www.smartarms.com

ETA®

Ergonomic Tool Arms, LLC

SmartArms™

Torque Arms With Position Feedback Sensors for Industrial Assembly Tools

PRICE • QUALITY • DELIVERY

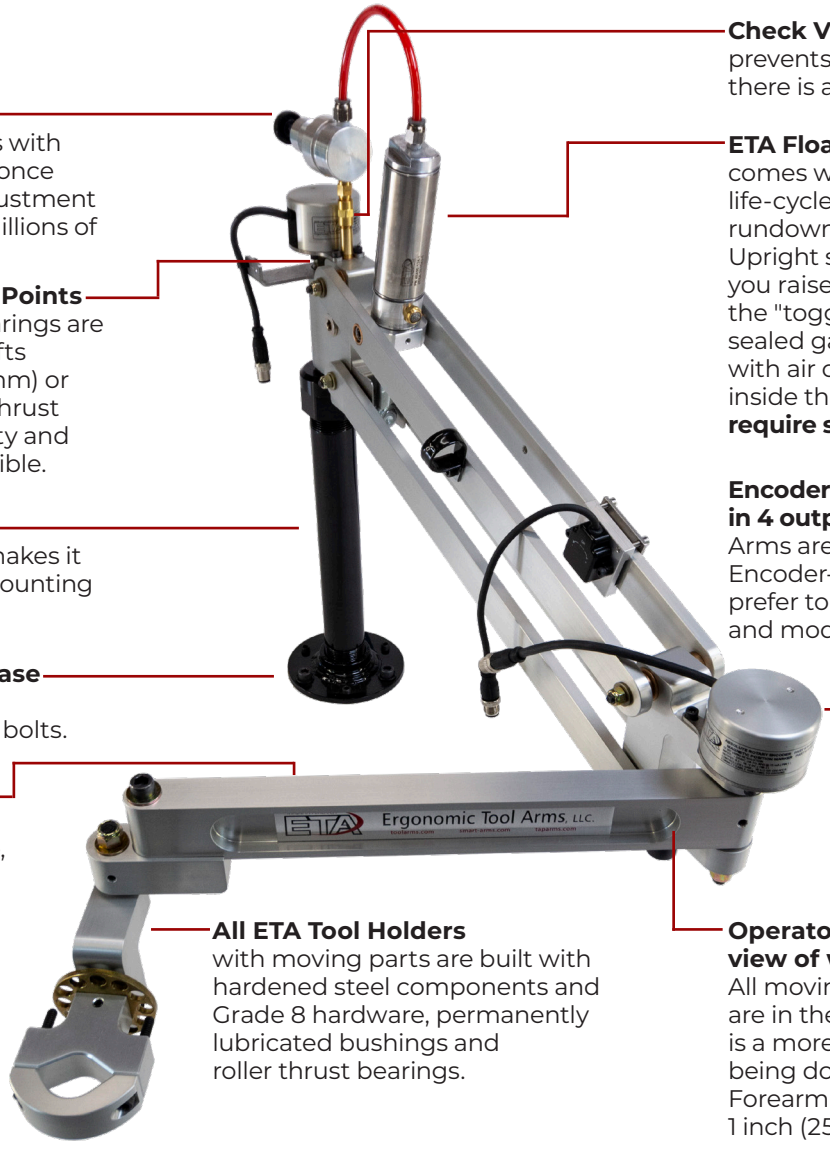
MADE IN AMERICA

SmartArms.com • ToolArms.com • TapArms.com

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

All 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 **SmartArms.com/warranty** for details.

- Designed specifically, and priced economically for INTEGRATORS and MACHINE BUILDERS who provide their own controls.
- Feedback of X and Y position on all models.
- Z axis position analog feedback available with all models. This option is also available to quickly add on to any existing ETA Arm.
- Pitch and yaw analog feedback also available for driving fasteners at off-vertical angles.
- 7 Standard Frame Sizes Eliminate Torque Reaction up to 125 Nm (1,100 in-lbs), and Weight of DC Tools up to 25 lbs (11.4 Kg)
- 21 Standard Tool Holders.
- Also used with Rivet-Nut and Blind Rivet Tools.
- 4 Encoder Output Options offered; plus Encoder-Ready Models.
- Shipped Fully Assembled via UPS Ground, ready to install.
- Quick Delivery!
- Useful for error-proofing and integrating IIoT Connected Machines.
- Customized Arms also available.
- Made in U.S.A.



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

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.

ETA Floatation Air Cylinder
comes 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 with air cylinders mounted on a bias inside the arm. **Note: All ETA arms require shop air for flotation.**

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.

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

Mounting Post
is 1-¼ 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 ⅜" (M8) bolts.

Engraved Data Plate
ETA Arms have individual serial numbers, model code, and basic specs.

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

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.

Model Ordering Code

All Smart Arm configuration model numbers will consist of at least three parts; the frame, tool holder, and encoder. An SP prefix is used only when an arm is customized or has non-standard components. The Options suffix is used when an arm is configured with any of the available options or accessories.
An example model number is shown below.

Frame	Tool Holder	Encoder	Options
EL815	**-UV**	**-IOSA**	**-OM**

FRAMES

EL306 – Standard Duty, Short Reach
*Maximum Reach 24" (610mm)***+**
Vertical Travel 10.3" (261mm)
*Maximum Tooling Weight 6 lbs (2.7 Kg)******
Maximum Vert Torque 550 in-lbs (62 Nm)
Maximum Horz Torque 275 in-lbs (31 Nm)

EL315 – Heavy Duty, Short Reach
*Maximum Reach 24" (610mm)***+**
Vertical Travel 10.3" (261mm)
*Maximum Tooling Weight 15 lbs (6.8 Kg)******
Maximum Vert Torque 800 in-lbs (90 Nm)
Maximum Horz Torque 400 in-lbs (45 Nm)

EL506 – Standard Duty, Full Reach
*Maximum Reach 36" (915mm)***+**
Vertical Travel 17.6" (447mm)
*Maximum Tooling Weight 6 lbs (2.7 Kg)******
Maximum Vert Torque 550 in-lbs (62 Nm)
Maximum Horz Torque 275 in-lbs (31 Nm)

EL806 – Medium Duty, Full Reach
*Maximum Reach 36" (915mm)***+**
Vertical Travel 17.6" (447mm)
*Maximum Tooling Weight 6 lbs (2.7 Kg)******
Maximum Vert Torque 800 in-lbs (90 Nm)
Maximum Horz Torque 400 in-lbs (45 Nm)

EL815 – Heavy Duty, Full Reach
*Maximum Reach 36" (915mm)***+**
Vertical Travel 17.6" (447mm)
*Maximum Tooling Weight 15 lbs (6.8 Kg)******
Maximum Vert Torque 800 in-lbs (90 Nm)
Maximum Horz Torque 400 in-lbs (45 Nm)

EL1015 – Extra Heavy Duty, Full Reach
*Maximum Reach 36" (915mm)***+**
Vertical Travel 17.6" (447mm)
*Maximum Tooling Weight 14 lbs (6.3 Kg)******
Maximum Vert Torque 1,100 in-lbs (125 Nm)
Maximum Horz Torque 600 in-lbs (68 Nm)

EL1025 – Extra Heavy Duty, High Weight –Full Reach
*Maximum Reach 36" (915mm)***+**
Vertical Travel 17.6" (447mm)
*Maximum Tooling Weight 25 lbs (11.4 Kg)******
Maximum Vert Torque 1,100 in-lbs (125 Nm)
Maximum Horz Torque 600 in-lbs (68 Nm)

TOOL HOLDERS

- **N** — No Tool Holder
- **UV** — Universal Vertical
- **TUV** — Thin Universal Vertical
- **RAV** — Right Angle Vertical
- **PS** — Pistol Spin (Horizontal)
- **PT** — Pistol Tilt +/- Angles off Horizontal
- **SRA** — Simple Right Angle
- **RAH** — Right Angle Horizontal
- **RAHV** — Right Angle Horizontal and Vertical
- **IPHV** — In-line or Pistol Horizontal and Vertical
- **FR** — Flip and Rotate
- **FRS** — Flip and Rotate with Stops
- **EXUV** — Extended Universal Vertical
- **LDUV** — Large Diameter Universal Vertical
- **NB** — Needle Bearing - rotating
- **NBBR** — Needle Bearing - rotating with Hydraulic Brake
- **ASG** — ASG SP2500 Adapter
- **QXP** — for IR QX DC Pistol
- **QE4** — for IR QE4 Inline with 2-bolt flange
- **QE6** — for IR QE6 Inline with 2-bolt flange
- **QE8** — for IR QE8 Inline with 2-bolt flange
- **ST61** — for Atlas Copco Inline Tools

X/Y ENCODERS

- **IOSA** — IO-Link Smart Arm
- **AVSA** — Analog Voltage Smart Arm
- **AMSA** — Analog Current Smart Arm
- **GCSA** — Gray Code Smart Arm
- **XXSA** — Encoder Ready Smart Arm

OPTIONS

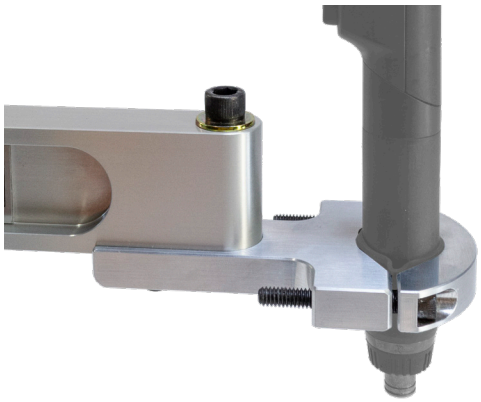
- **OM** — Overhead Mount
- **ZAV** — Z Axis 0.5-9.5 V Analog
- **ZAM** — Z Axis 4-20mA Analog
- **RS2** — Shoulder Rotational Stop
- **IRSH** — In-line Remote Start Handle
- **B250** — Heavy Duty Mounting Base Kit
- **ZF** — Zero Fold Elbow with Magnetic Park

+ Tool Holder provides additional reach, varies by holder.
***** Max Tooling Weight must include ETA Tool Holder chosen.

Tool Holders

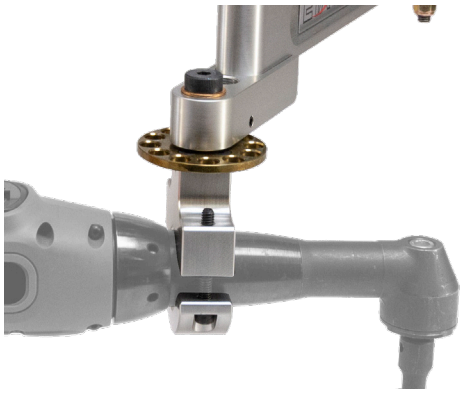
UV
Universal Vertical

For fastening Vertically with any inline tool from 1-⅛" (28.6mm) to 2.0" (50.8mm) diameter. UV is 1.0" thick for stability. Weight 0.8 lbs (0.4 Kg)



TUV
Thin Universal Vertical

For fastening Vertically with any inline tool. Identical to UV except it is only 0.540" (13.7mm) thick for tools with less clamping area. Weight 0.5 lbs (0.2 Kg)



RAV
Right Angle Vertical

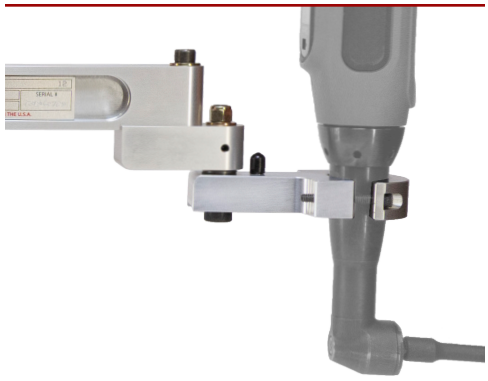
For Right Angle tools driving fasteners downward or upward. Set Screw allows 12 different handle positions.
Weight 1.6 lbs (0.7 Kg)

PS
Pistol Spin

For pistol or Inline tool bodies held on the horizontal plane while allowing them to spin sideways for axial alignment. Weight 1.5 lbs (0.7 Kg)

PT
Pistol Tilt

For pistol or Inline tools held in a basic horizontal attitude. Allows tool to tilt +/- 20 degrees from the horizontal plane, and spin sideways for axial alignment.
Weight 1.9 lbs (0.9 Kg)

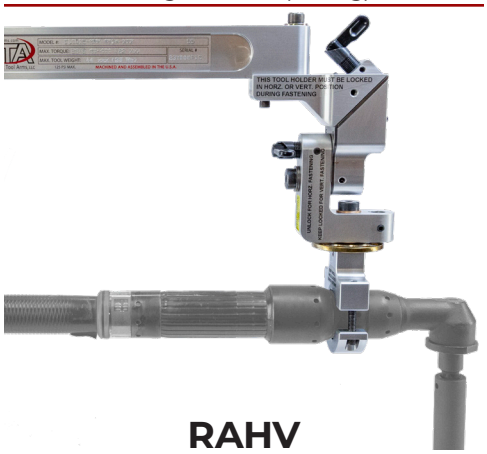


SRA
Simple Right Angle

For right angle tools, fastening horizontally with handle upward. Allows tool to swing freely 280 degrees for easy axial alignment with your fasteners.
Weight 1.5 lbs (0.7 Kg)

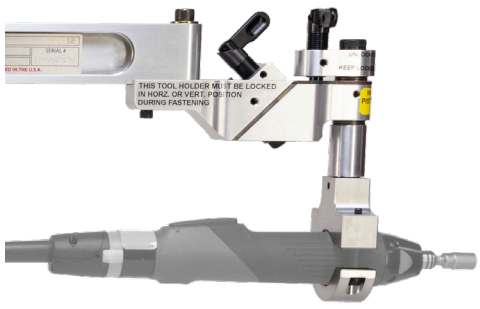
RAH
Right Angle Horizontal

For Right Angle tools driving fasteners horizontally. Set screw allows 12 different handle positions.
Weight 2.3 lbs (1.0 Kg)



RAHV
Right Angle Horizontal and Vertical

For driving vertical fasteners and horizontal fasteners in the same work zone using the same right angle tool. Set screw allows 12 different handle positions.
Weight 3.75 lbs (1.7 Kg)



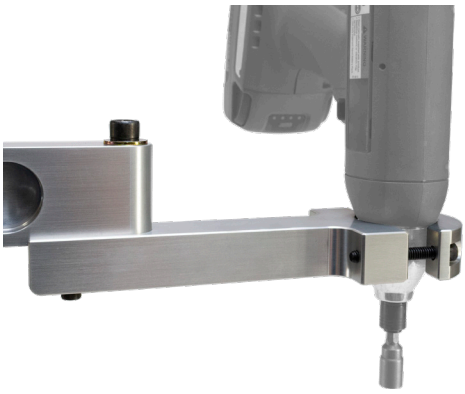
IPHV
Inline or Pistol Horizontal and Vertical

For driving vertical fasteners and horizontal fasteners in the same work zone using the same Inline or Pistol tool.
Weight 3.2 lbs (1.5 Kg)

Tool Holders

FR
Flip and Rotate
2 axis swivel for Inline or Pistol tools fastening in any direction without torque reaction.
Weight 1.7 lbs (0.8 Kg)

FRS
Flip and Rotate with Stops
The same mechanics as the FR with the addition of stop plates on both axis allowing adjustment of rotational limits.
Weight 2.1 lbs (1 Kg)



EXUV
Extended Universal Vertical
For fastening Vertically with any inline tool. Similar to UV-TH with 3" of additional reach.
Weight 1.3 lbs (0.6 Kg)

LDUV
Large Diameter Universal Vertical
For larger tools and other large components 2.0" (50.8mm) to 4.0" (101.6mm) in diameter.
Weight 1.3 lbs (0.6 Kg)

NB / NBBR
Needle Bearing /
Needle Bearing with Brake
For Inline, Inline offset, Crows Foot and Right Angle Tools; enabling them to rotate in place. Weight: NB = 2.6 lbs (1.2 Kg)
NBBR = 3.6 lbs (1.6 Kg)

ASG
SP2500 Adapter
ETA adapter for Vertical Fastening with X-PAQ Tools. The mounting loop #ASG-AC2500-TML, purchased from ASG, fits directly onto this adapter.
Weight 0.6 lbs (0.3 Kg)

QXP
For IR QX DC Pistol
Handle and Comfort Trigger spin 360 degrees for improved ergonomics. Works with QXC, QXX and QXN models. Makes QX Pistol work like an inline for vertical fastening. Weight 4.4 lbs (2 Kg)

QE4 / QE6 / QE8
For Vertical Fastening with IR Inline DC Tools that have 2-bolt Flanges
QE4 Flange holes on 55.6mm (2.19") Centers
QE6 Flange holes on 66.7mm (2.63") Centers
QE8 Flange holes on 76.2mm (3.0") Centers
Weight 0.8 lbs (0.4 Kg)

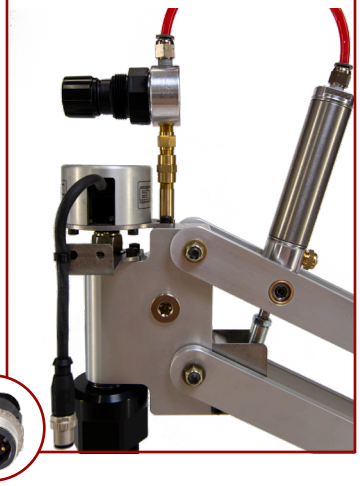
ST61
For Atlas Copco DC Inline Tools
For Vertical Fastening with Reaction Bar #420 234 02 typically included with applicable Atlas tools.
Weight 1.0 lbs (0.45 Kg)

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.

IOSA
IO-Link Digital Models

AVSA & AMSA
Analog Models



GCSA
Gray Code Models

XXSA
Encoder Ready Models

Model Designation	IOSA[1]	AVSA	AMSA	GCSA	XXSA
Output	IO-Link Spec V1.1 to IEC 61131-9, Smart Sensor Profile. Programmable Parameters for Zero point offset, averaging and rotational direction.	Analog 0.1 to 10.0 VDC	Analog 4 to 20 mA	Parallel Gray Code NPN open Collector Negative Logic (active low)	N/A
Encoder Connections Per X/Y Smart-Arm	[2] cables (150 mm long) with M12, 4 Pin Male Connectors	[2] cables (150 mm long) with M12, 4 Pin Male Connectors	[2] cables (150 mm long) with M12, 4 Pin Male Connectors	[2] cables 55" (1400 mm) long with flying leads having 13 conductors each + shield	N/A
Mechanical Description	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.	Mechanical rotary encoders coupled to smart-arm shafts by an alignment coupler. Long 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	1 connection to IO-Link Master per encoder	1 input per encoder	1 input per encoder	11 inputs per encoder Gray Code must be converted to binary by PLC	N/A
Absolute Resolution	14 bit (16,384)	12 bit (4096)	12 bit (4096)	11 bit (2048)	N/A
Repeatability (Each Encoder)[2]	0.10º	0.10º	0.10º	0.09º	N/A
Input Supply Voltage (24 VDC Nominal)	18 - 30 VDC	18 - 30 VDC	18 - 30 VDC	11 - 26 VDC	N/A

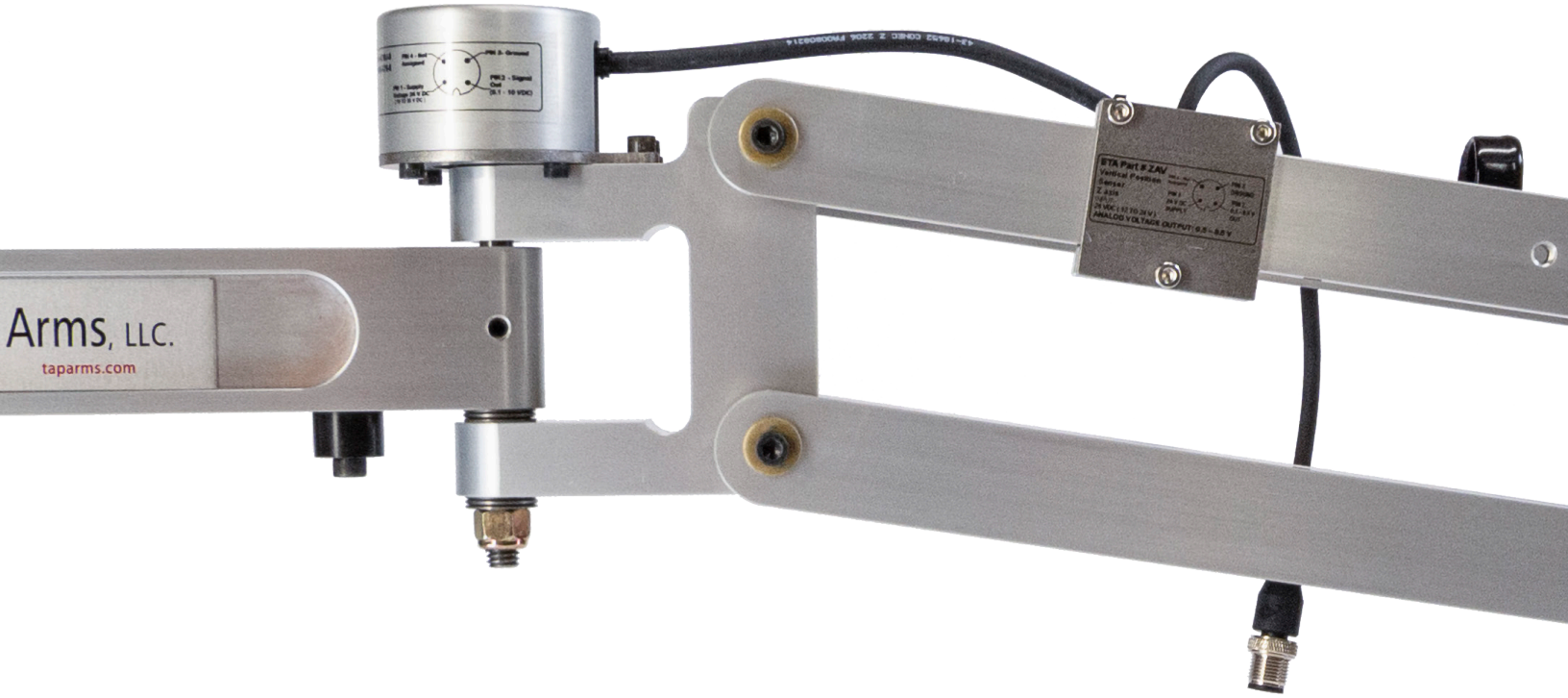
[1] IO-Link Data for these devices available to download at smartarms.com/downloads

[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 ⅛" (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.

ETA offers a simple solution for applications requiring Z axis feedback. The **ZAM** and **ZAV** sensors are electronic inclinometers that measure the tilt of the ETA Parallel Rack as the arm moves up and down. They can be ordered with a new smart arm, or purchased separately and added to any ETA arm at any time. The inclinometer simply clamps onto one of the parallel arms of any ETA model.*



ZAV

Z Axis 0.5-9.5 V Analog

Electronic Inclinometer for Z Axis position feedback. 0.5-9.5 V Analog. Accuracy is 0.3 degrees. Supply Voltage is 12-24 VDC. M12, 4 pin male connector matches AVSA encoder pin out.

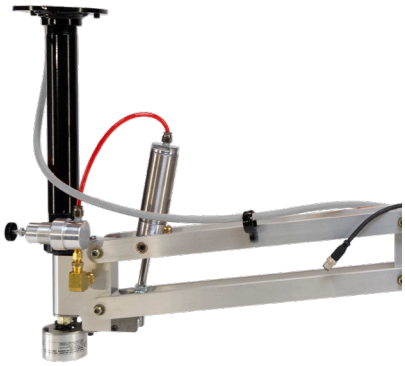
ZAM

Z Axis 4-20 mA Analog

Electronic Inclinometer for Z Axis position feedback. 4-20 mA Analog. Accuracy is 0.3 degrees. Supply Voltage is 12-24 VDC. M12, 4 pin male connector matches AMSA encoder pin out.

*ZAV and ZAM are for feedback on fastener location only. They are not recommended for use for precise control of vertical fastener depth. Precise fastener depth, if needed, must be certified by other means at the fastener location.

Other Accessories and Options



OM
Overhead Mount

Any ETA arm can be built and shipped ready to be field mounted from overhead.

RS2
Shoulder Rotational Stop

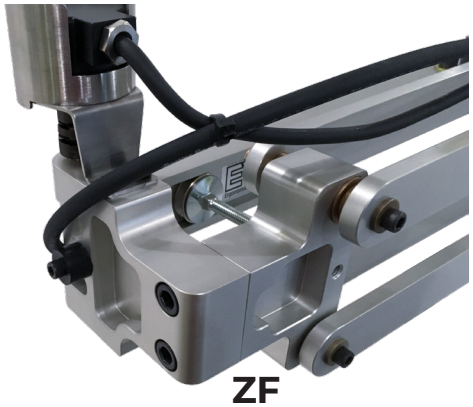
Limit ETA Shoulder Block rotation with two movable stops that can be set in any of 24 stop points, allowing custom rotation ranges on any ETA Arm.

IRSH
In-Line Remote Start Handle

Enhance the ergonomics of an assembly station by providing more control than most standard inline tool levers provide. Handle grip and low-force Trigger Hat rotate 360°. Not for use on 306, 506, or 806 Frames. Weight 3.3 lbs (1.5 Kg)

B-250-0
Heavy Duty Mounting Base Kit

Heavy Duty Base Kit for floor or overhead mount. 8" diameter forged and welded base plate with three holes for ½" (12mm) bolts. Adds rigidity when mounting surface is more than 2 feet from the arm's shoulder block. Uses 2-½ NPT black iron pipe and a short piece of 1-¼ NPT black iron pipe, typically supplied by others.



ZF
Zero Fold Elbow

Ordered as a left hand or right hand fold, this option allows forearm to fold completely flat to the paralell rack and is passively held in that position between assembly cycles with adjustable magnetic park. Not for use on 306, 506, or 806 Frames.

5-YEAR LIMITED MECHANICAL WARRANTY

All ETA Arms and accessories have a 5-year wear-out warranty on all metal components including bearings and shafts. That means that arms and accessories are warrantied to the original purchaser and their assigns against manufacturing defects and excessive wear or part breakage under normal industrial use for a period of 5 years from date of delivery. ETA float cylinders and regulators are also warrantied against excessive wear for a period of 5 years, regardless of the frequency of use. Premature failure of float cylinder or float regulator due to poor compressed air quality is excluded from this warranty. Items specifically addressed below are not covered by this 5-year wear-out warranty. *(Note; Expected life cycle of ETA Air Cylinders is at least 50 million full vertical cycles.)*

1 YEAR LIMITED ELECTICAL COMPONENT WARRANTY

Encoders and cables are covered by a 1 year warranty against manufacturing defects and premature failure. Note: Incorrect hookup, cable routing or component misapplication will void this 1-year warranty. Modification (other than cable length on GCSA encoders) of any electronic and electrical component will render the component unprotected by this warranty.

Limitations apply to these Warranties. For full warranty details, please see smartarms.com/warranty

Some Popular Models

ETA Smart-Arms are designed, machined and assembled in our Eastern Pennsylvania factory in over 1500 different standard model configurations. ETA arms enhance user ergonomics, improve quality and efficiency, and eliminate operator assembly errors.

Our modular design means ETA Smart Arms can be built to order to fit any specific application. Our selection of frame sizes and tool holders can handle most styles, and sizes of assembly tools.

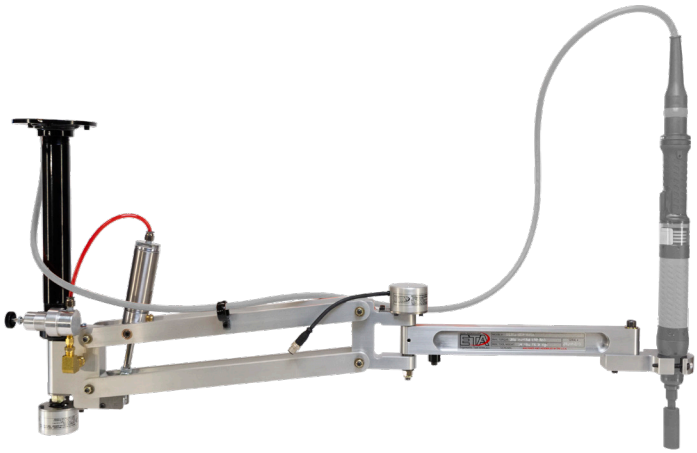
ETA Smart Arms are mechanically the same as our conventional torque arms that are detailed on **ToolArms.com**.

EL506-UV-IOSA

Standard Duty IO-Link, 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-GCSA

Heavy Duty Gray Code, 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.



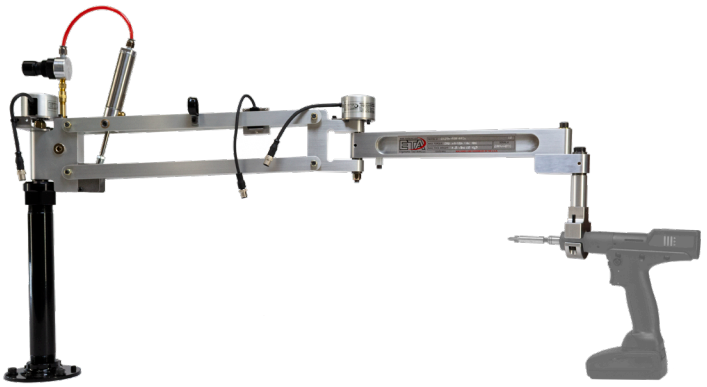
EL815-UV-IOSA-OM

Heavy Duty Overhead Mounted 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, 2 axis Smart-Arm with Right Angle Vertical tool holder for right angle tools driving fasteners vertically up to 90 Nm with a maximum of 6.1 Kg of tool weight.

Some Popular Models – Continued



EL506-PS-AMSA-ZAM

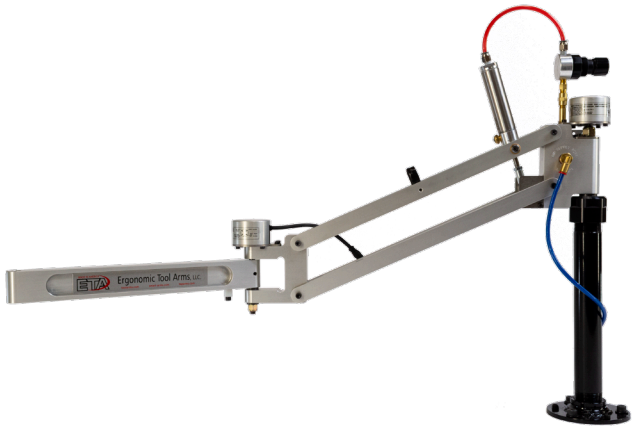
Standard Duty Analog Current, 3 axis Smart-Arm with Pistol Spin Tool Holder for pistol grip or inline tools driving fasteners horizontally up to 31 Nm with a maximum of 2.16 Kg of tool weight.

EL306-UV-AVSA

Standard Duty, Short Reach, Analog Voltage, 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-SRA-AVSA-ZAV

Heavy Duty Analog Voltage, 3 axis Smart-Arm with Simple Right Angle Tool Holder for Right Angle tools driving fasteners Horizontally up to 45 Nm with a maximum of 6.1 Kg of tool weight.

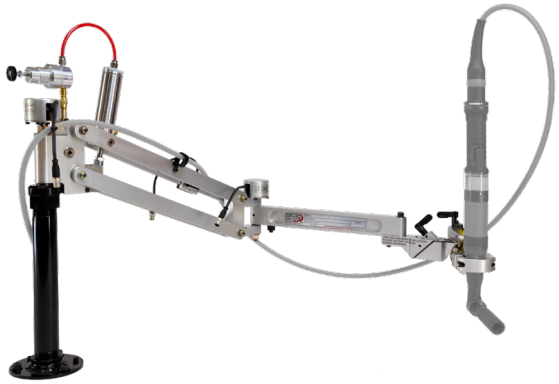


EL506-N-AMSA

Standard Duty Analog Current, 2 axis Smart-Arm with no tool holder included. Supports up to 62 Nm Vertical Torque, or 31 Nm Horizontal Torque, with a maximum of 2.7 Kg of tool weight.

EL815-RAH-AVSA-ZAV

Heavy Duty Analog Voltage, 3 axis Smart-Arm with Right Angle Horizontal Tool Holder for Right Angle tools driving fasteners horizontally up to 45 Nm with a maximum of 5.8 Kg of tool weight.



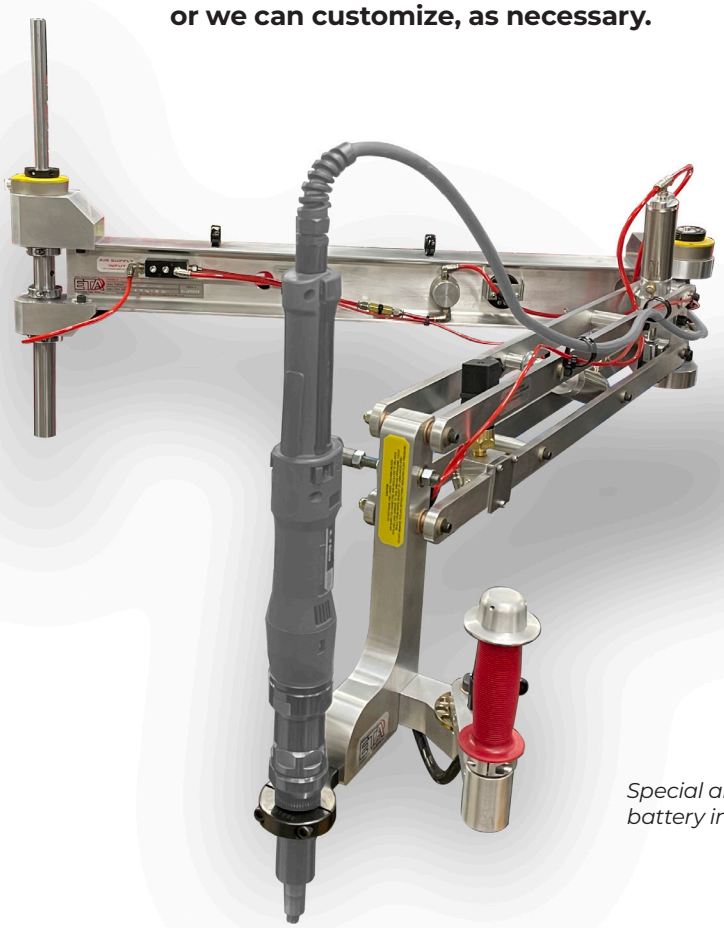
EL815-RAHV-AMSA-ZAM

Heavy Duty Analog Current, 3 axis Smart-Arm with Right Angle Horizontal and Vertical tool holder for right angle tools driving fasteners both Vertically and Horizontally at the same workstation up to 90 Nm Vertically and 45 Nm Horizontally with a maximum of 5.1 Kg of tool weight. (Higher torque models are available)

ETA Smart Arms provide torque abatement, tool flotation, tool alignment and location feedback; which, when combined with an intelligent tool, provides Industry 4.0 compliance in manual assembly operations.

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

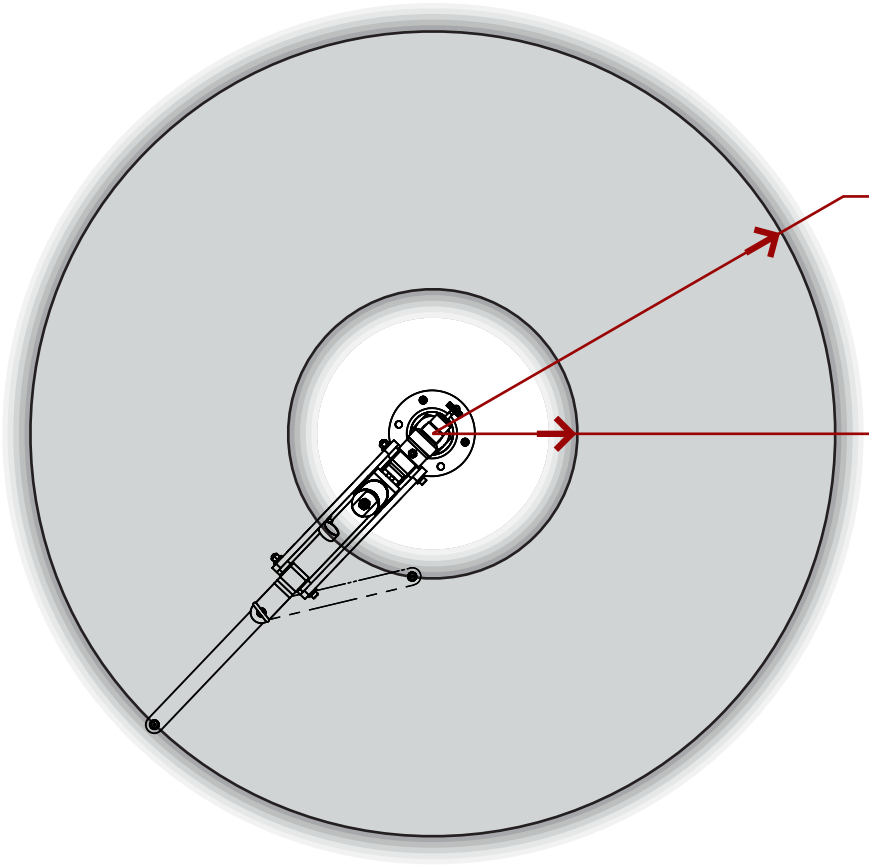
We can adapt to virtually any assembly application with one of our standard models; or we can customize, as necessary.



Special arm for Ford F150 Lightning battery installation

Work Areas of Standard Smart Arms

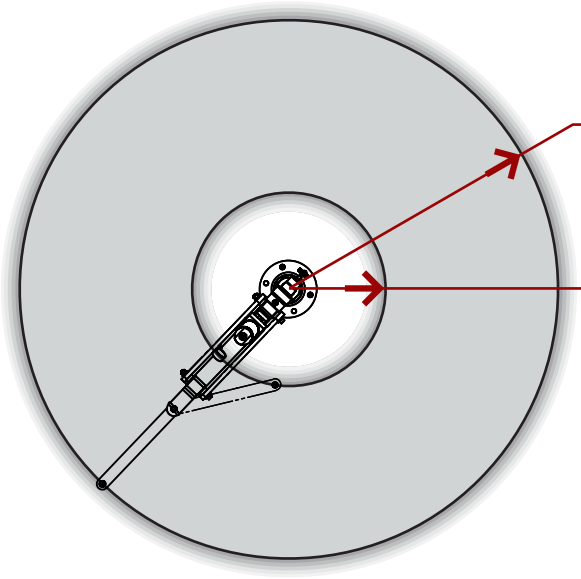
Minimum and maximum reach will vary based on tool holder and tooling used with the spesific model of smart arm.



506, 806, 815, 1015 & 1025 Frames

36in - 41in (914mm - 1041mm)
Maximum Reach, depedent on tool holder

13in - 14in (330mm - 356mm)
Minimum Reach



306 & 315 Frames

24in - 29in (610mm - 737mm)
Maximum Reach, depedent on tool holder

7.5in - 8.5in (191mm - 216mm)
Minimum Reach

Need application assistance? Call or email for help

SmartArms.com
855-TOOL-ARM (855-866-5276)
Contact@toolarms.com

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