

# Positioning system HDT/K 16

## Function:

Combined lifting/rotating unit, in which a rotating motion of the leading nut is transferred into a linear movement.

A splined shaft is mounted parallel to the spindle and serves in a double function both as a guide and as a transfer element for a rotating motion of a gripper or tool that is mounted on the pivot of the splined shaft.

## Fitting position:

As required. Max. length size HD 16 = 600 mm

## Unit mounting:

By bores, mounting sets.



| Forces and torques    | Size   | HDT/K  |         |
|-----------------------|--|--------|---------|
|                       | Forces / Torques   | static | dynam.  |
|                       | $F_x$ (N)  | 150    | 90      |
|                       | $F_y$ (N)  | 150    | 90      |
|                       | $F_z$ (N)  | 260    | 180     |
|                       | $M_x$ (Nm)   | 90     | 70      |
|                       | $M_y$ (Nm)   | 90     | 70      |
|                       | $M_z$ (Nm)   | 110    | 48      |
|                       | <b>All forces and torques relate to the following:</b><br>existing values $\frac{F_y}{F_{y_{dyn}}} + \frac{F_z}{F_{z_{dyn}}} + \frac{M_x}{M_{x_{dyn}}} + \frac{M_y}{M_{y_{dyn}}} + \frac{M_z}{M_{z_{dyn}}} \leq 1$<br>table values |        |         |
| <b>No-load torque</b> |  |        |         |
| Trapezoidal thread    |  | 18x4   | 18x8    |
| (Nm)                  |  | 0,60   | 0,80    |
| Ballscrew             |  | 16 x 5 | 16 x 10 |
| (Nm)                  |  | 0,40   | 0,6     |
|                       |  |        | 16 x 16 |
|                       |  |        | 0,7     |

13.1



## Formula: HDT/K

Driving torque:

$$M_o = \frac{F \cdot P \cdot S \cdot w}{2000 \cdot \pi \cdot \mu} + M_{leer}$$

$$P_o = \frac{M_o \cdot n}{9550}$$

- F = force (N)
- P = thread pitch (mm)
- $S_s$  = safety factor 1,2 ... 2
- $M_{leer}$  = no-load torque (Nm)
- n = rpm of screw ( $min^{-1}$ )
- $M_o$  = driving torque (Nm)
- $\mu$  = screw efficiency
- w = friction coefficient ~ 1,22
- $P_o$  = motor power (KW)

Efficiency of lead screws:

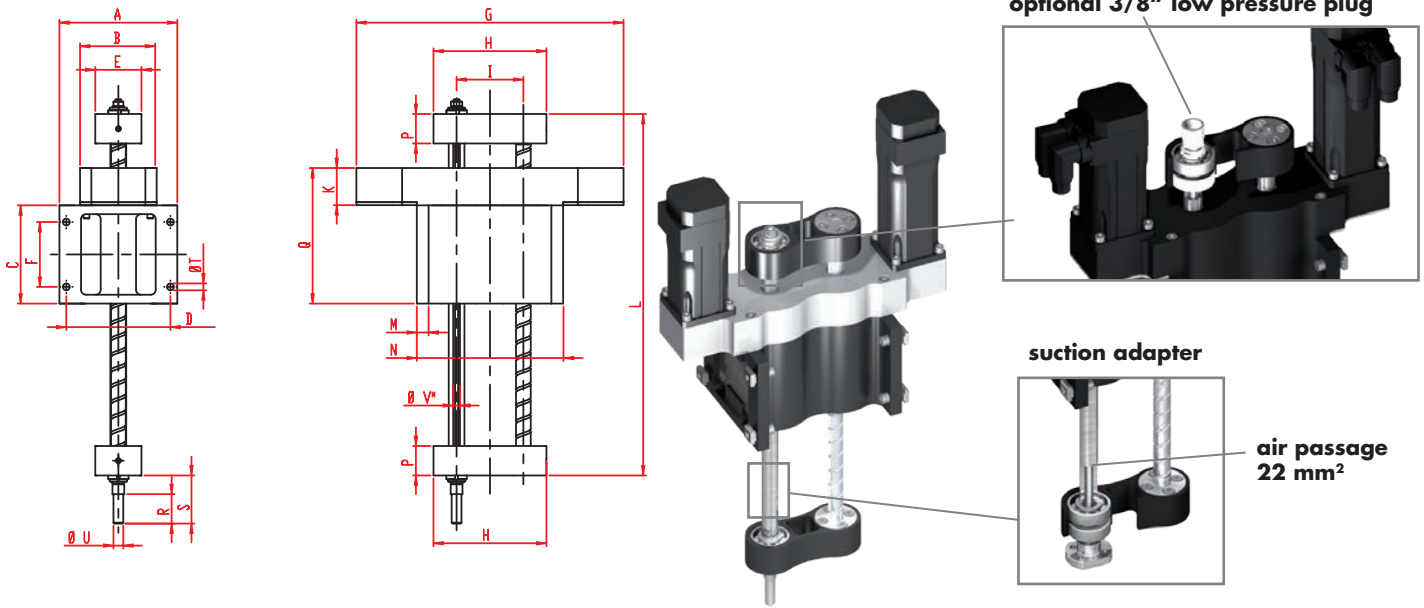
- All ballscrew 0.900
- Tr 18x4 0,399 Tr 18x8 0,565

$$f = \frac{F \cdot L^3}{E \cdot I \cdot 192}$$

- f = deflection (mm)
- F = load (N)
- L = free length (mm)
- E = elastic modulus 70000 (N/mm<sup>2</sup>)
- I = second moment of area (mm<sup>4</sup>)

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Dimensions (mm)



| Size □ | Basic length L | A   | B  | C   | D   | E  | F  | G   | H   | I  | K    | M  | N   | P  | Q   | R  | S  | T ∅ | U ∅ | V** ∅ | Basic weight | Weight per 100 mm |
|--------|----------------|-----|----|-----|-----|----|----|-----|-----|----|------|----|-----|----|-----|----|----|-----|-----|-------|--------------|-------------------|
| HD 16  | 210            | 120 | 78 | 100 | 106 | 47 | 66 | 272 | 115 | 68 | 37,8 | 12 | 149 | 30 | 138 | 30 | 49 | 7   | 10  | 8     | 6,48 kg      | 0,25 kg           |

\*\* Hollow shaft diameter

**K** Spindle:  
(T) trapezoidal thread (K) ballscrew

**1** Selection of screw:  
(1) right hand (2) left hand

**0** Choice of guide body profile:  
(0) standard (1) corrosion-protected screws

| 0 | Selection of screw: |             | Standard         |             | Multistart screw          |  |
|---|---------------------|-------------|------------------|-------------|---------------------------|--|
|   | Size                | Standard    | Multistart screw | Standard    | Multistart screw          |  |
|   | 16                  | (0) Tr 18x4 | (1) Tr 18x8      | (0) Kg 16x5 | (1) Kg 16x10 (2) Kg 16x16 |  |

**0** Ballscrew pitch accuracy:  
(0) 0,1 mm / 300 mm (standard) (1) 0,05 mm / 300 mm (2) 0,025 mm / 300 mm

**0** End play of ball nut:  
(0) 0,04 mm (standard), (1)\* < 0,02 mm, (2)\* 2% apply prestress  
\* only in combination with pitch accuracy (1) or (2)

**380** Basic length + stroke = total length

**Repeatability:**  
± 0,2 mm trapezoidal  
± 0,025 mm ballscrew

|      |    |   |   |   |   |   |   |   |       |
|------|----|---|---|---|---|---|---|---|-------|
| HDK  | 16 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 00380 |
| Pos. | 1  | 2 | 3 | 4 | 5 | 6 | 7 |   |       |

Sample ordering code:  
HDK16, ballscrew right hand thread, standard body profile, spindle 16x5, 180 mm stroke