

NEW!

Low-cost Actuator

VLA

E-Motion Cylinder



There are two different types of actuators. Choice is based on the application.

VLA-ST / Slider Type

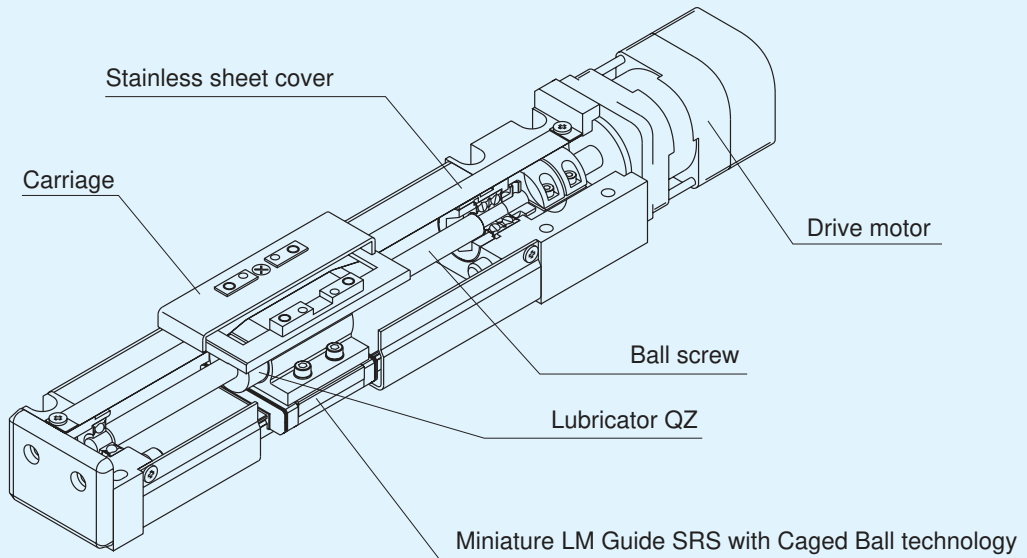


Fig. 1

VLA-CT / Cylinder Type

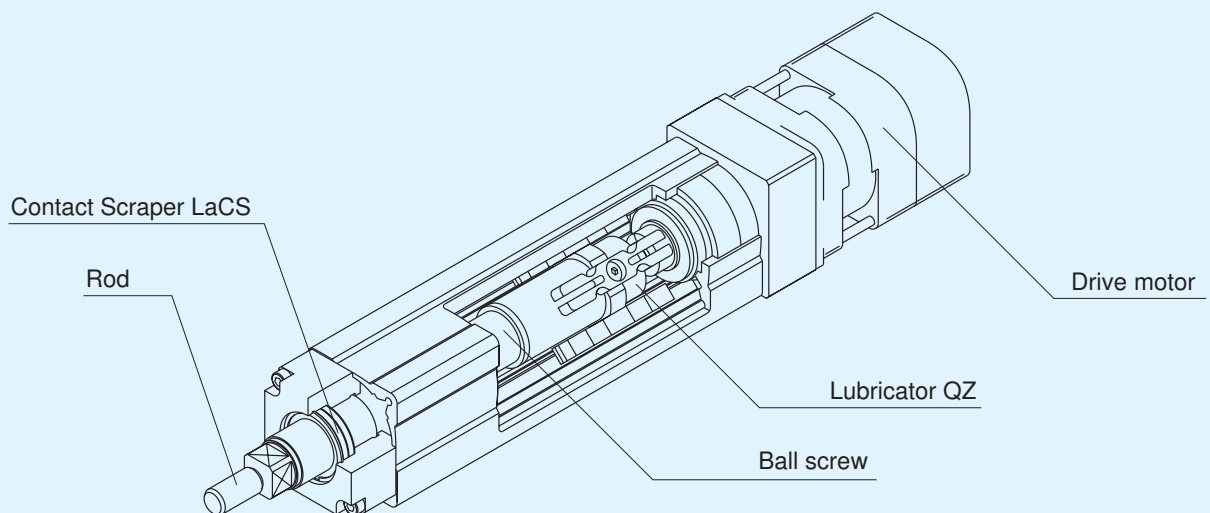


Fig. 2

Features

Simple Structure

THK achieved a simple, light weight, compact and cost effective design by using a Miniature LM Guide as the actuator's base and reducing the number of components.

Long-term Maintenance-free

By utilizing the Caged Ball Miniature LM Guide SRS and the Lubricator QZ for the ball screw, the actuator is long-term maintenance-free.

Environmentally friendly and energy efficient

By replacing pneumatic cylinders with the electric actuator VLA, oil mist lubrication is unnecessary, exhaust noise is eliminated, and efficiency is increased. Thus the system will be cleaner, quieter, and more efficient.

High Productivity

Using a high performance drive motor, ensures high speed motion, high productivity and high efficiency.

Flexibility

Various types of motors can be installed.

Contact Scraper LaCS

THK has developed Laminated Contact Scraper LaCS featuring superior foreign object removal capabilities.

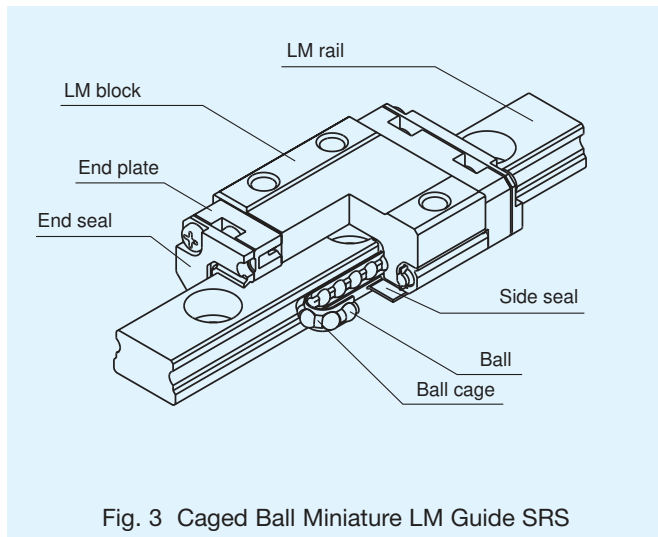


Fig. 3 Caged Ball Miniature LM Guide SRS

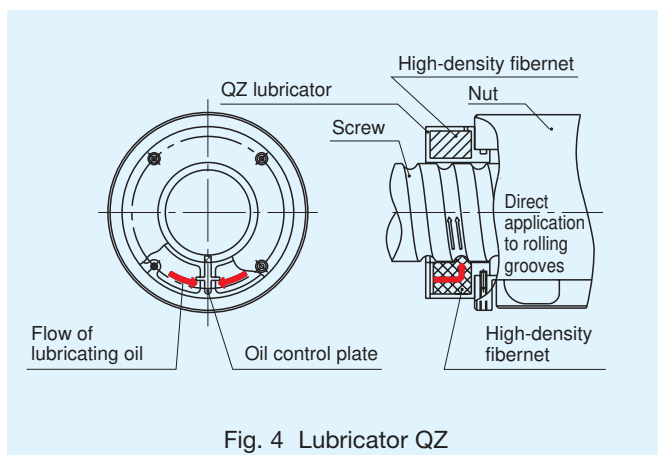


Fig. 4 Lubricator QZ

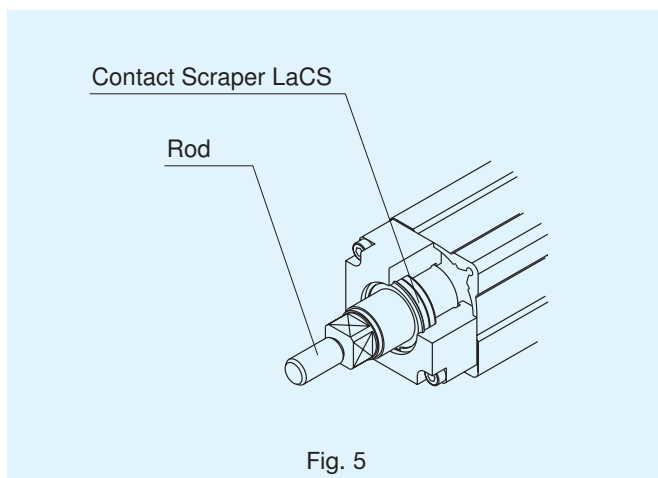


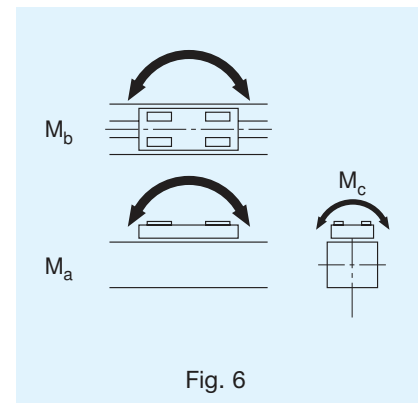
Fig. 5

VLA-ST / Model-Number Coding

VLA – ST – 45 – 06 – 0150 – N – 000 – N – N – N

1 2 3 4 5 6 7 8 9 10

- | | |
|---|--|
| 1 Actuator part number | 6 Motor N = No Motor |
| 2 Actuator type | 7 Motor size 000 = No Motor |
| 3 Actuator height (45 = 45 mm; 60 = 60 mm) | 8 Specification motor encoder N = No Motor |
| 4 Ball screw lead (06 = 6 mm; 12 = 12 mm) | 9 Motor lead line direction N = No Motor |
| 5 Stroke Ex) 0150 = 150 mm or 0050 = 50 mm | 10 Option N = No Option |



Specifications

| | Unit | ST-45 (30W) | | ST-60 (50 W) | | ST-60 (100W) | | |
|-------------------------|------------------|--------------------------|--------|---------------------------|--------|--------------|--------|------|
| | | High | Medium | High | Medium | High | Medium | |
| Continuous velocity | mm/s | 600 | 300 | 600 | 300 | 600 | 300 | |
| Max. velocity | mm/s | Stroke | 300 | 1000 | 500 | 1000 | 500 | 1000 |
| | | | 350 | 1000 | 500 | 800 | 400 | 800 |
| | | | 400 | 1000 | 500 | 800 | 400 | 800 |
| | | | 450 | 840 | 420 | 800 | 400 | 800 |
| | | | 500 | 680 | 340 | 800 | 400 | 800 |
| | | | 550 | | | 800 | 400 | 800 |
| | | | 600 | | 680 | 340 | 680 | |
| Continuous force | N | 40 | 80 | 67 | 133 | 134 | 267 | |
| Max. force | N | 117 | 235 | 201 | 402 | 398 | 796 | |
| Max. acceleration | m/s ² | 3 | | | | | | |
| Horizontal payload | kg | 5 | 10 | 8 | 16 | 16 | 30 | |
| Vertical payload | kg | 1.5 | 3 | 2.5 | 5 | 5 | 10 | |
| Ball screw shaft dia. | mm | 8 | | 12 | | | | |
| Ball screw lead | mm | 12 | 6 | 12 | 6 | 12 | 6 | |
| Motor wattage | W | 30 | | 50 | | 100 | | |
| Motor continuous torque | Nm | 0.095 | | 0.159 | | 0.319 | | |
| Repeatability | mm | ± 0,020 | | | | | | |
| Permissible moment | Nm | Ma = Mb = 12, Mc = 31 | | Ma = Mb = 25.7 Mc = 58 | | | | |
| Lifetime (1) | km | 5000 | | | | | | |

(1) Horizontal payload, acceleration= 3m/s², velocity= 600 bzw. 300 mm/s

VLA-ST-45

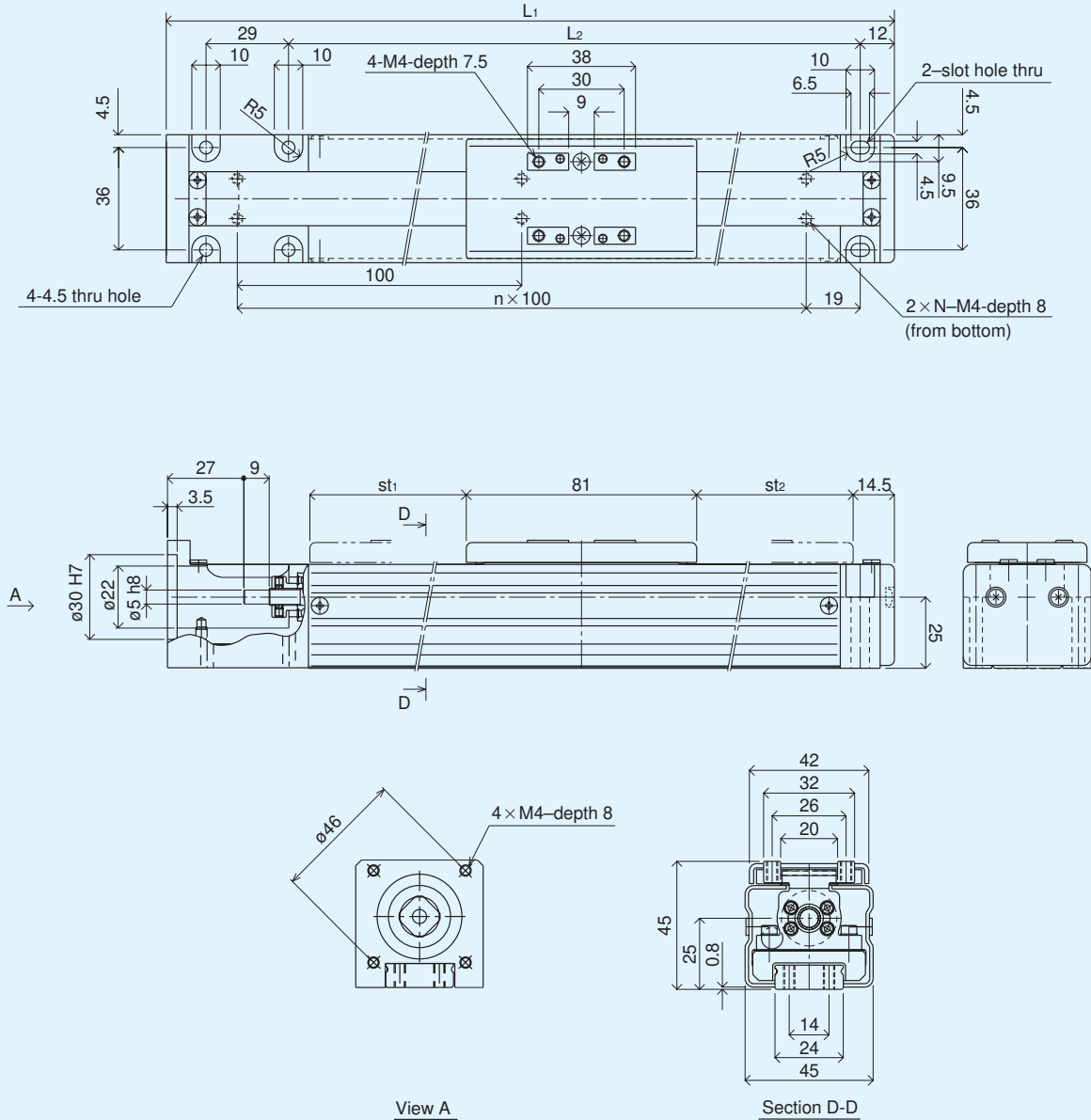


Fig. 7

Dimensions

| Model No. | Stroke [mm] | Stroke between Stoppers [mm] | L_1 [mm] | L_2 [mm] | n | N | Weight [kg] |
|-----------|-------------|------------------------------|------------|------------|---|---|-------------|
| 0050 | 50 | 60 | 206 | 151 | 1 | 2 | 0.83 |
| 0100 | 100 | 110 | 256 | 201 | 2 | 3 | 0.94 |
| 0150 | 150 | 160 | 306 | 251 | 2 | 3 | 1.05 |
| 0200 | 200 | 210 | 356 | 301 | 3 | 4 | 1.15 |
| 0250 | 250 | 260 | 406 | 351 | 3 | 4 | 1.26 |
| 0300 | 300 | 310 | 456 | 401 | 4 | 5 | 1.37 |
| 0350 | 350 | 360 | 506 | 451 | 4 | 5 | 1.48 |
| 0400 | 400 | 410 | 556 | 501 | 5 | 6 | 1.59 |
| 0450 | 450 | 460 | 606 | 551 | 5 | 6 | 1.70 |
| 0500 | 500 | 510 | 656 | 601 | 6 | 7 | 1.81 |

VLA-ST-60

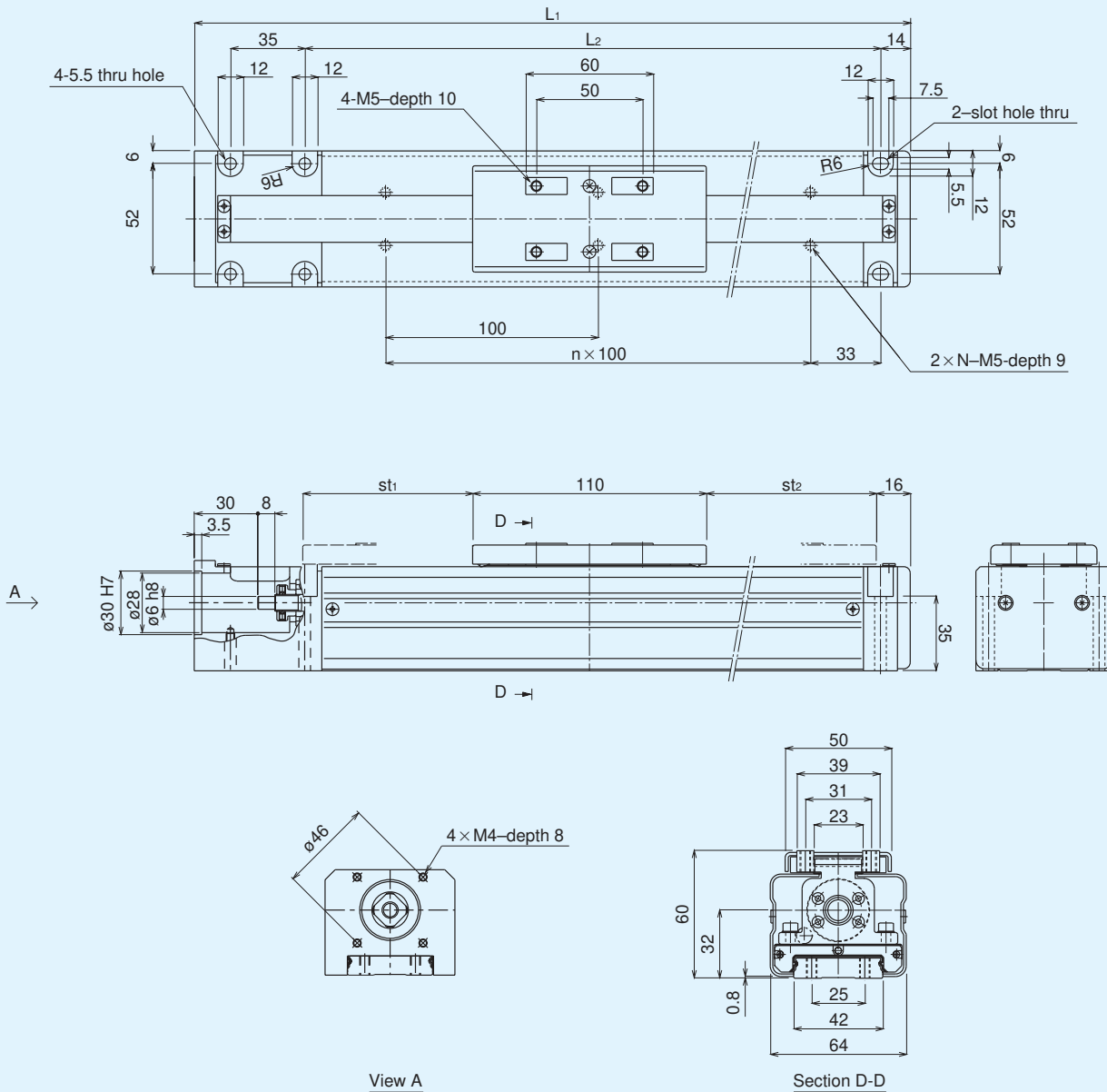


Fig. 8

Dimensions

| Model No. | Stroke [mm] | Stroke between Stoppers [mm] | L_1 [mm] | L_2 [mm] | n | N | Weight [kg] |
|-----------|-------------|------------------------------|------------|------------|---|---|-------------|
| 0050 | 50 | 60 | 237 | 171 | 1 | 2 | 1.87 |
| 0100 | 100 | 110 | 287 | 221 | 2 | 3 | 2.07 |
| 0150 | 150 | 160 | 337 | 271 | 2 | 3 | 2.28 |
| 0200 | 200 | 210 | 387 | 321 | 3 | 4 | 2.48 |
| 0250 | 250 | 260 | 437 | 371 | 3 | 4 | 2.68 |
| 0300 | 300 | 310 | 487 | 421 | 4 | 5 | 2.89 |
| 0350 | 350 | 360 | 537 | 471 | 4 | 5 | 3.09 |
| 0400 | 400 | 410 | 587 | 521 | 5 | 6 | 3.30 |
| 0450 | 450 | 460 | 637 | 571 | 5 | 6 | 3.50 |
| 0500 | 500 | 510 | 687 | 621 | 6 | 7 | 3.70 |
| 0550 | 550 | 560 | 737 | 671 | 6 | 7 | 3.91 |
| 0600 | 600 | 610 | 787 | 721 | 7 | 8 | 4.11 |

VLA-CT / Model-Number Coding

VLA – CT – 35 – 12 – 0150 – N – 000 – N – N – N

1 2 3 4 5 6 7 8 9 10

1 Actuator part number

2 Actuator type

3 Actuator width
(35 = 35 mm; 45 = 45 mm; 55 = 55 mm)

4 Ball screw lead
(12 = 12 mm)

5 Stroke
Ex) 0150 = 150 mm
oder 0050 = 50 mm

6 Motor assembly
(N = No Motor)

7 Motor size
(000 = No Motor)

8 Specification motor encoder
(N = No Motor)

9 Motor cable direction
(N = No Motor)

10 Option
(A: With Bracket Base;
B: With Flange; N = No Option)

Specifications

| | Unit | CT-35 | CT-45 | CT-55 |
|-------------------------|------|----------------|----------------------|----------------------------------|
| Continuous velocity | mm/s | 600 | 600 | 600 (470: For 300 mm stroke) |
| Continuous force | N | 40 | 67 | 134 |
| Max. force | N | 120 | 201 | 402 |
| Vertical payload (1) | kg | 1.9 | 3.1 | 6.5 |
| Ball screw shaft dia. | mm | 8 | | 12 |
| Ball screw lead | mm | 12 | | |
| Repeatability | mm | ± 0.020 | | |
| Motor wattage | W | 30 | 50 | 100 |
| Motor continuous torque | Nm | 0.095 | 0.158 | 0.319 |
| Rod dia. | mm | ø 16 | ø 20 | ø 25 |
| Stroke | mm | 50 / 100 / 150 | 50 / 100 / 150 / 200 | 50 / 100 / 150 / 200 / 250 / 300 |
| Lifetime (2) | km | 5000 | | |

* The actuator VLA is not suitable for radial and lateral loads. In this case please use THK LM Guides.

(1) Acceleration 3 m/s²

(2) Maximal payload, acceleration = 3 m/s², velocity = 600 mm/s

VLA-CT-35

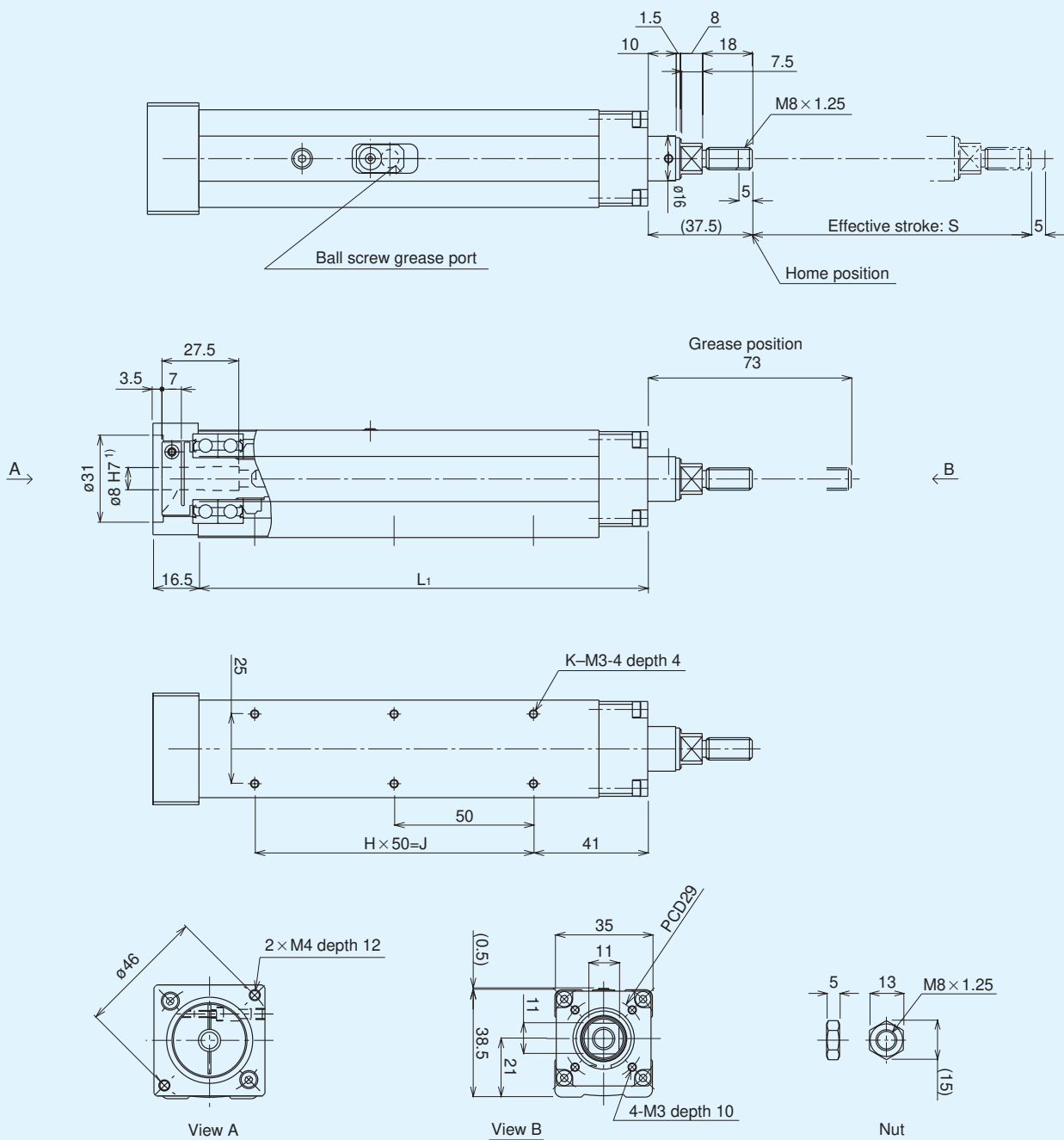


Fig. 9

Dimensions

| Model No. | Stroke [mm] | L_1 [mm] | H | J | K | Weight [kg] |
|-----------|-------------|------------|---|-----|----|-------------|
| 0050 | 50 | 161 | 2 | 100 | 6 | 0.7 |
| 0100 | 100 | 211 | 3 | 150 | 8 | 0.9 |
| 0150 | 150 | 261 | 4 | 200 | 10 | 1.0 |

¹⁾ When using other motors with different shaft diameters please contact THK.

VLA-CT-45

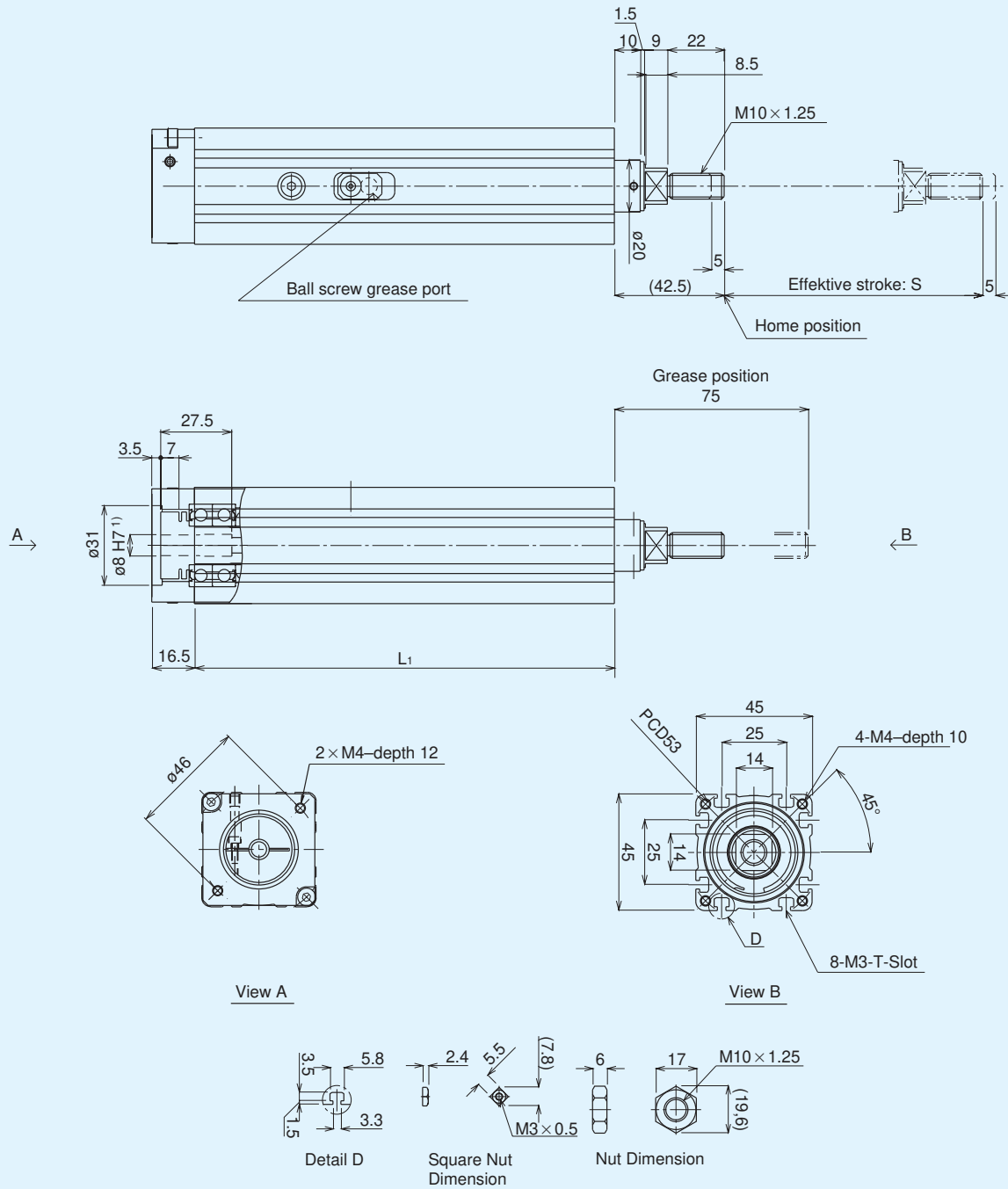


Fig. 10

Dimensions

| Model No. | Stroke [mm] | L_1 [mm] | Weight [kg] |
|-----------|-------------|------------|-------------|
| 0050 | 50 | 162.5 | 1.1 |
| 0100 | 100 | 212.5 | 1.4 |
| 0150 | 150 | 262.5 | 1.6 |
| 0200 | 200 | 312.5 | 1.9 |

¹⁾ When using other motors with different shaft diameters please contact THK.

VLA-CT-55

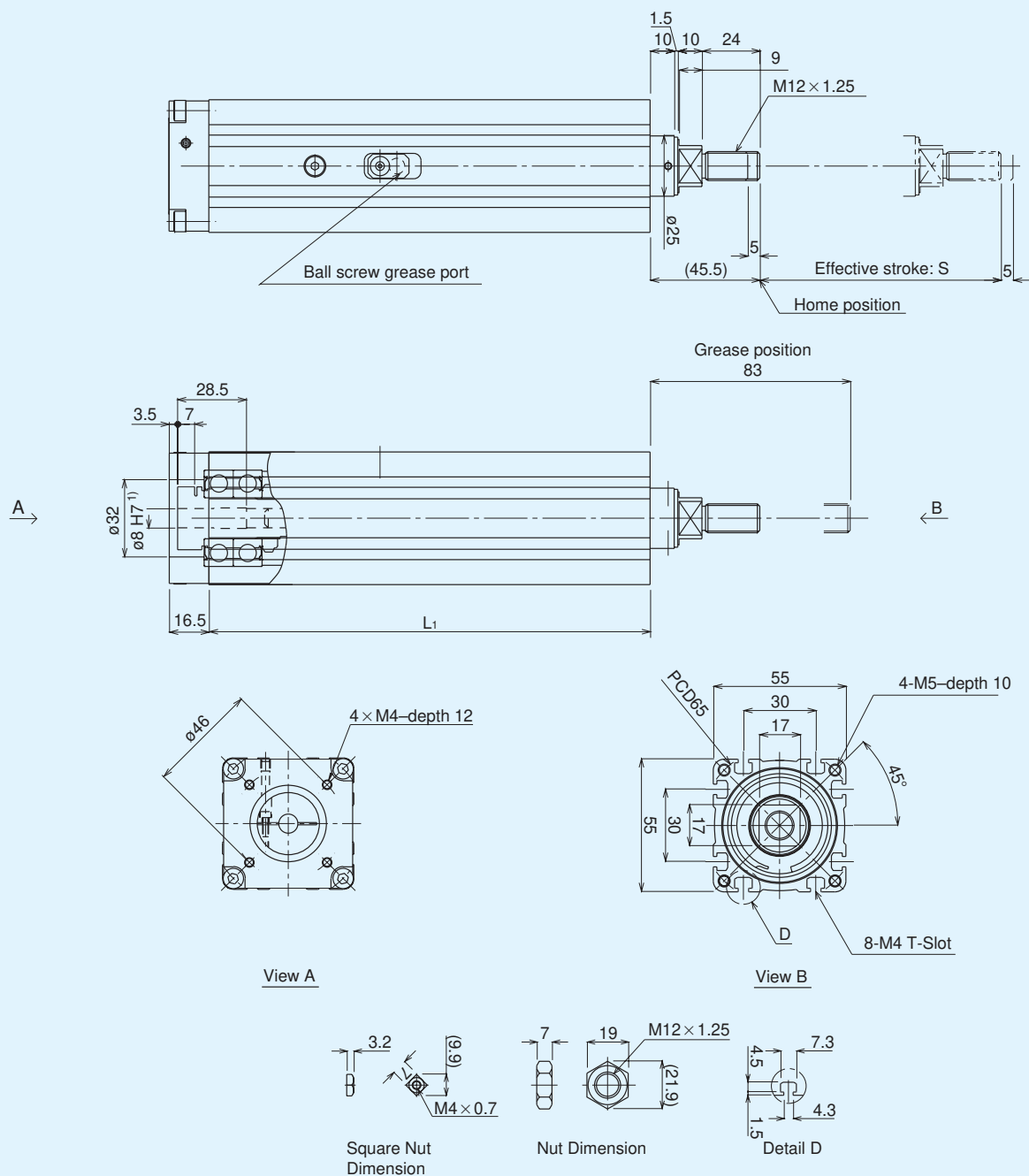


Fig. 11

Dimensions

| Model No. | Stroke [mm] | L ₁ [mm] | Weight [kg] |
|-----------|-------------|---------------------|-------------|
| 0050 | 50 | 183 | 1.7 |
| 0100 | 100 | 233 | 2.1 |
| 0150 | 150 | 283 | 2.5 |
| 0200 | 200 | 333 | 2.8 |
| 0250 | 250 | 383 | 3.2 |
| 0300 | 300 | 433 | 3.6 |

¹⁾ When using other motors with different shaft diameters please contact THK.

VLA-CT Option A: Base Attachment Bracket

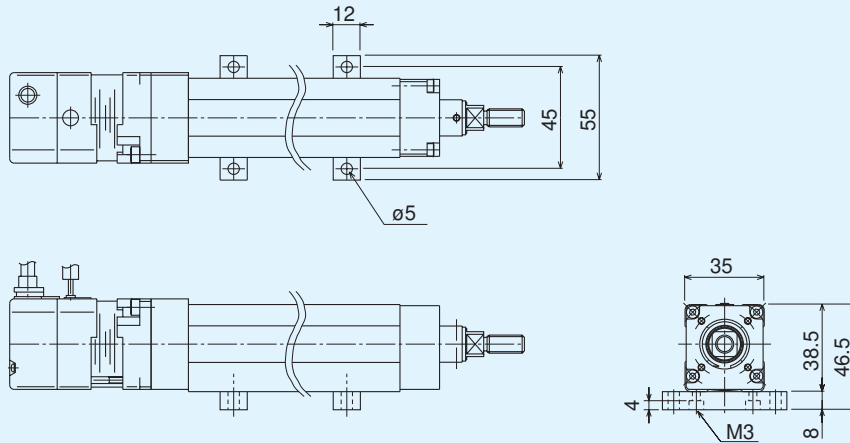


Fig. 12 Base Attachment Bracket CT 35

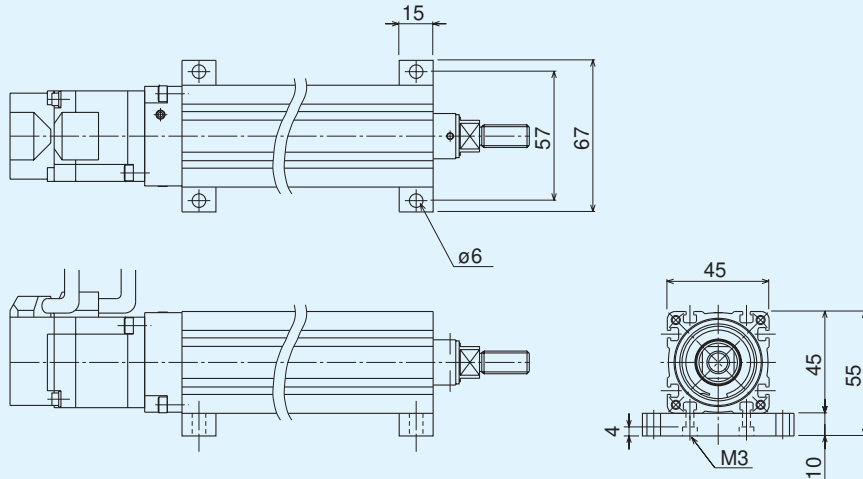


Fig. 13 Base Attachment Bracket CT 45

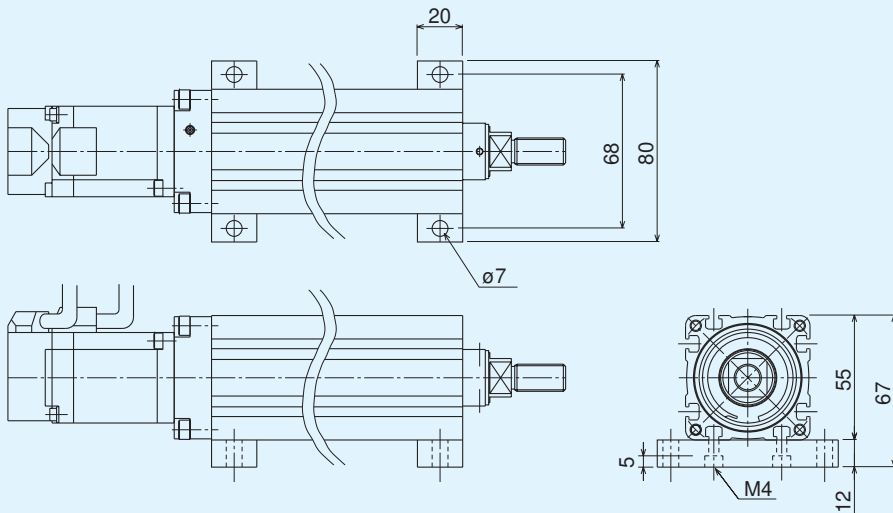


Abb. 14 Base Attachment Bracket CT 55

VLA-CT Option B: Flanges

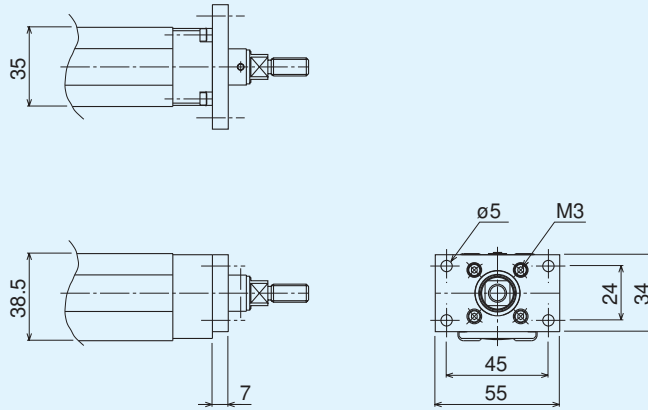


Fig. 15 Flange CT 35

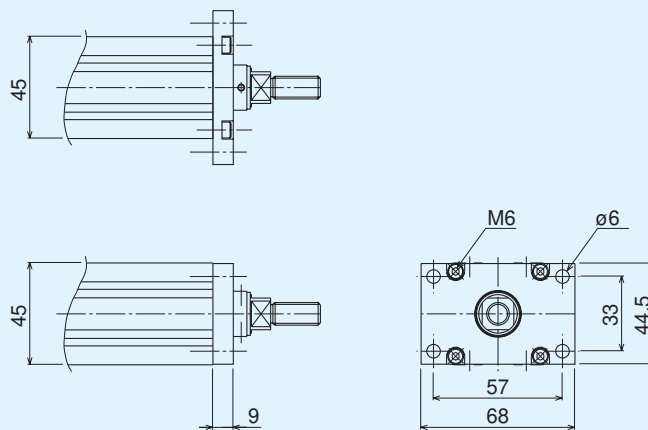


Fig. 16 Flange CT 45

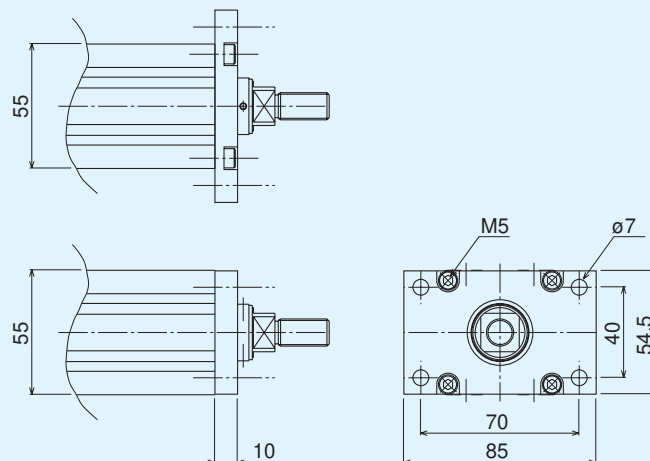
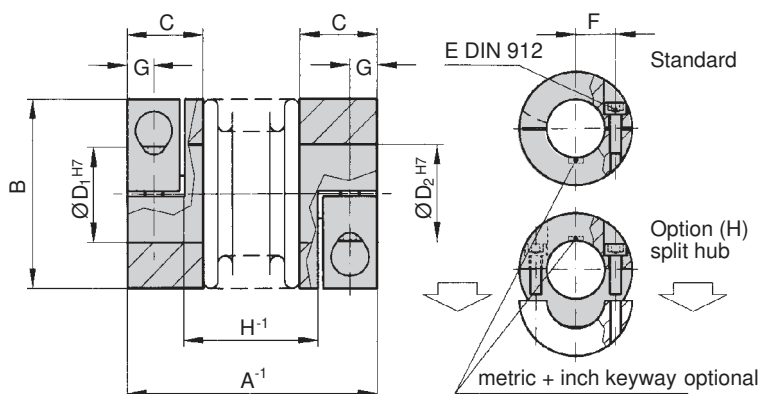


Fig. 17 Flange CT 55

Option: Couplings –Type MK 2 –



Properties

- frictional connection utilizing clamping hubs
- for high dynamic applications
- backlash-free and torsionally rigid
- low moment of inertia
- compensates for 3-axis of misalignment

Recommended Couplings

for ST45: MK2 - 10 - 30 - 5H7 - 8H7
ST60: MK2 - 15 - 30 - 6H7 - 8H7
referring to Mitsubishi Motors.

Note:

For the use of ST45 only model MK2-10 is possible.

Material:

Centre section is made of highly flexible high-grade stainless steel, hubs from aluminium

Design:

With a single radial clamping screw per hub DIN 912.

Technical specifications

| Series | Rated torque [Nm] | Overall length [mm] | Outer diameter [mm] | Fit length of hub [mm] | Special bores from ϕ to ϕ H7 [mm] | Standard bore H7 [mm] | Screws DIN 912 [mm] | Distance between centers [mm] | Distance [mm] | Distance [mm] | Mass moment of inertia [H] | Weight [g] | Torsional stiffness axial [Nm/rad] | lateral [mm] | angular [degrees] | |
|-----------------|-------------------|---------------------|---------------------|------------------------|---|-----------------------|---------------------|-------------------------------|---------------|------------------|----------------------------|-------------|------------------------------------|--------------|-------------------|-----|
| T _{KN} | A | B | C | D _{1/2} | D _{1/2} | E | F | G | H | J _{ges} | C _T | Max. values | | | | |
| 10 | 1.0 | 27 | 15 | 9 | 3-7 | 6 | M2 | 4,5 | 3 | 14 | 3 | 9 | 510 | 0.4 | 0.15 | 1 |
| | 30 | 17 | | | | | | | | 3.4 | 10 | 380 | 0.5 | 0.2 | 1.5 | |
| | 33 | 20 | | | | | | | | 3.6 | 11 | 320 | 0.6 | 0.25 | 2 | |
| 15 | 1.5 | 30 | 19 | 11 | 3-8 | 6 | M2.5 | 6 | 3.5 | 14.5 | 8.5 | 22 | 750 | 0.5 | 0.15 | 1.5 |
| | 35 | 19.5 | | | | | | | | 9.5 | 24 | 700 | 0.7 | 0.2 | 1.5 | |
| 20 | 2.0 | 35 | 25 | 13 | 3-12.7 | 6/10 | M3 | 8 | 4 | 17 | 25 | 36 | 1200 | 0.5 | 0.15 | 1.5 |
| | 40 | 22 | | | | | | | | 27 | 38 | 1300 | 0.6 | 0.2 | 1.5 | |
| | 44 | 26 | | | | | | | | 29 | 40 | 1200 | 0.7 | 0.25 | 2 | |

Temperature range: -30 to +120°C (3,6 F to 237 F), peaks up to 120°C (270 F).

Speeds: Up to 10,000 rpm, in excess of 10,000 rpm with balanced version.

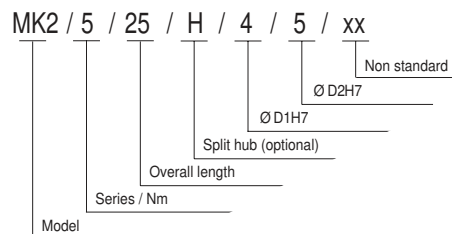
Backlash: Absolutely backlash-free due to frictional clamp connection.

Tolerance: On the hub/shaft connection 0.01 to 0.05 mm.

Service life: These coupling have an infinite life, and are maintenance-free if the technical limits are not exceeded.

Non-standard design applications: Custom designs with varied tolerances, keyways, non-standard material and bellows are available upon request.

Ordering example:



Option: Motor Adapter

Motor

The LM Guide Actuator VLA can be provided with a motor adapter. In this case please indicate the name of the motor manufacturer together with the type number and the fitting dimensions. - Please consider the dimensions of the connecting arrangement because the dimensions of the motor can be bigger than the dimensions of the LM Guide Actuator.

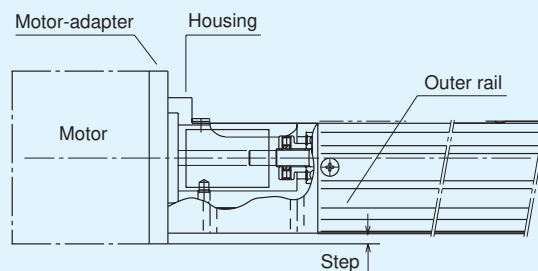


Abb. 18 Motor-Connection

Recommended Motors

The values for the motor power as well as for the motor torque, which are mentioned under the actuator specifications on page 4 and 7 respectively, are based on the following motors:

| Manufacturer ¹⁾ | Motor | | Encoder | | Actuator | |
|----------------------------|-------------|----------|---------|---|----------------|---------|
| | | | A | I | Type ST | Type CT |
| FANUC | βM0.2 | | x | | ST-60 | CT-45 |
| | βM0.3 | | x | | | CT-55 |
| Yaskawa | Σ-III | SGMAS-A5 | x | x | | ST-45 |
| | | SGMAS-01 | x | x | | |
| | Σ-II | SGMAH-A3 | x | x | ST-45 | CT-55 |
| | | SGMAH-A5 | x | x | | |
| | | SGMAH-01 | x | x | | |
| Mitsubishi | HC-MFS053 | | x | | ST-45 ST-60 | CT-45 |
| | HC-MFS13 | | x | | | CT-55 |
| | HC-KFS053 | | x | | | CT-45 |
| | HC-KFS13 | | x | | CT-55 | |
| | HC-PQ033 | | | x | ST-45 | CT-35 |
| | HC-PQ053 | | | x | ST-60 | CT-45 |
| | HC-PQ13 | | | x | | CT-55 |
| Sanyo Denki | P30B04003 | | x | x | ST-45 | |
| | P30B04005 | | x | x | ST-60 | CT-45 |
| | P30B04010 | | x | x | | CT-55 |
| OMRON | R88M-W03030 | | x | | ST-45 | |
| | R88M-W05030 | | x | | ST-60 | |
| | R88M-W10030 | | x | | | CT-55 |
| | R88M-U03030 | | | x | ST-45 | |
| | R88M-U05030 | | | x | ST-60 | |
| | R88M-U10030 | | | x | | CT-55 |

¹⁾ For confirmation of motors available please check with the appropriate European **THK** branch.

A = Absolute encoder
I = Incremental encoder

Important Note on Handling Precaution and Manufacturer Liability

Motor

If you want to use motors with more power or higher torque please consult THK and indicate the motor manufacturer together with the motor specifications.

Encoder

Please use a motor with an absolute encoder.

Sensor

When using a motor with an incremental encoder or a motor without encoder the end positions must have end of travel sensors. Furthermore, a reference switch is required.

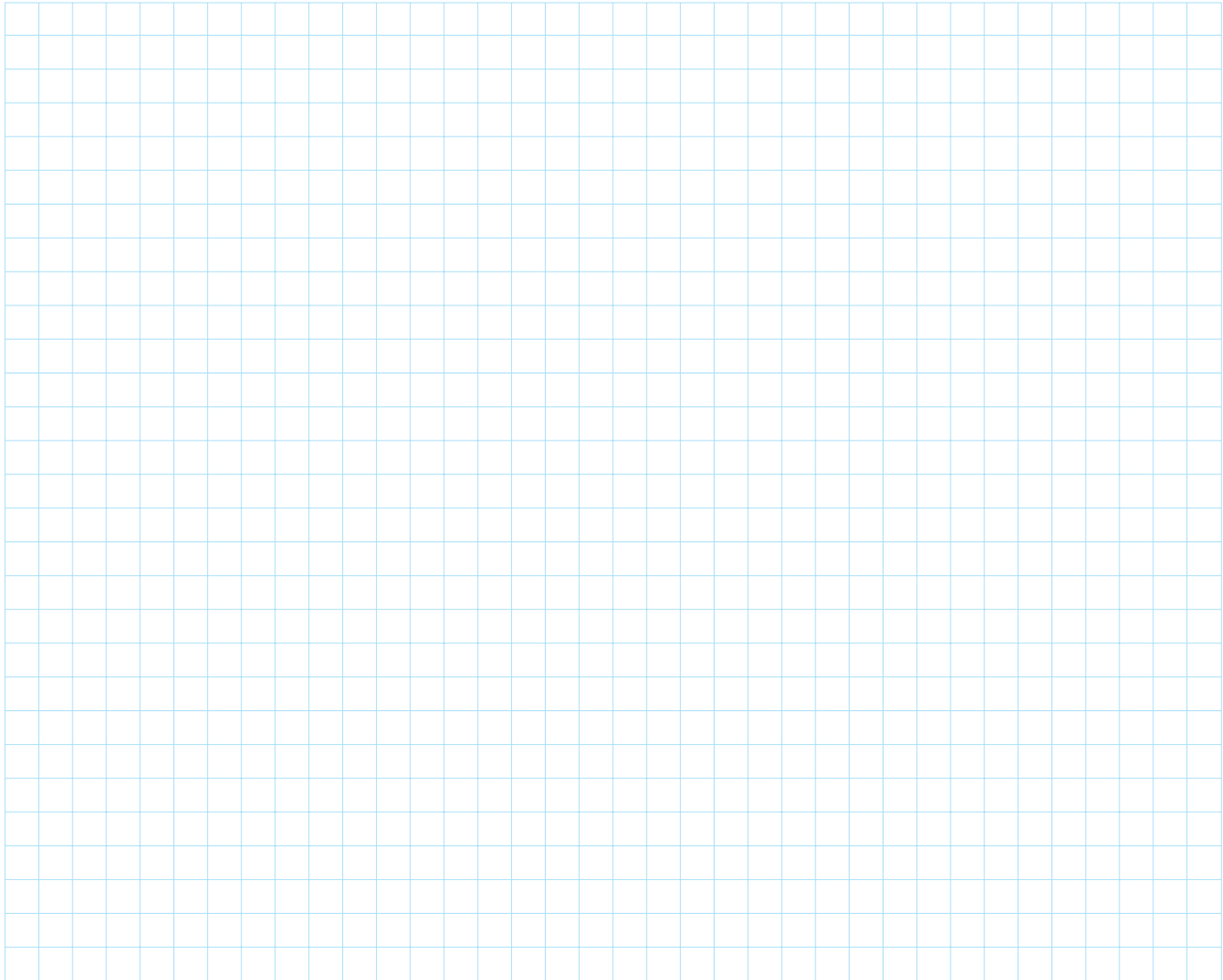
Max. Payload/Force

The cylinder actuator VLA-CT can only take loads in the axial direction. When loads are applied from different directions additional LM Guides must be used.

The slider actuator VLA-ST can bear loads in all four directions: radial, reverse-radial and lateral directions. If the loads are exceeding the permissible loads additional LM Guides must be used.

If these precautions are not adhered to, THK can't give any guarantee.

Sketches





Precautions on Use

• Handling

- Do not drop the actuator VLA or subject it to impacts, as doing so may damage it. Therefore, great care should be exercised in its handling.
- Unauthorized disassembly of the actuator could lead to contamination by foreign matter and impair the precision. Therefore, disassembly should not be performed unless it is absolutely necessary.

• Environmental Conditions

- Do not use the actuator VLA below or over 0 ~ 40 °C or at a humidity below or over 20 ~ 80 %. Otherwise, condensation water could lead to corrosion.

• Mounting Surface

- The flatness of the mounting surface must be better than 0,1 mm.

• Precautions on Use

- Do not touch moving parts during operation.
- Do not get into the working space during operation or in operable condition.
- Before opening the actuator VLA and the corresponding parts disconnect all electrical components from the power supply.

Specifications are subject to change without notice

04/2004 Printed in Belgium

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