



TGV SERIES

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

EN-26.3.1

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 $F_{cn} = 25.2\text{N} \sim 150.8\text{N}$

Peak Force $F_{pk} = 105.0\text{N} \sim 590.1\text{N}$

Features

- ▶ Direct drive, built-in cylindrical voice coil motor
- ▶ Large through hole
- ▶ Stroke from 10mm to 30mm
- ▶ Repeatability up to $\pm 0.5\mu\text{m}$
- ▶ Optional resolution of $0.2\mu\text{m}$, $0.05\mu\text{m}$, 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})						Stroke (mm)	Repeatability (μm)	Page
		30	50	100	300	500	700			
 TGV50	 AVM50	25.2 105.0						10	up to ± 0.5	105
 TGV75	 AVM75	127.9 590.1						25		105
 TGV90	 AVM90	57.3 202.6						30		106
 TGV130	 AVM130	150.8 452.3						10		106

Note:

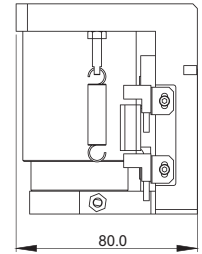
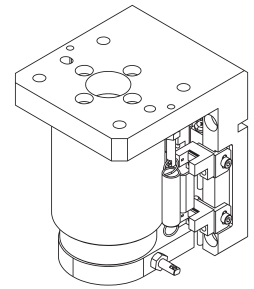
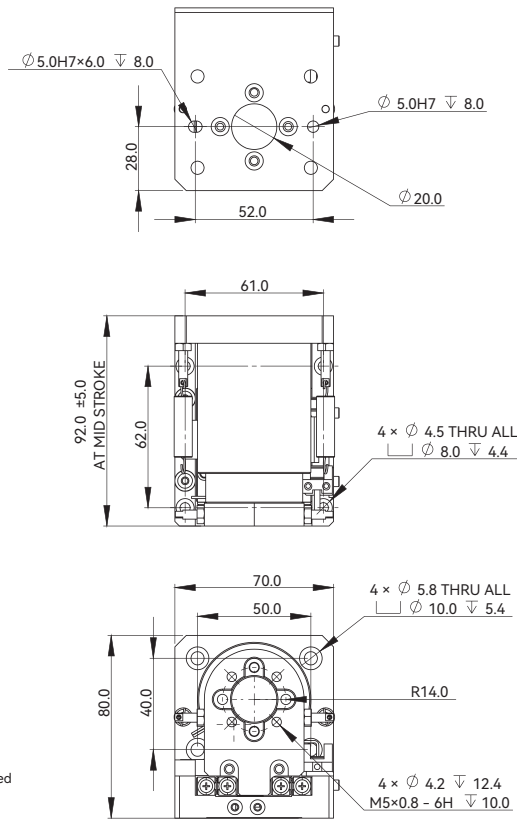
★ Products can be customized to meet specific working environments or for high frequency reciprocating motion, please contact cust-service@akribis-sys.com.

TGV50

Motor Specifications	Unit	Value
Motor	-	AVM50-HF-10-C15
Continuous Force (NC) @100°C ^{1 2}	N	25.2
Peak Force ²	N	105.0
Force Constant ±10% ²	N/A	21.0
Back EMF Constant ±10% ²	V/(m/s)	21.0
Resistance @25°C ±10% ³	Ω	8.75
Inductance ±20% ³	mH	4.93
Continuous Current (NC) @100°C ¹	A	1.2
Peak Current	A	5.0
Max. Voltage	Vdc	60
Mechanical Specifications	Unit	Value
Precision Grade	-	P N
Stroke ⁵	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 ⁶	kg	3.0
No-load Moving Mass	kg	0.26
No-load Total Mass	kg	1.21
Max. Static Moment	Nm	6.8

- ¹ Measurement is taken at ambient temperature 25°C. Value depends on the thermal environment.
- ² The values are at mid stroke.
- ³ Resistance is measured by DC current with standard 0.5m lead wire.
- ⁴ Inductance is measured by current frequency of 1 kHz.
- ⁵ Stroke refers to hardstop-to-hardstop mechanical stroke. The limit sensors are positioned 0.5mm from the hardstops.
- ⁶ 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

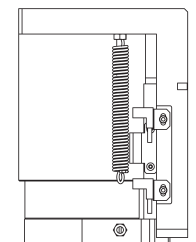
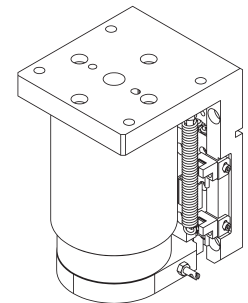
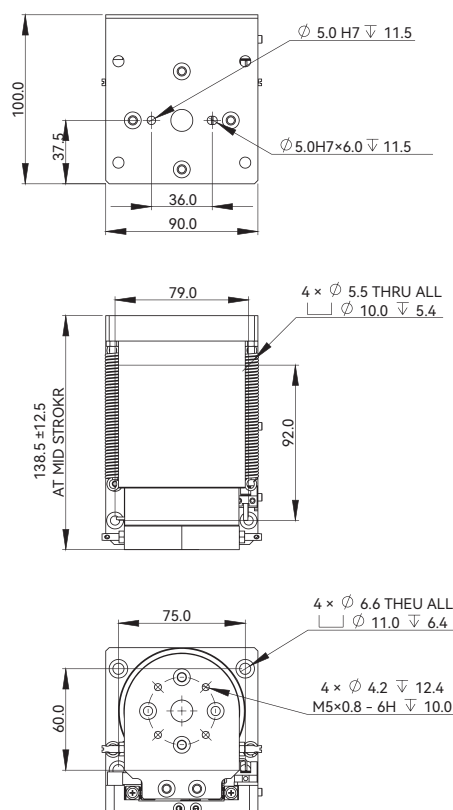


TGV75

Motor Specifications	Unit	Value
Motor	-	AVM75-HF-25
Continuous Force (NC) @100°C ^{1 2}	N	127.9
Peak Force ²	N	590.1
Force Constant ±10% ²	N/A	34.6
Back EMF Constant ±10% ²	V/(m/s)	34.6
Resistance @25°C ±10% ³	Ω	2.83
Inductance ±20% ³	mH	2.76
Continuous Current (NC) @100°C ¹	A	3.7
Peak Current	A	17.0
Max. Voltage	Vdc	60
Mechanical Specifications	Unit	Value
Precision Grade	-	P N
Stroke ⁵	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 ⁶	kg	8.0
No-load Moving Mass	kg	1.11
No-load Total Mass	kg	3.85
Max. Static Moment	Nm	14.4

- ¹ Measurement is taken at ambient temperature 25°C. Value depends on the thermal environment.
- ² The values are at mid stroke.
- ³ Resistance is measured by DC current with standard 0.5m lead wire.
- ⁴ Inductance is measured by current frequency of 1 kHz.
- ⁵ Stroke refers to hardstop-to-hardstop mechanical stroke. The limit sensors are positioned 0.5mm from the hardstops.
- ⁶ 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

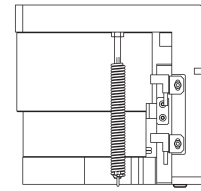
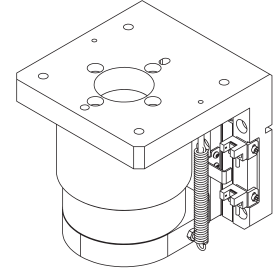
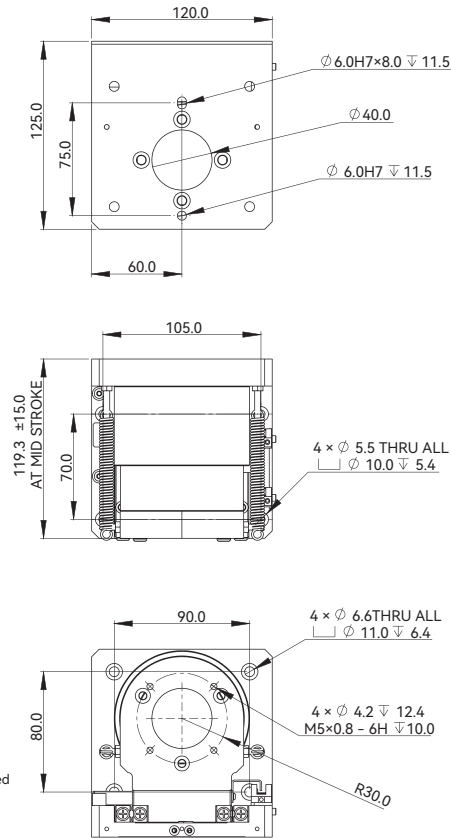


TGV90

Motor Specifications	Unit	Value	
Motor	-	AVM90-30-C77	
Continuous Force (NC) @100°C ^{1 2}	N	57.3	
Peak Force ²	N	202.6	
Force Constant $\pm 10\%$ ²	N/A	14.33	
Back EMF Constant $\pm 10\%$ ²	V/(m/s)	14.33	
Resistance @25°C $\pm 10\%$ ³	Ω	2.64	
Inductance $\pm 20\%$ ⁴	mH	4.09	
Continuous Current (NC) @100°C ¹	A	4.0	
Peak Current	A	14.0	
Max. Voltage	Vdc	120	
Mechanical Specifications	Unit	Value	
Precision Grade	-	P	N
Stroke ⁵	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 ⁶	kg	6.0	
No-load Moving Mass	kg	1.41	
No-load Total Mass	kg	3.76	
Max. Static Moment	Nm	21.1	

- ¹ Measurement is taken at ambient temperature 25°C. Value depends on the thermal environment.
² The values are at mid stroke.
³ Resistance is measured by DC current with standard 0.5m lead wire.
⁴ Inductance is measured by current frequency of 1 kHz.
⁵ Stroke refers to hardstop-to-hardstop mechanical stroke. The limit sensors are positioned 0.5mm from the hardstops.
⁶ 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

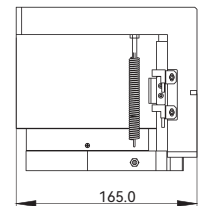
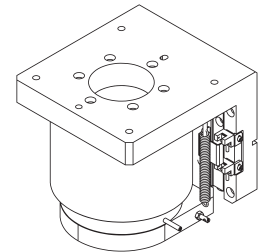
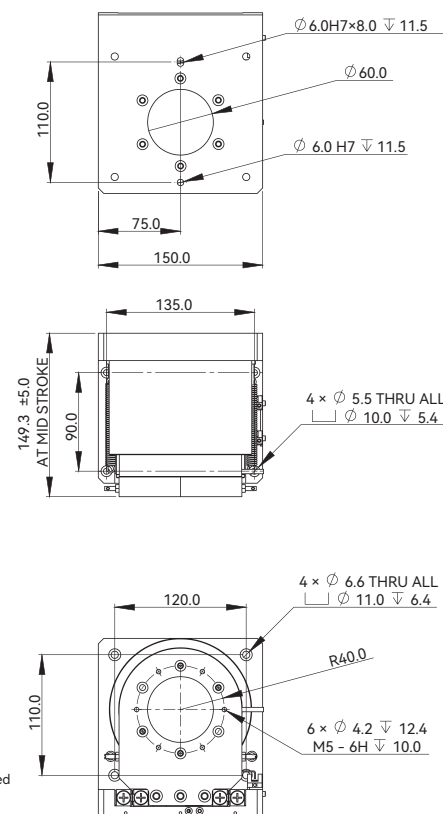


TGV130

Motor Specifications	Unit	Value	
Motor	-	AVM130-HF-10	
Continuous Force (NC) @100°C ^{1 2}	N	150.8	
Peak Force ²	N	452.3	
Force Constant $\pm 10\%$ ²	N/A	22.8	
Back EMF Constant $\pm 10\%$ ²	V/(m/s)	22.8	
Resistance @25°C $\pm 10\%$ ³	Ω	0.75	
Inductance $\pm 20\%$ ⁴	mH	0.75	
Continuous Current (NC) @100°C ¹	A	6.6	
Peak Current	A	19.8	
Max. Voltage	Vdc	120	
Mechanical Specifications	Unit	Value	
Precision Grade	-	P	N
Stroke ⁵	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 ⁶	kg	15.0	
No-load Moving Mass	kg	2.35	
No-load Total Mass	kg	10.1	
Max. Static Moment	Nm	70.9	

- ¹ Measurement is taken at ambient temperature 25°C. Value depends on the thermal environment.
² The values are at mid stroke.
³ Resistance is measured by DC current with standard 0.5m lead wire.
⁴ Inductance is measured by current frequency of 1 kHz.
⁵ Stroke refers to hardstop-to-hardstop mechanical stroke. The limit sensors are positioned 0.5mm from the hardstops.
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Dimensional Drawing



Ordering Part Number (OPN)

TGV50-T10-A0G4-A1-L1

Model:

TGV50
TGV75
TGV90
TGV130

Counter Balance: ¹

L1
L2
L3
L4

Precision Grade:

Unmarked: Normal

Termination:

1: Motor: Flying Leads/Encoder: DSUB 15

Cable Length:

A: 0.5m

Cover Type:

T: Standard (Black Anodized)

Scale Type:

4: Nickel, 14ppm/K

Stroke (Corresponding Models):

10: 10mm (TGV50/TGV130)
25: 25mm (TGV75)
30: 30mm (TGV90)

Encoder Type:

A0G: ABI-21, TTL (0.2μm)

TGV50P-T10-R0A2-A1-L1

Model:

TGV50
TGV75
TGV90
TGV130

Counter Balance: ¹

L1
L2
L3
L4

Precision Grade:

P: Precision

Termination:

1: Motor: Flying Leads/Encoder: DSUB 15

Cable Length:

A: 0.5m

Cover Type:

T: Standard (Black Anodized)

Scale Type:

2: Glass G8 Soda Lime, 8ppm/K

Stroke (Corresponding Models):

10: 10mm (TGV50/TGV130)
25: 25mm (TGV75)
30: 30mm (TGV90)

Encoder Type:

R0A: ATOM2, SINCOS (1Vpp)
R0J: ATOM2, TTL (0.05μm)

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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