

www.smart-arms.com



Ergonomic Tool Arms, LLC.

Smart-Arms

**Torque Arms With Position Feedback Sensors
for Industrial Assembly Tools**

- Position Feedback on X/Y or X/Y/Z
- 4 Encoder Options offered plus Encoder-Ready Models
- Designed specifically and priced right for INTEGRATORS and MACHINE BUILDERS who provide their own controls.
- 7 Standard Frame Sizes Eliminate Torque Reaction and Weight of DC Tools from 1 to 125 Nm (1 to 1,100 in-lbs) and 1 to 25 lbs of tooling
- 20 Standard Tool Holder options
- Also used with Rivet-Nut and Blind Rivet Tools
- Customized Arms also available
- 5-Year Mechanical Wear-Out Warranty
- Shipped Fully Assembled, ready to install via UPS Ground.
- Quick Delivery



PRICE • QUALITY • DELIVERY
MADE IN AMERICA

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Encoder Options

There are 2 encoders on each arm to provide X/Y position feedback. One at the Shoulder pivot and one at the Elbow pivot.



Model Designation	GCSA	AVSA	AMSA	IOSA ¹	XXSA
Output	Parallel Gray Code NPN open Collector Negative Logic (active low)	Analog 0.1 to 10.0 VDC	Analog 4 to 20 mA	IO-Link Spec V1.1 to IEC 61131-9, Smart Sensor Profile. Programmable Parameters for Zero point offset, averaging and rotational direction.	N/A
Encoder Connections Per X/Y Smart-Arm	[2] cables 55" (140 cm) long with flying leads having 13 conductors each + shield	[2] short cables (150 mm long) with M12, 4 Pin Male Connectors	[2] short cables (150 mm long) with M12, 4 Pin Male Connectors	[2] short cables (150 mm long) with M12, 4 Pin Male Connectors	N/A
Mechanical Description	Mechanical rotary encoders coupled to smart-arm shafts by an alignment coupler. Long Life	Hall Effect - Encoder. No moving sensor parts. Mechanically Decoupled from Tool Arm Shafts (No shaft coupler). Unlimited life.	Hall Effect - Encoder. No moving sensor parts. Mechanically Decoupled from Tool Arm Shafts (No shaft coupler). Unlimited life.	Hall Effect - Encoder. No moving sensor parts. Mechanically Decoupled from Tool Arm Shafts (No shaft coupler). Unlimited life.	Encoder Ready Arm with 8mm Ø x .375" L shaft extensions and 10-32 tapped holes for your bracket and encoders.
PLC I/O Requirement	11 inputs per encoder Gray Code must be converted to binary by PLC	1 input per encoder	1 input per encoder	1 connection to IO-Link Master per encoder	N/A
Absolute Resolution	11 bit (2048)	12 bit (4096)	12 bit (4096)	14 bit (16,384)	N/A
Repeatability (Each Encoder)²	0.09°	0.10 °	0.10 °	0.10 °	N/A
Input Supply Voltage (24 VDC Nominal)	11 - 26 VDC	18 - 30 VDC	18 - 30 VDC	18 - 30 VDC	N/A

¹ IO-Link Data for these devices available to download at smart-arms.com/downloads

² There are many factors that affect fastener location accuracy. Some of the common factors are bit or socket extension wiggle, tool spindle compliance and spring loaded spindle collapse, component dimensional consistency, accuracy of the component location in the fixture, and of course, repeatability and accuracy of the smart-arm encoders. These factors are not usually critical unless the fastener locations are very close together (almost touching). When all of the physical location issues are optimized, then typically your controls should be able to read our encoder outputs to differentiate between fasteners within approximately 1/8" (3mm).

Z Axis Position Feedback

Most applications require only 2-axis position feedback (X & Y) to error proof manual assembly operations; but sometimes the vertical or Z axis position is needed for location verification when fasteners are being driven horizontally. The Z axis can also be important if you are assembling components in layers, or fasteners are located at various heights or angles off-vertical.

We have a simple solution for these applications requiring Z axis feedback. It can be ordered with a new smart arm, or purchased separately and added to any ETA arm at any time. It simply clamps onto one of the parallel arms of any ETA model.

We offer it in 2 outputs. Model **ZAV** has analog voltage output. Model **ZAM** has analog current output. The **ZAV** and **ZAM** sensors are electronic inclinometers that measure the tilt of the ETA Parallel Rack as the arm moves up and down. Accuracy is 0.3 degrees. Supply voltage is 12-24 VDC for either model.



Model Examples

ETA Smart-Arms are manufactured in our Eastern Pennsylvania factory in over 180 different standard model configurations to enhance the ergonomics, improve the quality and eliminate operator assembly errors. Our modular design means they can be assembled to order to fit any specific application. Our selection of frame sizes and tool holders are designed to handle most styles and sizes of assembly tools. ETA Smart-Arms are the same mechanically as our conventional torque arms that are detailed on toolarms.com. Below are some examples of Smart-Arm models. More model configuration information along with detailed electrical specs can be found on smart-arms.com.

EL506-UV-GCSA

Standard Duty Gray Code, 2 axis Smart-Arm with Universal Vertical tool holder for inline tools driving fasteners vertically up to 62 Nm with a maximum of 2.25 Kg of tool weight.

EL815-UV-IOISA

Heavy Duty IO-Link, 2 axis Smart-Arm with Universal Vertical tool holder for inline tools driving fasteners vertically up to 90 Nm with a maximum of 6.3 Kg of tool weight.

EL815-RAV-AMSA

Heavy Duty Analog Current (M), 2 axis Smart-Arm with Right Ange Vertical tool holder for right angle tools driving fasteners vertically up to 90 Nm with a maximum of 6.1 Kg of tool weight.

EL815-PS-AVSA-ZAV

Heavy Duty Analog Voltage, 3 axis Smart-Arm with Pistol Spin tool holder for pistol grip or inline tools driving fasteners horizontally up to 45 Nm with a maximum of 6.2 Kg of tool weight.

EL1015-NB-AVSA-ZAV-OM

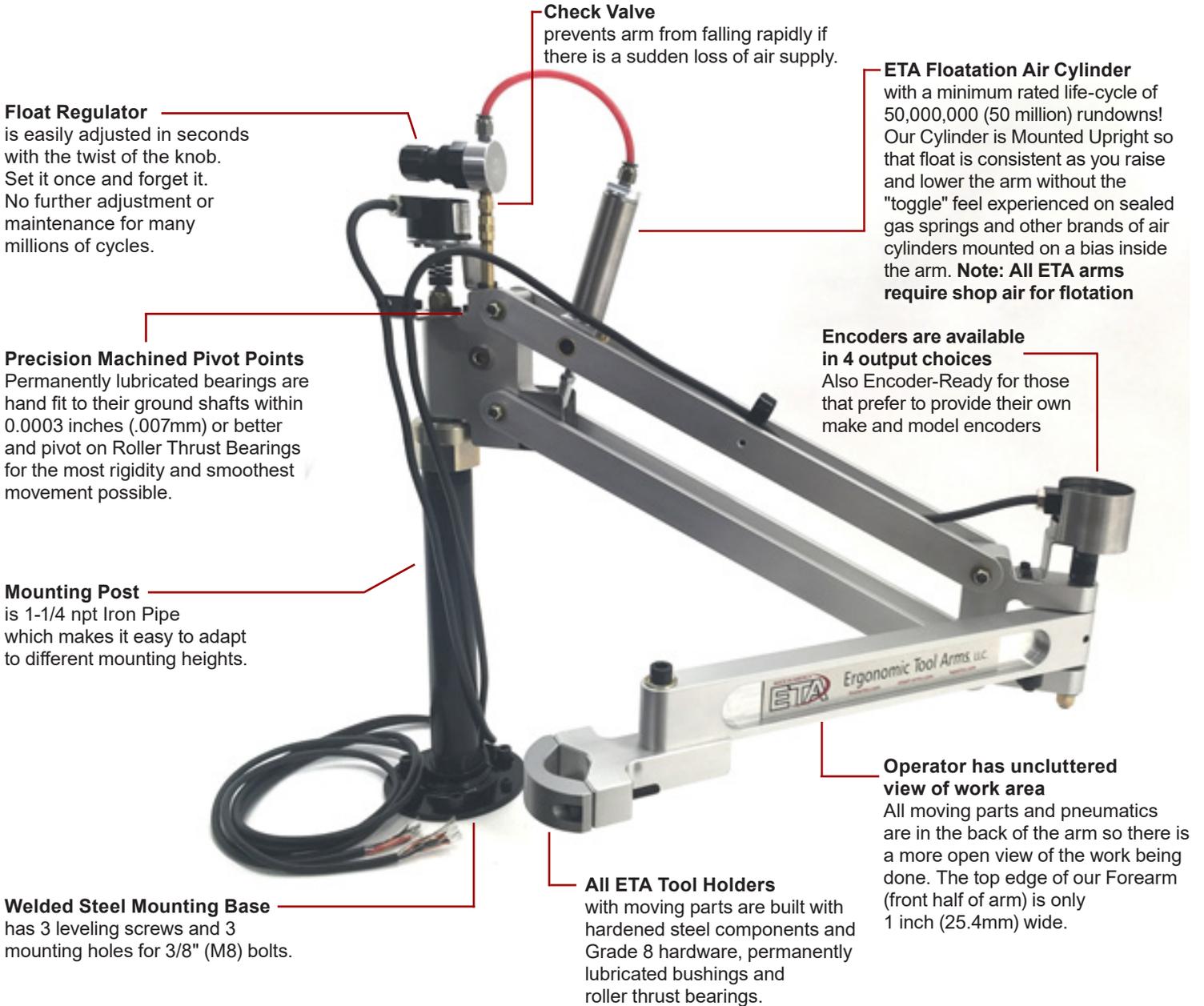
Overhead Mount, Extra Heavy Duty Analog Voltage, 3 axis Smart-Arm with Needle Bearing tool holder for right angle tools driving fasteners horizontally up to 68 Nm with a maximum of 5.6 Kg of tool weight.

**ETA Smart-Arms
can also be customized
to fit your application**



Good Design, Precision Machining & Careful Assembly make ETA the Smart-Arm solution for many years of efficient production.

ETA Tool Arms are covered by a 5-Year Warranty against excessive wear and/or part breakage. This 5 Year Warranty includes all bearings, bushings, shafts, and float cylinder for an unlimited amount of use cycles! See smart-arms.com/warranty for details.



Float Regulator
is easily adjusted in seconds with the twist of the knob. Set it once and forget it. No further adjustment or maintenance for many millions of cycles.

Precision Machined Pivot Points
Permanently lubricated bearings are hand fit to their ground shafts within 0.0003 inches (.007mm) or better and pivot on Roller Thrust Bearings for the most rigidity and smoothest movement possible.

Mounting Post
is 1-1/4 npt Iron Pipe which makes it easy to adapt to different mounting heights.

Welded Steel Mounting Base
has 3 leveling screws and 3 mounting holes for 3/8" (M8) bolts.

Check Valve
prevents arm from falling rapidly if there is a sudden loss of air supply.

ETA Flotation Air Cylinder
with a minimum rated life-cycle of 50,000,000 (50 million) rundowns! Our Cylinder is Mounted Upright so that float is consistent as you raise and lower the arm without the "toggle" feel experienced on sealed gas springs and other brands of air cylinders mounted on a bias inside the arm. **Note: All ETA arms require shop air for flotation**

Encoders are available in 4 output choices
Also Encoder-Ready for those that prefer to provide their own make and model encoders

Operator has uncluttered view of work area
All moving parts and pneumatics are in the back of the arm so there is a more open view of the work being done. The top edge of our Forearm (front half of arm) is only 1 inch (25.4mm) wide.

All ETA Tool Holders
with moving parts are built with hardened steel components and Grade 8 hardware, permanently lubricated bushings and roller thrust bearings.



Smart-Arms.com
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