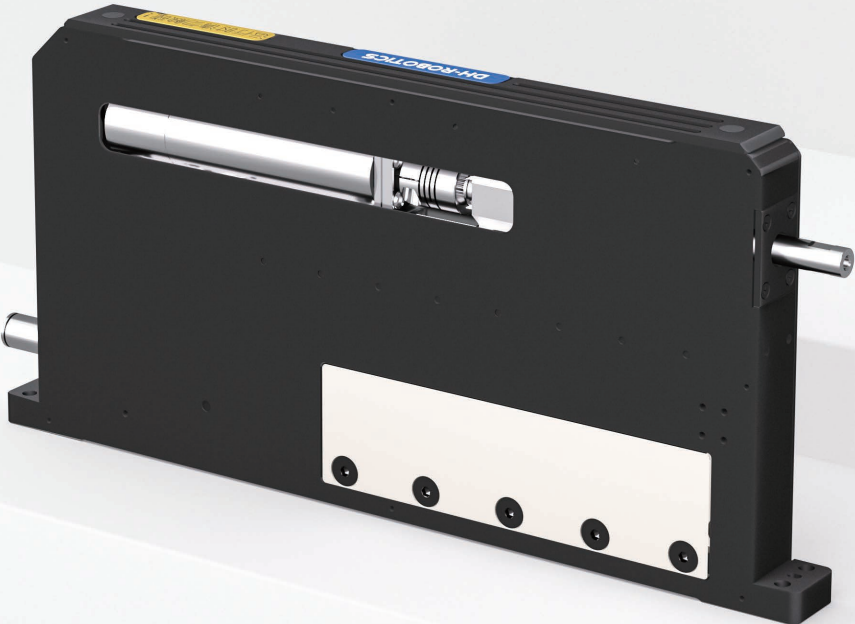


DLARA SERIES

Direct Drive Linear Rotary Actuator

- DLARA-16-25
- DLARA-16-40
- DLARA-20-25
- DLARA-20-40
- DLARA-20-60
- DLARA-25-25
- DLARA-25-50
- DLARA-35-50



PRODUCT FEATURES

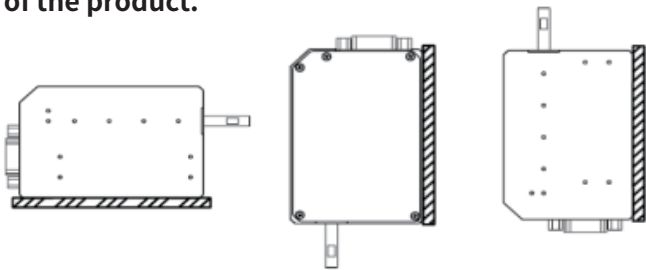
High Performance Linear/Rotary Motion Adjustable Parameters	Hollow Rod Soft Landing Power-off Protection	Precision Resolution Long Life over 100 Million Cycles
Provide accurate linear and rotary actions of the Z-axis during high-speed motion, with adjustable velocity, thrust, and position parameters, enabling complex actions requiring high frequency and high precision.	The product is compact, light, and thin. It employs a hollow rod design to support pick-and-place tasks. The intelligent soft landing function protects the picked and placed workpiece with precise force control. The Z-axis has a built-in spring to prevent the axis from falling off due to power-off during vertical operations.	Regarding this product, the stroke resolution is up to 0.5 μm , the rotary position resolution is 0.005°. With high-quality guide rail-level related components, it has a service life of up to 100 million cycles, and it is stable and durable.

INSTALLATION METHOD

Install it using the screw holes on the back of the product.

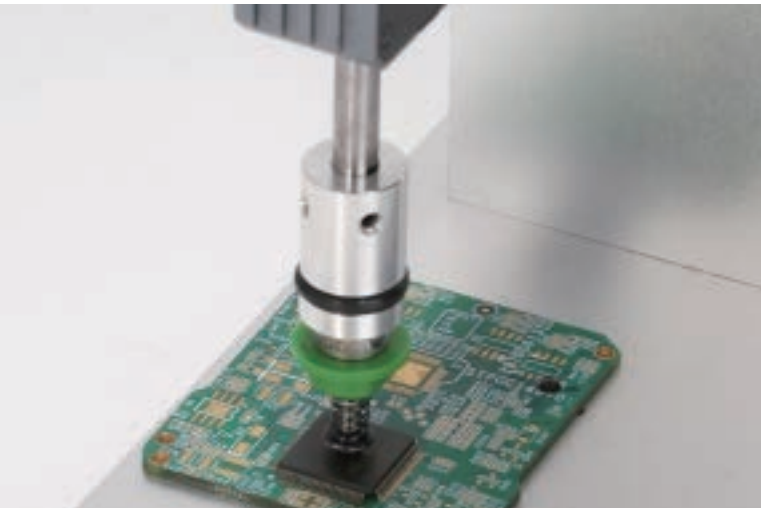
Installation Directions:

- Horizontal direction
- Vertical installation with the vertical rod pointing down
- Vertical installation with the vertical rod pointing up



APPLICATION SCENARIOS

The force repeatability of $\pm 10\text{ g}$ and the micron-level resolution can be applied to the fast pick-and-place, assembly, testing, and other scenarios in semiconductors, 3C electronics, and other industries. The unique linear and rotary motions of the Z-axis of the VLAR series can adapt to more abundant industrial scenarios, such as positioning, correction, and assembly in medical automation, 3C, and packaging automation.



DIRECT DRIVE LINEAR ROTARY ACTUATOR

Voice Coil Series	Thickness (mm)	Stroke (mm)	Linear Encoder	Rotary Encoder	Voltage (V)	Interface Location/ Vacuum	Accessories Bag	Drive /Cable
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Note: For magnetic scale configuration, the accessory package (with I/O cable) is required.

Peak thrust	15 N	
Continuous thrust* ^①	6 N	
Calculation formula for linear shaft motor output (vertically down)* ^②	$F=5.9-0.105 \times L$	(For the actual output, refer to the thrust-displacement curve)
Total stroke	25 mm	
Maximum speed	1 m/s	
Force control accuracy* ^③	50 g ~ 200 g: ± 10 g 200 g ~ 400 g: $\pm 5\%$	
Force constant	6.7 N/Arms	
Maximum torque	0.056 N.M	
Rated torque	0.018 N.m	
Maximum speed	2000 rpm	
Linear encoder resolution	1 μ m (Optical encoder)	0.5 μ m (Magnetic encoder)
Linear positioning repeatability	$\pm 5 \mu$ m (Optical encoder)	$\pm 2 \mu$ m (Magnetic encoder)
Rotary encoder resolution	0.005° (Optical encoder)	0.00275° (Magnetic encoder)
Rotary positioning repeatability	$\pm 0.1^\circ$ (Optical encoder)	$\pm 0.02^\circ$ (Magnetic encoder)

Overall mass	700 g
Movable part mass	200 g
Radial deviation of shaft	0.01 mm
Size	185 mm x 98 mm x 16 mm
Recommended air pressure range* ⁽⁴⁾	-0.1 Mpa ~ +0.2 Mpa
Recommended Input Vacuum	≥ -90 Kpa* ⁽⁵⁾
Pressure Drop	0-5 Kpa
Flow Rate	≥ 6 L/min

Operating voltage	24 V DC $\pm 10\%$
Continuous current	(Linear) 0.9 Arms (Rotary) 0.6 Arms
Peak current	(Linear) 2.25 Arms (Rotary) 1.8 Arms
Recommended load	< 100 g
Recommended load inertia	10 g.cm ²
Maintenance interval	Refer to Maintenance Instructions for DH-Robotics Linear coil actuator
IP rating	IP 40
Recommended operating environment	0~40°C, 85% RH or less
International standard compliance	CE, FCC, RoHS

Technical drawing of the SCST-36P windpipe assembly, showing three views: front, top, and side.

Front View Dimensions:

- Overall Width: 205
- Overall Height: 79
- Internal Width: 185
- Internal Height: 75
- Top Flange Width: 16
- Top Flange Height: 9
- Bottom Flange Width: 10
- Bottom Flange Height: 7

Top View Dimensions:

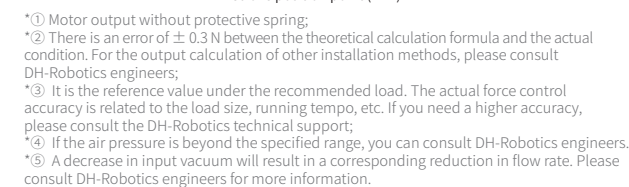
- Overall Length: 195
- Overall Width: 155
- Internal Length: 155
- Internal Width: 155
- Top Flange Width: 3.3
- Top Flange Height: 10
- Bottom Flange Width: 10
- Bottom Flange Height: 7

Side View Dimensions:

- Overall Width: 75 ± 0.05
- Overall Height: 16
- Internal Width: 9
- Internal Height: 5.5
- Top Flange Width: 3.3
- Top Flange Height: 10
- Bottom Flange Width: 10
- Bottom Flange Height: 7

Key Features and Annotations:

- 4 x Ø 3.40 thru ALL
- 2 x Ø 2 thru ALL
- M3 Depth 6
- 2 x M2.5 Depth 4
- 15 Rod Fully Ret
- Ø 4 Insertion of The Windpipe
- 2 x M2 thru A
- SCST-36P



DLARA-20-40

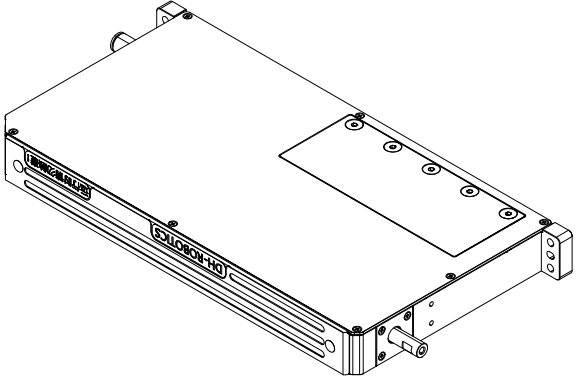
DIRECT DRIVE LINEAR ROTARY ACTUATOR

SELECTION METHOD

Voice Coil Series	Thickness (mm)	Stroke (mm)	Linear Encoder	Rotary Encoder	Voltage (V)	Interface Location/Vacuum	Accessories Bag	Drive /Cable
DLARA	20	40	ZH1	RH1	24U	BV	0	M L1
			ZH1					
			ZH2					
			RH1					
			RM2					
					24U			
						BV		
							0	
							1	
							N	
								M
								Y
								Z
								L1
								L3
								L5
								L7
								L10
								LX

Note: For magnetic scale configuration, the accessory package (with I/O cable) is required.

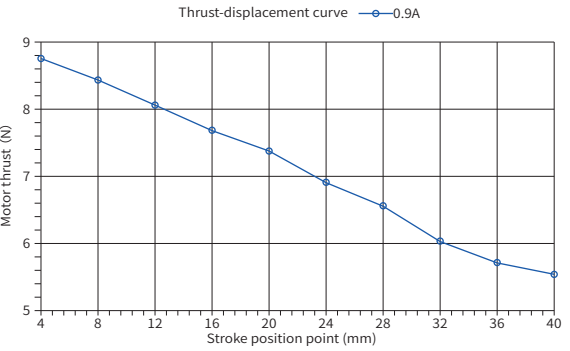
TECHNICAL SPECIFICATIONS



Performance Specifications	
Peak thrust	24 N
Continuous thrust* ^①	8 N
Calculation formula for linear shaft motor output (vertically down)* ^②	
$F=9.42-0.105 \times L$ (For the actual output, refer to the thrust-displacement curve)	
Total stroke	40 mm
Maximum speed	1.3 m/s
Force control accuracy* ^③	50 g ~ 200 g: ± 10 g
	200 g ~ 600 g: $\pm 5\%$
Force constant	8.9 N/Arms
Maximum torque	0.056 N.m
Rated torque	0.018 N.m
Maximum speed	2000 rpm
Linear encoder resolution	1 μ m (Optical encoder) 0.5 μ m (Magnetic encoder)
Linear positioning repeatability	± 5 μ m (Optical encoder) ± 2 μ m (Magnetic encoder)
Rotary encoder resolution	0.005° (Optical encoder) 0.00275° (Magnetic encoder)
Rotary positioning repeatability	$\pm 0.1^\circ$ (Optical encoder) $\pm 0.02^\circ$ (Magnetic encoder)

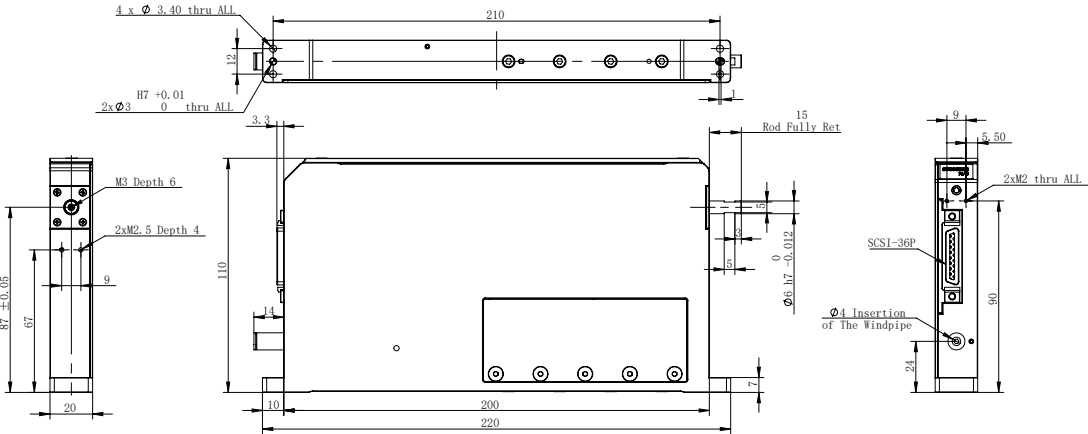
Mechanical Specifications	
Overall mass	955 g
Movable part mass	233 g
Radial deviation of shaft	0.01 mm
Size	200 mm x 110 mm x 20 mm
Recommended air pressure range* ^④	-0.1 Mpa ~ +0.2 Mpa
Recommended Input Vacuum	≥ -90 Kpa* ^⑤
Pressure Drop	0-5 Kpa
Flow Rate	≥ 6 L/min

Operating Environment	
Operating voltage	24 V DC $\pm 10\%$
Continuous current	(Linear) 0.9 Arms (Rotary) 0.6 Arms
Peak current	(Linear) 2.7 Arms (Rotary) 1.8 Arms
Recommended load	< 100 g
Recommended load inertia	10 g.cm ²
Maintenance interval	Refer to Maintenance Instructions for DH-Robotics Linear coil actuator
IP rating	IP 40
Recommended operating environment	0~40°C, 85% RH or less
International standard compliance	CE, FCC, RoHS



*^① Motor output without protective spring;
*^② There is an error of ± 0.3 N between the theoretical calculation formula and the actual condition. For the output calculation of other installation methods, please consult DH-Robotics engineers;
*^③ It is the reference value under the recommended load. The actual force control accuracy is related to the load size, running tempo, etc. If you need a higher accuracy, please consult the DH-Robotics technical support;
*^④ If the air pressure is beyond the specified range, you can consult DH-Robotics engineers.
*^⑤ A decrease in input vacuum will result in a corresponding reduction in flow rate. Please consult DH-Robotics engineers for more information.

Dimensions



DLARA-20-60

DIRECT DRIVE LINEAR ROTARY ACTUATOR

SELECTION METHOD

Voice Coil Series

DLARA

Thickness (mm)

20

Stroke (mm)

60

Linear Encoder

ZH1

ZH1

Optical encoder, 0.5 μm

ZH2

Magnetic encoder, 1 μm

Rotary Encoder

RH1

RH1

Optical encoder, 0.00275°

RM2

Magnetic encoder, 0.005°

Voltage (V)

24U

24U

24V main with 48V compatibility

Interface Location/ Vacuum

BV

BV

Bottom interface + vacuum

Accessories Bag

0

0

Accessories Bag (without I/O Cable)

1

Accessories Bag (with I/O Cable)

N

No Accessories Bag

Drive /Cable

M L1

M

SAC2-NP1

(Single Axis Drive)

Y

SAC-NP2

(Dual-Axis Drive)

Z

SAC-NP4

(Four-Axis Drive)

L1

1m Direct Cable Outlet

L3

3m Direct Cable Outlet

L5

5m Direct Cable Outlet

L7

7m Direct Cable Outlet

L10

10m Direct Cable Outlet

LX

No Cable Provided



Note: For magnetic scale configuration, the accessory package (with I/O cable) is required.

TECHNICAL SPECIFICATIONS

Intelligent Feedback

Adjustable Parameters

Long Life

Thrust-displacement curve — 0.9A

Stroke position point (mm)	Motor thrust (N)
6	9.0
12	8.5
18	8.0
24	7.5
30	7.0
36	6.5
42	6.0
48	5.5
54	5.0
60	2.5

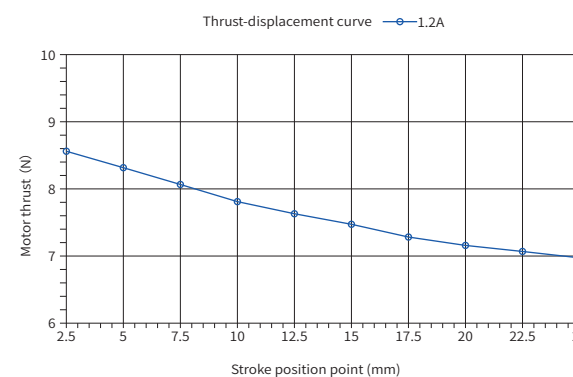
*① Motor output without protective spring;
*② There is an error of ± 0.3 N between the theoretical calculation formula and the actual condition. For the output calculation of other installation methods, please consult DH-Robotics engineers;
*③ It is the reference value under the recommended load. The actual force control accuracy is related to the load size, running tempo, etc. If you need a higher accuracy, please consult the DH-Robotics technical support;
*④ If the air pressure is beyond the specified range, you can consult DH-Robotics engineers.
*⑤ A decrease in input vacuum will result in a corresponding reduction in flow rate. Please consult DH-Robotics engineers for more information.

Performance Specifications	
Peak thrust	24 N
Continuous thrust* ①	8 N
Calculation formula for linear shaft motor output (vertically down)* ②	$F=9.63-0.116 \times L$ (For the actual output, refer to the thrust-displacement curve)
Total stroke	60 mm
Maximum speed	1.8 m/s
Force control accuracy* ③	50 g ~ 200 g: ±10 g 200 g ~ 600 g: ±5%
Force constant	8.9 N/Arms
Maximum torque	0.056 N.m
Rated torque	0.018 N.m
Maximum speed	2000 rpm
Linear encoder resolution	1 μm (Optical encoder) 0.5 μm (Magnetic encoder)
Linear positioning repeatability	±5 μm (Optical encoder) ±2 μm (Magnetic encoder)
Rotary encoder resolution	0.005° (Optical encoder) 0.00275° (Magnetic encoder)
Rotary positioning repeatability	±0.1° (Optical encoder) ±0.02° (Magnetic encoder)
Mechanical Specifications	
Overall mass	1140 g
Movable part mass	237 g
Radial deviation of shaft	0.02 mm
Size	225mm x 110 mm x 20 mm
Recommended air pressure range* ④	-0.1 Mpa ~ +0.2 Mpa
Recommended Input Vacuum	≥ -90 Kpa* ⑤
Pressure Drop	0-5 Kpa
Flow Rate	≥ 6 L/min
Operating Environment	
Operating voltage	24 V DC ±10%
Continuous current	(Linear) 0.9 Arms (Rotary) 0.6 Arms
Peak current	(Linear) 2.7 Arms (Rotary) 1.8 Arms
Recommended load	< 100 g
Recommended load inertia	10 g.cm ²
Maintenance interval	Refer to Maintenance Instructions for DH-Robotics Linear coil actuator
IP rating	IP 40
Recommended operating environment	0~40°C, 85% RH or less
International standard compliance	CE, FCC, RoHS

Dimensions

Key dimensions include: 4 x Ø 3.40 thru ALL, 235, 15, 9, 5.50, 2xM2 thru ALL, Ø4 Insertion of the Windpipe, 24, 110, 225, 245, 10, 14, 3.3, 87 ±0.05, 67, 9, M3 Depth 6, 2xM2.5 Depth 4, 15, 10, 2, 1, 0, 0.012, SCS1-36P.

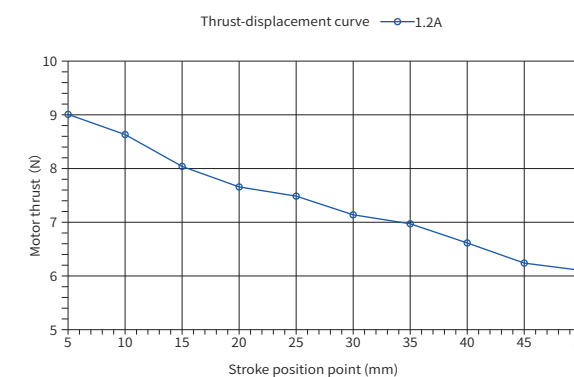
www.dh-robotics.com 33/34



DIRECT DRIVE LINEAR ROTARY ACTUATOR

Voice Coil Series	Thickness (mm)	Stroke (mm)	Linear Encoder	Rotary Encoder	Voltage (V)	Interface Location/ Vacuum	Accessories Bag	Drive /Cable
1000	10	10			12			
1001	10	10			12			
1002	10	10			12			
1003	10	10			12			
1004	10	10			12			
1005	10	10			12			
1006	10	10			12			
1007	10	10			12			
1008	10	10			12			
1009	10	10			12			
1010	10	10			12			
1011	10	10			12			
1012	10	10			12			
1013	10	10			12			
1014	10	10			12			
1015	10	10			12			
1016	10	10			12			
1017	10	10			12			
1018	10	10			12			
1019	10	10			12			
1020	10	10			12			
1021	10	10			12			
1022	10	10			12			
1023	10	10			12			
1024	10	10			12			
1025	10	10			12			
1026	10	10			12			
1027	10	10			12			
1028	10	10			12			
1029	10	10			12			
1030	10	10			12			
1031	10	10			12			
1032	10	10			12			
1033	10	10			12			
1034	10	10			12			
1035	10	10			12			
1036	10	10			12			
1037	10	10			12			
1038	10	10			12			
1039	10	10			12			
1040	10	10			12			
1041	10	10			12			
1042	10	10			12			
1043	10	10			12			
1044	10	10			12			
1045	10	10			12			
1046	10	10			12			
1047	10	10			12			
1048	10	10			12			
1049	10	10			12			
1050	10	10			12			
1051	10	10			12			
1052	10	10			12			
1053	10	10			12			
1054	10	10			12			
1055	10	10			12			
1056	10	10			12			
1057	10	10			12			
1058	10	10			12			
1059	10	10			12			
1060	10	10						

Note: For magnetic scale configuration, the accessory package (with I/O cable) is required.



- *1 Motor output without protective spring;
- *2 There is an error of $\pm 0.3 \text{ N}$ between the theoretical calculation formula and the actual condition. For the output calculation of other installation methods, please consult DH-Robotics engineers;
- *3 It is the reference value under the recommended load. The actual force control accuracy is related to the load size, running speed, etc. If you need a higher accuracy, please consult the DH-Robotics technical support;
- *4 If the air pressure is beyond the specified range, you can consult DH-Robotics engineers.
- *5 A decrease in input vacuum will result in a corresponding reduction in flow rate. Please consult DH-Robotics engineers for more information.

Peak thrust	27.5 N
Continuous thrust* ^①	10 N
Calculation formula for linear shaft motor output (vertically down)* ^②	$F=8.92-0.056 \times L$ (For the actual output, refer to the thrust-displacement curve)
Total stroke	50 mm
Maximum speed	1.7 m/s
Force control accuracy* ^③	50 g ~ 200 g: ± 10 g 200 g ~ 800 g: $\pm 5\%$
Force constant	8.3 N/Arms
Maximum torque	0.042 N.m
Rated torque	0.02 N.m
Maximum speed	2000 rpm
Linear encoder resolution	1 μ m (Optical encoder) 0.5 μ m (Magnetic encoder)
Linear positioning repeatability	± 5 μ m (Optical encoder) ± 2 μ m (Magnetic encoder)
Rotary encoder resolution	0.005° (Optical encoder) 0.00275° (Magnetic encoder)
Rotary positioning repeatability	$\pm 0.1^\circ$ (Optical encoder) $\pm 0.02^\circ$ (Magnetic encoder)

Overall mass	1265 g
Movable part mass	275 g
Radial deviation of shaft	0.015 mm
Size	210mm x 122 mm x 25 mm
Recommended air pressure range* ④	-0.1 Mpa ~ +0.2 Mpa
Recommended Input Vacuum	≥ -90 Kpa*⑤
Pressure Drop	0-5 Kpa
Flow Rate	≥ 8 L/min

Operating voltage	24 V DC $\pm 10\%$
Continuous current	(Linear) 1.2 Arms (Rotary) 0.9 Arms
Peak current	(Linear) 3.3 Arms (Rotary) 2 Arms
Recommended load	< 150 g
Recommended load inertia	20 g.cm ²
Maintenance interval	Refer to Maintenance Instructions for DH-Robotics Linear coil actuator
IP rating	IP 40
Recommended operating environment	0~40°C, 85% RH or less
International standard compliance	CE, FCC, RoHS

Technical drawing of the SCS1-36P window assembly, showing three views: Top View, Front View, and Side View.

Top View Dimensions:

- Overall Width: 230
- Overall Height: 220
- Top Edge Feature: 4x Ø1.50 thru ALI
- Left Edge Feature: 2x Ø3 thru ALI
- Right Edge Feature: 2x M3 thru ALI
- Bottom Edge Feature: 2x M3 thru ALI
- Internal Width: 210
- Internal Height: 122

Front View Dimensions:

- Overall Width: 230
- Overall Height: 97 ± 0.05
- Internal Width: 210
- Internal Height: 77
- Top Edge Feature: M4 Depth 8
- Bottom Edge Feature: 2x M2.5 Depth 4

Side View Dimensions:

- Overall Depth: 15
- Internal Depth: 10
- Top Edge Feature: 2x M3 thru ALI
- Bottom Edge Feature: 2x M3 thru ALI
- Internal Depth: 10
- Internal Width: 210
- Internal Height: 122

Key Features:

- 4x Ø1.50 thru ALI
- 2x Ø3 thru ALI
- M4 Depth 8
- 2x M2.5 Depth 4
- 2x M3 thru ALI
- SCS1-36P
- Ø6 Insertion of The Windseips
- Rod Puller Ret

DLARA-35-50

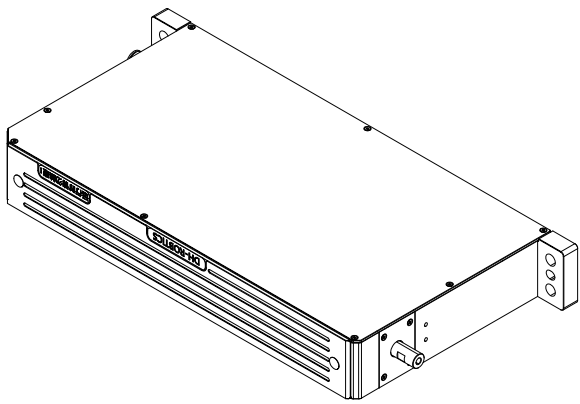
DIRECT DRIVE LINEAR ROTARY ACTUATOR

SELECTION METHOD

Voice Coil Series	Thickness (mm)	Stroke (mm)	Linear Encoder	Rotary Encoder	Voltage (V)	Interface Location/Vacuum	Accessories Bag	Drive /Cable
DLARA	35	50	ZH1	RH1	48	BV	0	M L1
			ZH1 Optical encoder, 0.5 μm					
			ZH2 Magnetic encoder, 1 μm					
				RH1 Optical encoder, 0.00275°				
				RM2 Magnetic encoder, 0.005°				
					24U 24V main with 48V compatibility			
						BV Bottom interface + vacuum		
							0 Accessories Bag (without I/O Cable)	
							1 Accessories Bag (with I/O Cable)	
							N No Accessories Bag	
								M SAC2-NP1 (Single Axis Drive)
								Y SAC-NP2 (Dual-Axis Drive)
								Z SAC-NP4 (Four-Axis Drive)
								L1 1m Direct Cable Outlet
								L3 3m Direct Cable Outlet
								L5 5m Direct Cable Outlet
								L7 7m Direct Cable Outlet
								L10 10m Direct Cable Outlet
								LX No Cable Provided

Note: For magnetic scale configuration, the accessory package (with I/O cable) is required.

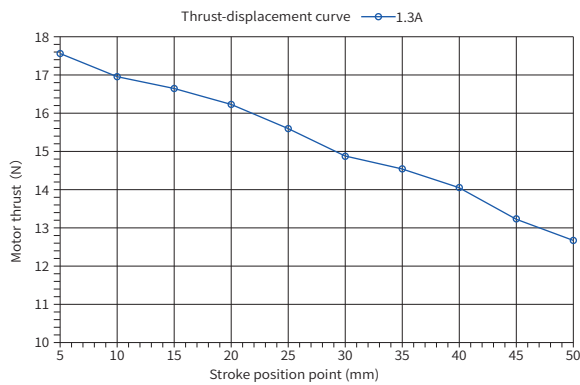
TECHNICAL SPECIFICATIONS



Intelligent Feedback

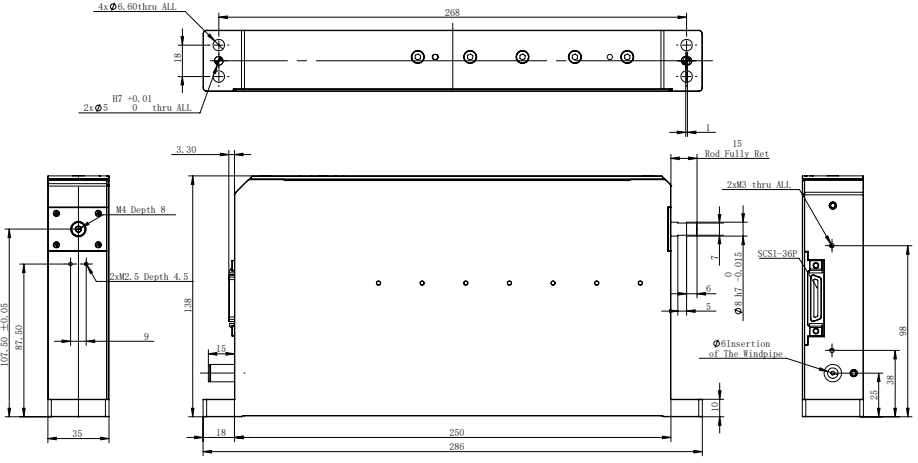
Adjustable Parameters

Long Life



*① Motor output without protective spring;
*② There is an error of ± 0.3 N between the theoretical calculation formula and the actual condition. For the output calculation of other installation methods, please consult DH-Robotics engineers;
*③ It is the reference value under the recommended load. The actual force control accuracy is related to the load size, running tempo, etc. If you need a higher accuracy, please consult the DH-Robotics technical support;
*④ If the air pressure is beyond the specified range, you can consult DH-Robotics engineers.
*⑤ A decrease in input vacuum will result in a corresponding reduction in flow rate. Please consult DH-Robotics engineers for more information.

Dimensions



Performance Specifications

Peak thrust	64 N
Continuous thrust* ①	19 N
Calculation formula for linear shaft motor output (vertically down)* ②	$F=17.96-0.1 \cdot L$ (For the actual output, refer to the thrust-displacement curve)
Total stroke	50 mm
Maximum speed	1.6 m/s
Force control accuracy* ③	50 g ~ 200 g: ±10 g 200 g ~ 1200 g: ±5%
Force constant	14.6 N/Arms
Maximum torque	0.14 N.m
Rated torque	0.035 N.m
Maximum speed	2000 rpm
Linear encoder resolution	1 μm (Optical encoder) 0.5 μm (Magnetic encoder)
Linear positioning repeatability	±5 μm (Optical encoder) ±2 μm (Magnetic encoder)
Rotary encoder resolution	0.005° (Optical encoder) 0.00275° (Magnetic encoder)
Rotary positioning repeatability	±0.1° (Optical encoder) ±0.02° (Magnetic encoder)

Mechanical Specifications

Overall mass	2370 g
Movable part mass	530 g
Radial deviation of shaft	0.015 mm
Size	250mm x 138 mm x 35 mm
Recommended air pressure range* ④	-0.1 Mpa ~ +0.2 Mpa
Recommended Input Vacuum	≥ -90 Kpa* ⑤
Pressure Drop	0-5 Kpa
Flow Rate	≥ 10 L/min

Operating Environment

Operating voltage	24 V DC ±10%
Continuous current	(Linear) 1.3 Arms (Rotary) 1.3 Arms
Peak current	(Linear) 4.2 Arms (Rotary) 3.5 Arms
Recommended load	< 300 g
Recommended load inertia	50 g.cm ²
Maintenance interval	Refer to Maintenance Instructions for DH-Robotics Linear coil actuator
IP rating	IP 40
Recommended operating environment	0~40°C, 85% RH or less
International standard compliance	CE, FCC, RoHS