

# Force-Regulated Grasping of Deformable Objects

## Case Study

Adaptive force control with fingertip 6-axis force/torque sensing

Pavlic et al. (2026). Control Architecture for Safe Grasping of Fragile Objects Using a Coarse Position-Controlled Gripper.

### Challenges

Standard grippers apply excessive force to fragile objects.

Unknown object properties make predefined force settings unreliable.

Grip force must prevent slip without deforming the object.

### Solution

Fingertip 6-axis F/T sensors measure contact forces directly.

Contact state estimation adapts the grasp without object knowledge.

Adaptive admittance control applies only the force needed.

### Results

Minimal-force grasping prevents visible deformation.

Stable handling of deformable and rigid objects.

Automatic force adaptation during lifts and disturbances.

### Impact

Robots can safely grasp unknown fragile objects with force feedback from the fingertips.

### Scientific Paper



# Resense F/T Sensors

## Portfolio Overview

### Compact

8 - 32 mm in diameter

### Precise

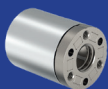
from 10 mN resolution

### Ready-to-Use

sensor kit

#### HEX 8

Ø 8.4 mm

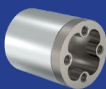


F = 25N

#### HEX 8 High Force

Ø 8.8 mm

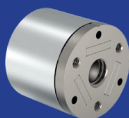
NEW



Fz = 250N

#### HEX 12

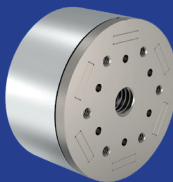
Ø 12.5 mm



F = 25N

#### HEX 21

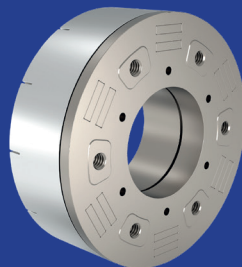
Ø 21 mm



F = 50N

#### HEX 32

Ø 32 mm



F = 125N



**Resense**

A Sense of Touch

#### Contact Us

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