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MS23 and MS34
Motor/Drive
Manual

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MS23 and MS34

Motor/Drive Manual

Description:

The DAEDAL MS23 and MS34 Motor/Drives are complete microstepping motor drives that require no external power supply to operate. These drives operate from a step and direction control input.

Inspection:

Carefully inspect the shipping carton for any evidence of physical abuse or damage. Report any such findings to your receiving department and to the carrier. DAEDAL will not be held responsible for in-transit damage.

Unpack the shipping carton and inspect the DRIVE for any damage, cracks, broken parts or damaged cables. Save the packing materials until inspection and functional checks have been completed.

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Front and Rear Panel Overview:

Power Inlet:
This is a 120 VAC/60Hz inlet with built in fuse protection. Fuse ratings are listed on page 4. A 8(eight) foot power cord is supplied with the drive.

Power Switch:
This rocker switch applies power to all circuits in the Motor/Drive.

Indexer Interface Input(s) (1,2,3):
This 25 pin female "D" type connector is where pulse and direction input is supplied to the respective Drive. Pin assignments and specifications are on page 4.

Motor Output(s) (1,2,3):
This 8(eight) pin circular type connector is where the motor windings are connected to the Motor/Drive. Pin assignments and specifications are page 5.

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Initial Set-up:

If a DAEDAL Motor/Drive and Controller are purchased as a package the following procedure should be followed.

Step #1
Connect the indexer cable from the 25 pin "D" connector on the Motor/Drive to the Drive output connector on the control.

Step #2
Connect the motor and the motor extension together and then connect the extension to the Motor output on the Motor/Drive.

Step #3
Plug the power cord into the power inlet on the Motor/Drive.Next plug the other end of the cord into either the Controller Aux. Power outlet or a wall outlet.NOTE:If the Aux. Power outlet on the Controller is used, power will be controlled by the power switch on the Controller.

Step #4
Turn the power switch of the Motor/Drive to the on position.

Step #5
Check if the motor windings are energized. Do this by trying to turn the motor shaft by hand. If it has resistance it is energized.

Step #6
Now operate the Motor/Drive from the Controller according to it's operating manual. Make sure to try different accelerations and velocities settings to see if motor is operating as expected.

If Motor/Drive is purchased separately:
If this is the case, then some type of control must be set up to operate the Motor/Drive.Once this done, follow steps 2 thru 6.
NOTE:Check Motor/Drive specifications for proper input signals.

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Specifications:

Power Inlet:

120 VAC/60Hz

Fuses:

Below is a list of fuse ratings. All fuses are slow-blow type. If a fast-blow type must be used to replace a bad fuse, add .5 amp. to the listed rating for your size Motor/Drive. Example: If a fuse rating of 2 amp. slow-blow type is listed, a 2.5 amp. fast-blow type can be substitued.

Motor/Drive	Slow-Blow Fuse
MS2301 or MS3401	250 VAC/ 1.5 A
MS2302 or MS3402	250 VAC/ 2 A
MS2303 or MS3403	250 VAC/ 3A

Indexer Interface Input:

Type; Step and Direction with Shutdown.

Pin #	Description	Specification
1	Step Input	Steps on high going pulse. Minimum pulse width 500 nanosec. Max., pulse rate 1MHz
14	Step Return	Ground
2	Direction Input	Logic High = CW dir Logic Low = CCW dir
15	Direction Return	Ground
16	Shutdown Input	Logic High =disabled Logic Low = normal operation
17	Shutdown Return	Ground

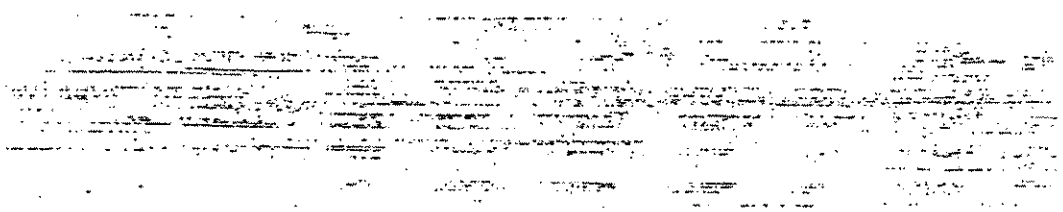
These inputs are fully optically isolated and require a TTL type signal to operate (3.5VDC to 5VDC =Logic High; < 0.8VDC =Logic Low). User's control must be able to provide 20 milliamps per input.

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Specifications (cont.):

Motor Output:

Pin #	Function	Motor Lead Color
1	Phase #2	Red
2	Center Tap	White
3	Phase #2	Red/White
4	Phase #1	Green/White
5	Phase #1	Green
6	Center Tap	Black
7	Shield	Yellow(connected to motor case)



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Ordering Information

Model No.	Description	Price
Single-Axis System: MS23-01 MS34-01	 Size 23 motor Size 34 motor	$
Two-Axis System MS23-02 MS34-02	 Size 23 motors Size 34 motors	
Three-Axis System MS23-03 MS34-03	 Size 23 motors Size 34 motors	

A variety of system resolutions are available:

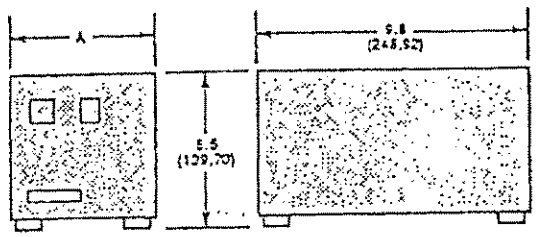
Resolution Number	Steps/Rev
02	2,000
04	4,000
10	10,000
20	20,000

After selecting the desired resolution for each drive axis, add the resolution number(s) to the end of the model number. For example, model number MS23-03-021020 indicates a three-axis drive with three size 23 motors, a resolution of 2,000 steps/rev on axis 1, 10,000 steps/rev on axis 2 and 20,000 steps/rev on axis 3.

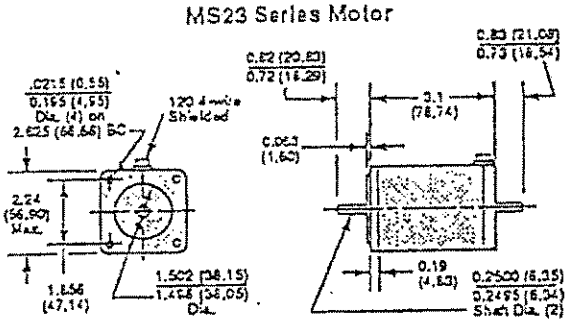
Dimensions ( ) denotes millimeters

1 axis 4.6 (116.8)
2 axes 9.1 (231.1)
3 axes 13.6 (345.4)

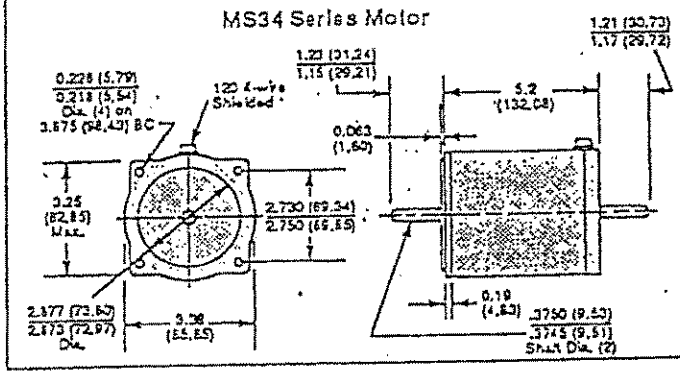
Motor Drive



MS23 Series Motor



MS34 Series Motor



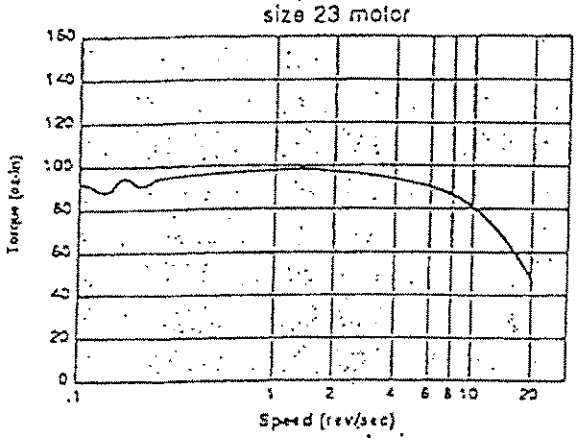
Motor Data

Motor Frame Size	Static Torque oz-in (Nm)	Rotor Inertia oz-in-sec² (kg-cm²)	Residual (Detent) Torque oz-in (Nm)	Ambient Temperature Maximum	Maximum Thrust Load lb (kg)	Maximum Radial Load lb (kg)	Weight lb (kg)
23	80 (0,56)	0.0045 (0,234)	9 (0,06)	130°F (54°C)	25 (11,4)	15 (6,8)	2.2 (1,0)
34	350 (2,65)	0.0358 (1,87)	50 (0,35)	110°F (43°C)	50 (22,8)	25 (11,4)	8.1 (3,7)

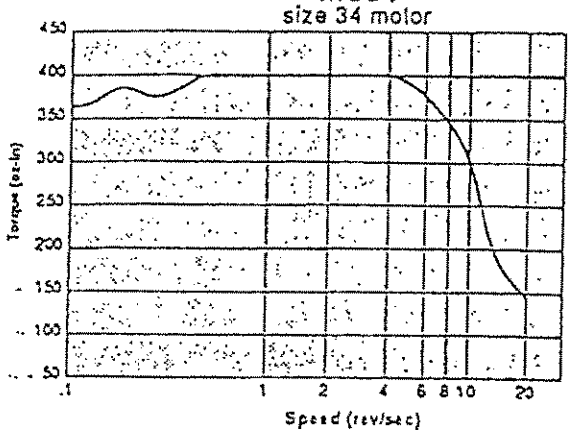
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Torque/Speed Curves

MS23
size 23 motor



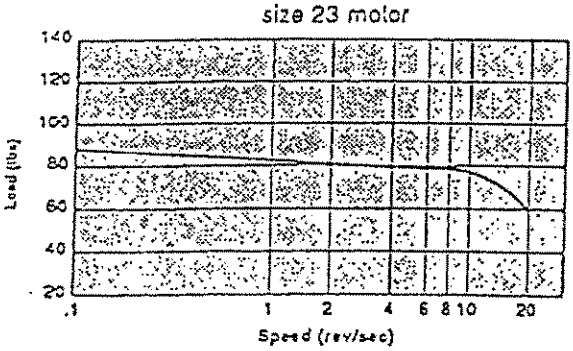
MS34
size 34 motor



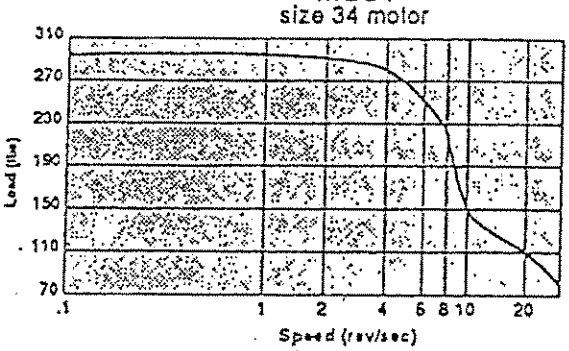
Typical Load Capacities:

The charts below indicate vertical load lifting capability when using an MS23 or MS34 series motor/drive to drive a Daedal table having a 5-pitch ballscrew drive mechanism.

MS23
size 23 motor



MS34
size 34 motor



Resolution Reference Guide

The resolution guide shows the distance which a linear or rotary table will travel with one microstep of movement. For example, a linear table with a five-pitch leadscrew, driven by a 2,000 step/revolution MS series motor, will travel 0.0001" with one microstep of rotation. A travel of 1.0" would require the motor to rotate 10,000 steps (five revolutions).

Motor Steps Per Rev.	English Leadscrew (in.)			Metric Leadscrew (mm)			Rotary Gear Ratio			
	5 Pitch	10 Pitch	50 Pitch	2 mm	1 mm	0.4 mm	36:1	45:1	90:1	180:1
2,000	0.0001"	0.00005"	0.00001"	0.001"	0.0005"	0.0002"	0.005"	0.004"	0.002"	0.001"
4,000	0.00005"	0.000025"	0.000005"	0.0005"	0.00025"	0.0001"	0.0025"	0.002"	0.001"	0.0005"
10,000	0.00002	0.00001	0.000002	0.0002	0.0001	0.00004	0.001"	0.0008"	0.0004"	0.0002"
20,000	0.00001	0.000005	0.000001	0.0001	0.00005	0.00002	0.0005"	0.0004"	0.0002"	0.0001"

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RESOLUTION	J8	J9	J10
50,000 STEP/REV	OFF	ON	ON
36,000 STEP/REV	ON	OFF	ON
25,000 STEP/REV	ON	ON	ON
20,000 STEP/REV	OFF	OFF	ON
18,000 STEP/REV	ON	ON	OFF
10,000 STEP/REV	OFF	ON	OFF
4,000 STEP/REV	ON	OFF	OFF
2,000 STEP/REV	OFF	OFF	OFF

WAVEFORM	J11	J12
PURE SINE	OFF	OFF
-2% 3RD HAR.	OFF	ON
-4% 3RD HAR.	ON	ON
-6% 3RD HAR.	ON	OFF

IT SHOULD BE NOTED THAT THE C-DRIVE AND THE A-DRIVE HAVE A MAXIMUM STEP INPUT RATE OF 750KHZ AND A MAXIMUM VELOCITY OF 40 RPS. THIS TRANSLATES TO THE FOLLOWING MAXIMUM VELOCITIES.

50,000	15.0 RPS
36,000	20.8 RPS
25,000	30.0 RPS
20,000	37.5 RPS
18,000	40.0 RPS
10,000	40.0 RPS
4,000	40.0 RPS
2,000	40.0 RPS

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