

Robotic Accessories

Uni-Coupler™ Safety Joints

General Purpose Series — U. S. Patent Numbers 4,639,184, 4,786,769 & 4,954,005

Operating Principle

The Uni-Coupler safety joint is a spring-loaded mechanical device. It is activated by lateral and vertical forces which open a

normally closed switch, signaling the robot when the hand encounters an obstruction.

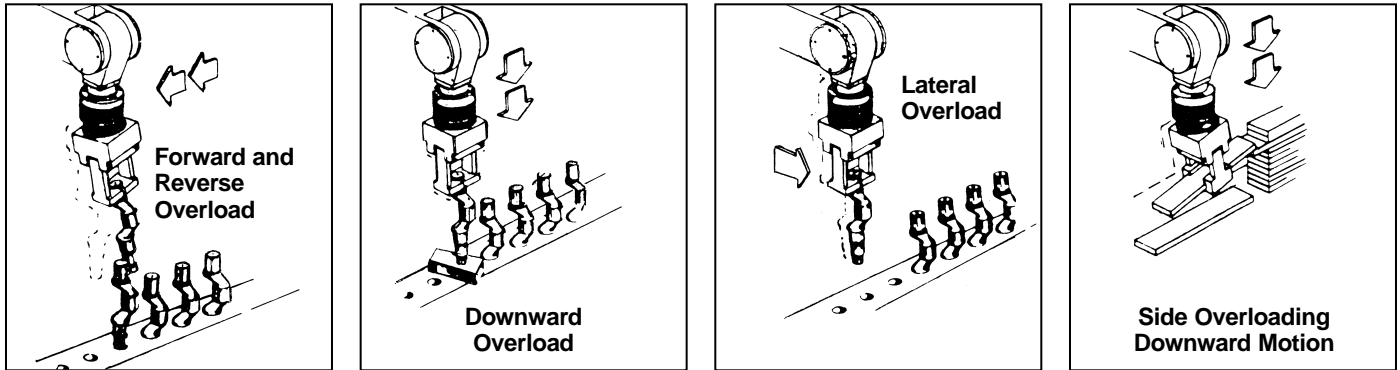
Options Available

- Compliance or Noncompliance. Units with compliance allow up to 0.040 inch “give” in the coupling before the load sensing mechanism is tripped. Models with compliance are recommended for most applications to avoid nuisance tripping. Models without compliance are sensitive to less than one degree of deflection.
- Some models can be modified to provide vertical travel only.
- Hard Wire or Quick Disconnect Option. Uni-Coupler safety joints are available in a hard wire version or with a connector which allows safety joint change or removal without rewiring to the controller.
- Adapter Plates are available for your robot and end effector to make the installation easy.
- Dust Bellows are recommended to protect your safety joint during welding, painting, grinding, etc.
- The Uni-Coupler Safety Joint may be used as a compliance device without the emergency-stop signal.

Features

- Automatic reset following removal of obstruction, unlike common safety joints which require manual reset.
- Simple switching mechanism eliminates the need for tedious adjustment of proximity and mechanical switches common among safety joints.
- Quality Materials. Constructed of tough, nylon-graphite composite with an aluminum mounting flange. Reinforced at critical points to prevent fatigue or sag.
- Built-in Robot Protection. Allows up to 15° deflection (depending on model) for continued motion, without damage, after the robot has been shut off.
- Simple Installation. Just connect the two wires to your 24 volt system.

- Uni-Coupler safety joints are completely field repairable for minimum downtime.
- Repeatability. Returns to within 0.002" of the original position after deflection (measured at mounting flange).
- Wide Range. Five model sizes offer a moment resistance range from 4.2 to 6653.3 in-lbs.
- Outriggers upgrade the capacity of the Uni-Coupler safety joint without advancing to the next larger size. Some safety joint models include Outriggers (reference specifications).



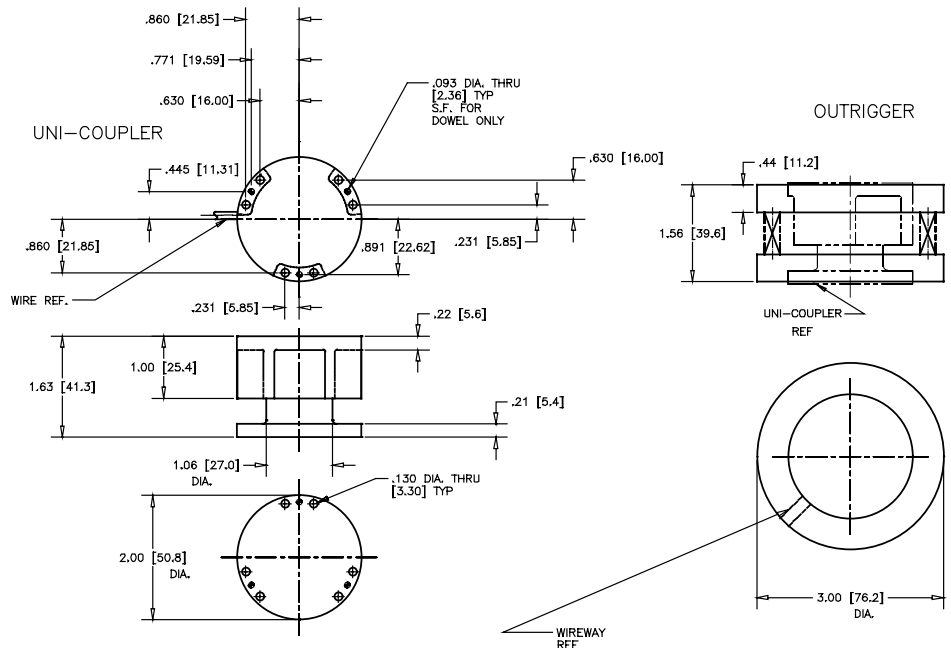
MODEL 4418

Specifications

Weight of Uni-Coupler 6 oz.
 Weight with Outrigger 9.5 oz.
 Maximum Deflection 12°

Moment Resistance Setting (in-lb)

Model	In-Lb
A	4.2
B	5.8
C	9.0
D	10.7
E	11.6
F	18.8
G	28.9
H	45.8
I	60.9
J	65.8



Models E through J include Outrigger.

NOTE: Model 4418 is not available with Quick Disconnect Option.

Robotic Accessories

Collision Sensor Accessories

Bellows

Robotic Accessories stocks two styles of bellows, however, availability of each style varies within the safety joint model line.

Aluminum coated nylon sleeves are flame retarding and the aluminum cover allows the material a 95% reflective heat property that makes it a good material in high heat. This style of sleeve is recommended for welding and other high heat applications.

Buna-N coated nylon bellows are generally resistant to oils, greases and hydrocarbons and offer good abrasion resistance. This style is recommended for protection against unclean environments.

Custom bellows can be manufactured for almost any application (i.e. clean room). We will recommend bellows manufacturers, at your request.

Hard Wire or Quick Disconnect



With the exception of Model 4418, all safety joint models are available with either a hard wire or a quick disconnect wire. The quick

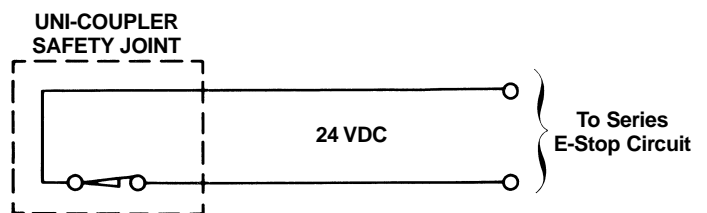
disconnect feature simplifies the removal of the safety joint from the robot. The molex connector is not recommended for those applications in which the tooling experiences extensive rotary motions.

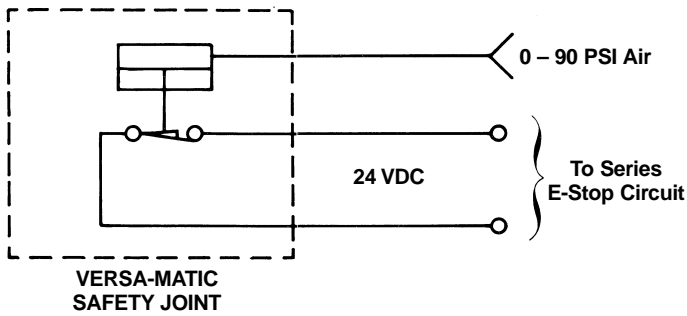
Adapter Plates

Adapter plates are available for any robot model or end effector. Following are estimated specifications on adapter plates for robots:

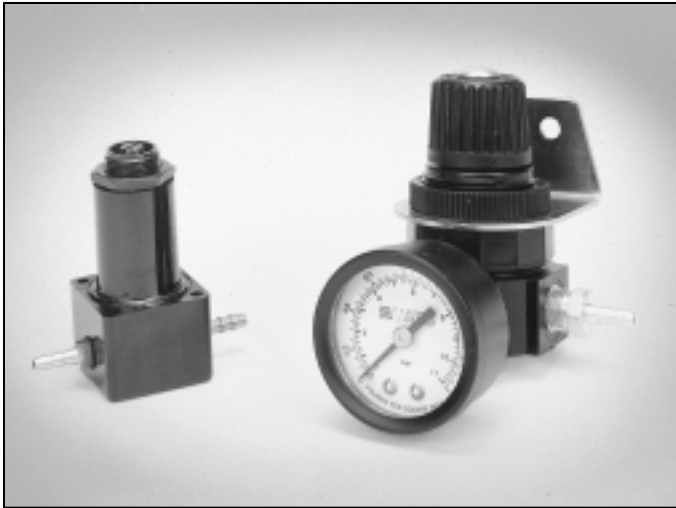
Estimated Adapter Plate Specifications			
Safety Joint Model	Height	Diameter	Weight
4318	3/8"	2-3/4"	3.5 oz.
4319	3/8"	4"	7.4 oz.
4320	1/2"	5-1/4"	1.1 lbs.
4321	5/8"	6-1/2"	2.0 lbs.
4322	3/4"	8-3/4"	4.4 lbs.
4418	3/8"	2"	2.0 oz.
4419	3/8"	3-3/4"	6.5 oz.
4420	1/2"	5-1/4"	13.0 oz.
4421	5/8"	6-1/2"	1.7 lbs.
4422	3/4"	8"	3.7 lbs.

Electrical & Pneumatic Schematics





Regulators (*For Versa-Matic Safety Joints*)



A regulator is available with each Versa-Matic safety joint. We will recommend programmable regulator suppliers at your request.

Air Trol Regulator (Part No. 5462): Miniature regulator shipped preset (psi) for your application, may be adjusted as required, designed for panel or box mounting, tamper-proof, 1.5 oz.

Watts Regulator (Part No. 5463): Compact regulator complete with gage and mounting bracket, removable adjustment knob, 10.5 oz.

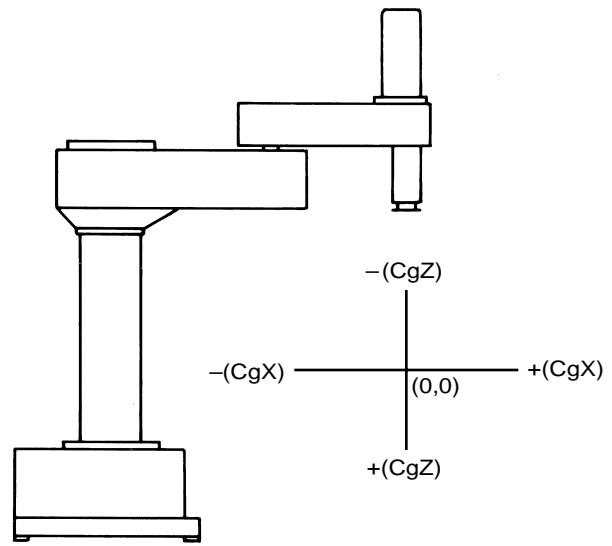
Ordering Data

Safety Joint Model Selection

For assistance in selecting the correct safety joint model for your application, please provide us with the following information or send prints of your tooling.

1. Total Payload, including all tooling, part weight and any additional loads, such as insertion forces.
2. Acceleration of robot arm (inches/second²).
3. Center of gravity of part and tool, X axis (inches).
4. Center of gravity of part and tool, Z axis (inches).

Center of Gravity Diagram



NOTE: Dimensions are taken from robot flange face (ref 0,0)

