TGV SERIES

- Linear voice coil modules with through holes
- Low friction
- High precision
- Well-suited for optical and vision applications

EN-26.3.1

TGV Series

Introduction

TGV series voice coil module consists of cylindrical voice coil motor, cross roller bearing system， encoder position feedback system, and customized parts which are assembled as a compact structure, to give a high-performance direct drive motion platform. A sizable central hole provides a clear aperture through the module.

There are four standard products: TGV50, TGV75, TGV90 and TGV130. These can be customized according to the actual technical requirements. The built-in voice coil motor and encoder of the standard modules are optional.

TGV modules have the following characteristics, no cogging force, low friction because of the use of cross roller bearings, precise and highly responsive.

Continuous Force F_{cn} = 25.2N~150.8N
Peak Force F_{pk} = 105.0N~590.1N

Features

- Direct drive, built-in cylindrical voice coil motor
- Large through hole
- Stroke from 10mm to 30mm
- Repeatability up to ±0.5μm
- Optional resolution of 0.2μm, 0.05μm, SINCOS
- Excellent straightness and flatness, high rigidity, high dynamic performance

Applications

Applications in various industries such as automation equipment which requires point-to-point high speed positioning, z-axis optical focusing, leveling mechanism, high speed pick and place, flying probe test, material fatigue tester and others.

Voice Coil Module Series	Voice Coil Motor Series		Continuous Force (F_{cn}) ■ Peak Force (F_{pk}) Unit: N 30 / 50 / 100 / 300 / 500 / 700	Stroke (mm)	Repeatability (μm)	Page
 TGV50	 AVM50	AVM50-HF-10-C15	25.2 — 105.0	10	up to ±0.5	105
 TGV75	 AVM75	AVM75-HF-25	127.9 — 590.1	25		105
 TGV90	 AVM90	AVM90-30-C77	57.3 — 202.6	30		106
 TGV130	 AVM130	AVM130-HF-10	150.8 — 452.3	10		106

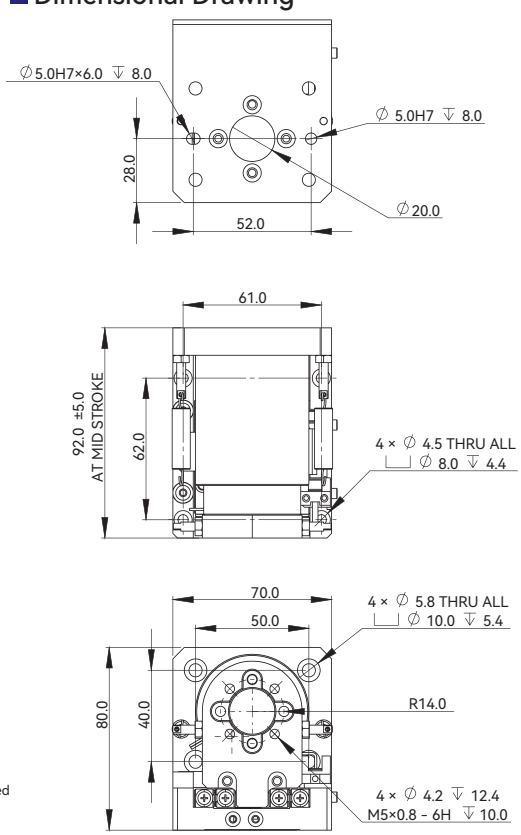
Note:
★ Products can be customized to meet specific working environments or for high frequency reciprocating motion, please contact cust-service@akribis-sys.com.

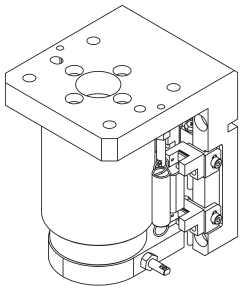
TGV50

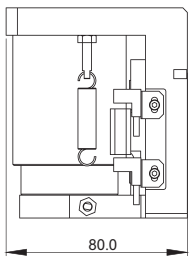
Motor Specifications	Unit	Value
Motor	-	AVM50-HF-10-C15
Continuous Force (NC) @100℃ ❶❷	N	25.2
Peak Force ❷	N	105.0
Force Constant ±10% ❷	N/A	21.0
Back EMF Constant ±10% ❷	V/(m/s)	21.0
Resistance @25℃ ±10% ❸	Ω	8.75
Inductance ±20% ❹	mH	4.93
Continuous Current (NC) @100℃ ❶	A	1.2
Peak Current	A	5.0
Max. Voltage	Vdc	60
Mechanical Specifications	**Unit**	**Value**
Precision Grade	-	P / N
Stroke ❺	mm	10
Resolution	μm	SINCOS/0.05 / 0.2
Repeatability	μm	±0.5 / ±1
Horizontal Straightness	μm	±2.5
Vertical Straightness	μm	±2.5
Rated Payload ❻	kg	3.0
No-load Moving Mass	kg	0.26
No-load Total Mass	kg	1.21
Max. Static Moment	Nm	6.8

❶ Measurement is taken at ambient temperature 25ºC. Value depends on the thermal environment.
❷ The values are at mid stroke.
❸ Resistance is measured by DC current with standard 0.5m lead wire.
❹ Inductance is measured by current frequency of 1 kHz.
❺ Stroke refers to hardstop-to-hardstop mechanical stroke. The limit sensors are positioned 0.5mm from the hardstops.
❻ The rated load is based on the load in which the acceleration of the mass is at least 1G.
The contents of datasheet are subject to change without prior notice.

Dimensional Drawing







TGV75

Motor Specifications	Unit	Value
Motor	-	AVM75-HF-25
Continuous Force (NC) @100℃ ❶❷	N	127.9
Peak Force ❷	N	590.1
Force Constant ±10% ❷	N/A	34.6
Back EMF Constant ±10% ❷	V/(m/s)	34.6
Resistance @25℃ ±10% ❸	Ω	2.83
Inductance ±20% ❹	mH	2.76
Continuous Current (NC) @100℃ ❶	A	3.7
Peak Current	A	17.0
Max. Voltage	Vdc	60
Mechanical Specifications	**Unit**	**Value**
Precision Grade	-	P / N
Stroke ❺	mm	25
Resolution	μm	SINCOS/0.05 / 0.2
Repeatability	μm	±0.5 / ±1
Horizontal Straightness	μm	±2.5
Vertical Straightness	μm	±2.5
Rated Payload ❻	kg	8.0
No-load Moving Mass	kg	1.11
No-load Total Mass	kg	3.85
Max. Static Moment	Nm	14.4

❶ Measurement is taken at ambient temperature 25ºC. Value depends on the thermal environment.
❷ The values are at mid stroke.
❸ Resistance is measured by DC current with standard 0.5m lead wire.
❹ Inductance is measured by current frequency of 1 kHz.
❺ Stroke refers to hardstop-to-hardstop mechanical stroke. The limit sensors are positioned 0.5mm from the hardstops.
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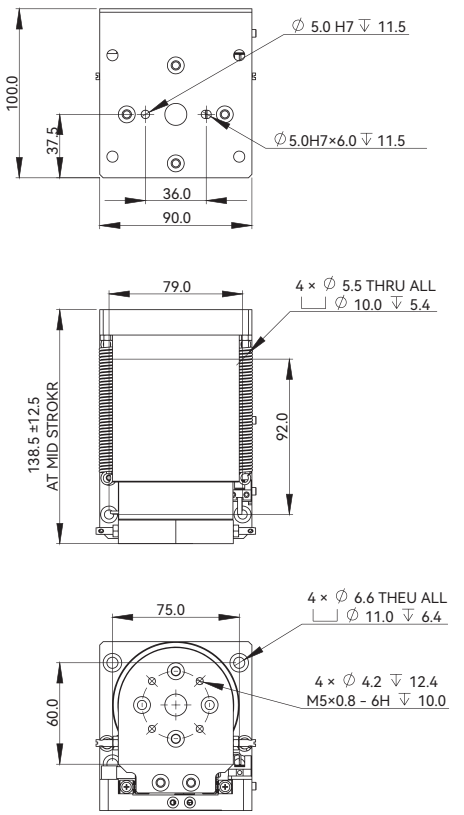
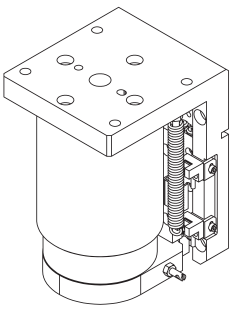
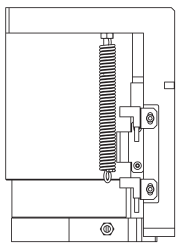
Dimensional Drawing







TGV90

Motor Specifications	Unit	Value	
Motor	-	AVM90-30-C77	
Continuous Force (NC) @100℃ ❶❷	N	57.3	
Peak Force ❷	N	202.6	
Force Constant ±10% ❷	N/A	14.33	
Back EMF Constant ±10% ❷	V/(m/s)	14.33	
Resistance @25℃ ±10% ❸	Ω	2.64	
Inductance ±20% ❹	mH	4.09	
Continuous Current (NC) @100℃ ❶	A	4.0	
Peak Current	A	14.0	
Max. Voltage	Vdc	120	
Mechanical Specifications	**Unit**	**Value**	
Precision Grade	-	P	N
Stroke ❺	mm	30	
Resolution	μm	SINCOS/0.05	0.2
Repeatability	μm	±0.5	±1
Horizontal Straightness	μm	±2.5	
Vertical Straightness	μm	±2.5	
Rated Payload ❻	kg	6.0	
No-load Moving Mass	kg	1.41	
No-load Total Mass	kg	3.76	
Max. Static Moment	Nm	21.1	

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❷ The values are at mid stroke.
❸ Resistance is measured by DC current with standard 0.5m lead wire.
❹ Inductance is measured by current frequency of 1 kHz.
❺ Stroke refers to hardstop-to-hardstop mechanical stroke. The limit sensors are positioned 0.5mm from the hardstops.
❻ The rated load is based on the load in which the acceleration of the mass is at least 1G.
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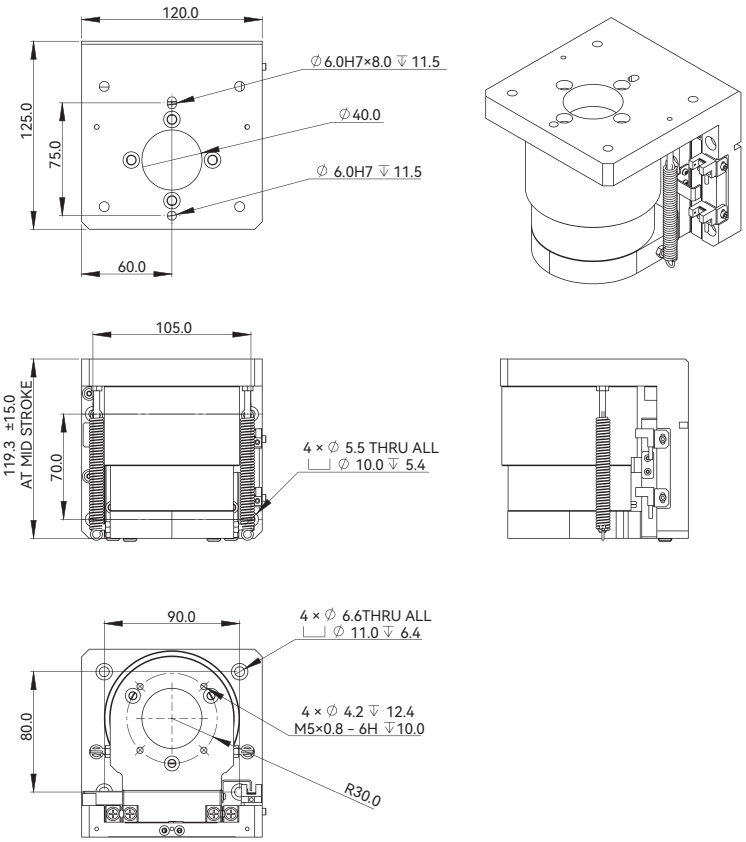
Dimensional Drawing



TGV130

Motor Specifications	Unit	Value	
Motor	-	AVM130-HF-10	
Continuous Force (NC) @100℃ ❶❷	N	150.8	
Peak Force ❷	N	452.3	
Force Constant ±10% ❷	N/A	22.8	
Back EMF Constant ±10% ❷	V/(m/s)	22.8	
Resistance @25℃ ±10% ❸	Ω	0.75	
Inductance ±20% ❹	mH	0.75	
Continuous Current (NC) @100℃ ❶	A	6.6	
Peak Current	A	19.8	
Max. Voltage	Vdc	120	
Mechanical Specifications	**Unit**	**Value**	
Precision Grade	-	P	N
Stroke ❺	mm	10	
Resolution	μm	SINCOS/0.05	0.2
Repeatability	μm	±0.5	±1
Horizontal Straightness	μm	±2.5	
Vertical Straightness	μm	±2.5	
Rated Payload ❻	kg	15.0	
No-load Moving Mass	kg	2.35	
No-load Total Mass	kg	10.1	
Max. Static Moment	Nm	70.9	

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❷ The values are at mid stroke.
❸ Resistance is measured by DC current with standard 0.5m lead wire.
❹ Inductance is measured by current frequency of 1 kHz.
❺ Stroke refers to hardstop-to-hardstop mechanical stroke. The limit sensors are positioned 0.5mm from the hardstops.
❻ The rated load is based on the load in which the acceleration of the mass is at least 1G.
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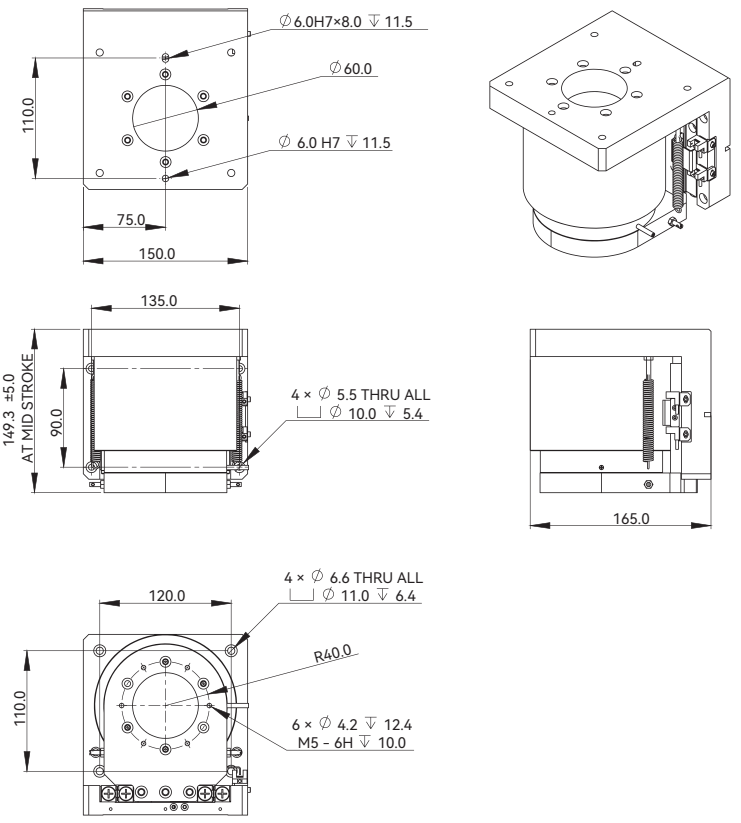

Ordering Part Number (OPN)

TGV50-T10-A0G4-A1-L1

- Model: TGV50 / TGV75 / TGV90 / TGV130
- Precision Grade: Unmarked: Normal
- Cover Type: T: Standard (Black Anodized)
- Stroke (Corresponding Models): 10: 10mm (TGV50/TGV130); 25: 25mm (TGV75); 30: 30mm (TGV90)
- Encoder Type: A0G: ABI-21, TTL (0.2μm)
- Scale Type: 4: Nickel, 14ppm/K
- Cable Length: A: 0.5m
- Termination: 1: Motor: Flying Leads/Encoder: DSUB 15
- Counter Balance[1]: L1 / L2 / L3 / L4

TGV50P-T10-R0A2-A1-L1

- Model: TGV50 / TGV75 / TGV90 / TGV130
- Precision Grade: P: Precision
- Cover Type: T: Standard (Black Anodized)
- Stroke (Corresponding Models): 10: 10mm (TGV50/TGV130); 25: 25mm (TGV75); 30: 30mm (TGV90)
- Encoder Type: R0A: ATOM2, SINCOS (1Vpp); R0J: ATOM2, TTL (0.05μm)
- Scale Type: 2: Glass G8 Soda Lime, 8ppm/K
- Cable Length: A: 0.5m
- Termination: 1: Motor: Flying Leads/Encoder: DSUB 15
- Counter Balance[1]: L1 / L2 / L3 / L4

Payload[1]					
Model	Unit	L1	L2	L3	L4
TGV50-10	g	500	1000	2000	3000
TGV75-25	g	2000	4000	6000	8000
TGV90-30	g	2000	3000	4000	6000
TGV130-10	g	5000	8000	10000	15000

Note:

[1] Counter-balance position is at mid- stroke.

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