

Product Introduction

Column & Boom Manipulator

AMET is pleased to provide the following technical specifications on our standard model of column and boom manipulator. These manipulators are designed to move a weld head over a weld joint. The CBM series is produced in a several ranges, from 1.2x1.2 to 6x6 meters, in order to meet your application requirements. We offer manipulators in one standard version. The standard version is not designed to be a welding axis.* However, AMET can upgrade each axis of the CBM motion to be a precision welding axis. We upgrade the X-Y drive to a ball screw and nut, driven by a servo motor with encoder feedback. On the travel car, we use a servo motor with encoder feedback, driving a precision pinion gear which engages a precision gear rack, mounted to the base assembly. AMET will also consider your special requests for column and boom manipulators and features as well.

Purpose:

Standard column and boom manipulators are used to locate a weld head to a desired position for welding in a stable and secure manner. Once in position, the part is moved during welding to produce high quality welds. A CBM can be used on a wide variety of parts and part shapes. Welding is performed using GTAW, PAW, GMAW, FCAW, SAW or YAG Laser.

In some GMAW, SAW and FCAW welding, the standard boom can be used as a linear welding axis, as these weld processes may not require precise welding motion. We strongly recommend upgrading the boom motion to the precision CBM model if linear welding is desired for GTAW, PAW and Laser welding.

Benefits:

The standard column and boom manipulator has several benefits over welding the part manually, including:

- Able to achieve consistent weld results
- Able to maintain weld head over weld joint in a stable position during the weld
- Increases arc-on time and overall productivity
- Provides ability to have multi-weld stations using only one weld head, increasing your return on investment
- Reduced operator fatigue
- Reduced consumable costs
- Ability to have two welding process at one welding station by using both ends of the boom

These benefits greatly reduce the time to prepare a part for welding and the time to finish a part after welding. Also, rework time will be reduced and part scrap will be cut.

AMET can include optional features, such as travel carts, machined base rails, flexible cable carriers, and precision linear boom travel, to complete the standard CBM series.



CBM-S-2x2 with GTAW and Positioner
Puget Sound Naval Shipyard

Capacities:

As standard, AMET can produce column and boom manipulators with a wide capacity range from 1200 to 6000 mm (48" to 236") strokes

All standard column and boom manipulators have the following general capacities and specifications:

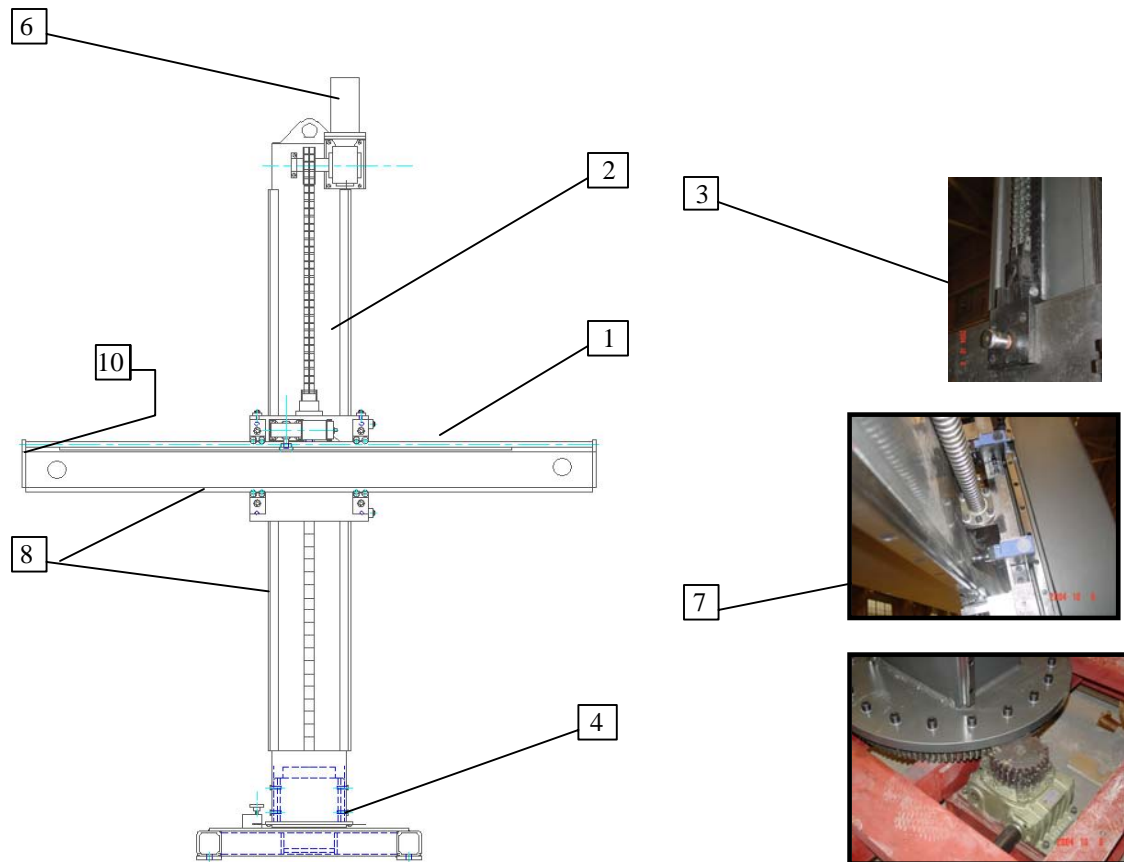
- Boom Weight capacity: 225 kg (500 lbs)
- Boom drive: Gear rack and pinion drive
- Boom motor: AC Motor, adjustable speed
- Column Lift mechanism: Chain drive and gear box
- Column drive motor: AC Motor, adjustable speed
- King-pin base: allows 360 degrees of column rotation
- Safety Device to stop boom if chain should fail



CBM-3x3 for Chart using VPPA Weld Process

Product Introduction

STANDARD FEATURES on CBM-S Manipulators



1. Motorized horizontal boom travel, rack and pinion gear drive. Adjustable speed, 45 to 1300 mm/min. (2 to 50 IPM) using AC Motor. (Precision drive uses ball screw and nut, with Servo motor with encoder feedback, speed range is 1 to 60 IPM)
2. Motorized boom lift travel, double chain drive. Adjustable speed, 45 to 1300 mm/min. (2 to 50 IPM) (Precision drive uses ball screw and nut, with Servo motor with encode feedback, speed range is 1 to 60 IPM)
3. Safety Device – anti-fall device in case the chain should fail
4. Rotational Base assembly – allows column to be rotated 360 degrees. Includes locking brake.

With travel Car option, includes manual gear to rotate column.
5. Pendent Control – Includes joystick for operator to control up/down and in/out position of manipulator
6. AC Motors drive boom – both horizontally and vertically.
7. Limit Switches included to prevent over-travel.
8. Heavy-duty linear ways (THK style rails) on boom and column to insure smooth travel in both axis. Horizontal boom travel acceptable for some GMAW, FCAW and SAW applications.
9. Boom and Column are machined to insure smooth and accurate travel motion
10. Designed to hold 225 kgs (500 lbs) of total weight on boom, on either end.

NOTE: AMET manipulators are NOT designed as personnel carriers. A seat or operator platform should never be added to the boom, nor should a person ever ride on the boom.

Product Introduction

Typical Applications for a CBM-S Column & Boom Manipulator

Large Dry Storage Tanks

These large storage tanks are typically welded using the SAW process. The tank is placed on turning rolls and CBM holds the weld head in position as the tank rotates beneath it.



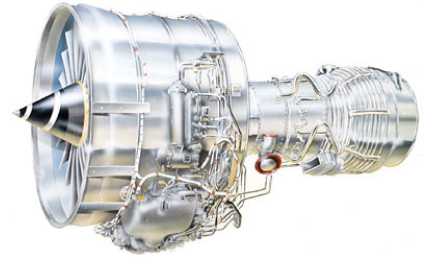
Boiler Industry

Typically used for high pressure vessels and condensers.



Aero-engine

Components used on jet engines (and other areas on aircraft), using the Dabber type GTAW process



Chemical Tanks

These tanks are typically made of stainless steel, aluminum or other special alloys and welded using various weld processes.



Bore Cladding

Internal cladding on valves and pipe used in the petrol-chemical industry.



Aerospace

Large fuel cells used in launch vehicles.



Fuel Tanks

Fuel storage containers, including large LPG tanks and propane tanks.



Tanker Truck & Rail Trailers

Stainless and Aluminum tanks associated with truck hauling and trailers.



Pipe Manufacturing Industry

Used to weld flange and fittings to pipe sections.



CBM-S Manipulator Optional Features

QII System Control

Allows operator to control 4 welding parameters at one time with one weld program, including the weld sequence. See QII Literature for details.



Linear Boom Weld Travel

Upgrade the linear boom travel mechanism for GTAW/PAW welding applications. Boom design and boom drive are enhanced for smoother, more accurate travel required for these welding processes. Upgrade includes ball screw drive and DC motor with encoder feedback



Motorized Travel Cart

The standard manipulator can include a motorized travel cart. These are friction driven, using a DC Motor drive with gearbox to drive one axle of the cart. AMET supplies prints so customer can manufacture their own base rails.



Travel carts are designed to hold weld gear and gas bottles for one weld head as standard. AMET can design larger travel carts upon request.

Flexible Cable Carriers

AMET can supply flexible cable carriers for the manipulator and travel cart. (shown below) The carriers protect the cables and hoses, and properly maintain them as the system is moved into welding position.



Operator Platform (for travel cart only)

The travel cart can be fitted with a operator platform, which extends from the travel cart. This feature allows the operator to move out closer to the weld zone. Maximum 1 meter extension allowed.



Welding Positioners

AMET can also supply welding positioners to hold, rotate and tilt the part under the weld head. These positioners are made in many models to meet you exact requirements.



Turning Rolls

AMET manufactures a complete line of powered and idler turning rolls for welding application. These turning rolls assist in rotating and supporting vessels under the weld head during welding. Please see separate literature.



Manual Cross-Slides

AMET can supply single axis or dual axis manual cross slides to allow the operator to have manual cross seam adjustment and vertical stand-off adjustment for the weld head. Each standard slide has 100 mm of adjustment. The slides include necessary mounting hardware. Please see separate literature.

Manual Pivot and Tilt Axis

AMET can supply single axis or dual axis pivot assemblies to allow the operator to have manual tilt and pivot adjustment. Tilt axis for fillet welding are rated for +/- 45 degrees and Pivot axis for Lead/Lag angles are rated for +/- 15 degrees. Please see separate literature.

Motorized Cross-Slides

AMET can supply a single axis or dual axis motorized cross slides for minor torch adjustment. Includes slide assembly, variable speed control and a joystick pendant for positioning the torch position. AMET can offer the motorized slide in 3 different configurations, with various slide strokes. Slides include necessary mounting hardware. Please see separate literature.