

AX1 Articulated Arm

External Product Information

Atlas Copco

Contents

Introduction	3
Overview	4
Technical Data	6
Options	
Mounting	7
Vertical Rod	7
Tool Holders	8
Mounting Options	9
Hand Adapter	10
Balance Control	10
Accessories	
Workbench Mounting Hardware	12
Controller Mounting System	12
HLT15/19 Mounting Kit	12
Position Recognition Switch	13
Position Limit Switch Assemblies	13



AX1 Articulated Arm

The AX1 Articulated Arm was designed for applications with small working areas and high production rates – ideal for workbench and conveyor type applications.

The arm's lightweight, compact design provides smooth, comfortable handling for reduced operator fatigue and easy movement for increased productivity. Further, the design includes a parallel arm style which allows for optimal accessibility and clear sight to the work piece.

Torque can be applied in horizontal, vertical or angular tightening orientations, enabling multiple tool orientations within a single workstation - compared to other small workbench style arms that are limited in tightening orientation capability.

Equipped with either a gas spring assembly or a pneumatic cylinder, the system provides a lift assist for the operator. The gas spring can be set to hold at a balanced position along the vertical travel, or be biased in either the up or down direction.

The AX1 Articulated Arm supports a series of hand tool holders that can be selected to provide an optimized solution for each unique application. A range of modular, easily-adaptable accessories are available to complement the offering.



An Articulated Arm reacts the torque generated by a tool – eliminating the impact on the operator.

BENEFITS

- ▶ Lightweight, compact design with low-operating forces and smooth, comfortable handling for reduced operator fatigue and increased productivity
- ▶ Parallel arm style for optimal accessibility and clear sight to the work piece
- ▶ Torque can be applied in horizontal, vertical or angular tightening orientations
- ▶ Easy to assemble and install, saving valuable set-up time
- ▶ Low maintenance for increased productivity
- ▶ Adaptable for various applications and tool configurations for repurposing or lean production optimization



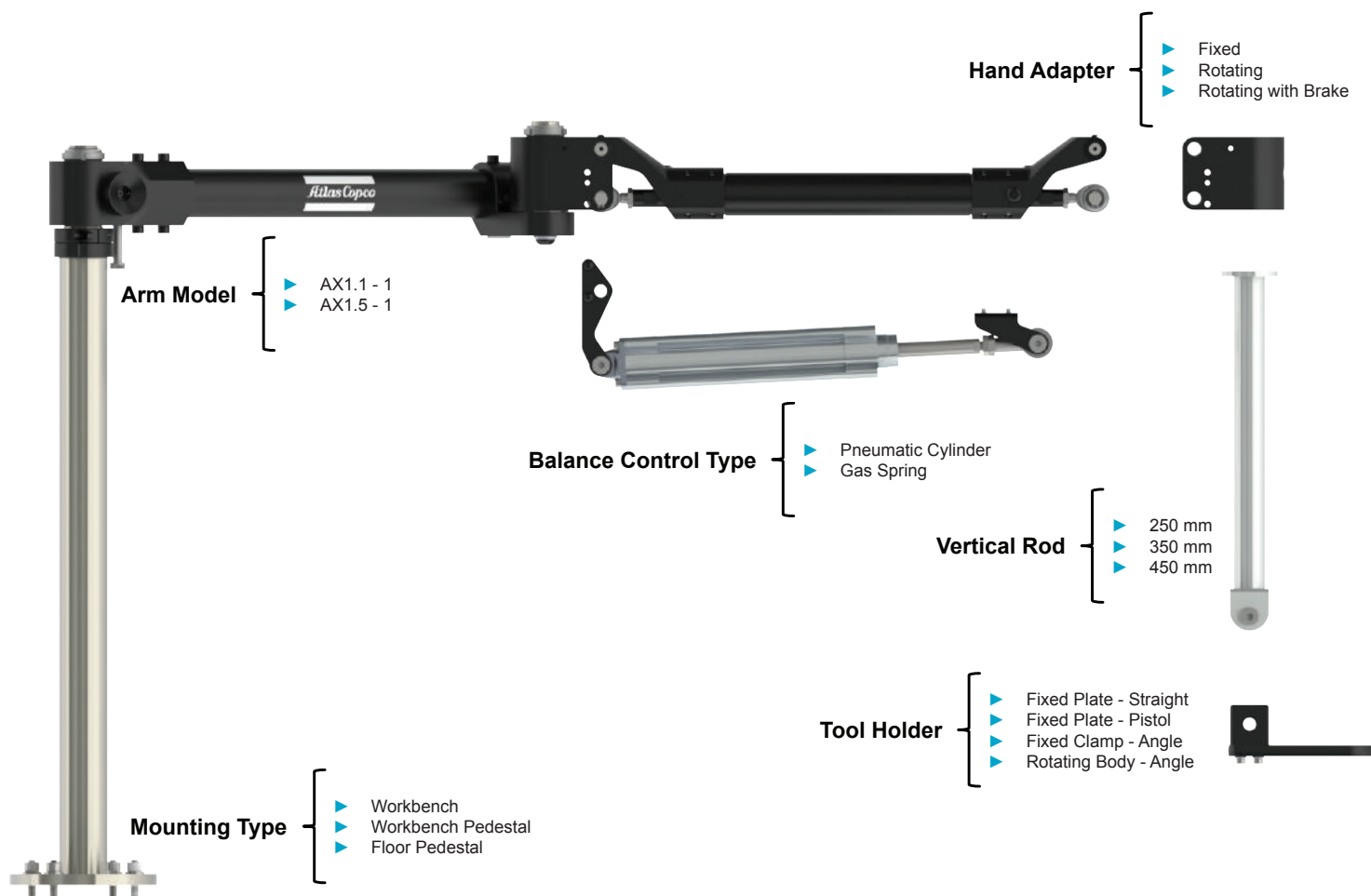
An Articulated Arm assists the operator with lifting the tool and provides stability for tool positioning.

Arm Model	Torque Capacity Nm	Payload Capacity kg (lb)	Reach Length	
			1m (3.3ft)	1.5m (4.9ft)
AX1-1	120	15 (33.1)	•	
AX1-1.5	150	15 (33.1)		•

AX1 Articulated Arm

FEATURES

- ▶ 335° rotation at pillar for increased working area (360° capability - limited by the tool cable wind up)
- ▶ Adjustable rotational stops located at shoulder and fixed rotation limiter at the elbow for limiting lateral movement
- ▶ Extensive vertical travel
- ▶ Adjustable leveling at pillar base
- ▶ Adjustable inner parallel arm/vertical rod leveling
- ▶ Parking block for parking and maintenance
- ▶ Sealed ball and plain bearings
- ▶ Integrated cable management
- ▶ Optional hand adapter type: fixed or rotating with/without torque reaction brake
- ▶ Optional lift assist type: pneumatic and gas shock
- ▶ Optional vertical rod lengths
- ▶ Standard range of tool holders and accessories
- ▶ Position Recognition System (PRS) adaptable
- ▶ Adjustable limit switch accessories easily adaptable



AX1 Articulated Arm

The flexibility of the AX1 Articulated Arm allows it to be used in a number of different configurations. It is easily adapted to suit a variety of unique applications.

WORKBENCH STATION

AX1-1 Articulated Arm

- ▶ Balance Control – Pneumatic Cylinder
- ▶ Fixed Hand Adapter
- ▶ Straight Tool with Fixed Plate Tool Holder
- ▶ Controller Mounting System

Mobile Assembly Station (Cart)

- ▶ HLTQ for PRS HMI
- ▶ Keyboard on large shelf accessory



CONVEYOR / FLOOR-MOUNTED STATION

AX1-1 Articulated Arm

- ▶ Balance Control – Gas Spring
- ▶ Fixed Hand Adapter
- ▶ Straight Tool with Tool Holder
- ▶ Controller Mounting System
- ▶ 3-Axis PRS System

Compact Mounting System

- ▶ HLTQ HMI / Mounting System with Large Shelf

CONVEYOR / FIXED SUSPENDED STATION

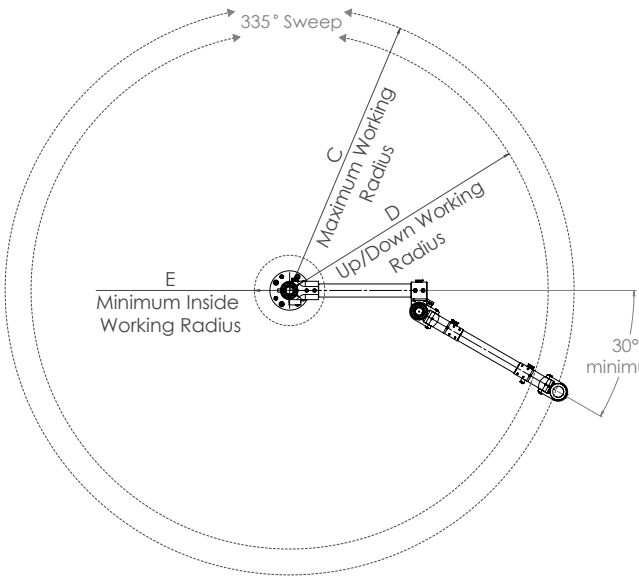
AX1-1 Articulated Arm

- ▶ Balance Control – Gas Spring
- ▶ Rotating Hand Adapter
- ▶ Right Angle Tool with Tool Holder
- ▶ Controller Mounting System

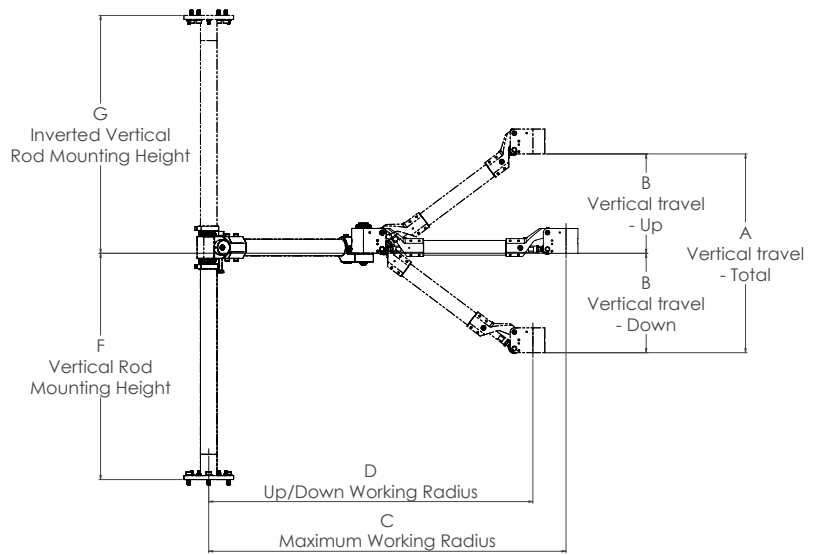


AX1 Articulated Arm - technical data

WORKING AREA

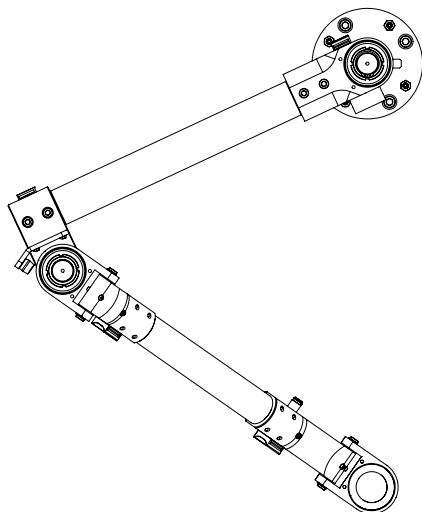


VERTICAL RANGE OF MOTION

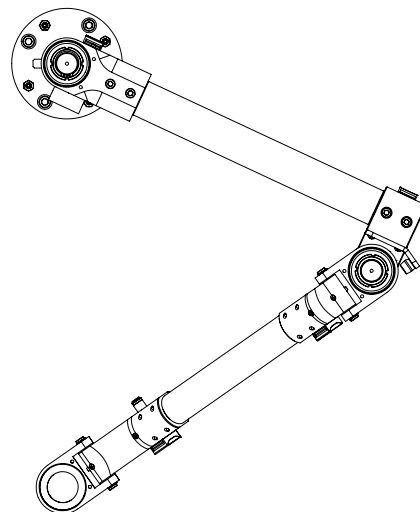


Model	Torque Capacity Nm (lb. ft)	Load Capacity kg (lb)	Weight kg (lb)	A	B	C	D	E
				Vertical Travel - Total mm (in)	Vertical Travel - Up/Down mm (in)	Max. Working Radius mm (in)	Up/Down Working Radius mm (in)	Min. Inside Working Radius mm (in)
AX1-1	120 (88.5)	15 (33.1)	20.4 (44.5)	600 (23.6)	300 (11.8)	1094 (43.1)	995 (39.2)	135 (5.3)
AX1-1 - Inverted	120 (88.5)	15 (33.1)	20.4 (44.5)	600 (23.6)	300 (11.8)	1094 (43.1)	995 (39.2)	135 (5.3)
AX1-1.5	150 (110.6)	15 (33.1)	22.5 (49.6)	750 (29.5)	375 (14.7)	1577 (62.1)	1479 (58.2)	135 (5.3)
AX1-1.5 - Inverted	150 (110.6)	15 (33.1)	22.5 (49.6)	750 (29.5)	375 (14.7)	1577 (62.1)	1479 (58.2)	135 (5.3)

Model	F	G
	Vertical Rod Mounting Height mm (in)	Vertical Rod Mounting Height mm (in)
AX1-1	684 (26.9)	-
AX1-1 - Inverted	-	718 (28.3)
AX1-1.5	684 (26.9)	-
AX1-1.5 - Inverted	-	718 (28.3)



Right Arm



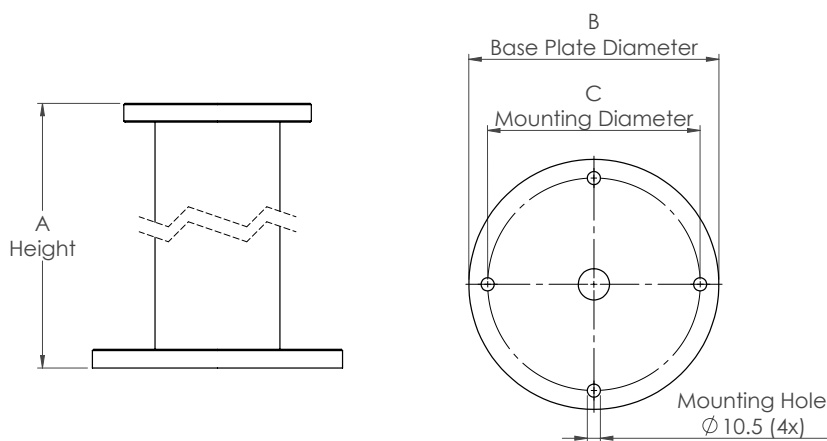
Left Arm

AX1 Articulated Arm - options

MOUNTING

AX1 Articulated Arm can be mounted in numerous configurations based on application requirements. For workbench applications, a Workbench Mounting Plate is used as a base for the arm. Where additional height is needed, a Workbench Pedestal is available in various heights. For floor mounted applications, a Floor Pedestal is available in various heights. The workbench and floor mounting hardware is not included.

Description	Weight kg (lb)	A mm (in)	B mm (in)	C mm (in)
Workbench Mounting Plate - AX1	2 (4.4)	15 (0.7)	150 (5.9)	120 (4.7)
Workbench Pedestal - AX1 - 100 mm	4.8 (10.6)	100 (3.9)	150 (5.9)	120 (4.7)
Workbench Pedestal - AX1 - 200 mm	5.9 (13)	200 (7.9)	150 (5.9)	120 (4.7)
Workbench Pedestal - AX1 - 300 mm	7.1 (15.7)	300 (11.8)	150 (5.9)	120 (4.7)
Floor Pedestal - AX1 - 500 mm	11.1 (24.5)	500 (19.7)	200 (7.9)	170 (6.7)
Floor Pedestal - AX1 - 750 mm	14 (30.9)	750 (29.5)	200 (7.9)	170 (6.7)
Floor Pedestal - AX1 - 1000 mm	17 (37.5)	1000 (39.4)	200 (7.9)	170 (6.7)



VERTICAL ROD

The vertical rod is used to connect a tool holder to the hand adapter on the articulated arm. Available in three lengths, it can be configured to suit part height requirements. The vertical rods feature a clevis interface at the lower end that adapts to all AX1 tool holders.

Description	Weight kg (lb)	Height kg (lb)
Vertical Rod - AX1 - 250 mm	0.9 (2)	265 (10.4)
Vertical Rod - AX1 - 350 mm	1.1 (2.4)	365 (14.4)
Vertical Rod - AX1 - 450 mm	1.4 (3.1)	465 (18.3)



AX1 Articulated Arm - options

The AX1 Articulated Arm supports a series of standard tool holders that are designed to enable various tool and position configurations. There are four standard tool holder types, each designed to adapt to different tool type and size. All tool holders mount directly to the lower clevis of the vertical rod.

FIXED PLATE - STRAIGHT

The Fixed Plate Straight Tool Holder is configurable for either horizontal or vertical tightening orientations. It mounts rigidly to the lower clevis. The tool holder has provisions to mount two handle mounting assemblies.

FIXED CLAMP - ANGLE

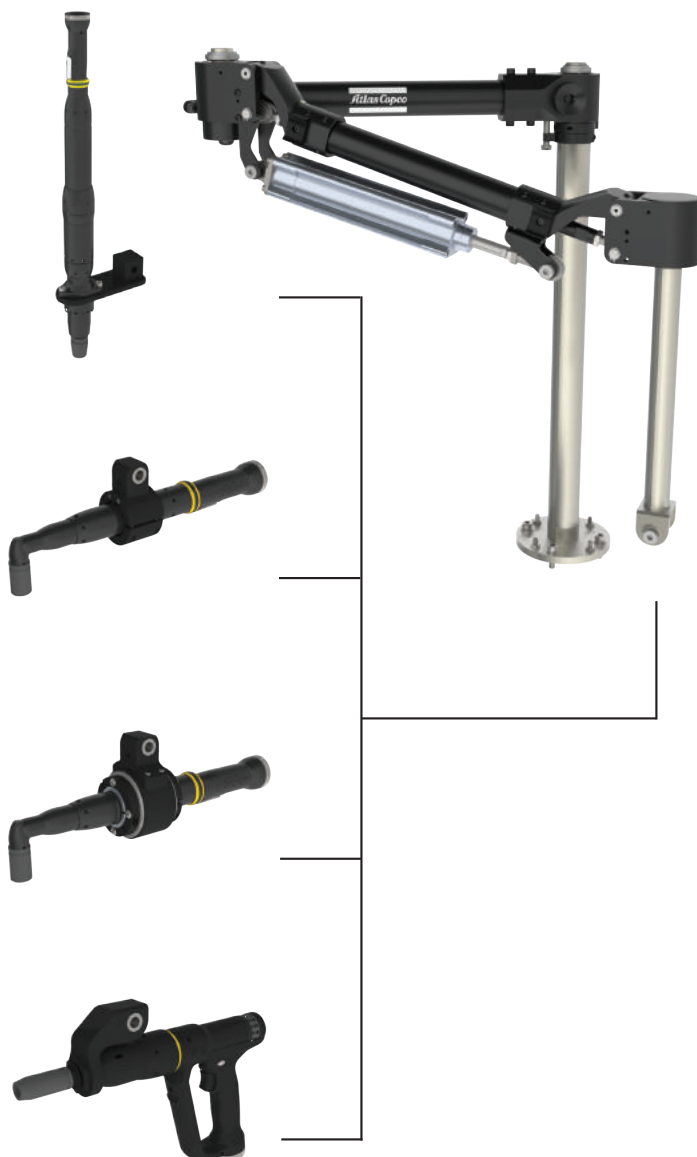
The Fixed Clamp Angle Tool Holder can be used for horizontal or vertical applications. The tool clamps to the grip area of an angle tool. It has a pivot for tool angle compliance and can be locked if fixed mounting is desired. The tool body can be configured either parallel or perpendicular to the pivot axis.

ROTATING BODY - ANGLE

The Rotating Body Angle Tool Holder clamps to the grip area of an angle tool. It allows the tool to rotate up to 345° to accommodate horizontal and vertical tightening orientations. Adjustable rotational stops are included to limit tool rotation. It also has a pivot for tool angle compliance and can be locked if fixed mounting is desired.

FIXED PLATE - PISTOL

The Fixed Plate Pistol Tool Holder is designed for horizontal tightening orientations utilizing a pistol tool. It has a pivot for tool angle compliance and can be locked if fixed mounting is desired.



AX1 Articulated Arm - options

TOOL HOLDERS – AX1

AX1 Model	Torque Range (Nm)	Mounting Type	Weight kg (lb)	Height mm (in)
Right Angle - Mounting Type				
ETD ST31	5 - 20	M - 39	0.5 (1.1)	55 (2.2)
	5 - 20	M - 39	1.2 (2.7)	70 (2.8)
ETD ST61	28 - 70	M - 39	0.5 (1.1)	55 (2.2)
	28 - 70	M - 39	1.2 (2.7)	70 (2.8)
	100 - 200	M - 39	0.5 (1.1)	55 (2.2)
	100 - 200	M - 39	1.2 (2.7)	70 (2.8)
ETV ST81	50 - 70	M - 43	0.5 (1.1)	55 (2.2)
	50 - 70	M - 43	1.2 (2.7)	70 (2.8)
	100 - 200	M - 43	0.5 (1.1)	55 (2.2)
	100 - 200	M - 43	1.2 (2.7)	70 (2.8)
ETV ST101	100 - 200	M - 54.4	0.8 (1.8)	66 (2.6)
Straight - Mounting Type				
ETD ST31	5 - 10	Dia 24 mm	0.6 (1.3)	17 (0.7)
ETD ST61	15 - 30	Dia 24 mm	0.6 (1.3)	17 (0.7)
	50 - 90	Spline 2	0.6 (1.3)	17 (0.7)
ETD ST61 Telescopic	10 - 30	Spline 2	0.6 (1.3)	17 (0.7)
	50 - 120	Spline 3	0.6 (1.3)	17 (0.7)
ETD ST81	30	Dia 24 mm	0.6 (1.3)	17 (0.7)
	50 - 120	Spline 2	0.6 (1.3)	17 (0.7)
ETD ST81 Telescopic	30 - 50	Spline 2	0.6 (1.3)	17 (0.7)
	70 - 120	Spline 3	0.6 (1.3)	17 (0.7)
ETD ST101	100 - 120	Flange (2) M8	0.8 (1.8)	17 (0.7)
	150 - 200	Flange (2) M10	0.8 (1.8)	17 (0.7)
Pistol - Mounting Type				
ETP ST Revo	200	Spline 3	-	-
ETD STR61	20 - 30	Dia 24 mm	0.2 (0.5)	50 (2)
	50 - 120	Spline 2	0.3 (0.6)	50 (2)
Tool Holder Accessories				
Handle Mounting Assembly			0.3 (0.7)	70 (2.8)

Mounting options



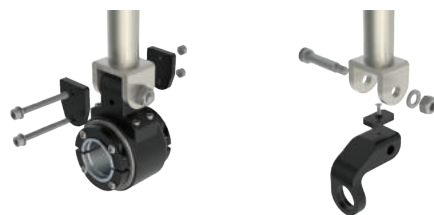
CLEVIS/TOOL HOLDER INTERFACE

The tool holders mount to the Lower Clevis and can be easily integrated.



HANDLE MOUNTING ASSEMBLY

The Handle Mounting Assembly mounts directly to predrilled threaded holes in a Fixed Plate Straight Tool Holder. The handle is separate from the assembly.



LOWER PIVOT FIXING ASSEMBLY

A Lower Pivot Fixing Assembly is used to lock the lower pivot. This can be easily removed for applications where a pivot is required for compliance. Compatible with Fixed Clamp and Rotating Body tool holders.

AX1 Articulated Arm - options

HAND ADAPTER

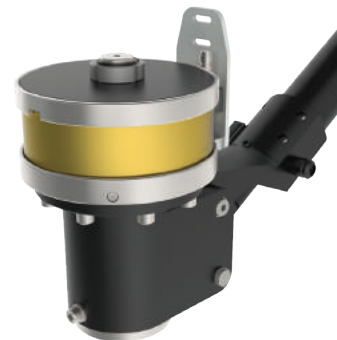
The hand adapter is used to mount the vertical rod to the articulated arm. Both fixed and rotating options are available for flexible application set-ups, with a torque reaction brake option available for vertical tightening orientation applications with rotation required.



Fixed Hand Adapter



Rotating Hand Adapter



Rotating Hand Adapter with Brake

Description	Weight kg (lb)	Vertical Application	Horizontal Application	Angular Application ≥ 45° from horizontal	Ordering No.
Fixed Hand Adapter - AX1	0.6 (1.3)	✓	✓	✓	8439 6204 10
Rotating Hand Adapter - AX1	1.7 (3.8)	-	✓	✓	8439 6204 11
Rotating Hand Adapter with Brake - AX1	5 (11)	✓	✓	✓	8439 6204 12

Note: Hand adapters capable of inverted mounting.

BALANCE CONTROL

The balance control is a lift-assist for easy handling of the tool. Both options can be adjusted for the load requirements within the balancing capacity range.

Pneumatic Cylinder

- ▶ Position balancing
- ▶ Adjustable based on load



Gas Spring

- ▶ Up or down bias with position balancing
- ▶ Adjustable based on load



Description	Load Capacity Minimum kg (lb)	Load Capacity Maximum kg (lb)
AX1-1 Balance Control Options		
Balance Control - AX1-1 - Pneumatic – SMC*	-	9.3 (20.5) @ 4 bar
	-	12.5 (27.5) @ 5 bar
	-	15.0 (33.0) @ 6 bar
Balance Control - AX1-1 - Gas Spring - 150 N	2.2 (4.8)	4.1 (9.0)
Balance Control - AX1-1 - Gas Spring - 200 N	3.3 (7.3)	5.6 (12.3)
Balance Control - AX1-1 - Gas Spring - 275 N	4.8 (10.6)	7.9 (17.4)
Balance Control - AX1-1 - Gas Spring - 375 N	6.8 (15.0)	10.9 (24.0)
Balance Control - AX1-1 - Gas Spring - 525 N	9.9 (21.8)	15.0 (33.1)
AX1-1.5 Balance Control Options		
Balance Control - AX1-1.5 - Pneumatic – SMC*	-	15.0 (33.1) @ 4 bar
Balance Control - AX1-1.5 - Gas Spring - 275 N	2.4 (5.3)	4.4 (9.7)
Balance Control - AX1-1.5 - Gas Spring - 375 N	3.7 (8.1)	6.5 (14.3)
Balance Control - AX1-1.5 - Gas Spring - 525 N	5.8 (12.8)	9.5 (20.9)
Balance Control - AX1-1.5 - Gas Spring - 725 N	8.5 (18.7)	13.6 (30.0)
Balance Control - AX1-1.5 - Gas Spring - 850 N	10.2 (22.5)	15.0 (33.1)

* Listed pneumatic balancing capacity based on supply air pressure of 4 bar (60 psi). While a lower supply pressure will decrease the load capacity, a higher pressure may not be used to increase the maximum capacity.

AX1 Articulated Arm - accessories

WORKBENCH MOUNTING HARDWARE

The workbench mounting hardware may be used when either a workbench mounting plate or workbench pedestal option is selected. Options are available for either direct or through-benchttop mounting. Direct version is used when arm can be bolted directly to mounting surface with threaded holes. Through version is used when arm cannot be bolted directly to mounting surface – measurement indicates maximum mounting surface thickness.



Through Mounting Hardware

Description	Weight kg (lb)
Workbench Mounting Hardware - Direct *Tapped hole surfaces	0.1 (0.2)
Workbench Mounting Hardware - Through - 40 mm *Bolt through hole surfaces	1.0 (2.2)
Workbench Mounting Hardware - Through - 75 mm *Bolt through hole surfaces	1.1 (2.4)

CONTROLLER MOUNTING SYSTEM

The controller mounting system for the AX1 Articulated Arm mounts directly to the pillar to allow for a compact system size. The controller mounting system is compatible with Power Focus 4000, Power Focus 600/6000, and Power MACS 4000 controllers. It includes mounting for a stacklight and integrated cable management. An optional cable enclosure can be added to protect and hide extra cable length.



Controller Cable Cover

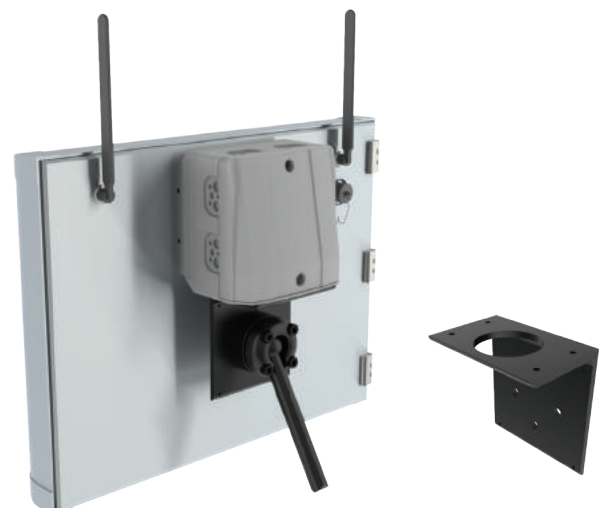


Description	Weight kg (lb)
Controller Mounting – AX1 - Pillar Mount	6.2 (13.6)
Controller Cable Cover	1.0 (2.2)

HLT15/19 MOUNTING KIT

Provides a mounting interface for Atlas Copco Express Mechanics or VESA mounting to an HLT display.

Description	Weight kg (lb)
HLTQ15/19 Mounting Kit	1.0 (2.2)



AX1 Articulated Arm - accessories

POSITION RECOGNITION SYSTEM - PRS

The PRS is an integrated, highly flexible, standalone error-proofing solution. Combined with the AX1 Articulated Arm, the system tracks the exact position of the tool, ensuring the correct fasteners are tightened to the required torque in the proper sequence.

AX1 Articulated Arm is compatible with the full feature set of the Atlas Copco Position Recognition System - PRS. It utilizes durable, contactless encoders with integrated zero-position indicators.

POSITION RECOGNITION SYSTEM - PRS - HMI KITS

Description

PRS HMI Kit - HLT15Q - Power Cable - Ethernet Cable

PRS HMI Kit - HLT19Q - Power Cable - Ethernet Cable

PRS HMI Kit - HLT24Q - Power Cable - Ethernet Cable

Note: Includes HMI (human machine interface), Ethernet switch, and cables



POSITION RECOGNITION SYSTEM - PRS - ENCODER CABLES

Description

Encoder Cable Kit - 3-Axis - 1/1.5 m

Encoder Cable Kit - 4-Axis - 1/1.5 m

POSITION RECOGNITION SYSTEM - PRS HARDWARE KITS

Description	Single-Plane Vertical Applications	Multi-Plane Vertical Applications	Horizontal Applications
PRS - AX1 - 3-Axis	✓	✓	-
PRS - AX1 - 4-Axis - Rotate	✓	✓	✓
PRS - AX1 - 4-Axis - Brake	✓	✓	✓

Note: Includes PRS software, encoders, communication hardware, cables, and mounting hardware

POSITION LIMIT SWITCH ASSEMBLIES

The available position switch assemblies utilize mechanical switches mounted at different points on the arm to indicate when the arm is in a specific position. Often used with safety systems, these switches feature open-end cables that can be adapted to various system types. Switches for each arm pivot are available.

NOTES

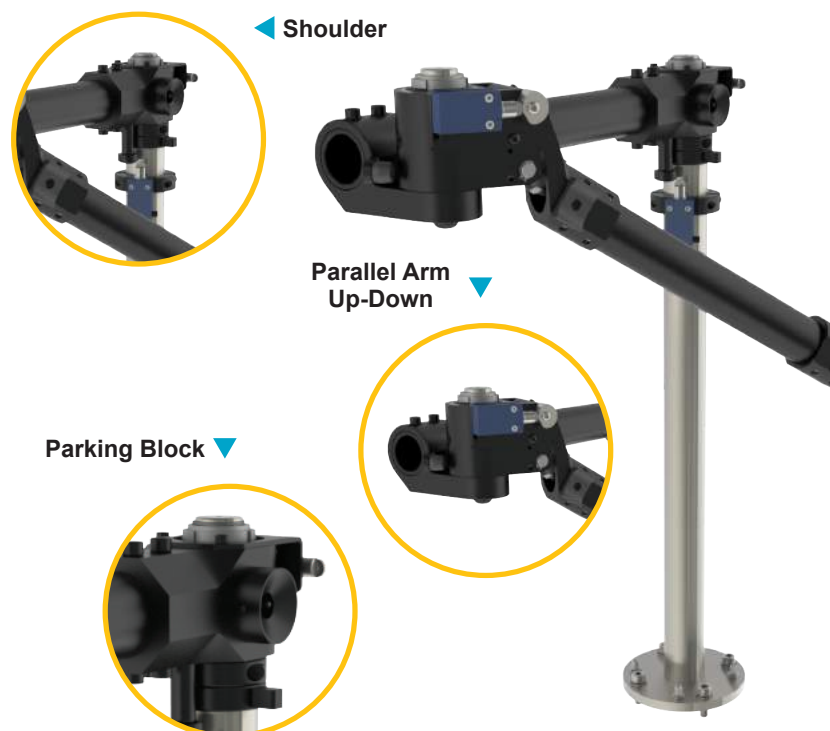
- ▶ All standard limit switches are Telemecanique.

Description

Position Switch Assembly – AX1 – Parking

Position Switch Assembly – AX1 – Shoulder

Position Switch Assembly – AX1 – Up-Down



Committed to sustainable productivity

We stand by our responsibilities towards our customers,
towards the environment and the people around us.
We make performance stand the test of time.
This is what we call — Sustainable Productivity.

The Atlas Copco logo consists of the company name in a white, italicized serif font, centered between two horizontal white bars of equal length.

Atlas Copco