

NEW



ELECTRICAL CYLINDER WITH
AND WITHOUT THROUGH-HOLE

Efficient - Precise - Energy saving

RÖHM
driven by technology

ELECTRICAL CYLINDER WITH AND WITHOUT THROUGH-HOLE

Electric clamping systems are still at the starting point of their development. However, they are becoming increasingly interesting since well-known machine manufacturers already offer highly efficient all-electric machines which are operating without hydraulic and pneumatic systems. With the development of its EHS / EVS electric clamps, RÖHM has made an important contribution to this trend.

In the different areas of mechanical engineering and the automotive industry, the trend to replace hydraulic drives by electro-mechanical drives is recognizable. There are several reasons for this. One of them is **energy efficiency**: With hydraulic systems, energy always has to be kept available or stored, which results in a continuously high energy consumption. Electric drives, on the other hand, consume energy „on demand“, that is, only when they actually carry out a movement (such as clamping or releasing).

Another reason for the substitution of hydraulic by electric drives is the fact that a **higher precision and sensitivity** is achieved in this way. An example for this are plastic injection moulding machines: in the production of extremely thin-walled parts, such as mobile phone housings, machines with electric clamping axes are mostly used now

since they are more precisely adjustable than the hydraulic clamping systems commonly used. Further advantages of the combination of mechanics and electronics are the greater flexibility, the excellent controllability and the possibility of integrating the drives directly into higher-level control systems.

Electric clamps are the consistent and pioneering response to this trend. They are activated by a drive equipped with the latest control technology and electronics, replacing the previously necessary hydraulic clamping cylinders. In the future, this will enable the attachment of future novel clamping systems to the machine spindles with important quality characteristics such as **energy saving, fast, strong and still very „sensitive“ combined with high reliability.**

ENERGY SAVINGS OF AN ELECTRICAL CYLINDER

Energy consumption of a hydraulic clamping cylinder:

| | |
|----------------------------------|---------------|
| Output of hydraulic unit | 1,5 kW |
| Power dissipation from cylinders | 0,9 kW |
| Total output | 2,4 kW |
| Energy consumption per year | 14.400 kWh |

Energy consumption of an electrical cylinder:

| | |
|-----------------------------|---------------|
| Output electrical cylinder | 0,1 kW |
| Total output | 0,1 kW |
| Energy consumption per year | 600 kWh |

Energy saving potential per year 13.800 kWh

this corresponds with an annual energy consumption of 3 single-family households

The above assumptions have been based on a standard manufacturing process in three-shift operation and may vary depending on the application involved. Where greater efficiency is achieved in the processing (e.g. by getting the best possible match between the cylinder and the process, or through shorter lift times), even more energy can be saved by indirect means.

BENEFITS AT A GLANCE

EFFICIENT & FLEXIBLE

- ⊕ Adjustable stroke: reduction of stroke times to a minimum
- ⊕ Adjustable power: modifiable even during rotation

ECOLOGICALLY

- ⊕ Energy is used only „on demand“
- ⊕ Clean, oil-free and noise reduced work environment

PRECISE

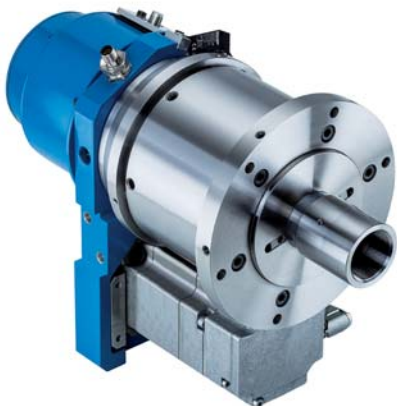
- ⊕ Fully adjustable power for sensitive workpieces
- ⊕ Lower thermal influences on the machine spindle

LOW-MAINTENANCE

- ⊕ No oil changes, no danger of leakage
- ⊕ Maintenance requirements identified at an early stage by the control

SAFE

- ⊕ Reliable processes due to continuous monitoring by sensors
- ⊕ Clamping force backup in case of power failure



Electrical cylinder with through-hole EHS



Electrical cylinder without through-hole EVS

EHS ELECTRICAL CYLINDER WITH THROUGH-HOLE



APPLICATION

Electrical actuation of power chucks/collet chucks with through-hole.

TYPE

Hollow clamping cylinder with bar through-hole up to 67 mm.

CUSTOMER BENEFITS

- ⊕ Energy-efficient, since energy is only required during the clamping and unclamping operation
- ⊕ Flexible use thanks to optimal stroke and force control option (force change even during rotation)
- ⊕ High precision thanks to low thermal influences
- ⊕ Increase in operational safety and quality thanks to constant monitoring of the clamping status
- ⊕ Low-maintenance and environmentally friendly thanks to omission of hydraulic components
- ⊕ Sensor outside of dirty area to reduce error susceptibility

TECHNICAL FEATURES

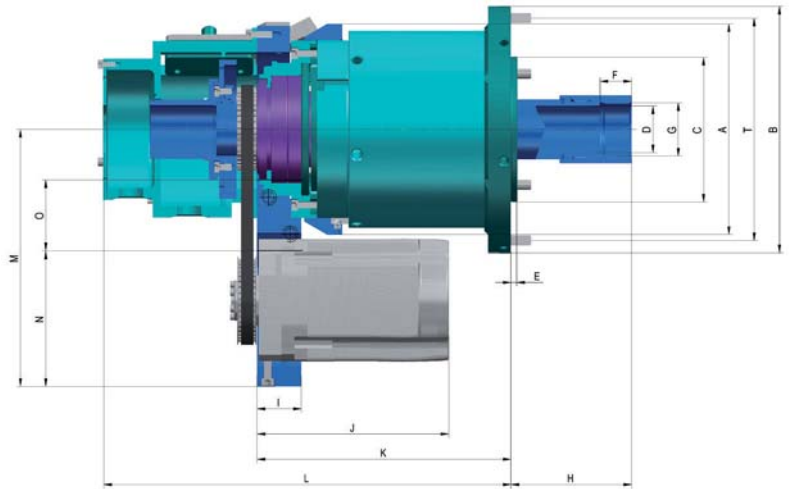
- Coolant collector
- Standard spindle fastening: EHS-37 from the rear, EHS-67 from the front (other spindle flanges on request)
- Motor mount must be fastened to the machine

Scope of delivery:

Mechanical electric clamping cylinder, incl. sensors, stationary motor mount, incl. connection components of the toothed belt drive

Note:

Servo motor, control unit, servo amplifier, set of cables and electronic accessories must be ordered separately



C 15
Electrical cylinder with through-hole EHS

| Item no. | 1289821 ▲ | 1290622 ▲ |
|-------------------------------------|---|---|
| Pull-in / compressing force area kN | 5-50 | 5-68 |
| Total stroke mm | 32 | 32 |
| External Ø A mm | 167 | 255,5 |
| Ø B mm | 195 | 209,8 |
| C h 6 mm | 115 | 170 |
| Through-hole D mm | 37 | 67 |
| E mm | 5 | 8 |
| T Pitch circle spindle connection | 176 (M8 - 6x60°) Befestigung von hinten | 196 (M6 - 12x30°) Befestigung von vorne |
| F mm | 25 | 25 |
| G | M42x1,5 | M75x2 |
| Stroke min/max | 63/95 | 67/89 |
| I mm | 35 | 33,5 |
| J mm | 151,5 | 177,5 |
| K mm | 200,7 | 226,6 |
| L mm | 322,5 | 348 |
| M mm | 203 | 260 |
| N mm | 98 | 130 |
| O mm | 55 | 55 |
| Speed max. min ⁻¹ | 6000 | 6000 |
| Weight approx. kg | 28,9 | 70 |
| Rotating mass kg | 25 | 53 |
| Moment of inertia kg/m ² | 0,086 | 0,36 |

ACCESSORIES EHS

Necessary for function

C 15
Servo drive for electrical cylinders

| Item no. | Size | Contents of delivery | Type |
|-----------|--------|----------------------|---|
| 1293003 ▲ | EHS-37 | piece | Siemens 1FK7040-2AK71-1TG0, Type: Resolver, without brake |
| 1293004 ▲ | EHS-67 | piece | Siemens 1FK7042-2AK71-1TG0, Type: Resolver, without brake |

C 15
Control unit for electrical cylinders

| Item no. | Contents of delivery | Type |
|-----------|----------------------|---|
| 1266223 ▲ | piece | Controller for electrical cylinders, communication Type: PROFIBUS, incl. software with standard functions |

Optional: PROFINET, CANopen, Digital/Analog on request

C 15
Servo amplifier for electrical cylinders

| Item no. | Contents of delivery | Type |
|-----------|----------------------|---|
| 1290634 ▲ | piece | Servo amplifier AC12A00S03.00 to control servo motor; without security card |
| 1290635 ▲ | piece | Servo amplifier SIK2 AC12A00S03.00 to control servo motor; with security card |

A servo amplifier optionally with or without security card will be needed

C 15
Cable set for electrical cylinders

| Item no. | Contents of delivery | Type |
|-----------|----------------------|---|
| 1268783 ▲ | piece | Contains encorder cable and power line between servo drive and servo amplifier; sensor cable between electrical cylinder and control unit; CAN-line (3m) between servo amplifier and control unit (cable length: 20m) |

All electrical connections and cables between machine and cylinder have to be provided by the customer

Optionally for function

C 15
Brake module for electrical cylinders

| Item no. | Contents of delivery | Type |
|-----------|----------------------|--|
| 1266231 ▲ | piece | Brake modul 11BC1-14: For connection to the servo amplifier to dissipate the braking energy. Necessary if there is no intermediate circuit supply at the machine |

C 15
Brake resistor for electrical cylinders

| Item no. | Contents of delivery | Type |
|-----------|----------------------|--|
| 1266232 ▲ | piece | Brake resistor 39BR006: For dissipate of the braking energy. Necessary if there is no intermediate circuit supply at the machine |

EVS ELECTRICAL CYLINDER WITHOUT THROUGH-HOLE



APPLICATION

Electrical actuation of power chucks without through-hole.

TYPE

Clamping cylinder with feed-through \varnothing 11 mm for coolant or other media.

CUSTOMER BENEFITS

- ⊕ Energy-efficient, since energy is only required during the clamping and unclamping operation
- ⊕ Flexible use thanks to optimal stroke and force control option (force change, even during rotation)
- ⊕ High precision thanks to low thermal influences
- ⊕ Low-maintenance and environmentally friendly thanks to omission of hydraulic components
- ⊕ Increase in operational safety and quality thanks to constant monitoring of the clamping status

TECHNICAL FEATURES

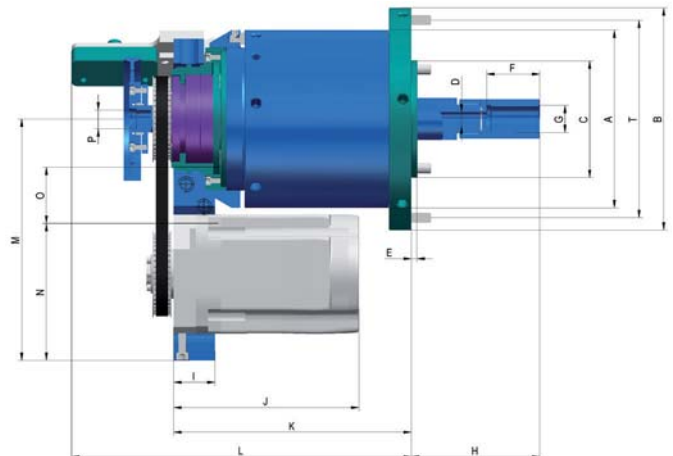
- Standard spindle mounting from the rear (other spindle flange on request)
- Motor mount must be fastened to the machine
- Possible attachment of rotary feed-throughs

Scope of delivery:

Mechanical electric clamping cylinder, incl. sensors, stationary motor mount, incl. connection components of the toothed belt drive

Note:

Servo motor, control unit, servo amplifier, set of cables and electronic accessories must be ordered separately



C 15

Electrical cylinder without through-hole EVS with feed-through \varnothing 11 mm for coolant or other media

| Item no. | 1267620 ▲ |
|-------------------------------------|----------------|
| Pull-in / compressing force area kN | 5-50 |
| Total stroke mm | 32 |
| External \varnothing A mm | 144 |
| \varnothing B mm | 180 |
| C h 6 mm | 95 |
| Through-hole D mm | 11 |
| Pitch circle spindle connection T | 160 (M8 6x60°) |
| E mm | 5 |
| F mm | 43 |
| G | M22x1,5 |
| Stroke min/max | 72/104 |
| I mm | 33,5 |
| J mm | 150 |
| K mm | 192,5 |
| L mm | 275 |
| M mm | 195,5 |
| N mm | 110,5 |
| O mm | 55 |
| P | 5/8-18 UNF |
| Speed max. min ⁻¹ | 6000 |
| Rotating mass kg | 22,8 |
| Weight approx. kg | 34,8 |
| Moment of inertia kg/m ² | 0,059 |

ACCESSORIES EVS

Necessary for function

C 15
Servo drive for electrical cylinders

| Item no. | Size | Contents of delivery | Type |
|-----------|--------|----------------------|---|
| 1293003 ▲ | EVS-50 | piece | Siemens 1FK7040-2AK71-1TG0, Type: Resolver, without brake |

C 15
Control unit for electrical cylinders

| Item no. | Contents of delivery | Type |
|-----------|----------------------|---|
| 1266223 ▲ | piece | Controller for electrical cylinders, communication Type: PROFIBUS, incl. software with standard functions |

Optional: PROFINET, CANopen, Digital/Analog on request

C 15
Servo drive for electrical cylinders

| Item no. | Contents of delivery | Type |
|-----------|----------------------|---|
| 1290634 ▲ | piece | Servo amplifier AC12A00S03.00 to control servo motor; without security card |
| 1290635 ▲ | piece | Servo amplifier SIK2 AC12A00S03.00 to control servo motor; with security card |

A servo amplifier optionally with or without security card will be needed

C 15
Cable set for electrical cylinders

| Item no. | Contents of delivery | Type |
|-----------|----------------------|--|
| 1268783 ▲ | piece | Contains encoder cable and power line between servo drive and servo amplifier; sensor cable between electrical cylinder and control unit; CAN-line (3m) between servo amplifier and control unit (cable length: 20m) |

All electrical connections and cables between machine and cylinder have to be provided by the customer

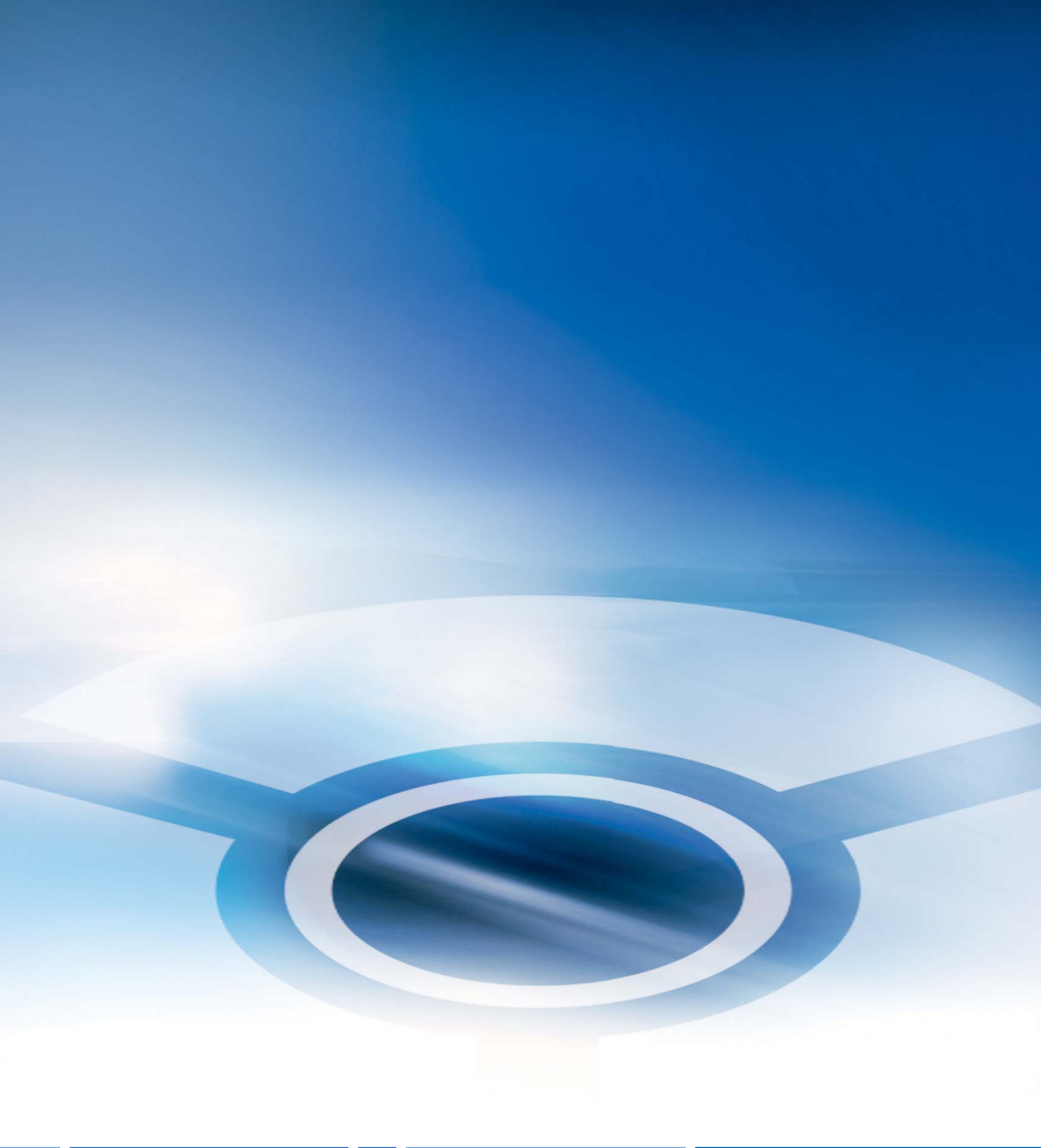
Optionally for function

C 15
Brake module for electrical cylinders

| Item no. | Contents of delivery | Type |
|-----------|----------------------|--|
| 1266231 ▲ | piece | Brake modul 11BC1-14: For connection to the servo amplifier to dissipate the braking energy. Necessary if there is no intermediate circuit supply at the machine |

C 15
Brake resistor for electrical cylinders

| Item no. | Contents of delivery | Type |
|-----------|----------------------|--|
| 1266232 ▲ | piece | Brake resistor 39BR006: For dissipate of the braking energy. Necessary if there is no intermediate circuit supply at the machine |



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