

NEW! MAX Series

30% performance increase
compared to standard Size 17

Compact and High Performance!

M43000 MAX Series Size 17 Hybrid Rotary Motor

Recently introduced in our Size 17 product offering, our new MAX motors now provide 30% performance increase in our most popular motor size. Top selling designs deliver high performance, opening avenues for equipment designers who previously settled for products with inferior performance and endurance.

The Size 17 by Haydon Kerk Motion Solutions is a 43mm hybrid rotary stepper motor. At rated voltage, the Size 17 – 43MAX series - single stack standard 1.8° step angle version produces torque up to 184.2 mNm (26.1 oz-in), while the 0.9° step angle version 135.7 mNm (19.2 oz-in). Typical applications include medical equipment, semiconductor handling, valve control, X-Y tables, handheld instruments, or wherever precise linear motion is required.

Stepper motors deliver accurate positioning and high torques at loads. The modular design of our motors gives us the building blocks to address your specific needs, and high flexibility for shaft modifications, encoders, gearboxes, brakes, etc.

Fast prototyping is available to assist in quick proof of concept.



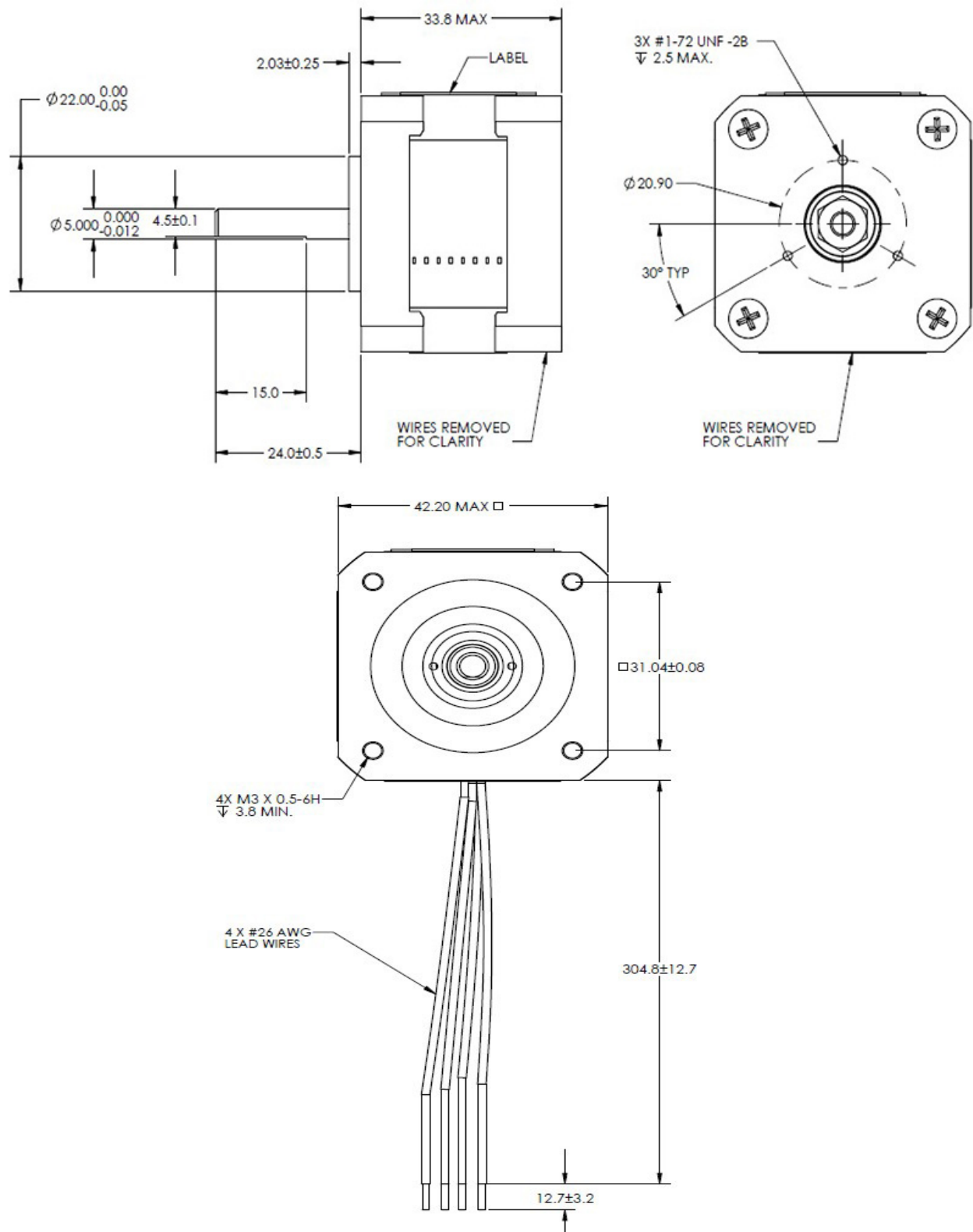
Size 17, 43mm Hybrid
Rotary Motor

Size 17, 43mm Hybrid Rotary Motor (1.8° Step Angle)				
Part No.	Rotary	M43H40 – ■ ■ ■ – ■ ■ ■ ■		
Wiring	Units	Bipolar		
Step Angle	Degree	1.8°		
Winding Voltage	VDC	2.8 VDC	5.8 VDC	13.8 VDC
Current/Phase	A rms	1.5	0.70	0.29
Resistance/Phase	ohms (Ω)	1.77	8.3	47.6
Inductance/Phase	mH	2.45	13.5	88
Power Input	Watts	8		
Rotor Inertia	gcm ²	37		
Insulation Class		Class B (Class F available)		
Weight	oz (g)	9 (255)		
Insulation Resistance	M(Ω)	20		

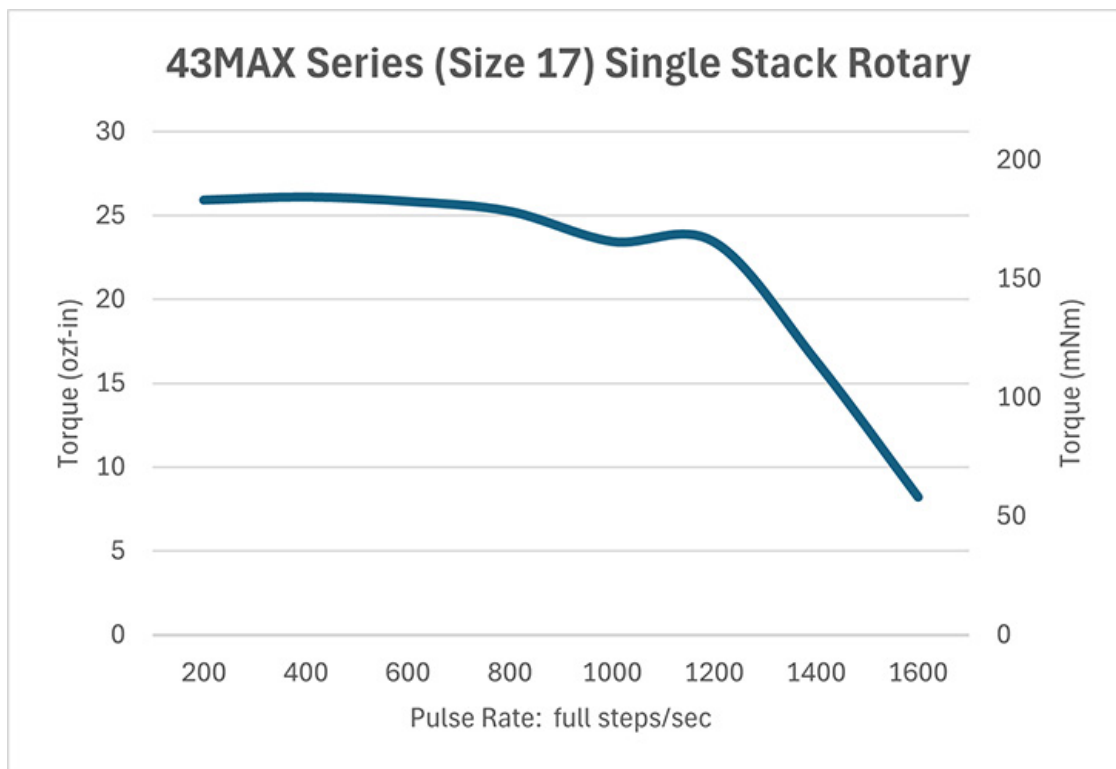
Note: Standard motors are Class B rated for a maximum temperature of 130°C (155°C for Class F)

43000 Series • Size 17 Single Stack Rotary Stepper Motor

Dimensional Drawing



Performance Curve



NOTE: All chopper drive curves were created with a 7.5 volt motor and a 40 volt power supply.

Ramping can increase the performance of a motor either by increasing the top speed or getting a heavier load accelerated up to speed faster. Also, deceleration can be used to stop the motor without overshoot.

With L/R drives peak force and speeds are reduced, using a unipolar drive will yield a further 30% force reduction.

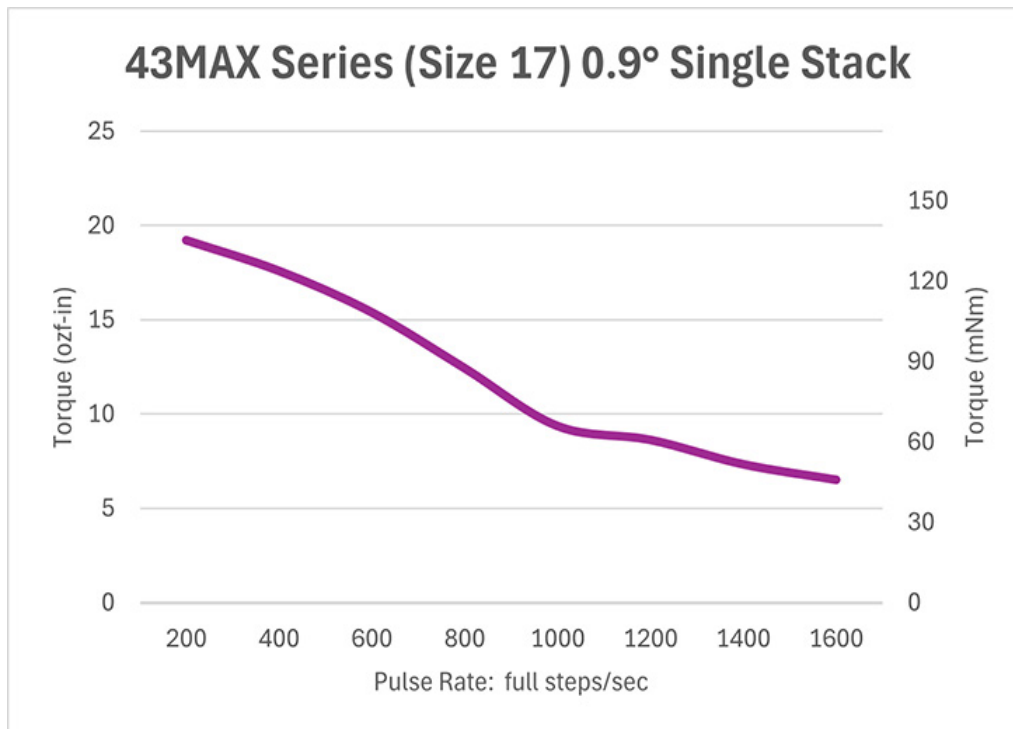
43000 Series • Size 17 Single Stack Rotary Stepper Motor

M43000 MAX Series Size 17 0.9°

Rotary Stepper Motor

Size 17, 43mm Hybrid Rotary Motor (0.9° Step Angle)				
Part No.	Rotary	M43K40 – ■ ■ ■ ■ ■ ■		
Wiring	Units	Bipolar		
Step Angle	Degree	0.9°		
Winding Voltage	VDC	2.8 VDC	5.8 VDC	13.8 VDC
Current/Phase	A rms	1.5	0.70	0.29
Resistance/Phase	ohms (Ω)	1.77	8.3	47.6
Inductance/Phase	mH	3.2	17.7	116.2
Power Input	Watts	8.1		
Rotor Inertia	gcm ²	37		
Insulation Class		Class B (Class F available)		
Weight	oz (g)	9 (255)		
Insulation Resistance	M(Ω)	20		

Note: Standard motors are Class B rated for a maximum temperature of 130°C (155°C for Class F)



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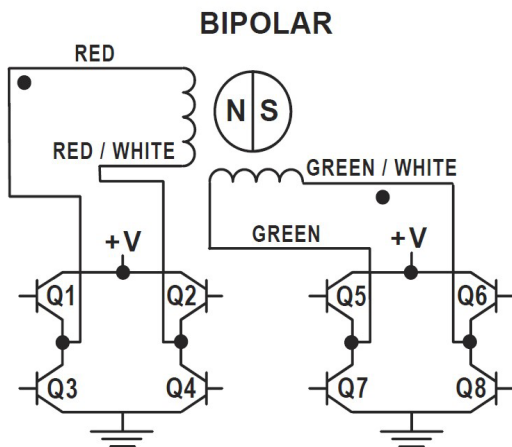
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Identifying the Hybrid Part Number Codes when Ordering

M43	H	4	0	2.8	900
Series Number Designation	Style	Coils	Code ID	Voltage	Suffix
M43=M43000 (Series numbers represent approximate width of motor body)	H = 1.8° Step Size K = 0.9° Step Size	4 = Bipolar (4 wire)	0 = Rotary	2.8 = 2.8 VDC 5.8 = 5.8 VDC 13.8 = 13.8 VDC Custom voltages available	-900 = Catalog Motor -XXX = Proprietary suffix assigned to a specific customer application. The identifier can apply to either a standard or custom part.

NOTE: Dashes must be included in Part Number (-) as shown above. For assistance call our Engineering Team at 203-756-7441

Hybrids: Wiring



Hybrids: Stepping Sequence

Bipolar	Q2-Q3	Q1-Q4	Q6-Q7	Q5-Q8
Step				
1	ON	OFF	ON	OFF
2	OFF	ON	ON	OFF
3	OFF	ON	OFF	ON
4	ON	OFF	OFF	ON
1	ON	OFF	ON	OFF

EXTEND CW ↓ RETRACT CCW ↑

Note: Half stepping is accomplished by inserting an off state between transitioning phases.

Integrated Connector for Hybrid Size 8

Offered alone or with a harness assembly, this connector is RoHS compliant and features a positive latch in order for high connection integrity. The connector is rated up to 2 amps and the mating connector will handle a range of wire gauges from 24 to 28. Ideal for those that want to plug in directly to pre-existing harnesses.

Motor Connector:

JST part # S04B-ZESK-2D

Mating Connector:

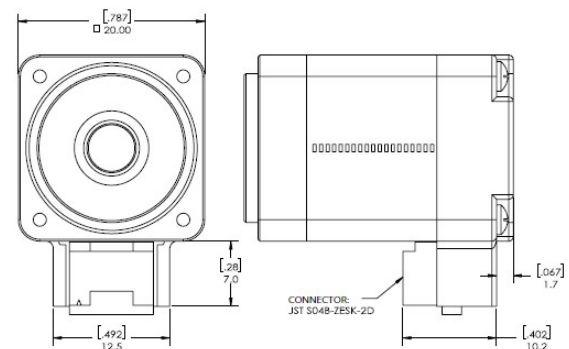
JST part # ZER-04V

Haydon Kerk Part # 56-2369-1 (12 in. Leads)

Wire to Board Connector:

JST part # SZE-002T-P0.3

Pin #	Bipolar	Color
1	Phase 2 Start	G/W
2	Phase 2 Finish	Green
3	Phase 1 Finish	R/W
4	Phase 1 Start	Red

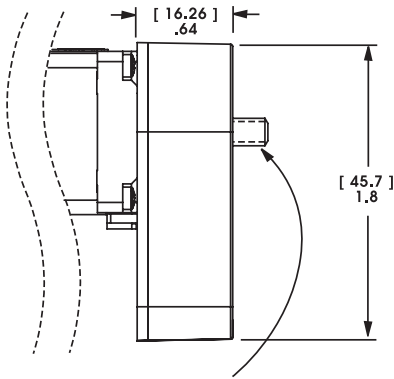


Incremental Encoders Designed for All Sizes of Hybrid Motors

All Haydon Hybrid Motors are available with specifically designed encoders for applications that require feedback. The compact optical incremental encoder design is available with two channel quadrature TTL squarewave outputs. An optional index is also available as a 3rd channel. The Size 17 Encoder provides resolutions for applications that require 200, 400 and 1000 counts per revolution. Encoders are available for all motor configurations.

Simplicity and low cost make Encoders ideal for both high and low volume motion control applications. The internal monolithic electronic module converts the real-time shaft angle, speed, and direction into TTL compatible outputs. The encoder module incorporates a lensed LED light source and monolithic photo-detector array with signal shaping electronics to produce the two channel bounceless TTL outputs.

43 mm M43000 Series Size 17



Differential Ended Encoder - Pinout - Size 17

Connector Pin #	Description
1	Ground
2	Ground
3	- Index
4	+ Index
5	Channel A -
6	Channel A +
7	+5 VDC Power
8	+5 VDC Power
9	Channel B -
10	Channel B +

Electrical Specifications

	Minimum	Typical	Maximum	Units
Input Voltage	4.5	5.0	5.5	VDC
Output Signals	4.5	5.0	5.5	VDC

2 channel quadrature TTL squarewave outputs.

Channel B leads A for a clockwise rotation of the rotor viewed from the encoder cover.

Tracks at speeds of 0 to 20,000 cycles/sec.

Optional index available as a 3rd channel (one pulse per revolution).

Operating Temperature

Size 17	Minimum	Maximum
	- 40°C (-40°F)	100°C (212°F)

Mechanical Specifications

	Maximum
Acceleration	250,000 rad/sec ²
Vibration (10 Hz to 2 kHz)	20 g

Resolution

4 Standard Cycles Per Revolution (CPR) or Pulses Per Revolution (PPR)

Size 17	CPR	200	400	1000*
	PPR	800	1600	4000*

*Index Pulse Channel not available.

Single Ended Encoder - Pinout - Size 17

Connector Pin #	Description	Connector Pin #	Description
1	Ground	4	+5 VDC Power
2	Index (optional)	5	Channel B
3	Channel A		