

# dyNALOX

## Torque transfer and lock without electricity

"dyNALOX" is designed to transfer torque from the input shaft to the output shaft, but rotation from the output shaft is locked so the torque from the outside does not transfer to the inside. This system can be easily adopted by adding a few extra millimeters on top of a planetary gear. With this, the motor is locked from outside force even under no-power conditions.

### Features

- Outer force is disconnected without use of a low efficiency reduction system such as a worm gear or slide screw.: System can be made small in size
- No electric power is required in this system.: Contributes to low current consumption, emergency stop function



#### Application Example

Impulsing Paradigm Change through Disruptive Technologies Program (ImPACT)  
Product developed for Tough Robotics Challenge: Multi-fingered robot hand

With dyNALOX integrated into  $\Phi 12\text{mm}$  planetary gearheads, workpieces can be gripped with zero power consumption, even when the motor is not energized.

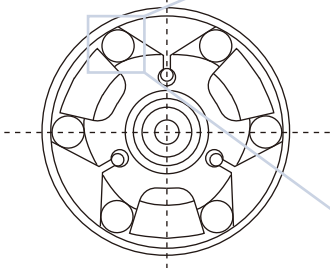
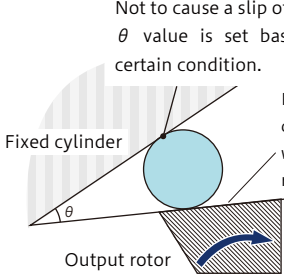
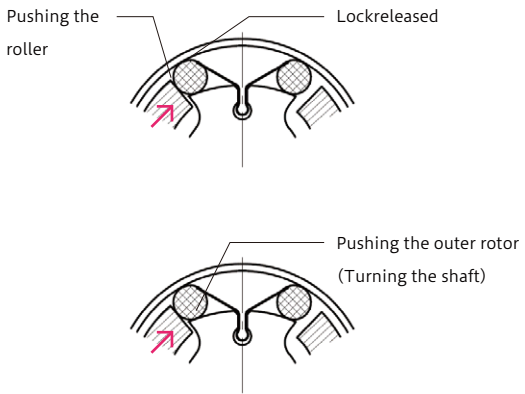
→Reduce power consumption + ensure safety in emergencies

- dyNALOX's grip force allows the motor to be miniaturized, achieving compactness and light weight, as well as high power output.

→With  $\phi 12\text{mm}$  on-board motors

- Fingertip force: 150 N, Grip force: 600 N (non-energized holding)

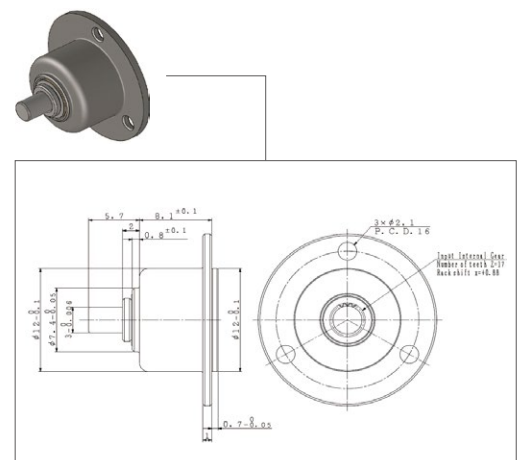
# Composition and Mechanism

|                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Stop Condition<br/>(Locked)</p>   | <p>Rollers prevent the output shaft from rotating either direction.</p>  <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Not to cause a slip of the roller, <math>\theta</math> value is set based upon a certain condition.</p>  <p>Fixed cylinder</p> <p>Output rotor</p> <p>Roller pinching occurs when the contact surface is not coaxial with the output rotor axis of rotation.</p> </div> |
| <p>Move Condition<br/>(unlocked)</p> | <p>The rollers are pushed out by the input rotor, and the lock is removed.</p> <p>Input rotor makes contact with the output rotor and the output shaft rotates.</p>                                                                                                                                                                                                                                                                                                                                        |

## dyNALOX Mounted Planetary Gearhead

| dyNALOX series             |                   | Integrated with planetary gearhead LPG12 | External attachment, standalone mechanism L12 |
|----------------------------|-------------------|------------------------------------------|-----------------------------------------------|
| Outer diameter [mm]        |                   | 12                                       | 12 ※Excludes mounting flange                  |
| Max allowable [mNm]        |                   | 400                                      |                                               |
| Max input speed [rpm]      |                   | 140                                      |                                               |
| Shaft radial play [°]      |                   | ≅0.02                                    |                                               |
| Output shaft bearing [mm]  |                   | Sintered sleeve bearing                  |                                               |
| Gear ratio<br>(Efficiency) | Total length [mm] | 1 Stage                                  | 4.8 : 1 (57%)    15.7    -                    |
|                            |                   | 2 Stage                                  | 23 : 1 (66%)    19.5    -                     |
|                            |                   | 3 Stage                                  | 107 : 1 (60%)    23.3    -                    |
|                            |                   | 4 Stage                                  | 509 : 1 (52%)    27.2    -                    |

External attachment, standalone mechanism L12 Example figure



※Specifications, figures, etc. are development examples. Please contact us if you have any questions. Specifications may include content based on calculated values.

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Details of this product

