



Conveying Motorized Driven Roller

Catalogue

Direct Drive Gearless Feature

High Efficient, Save Energy

Gearless design, external rotor direct drive tube , reduce the mechanical loss of energy, improve the energy efficiency at least 10% higher than traditional MDR.

High Precision Control

Use 17 bit absolute encoder, servo control with high precision.

Maintain Big Torque Output In High Speed

Servo external rotor direct drive motor design, maintain Big torque output even in speed 2.0m/s.

Wide Operating Temperature

Operate in ambient temperature -20~45°C, only need one type to handle. No need to distinguish between high and low temperature types.

Remark:

Motorized Driven Roller abbreviated as “MDR” .

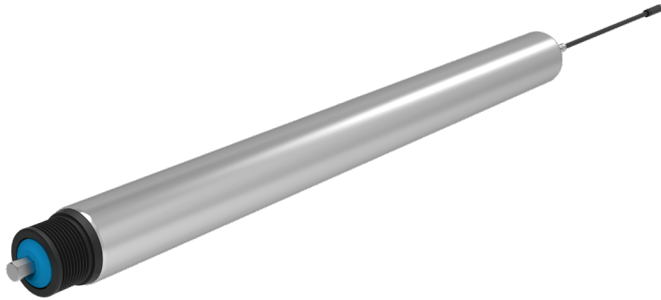
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MDR

General Information

1.1 Product



- Diameter: : ϕ 50mm
- Tube: Steel zinc plating/ Stainless steel
- Ambient Temperature : -20-45°C
- Ambient Humidity 20~90%RH (Non-condensation)

✓ Cable normal length 500mm, extension cable 600mm, 1000mm are available.

1.2 Performance Parameter

Identifying Color	Nominal Max speed	Speed (m/min)	Rate Torque (N·m)	Starting Torque (N·m)	Rate Force (N)	Starting Force (N)	Rate Current (A)	Starting Current (A)	Rate Power (W)
Black	36	6-18	2.65	9.2	106	368	3	4.5	60
		18-36	2.13		85.2				
Yellow	90	18-60	1.25	7.2	50	288	2	3.5	50
		60-90	0.83		33.2				
White	120	60-120	0.72	4.2	28.8	168			

1.3 Static Load Capacity

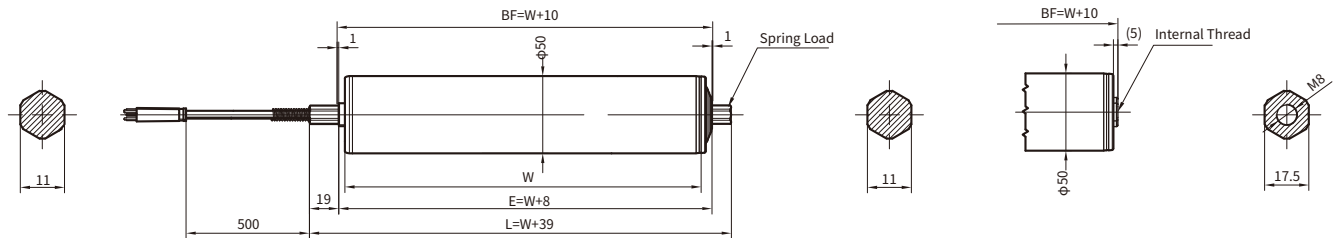
Diameter ϕ 50*1.5	Roller Length (mm)								
	400	500	600	700	800	900	1000	1100	1200
Load (Kg)	100	80	75	70	65	60	55	50	45

Remark: The max. Roller Length **W** is 1200mm.

MDR

Dimension

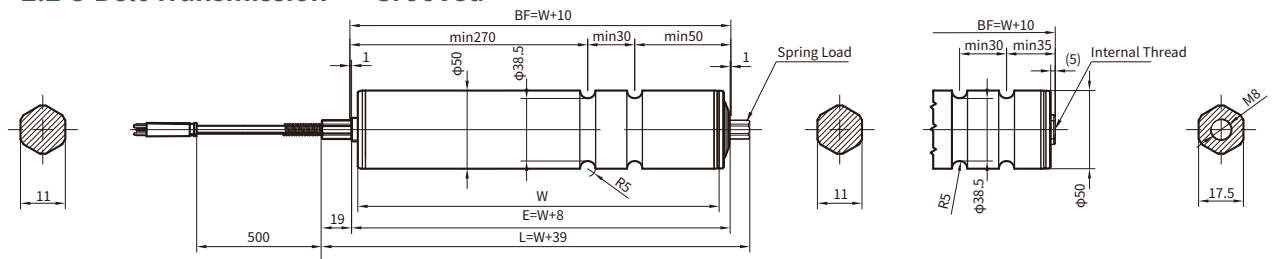
2.1 No Interlocking



Minimum length W (unit: mm)

Dia (mm)	Nominal Max speed	Spring Load		Internal Thread	
		W	BF	W	BF
φ50	36	402	412	368	378
	90	362	372	328	338
	120	362	372	328	338

2.2 O Belt Transmission—Grooved



Minimum length W (unit: mm)

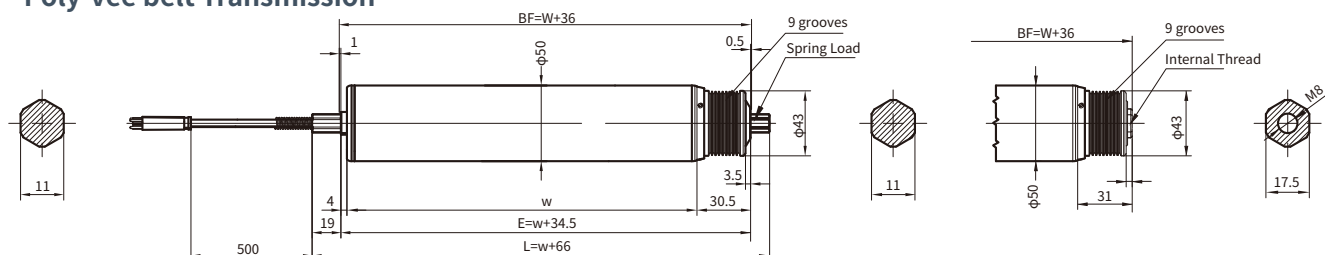
Dia (mm)	Nominal Max speed	Spring Load		Internal Thread	
		W	BF	W	BF
φ50	36	418	428	403	413
	90	378	388	363	373
	120	378	388	363	373

MDR

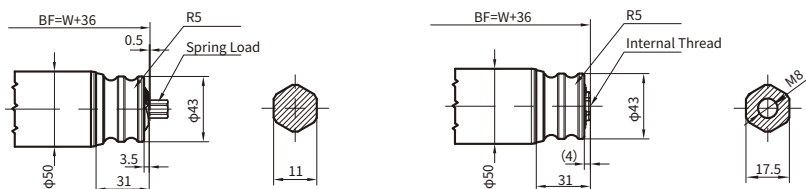
Dimension

2.3 Belt Transmission

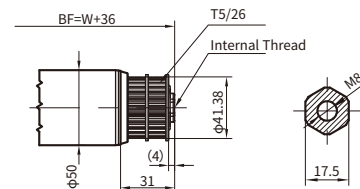
Poly-vee belt Transmission



O belt transmission—Pulley head



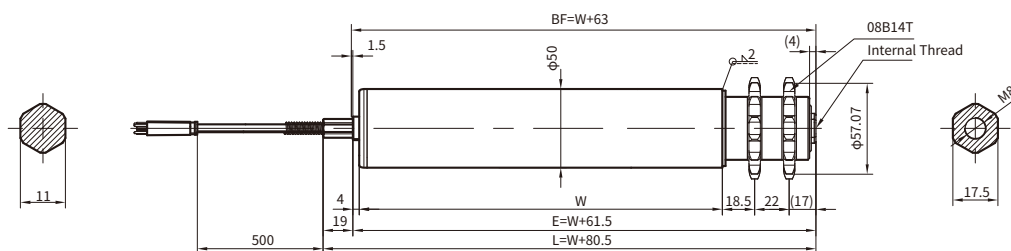
Timing Belt Transmission



Minimum length W (unit: mm)

Dia (mm)	Nominal Max speed	Spring Load		Internal Thread	
		W	BF	W	BF
φ50	36	397	433	372	408
	90	357	393	332	368
	120	357	393	332	368

2.4 Double Steel Sprocket (08B14T)



Minimum length W (unit: mm)

Dia (mm)	Nominal Max speed	Internal Thread	
		W	BF
φ50	36	343	406
	90	303	366
	120	303	366

2.5 Taper MDR



unit:mm

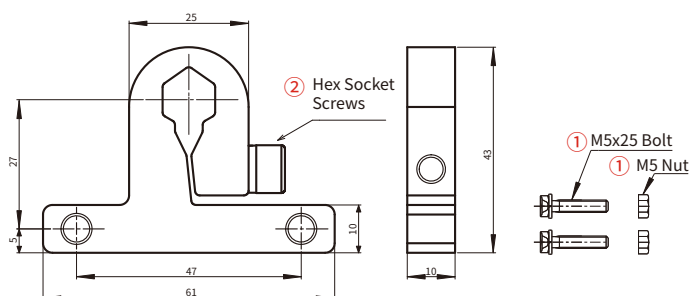
Remark: The max. Roller Length **W** is 1200mm.

MDR

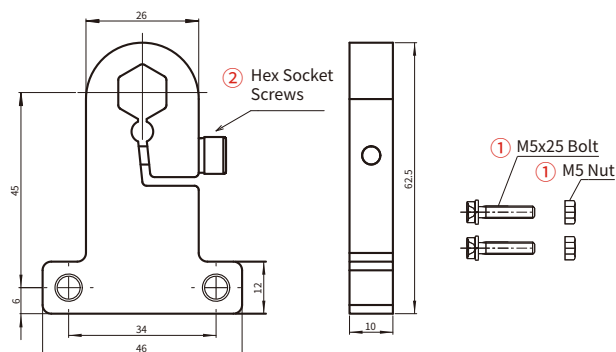
Bracket

2.6 Bracket (for 11hex Shaft)

AS-11P (Standard)



TS-11P (For Taper)



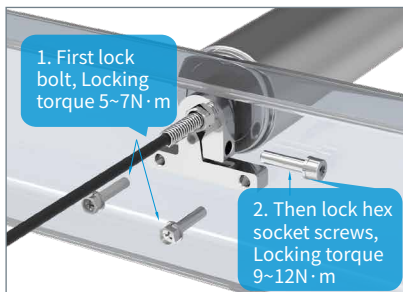
⚠ Vertical installation only,
not horizontal or diagonal installation.

First tighten ①M5 bolts and nuts, then tighten ②hex socket screws.

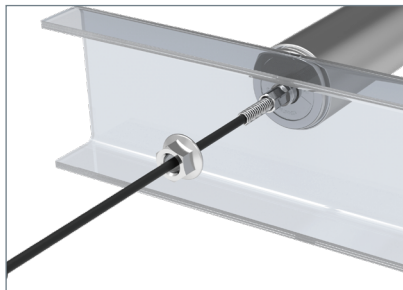
⚠ Please be sure to use the mounting bracket to lock the motor shaft, otherwise there will be severe shaking and abnormal noise

2.6 Bracket Installation

MB-A Bracket



M12 External Thread Installation



MDR

Part No.

DMD - A D24 - 50 - 650 - 36 A S G A / C Y

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫

① Basic Model: DMD

② Basic Type: **A** Standard **T** Taper

③ Power: DC24V

④ Nominal Roller Diameter: $\phi 50\text{mm}$

⑤ Roller Length: Refer to MDR drawing (W)

⑥ Nominal Max speed: 36,90,120(m/min)--Dia.50

⑦ Tube Version:

A Steel zinc plated	X 5mm Natural rubber(black)
J Stainless steel	N 5mm PU (black)
H Steel, Hard chromium plated	K 5mm NBR(black)
Q 2mm PVC sleeve (grey)	P 2mm PU (black)

⑧ Motor Shaft: **S** 11hex **E** M12 external thread

⑨ Interlocking Version:

A No Interlocking(straight)	D Double steel sprocket (08B14T)
G Grooved (R5)	F O belt pulley
H Poly-vee belt pulley (PJ)	I Timing belt pulley

⑩ Idler Side Installation:

A 11hex spring load	U Fixed shaft
F Internal Thread	

⑪ Material Of Interlocking Element:

Empty Default (polymer)	A Aluminum
C Steel	S Stainless steel

⑫ **Empty** Standard; **Y** Non-Standard

MDR

Product Selection Example

3.1 Drive Force For Conveying



$$F = \mu \cdot W \cdot 9.8$$

F -Starting Force for conveying (N)

μ -Friction coefficient

W -Weight of Goods (kg)

	Metal	Plastic	Wooden	Carton box
Metal	0.02	0.04	0.05	0.10
PVC Sleeve	0.03	0.04	0.05	0.15
PU	0.02	0.04	0.05	0.15

3.2 Starting Torque For Conveying

$$T = F \cdot D \cdot S / 2000$$

T -Starting Torque

S -Safety Factor

D -Roller Diameter

3.3 Loss Factor For Interlocking Roller

$$P_f = 0.95^n$$

P_f -Loss Factor For Drive Force

n -Quantity Of Interlocking Roller

MDR

Product Selection example

3.4 Determination Method

- Starting Torque Determination: Conveying starting Torque < MDR rate starting Torque (N · m)
- Quantity of Interlocking roller Determination: Quantity of Interlocking roller time 2 < MDR rate Torque divid 0.025, Quantity lower than 24pcs(poly-vee version)
- Motor Type selection: If more motor types can be matched, select the bigger torque one.
- Remark: the conveying capacity of MDR is affected by the conveyed surface of goods and flatness of roller bed surface etc., the Drive force will be added. Base on different situation, put a reasonable safety factor.
- Range:1.5-3

3.5 Caculation Example

Conveying inforamtion

Weight of Goods:W=50kg; material of box:Carton;Convey speed:60m/min;

Quantity of Interlocking roller:9; Safety factor:1.5

$$F=W*\mu*9.8/0.95n=77.75N$$

$$T=F*D*S/2000=2.91Nm$$

Based on the calculation result, select 24M Type, the MDR' s Starting Torque , can be matched .

3.6 Quantity Of Interlocking Roller

No.	Interlock Type	The Max. Quantity Of Roller	Remark
1	Poly-vee belt	24	MDR should be installed in the middle of conveyor Zone, as below
2	Timing belt	12	
3	O belt	10	
4	Sprocket	24	

Installation Example



Drive Card

General Function

4.1 General Function



- 3 Speed stage I/O signal input (PNP&NPN)
- Run motor forward or reverse
- Dynamic brake / Servo Lock brake
- RS485 communication (Modbus Rtu)
- 16 Stage fixed speed setting with DIP Switch
- 4 Stage Accel / Decel setting

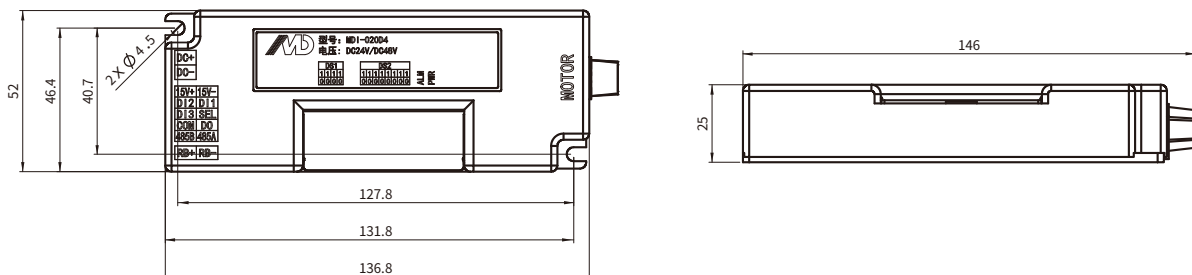
4.2 Rate Parameter

	Specification	Remark
Rate Voltage (V)	24±5%	DC
Rate Current (A)	2.5	Effective Value
Starting Current (A)	3.5	
Required Input Power (W)	120	
Operating Ambient temp(°C)	-20~45	
Operating Ambient Humidity	20~90%RH	(No Condensation)
Vibration	2G以下	

4.3 Match Information with MDR

Drive Card model	Nominal Max speed	Identifying Color
MDI-020D2N02A	36	Black
MDI-020D2N03A	90	Yellow
MDI-020D2N01A	120	White

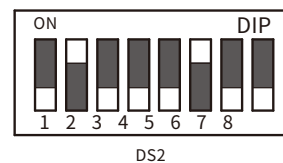
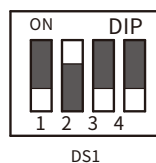
4.4 Dimension



⚠ To prevent static damage to the driver card, please ensure that the "driver card backplane" is effectively grounded to ensure that the static energy is effectively discharged.

Drive Card

General Function



4.5 DIP Switch Function

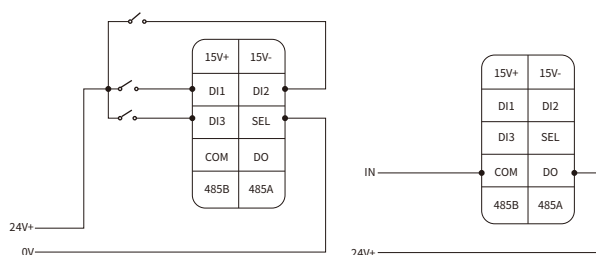
Setting	No. of terminal	Function	Remark
DS1	1	Terminal Resistors	0:NO Connect;1:Connect
	2	Control Switching	0:I/O Control;1:485Control
	3	Electrical Brake Method Setting	0:Dynamic Brake;1:Servo Lock Brake
	4	Direction Of Rotation	0:CCW;1:CW(from cable side)
DS2	1	Speed Setting	16 Stage Speed
	2		
	3		
	4		
	5	Accel Setting	4 Stage Acceleration
	6		
	7	Decel Setting	4 Stage Deceleration
	8		

4.6 Terminal And Wiring

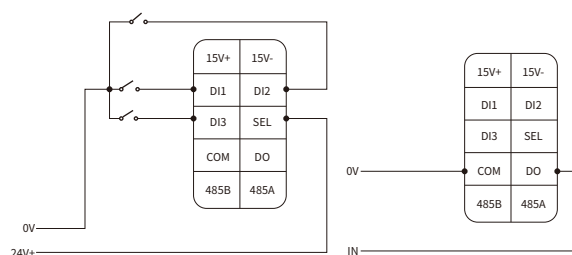
Terminal Description

Terminal Block	Terminal	Description				
CN2 I/O Terminal Block	15V-	15V Power Negative Pole				
	15V+	15V Power Positive Pole				
	DI1	Multi-Speed Setting	DI1 State	DI3 State	Speed	
			1	0	100%	
	DI3		1	1	75%	
			0	1	50%	
			0	0	stop	
	DI2	Direction Control; 0:CCW; 1:CW				
	SEL	Input Common				
	DO	Error Output				
	COM	Output Common				
	A	485 COM Port A				
B	485 COM Port B					

PNP Wiring Connection



NPN Wiring Connection





MD is dedicated to the research and development of motorized driven rollers, energy-efficient permanent magnet synchronous linear motors and intelligent motor drivers for logistics industry. While deeply focusing on intelligent equipment for logistics, MD is also heavily investing in R&D to explore related industries. MD has already achieved more and more good outcomes and is planning to fully expand into new fields over the next three years.

www.dlmd.cn

Headquarter

Block 2, No.36 Dalian Road,
Taicang city, Suzhou (215400)
Tel: 0512-53980061/0512-66180603
Email: moandi2020@dlmd.cn



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