

Basic Description

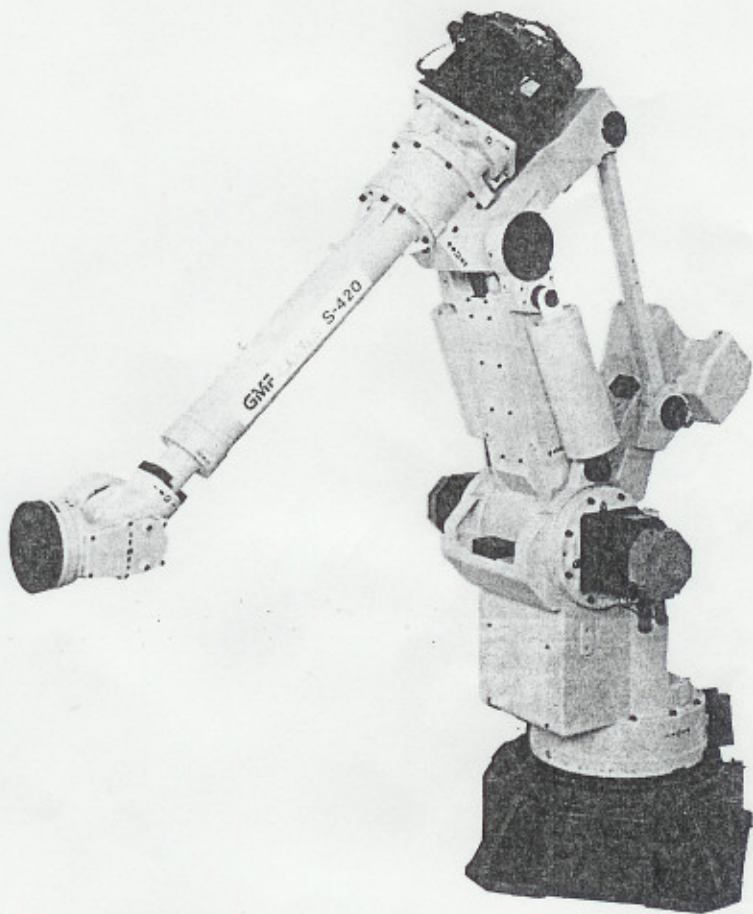
The GMF Model S-420 is a six-axis articulated arm, electric servo driven robot. All six axis motions are controlled simultaneously.

S-420 features include:

- * 6 axes of motion.
- * Absolute encoder positioning and brakes on all axes.
- * 120kg (264 lbs.) payload.
- * $\pm 0.5\text{mm}$ ($\pm 0.02''$) repeatability.
- * 300° base rotation.
- * 2413 mm (95'') reach.
- * 2731 mm (107.5'') vertical travel.
- * Forklift provision.
- * Slender profile.
- * Large work envelope.
- * Ability to carry additional load on axis #1 (i.e. spot weld transformer, valves, manifolds, etc.)
- * Controlled by KAREL[®] Controller.

S-420 applications

- * Spot welding.
- * Machining loading/unloading.
- * Sealing.
- * Material handling.
- * Parts transfer.
- * Water jet cutting.



Mechanical Features and Benefits

Model S-420 employs heavy-duty machine tool-type construction throughout and is built to operate in the most severe plant environments.

Design features include:

- Massive cast iron mounting base.
- Arm joints are anti-friction bearing mounted.

- Precision gear drives in 5th and 6th axes.
- Sealed for life bearings on all critical rotating elements.
- Safety limit switches for overtravel protection.

- Dust-proof maintenance access covers.
- Industrial electrical cabinets.
- Fittings provided on all user lubricated components.

Drive Features and Benefits

All axes driven by state-of-the-art, compact AC servo motors offering:

- Fast acceleration and deceleration.
- Precision positioning.
- No brush maintenance.
- Long service life.

■ World renowned dependability of FANUC servo drives.

Simple drive train concepts:

- RV drives for speed reduction on all axes.

- Compact.
- Less friction—longer life.
- High efficiency.
- Drives directly coupled to AC servo motors on axes 1, 2, and 3.

- Precision gear sets employed on the wrist axes.

S-420 Drive Description

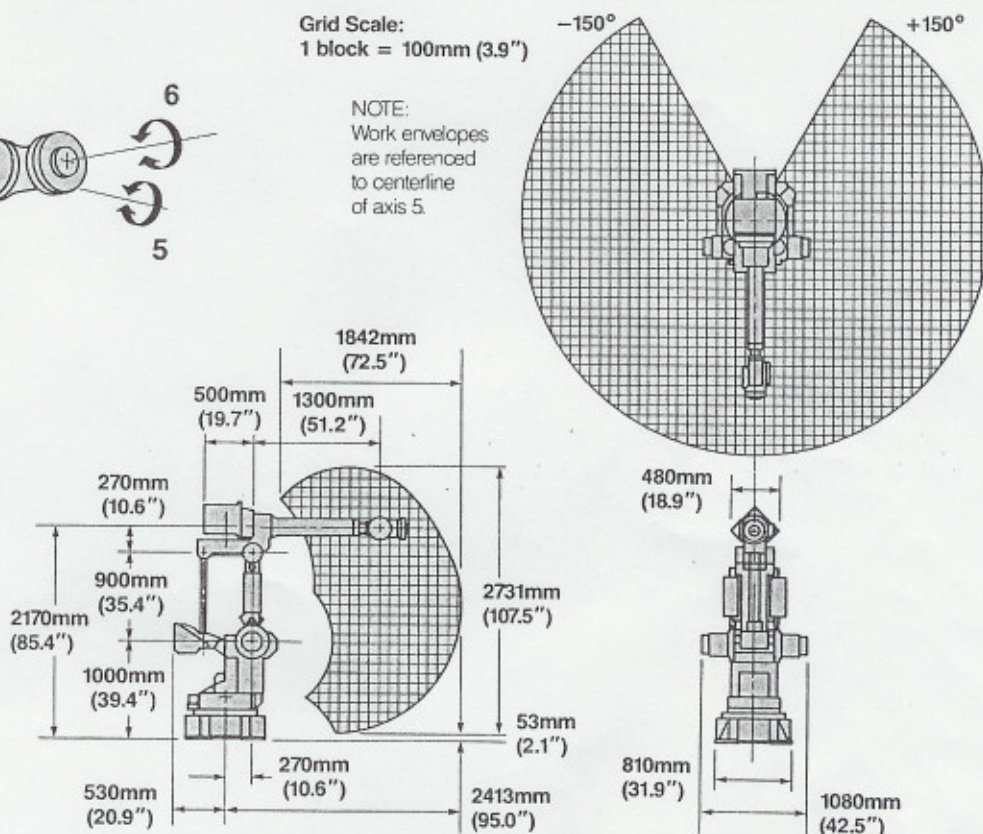
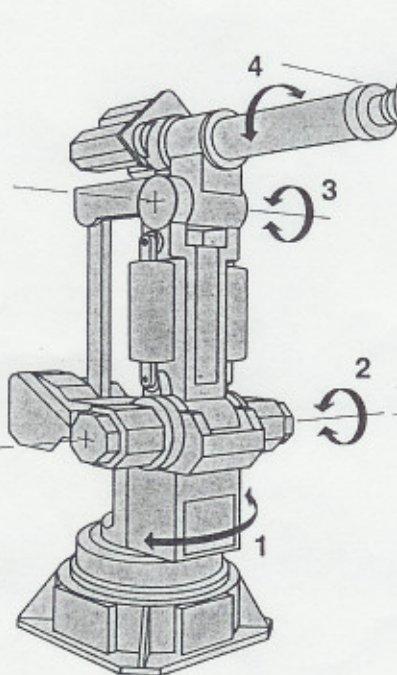
Axes 1, 2 and 3 of the S-420 are driven by AC servo motors through RV reducers. The motors are directly connected to the reducer and the driving force for the axis is supplied directly from the output of the RV drive. This direct connection of the RV drive

allows for fewer drive train members, more rigidity and smoother motion. Wrist axes (4,5, and 6) are also powered by AC servo motors through RV reducers. The motors are located at the rear of the third axis and transmit power to the wrist through

torque tubes. The motors are connected to the torque tubes through a set of precision high speed gears. The wrist end of the torque tube on axis 4 is directly connected to the output of the RV drive. The wrist end of the torque tube for axes 5 and 6 con-

nect to the input of the RV reducer through a second set of precision gears. For all three axes, the output of the reducer is directly connected to the axis member. All six axes utilize electro-mechanical brakes at the motor side of the axis drive train.

S-420 DIMENSIONS



Capacity

The S-420 can manipulate 120kg (264 lbs.) payloads with a center of gravity located 240mm, (9.45") from the face of the wrist flange and with a 300mm (11.8") offset from the wrist center line. Repeatability: ± 0.5 mm (± 0.02 ") at maximum speed and extension.

Approximate weight:
Mechanical unit = 1600kg (3520 lbs.)

Axis	Description	Range	Axis Velocity (Degrees/Sec.)	
			Floor Mount 120kg	Angle Mount 120kg
(1)	Base rotation	300°	90	60
(2)	Waist bend	115°	90	60
(3)	Shoulder bend	130°	90	90
(4)	Arm roll	$\pm 360^\circ$	120	120
(5)	Wrist pitch	240°	120	120
(6)	Wrist roll	$\pm 360^\circ$	120	120
Axis	Wrist Moment (kg-m)	Wrist Inertia (kg-cm-sec ²)		
(4)	60	306		
(5)	60	306		
(6)	36	110		

GMF Robotics

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Specifications subject to change without notice.
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