

# UCC U1-050

## Universal Compliance Compensator



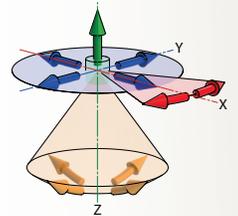
**U1-050 Universal Compliance Compensator**  
allows simultaneous X-Y lateral, X-Y-Z rotation  
and Z-compression compliance

### Product Description

The U1-050 Universal Compliance Compensator (UCC) is designed for high endurance. It provides multi-directional compliance and repeatedly returns to center by means of a pneumatic reset piston. This unique compensator allows the robot to overcome severe misalignment between the tool and workpiece. Users can tune the compliance stiffness for specific applications by varying the supply air pressure. This dynamic allows the UCC to adapt to a variety of demanding applications including: automated assembly, bin picking, loading and unloading machines, robotic finishing, and more.

### Product Features

**Universal Compliance:** Patented mechanism allows simultaneous X-Y lateral, X-Y-Z rotation and Z-compression compliance.

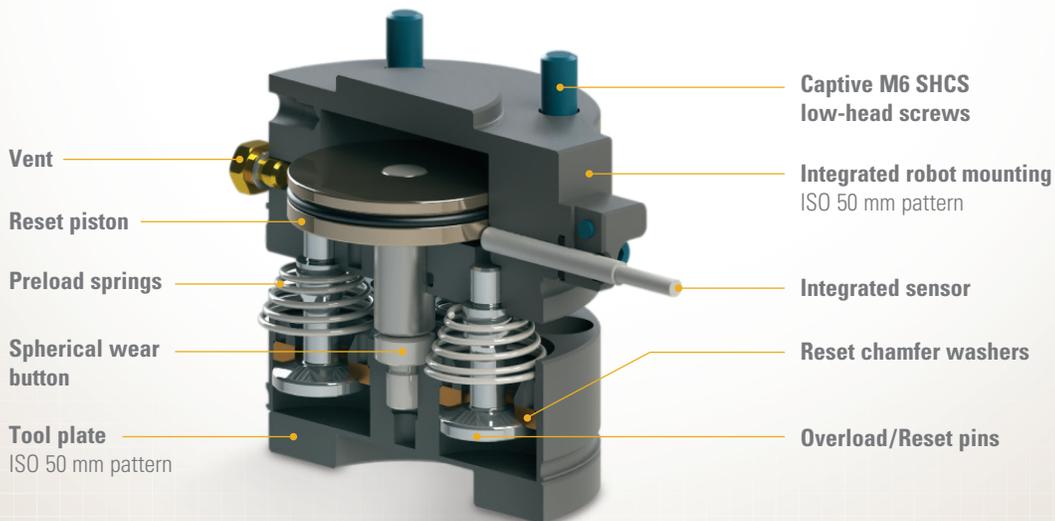


**Pneumatic Reset:** A pneumatically-actuated piston returns the unit to a reset position.

**Adjustable Stiffness:** By varying pneumatic pressure to the reset piston, compliance stiffness can be tuned for each application or payload.

**Integrated Sensing:** An optional compliance sensor can provide a position feedback signal.

**ISO Mounting Pattern:** Compact body with ISO robot flange pattern directly mounts to most robot wrists.

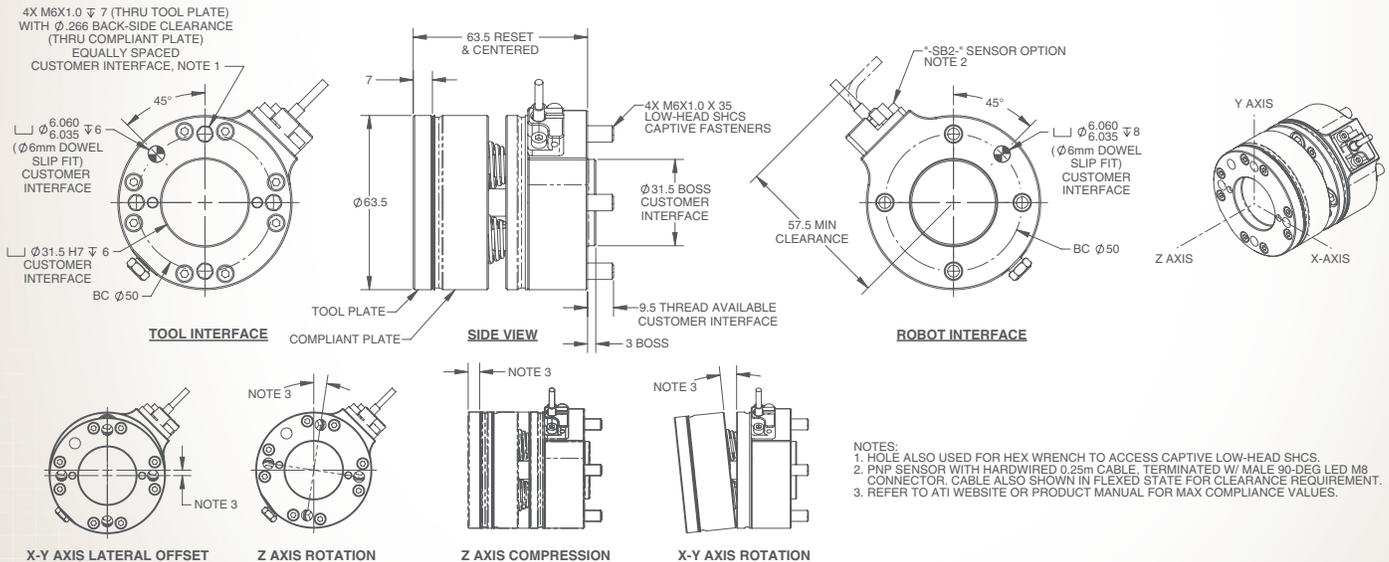


Specifications	Values	Comments
Max Payload	5 kg (11.0 lb)	See also Max Static Moment ratings.
X/Y Lateral Compliance	± 2.7 mm (0.11 in)	Some axial compliance coincides. See also Note A.
X/Y Axis Rotation	± 3°	See Notes A, B.
Z Axis Rotation	± 8°	See Note A.
Z Axial Compression	6.1 mm (0.24 in)	See Note A.
Max Static Moment X/Y	2.26 Nm (20 lbf-in)	For zero deflection under 3g robot accelerations.
Max Static Moment Z	1.13 Nm (10 lbf-in)	For zero deflection under 3g robot accelerations.
Spring Force Min/Max	35.6/92.1 N (8.0/20.7 lbf)	Total at 0 psi supply pressure and min/max axial compliance.
Weight	0.6 kg (1.4 lb)	Includes optional sensor.
Nominal Operating Pressure	5.5 bar (80 psi)	Used to determine ratings.
Compliance Stiffness Tuning	2.1 bar (30 psi) max pressure	See Note C.
Rated Service Life	One million cycles	See Note B.
Compliance Sensor	PNP or NPN	See Note D.
Robot Mounting	ISO 50 mm BC, (4) M6 SHCS, (1) 6 mm Dowel, 31.5 mm Boss	
Tool Mounting	ISO 50 mm BC, (4) M6 SHCS, (1) 6 mm Dowel, 31.5 mm Recess	Default "-2131" Tool plate, if included. See Note E.

- Notes:
- A: Compliance allowed in all directions simultaneously, but max compliance cannot be reached in all directions simultaneously.
- B: Compliance limit for rated service life. Internal hard stops allow up to ± 8°, but reduced spring life should be expected.
- C: Tune compliance stiffness by varying lock pressure between 0-30 psi. Forcing compliance above 30 psi may reduce service life.
- D: Sensor Options: SB2 – 3 wire DC PNP with 0.25 m lead and 90° LED M8 Quick Connect / S0 - No sensor.
- E: Tool plate Options: 0000 – Omit ISO Tool plate/XXXX – Custom Tool plate, available upon request.
- ATI reserves the right to change these specifications.

## U1-050 Universal Compliance Compensator

Drawing # 9630-15-U1K-050-SB2-M-2131-L-03



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