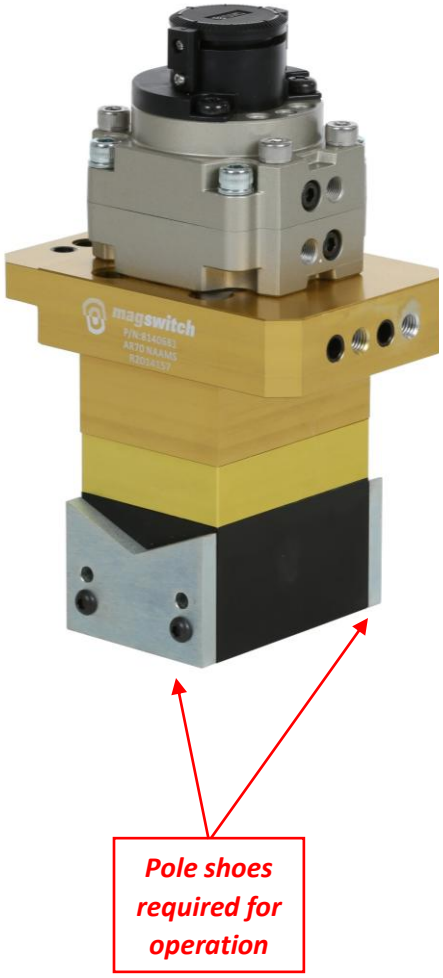
**MAGSWITCH AR70 NAAMS**
P/N: 8140681
+ 1 (303) 468.0662
magswitch.com

# AR70 NAAMS | P/N: 8140681

The AR70 spans the gap between our best-selling AR50 Classic and the AR110 behemoth. Featuring precision NAAMS mounting on top and side faces, it's a well-rounded tool designed for part pick and place, with a bit of extra "oompf" for those tricky applications.




## General Specifications[1]

| | | | |
|---|---|---|---|
| **Maximum Breakaway Force** | 4261.3 N | 958.0 lbf | 434.5 kgf |
| **Maximum Shear Force** | 1127.8 N | 253.0 lbf | 115.0 kgf |
| **Net Tool Weight** | | 15.0 lbs | 6.8 kg |
| **Full Saturation Thickness** | | 0.50 in | 12.7 mm |
| **Minimum De-Stack Thickness** | | 0.50 in | 12.7 mm |
| **Maximum Magnet Temperature** | | 176 $^{0}$F | 80 $^{0}$C |
| **Maximum Allowable Air Pressure** | | 145.0 psi | 10.0 bar |
| **Actuator Volume** | | 5.49 in$^3$ | 90.00 cm$^3$ |
| **Air Port Threads** | | | 2x G1/8 |
| **Mounting Options** | | | Sides: (6x) M8x1.25<br>Bottom: (4x) M8x1.25 |

### Thin Sheet and Off-Target Operation

This tool was designed to operate on-target on material thicker than 3mm. Continuous operation of the tool off-target or on material thinner than 3mm will result in decreased tool life.

If this tool must be operated off-target or on thin material, Magswitch recommends adding a 0.74 mm (0.029") orifice in the OFF port to prolong tool life. If cycle time is a concern and application uses target material that is 3mm or thicker, do not operate the tool with an orifice in the OFF port.

Magswitch recommends AR50s (PN 81401167) or D120s (PN 81401457) for lifting thin sheets.

Contact Magswitch engineering at +1 (303) 468.0662 if you have any questions or concerns about your application.

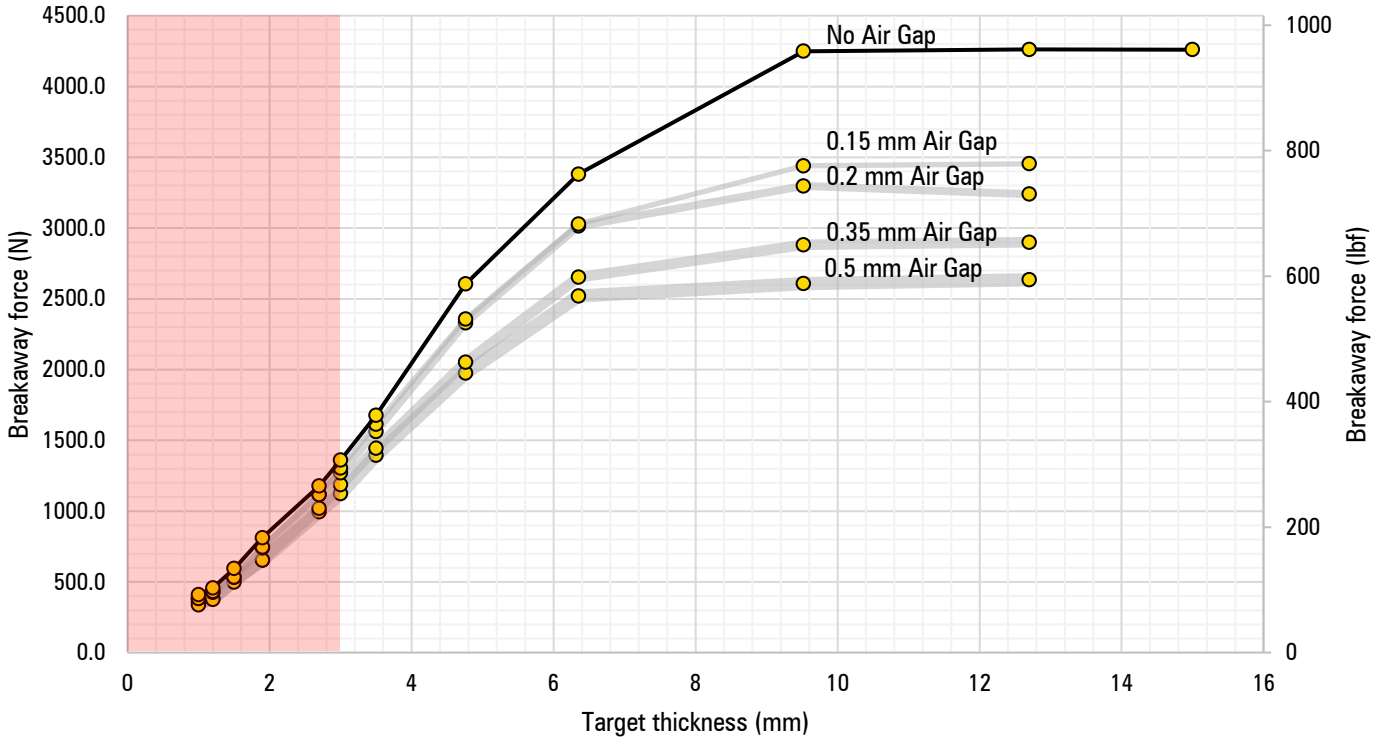
## Magnet Strength[1]

**Table 1: Breakaway Strength with Different Sheet Thicknesses**

(See thin sheet warning on page 1 for operation on material thinner than 3mm)

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Target Thickness** | mm | 1 | 1.2 | 1.5 | 1.9 | 2.7 | 3 | 3.5 | 4.76 | 6.35 | 9.52 | 12.7 | 15 |
| | *in* | 0.039 | 0.047 | 0.059 | 0.075 | 0.106 | 0.118 | 0.138 | 0.187 | 0.250 | 0.375 | 0.500 | 0.591 |
| **Hold Force** | N | 410.6 | 457.6 | 594.0 | 812.3 | 1178.8 | 1361.5 | 1676.0 | 2605.0 | 3380.7 | 4248.9 | 4261.3 | 4260.0 |
| | *lbf* | 92.3 | 102.9 | 133.5 | 182.6 | 265.0 | 306.1 | 376.8 | 585.6 | 760.0 | 955.2 | 958.0 | 957.7 |

**Figure 1: Breakaway Strength with Different Air Gaps**




### [1] Footnotes:

- **The forces listed in this document represent ideal maximums and may not accurately reflect the actual forces achievable in a customer's specific application due to variations in materials or process conditions.**
- **Review and understand the warnings section on page 3 before operating the tool.**
- Breakaway forces were determined in laboratory environment on a 200mm x 200mm sheet of SAE1018 Steel with surface roughness of 63 microinches with standard pole shoes.
- Breakaway forces in General Specifications, Table 1, and Figure 1 were determined using standard pole shoes on clean, flat surfaces with no air gaps between the pole shoes and the target material. Any variation from this ideal scenario will decrease breakaway forces.

## Warnings

**Review and understand all warnings before operating the tool.**

**Contact and consult Magswitch engineering at +1 (303) 468.0662 if you have any questions or concerns about your application or the tool's operation.**

- The breakaway and shear forces listed in this document are not safe lifting forces. Designers must account for the safety factor. Safe working loads must account for additional forces placed on the magnet and part when in motion or out of balance.
- All mounting hardware SHALL be non-magnetic stainless steel or aluminum.
- The forces listed in this document represent ideal maximums and may not accurately reflect the actual forces achievable in a customer's specific application due to variations in materials or process conditions.
- The following conditions affect the tool's strength and impact the safe handling and transport of target materials:
    - Motion of the magnet (e.g. fast movements, emergency stops, and steep carrying angles)
    - Debris or contamination on the target surface
    - Air gaps between the magnet and target materials
    - Wear and damage to the tool's pole shoes
    - Target material thickness (Reference *Table 1* on page 2 for reduced hold force on thinner material)
    - Target material shape
    - Target material alloy
    - Pole shoe design
- To safely use the tool:
    - Always use pole shoes. If your pole shoes include dowel pins, always operate with dowel pins installed.
    - Failure to provide adequate air pressure to the tool may result in incomplete actuation and reduced breakaway force. If the tool is partially actuated and a power failure occurs, the tool will lose grip and parts may fall.
    - The COG of the material being lifted should be centered on the magnet to reduce pry.
    - Ensure all surfaces are clean and free of debris for maximum magnetic hold force. Any air gaps will reduce the magnet's hold force.
    - Do not expose the magnet to temperatures above 80$^{0}$C (176$^{0}$F). High temperatures will permanently degrade the magnet and may result in an unsafe condition.
    - Consult Magswitch engineering for custom pole shoes if working with irregular target surfaces.
- To prolong the life of the tool:
    - Always use armor in bin picking operations.
    - Do not actuate the magnet off-Thin Sheet and Off-Target Operation. Actuation of the magnet off-Thin Sheet and Off-Target Operation will lead to increased wear on the magnet's internal actuation mechanisms.
    - Do not operate using more than the maximum listed actuation pressure.
    - Use clean dried air filtered to 40um to operate the tool.
- Always perform testing before deployment.
- Please refer to document 110636, Magswitch Automation Tool Operation and Integration Guidelines, or contact Magswitch engineering for details on actuation pressures, volumes, and detailed actuator information.

## Accessories Available

| | |
|---|---|
| **Standard Pole Shoes** | |
| AR70 Standard Flat Pole Shoes (Included) | 8800363 |
| Kit AR70 Combo Flat/Pipe Poles Standard | 8800072 |
| AR70 Standard Pin Clamp Pole Shoe Kit | 8800493 |
| **Armor** | |
| ARMOR KIT, AR70, Bin Picking Kit | 88001415 |
| **Armor-Ready Pole Shoes** | |
| PSK, AR70, FLAT, ARMOR READY | 88001416 |
| PSK, AR70, 135deg V-CUT, 2”-5” DIA. Range, ARMOR READY | 88001417 |
| PSK, AR70, 155deg V-CUT, 5”-10” DIA. Range, ARMOR READY | 88001418 |
| **Flow Control for Thin-Target Applications** | |
| KIT, ADAPTER, BUILT IN ORIFICE, 1/8 BSPT MALE X FEMALE, FOR AR70 NAAMS, AR70 NAAMS EH, WITH RC1/8 PORTS | 88002242 |
| **Sensing** | |
| SENSOR BRACKET, M8 PROX, AR70 CLASSIC | 8800797 |

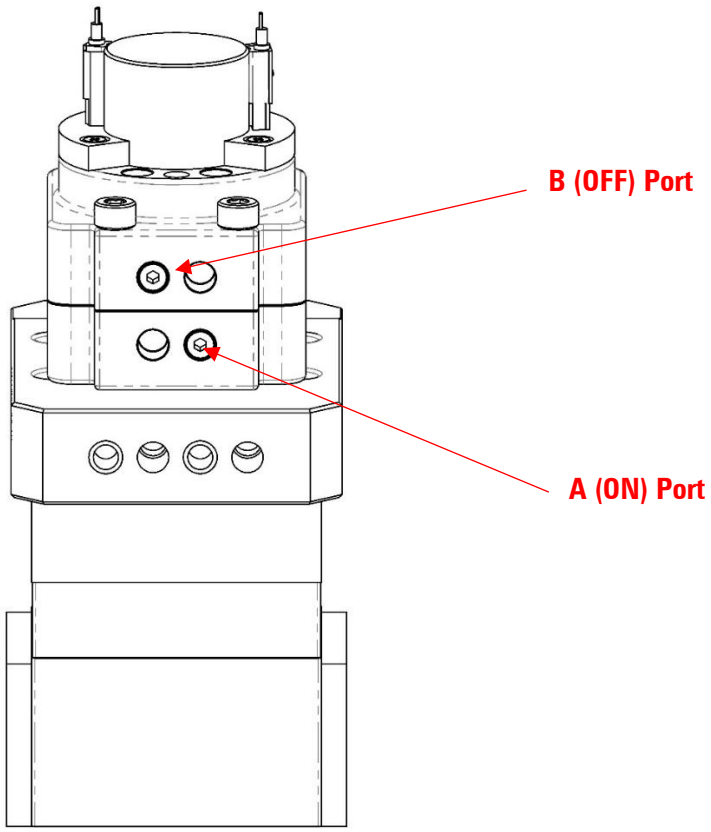
## Pole Shoe Installation

1. Remove any pole shoes currently installed on the sides of the tool.
2. Ensure dowel and fastener holes are clean. Confirm the side surfaces of the magnet housing are flat and smooth.
3. Align dowel pins with housing bores and apply light pressure to seat poles flush against housing.
4. Apply Loctite 222 to fastener threads and install 4x M6 socket head cap screws.
5. Torque all screws to 11.5 Nm (8.5 ft-lbf). There should be no visible gap between the pole shoes and the magnet housing.

## Pneumatic Operation

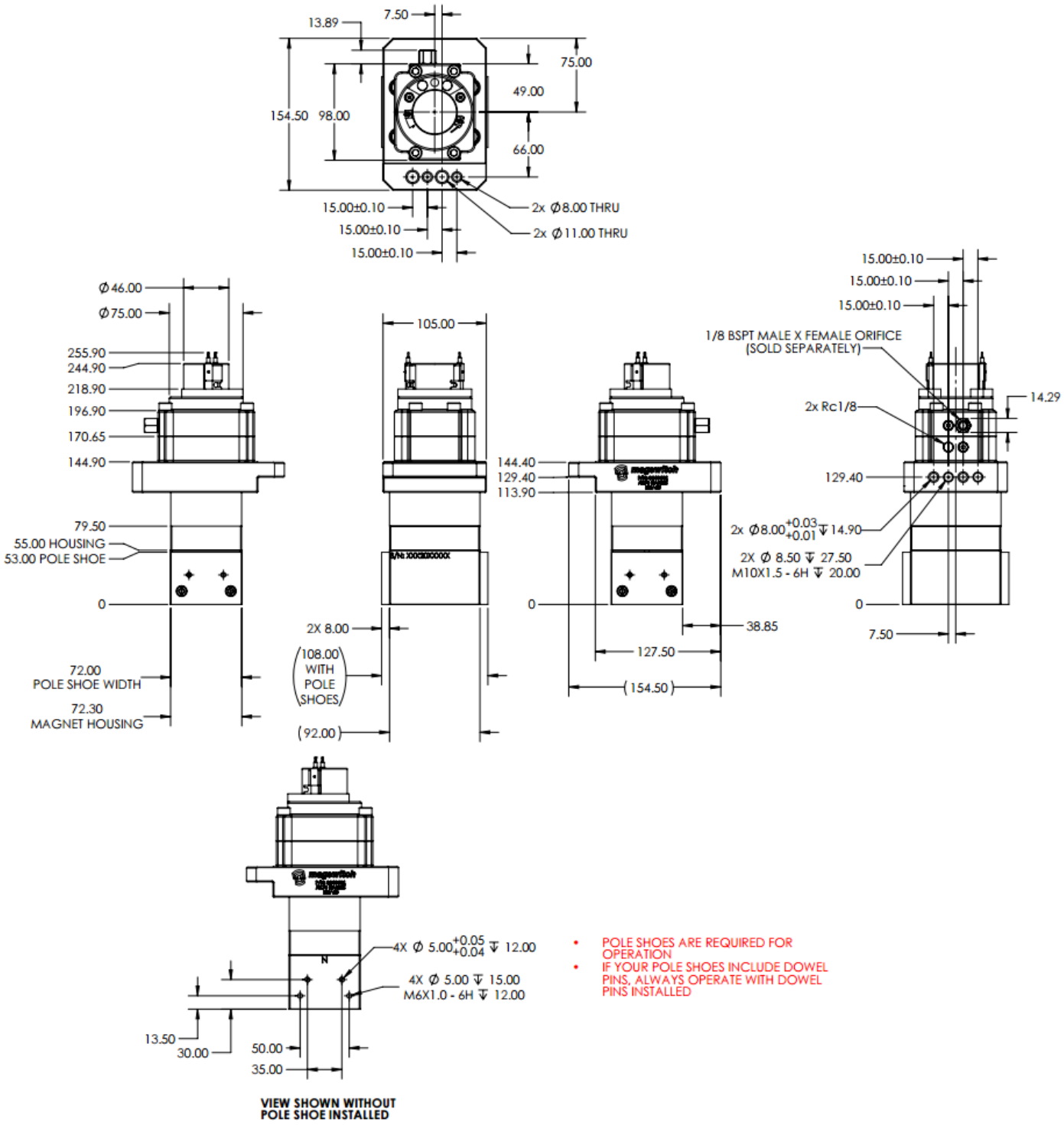
| | | |
|---|---|---|
| **Maximum Allowable Air Pressure** | 145.0 psi | 10.0 bar |
| **Minimum Pressure Required for Actuation (Full saturation)** | 29.0 psi | 2.0 bar |
| **Maximum Pressure Required for Actuation (Off-target)** | 79.8 psi | 5.5 bar |
| **Actuator Volume** | 5.49 $in^3$ | 90.00 $cm^3$ |
| **Actuation On Time** | On target | 96 ms |
| | On target, with flow restriction | 800 ms |
| | Off target | 295 ms |
| | Off target, with flow restriction | 1200 ms |
| **Actuation Off Time** | On target | 64 ms |
| | On target, with flow restriction | 500 ms |
| | Off target | 78 ms |
| | Off target, with flow restriction | 500 ms |
| **Air Port Threads** | 2x G1/8 | |
| **Air Preparation** | Clean dried air filtered to 40um | |

**Figure 2: Air Port Configuration**




**Positive pressure must be applied to A port to actuate magnet ON.**
Reversal of ports may result in dangerous off-target actuation.

## Tool Dimensions




- POLE SHOES ARE REQUIRED FOR OPERATION
- IF YOUR POLE SHOES INCLUDE DOWEL PINS, ALWAYS OPERATE WITH DOWEL PINS INSTALLED

**WARNING! Review and understand the warnings section on page 3 before operating the tool.**

## Center of Mass

