THK

ELECTRIC ACTUATORS

Low Price Actuator

VLA

For details, visit THK at **www.thk.com**

*Product information is updated regularly on the THK website.

THK CO., LTD.
TOKYO, JAPAN

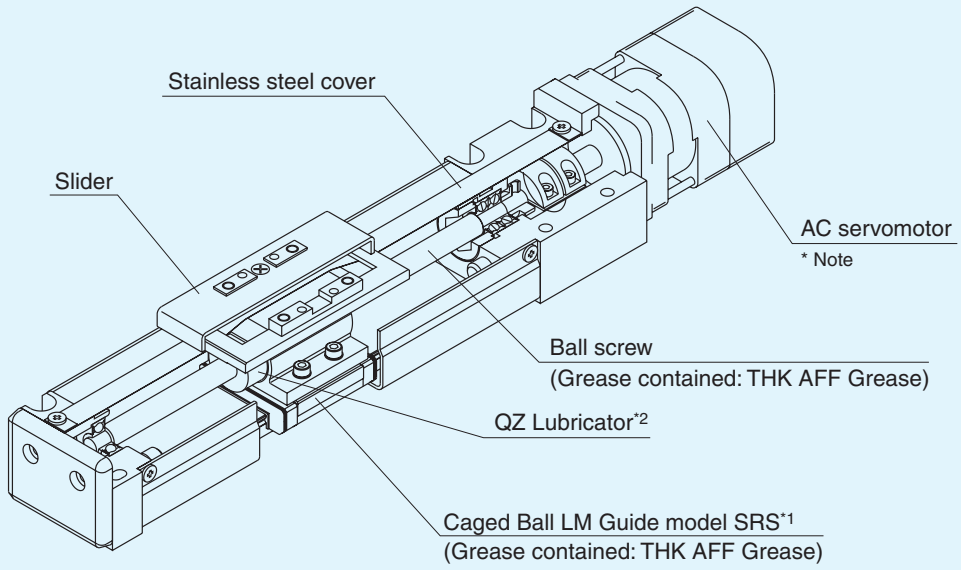
CATALOG No.320-7E

Two types of actuator are available.

Actuator Model VLA is offered in two types. You can select either type according to your service conditions.

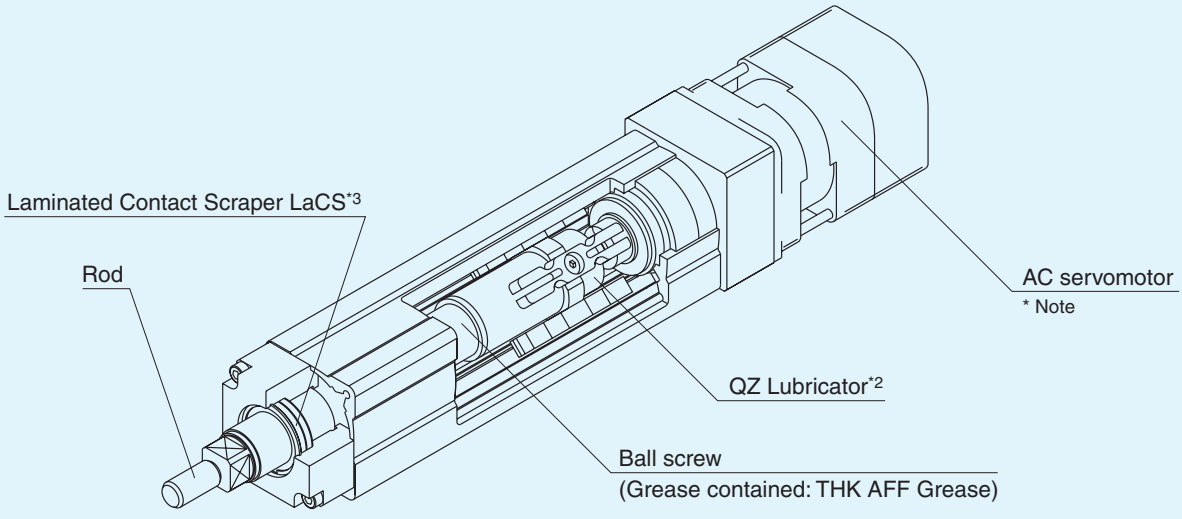
Slider Type: Model VLAST

Structural drawing of Model VLAST



Cylinder Type: Model VLACT

Structural drawing of Model VLACT



Note) AC servomotors are not included in VLA actuator.
Installation of the Motor need to be performed by customer.

Features of Model VLA

●Low Price with Simple Structure

Since model VLA uses an LM Guide as the direct base of the actuator unit and has fewer components, a simple structure, Lightweight and compact design are achieved. As a result, a low price actuator is realized.

●Long-term Maintenance-free Operation

Lightweight, compact type LM Guide model SRS*1, which provides a significantly high performance through adoption of ball cages, is used in the linear motion guide unit. In addition, the ball screw unit is attached with QZ Lubricator*2, which is capable of minimum and optimal lubrication. As a result, long-term maintenance-free operation is achieved.

●Eco-friendly and Highly Energy-efficient

By replacing a conventional air cylinder with Motored Actuator model VLA, the customer can eliminate exhaust noise and achieve high energy-efficiency and energy saving without contaminating the environment with lubrication oil mist.

●Productivity

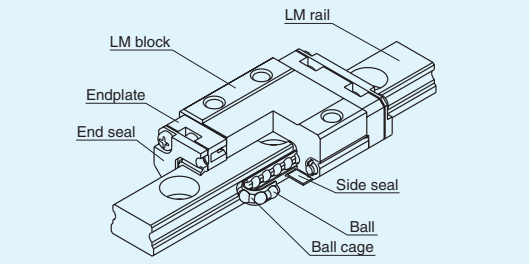
Several manufacturers of motors can be assembled without additional flange according to your control specifications.

●A Motor of a Different Manufacturer Mountable

You can choose an AC servomotor to mount on the actuator from several manufacturers according to your control specifications.

Note: Mountable motors may be limited depending on the dimensions and the capacity. See page 14 for details.

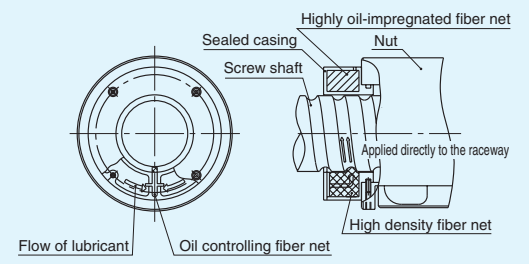
*1: Caged Ball LM Guide model SRS



With model SRS, use of ball cages eliminates friction between balls and allows the following effects to be obtained.

1) Low noise, acceptable running sound
2) Long-term maintenance-free operation
3) High-speed response, long service life
4) Excellent smoothness
5) Low dust generation

*2: QZ Lubricator



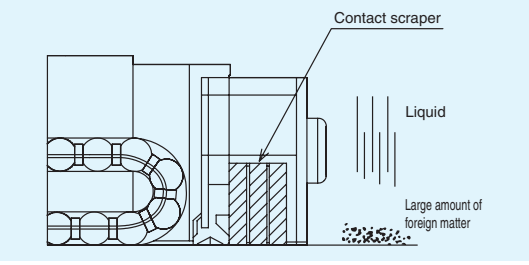
1) Substantially extended maintenance interval

With ordinary grease lubrication for a ball screw, slight amount of oil is lost as the ball screw travels. Attaching QZ Lubricator supplements oil loss over a long period and allows the maintenance intervals to be significantly extended.

2) Eco-friendly lubrication system

QZ Lubricator feeds the right amount of oil to the right location with a high density fiber net, making itself an eco-friendly lubrication system that dose not waste oil.

*3: Laminated Contact Scraper LaCS



With a laminated contact structure (2-layer scraper), LaCS removes minute foreign matter adhering to the LM rail in multiple stages to prevent it from entering the LM block.

Low noise, acceptable running sound

- Since 2-layer scrapers are in full contact with the LM rail, LaCS is highly capable of removing minute foreign matter.
- Use of oil-impregnated expanded synthetic rubber with a self-lubricating capability achieves a low frictional resistance.

Model VLAST

●Example of the actuator's model number coding

VLAST45 – 06 – 0050 – 0 – 0N
① ② ③ ④ ⑤ ⑥⑦

① Type : ST

② Classification in main unit size
45:45mm height
60:60mm height

③ Ball screw lead
06: 6mm
12: 12mm

④ Stroke : Ex. 0050: 50mm
0200: 200mm

⑤ Motor
0 : no motor

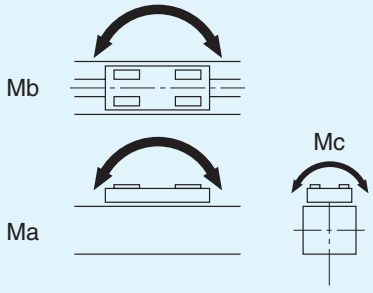
⑥ Sensor:(P.7)

⑦ Option
N : no option

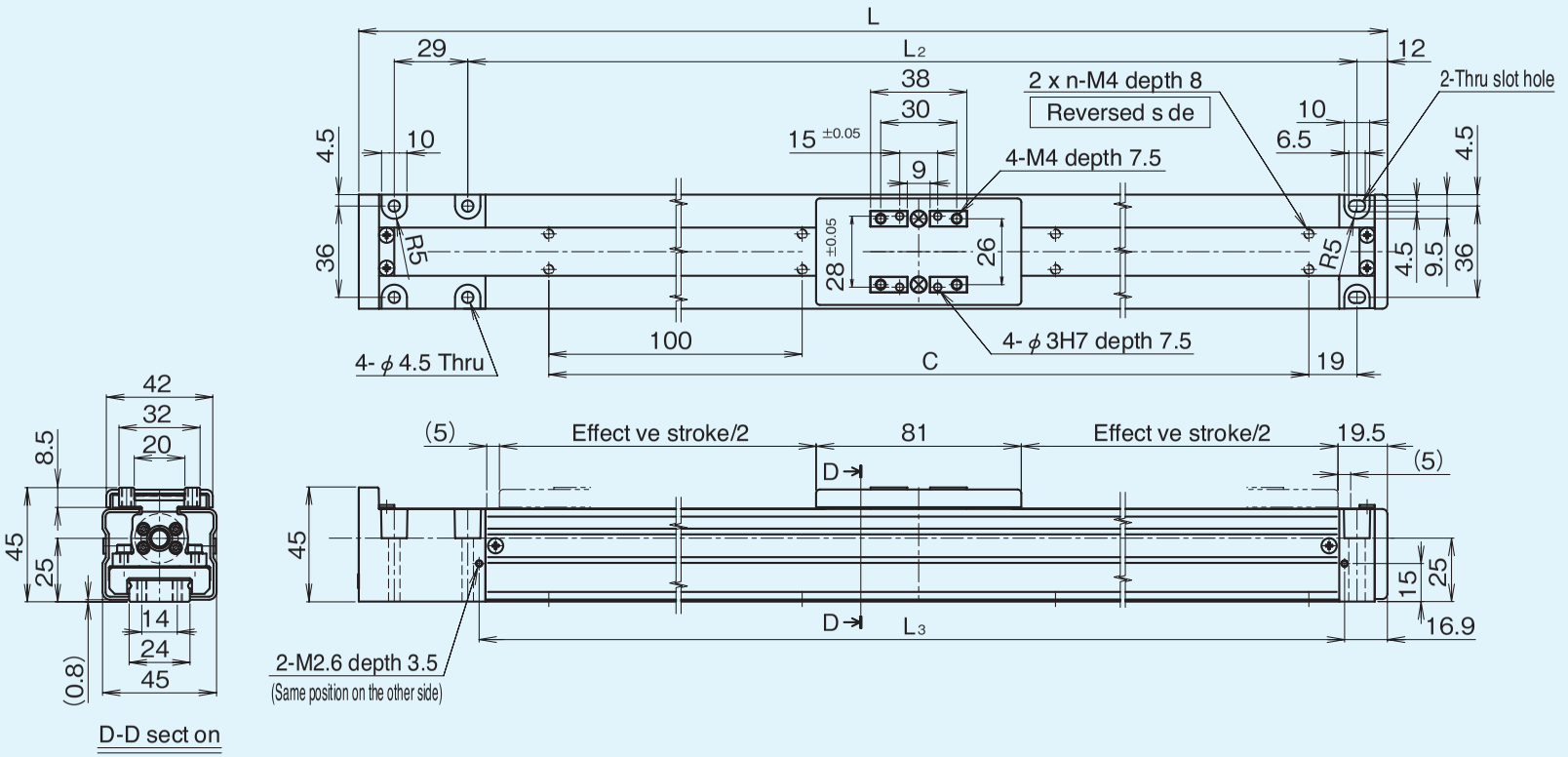
●Model VLAST Specifications

Model No.	Unit		VLAST45 (30W)		VLAST60 (50W)		VLAST60 (100W)	
			High speed type	Medium speed type	High speed type	Medium speed type	High speed type	Medium speed type
Rated speed (Note 1)	mm/s		600	300	600	300	600	300
Maximum speed	mm/s	Stroke: 300 or less	1000	500	1000	500	1000	500
		Stroke: 350	1000	500	800	400	800	400
		Stroke: 400	1000	500	800	400	800	400
		Stroke: 450	840	420	800	400	800	400
		Stroke: 500	680	340	800	400	800	400
		Stroke: 550			800	400	800	400
		Stroke: 600			680	340	680	340
		Stroke: 700			500	250	500	250
Rated thrust	N		40	80	67	133	134	267
Maximum thrust	N		117	235	201	402	398	796
Maximum acceleration	G		0.3					
Horizontal mass capacity	kg		5	10	8	16	16	30
Vertical mass capacity	kg		1.5	3	2.5	5	5	10
Ball screw shaft diameter	mm		8		12			
Ball screw lead	mm		12	6	12	6	12	6
Motor wattage (Note 3)	W		30		50		100	
Motor rated torque (Note 3)	N-m		0.095		0.159		0.319	
Positioning repeatability	mm		±0.02					
Backlash	mm		0.1					
Permissible moment	N-m		Ma=Mb=12 Mc=31		Ma=Mb=25.7 Mc=58			
Service life in distance traveled (Note 2)	km		5000					

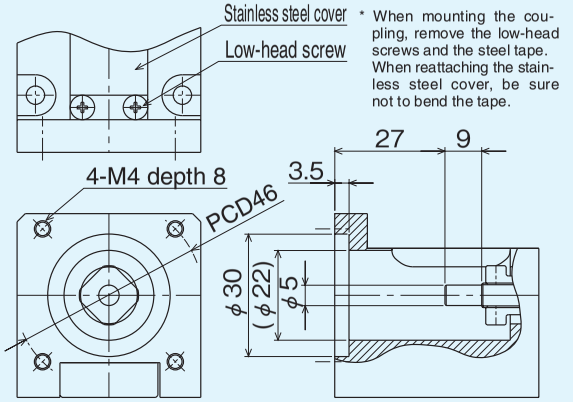
Note 1: Both the rated speed and the maximum speed in the case of the 700mm stroke are 500mm/s for the high-speed type and 250mm/s for the medium-speed type.
Note 2: The value applies when the actuator receives a load and operates at the rated speed and acceleration of 0.3G
Note 3: The specifications apply to the actuator mounted with each size of a standard motor in page 14. If a different motor is used, the actuator's specifications are different. Also note that the rated values of the actuator unit must not be exceeded.



●Outline Drawing of Model VLAST45



●Dimensions of the motor mounting section

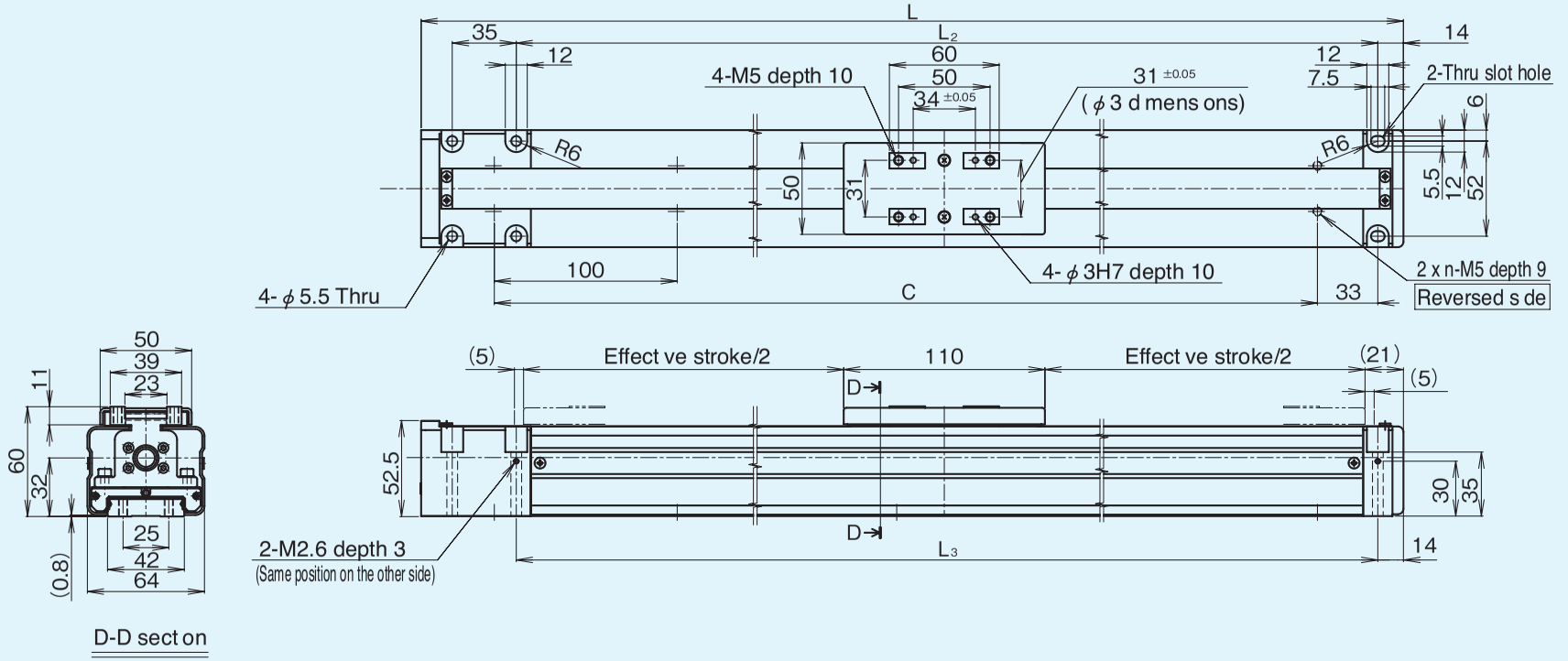


Dimensional Table

Unit : mm

Stroke	Effective stroke	Mechanical stroke	L	L2	L3	C	n	Mass : kg
0050	50	60	206	151	141.6	100	2	0.9
0100	100	110	256	201	191.6	200	3	1.0
0150	150	160	306	251	241.6	200	3	1.1
0200	200	210	356	301	291.6	300	4	1.2
0250	250	260	406	351	341.6	300	4	1.3
0300	300	310	456	401	391.6	400	5	1.4
0350	350	360	506	451	441.6	400	5	1.5
0400	400	410	556	501	491.6	500	6	1.6
0450	450	460	606	551	541.6	500	6	1.7
0500	500	510	656	601	591.6	600	7	1.9

●Outline Drawing of Model VLAST60

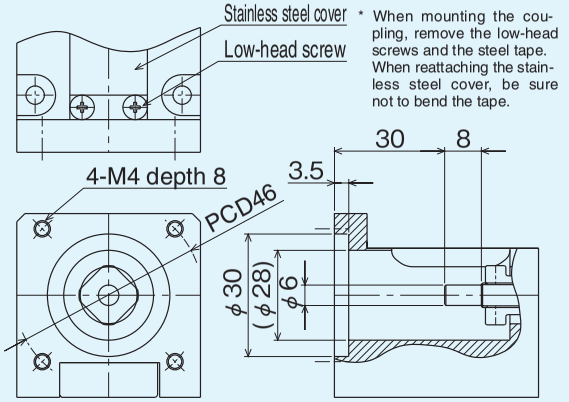


Dimensional Table

Unit : mm

Stroke	Effective stroke	Mechanical stroke	L	L2	L3	C	n	Mass : kg
0050	50	60	237	171	171	100	2	1.9
0100	100	110	287	221	221	200	3	2.1
0150	150	160	337	271	271	200	3	2.3
0200	200	210	387	321	321	300	4	2.5
0250	250	260	437	371	371	300	4	2.7
0300	300	310	487	421	421	400	5	2.9
0350	350	360	537	471	471	400	5	3.1
0400	400	410	587	521	521	500	6	3.3
0450	450	460	637	571	571	500	6	4.0
0500	500	510	687	621	621	600	7	4.2
0550	550	560	737	671	671	600	7	3.5
0600	600	610	787	721	721	700	8	3.7
0700	700	710	887	821	821	800	9	4.6

●Dimensions of the motor mounting section



Model Number Coding of the Sensor Rail

TH - VSR - 45 - 0100
① ② ③ ④

① Model number
② Class
③ Type
45: for VLAST45
60: for VLAST60
④ Type
Ex. 0100: for stroke 100mm
0250: for stroke 250mm

TH-VSR-45

		Nominal stroke									
		0050	0100	0150	0200	0250	0300	0350	0400	0450	0500
L_1	mm	141.6	191.6	241.6	291.6	341.6	391.6	441.6	491.6	541.6	591.6
L_0		153.6	203.6	253.6	303.6	353.6	403.6	453.6	503.6	553.6	603.6

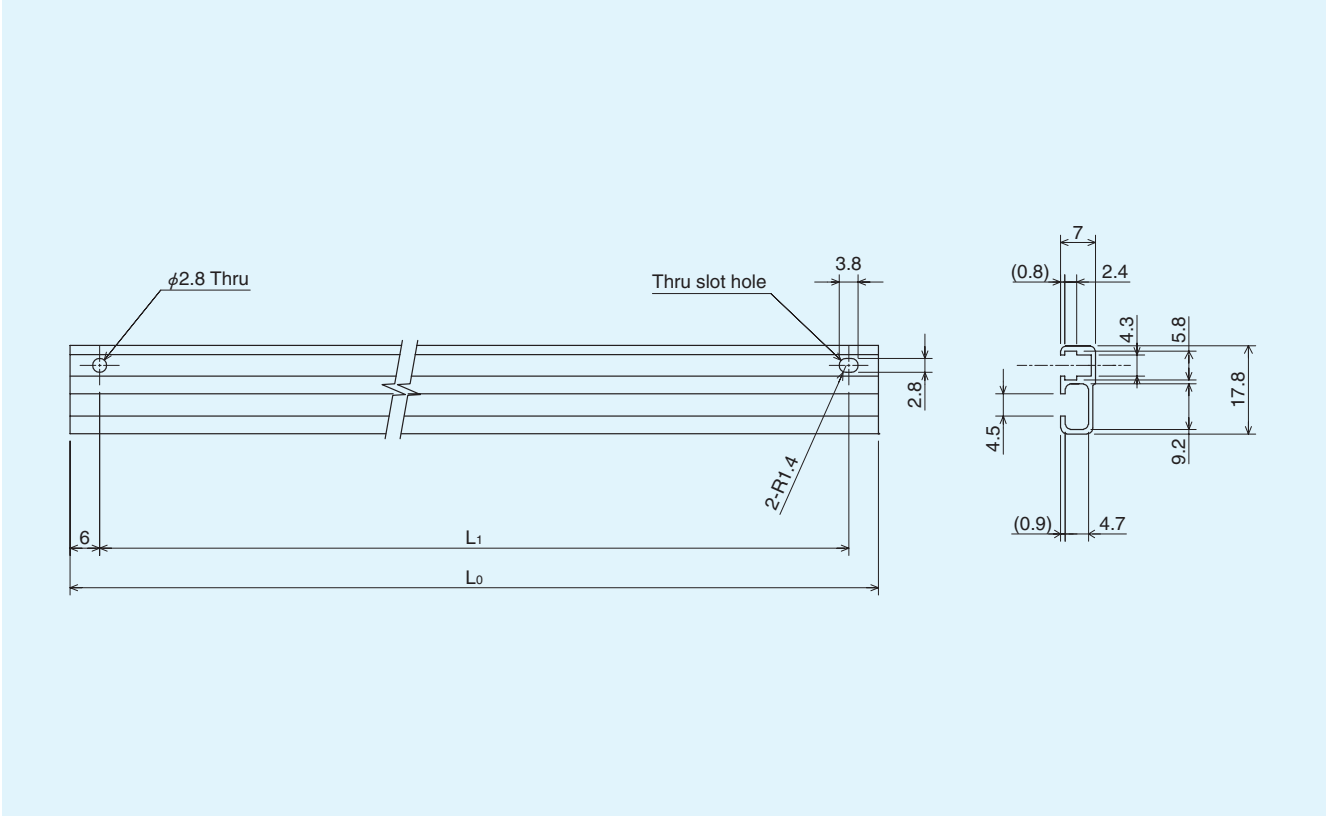
* Screw for securing the sensor rail: number 0 pan-head screw (M2.6 x 4L)

TH-VSR-60

		Nominal stroke												
		0050	0100	0150	0200	0250	0300	0350	0400	0450	0500	0550	0600	0700
L_1	mm	171	221	271	321	371	421	471	521	571	621	671	721	821
L_0		183	233	283	333	383	433	483	533	583	633	683	733	833

* Screw for securing the sensor rail: number 0 pan-head screw (M2.6 x 4L)

Dimensional Drawing of the Sensor Rail



Mountable Sensors

Symbol	Description	Type	Accessory
0	None	—	—
1	With sensor rail	—	Mounting screws, sensor rail
6	Photo Sensor [3 units]	EE-SX674 (Omron Corp.)	Mounting screw/nut, sensor rail, sensor bracket, connector (EE-1001)
7	Proximity Sensor N.O. contact [3 units]	APM-D3A1-001 (Yamatake Corp.)	Mounting screw/nut, sensor rail
B	Proximity Sensor N.C. contact [3 units]	APM-D3B1-003 (Yamatake Corp.)	Mounting screw/nut, sensor rail
E	Proximity Sensor N.O. contact [1 unit] N.C. contact [2 units]	APM-D3A1-001 APM-D3B1-003 (Yamatake Corp.)	Mounting screw/nut, sensor rail
H	Proximity Sensor N.O. contact [3 units]	GX-F12A (Panasonic Electric Works SUNX)	Mounting screw/nut, sensor rail
L	Proximity Sensor N.C. contact [3 units]	GX-F12B (Panasonic Electric Works SUNX)	Mounting screw/nut, sensor rail
J	Proximity Sensor N.O. contact [1 unit] N.C. contact [2 units]	GX-F12A GX-F12B (Panasonic Electric Works SUNX)	Mounting screw/nut, sensor rail
M	Proximity Sensor (PNP output) N.O. contact [1 unit] N.C. contact [2 units]	GX-F12A-P GX-F12B-P (Panasonic Electric Works SUNX)	Mounting screw/nut, sensor rail

*1 The sensor target cannot be mounted directly on the carriage. Mount it outside the carriage.
*2 For sensors other than the above, contact THK.
Note1: N.O. contact: normally open contact
Note2: N.C. contact: normally closed contact
The photo-sensors can be switched between ON when lit and ON when unlit.

Example of Mounting Sensors

The sensor option dose not contain sensor targets.
Refer below drawings to design the sensor detecting parts.

Model VLAST45

Proximity Sensors

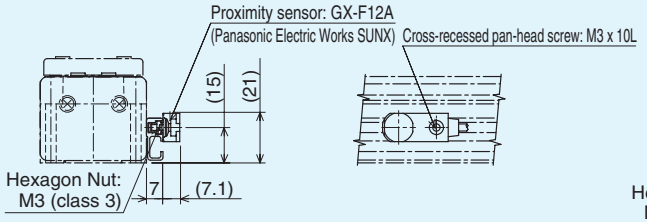
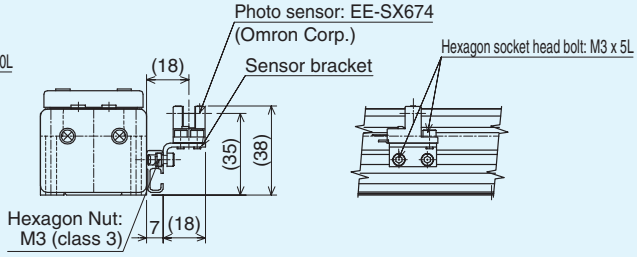


Photo Sensors



Model VLAST60

Proximity Sensors

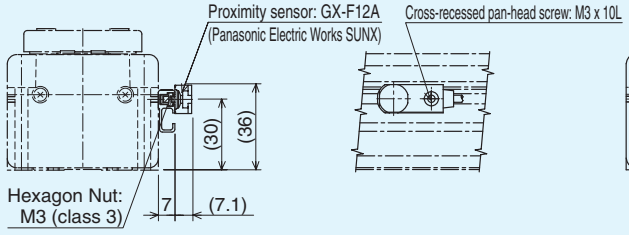
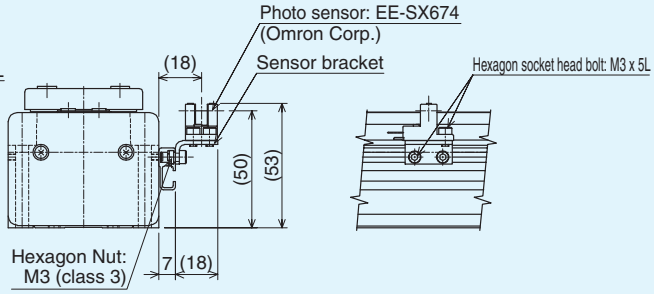


Photo Sensors



Model VLACT

●Example of the actuator's model number coding

VLACT35 – 06 – 0050 – 0 – 0N
① ② ③ ④ ⑤ ⑥⑦

① Type : CT

② Classification in main unit size
35:35mm width
45:45mm width
55:55mm width

③ Ball screw lead
06: 6mm
12:12mm

④ Stroke : Ex. 0050: 50mm
0200: 200mm

⑤ Motor
0 : no motor

⑥ Sensor
0 : no sensor

⑦ Option
N:no option
A:Bracket Base
B:Flange

●Model VLACT Specifications

Item	Unit	VLACT35 (30W)		VLACT45 (50W)		VLACT55 (100W)	
		High speed type	Medium speed type	High speed type	Medium speed type	High speed type	Medium speed type
Rated speed (Note 1)	mm/s	600	300	600	300	600	300
Rated thrust	N	40	80	67	134	134	267
Maximum thrust	N	120	240	201	402	402	804
Horizontal mass capacity (Note 2, 3)	kg	4	8	7	14	25	40
Vertical mass capacity (Note 3)	kg	1.9	3.8	3	6	6	10
Ball screw lead	mm	12	6	12	6	12	6
Positioning repeatability	mm	±0.02					
Ball screw shaft diameter	mm	8				12	
Motor wattage (Note 5)	W	30		50		100	
Motor rated torque (Note 5)	N-m	0.095		0.158		0.318	
Rod diameter	mm	ϕ16		ϕ20		ϕ25	
Stroke	mm	50/100/150		50/100/150/200		50/100/150/200/250/300	
Service life in distance traveled (Note 4)	km	5000					

Note 1: The rated speed is 470mm/s for the high-speed type and 235mm/s for the medium-speed type of model CT55 with a 300mm stroke, according to the critical speed of the Ball Screw. With shorter strokes, model CT55 can operate at up to 500mm/s for the medium-speed type or up to 1,000mm/s for the high-speed type. However, the service life may be shortened.

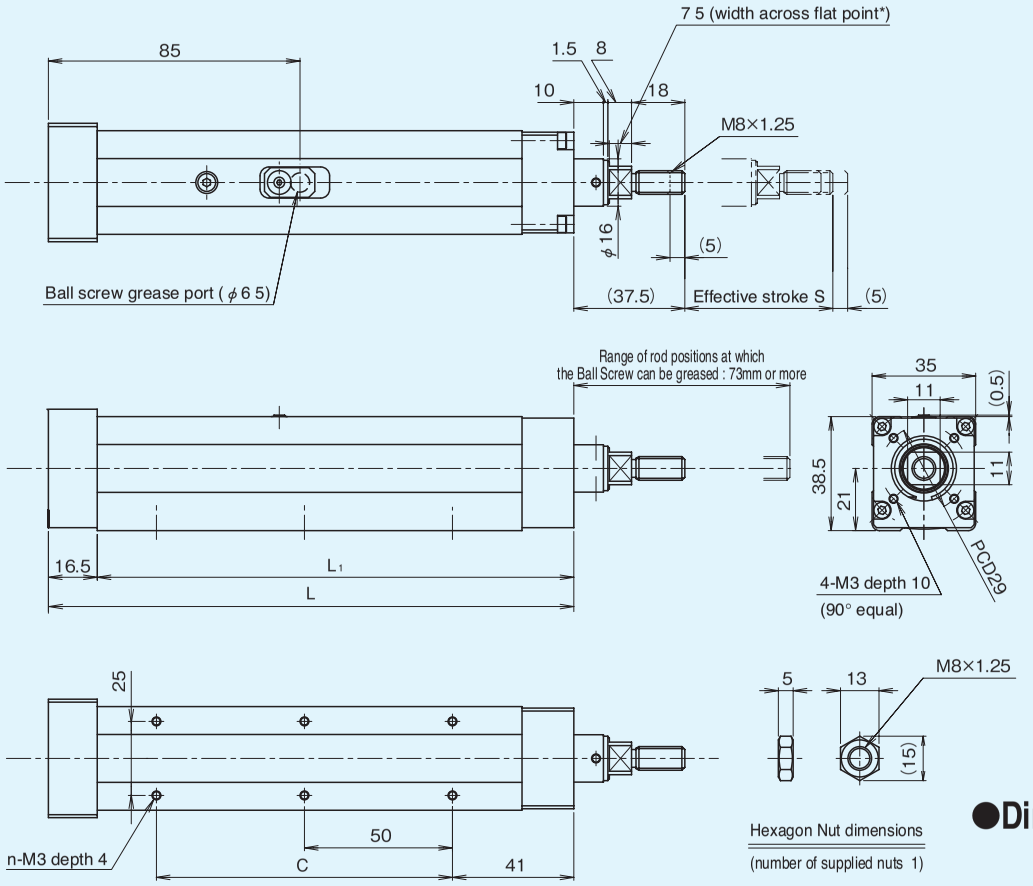
Note 2: Model CT is capable of receiving only an axial load. The horizontal mass capacity is the value when an LM Guide is also used and no axial load is applied to the rod. When making a selection, take into account the sliding resistance of the LM Guide. For specific sliding resistances of LM Guides, see the general catalog.

Note 3: The values apply at acceleration of 0.3G.

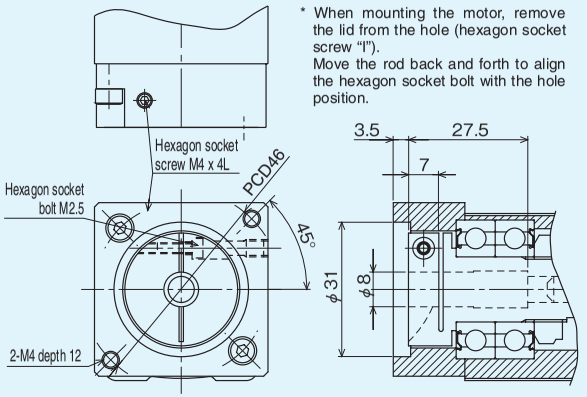
Note 4: The specifications apply to the actuator mounted with each size of a standard motor in page 14. If a different motor is used, the actuator's specifications are different. Also note that the rated values of the actuator unit must not be exceeded.

Note 5: The value applies when the actuator receives a load and operates at the rated speed and acceleration of 0.3G.

●Outline Drawing of Model VLACT35



●Dimensions of the motor mounting section



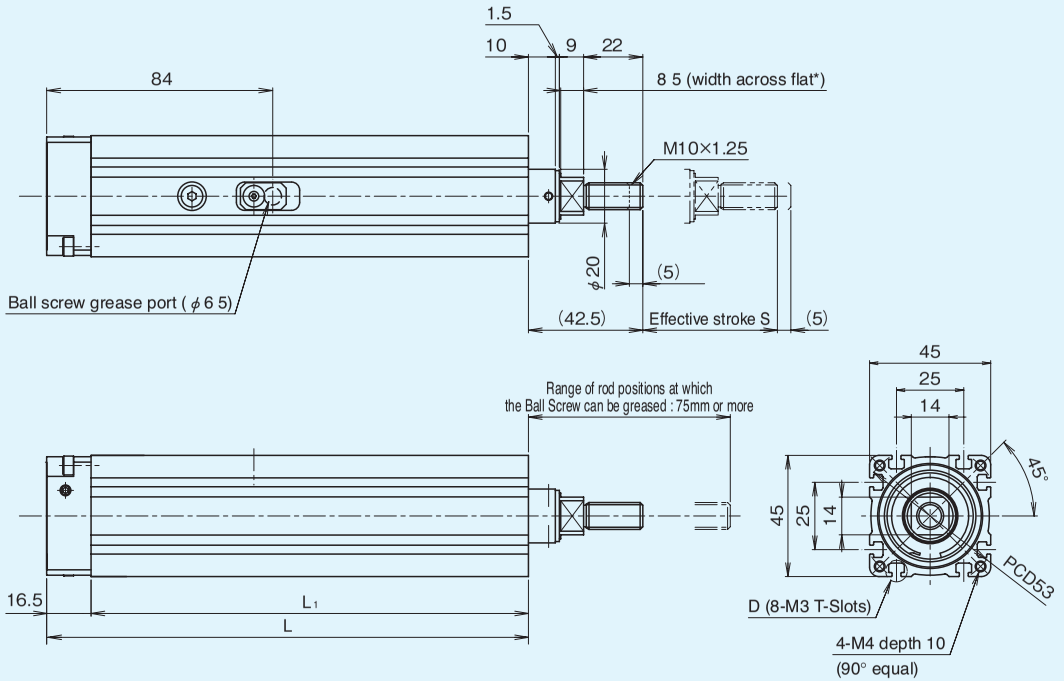
Dimensional Table

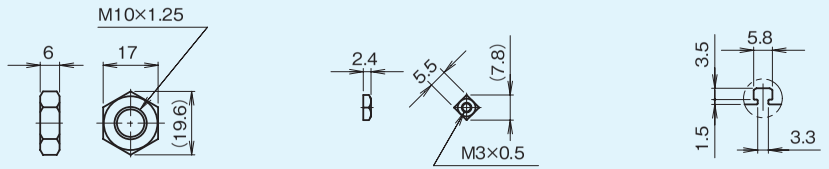
Unit : mm

Stroke	Effective stroke: S	L	L_1	C	n	Mass : kg
0050	50	177.5	161	100	6	0.7
0100	100	227.5	211	150	8	0.9
0150	150	277.5	261	200	10	1.0

* The direction to the baseside is not fixed.

●Outline Drawing of Model VLACT45



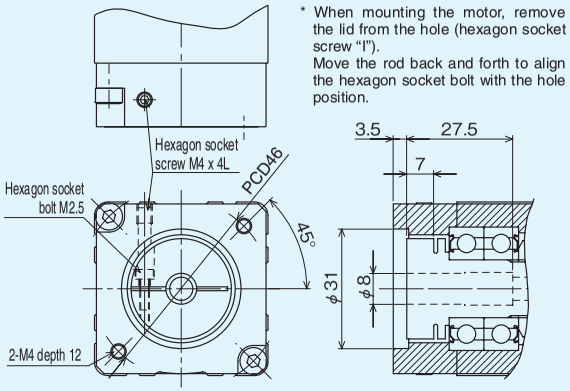


Hexagon Nut dimensions
(number of supplied nuts 1)

Square nut (provided) dimensions
(number of square nuts 6)

Detail on "D"
(M3 T-Slot)

●Dimensions of the motor mounting section



* When mounting the motor, remove the lid from the hole (hexagon socket screw "I").
Move the rod back and forth to align the hexagon socket bolt with the hole position.

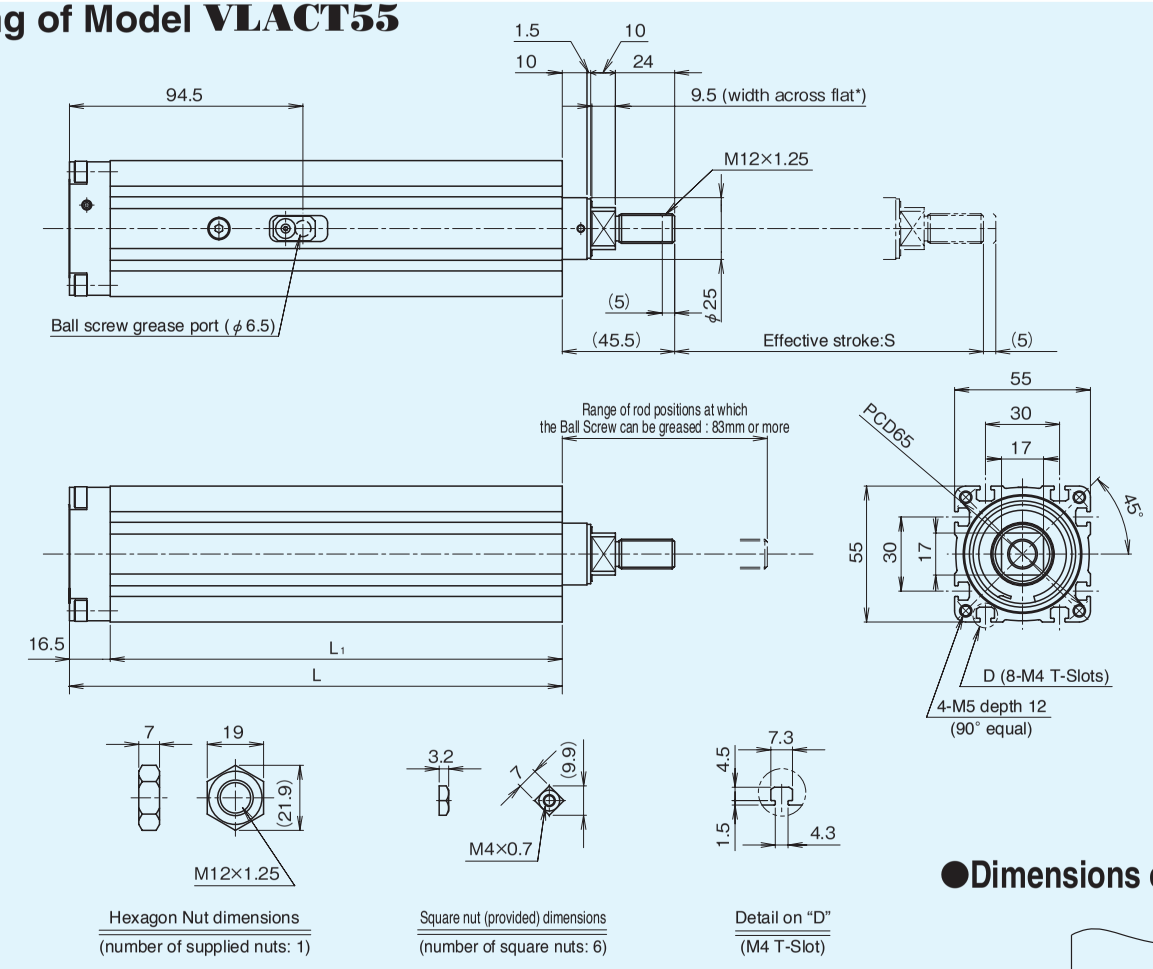
Dimensional Table

Unit : mm

Stroke	Effective stroke: S	L	L_1	Mass : kg
0050	50	179	162.5	1.1
0100	100	229	212.5	1.4
0150	150	279	262.5	1.6
0200	200	329	312.5	1.9

* The direction to the baseside is not fixed.

●Outline Drawing of Model VLACT55

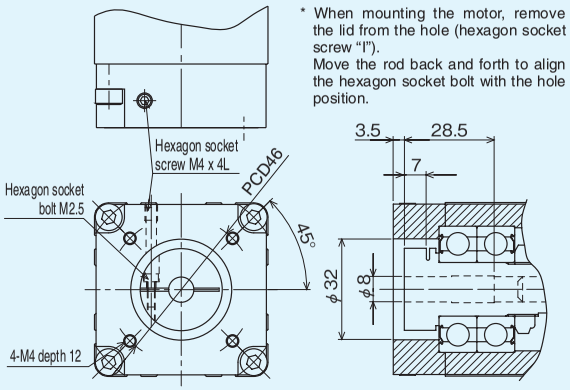


Hexagon Nut dimensions (number of supplied nuts: 1)

Square nut (provided) dimensions (number of square nuts: 6)

Detail on "D" (M4 T-Slot)

●Dimensions of the motor mounting section



* When mounting the motor, remove the lid from the hole (hexagon socket screw "I").
Move the rod back and forth to align the hexagon socket bolt with the hole position.

Dimensional Table

Unit : mm

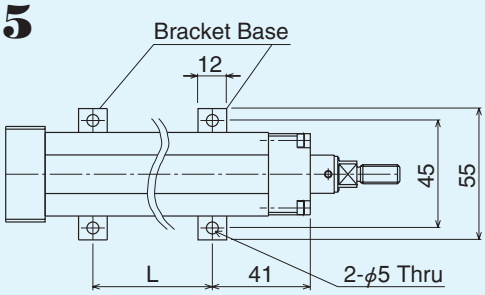
Stroke	Effective stroke: S	L	L_1	Mass : kg
0050	50	199.5	183	1.7
0100	100	249.5	233	2.1
0150	150	299.5	283	2.5
0200	200	349.5	333	2.8
0250	250	399.5	383	3.2
0300	300	449.5	433	3.6

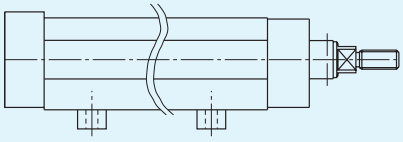
* The direction to the baseside is not fixed.

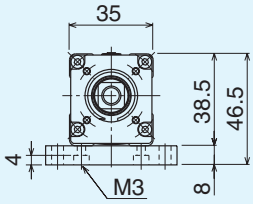
●Options for Model VLACT

Bracket Base **[Option symbol]: A**

VLACT35



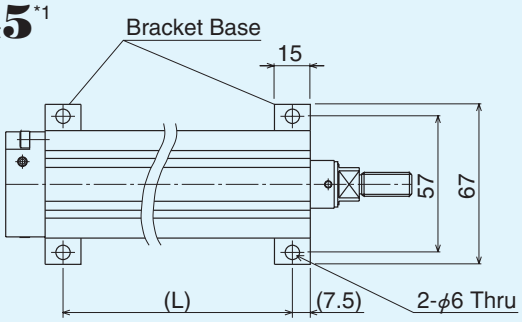


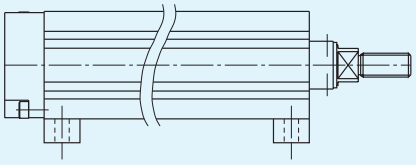


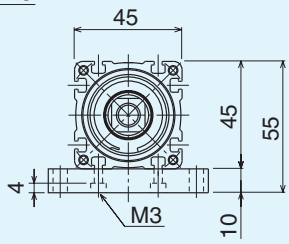
Unit : mm

Nominal Stroke	L
50	100
100	150
150	200

VLACT45*1



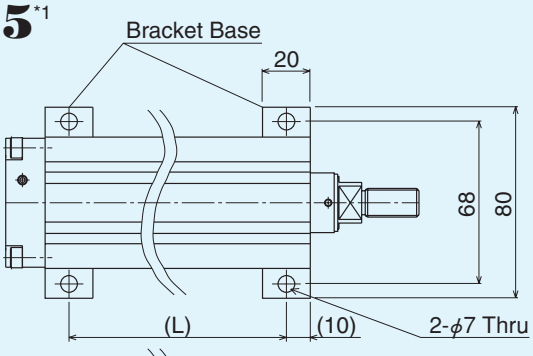


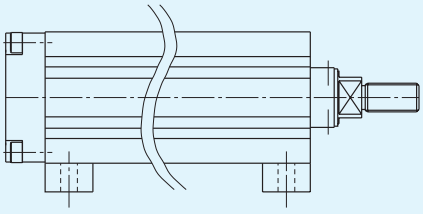


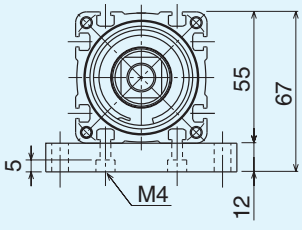
Unit : mm

Nominal Stroke	L
50	147.5
100	197.5
150	247.5
200	297.5

VLACT55*1







Unit : mm

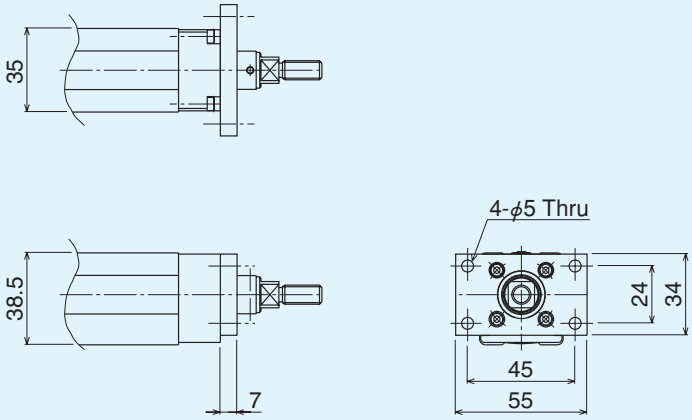
Nominal Stroke	L
50	163
100	213
150	263
200	313
250	363
300	413

The bracket base is an option available in a 2-piece set.
*1 VLACT45 and VLACT55 are each provided with two square nuts.

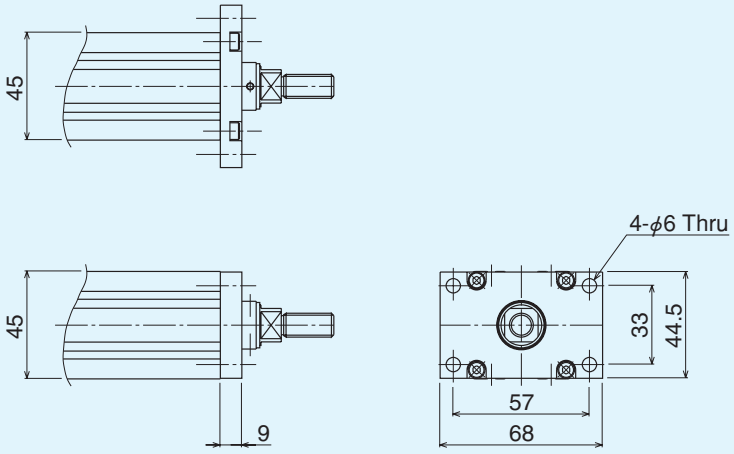
Flange

[Option symbol]: B

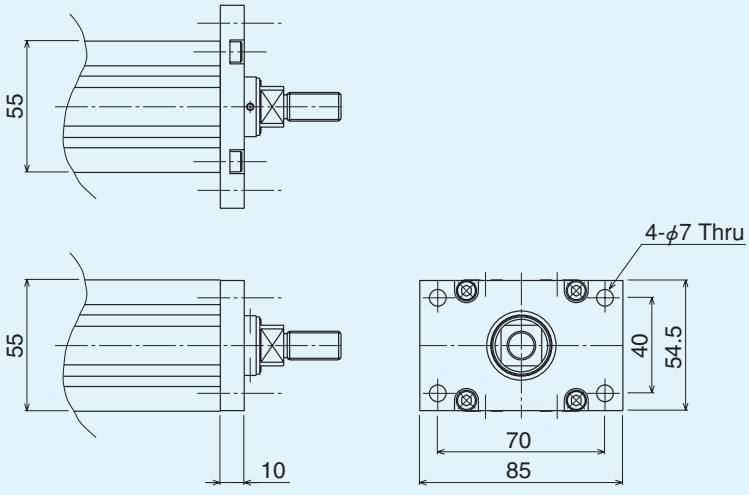
VLACT35



VLACT45



VLACT55



Note: Each flange is attached to the actuator in the position as indicated in the figure when the actuator is shipped.

●Specifications of Mountable Motors

With model VLA, any of the motors indicated in the table below can be mounted without an intermediate flange.

* For details of the motor mounting area, see the corresponding drawing P.4~5, P.9~11.
* For the specifications and options of a motor of a particular manufacturer, see the manufacturer's catalog and select and purchase one.

Maker	Model No.			Rated output	Applicable Actuator VLA				
					ST45	ST60	CT35	CT45	CT55
Yaskawa Electric	Σ-V		SGMJV-A5	50W	—	○	—	○	—
			SGMAV-A5		—	○	—	○	—
			SGMJV-01	100W	—	○	—	—	○
			SGMAV-01		—	○	—	—	○
Mitsubishi Electric	MELSERVO	J3	HF-MP053	50W	—	○	—	○	—
			HF-KP053		—	○	—	○	—
			HF-MP13	100W	—	○	—	—	○
			HF-KP13		—	○	—	—	○
SANYO Electric	SANMOTION Q1		Q1AA04003D	30W	○	—	—	—	—
			Q1AA04005D	50W	—	○	—	○	—
			Q1AA04010D	100W	—	○	—	—	○
Omron	OMNUC G5		R88M-K05030	50W	—	○	—	○	—
			R88M-K10030	100W	—	○	—	—	○
	OMNUC G		R88M-G05030	50W	—	○	—	○	—
			R88M-G10030	100W	—	○	—	—	○
Fanuc	β is series		βis0.2/5000	50W	—	○	—	—	—
			βs0.3/5000	100W	—	○	—	—	—
Keyence Corporation	MV		MV-M05	50W	—	○	—	○	—
			MV-M10	100W	—	○	—	—	○

Note1 : For motor shaft, select a straight shaft.
Note2 : Customer to provide options and accessories for custom motors, such as, brakes, encoders, cables etc. Refer to the motor manufacturer's catalog to select options.
Note3 : If a custom motor is specified, actuator specification may change. The actuator is pre-set standard motor specifications. The actuator is not capable to operated beyond its rated preset conditions.
Note4 : Controller adjustments to be made by customer.
Note5 : With VLAST units with no motor mounted, no coupling attached. Customer to provide own coupling.
Note6 : If you select a coupling for VLAST45, be sure the coupling length must be 20mm or less. If the coupling length is longer than 20mm, the outer diameter must be 18.5mm or less.

THK Low Price Actuator Model VLA

⚠ Precautions on Use

●Service environment

Using the actuator and the controller in an adverse environment may cause failure. Be sure to use them in places such as the following.

- Indoor place with ambient temperature 0 to 40°C and ambient humidity 20 to 80% RH, and with no freezing or condensation
- Place with no corrosive gas or flammable gas
- Place with no inductive power such as iron power, dust, oil mist, cutting fluid, moisture, salt or organic solvent in the air
- Place with no direct sunlight or radiant heat
- Place with no intense electric field or intense magnetic field
- Place where vibrations or impact will not transmit to the unit
- Place where the unit can easily be inspected and cleaned

●Mounting surface for the actuator

- The mounting surface must be machined flat or similarly accurate planar, with flatness within 0.050/200mm for VLAST45, 0.060/200mm for VLAST60, or 0.1mm for VLACT.

●Precautions on safety

- Do not drop or hit the product. Doing so may cause injury or failure.
- Do not disassemble the product. Doing so may cause foreign material to enter the product or deteriorate its accuracy. Disassembling the controller may cause electric shock.
- Never touch the moving part of the actuator while it is energized. Do not enter the operating range of the actuator while it is operating or operable.
- Before installing, adjusting, inspecting or maintaining the actuator unit, the controller or the equipment to which the actuator or controller is connected, be sure to disconnect every power plug from the outlet, and lock the outlet or apply a safety plug in order to prevent people other than the operator from turning on the power again. In addition, post a “work in progress” notice in a place where it is easily visible.
- If two or more people are involved in operating the product, familiarize them with the procedures, signs and anomaly handling in advance, and appoint another person for overseeing their operation.
- Carefully read and fully understand the instruction manual, and be sure to observe the safety precautions.

■Instruction manual

- You can download the “Instruction Manual for Low-Priced Actuator Model VLA” and the “Instruction Manual for the Personal Computer Communication Software” from THK’s website. THK website: http://www.thk.com/

■CAD data, personal computer communication software

- You can download the CAD data of the actuator and the personal computer communication software (including English indications) from THK Technical Support site.
  Technical Support site: https://tech.thk.com/

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