

# CoBot SmartMagGrip E30 | P/N: 81401484

## Summary

The CoBot SmartMagGrip E30 is designed specifically to work well in the collaborative robot environment. It incorporates all of the same features as a typical Magswitch E-Series tool, including variable field output (VFO) and integrated sensing technology. The VFO allows for adjustability of the magnetic strength between 0 and 100% for de-stacking, picking single parts, or picking multiple parts. The integrated sensing technology can be used to determine or confirm the proper part is picked. The parts are taught to the tool through a simple learning process. The CoBot SmartMagGrip E30 is currently supported with direct integration to Universal Robots and Fanuc CRX robots with dedicated plugins operating via RS-485.



## Specifications

<b>Nominal Maximum Breakaway Force</b> <sup>1,2</sup>	124.1 lb	56.3 kg
<b>Nominal Maximum Shear Force</b> <sup>1,2</sup>	39.7 lb	18 kg
<b>Nominal Supply Voltage</b>	24 V DC	
<b>Peak Power Draw</b>	1A @ 24 V DC	
<b>Net Weight</b>	1.98 lb	0.9 kg
<b>Connector Type</b>	Male M12x1.0 – 5 Pin – A-coded	
<b>Mounting Options</b>	TOP: Ø6-M8-Ø6 NAAMS pattern (x2)	

De-stack Settings <sup>3</sup>	Minimum Thickness for De-stack - mm (in)	0.5 (0.020)	1 (0.039)	2 (0.079)	4 (0.157)
	Partial Actuation	30%	45%	70%	100%

Material Thickness - mm (in)	0.5 (0.020)	1 (0.039)	2 (0.079)	3 (0.118)	4 (0.157)	5 (0.197)	6 (0.236)
Maximum Force <sup>1,2,5</sup> - kg (lbs)	6.2 (13.67)	17.3 (38.14)	30.9 (68.12)	48 (105.82)	51.2 (112.88)	56.2 (123.90)	56.3 (124.12)

$$SWL \text{ (Safe Working Load)} = \frac{\text{Maximum Force}^5}{\text{Safety Factor} (\geq 5)}$$

<sup>1</sup> Determined in laboratory environment on SAE1018 Steel with surface roughness 63 micro inches with optimized pole shoes. Many factors contribute to the actual breakaway force and safe working load in each application. Consult a Magswitch Applications Engineer and test the Magswitch in each application before deployment.

<sup>2</sup> All data applies to unit with flat pole shoes installed.

<sup>3</sup> Determined with SAE1018 Steel L=200mm W=200mm with clean and dry surface condition.

<sup>4</sup> Values may vary by +/- 5%.

<sup>5</sup> Maximum forces listed above are not safe lifting forces. Designer must take into account safety factor when specifying tool. Magswitch recommends SWL = 5:1 for most applications.

**Pole shoes required for operation**

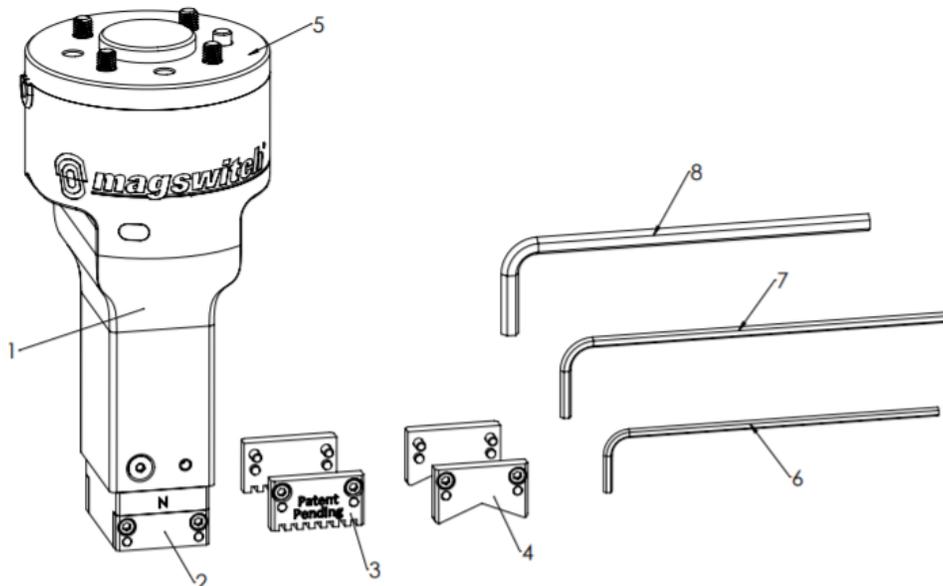
**Standard Kits Available:**

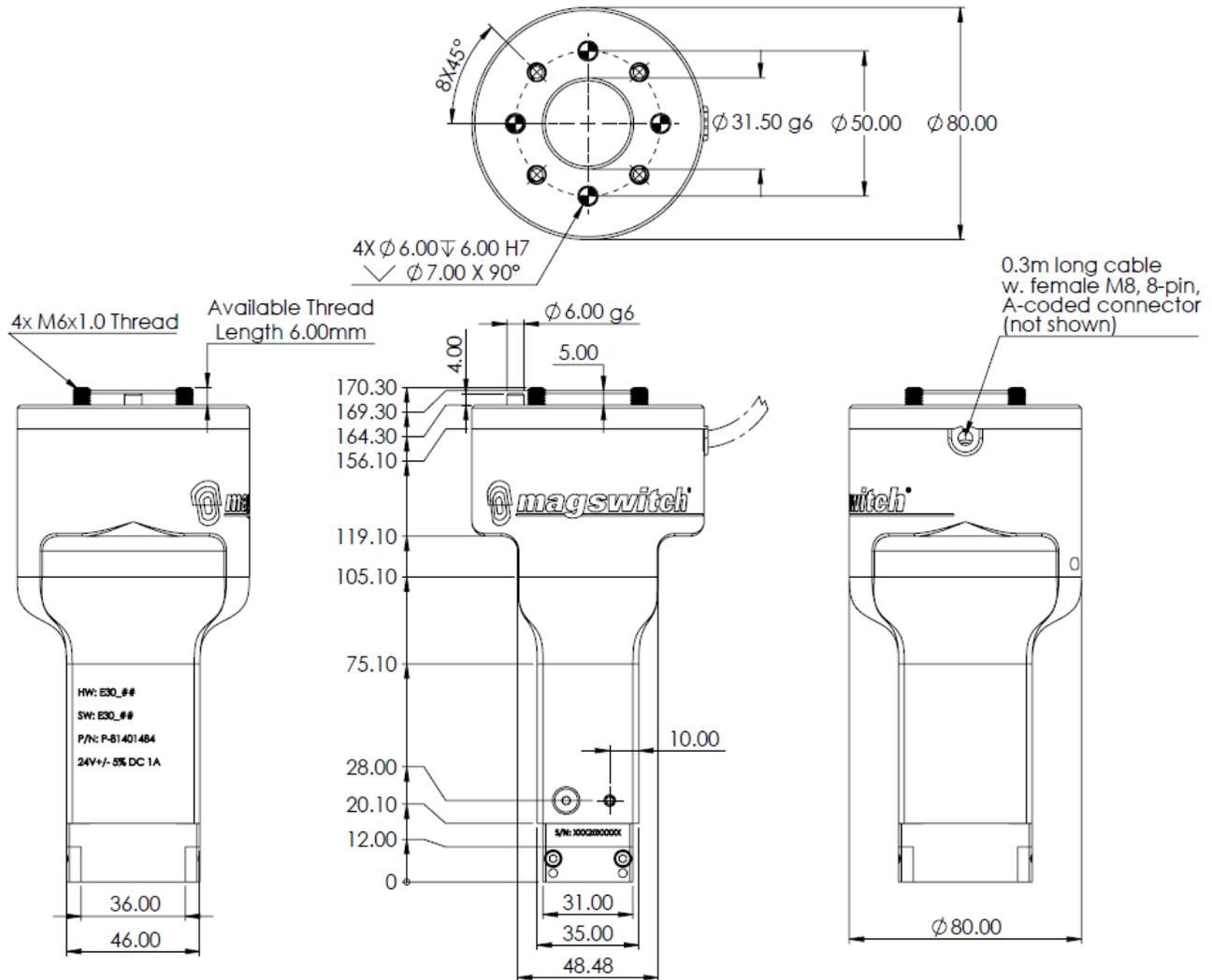
Standard Pole Shoe Kit	8800782
Teeth Pole Shoe Kit	8800862
135 Degree V-Cut Pole Shoe Kit	88001123
CoBot SmartMagGrip E30 Bin Picking Kit (including 45 Degree Mount Kit, Armor Kit, Standard Pole Shoe Kit for Armor, 135 Degree V-Cut Pole Shoe Kit for Armor, 155 Degree V-Cut Pole Shoe Kit for Armor)	88001350
Straight Mount Kit	88001353
45 Degree Mount Kit	88001473
Bin Picking Armor Kit	88001423
Standard Pole Shoe Kit – Armor	88001424
135 Degree V-Cut Pole Shoe Kit – Armor	88001426
155 Degree V-Cut Pole Shoe Kit – Armor	88001427

**Items in The Package:**

Item No.	Item	QTY
1	CoBot SmartMagGrip E30	1
2	Standard Pole Shoe Kit	1
3	Teeth Pole Shoe Kit	1
4	135 Degree V-Cut Pole Shoe Kit	1
5	Straight Mount Kit	1
6	2.5mm Allen Key	1
7	3mm Allen Key	1
8	5mm Allen Key	1

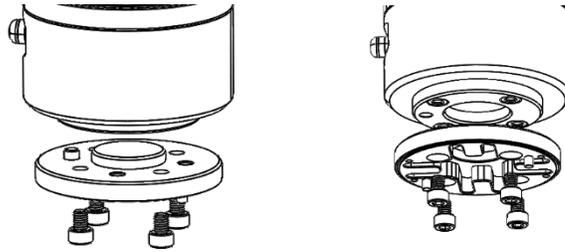
**WARNING!**  
Do Not Operate Unless In  
Contact With Ferrous Target!



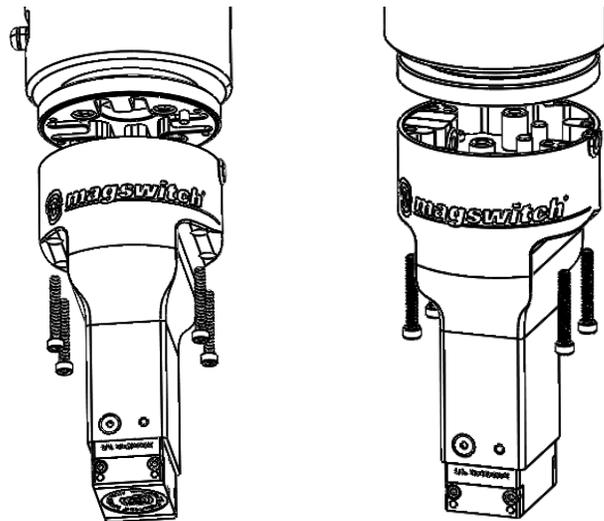


## Installation Instructions

- Actuate the CoBot SmartMagGrip E30 tool to the OFF state.
- Remove the CoBot SmartMagGrip E30 tool from preexisting mounting surfaces as required to expose top surface of the tool. Ensure dowel and fastener holes are clean.
- Remove the Straight Mount Kit from preexisting mounting surfaces as required to expose top surface of the mount kit. Ensure dowel and fastener holes are clean.
- Align the Straight Mount Kit with fastener pattern on the robot arm and insert dowel until the bracket is flush with the mounting surface of robot arm.
- Thread four M6x16mm SHCS fasteners through the Straight Mount into the thread bores on the robot arm. All M6 fasteners must be tightened with 8Nm.



- Align the CoBot SmartMagGrip E30 tool with fastener pattern on the Straight Mount and insert two dowels until the top surface of the tool is flush with the bottom surface of Straight Mount.
- Apply Loctite 222 on the thread of four M4x30mm SHCS fasteners. Thread all M4 fasteners through the CoBot SmartMagGrip E30 tool into the thread bores on the Straight Mount. Torque all M4 fasteners to 1Nm.



## General Electrical Characteristics

Parameter	Value
Input Voltage Range	24 ± 5% V DC
Rated Current Draw (Continuous and Peak)	1 A DC @ 24 V DC
Connection to tool	0.3 m long, 5 mm diameter cable to M8 connector
Connector Style	Female Right Angle M8 – 8 Pin – A-Coded

## Ambient Conditions

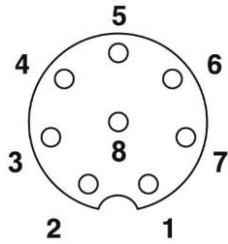
Parameter	Range
Ambient Temperature (Operation)	-10 to +40 Degrees Celsius
Ambient Temperature (Storage)	-25 to +80 Degrees Celsius
Relative Humidity (non-condensing)	0 to 95%

## LED Color Codes

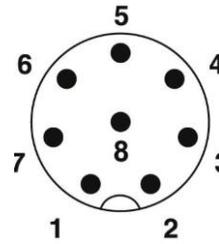
Function/State	Blue LED State	Green LED State
No power to tool	OFF	OFF
Waiting to home magnet	Blinking	Blinking
Magnet actuated OFF	ON	OFF
Magnet actuated ON 100% (Fail-Safe)	ON	ON
Magnet partially actuated	ON	Blinking
Standard calibration routine	Blinks when calibration mode is entered Blinks when steps 1-4 are confirmed	OFF/ON depending on magnet state
Auto-calibration routine	Blinks on entry and exit/confirmation	OFF/ON depending on magnet state

## Connector Pinout

Pin #	Function	Logic
1	RS-485 +	TX/RX high line (RS-485 +)
2	RS-485 -	TX/RX low line (RS-485 -)
3	(Internally Disconnected)	-
4	(Internally Disconnected)	-
5	Vin (V+)	+24 VDC
6	GND (V-)	GND (0 VDC)
7	Vin (V+) – Internally connected to 5	+24 VDC
8	GND (V-) – Internally connected to 6	GND (0 VDC)



Tool Side: Pin Assignment M8, 8-pin, A-coded, Female Connector (socket-side)



Robot side: Pin Assignment M8, 8-pin, A-coded, Male Connector (pin-side) View

## 4-Step Calibration Procedure

See setup manual 1101607 for more detail.

### Step 1

Limiting Position 1 for Calibration Match Signal

### Step 2

Limiting Position 2 for Calibration Match Signal

### Step 3

South Pole Position for South Pole Signal

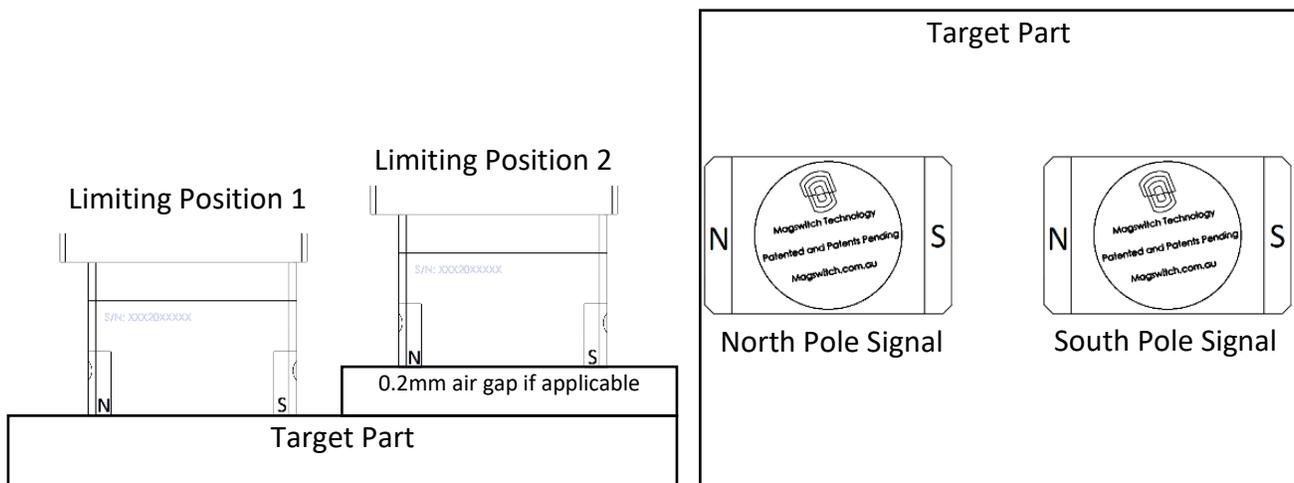
### Step 4

North Pole Position for North Pole Signal

**Part Present, N Pole, and S Pole** will return HIGH when the contact quality between both poles and the part lie within the zone created by bounding Limiting Position 1, Limiting Position 2, and North and South Pole calibration signals.

**S Pole** will return HIGH if contact quality is equal to or better than the stored South Pole signal.

**N Pole** will return HIGH if contact quality is equal to or better than the stored North Pole signal.



It is critical that the magnet be fully actuated (Actual Position = 100) at each calibration step to guarantee proper field values are stored. **The tool will not allow you to confirm calibration steps 1 through 4 unless the magnet is ON and the green light is lit.**

The supplementary document 1101607 can be provided by Magswitch if additional information regarding calibration procedure is needed.