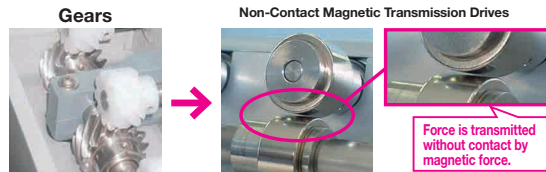
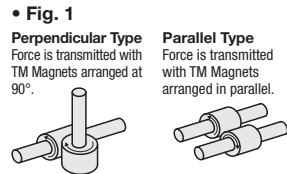


# Non-Contact Magnetic Transmission Drives

## Overview

What are Non-Contact Magnetic Transmission Drives?  
**Non-Contact Magnetic Transmission Drives are Toothless Magnetic Gears.**  
 Motive force is transmitted by using magnetic pull / repulsion without any gear engagement or contact.



### Main Merits of Non-Contact Magnetic Transmission Drive

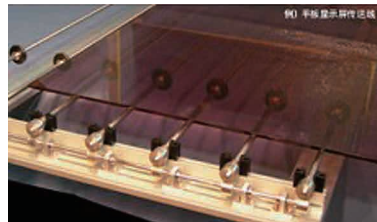
The following merits are realized from non-contact rotation

- ① **Can be used in clean rooms**  
 • Ultra low particle generation. Can be used even for Class 1.
- ② **Semi-permanently maintenance free**  
 • No need for lubricating grease • No need for replacement due to wearing or damage

### Ordering Code

#### Selection Procedure

- Selection of Transmission Direction (Perpendicular Type or Horizontal Type)
- Selection of Product Type (See Table 1)
- Calculate Qty from work size and conveyance distance
- Calculate the load torque (Refer to the selection example on the right)
- Select the external form size by the load torque required for 1 magnet
- Select inner diameter size from the size of the shaft



#### Selection Example

##### Preconditions

- Roller Dia: 50mm • Roller Total Weight: 0.3 kg • Work Weight: 5 kg • Shaft Size: 12φ • Shaft Weight: 0.5 kg • No. of Shafts: 7 • Seal Frictional Coefficient: 0.1
- Transmission Efficiency: 0.9 • Safety Ratio: 3 • Use of Induction Motor
- ① Orthogonal Type ② Select Precision Type from the size of the shaft
- ③ Required Qty: 14 ④ Load Torque Calculation (See the following) ⑤ External Dimension Size: D35
- ⑥ Internal Diameter Size: d12

- \* Example of a safety ratio. Set it according to your specifications.
- \* Calculate the transmission efficiency by referencing the magnet transmission efficiency.
- \* Calculate the seal frictional coefficient from the bearing, etc. that will be used.

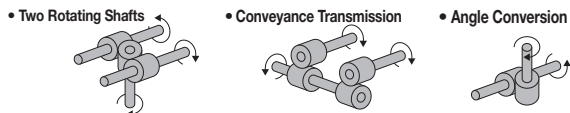
##### Formula Example

$$F = (\text{Work Weight (kg)} + \text{Shaft Weight (kg)} + \text{Roller Weight (kg)}) \times \text{Seal Frictional Coefficient}$$

$$T = (F (N) \times D (\text{Roller Dia. (m)}) / 2 \times \text{Transmission Efficiency}) \times \text{Safety Ratio}$$

Set the following as prerequisites:  
 $F = (5 + 3.5 + 0.3) \times 0.1 = 0.88 \text{ kg} \Rightarrow 8.6 \text{ N}$   
 $T = (8.6 \times 0.05 / 2) \times 3 = 0.58 (\text{N} \cdot \text{m})$   
 0.58 / Minimum Interlocking Gears When Carrying Work 5 pc = 0.116 (N · m)

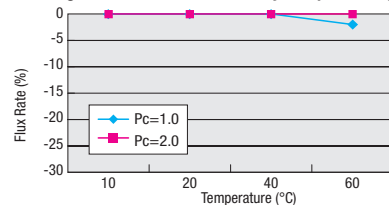
#### Main Transmission Methods



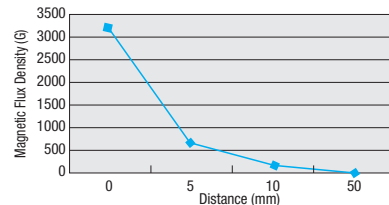
#### Cautions During Use

- Allowable torque changes depending on the temperature (Design Data 2).
- The following objects are negatively affected by strong magnetic field (Design Data 3).  
 Electronic devices such as mobile phones, PCs, watches  
 Electronic medical devices such as pacemakers
- No alteration is available for the magnetic parts.
- Strong impact may cause damage and lead to deterioration in magnetic force.
- Due to its non-contact nature, it is not suitable for extremely high-speed rotation (Max. Speed 1500 rpm)

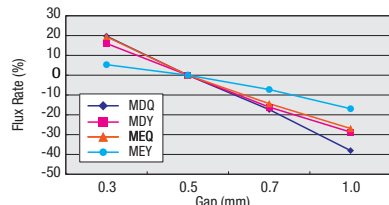
#### Design Data 2: Magnetic Flux Variation Rate by Temperature (Reference)



#### Design Data 3: Space Magnetic Flux Density by Distance from Non-Contact Magnetic Transmission Drive (Reference)



#### Design Data 1: Torque Variation by Distance Change (Reference)



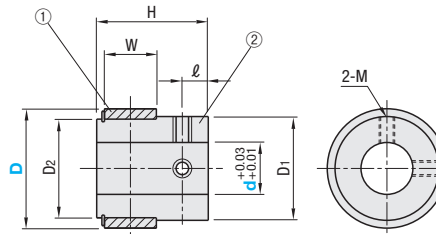
# Non-Contact Magnetic Transmission Drives / Non-Contact Magnetic Transmission Drives Economy Type

Q&A can be viewed regarding the TM Magnets from the URL on the right. <http://jp.misumi-ec.com/mech/product/ro/tm.html>  
**Features:** Rotational displacement is unlikely to occur even at low-speed rotation.

### Standard Type

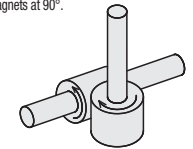


Type	Combined Type	Material		Surface Treatment	
		① Magnet Section	② Holder Section	① Magnet Section	② Holder Section
Standard Type	MDQ	Perpendicular Type	Neodymium Sintered Magnet	A5056	Out-gassing Prevention Treatment
	MDY	Parallel Type	Neodymium Sintered Magnet	A5056	Corrosion Resistant Anodizing

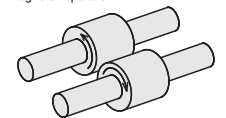


- Maximum Rotational Speed: 1500rpm
- Operating Temperature: 0 ~ 60°C

**Perpendicular Type**  
 Motive force is transmitted by arranging TM magnets at 90°.



**Parallel Type**  
 Motive force is transmitted by arranging TM magnets in parallel.



Part Number	Type	D	d Selection				D1	D2	H	W	l	M	* Allowable Torque (N · m)		Unit Price
			6	8	10	12							MDQ	MDY	
Perpendicular Type MDQ		16	6	8			13	12	19.5	8	5	M3	0.013	0.032	
		22	8	10	12	18	17	23.5	12	0.050			0.105		
		26	10	12	15	22	20	25.5	14	0.068			0.186		
Parallel Type MDY		35			12	15	20	32	29	34.0	22	M4	0.245	0.558	

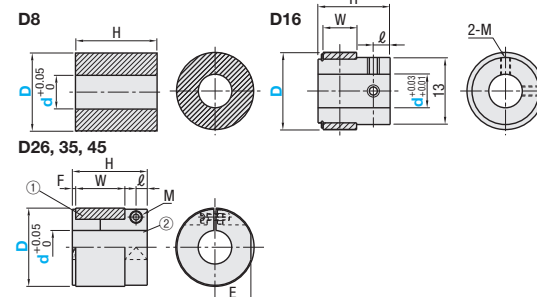
- Perpendicular Type and Parallel Type cannot be used in combination.
  - Cannot be combined with other manufacturer's products. Please be sure to order in sets of the compatible product types.
  - Drives with different diameters cannot be used in combination. Combine the drives of same diameter.
- \* Allowable Torque values are for reference at 0.5mm gap.

**Features:** This type is made of plastic and more economical than the Standard Type. Suitable for use in normal atmosphere. Equivalent allowable torque to the Standard Type.

### Economy Type

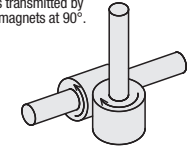


Type	Combined Type	Material		Surface Treatment	
		① Magnet Section	② Holder Section	① Magnet Section	② Holder Section
Economy Type	MEQ	Perpendicular Type	Neodymium Bonded Magnet	Polyacetal (D16:A5056)	Electrostatic Paint
	MEY	Parallel Type	Neodymium Bonded Magnet	Polyacetal (D16:A5056)	Electrostatic Paint

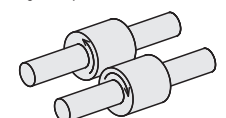


- Maximum Rotational Speed: 1500rpm
- Operating Temperature: 0 ~ 60°C

**Perpendicular Type**  
 Motive force is transmitted by arranging TM magnets at 90°.



**Parallel Type**  
 Motive force is transmitted by arranging TM magnets in parallel.



Part Number	Type	D	d Selection				H	W	l	Locking Screw (D16: Set Screw)		F	E	* Allowable Torque (N · m)		Unit Price	
			M	Tightening Torque (N · m)	MEQ	MEY				MEQ	MEY						
Perpendicular Type MEQ		8	5				8	-	-	-	-	-	-	0.0058	0.0078		
		16	6	8		19.5	8		M3	1.5	-	-	-	0.015	0.021		
Parallel Type MEY		26		12	15		25.5	14	5	M2.5	0.333	1.5	11.5	0.098	0.167		
		35		15	20		33.5	22		M3	0.422		16	0.221	0.515		
		45			20		45	30	6.35	M5	0.784	2	20.5	0.804	-	-	

- Perpendicular Type and Parallel Type cannot be used in combination.
  - Cannot be combined with other manufacturer's products. Please be sure to order in sets of the compatible product types.
  - Drives with different diameters cannot be used in combination. Combine the drives of same diameter.
  - D diameter 45 is available for Perpendicular Type only.
  - D8 does not have the ② holder section. Use adhesive to fix.
  - The holder section of D16 is tightened with a set screw. (Set screw included)
- \* Allowable Torque values are for reference at 0.5mm gap.

Ordering Example

Part Number	d
MDQ22	8
MEQ35	20