



# ESTAT

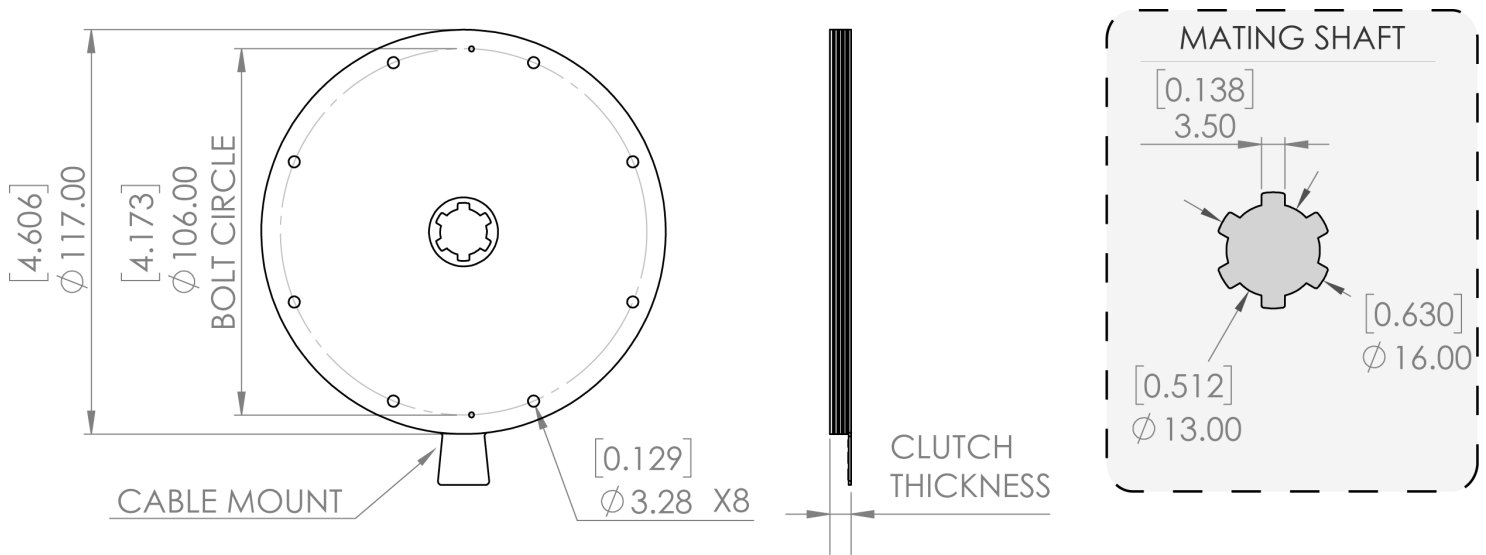
ACTUATION

Compact motion starts—and stops—with us

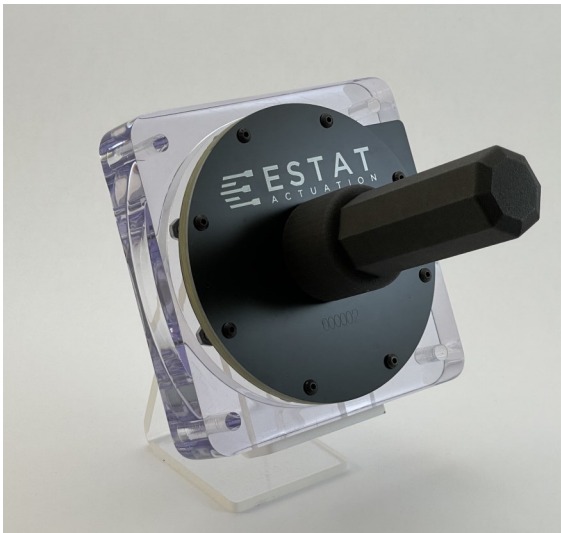
## UltraSlim Rotary Evaluation Unit

### Nested Disc Clutch

The Evaluation Unit includes the UltraSlim Clutch along with a base and handle for instant evaluation after unboxing. The UltraSlim 3.2 is only 3.2 mm thick and contains a single clutch module. The UltraSlim 7.0 is 7 mm THICK and contains three clutch modules.



Technical Specifications	Model		
	ESTAT US-12	ESTAT US-24	ESTAT US-36
Clutch thickness—mm (inch)	6.2 (.244)	9.4 (0.370)	12.8 (.504)
Weight: clutch only—g (lb)	160 (0.35)	271 (0.60)	382 (0.842)
Rotational inertia—kg m <sup>2</sup> (lb ft <sup>2</sup> )	$7.5 \times 10^{-5}$ ( $1.8 \times 10^{-3}$ )	$1.5 \times 10^{-4}$ ( $3.6 \times 10^{-3}$ )	$2.2 \times 10^{-4}$ ( $5.3 \times 10^{-3}$ )
Max rated torque—Nm (in-lb)	12 (106.2)	24 (212.4)	36 (318.6)
Off-state friction—Nm (in-lb)	0.05 (0.44)	0.06 (0.53)	0.09 (0.80)
Response— msec	< 25	< 25	<25
Power consumption with 1 Hz cycling — W @ 400 V	< 0.006	< 0.012	< 0.018
Activated maintenance power — mW @ 400V	< 0.16	< 0.32	< 0.48



## Device overview:

The **UltraSlim Evaluation Unit** allows users to experience our electrostatic rotary clutch within seconds of unboxing. The handle and base accessories provide simple grips for a tactile experience. Just click “engage” on the provided voltage driver to operate.

The clutch itself is extremely compact. ESTAT clutches are formed of multiple clutch modules (below) each measuring only 0.8 mm thick. Stacking multiple modules increases the torque capacity of the clutch. The quantity and diameter of these modules can be selected to fit any application.

Our clutches are 10 times lighter and 1000 times more efficient than conventional electromagnetic options.

## Device operation:

ESTAT clutches are load-bearing capacitors. Applying voltage across the clutch electrodes causes accumulation of positive charges on one side of the clutch and negative charges on the other. This results in adhesion between the rotor and the flexible electrodes which locks the clutch. As capacitors, ESTAT clutches require minimal maintenance current to remain engaged (< 10  $\mu$ A). The clutch disengages when the voltage potential is removed.

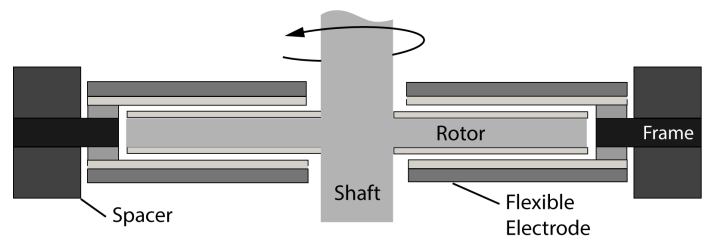
The inner clutch rotor interacts with a spline shaft. The outer clutch electrodes are connected to the clutch housing. Clutches can be customized to fit spline shafts, keyed shafts or other transmission elements.

## Adjusting max load:

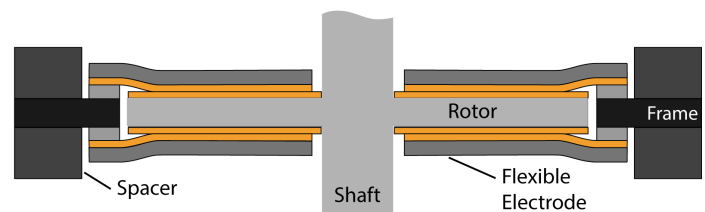
Maximum torque can be adjusted by modulating applied voltage (right bottom). This behavior can be used as a mechanical fuse to provide gear train protection or for other torque-limiting applications. If applied torque exceeds the maximum holding torque, the clutch will slip. This slip is accompanied by a drop in torque as the clutch transitions from static to kinetic friction. Try the low, medium and high voltage settings on the included voltage driver to experience this feature.

Operate the evaluation unit in a dry environment free of metal filings or other debris. Sealed clutches for other operating conditions are in development.

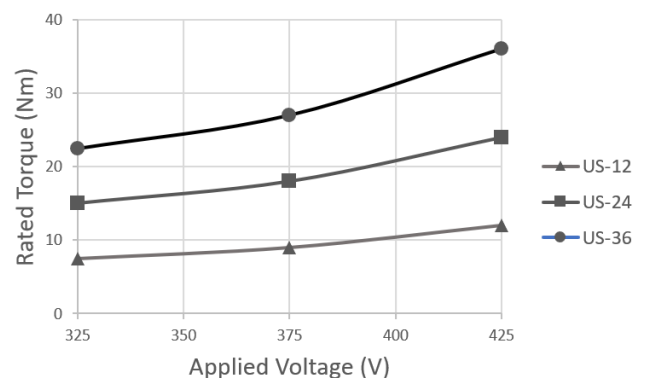
**Disengaged - Power Off**  
Shaft and rotor are free spinning



**Engaged - Power On**  
Shaft and rotor are coupled to outer frame



## Tunable Torque Capacity



\*Markers denote low, medium and high voltage driver settings

Email [info@estat.tech](mailto:info@estat.tech) for availability, questions, or to place an order.

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*Note: specifications subject to change without notice.*