1040 CLASSIC ROAD | APEX, NC 27539
P: 919.577.6333
www.griffinmotion.com

3CS: Precision Spindle with 3C Collet Integration

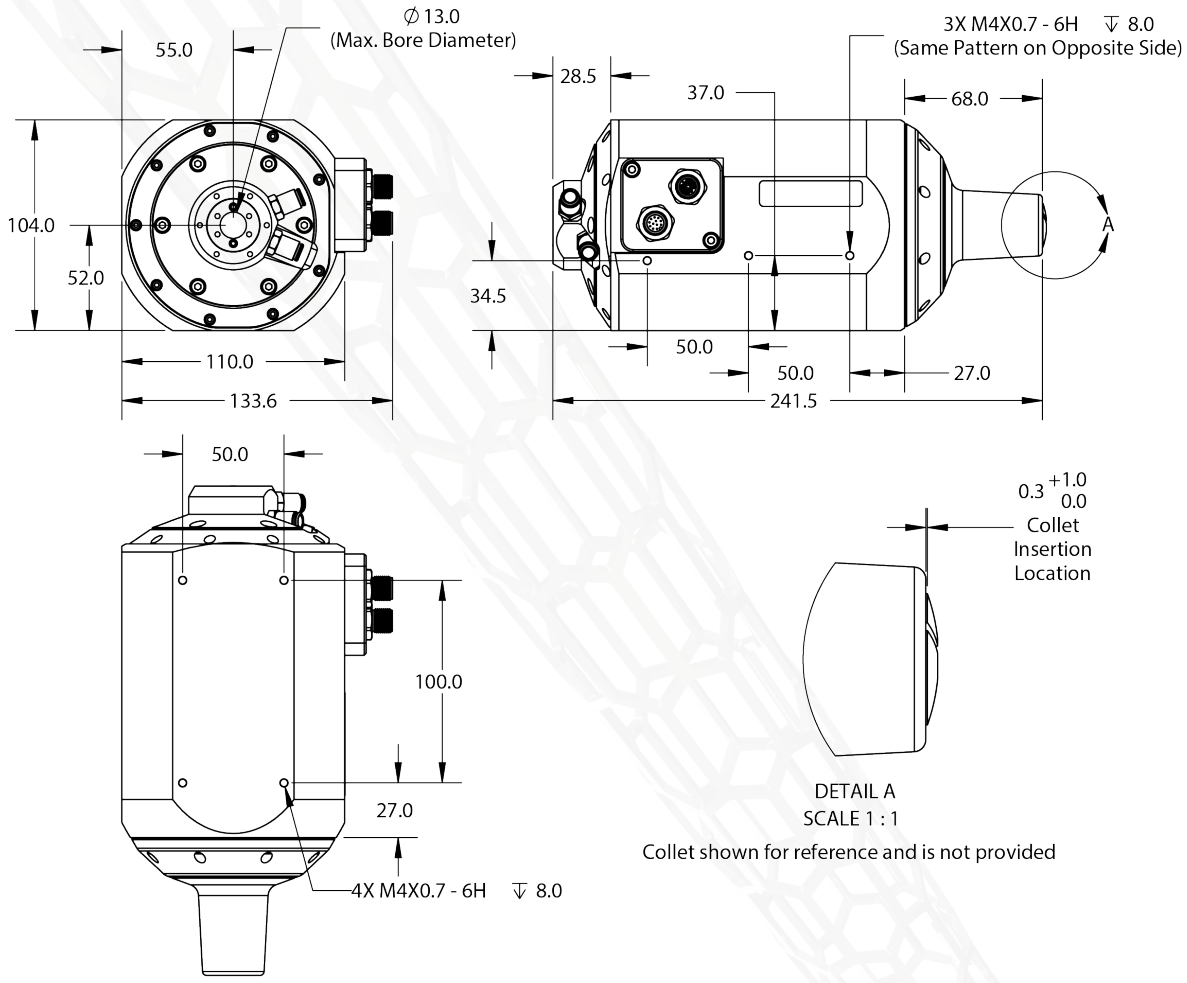
FEATURES

- Integrated Pneumatic Actuation with Zero-Friction Air Union
- High Precision Spindle Bearings
- Compatible with 3C Lathe Collets
- Up to 13.0mm Workpiece Diameter
- Low-Inertia, High Speed Design (3000rpm)
- Dead-Length Collet Closing
- Wet-Cut Capable
- Field-Serviceable Collet-Closing Mechanism

The 3CS Spindle is a high-precision rotary motion system with integrated pneumatic workholding, designed for processing sensitive tubular components in medical device manufacturing.

Its design incorporates precision spindle bearings, a non-contact rotary union, and a high-resolution encoder to enable high speeds, smooth rotation, and precise positioning. The 3CS is compatible with wet-cut operations and supports 3C collets.

For additional specifications and configuration options, contact the Griffin Motion Applications Team.


∅ 13.0
(Max. Bore Diameter)
55.0
104.0
52.0
110.0
133.6
28.5
37.0
68.0
3X M4X0.7 - 6H ↧ 8.0
(Same Pattern on Opposite Side)
A
34.5
50.0
50.0
27.0
241.5
50.0
100.0
27.0
4X M4X0.7 - 6H ↧ 8.0
0.3 +1.0 0.0
Collet
Insertion
Location
DETAIL A
SCALE 1 : 1
Collet shown for reference and is not provided

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Specifications

Performance Specifications	
Air Pressure Range (PSI)	60-90
Air Quality Required	ISO8573-1:2010 Class 3.4.3
Angular Accuracy +/- (arc-sec)	30
Angular Repeatability +/- (arc-sec)	4
Max Angular Velocity (rpm)	3000
Collet Type	3C
Continuous Torque (Nm)	2.2
Peak Torque (Nm)	4.4
Piston Surface Area (mm^2)	1650
Radial Runout of Gage Pin (µm)	<30
Rotational Inertia ($kg-m^2$)	0.00134
Stage Mass (kg)	5.4
Maximum Workpiece Diameter (mm)	13.0

Motor Specifications	
Motor Type	3φ Brushless DC
Max Voltage (VDC)	340
Back EMF (Vp/KRPM)	83.0
Electrical Time Constant (ms)	0.72
Max Continuous Current (Apk)	3.218
Peak Current (Apk)	6.436
Torque Constant (Nm/Apk)	0.684
Pin-to-Pin Resistance (Ω)	4.83
Pin-to-Pin Inductance (mH)	3.480
Pole Pairs	8

*Apk refers to Amps-peak-of-sine which is the maximum current in one phase during the full electrical cycle

Feedback Specifications	
Supply Voltage (V)	5.0±10%
Supply Current (mA)	200
Encoder Type	Incremental
Encoder Output	Analog Option: 1Vpp, Sin, Cos, Idx; Differential Pairs Digital Option: TTL, RS-422, A, B, Z, Differential Pairs
Encoder Resolution	Analog Option: 9,000 Periods/Rev Digital Option: 900,000 Counts/Rev
Hall Switch Output	Open Collector, Internal Pullup
Hall Switch Max Current (mA)	-20
Index Pulse	Once per Rev, Differential Pair

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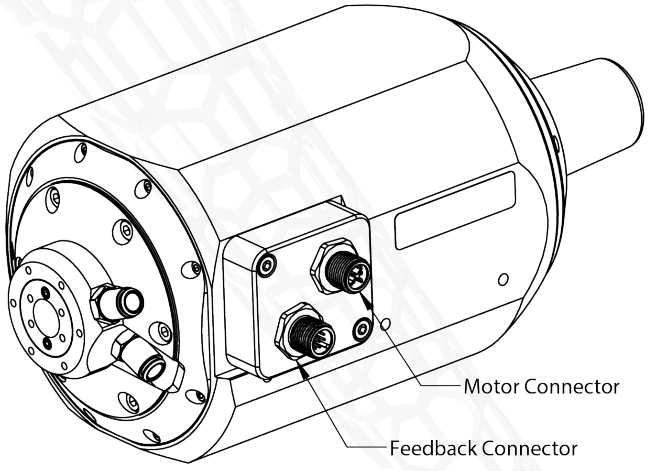
Electrical Connections

Feedback Connector Pinout (M12-12 Male)	
Pin	Signal
1	+5V
2	Sin+/A+
3	GND
4	Cos+/B+
5	*
6	Cos-/B-
7	Hall A
8	Hall B
9	Sin-/A-
10	Hall C
11	Idx+/Z+
12	Idx-/Z-
*Reserved	

Motor Power Pinout (M12-4 Male)	
Pin	Signal
1	Phase A
2	Phase B
3	Phase C
4	PE GND
*Reserved	



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3CS Ordering Options	
Product Series	3CS: Medium Tube Spindle
Encoder Options	Analog: 1Vpp, Sin, Cos, Idx; Differential Pairs, 9,000 Periods/Rev Digital: TTL, A, B, Z; Differential Pairs, 900,000 Counts/Rev
Fasteners	Black Oxide (Recommended for Dry Applications) Stainless (Recommended for Wet-Cutting Applications)
Example Part Number	35560 (All 3CS Spindles are Assigned 5 Digit Part Numbers)

Collet Operation

Apply a light layer of anti-seize to the external tapered surface of the collet. Thread the collet fully into the spindle until the front face of the collet is flush with the spindle nose.

Supply compressed air to the appropriate port using 6 mm OD tubing. Increasing air pressure will increase clamping and release force. Exhaust air will exit through the non-pressurized port and must be vented to atmosphere.

Due to the non-contact design of the rotary union, a small amount of air leakage at the rear of the union is normal.