

POWER CYLINDER

T SERIES



CO₂
emission
-80%
Electrical
Usage

ECO
SERIES

POWER CYLINDER/LINEAR ACTUATORS
THE ECOLOGICALLY-FRIENDLY SOLUTION

80% less CO₂ emission and electricity usage
compared to hydraulic or pneumatic cylinders.

POWER CYLINDER THE ECOLOGICALLY-FRIENDLY SOLUTION

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Clean operation

Clean operation is possible because there is no oil leak.



Easy installation

Unlike hydraulic cylinders, operation at a high place and under adverse environment is easier, because power cylinder does not require extra components installation.



Operable only by electrical wiring

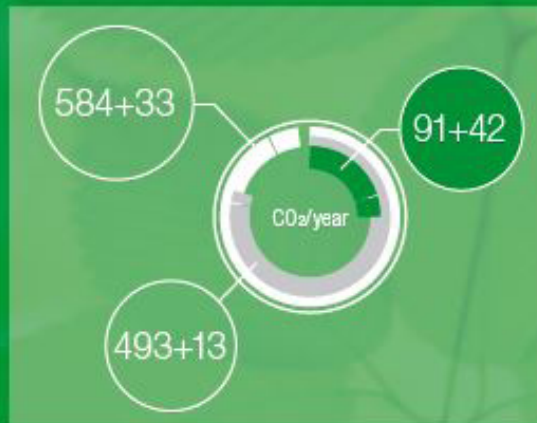
All you need for operation is electrical wiring.

Eco-Friendly

The Power Cylinder has been recognized as a power-saving product by LCA (Life Cycle Assessment). In addition to its energy-saving feature, CO₂ emissions can be significantly reduced compared with air cylinders and hydraulic cylinders.

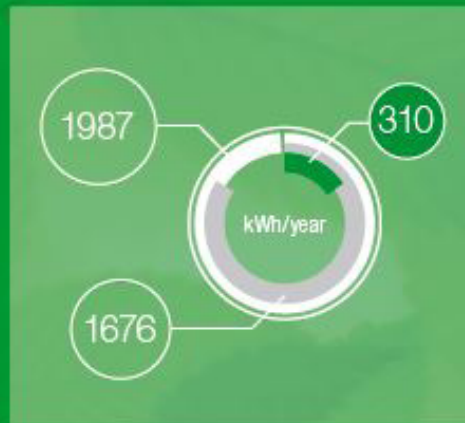
CO₂ Emission

(kg CO₂/year)



Electrical Usage

Comparison of electricity per 1set (kWh/year)



CO₂ comparison

Power cylinder	1.0
Pneumatic cylinder	4.6
Hydraulic cylinder	3.8

Electrical comparison

Power cylinder	1.0
Pneumatic cylinder	6.4
Hydraulic cylinder	5.4

Pneumatic cylinder
 Hydraulic cylinder
 Power cylinder

CO₂ Emission (kg CO₂/year)

In Operation

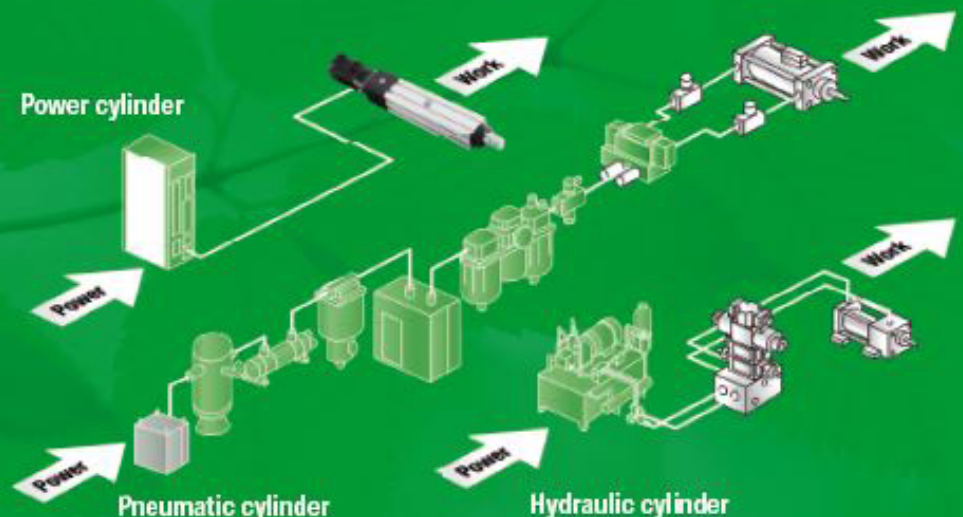
Power cylinder;	91
Pneumatic cylinder;	584
Hydraulic cylinder;	493

In Production

Power cylinder;	42
Pneumatic cylinder;	33
Hydraulic cylinder;	13

Comparison Condition

Thrust; 3 kN, Velocity; 200 mm/s, Stroke 500 m
 1 reciprocating/min x 12 Hrs. x 250 days
 Including all drive unit such as drive motor,
 hydraulic pump or compressor



T SERIES

Thrust: 2.45 kN to 313 kN

This T series consist of ball screw and helical gear to achieve most efficient combination.

■ High Efficiency

Ball screw and helical gear combination brings better efficiency to operate with lower kW and also the brake system gives no electrical power consumption when the cylinder hold the load.

■ Ball screw & helical gear in house

We develop and manufacture ball screw and gears in house and we can develop the market requirements in short term.

■ Control Options

Position control limit switches

- External; Easy to set positioning at both ends or in the middle.
- Internal; It is better in abrasive to be protected in internal box.

■ Over load protection

Our over load protection system has 2 types and both can work with the same value on push and pull load.

TB type; with built-in Torque Limiter

TC type; with Spring thrust detector, it can give signal to control system.



High performance linear actuators offering efficient, clean and quiet drive

Technical Information:



BITTE VOR
DRUCK
PRÜFEN



Brake motor

This motor adopts a deenergization operation type (spring close type), and the brake is applied while the cylinder stops. This brake action holds load while the power cylinder stops and reduces coasting during stoppage, and serves the purpose of increasing stop accuracy. All of the brake motors adopt outdoor types (IP55).

Reduction part

The reduction part adopts a combination of a helical gear on the high speed side and a spur gear on the low speed side. The lubrication method is grease bath type, and has a quiet operating specification. Furthermore, a manual handle shaft is provided, and the structure of the speed reducer facilitates operation at power failure and adjustment for installation. Optionally, various position detecting devices can be installed.

Actuation part

The actuation part is provided with a ball screw and nut which converts a rotating force into linear motion. Further, external limit switches for stroke adjustment can be mounted.

A high precision ball screw and nut have advantages such as high transmission efficiency, less wear, long life and easy lubrication.

The external limit switches for stroke adjustment are structured to freely adjust the stroke and endure outdoor use. The bellows are excellent in weatherproofing, and the stroke does not change even, if the bellows are mounted.

The seal for the rod also endures outdoor use.

ECO SERIES

Thrust: 300 N to 15 kN

Eco series performs high speed and accuracy with servomotor and high efficiency ball screw.

■ **±0.02 mm, high repeatable positioning accuracy**

Each servomotor manufacturer's attaching parts are mount-coded, which can be indicated by main body model no.

■ **Selectable servo motor**

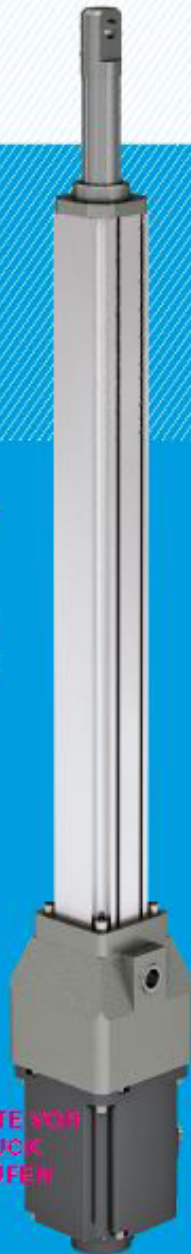
We prepare major servo motor attachment parts to adopt required motor to be installed.

■ **High speed control**

We design straight type as couple direct with servo motor and it achieves high speed as 333 mm/s.

■ **Effect drive low speed**

We also design with precision planetary reducer to drive more ecological and efficient drive. Planetary reducer redacts power consumption for the drive.



New models of power cylinders capable of corresponding to wide-ranging speeds and thrusts



Maximization of servomotor performance

Servomotor performance is maximized by combining high-efficiency ball screw, high-rigidity and light-weight disc coupling. Because of clamp type fastening, there is no backlash like key fastening. Clamp type fastening also applies even with precision planetary reducer.

Selectable servomotor

A desired servomotor can be installed. For an estimate, inform us of the servomotor manufacturer or mount code.

Realization of high speeds and wide-ranging thrusts

For high speeds in a large thrust area.

- 45 frame 300 mm/s at the maximum thrust of 300 N {30.6 kgf}
- 70 frame 300 mm/s at the maximum thrust of 3000 N {306 kgf}
- 105 frame 333 mm/s at the maximum thrust of 15000 N {1530 kgf}

Realization of high stopping accuracy

High stopping accuracy is realized through the adoption of high-precision ball screw. The repeated positioning accuracy*1 is ±0.02 mm. The stopping accuracy*2 is within ±0.1 mm.

*1) Difference in the position of stopping at one point in the same direction of operation

*2) Difference between target point and actual stopping position

Effects with precision planetary reducer

Due to the reduction in servomotor size, the following effects can be expected:

- Peripheral equipment, such as amplifier, can also be made smaller, so that the initial cost can be reduced.
- Electric energy decreases, so that the running costs can also be reduced.
- The coupling housing is also downsized to be lightweight and compact.

Technical Information:

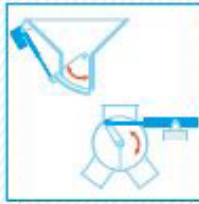


BITTE VOR DRUCK PRÜFEN

EXAMPLES IN USE

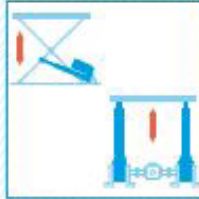
Opening and Closing

Various types of opening and closing can be performed by changing the linear motion of power cylinders into turning force through link mechanisms.



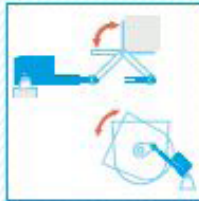
Elevation

Various types of elevation can be performed by using the linear motion of power cylinders. Power cylinders are effective for holding loads reliably and in synchronization.



Turnover

Conveyed objects can be turned over and transferred by the linear motion of power cylinders and simple supporting arrangements. Smooth operation can be performed with little backlash.



Handling

Various handling devices can be established by combining power cylinders and link mechanisms. Power cylinders enable reliable fastening.



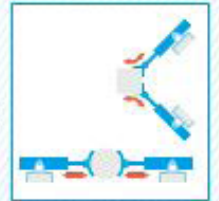
Stopper

Conveyed objects can be stopped or changed in direction mainly through the link mechanisms in addition to the linear motion of power cylinders. Also, they can be stopped directly.



Positioning

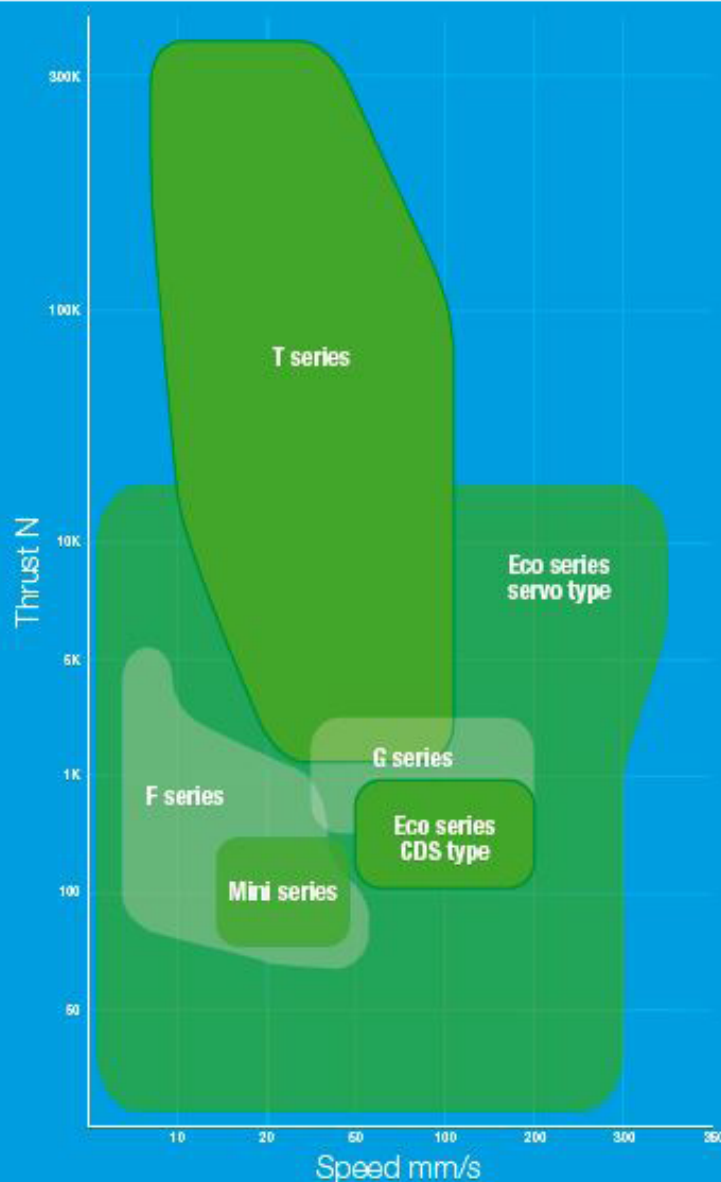
Goods and materials can be moved into place and positioned by using a single or multiple power cylinders. Furthermore, they can be held and fixed in place.



APPLICATION@WORK



CAPACITY RANGE



Eco series – Servo type

150 kN ~ 1500 kN
(15.3 ~ 1530 kgf)



Eco series – CDS type

0.25 kN ~ 1.00 kN
(25.5 ~ 103 kgf)



F series

100 kN ~ 6.00 kN
(10.2 ~ 612 kgf)



G series

700 N ~ 3.00 kN
(71.4 ~ 306 kgf)



T series

2.45 kN ~ 313 kN
(250 ~ 32000 kgf)



Large series

617 kN ~ 882 kN
(63000 ~ 90000 kgf)



Multi series

4.9 kN ~ 313 kN
(500 ~ 32000 kgf)



Mini series

98.0 kN ~ 392 kN
(10 ~ 40 kgf)



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