Lining
0.02~0.05	0.01~0.02	0.05~0.1	0.02~0.04	0.1

② Above values vary depending on roller pitch or condition of roller surface, etc.

Sample Calculation When carrying a cardboard box of weight 40 (kg):

From the above Rolling Friction Coefficient Table, maximum friction coefficient for cardboard is 0.10.

$$\text{Required Tangential Force} = 9.8 \times 40(\text{kg}) \times 0.10 = 39.2(\text{N})$$

* Rolling friction coefficient depends on the material of the object. Refer to the table above.

② Select the model provisionally

Provisionally select the model that matches the speed from the specification table on the next page.

Example When carrying the objects at the speed of 20m/min, MOR57-(Length)-20.

③ Determine the number of required rollers

Determine the number of required rollers considering the following 2 elements.

- Motor Roller Tangential Force (Start-up or at Rated Output)
- Carried Weight and Roller Allowable Static Load (Please see the standards table "Roller Strength (N)" on the next page.)

- ◆ Calculating the required tangential force

$$\text{Carrying Capability (N)} = \text{Starting Tangential Force of the Motor Roller (N)} \times 0.9 \text{ (Constant Value)}$$

- ◆ Determine the number of required rollers

$$\text{The Number of Required Rollers} = \text{Required Tangential Force (N)} / \text{Carrying Capability (N)}$$

Sample Calculation Required tangential force for carrying is 39.2 (N) from the sample calculation above.

For MOR57-(Length)-20:

- Carrying capability is 55 (N) (Starting Tangential Force) $\times 0.9 = 49.5$ (N).
- The Number of Required Rollers is $39.2(\text{N}) / 49.5(\text{N})$ (Carrying Capability) = 0.79 (pcs.) ← One roller is capable

④ Determine the length of the rollers

- From the size of the bottom surface (length and width) of the object

Sample Calculation When the length of the bottom surface is 300mm and the width is 400mm:

- The width of the object is 400mm + Margin 100mm = 500mm.

It follows that in this case, the part numbers should be **MOR57-500-20**.

Caution in Selection

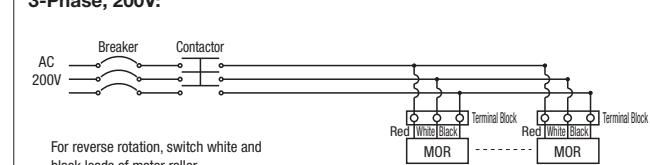
- The calculated value using carrying tangential force gives the minimum value for required tangential force needed to carry the work. Transfer capability could vary depending on roller level differences, carried object bottom surface shape (conditions), material and motor roller speed, etc. Please use more rollers depending on usage conditions and considering safety. If rated speed is important, use rated tangential force for calculation.
- When motor rollers are loaded at all times, use rated tangential force in calculating for selection.
- The object is assumed to start from on the motor rollers.

Features

- Built-in motor and gear enable space savings for driving mechanisms.
- Requires no maintenance such as lubrication.
- Use of multiple Motor Integrated Rollers prevents manufacturing line stoppage due to one roller failure.

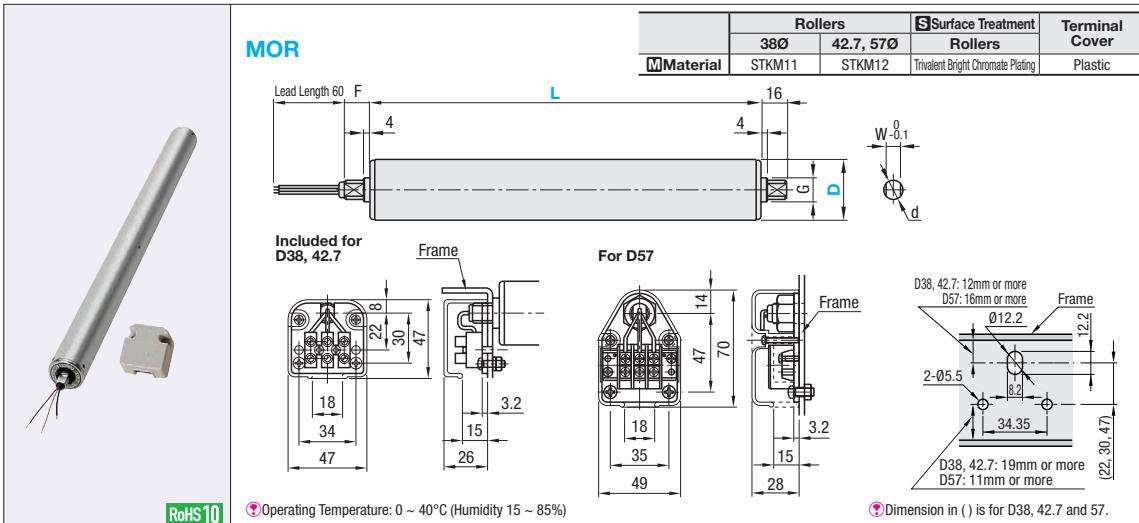
Circuit Layout Diagram

3-Phase, 200V:



- If the motor rotates in a direction other than originally desired, switch two of the three power leads.
- Normal / reverse rotation can be changed by a switch.
- When red, white and black wires are connected in the identical manner, the rollers will all rotate in the same direction.

③ Conveyor Rollers with a built-in motor and a reducer.



Dimension in () is for D38, 42.7 and 57.

Part Number	Type	D	L election	Nominal Speed	Unit Price						
					38	42.7	57	300	400	500	L300
MOR					300	400	500	10	15	20	441

④ For orders larger than indicated quantity, please request a quotation.

D	Nominal Velocity	Power Supply	Rated Current	d	G	W	F	Speed (m/min)		Tangential Force (N)		Torque (N·cm)		Roller Strength (N)			
								50Hz	60Hz	50Hz	60Hz	50Hz	60Hz	L300	L400	L500	
38	10	Three-Phase 200V 50/60Hz Input 16/12W	0.055/0.050 (A)	18	8	16	12	10.4	13.1	16.7	37.3	12.4	31.3	31.8	70.9	23.6	59.6
	15							14.2	16.1	12.3	39.6	9.2	30.9	23.3	75.3	17.5	58.7
	20							22.2	25.2	7.8	25.3	5.8	19.7	14.9	48.0	11.1	37.4
	10	Three-Phase 200V 50/60Hz Input 18/17W						12.3	14.0	14.2	30.7	14.2	23.4	30.3	65.5	30.3	50.1
	15							18.2	20.7	9.6	20.8	9.6	15.9	20.5	44.4	20.5	33.9
	20							24.8	28.3	7.0	15.2	7.0	11.6	15.0	32.5	15.0	24.8
42.7	10	Three-Phase 200V 50/60Hz Input 18/17W	0.065/0.062 (A)	15	8	23	12	11.2	13.3	44.5	83.1	37.0	78.4	126.8	236.8	105.4	223.4
	15							12.4	14.8	40.2	75.1	33.5	67.6	114.5	214.1	95.4	192.6
	20							17.0	20.2	29.4	55.0	24.5	49.5	83.7	156.7	69.8	141.0
	10	Three-Phase 200V 50/60Hz Input 33/27W															
	15																
	20																

⑤ Voltage fluctuation is allowed up to $\pm 3\%$ for 50Hz. (Up to $\pm 5\%$ allowed for 60Hz)

⑥ In case 50Hz is applied at $\pm 5\%$ of voltage variation, the torque value becomes approx. 40% lower than the values shown in the table above.

⑦ Indicated speed applies for rated power. Also rotational velocity and torque change when load is light or excessive.

⑧ Roller strengths may vary depending on applied shock loads, load weights, materials. Be sure to provide ample margin. (Recommendations: 1/2 ~ 1/3 of the chart values) kgf=Nx0.101972

Ordering Example: MOR38 - 300 - 10

ex Example

