

PRODUCT CATALOG



www.tricore.com.tw

TRICORE CORPORATION

No.8 Jingke 2nd Road, Nantun District,
Taichung City 40852, TAIWAN

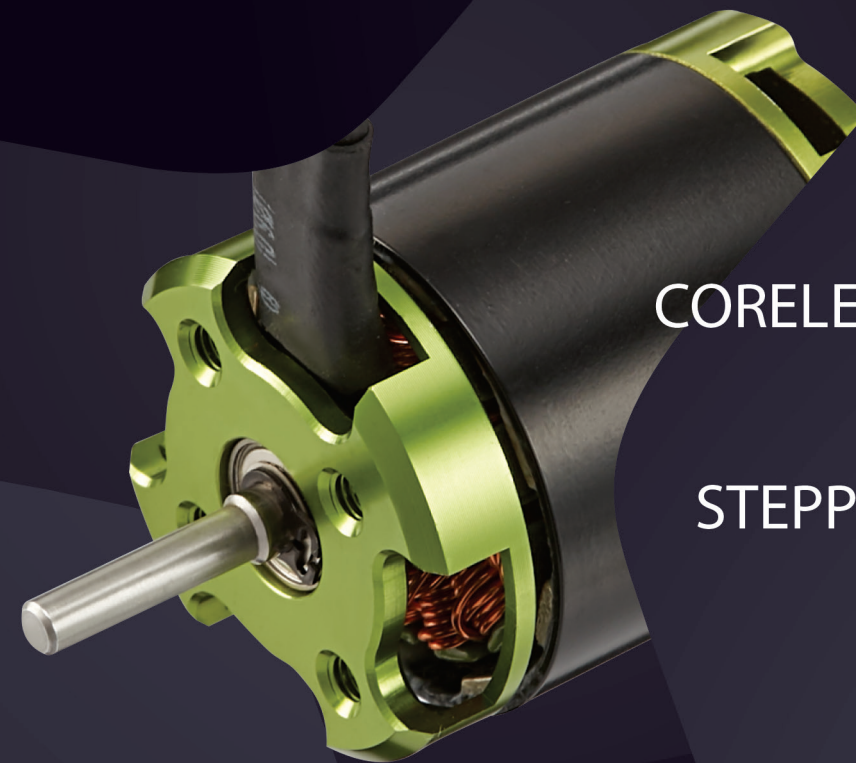
TEL +886-4-23505088

FAX +886-4-23505087

EMAIL contact@tricore.com.tw

TRICORE (CHINA) CORPORATION

No.1 Ku Hsin Road, Cheng Hsi Industrial Zone,
Chang Cha Town, Foshan City, Guang Dong Province, CHINA



CORELESS MOTOR



STEPPER MOTOR



PUMP



OPTICAL



AUTOMOTIVE



About TRICORE

TRICORE provides excellent products with high quality. We provide custom-made services to meet customers' demands. In the past three decades, over 5,000 TRICORE models have been exported to over 1,000 customers from 55 countries around the world, to supply industries such as the medical, automobile, RC, IT, digital camera, and security industry.



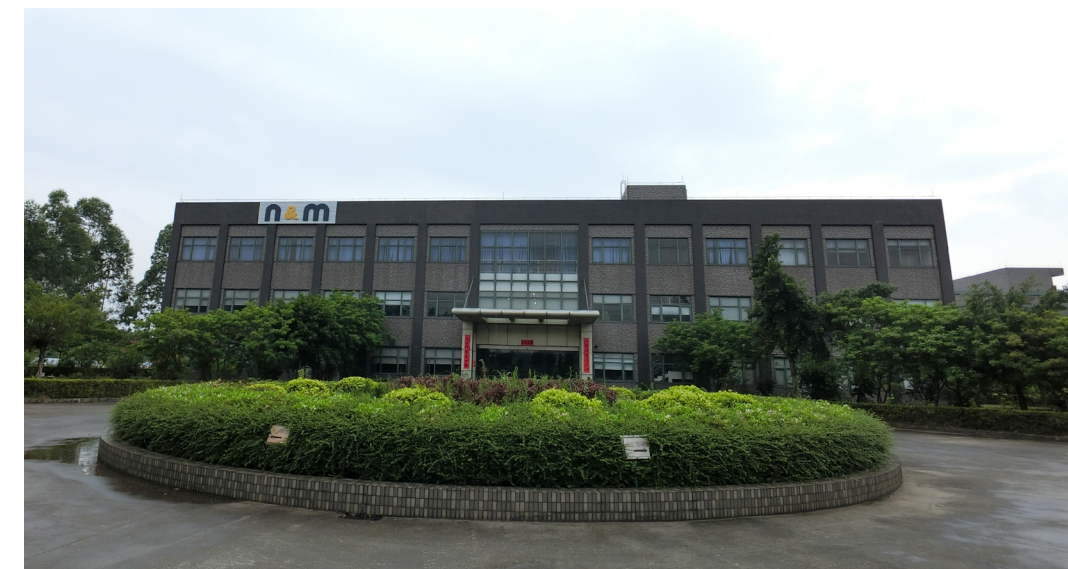
Established : Aug, 1985

Employee : 2,250 persons

Headquarter : Taichung City, Taiwan

China Plant A : Guangdong, 24,000 m²

China Plant B : Guangdong, 67,000 m²



Customized Services

TRICORE is one of the leading companies in micro motors and modules. With 35 years of experience of making a wide range of products. We provide customized products with a high level of vertical integration from designing to manufacturing. The fast service for every step of the way is our promise to customers. To ensure quality control, up to 85% of the parts are made in-house. This strategy also benefits and adds value by shortening the lead time to our customers.

TRICORE products have a high reputation in markets such as the automotive, digital camera, health-care, and security system. We've been providing more than 5,000 of our products to over 1,000 customers around the world, including many international and well-known companies.

Consisting of well-trained mechanical and software engineers, TRICORE's PE team is able to develop customized testers to meet the different requirements from customers, and to build in-house production lines. Currently TRICORE is able to deliver over 160 million units of products annually, and our production capacity is continuously growing.

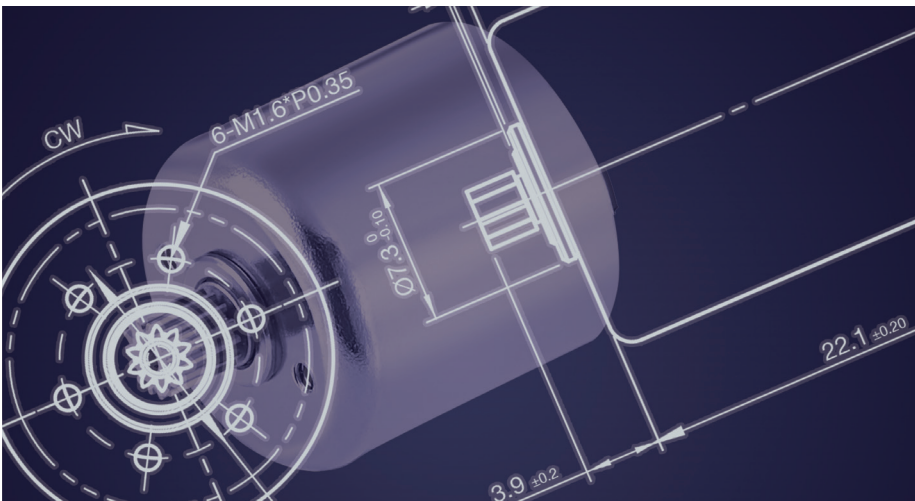


Content

Technology	005	Coreless Motor	051
Catalog Key	012	Carbon Brush	
		Metal Brush	
Brush Motor	015	Brushless Motor	061
Carbon Brush		Inner Type	
Metal Brush		Outter Type	
Stepping Motor	025	Pump & Valve	071
Axis		Water Type	
Bracket		Air Type	
Gear		Optical Module	081
Leadscrew		IRIS	
Metal Gearbox		IR-CUT	
Plastic Gearbox		Shutter	
Gear Motor	037	Automotive Module	093
Metal Gearbox		TRICORE Innovation	101
Plastic Gearbox		Quality Assurance	109

Technical Ability

The micro motors TRICORE develops, strive to achieve high performance levels, quiet technology, miniaturization, and a life-span of products. TRICORE's motors have been characterized as high-precision measurement and analysis equipment. This has allowed TRICORE to play a leading role in many motor industries and become conducive to future analyses and improvement on motor-related products.

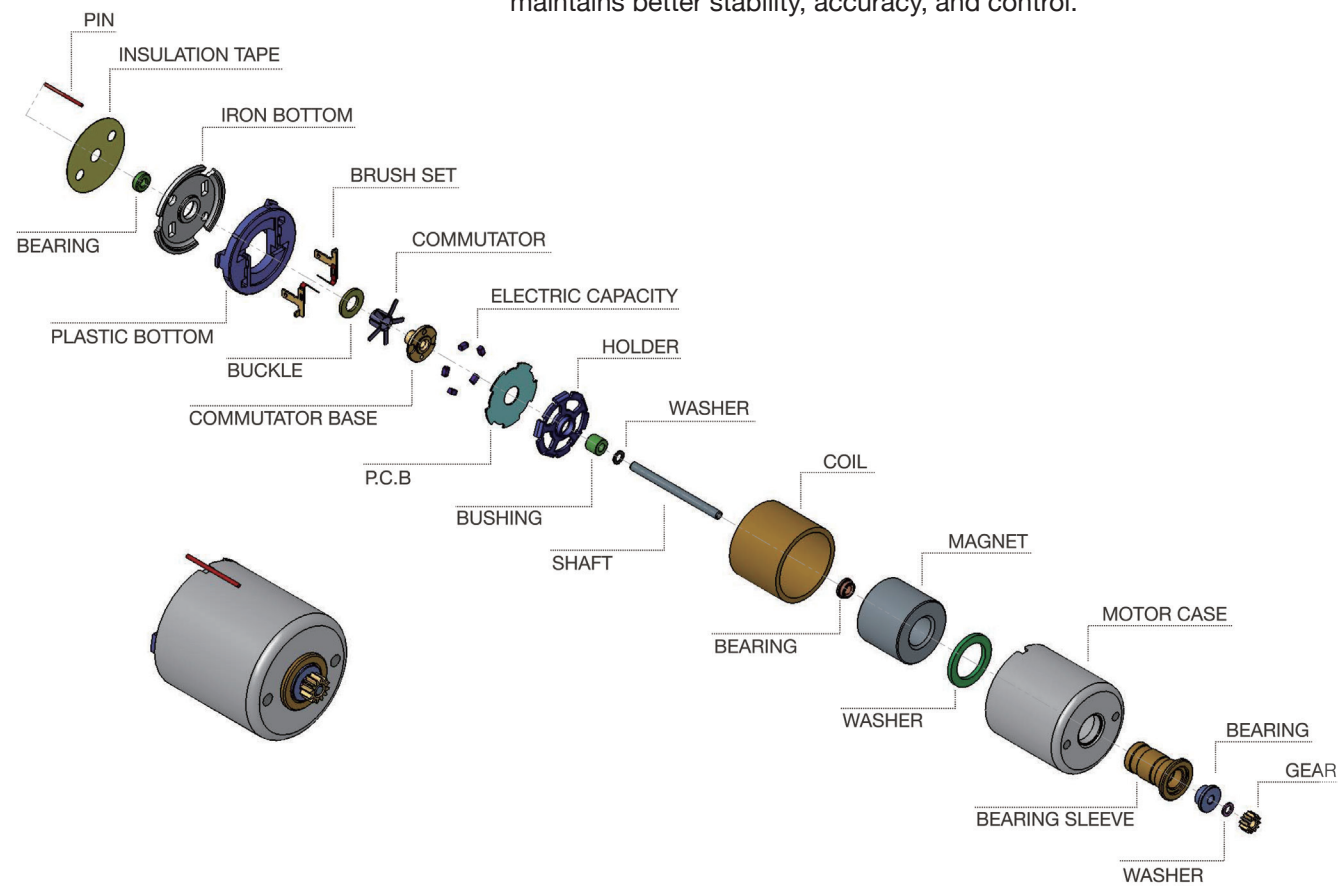


From product conceptualizing, designing, group distributing, testing, and producing, TRICORE has accumulated a wealth of technical experience. With a professional R&D group, we are able to popularize our products into markets within a short period of time. We try our best in administrating and monitoring everything such as our product structures, production processes, and materials to pursue perfection to meet the customer's demands.

TRICORE has been and is dedicated in developing technical production services on shutter modules. Up till now, the structure of shutters has built a solid foundation for performance improvement. In 2008, in accordance to the trend in extended development of molds, TRICORE concentrated on the development of shutter design and committed to uphold the rapid response with low power consumption, and miniscule sizes. We regard low noise while maintaining high quality as a starting point for innovation in our products which have been approved through a number of new forms of applications for patents in Japan, USA and other countries.

Motor Assembly Drawing

To make sure we are producing the best motors we can, 80% of the components in our motors are made by TRICORE itself, which also ensures customers that they are getting the best they can get from us. This also allows flexibility in customizations if needed and allows the customer make specific requests. Within the over 5,000 products we have, 60% of them are customizable. Having automatic machines also brings up the product quality as it maintains better stability, accuracy, and control.



Motor

A motor is a mechanism that converts one form of energy into mechanical energy. This process is shown below in Figure 1. The main parameters of a motor are voltage (V), current (I), rotational speed (N) and torque (T). The motor quality can be expressed as percentage efficiency (η).

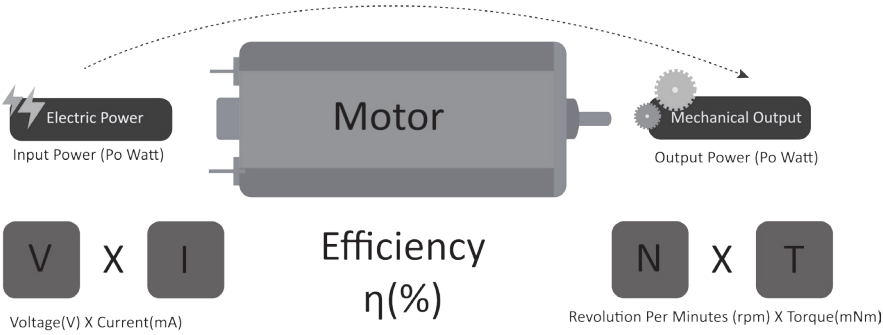
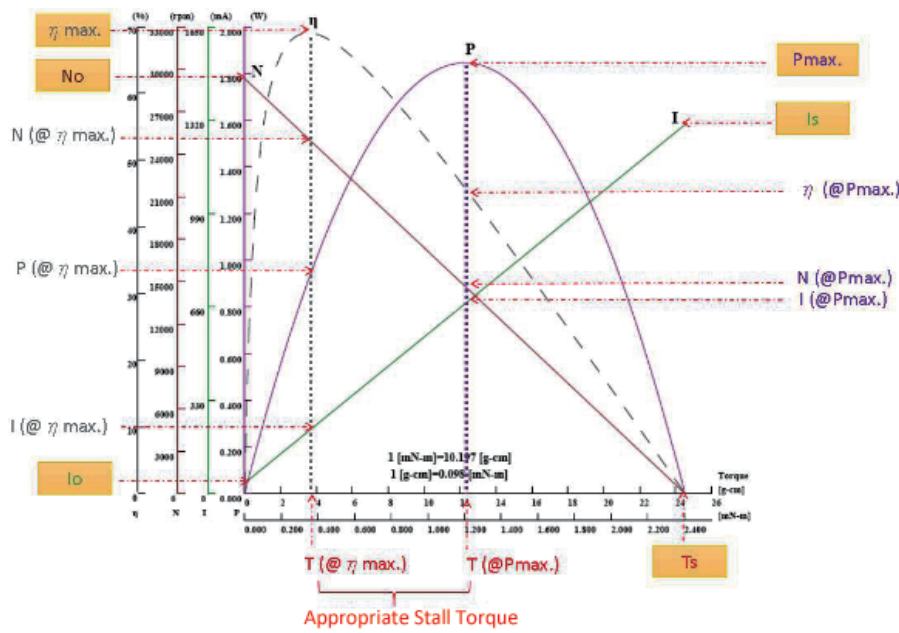


Figure 1. A motor converting electric power into mechanical power.

Motor Characteristic Curve Explanation



General Data

	Unit	Symbol	Definition	Testing Method
Terminal Resistance	Ω (Ohm)	R	The electric resistance at room temperature across a brush, a commutator or a coiled wire connection.	Ohmmeter
Nominal Voltage	V	V	The DC voltage supplied to the motor while testing for all the other characteristics.	Voltmeter
No Load Speed	RPM	N_o	The speed of an unloaded motor at the nominal voltage.	Tachometer Oscilloscope
No Load Current	mA	I_o	The typical current of an unloaded motor at the nominal voltage.	Ammeter
Stall Torque	mNm	T_s	The torque produced by a stalled motor at the nominal voltage.	Torque meter Calculation formula
Stall Current	A	I_s	The current of a stalled motor at the nominal voltage.	Ammeter Calculation formula
Rated Torque	mNm	T_a	The motor's continuous torque that it can output at rated speed	Utilising: A specific value Costumer determined loaded value.
Rated Speed	RPM	N_a	The speed of a loaded motor at the rated voltage.	Tachometer
Rated Current	mA	I_a	The current of a loaded motor at the rated voltage.	Ammeter
Input Power	Watt	P_i	The electric power input to the motor.	Calculation formula
Output Power	Watt	P_o	The electric power output by the motor.	Calculation formula
Max. Output Power	Watt	P_{max}	The maximum power output by the motor at the nominal voltage.	Calculation formula
Max. Efficiency	%	η_{max}	The ratio of the maximum input power to . Specific value of max.input power and max mechanism power	Calculation formula
Back emf Constant	mV/RPM	KE	The ratio of the motor's generated voltage to the speed of the motor's rotation.	Calculation formula
Constant Torque	mNm/A	KT	The ratio of torque delivered by the motor to the current supplied by it.	Calculation formula

Calculation Method Explanation

1.

Terminal Resistance (R)

Unit : Ω

Formula : $R= V/I_s$
2.

Input Power (P_i)

Unit: Watt

Formula : $P_i = V \times I$ (I unit : A)
3.

Output Power (P_o)

Unit: Watt

Formula : $P_o = (1/9550) \times T \times N$ (T unit: mNm)

$= (1/97500) \times T \times N$ (T unit: g-cm)
4.

Max. Output Power (P_{max})

Unit : Watt

Formula : $P_{max} = (R / 4) / (V / R - I_o / 1000)^2$
5.

Efficiency (η)

Unit : %

Formula : $\eta =(P_o / P_i) \times 100\%$
6.

Max. Output

Unit : %

Formula : $\eta_{max}= (1-(I_o \times R / V))^2$
7.

No-load Speed (N_o)

Unit: RPM

Formula : $N_o = (V-I_o \times R) / K_E$
8.

Stall Torque (T_s)

Unit : mNm

Formula : $T_s = (I_s -I_o) \times K_T$
9.

Back emf Constant (K_E)

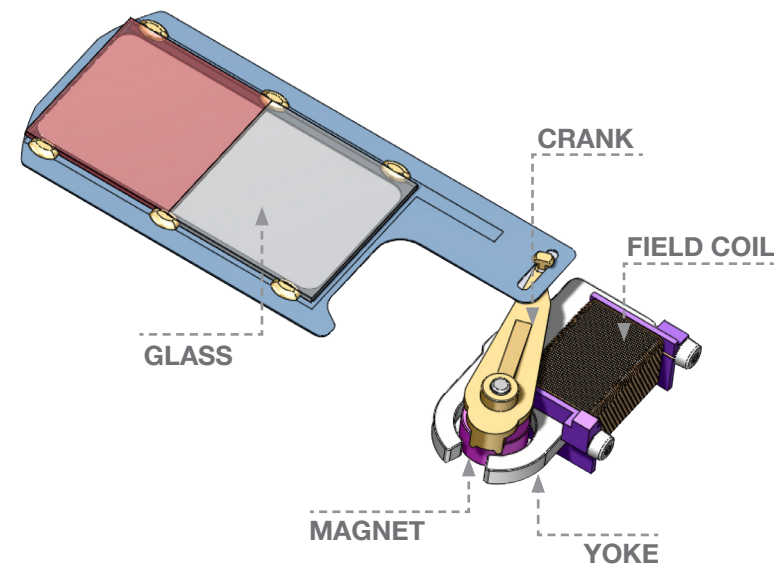
Unit : mV /RPM

Formula : $K_E = (2 \times \pi / 60) \times K_T$

Technology

ICR Driving (Design) Principle

IR-CUT Component Assembling

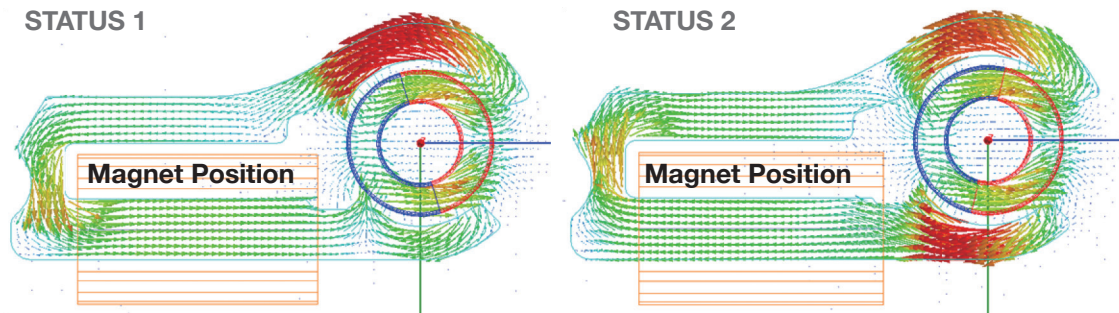


IR-CUT Driving Principle

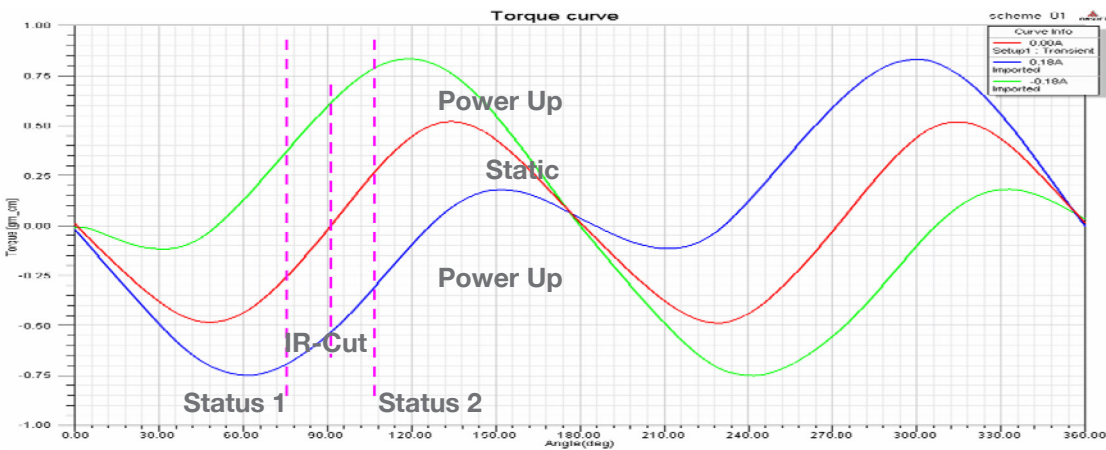
When the coil is powered on, the magnetic field across the coil will cause the magnet to interact with the other magnetic component (yoke). This will cause the rotor magnet stay in place or keep the torque in static. When the coil is powered on, the magnetic field across the coil will cause the magnet to interact with the other magnetic component (yoke) and cause the magnet to drive the rotor. This then causes the crank to swing the same amount and the filter on shutter will move over covering the lens.

Magneto-Static Field

Magnet and conductive magnet interaction



Magnetic Circuit Analysis and Simulating Curve

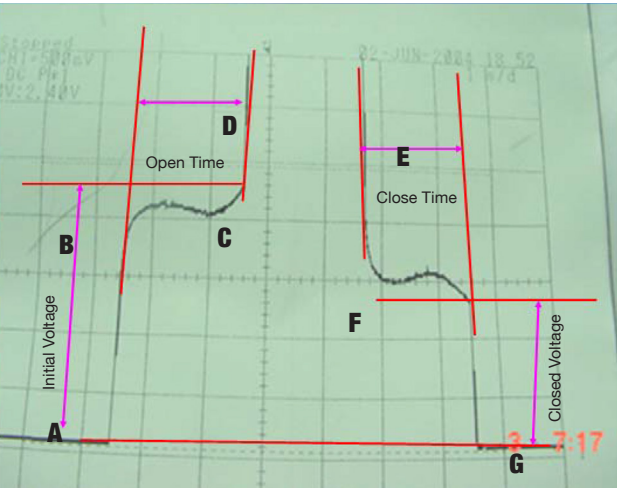


IRIS Driving (Design) Principle

Theory:

An Iris has 2 coils. One is a driving coil, and the other one is a damping coil.

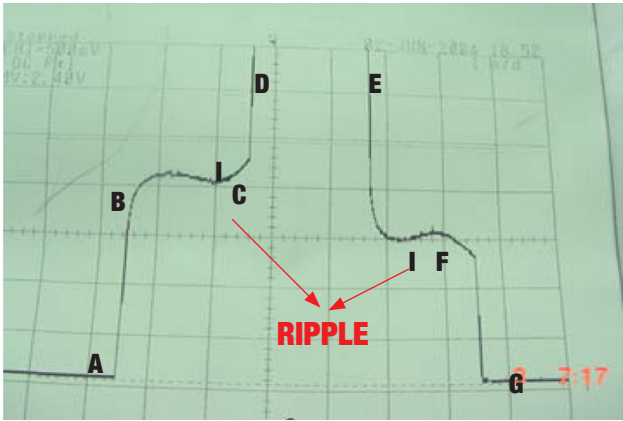
A-B: The driving coil is powered up.
B-C: The driving coil and the damping coil are controlled by PWM to open the blades of the aperture.
C-D: Fully open.
F-G: The driving coil and the damping coil are controlled by PWM to close the blades.



X AXIS: Time
Y AXIS: Voltage

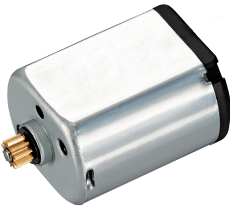
Ripple

Due to the rough surfaces between the blades, the higher surface friction produces the ripple seen on the graph, which can also be observed on an oscilloscope. Furthermore, these ripples can be reduced by lowering the friction between the blades.



X AXIS: Time
Y AXIS: Voltage

Catalog Key



DC MOTOR

- #1 Sale Type | 1= Bonding | 2= Non-Bonding
- #2 Primary Category | 1= Finished product | 2= Semi-Finished Product

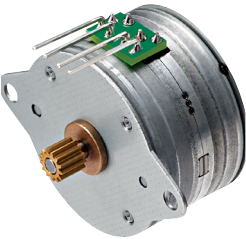
#3	#4	#5	#6-7	#8-9	#10-12
Type	Code	Type	Code	Type	Code
Brush	B	Round	R	Axial	A
Carbon Brush	C	Flat	F	Tray	T
		Coreless	C	Waving	W
		Vibrating	V	Pinion Gear	G
		Pump Motor	P	Metal Gear Box	M
		Coreless with Encoder	E	Plastic Gear Box	P
			Others	O	
			Diameter	##	Length
				##	Serial Number
					###



BRUSHLESS MOTOR

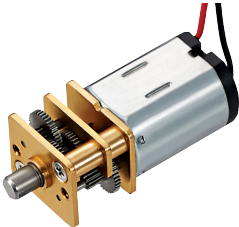
#3	#4	#5	#6-7	#8-9	#10-12
Type	Code	Type	Code	Type	Code
Inner	I	With Hall Sensor and Slot	G	Axial	A
Outter	O	Hall Sensor	H	Tray	T
		Without Hall Sensor and Slot	N	Ring	R
		Slot	M	Metal Gear Box	M
		Pump	P	Plastic Gear Box	P
		Hydroelectric Power	W	Pinion Gear	G
				Turn table	T
				Others	O
			Diameter	##	Length
				##	Serial Number
					###

Catalog Key



STEPPING MOTOR

#3		#4		#5		#6-7		#8-9		#10-12	
Type	Code	Type	Code	Type	Code						
Stepping Motor	S	Round	R	Axial	A						
		Flat	F	Bracket	B						
				Pinion Gear	G						
				Leadscrew	L			Diameter	##	Length	##
				Metal Gear Box	M						
				Plastic Gear Box	P						
				Others	O						



GEAR MOTOR

#3		#4		#5		#6-7		#8-9		#10-12	
Type	Code	Type	Code	Type	Code						
Gear Box	H	Medical Industry	M	Planetary	P	Reduction Ratio	##	-	##	-	###
		Optical Industry	O	Spur	T						
		Others	Q	Others	A						



PUMP MOTOR

#3		#4		#5		#6-7		#8-9		#10-12	
Type	Code	Type	Code	Type	Code						
-	T	Pump	P	Air	M	Diameter	##	Length	##	Serial Number	###
				Solenoid	T						
				Vacuum	V						
				Water	W						
		Valve	V	Open	O	No. of Valve Way	##	00		Serial Number	###
				Close	C						
				Water	W						

Catalog Key



OPTICAL

#3		#4		#5		#6-7		#8-9		#10-12	
Type	Code	Type	Code	Type	Code						
Part	P	Solenoid	S	Normally Open	N	Length	##	00			
				Others	O						
				Nomally Colse	C						
				Rotation	R						
				With Sensor	I						
Assembly	A	Shutter	H	Focal Plane	M	Aperture Diameter	##	00	00	Serial Number	###
				Blade	B		##	00	00		
		Aperture	O	With IR-Cut	F	Diameter	##	00	00		
				Without IR-Cut	N		##	00	00		
		Brake	B	-	G	Max. Size of Appearance	##	00	00		
		IR-Cut	D	-	F	Aperture Diameter	##	00	00		
		Vibration Reduction	V	-	R	Max. Length of Magnet	##	00	00		

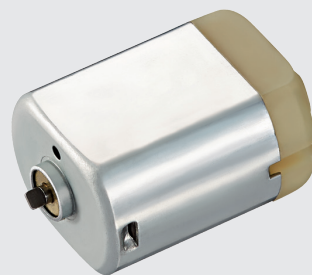


AUTOMOTIVE

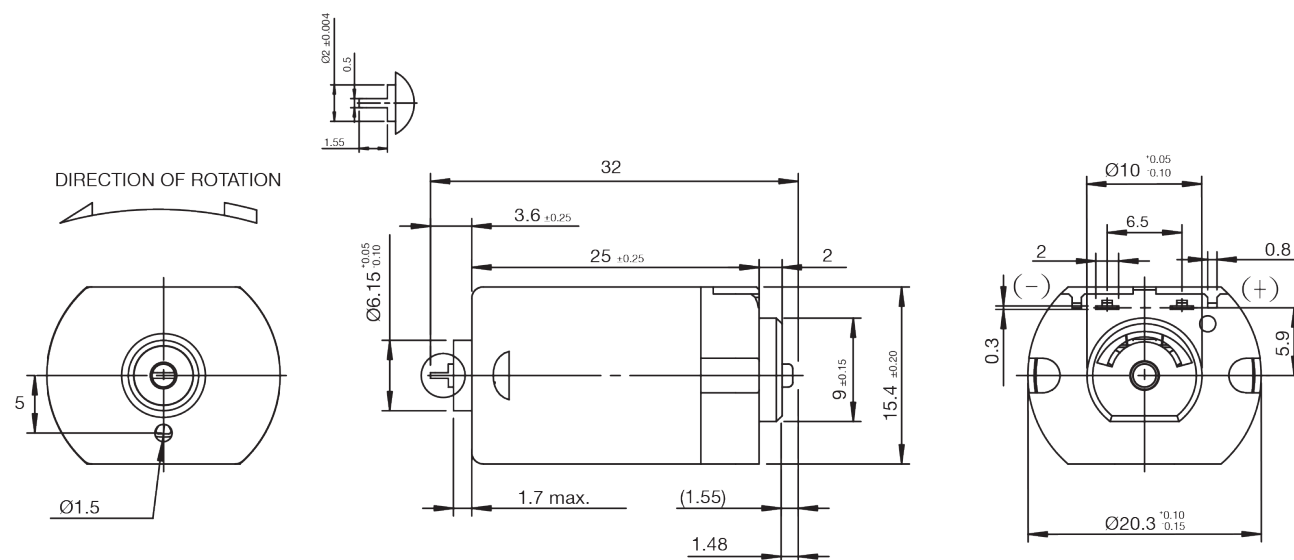
#3		#4		#5		#6-7		#8-9		#10-12	
Type	Code	Type	Code	Type	Code						
Auto	A	Headlight	F	System	S	CW	10	IC	01	Serial Number	###
		Switch	S			CCW	20		02		
						Outter Control	30		03		
									04		

DC BRUSH MOTOR | Ø20

Carbon Brush

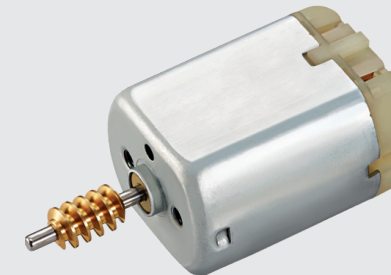


unit		CFA2024003	CFG2025008	CFG2025009			
		Axial	Pinion Gear	Pinion Gear			
Standard Operating Conditions							
Nominal Voltage	V	12.0	22.8	12.0			
Operating Range	V	10.0~16.0	10.0~24.0	10.0~14.0			
Rated Load	mNm	0.98	1.98	2.45			
Direction of Rotation		CW&CCW	CW&CCW	CW&CCW			
Operating Temperature Range	°C	-30~+85	0~+50	-40~+105			
Storage Temperature Range	°C	-40~+105	-20~70	-40~+120			
Electrical Characteristic							
No-Load Current	mA	60	80	70			
No-Load Speed	rpm	7500	14400	9500			
Rated-Load Current	mA	140	230	350			
Rated-Load Speed	rpm	6400	12300	6300			
Stall Torque	mNm	5.4	9.3	5.4			
Max. Starting Voltage	V	-	-	-			
Max. Starting Current	mA	700	1500	900			
Rotor Resistance	Ω						
Output Power	W	0.656	2.54	1.61			
Insulation Resistance	Mohm	1.0	1.0	1.0			
Weight of Motor	g	22.5	23.2	24			

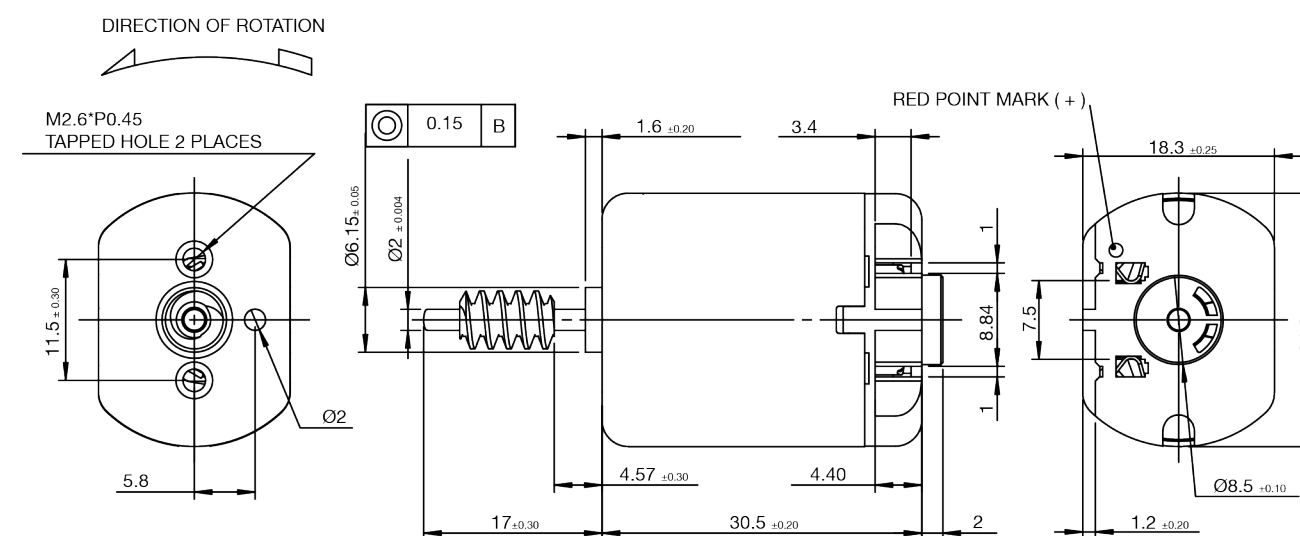


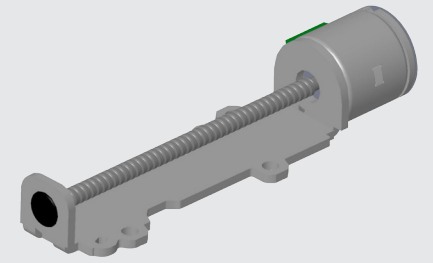
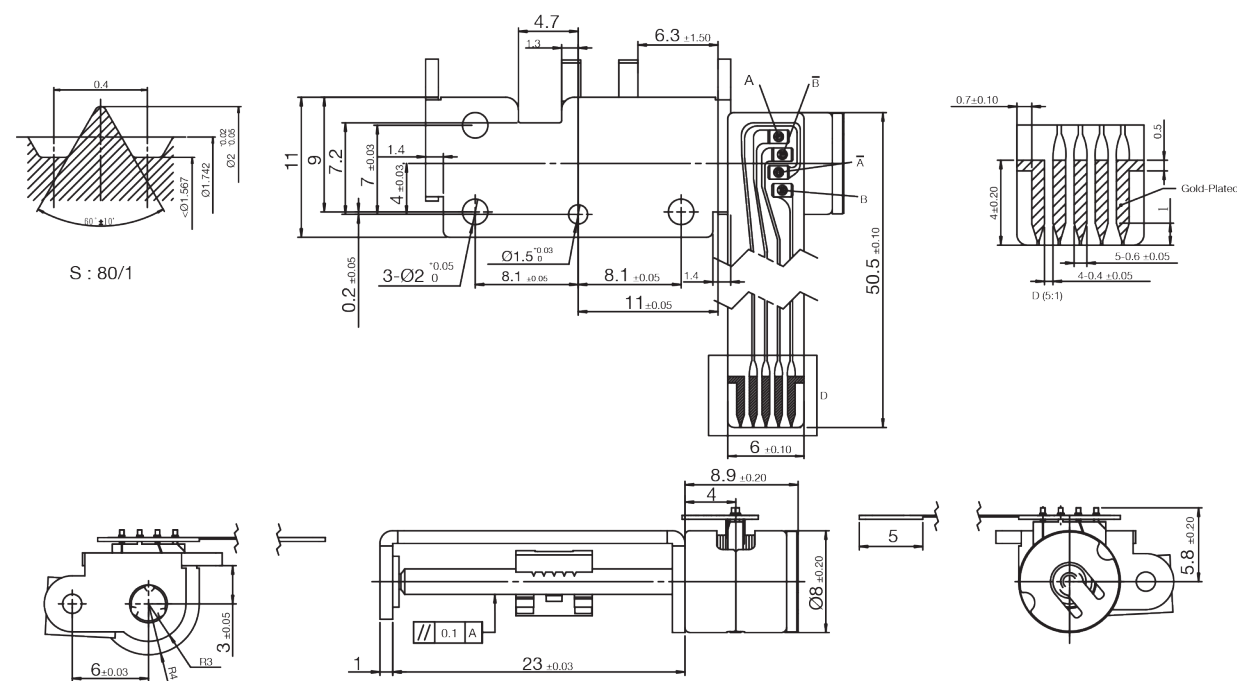
DC BRUSH MOTOR | Ø24

Carbon Brush

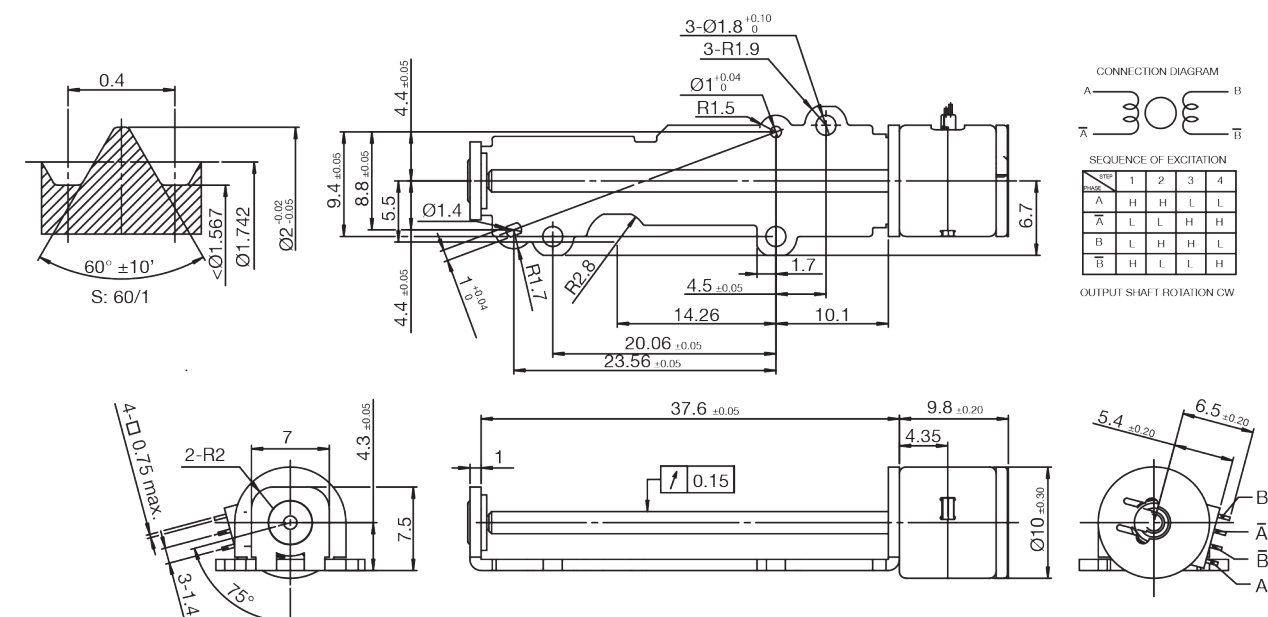


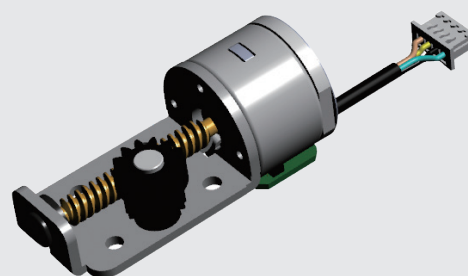
unit		CFA2426001	CFA2426003	CFA2430004			
		Axial	Axial	Axial			
Standard Operating Conditions							
Nominal Voltage	V	12.0	2.4	12.0			
Operating Range	V	8.0~15.0	1.0~4.0	8.0~15.0			
Rated Load	mNm	1.96	1.96	2.45			
Direction of Rotation		CW&CCW	CW&CCW	CW&CCW			
Operating Temperature Range	°C	-10~+60	-10~+60	-10~+60			
Storage Temperature Range	°C	-30~+85	-30~+85	-30~+85			
Electrical Characteristic							
No-Load Current	mA	60	330	80			
No-Load Speed	rpm	5700	9000	9200			
Rated-Load Current	mA	180	1250	330			
Rated-Load Speed	rpm	4100	7600	8250			
Stall Torque	mNm	4.905	9.81	17.658			
Max. Starting Voltage	V	1.8	1.0	1.0			
Max. Starting Current	mA	510	10000	2700			
Rotor Resistance	Ω	25.5	0.25	4.1			
Output Power	W	0.841	1.559	2.11			
Insulation Resistance	Mohm	1.0	1.0	1.0			
Weight of Motor	g	30.8	33	40			



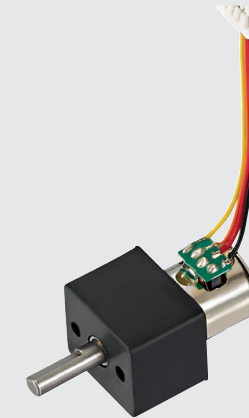
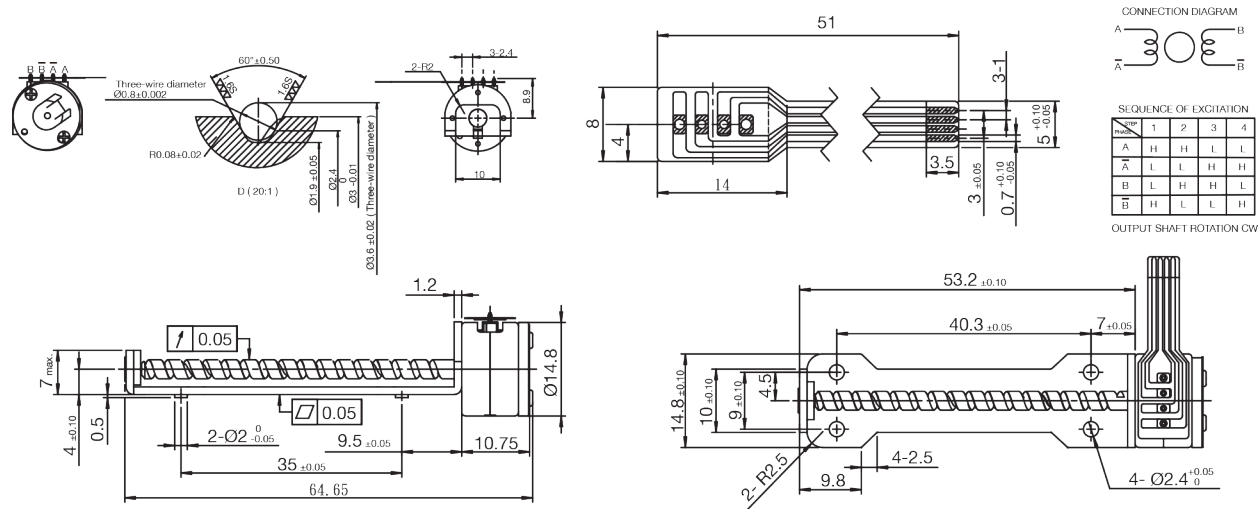
[illegible]

	unit	SRA1008004	SRB1008013	SRG1008031	SRA1008048	SRB1008092		
		Axial	Bracket	Pinion Gear	Axial	Bracket		
Electrical Characteristic								
Nominal Voltage	V	5.0	5.0	5.0	5.0	4.6		
Coil Resistance	Ω	45	55	20	15	40		
No. of Phases		2	2	2	2	2		
Step Angle	°/step	18	18	18	18	9		
Excitation Method		2	2	2	2	4W1-2		
Drive Mode		Bi-Polar	Bi-Polar	Bi-Polar	Bi-Polar	Bi-Polar		
Max. Starting Frequency	PPS	800	800	1000	1000	1200		
Max. Stewing Frequency	PPS	1300	1200	2500	2500	2200		
Insulation Class		E	E	E	E	E		
Insulation Strength	V	300	300	100	100	300		
Insulation Resistance	Ω	100	50M	1M	1M	50M		
Operating Temperature Range	℃	0~50	-10~+70	-10~+60	-10~+60	-20~+80		
Operating Frequency	PPS	500	480	500	500	480		
Pull-in Torque	mNm	0.40	0.28	0.65	0.75	0.2		
Pull-out Torque	mNm	0.42	0.30	-	-	-		





unit		SRB1509004	SRA1509013	SRB1509028	SRG1509030	SRB1509040		
		Bracket	Axial	Bracket	Pinion Gear	Bracket		
Electrical Characteristic								
Nominal Voltage	V	4.5	3.3	5.0	5.0	4.5		
Coil Resistance	Ω	10	10	10	10	10		
No. of Phases		2	2	2	2	2		
Step Angle	°/step	18	18	18	18	18		
Excitation Method		2	2	2	2	2		
Drive Mode		-	-	-	-	-		
Max. Starting Frequency	PPS	900	800	800	1100	900		
Max. Stewing Frequency	PPS	2000	1200	1500	1800	2000		
Insulation Class		E	F	E	F	E		
Insulation Strength	V	500	200	200	200	200		
Insulation Resistance	Ω	30	100M	100M	100M	30M		
Operating Temperature Range	°C	0~+55	-20~+75	-20~+80	-40~+125	0~55		
Operating Frequency	PPS	500	500	500	500	500		
Pull-in Torque	mNm	1.2	0.6	0.12	0.12	0.15		
Pull-out Torque	mNm	1.6	0.9	0.18	0.18	0.16		

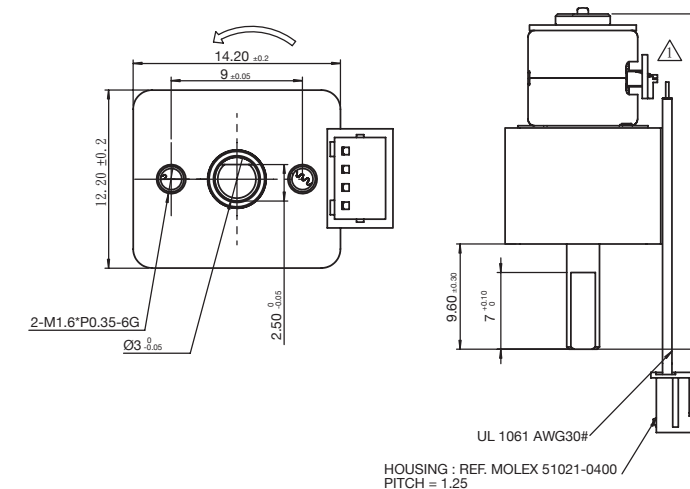
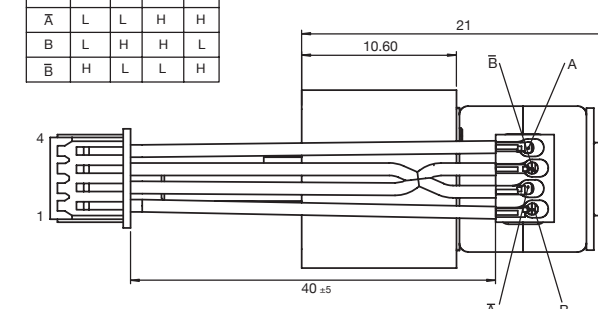


	unit	SRM1008003	SRM1008014	SRM1008025	HOT0052001	HQT0204002	HOT0298014	SRM1008011
Dimension	mm	φ10*31.2L	φ10*19.2L	φ10*44L	φ10*19.2L	φ10*19.5L	φ10*19.5L	φ10*19.5L
Electrical Characteristic								
Nominal Voltage	V	3.0	-	5.0	5.0	3.3	5.0	5.0
Rated Current	mA	-	75	-	-	-	-	-
Operating Range	V	-	-	-	-	-	-	-
Coil Resistance	Ω	7	50	30	15	20	19	19
No. of Phases		2	2	2				
Step Angle	°/step	0.346	1.2	0.06	0.346	0.088	0.06	0.18
Excitation Method		2-2	2-2	2-2	2-2	2-2	2-2	2-2
Drive Mode		Bi-Polar	-	-	Bi-Polar	-	-	-
Operating Temperature Range	℃	-10~+60	-30~+85	-20~+75	-10~+60	-10~+60	-10~+70	-10~+70
Storage Temperature	℃	-	-40~+105	-	-40~+80	-	-30~+70	-30~+70
Mechanical Specification								
Reduction Ratio		1:52	1:15	1:298	1:52	1:204	1:298	1:100
Output Torque	mNm	250	60	1000	250	200	100	300
Max Starting Frequency	PPS	000	1280	1000	1000	800	600	600
Max Slewing Frequency	PPS	2500	1400	2000	2500	1100	1900	1900
Mechanical Noise	dB	-	60	-	60	60	40	60
Power Supply Type								
Type		AC	AC	AC	AC	AC	AC	AC
FPC		x	x	x	x	x	x	o
Lead Wire		x	o	o	x	o	o	x
Pin Connector		x	o	o	x	o	o	x

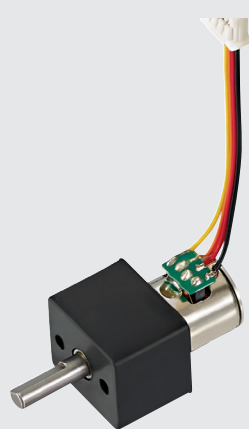


SEQUENCE OF EXCITATION

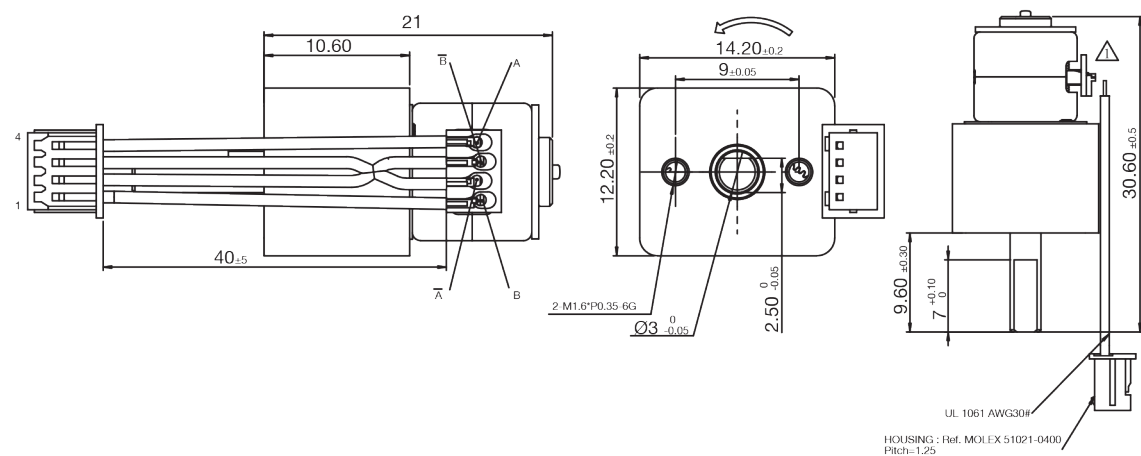
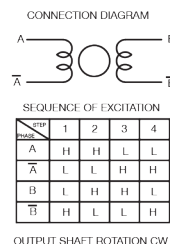
STEP PHASE	1	2	3	4
A	H	H	L	L
$\bar{A}$	L	L	H	H
B	L	H	H	L
$\bar{B}$	H	L	L	H



Metal Gearbox

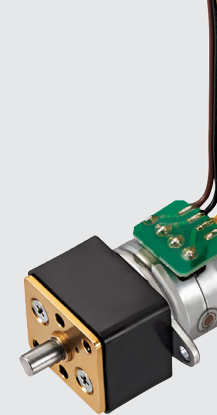


	unit	HOT0052012	HOT0063003	SRM1008002	SRM1008009			
Dimension	mm	φ10*24.7L	φ10*26.9L	φ10*45.4L	φ10*47.22L			
Electrical Characteristic								
Nominal Voltage	V	5.0	5.0	3.3	-			
Rated Current	mA	-	-	-	200			
Operating Range	V	-	4.5~5.5	-	-			
Coil Resistance	Ω	15	19	15	19			
No. of Phases		-	-	-	-			
Step Angle	°/step	0.346	0.143	18	0.134			
Excitation Method		2-2	1-2	2-2	2-2			
Drive Mode		Bi-Polar	-	-	-			
Operating Temperature Range	°C	-10~+60	-30~+85	-10~+75	-40~+70			
Storage Temperature	°C	-40~+80	-40~+105	-	-40~+70			
Mechanical Specification								
Reduction Ratio		1:52	1:63.07	1:900	1:298			
Output Torque	mNm	250	45	1200	100			
Max Starting Frequency	PPS	1000	1000	800	800			
Max Slewing Frequency	PPS	2500	2500	1200	1000			
Mechanical Noise	dB	60	40	-	60			
Power Supply Type								
Type		AC	AC	AC	AC			
FPC		x	x	x	o			
Lead Wire		o	o	x	x			
Pin Connector		o	o	x	x			

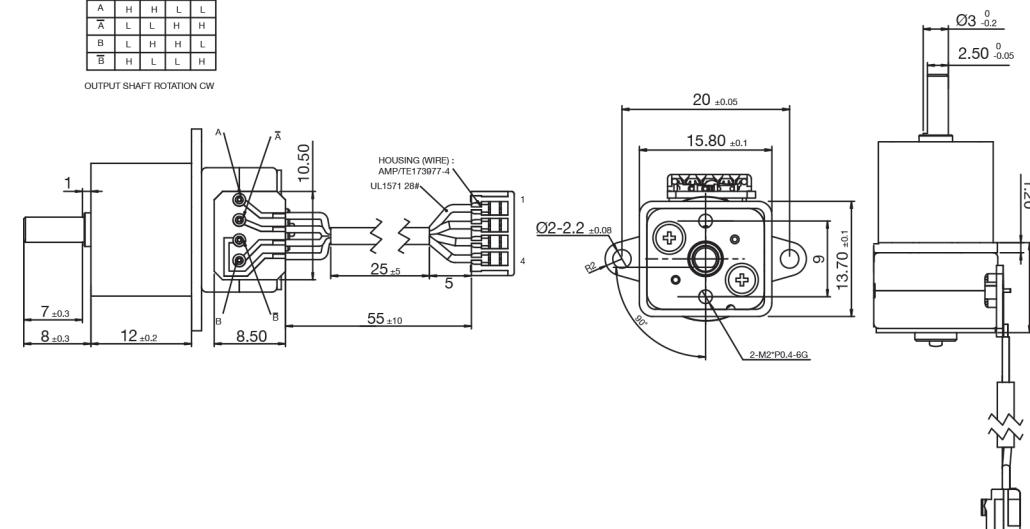
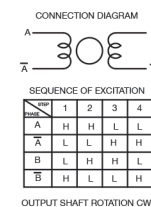


STEPPING MOTOR | Ø15

Metal Gearbox



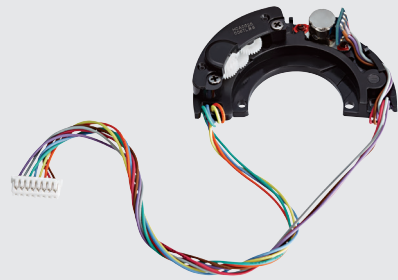
	unit	HOT0096012	SRM1509009	HOT0233016	SRM1509030			
Dimension	mm	φ15*19.9L	Φ14.8*21.6L	φ14.8*22.7L	φ14.8*28.1L			
Electrical Characteristic								
Nominal Voltage	V	5.0	3.3	12.0	5.0			
Rated Current	mA	-	-	-	-			
Operating Range	V	-	-	-	-			
Coil Resistance	Ω	10	10	40	10			
No. of Phases		-	-	-	-			
Step Angle	°/step	0.188	0.514	0.077	0.188			
Excitation Method		2-2	2-2	2-2	2-2			
Drive Mode		-	-	Bi-Polar	-			
Operating Temperature Range	°C	0~+55	0~+55	0~+55	-40~+125			
Storage Temperature	°C	-	-	0~+55	-			
Mechanical Specification								
Reduction Ratio		96	1:35	1:233	96			
Output Torque	mNm	310	230	800	310			
Max Starting Frequency	PPS	800	800	1000	800			
Max Slewing Frequency	PPS	900	1200	1800	900			
Mechanical Noise	dB	-	-	60	-			
Power Supply Type								
Type		AC	AC	AC	AC			
FPC		x	x	x	x			
Lead Wire		o	o	o	o			
Pin Connector		o	o	o	o			



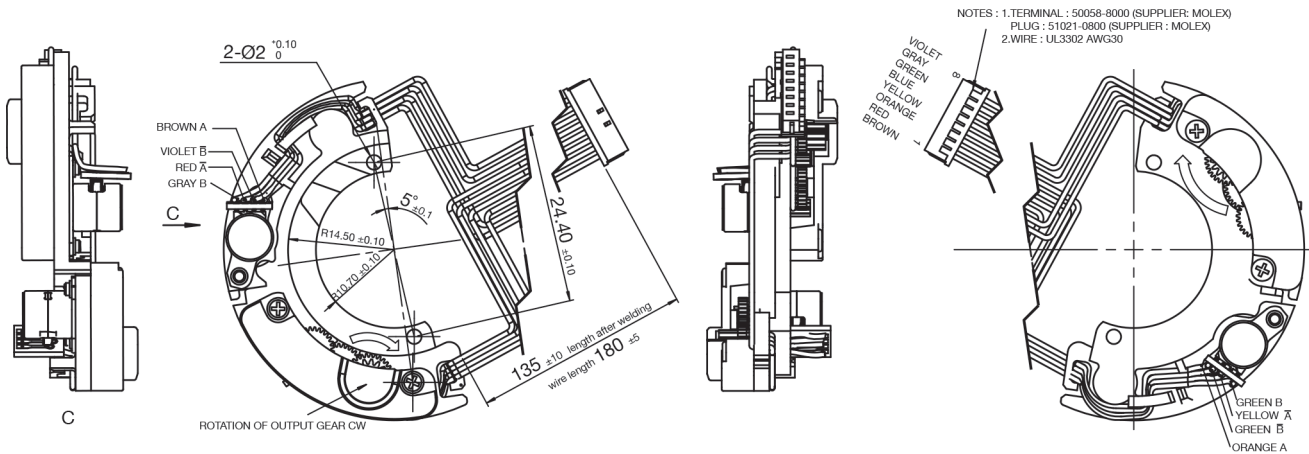
33

STEPPING MOTOR | Ø06

Plastic Gearbox

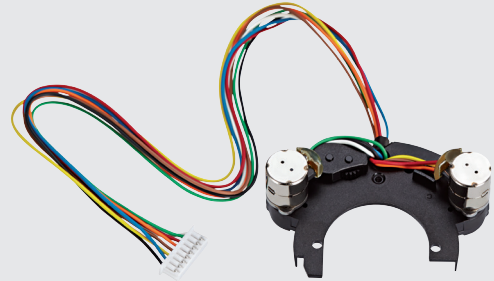


	unit	HOA0025006	SRP0605002				
Dimension	mm	R23.3*R14.5*R10.7	Φ6.5*15.3L				
Electrical Characteristic							
Nominal Voltage	V	2.5	3.3				
Rated Current	mA	-	-				
Operating Range	V	1.0~3.0	2.8~4.5				
Coil Resistance	Ω	11	30				
No. of Phases		-	-				
Step Angle	°/step	0.714	0.165				
Excitation Method		2-2	2-2				
Drive Mode		Bi-Polar					
Operating Temperature Range	°C	-20~+60	-20~+80				
Storage Temperature	°C	-30~+70	-20~+80				
Mechanical Specification							
Reduction Ratio		1:25.2	1:109				
Output Torque	mNm	15.3	60				
Max Starting Frequency	PPS	-	-				
Max Slewing Frequency	PPS	-	-				
Mechanical Noise	dB	65	60				
Power Supply Type							
Type		AC	AC				
FPC		x	x				
Lead Wire		o	o				
Pin Connector		o	o				

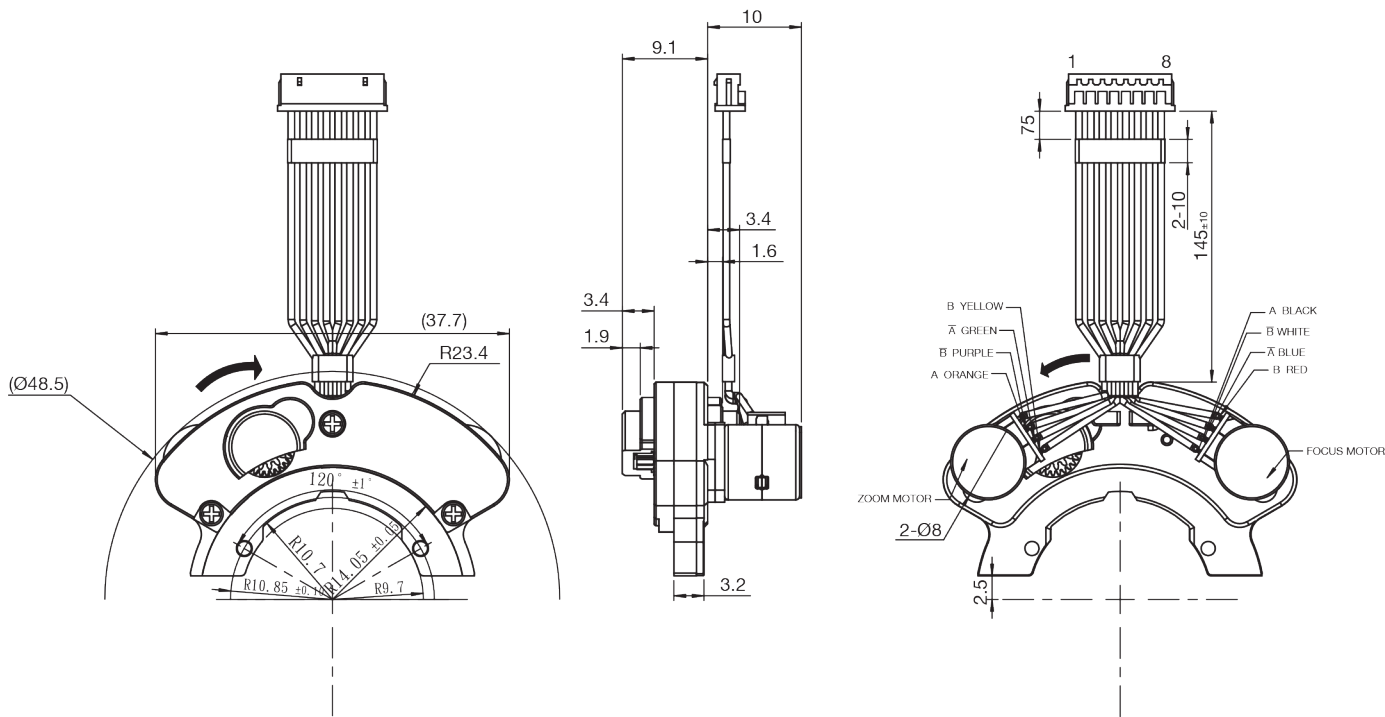


STEPPING MOTOR | Ø08

Plastic Gearbox



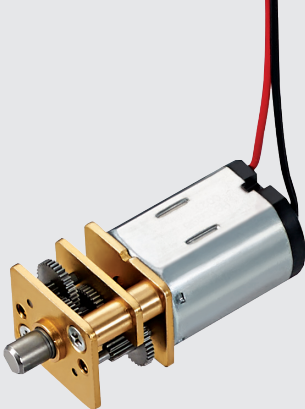
	unit	HOA0067007	HOA0069001	SRP0808026	SRP0808032	SRP0808001	SRP0808006	HOA0097005
Dimension	mm	R23.5*R16.3*R14.5	R24*R14.64*R9.7	Φ46.8*21*13.35	Φ08*8L	Φ8*17L	Φ8*18L	Φ8*59.276L
Electrical Characteristic								
Nominal Voltage	V	3.3	3.0	3.0	3.0	3.3	3.3	5.0
Rated Current	mA	-	-	-	-	-	-	-
Operating Range	V	3.3~4.5	3.0~5.0	2.0~4.0	3.0~5.0	1.5~4.0	3.3~4.5	3.0~5.0
Coil Resistance	Ω	21	20	40	40	60	16	35
No. of Phases		2	-	-	-	-	-	-
Step Angle	°/step	0.2687	0.187	0.224	0.514	0.514	0.29	0.1846
Excitation Method		2-2	2-2	2-2	1-2	2-2	2-2	2-2
Drive Mode		Bi-Polar	-	Bi-Polar	Bi-Polar	-	Bi-Polar	Bi-Polar
Operating Temperature Range	°C	-20~+80	-30~+80	-10~+60	-30~+80	-20~+80	-40~+70	-20~+80
Storage Temperature	°C	-40~+80	-40~+80	-20~+70	-30~+80	-	-	-40~+80
Mechanical Specification								
Reduction Ratio		1:67	1:69	1:80.3	1:80.3	1:200	1:62	1:97.48
Output Torque	mNm	70	50	35	230	130	50	20
Max Starting Frequency	PPS	-	-	800	1100	-	900	600
Max Slewing Frequency	PPS	-	-	1000	1800	-	1300	1800
Mechanical Noise	dB	60	60	60	40	-	-	45
Power Supply Type								
Type		AC	AC	AC	AC	AC	AC	AC
FPC		x	x	o	x	x	o	x
Lead Wire		o	o	x	o	o	x	o
Pin Connector		o	o	x	o	o	x	o



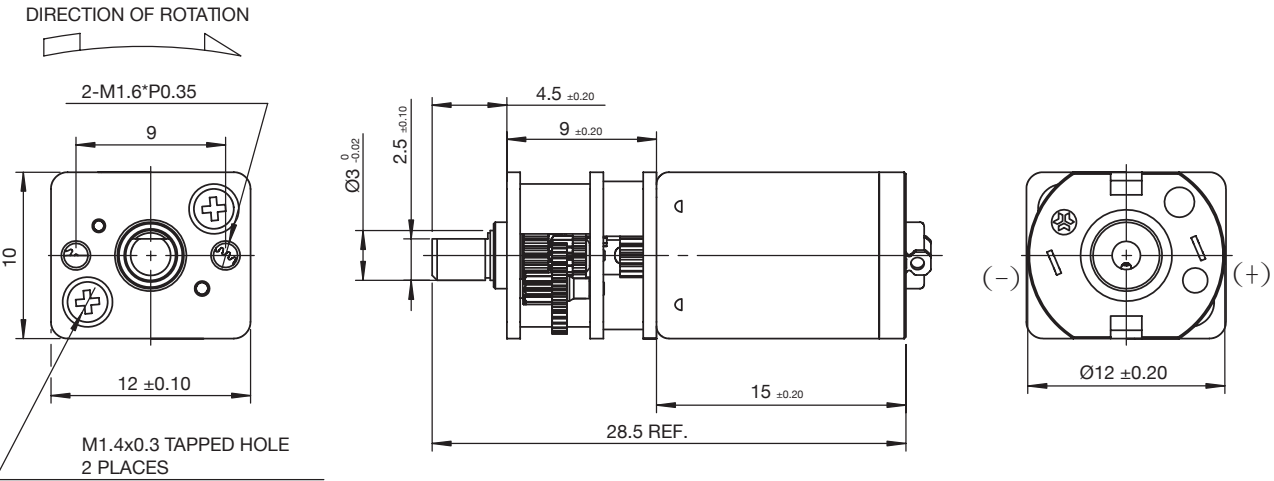


GEAR MOTOR

GEAR MOTOR I Ø12 Metal Gear



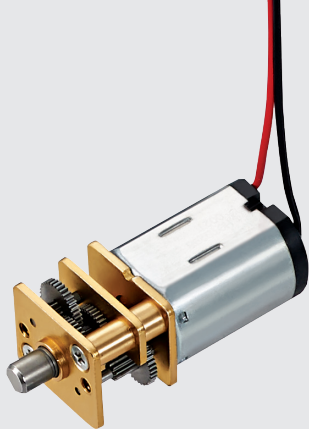
	unit	BFM1215001	BFM1215021	BFM1215079	BFM1215081	BFM1215084		
Dimension	mm	φ12*15	φ12*15	φ12*15	φ12*15	φ12*15		
Standard Operating Conditions								
Nominal Voltage	V	4.5	4.5	3.7	4.5	3.0		
Operating Range	V	3.0~6.0	3.0~6.0	2.0~5.0	3.0~6.0	3.0~4.0		
Rated Load	mNm	500	200	500	30	200		
Direction of Rotation		CW&CCW	CW&CCW	CW&CCW	CW&CCW	CW&CCW		
Operating Temperature Range	°C	-20~+50	-35~+50	-40~+65	-40~+85	-10~+65		
Storage Temperature Range	°C	-30~+70	-40~+70	-40~+85	-40~+80	-20~+70		
Mechanical Specification								
No-Load Current	mA	90	80	65	100	100		
No-Load Speed	rpm	54	107	55	1086	141		
Rated-Load Current	mA	220	250	300	270	350		
Rated-Load Speed	rpm	40	93	37	870	112		
Stall Torque	mNm	1500	755	704	112.2	622		
Stall Current	mA	880	800	1000	1500	1000		
Output Power	W	0.99	1.125	1.11	1.215	7.875		
Mechanical Noise	dB	60	60	65	60	70		
Gearhead								
Gearhead Length	mm	4.5	4.5	10	4	10		
Reduction Ratio		1:298	1:150	1:210	1:15	1:100		
Gearhead Type		Spur	Spur	Spur	Spur	Spur		
Number Of Stages		5	4	5	3	4		



39

GEAR MOTOR | Ø12

Metal Gear



	unit	BFM1220011	BFM1220009#	HOT0052014	BFM1225002			
Dimension	mm	φ12*20	φ12*20	φ12*20	φ12*25			
Standard Operating Conditions								
Nominal Voltage	V	3.6	4.5	4.5	3.0			
Operating Range	V	2.0~5.0	2.0~5.0	2.5~6.0V	1.5~4.5			
Rated Load	mNm	500	725	200	200			
Direction of Rotation		CW&CCW	CW&CCW	CW&CCW	CW&CCW			
Operating Temperature Range	°C	-20~+65	-40~+65	-20~+50	-20~+50			
Storage Temperature Range	°C	-	-40~+85	-30~+70	-30~+70			
Mechanical Specification								
No-Load Current	mA	120	50	150	70			
No-Load Speed	rpm	35	34	300	70			
Rated-Load Current	mA	-	180	500	180			
Rated-Load Speed	rpm	-	30	150	53			
Stall Torque	mNm	3998	397.8	755	600			
Stall Current	mA	1500	1000	800	250			
Output Power	W	1.08	0.81	1.125	1.8			
Mechanical Noise	dB	64	64	60	60			
Gearhead								
Gearhead Length	mm	10	1.5	4.5	4.5			
Reduction Ratio		1:500	1:378	1:52	1:52			
Gearhead Type		Spur	Spur	Spur	Spur			
Number Of Stages		6	5	3	4			

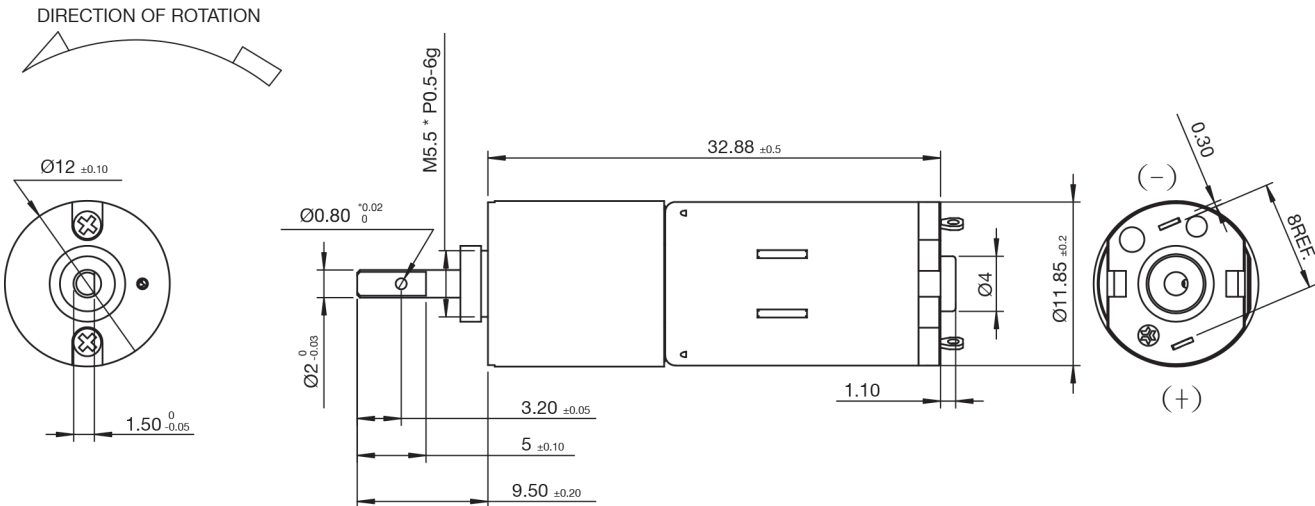
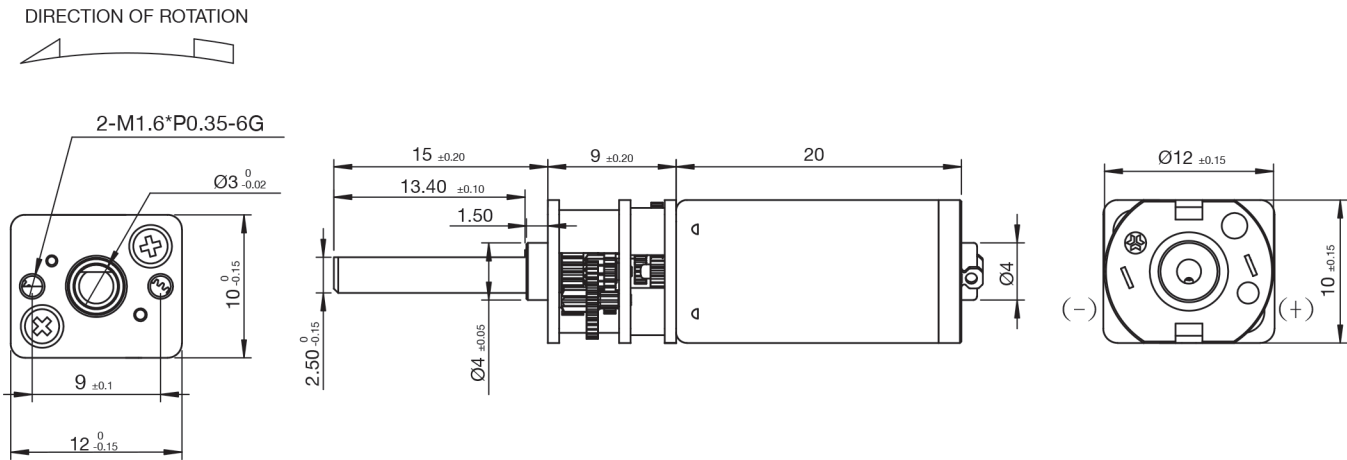
40

GEAR MOTOR | Ø12

Metal Gear



	unit	BFM1220006						
Dimension	mm	φ12*20						
Standard Operating Conditions								
Nominal Voltage	V	12.0						
Operating Range	V	6.0~13.0						
Rated Load	mNm	250						
Direction of Rotation		CW&CCW						
Operating Temperature Range	°C	-20~+60						
Storage Temperature Range	°C	-40~+80						
Mechanical Specification								
No-Load Current	mA	65						
No-Load Speed	rpm	80						
Rated-Load Current	mA	160						
Rated-Load Speed	rpm	74						
Stall Torque	mNm	1275						
Stall Current	mA	2000						
Output Power	W	1.92						
Mechanical Noise	dB	60						
Gearhead								
Gearhead Length	mm	9.5						
Reduction Ratio		1:210						
Gearhead Type		Spur						
Number Of Stages		4						



43

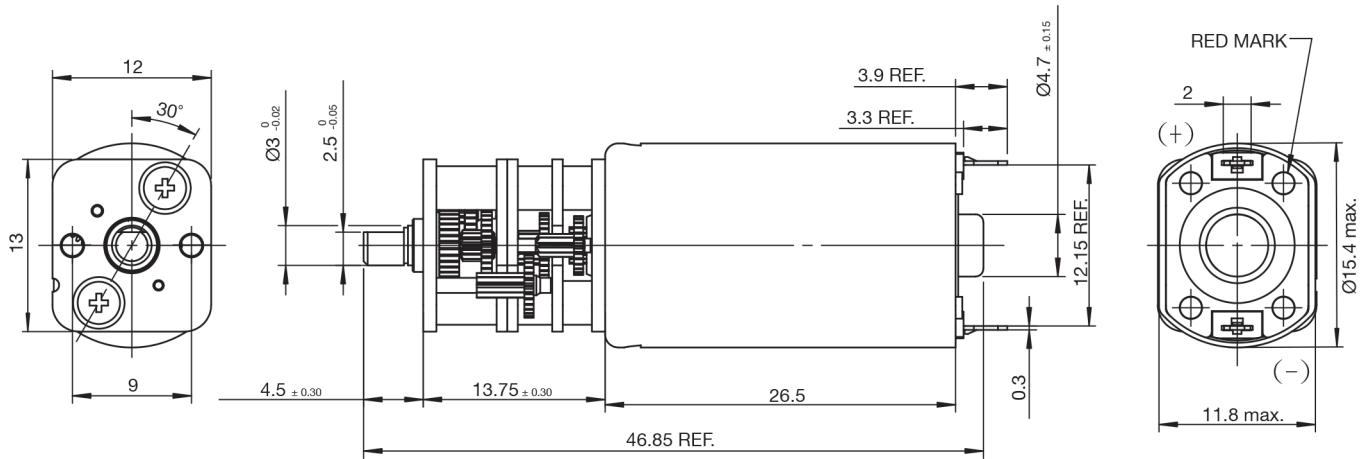
GEAR MOTOR | Ø15

Metal Gear



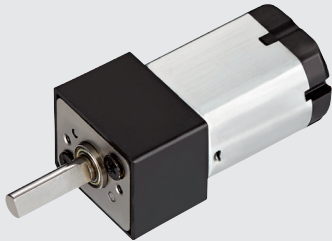
	unit	BFM1526020	BFM1526004					
Dimension	mm	φ15*26	φ15*26.5					
Standard Operating Conditions								
Nominal Voltage	V	6.0	12.0					
Operating Range	V	4.5~6.5	10.0~14.0					
Rated Load	mNm	100	500					
Direction of Rotation		CW&CCW	CW&CCW					
Operating Temperature Range	°C	-20~+70	-10~+40					
Storage Temperature Range	°C	-40~+85	-20~+60					
Mechanical Specification								
No-Load Current	mA	20	60					
No-Load Speed	rpm	3.3	42					
Rated-Load Current	mA	49	120					
Rated-Load Speed	rpm	2.5	39					
Stall Torque	mNm	1499	4998					
Stall Current	mA	300	800					
Output Power	W	0.6	1.44					
Mechanical Noise	dB	60	60					
Gearhead								
Gearhead Length	mm	13.5	4.4					
Reduction Ratio		1:233	1:233					
Gearhead Type		Spur	Spur					
Number Of Stages		4	4					

DIRECTION OF ROTATION



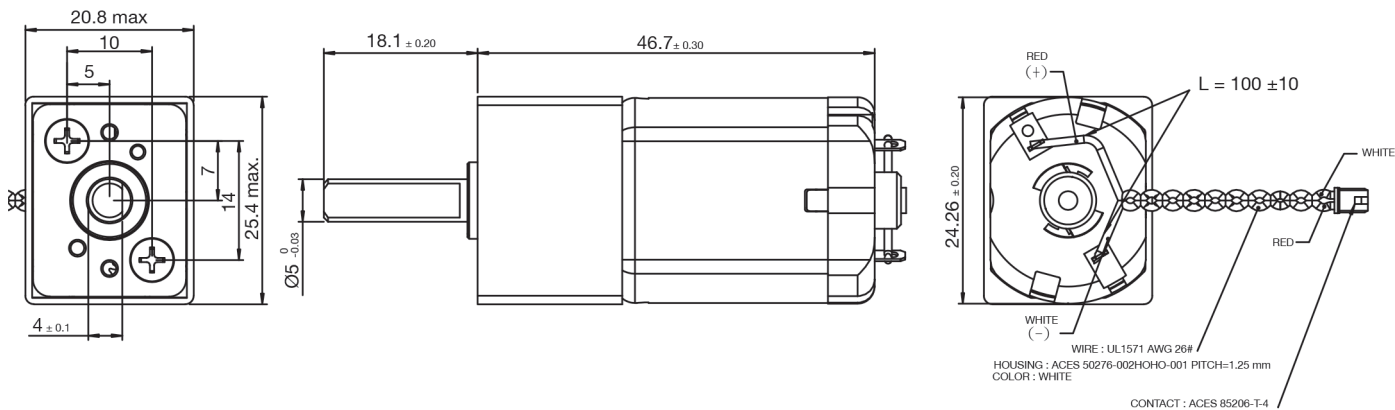
GEAR MOTOR | Ø24

Metal Gear



	unit	CFM2430013	CFM2430006					
Dimension	mm	φ24*30	φ24*30					
Standard Operating Conditions								
Nominal Voltage	V	12.0	12.0					
Operating Range	V	8.0~15.0	8.0~15.0					
Rated Load	mNm	5000	490.33					
Direction of Rotation		-	CW&CCW					
Operating Temperature Range	°C	-20~+80	-20~80					
Storage Temperature Range	°C	-30~+70	-30~+70					
Mechanical Specification								
No-Load Current	mA	100	100					
No-Load Speed	rpm	136	136					
Rated-Load Current	mA	1500	1500					
Rated-Load Speed	rpm	80	80					
Stall Torque	mNm	9996	980.66					
Stall Current	mA	3000	-					
Output Power	W	18	-					
Mechanical Noise	dB	60	-					
Gearhead								
Gearhead Length	mm	18.1	18.1					
Reduction Ratio		1:77	1:77					
Gearhead Type		Spur	Spur					
Number Of Stages		3	3					

DIRECTION OF ROTATION



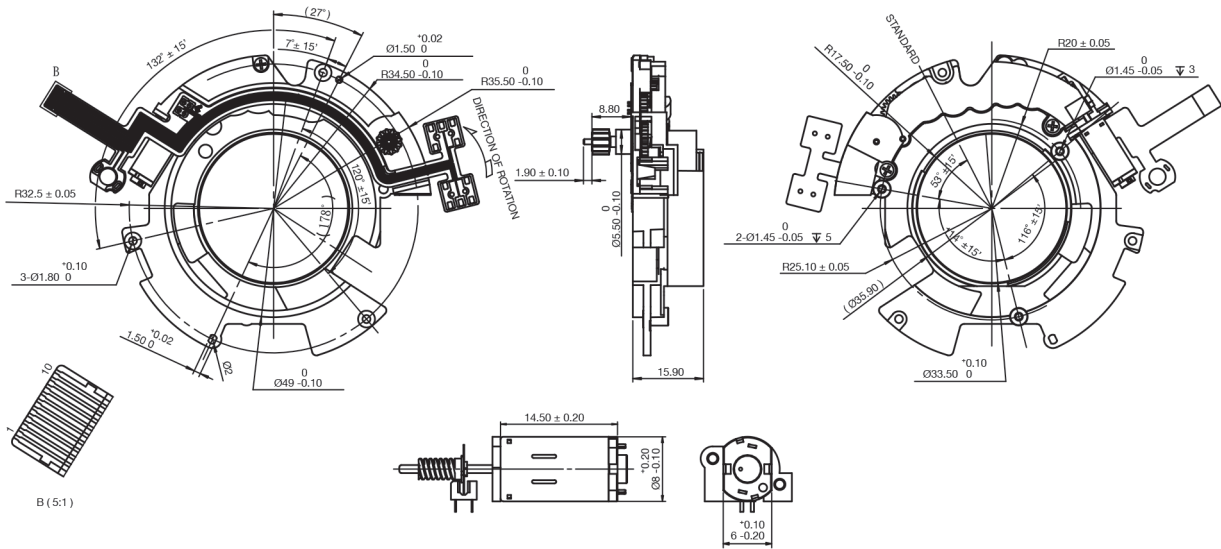
45

GEAR MOTOR | Ø08

Plastic Gear

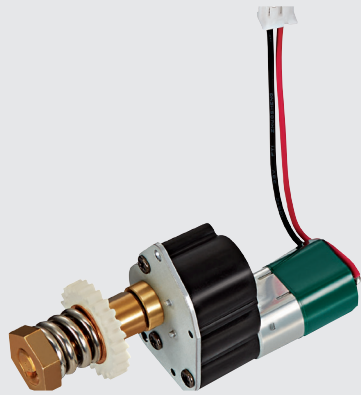


	unit	BFP0814001	BFP0814005					
Dimension	mm	Φ8*14L	Φ8*14L					
Standard Operating Conditions								
Nominal Voltage	V	4.0	5.6					
Operating Range	V	2.0~5.0	2.0~6.0					
Rated Load	mNm	6	10					
Direction of Rotation		CW&CCW	CW&CCW					
Operating Temperature Range	°C	-10~+70	-10~+70					
Storage Temperature Range	°C	-40~+85	-40~+86					
Mechanical Specification								
No-Load Current	mA	45	60					
No-Load Speed	rpm	94	180					
Rated-Load Current	mA	100	180					
Rated-Load Speed	rpm	74	140					
Stall Torque	mNm	190	380					
Stall Current	mA	270	480					
Output Power	W	0.40	1.01					
Mechanical Noise	dB							
Gearhead								
Gearhead Length	mm	-	-					
Reduction Ratio		-	-					
Gearhead Type		Spur	Spur					
Number Of Stages		3	2					

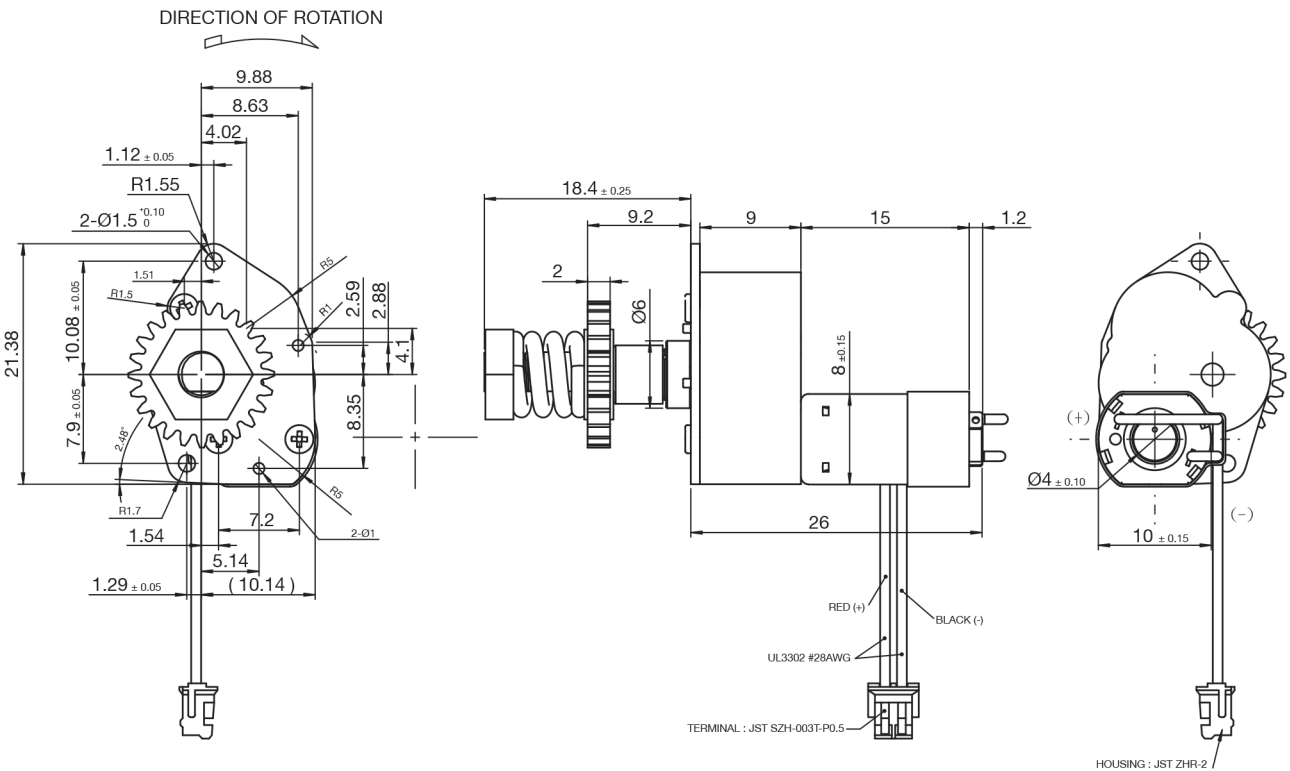


GEAR MOTOR | Ø10

Plastic Gear

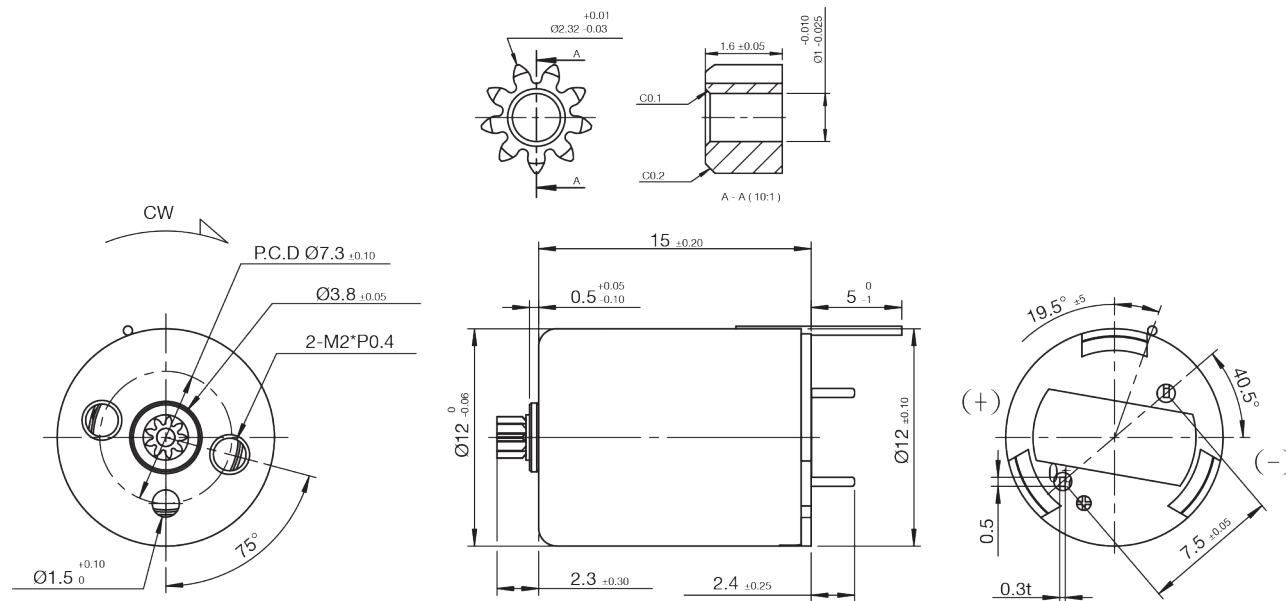


	unit	BFP1015021						
Dimension	mm	Φ10*15L						
Standard Operating Conditions								
Nominal Voltage	V	5.0						
Operating Range	V	4.0~6.0						
Rated Load	mNm	25.0						
Direction of Rotation		CW&CCW						
Operating Temperature Range	°C	-20~+60						
Storage Temperature Range	°C	-20~+60						
Mechanical Specification								
No-Load Current	mA	25						
No-Load Speed	rpm	25.2						
Rated-Load Current	mA	-						
Rated-Load Speed	rpm	-						
Slip Torque	mNm	60						
Slip Current	mA	70						
Output Power	W	0.63						
Mechanical Noise	dB	-						
Gearhead								
Gearhead Length	mm	18.4						
Reduction Ratio		1:359.95						
Gearhead Type		Spur						
Number Of Stages		2						



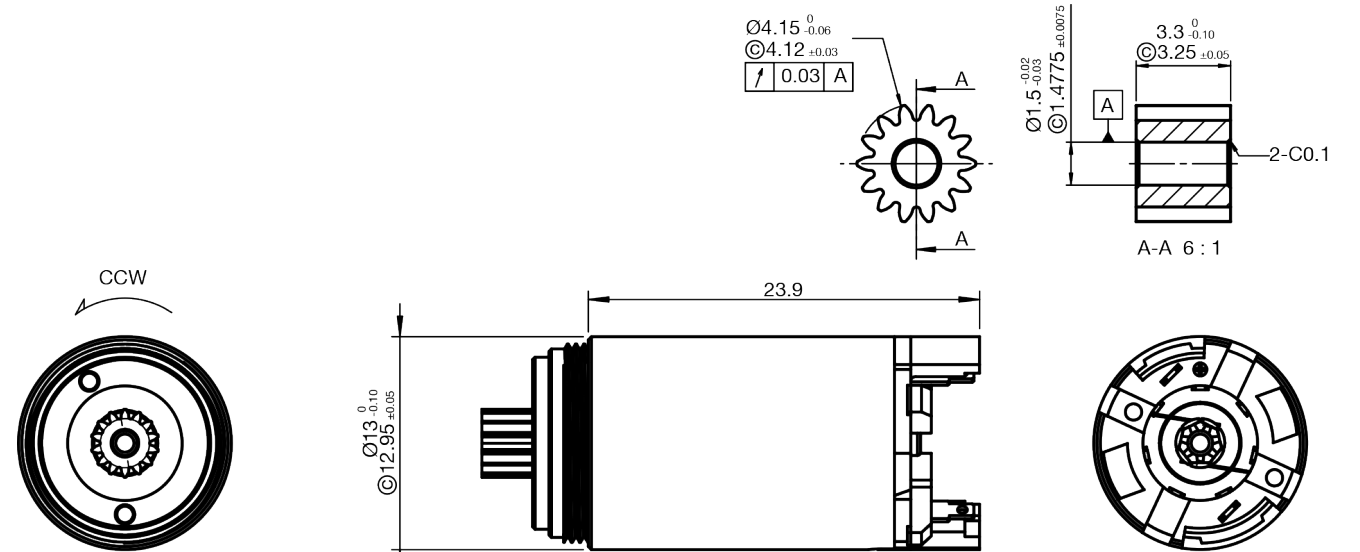
CORELESS MOTOR | Ø12

Metal Brush

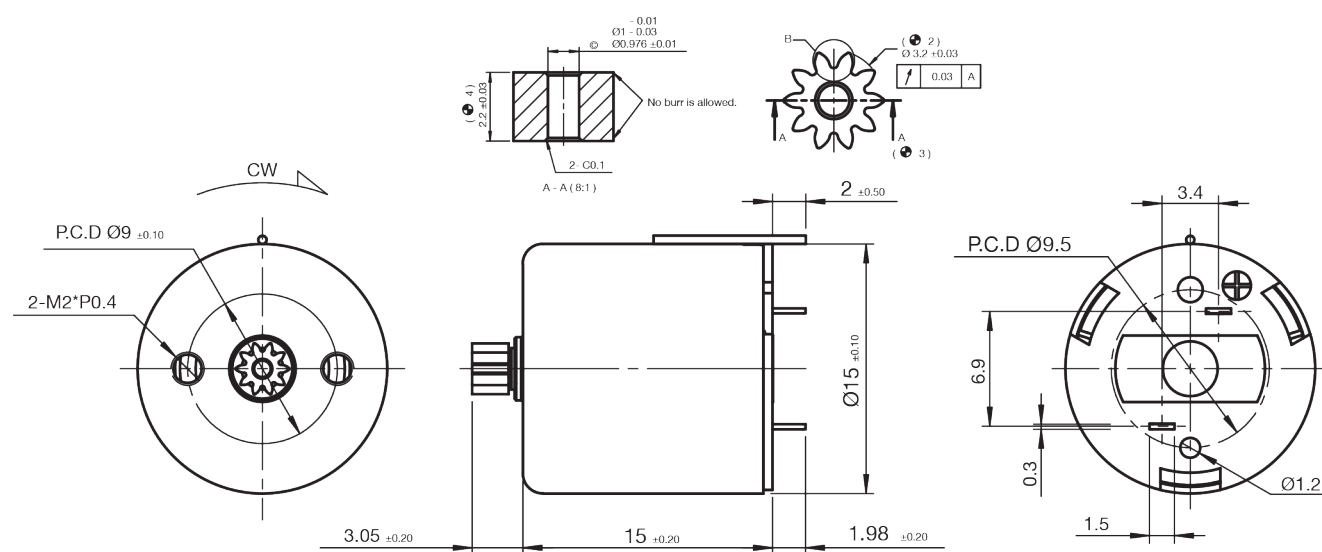
[illegible]

CORELESS MOTOR | Ø13

Metal Brush

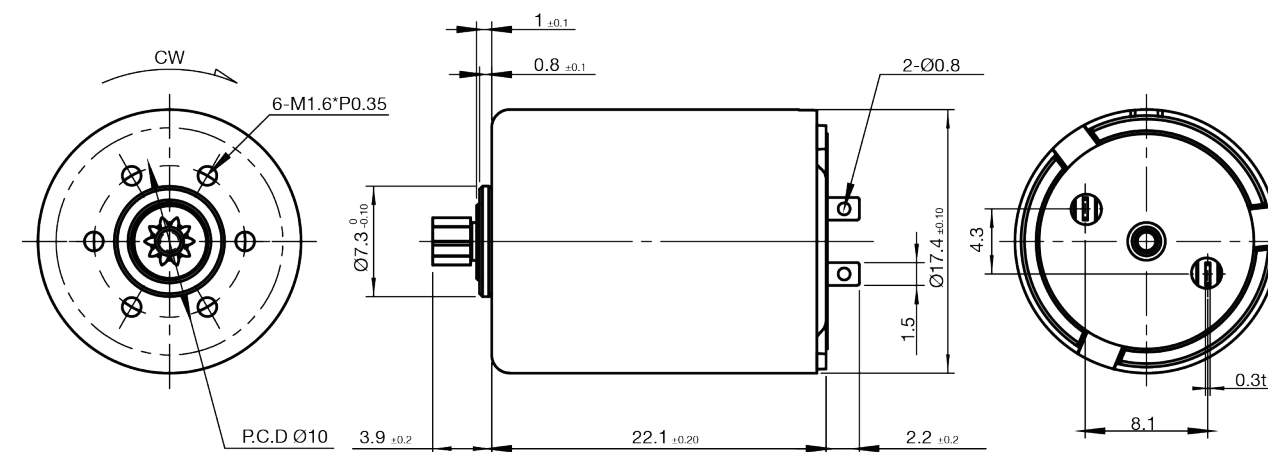
[illegible]

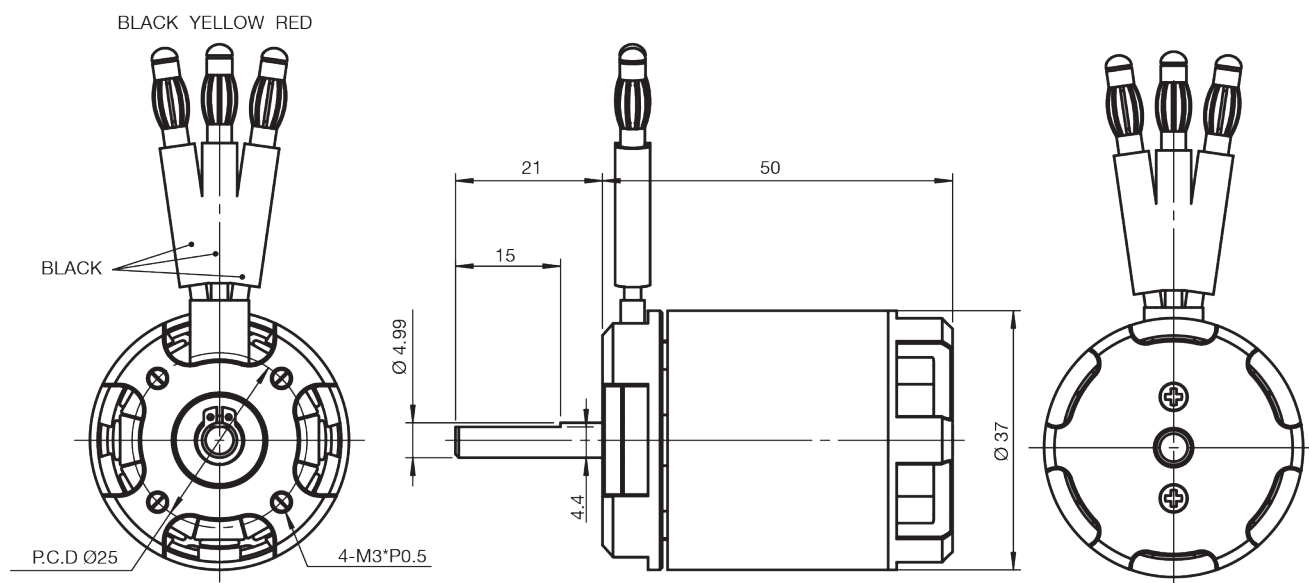
Metal Brush

[illegible]

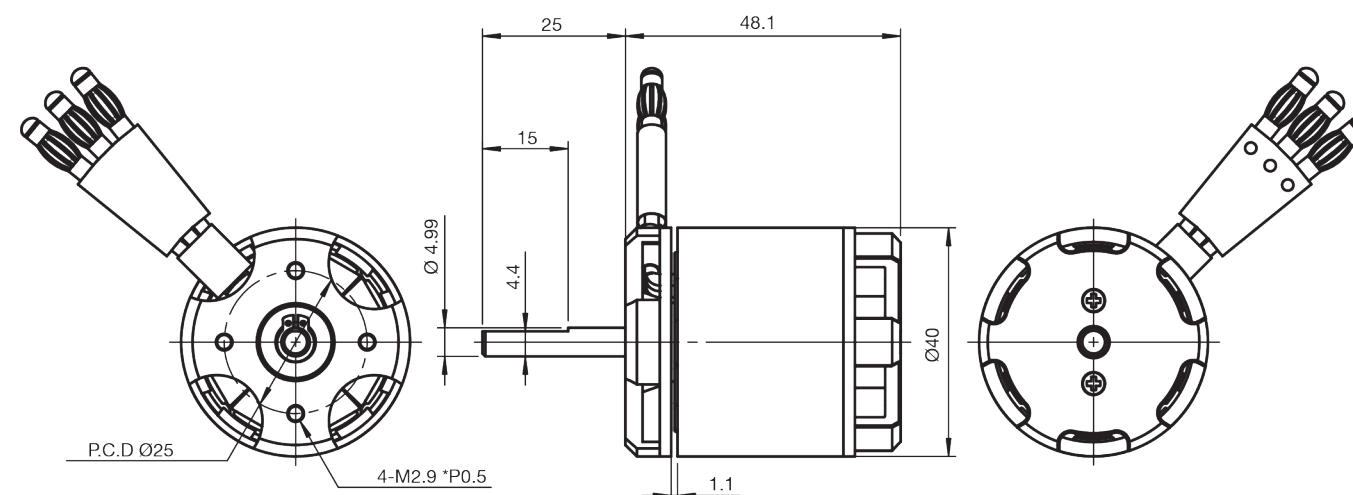
CORELESS MOTOR | Ø17

Metal Brush

[illegible]

[illegible]

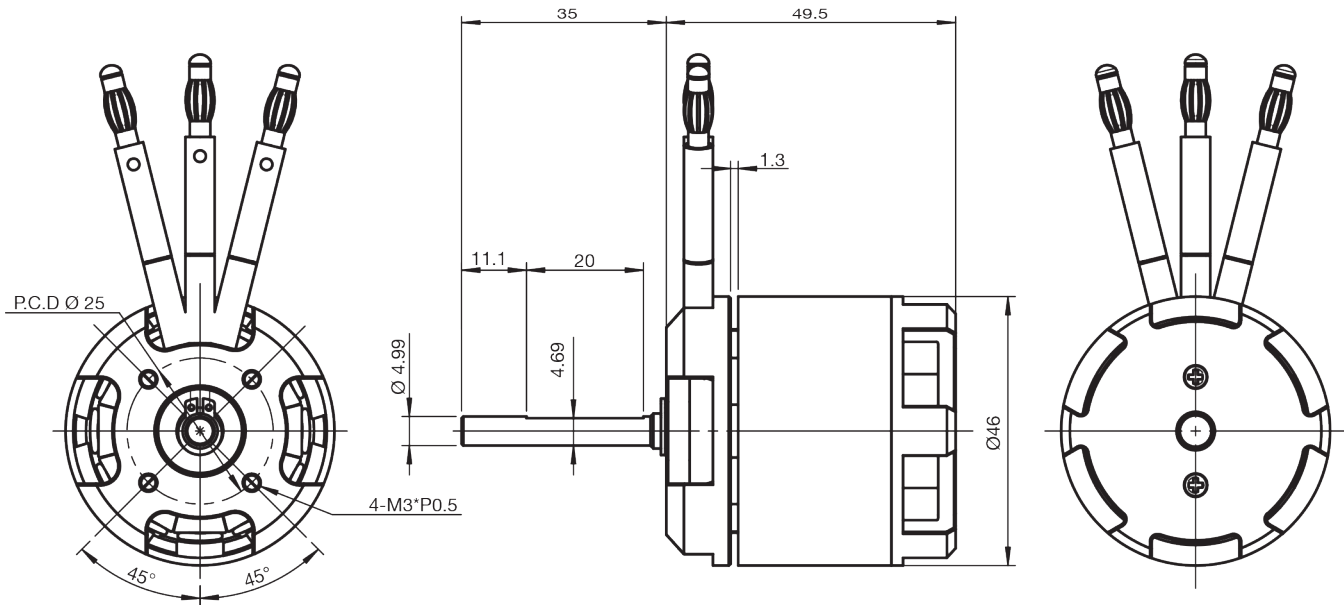
unit		OMA4050013	OMA4050017	OMA4050018			
Standard Operating Conditions							
Nominal Voltage	V	22.2	22.2	22.2			
Operating Range	V	11.1~22.2	11.1~22.2	11.1~22.2			
Direction of Rotation		CW/CCW	CW/CCW	CW/CCW			
Number of Phases		3	3	3			
Operating Temperature Range	°C	0~50	0~50	0~50			
Storage Temperature Range	°C	-20~60	-20~60	-20~60			
Electrical Characteristic							
No-Load Current	A	6.2	9.2	5.3			
No-Load Speed	rpm	28500	31824	26250			
Constant Torque	mNm/A	81	67	89			
Constant Speed	rpm/V	1300	1600	1200			
Stall Torque	mNm	3430	3706	3221			
Stall Current	A	427	475	364			
Max. Output Power	W	9479	10545	8081			
Max. Efficiency	%	84	82	85			
Weight of Motor	g	215	215	214			



69 BRUSHLESS MOTOR | Ø47
Outter Type



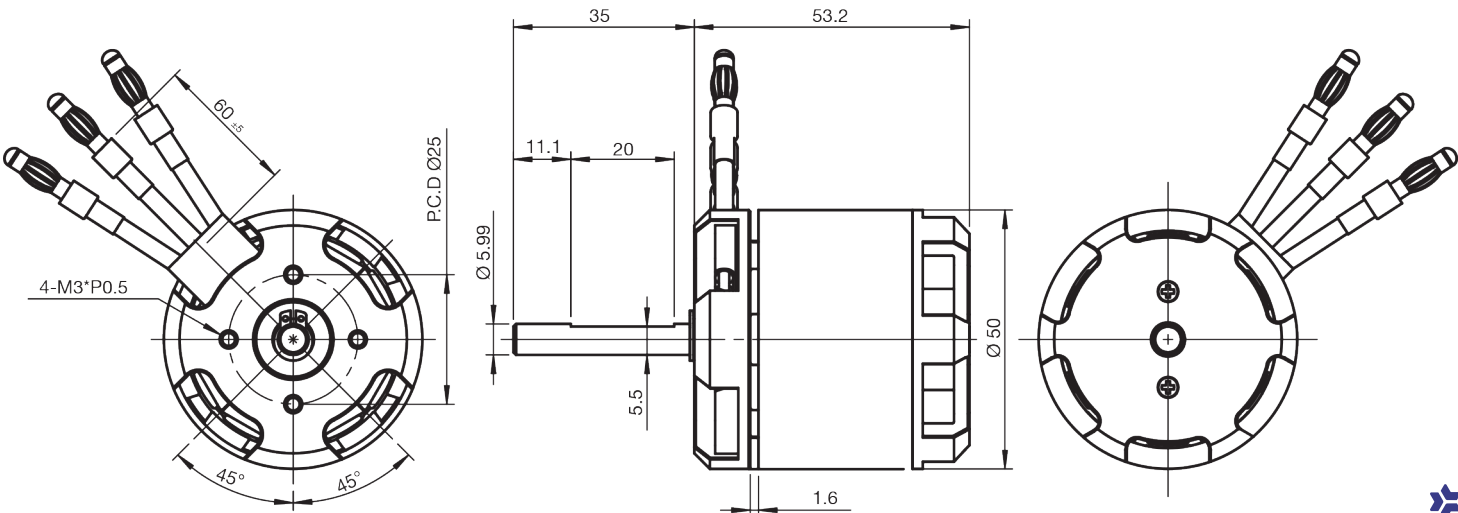
unit		OMA4750001	OMA4760002	OMA476003	OMA4760004	OMA476005		
Standard Operating Conditions								
Nominal Voltage	V	22.2	22.2	44.4	46	44.4		
Operating Range	V	11.1~22.2	11.1~22.2	11.1~44.4	11.1~46	11.1~44.4		
Direction of Rotation		CW/CCW	CW/CCW	CW/CCW	CW/CCW	CW/CCW		
Number of Phases		3	3	3	3	3		
Operating Temperature Range	°C	0~50	0~50	0~50	0~50	0~50		
Storage Temperature Range	°C	-20~+60	-20~+60	-20~+60	-20~+60	-20~+60		
Electrical Characteristic								
No-Load Current	A	6	9.3	3.1	3.3	3.1		
No-Load Speed	rpm	25650	26694	21900	24552	21900		
Constant Torque	mNm/A	91	89	211	200	211		
Constant Speed	rpm/V	1200	1200	500	530	530		
Stall Torque	mNm	1528	4560	8728	8822	8729		
Stall Current	A	168	517	414	442	414		
Max. Output Power	W	3730	11477	18382	20332	18382		
Max. Efficiency	%	76	85	90	92	90		
Weight of Motor	g	272	339	339	335	339		



BRUSHLESS MOTOR | Ø50
Outter Type



unit		OMA5055015	OMA5065013	OMA50605014	OMA5065017	OMA5065018		
Standard Operating Conditions								
Nominal Voltage	V	46	44.4	46	46	46		
Operating Range	V	22.2~46	22.2~44.4	11.1~46	11.1~46	11.1~46		
Direction of Rotation		CW/CCW	CW/CCW	CW/CCW	CW/CCW	CW/CCW		
Number of Phases		3	3	3	3	3		
Operating Temperature Range	°C	0~50	0~50	0~50	0~50	0~50		
Storage Temperature Range	°C	-20~+60	-20~+60	-20~+60	-20~+60	-20~+60		
Electrical Characteristic								
No-Load Current	A	3.9	3.3	4.2	4.7	5.3		
No-Load Speed	rpm	25650	20400	22500	23994	24864		
Constant Torque	mNm/A	178	170	202	189	186		
Constant Speed	rpm/V	550	450	500	530	550		
Stall Torque	mNm	9140	5140	11333	19277	13876		
Stall Current	A	513	303	569	1035	751		
Max. Output Power	W	23598	13453	26174	47610	34546		
Max. Efficiency	%	86	65	85	87	87		
Weight of Motor	g	347	443	463	467	455		

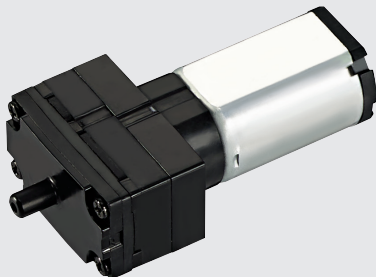




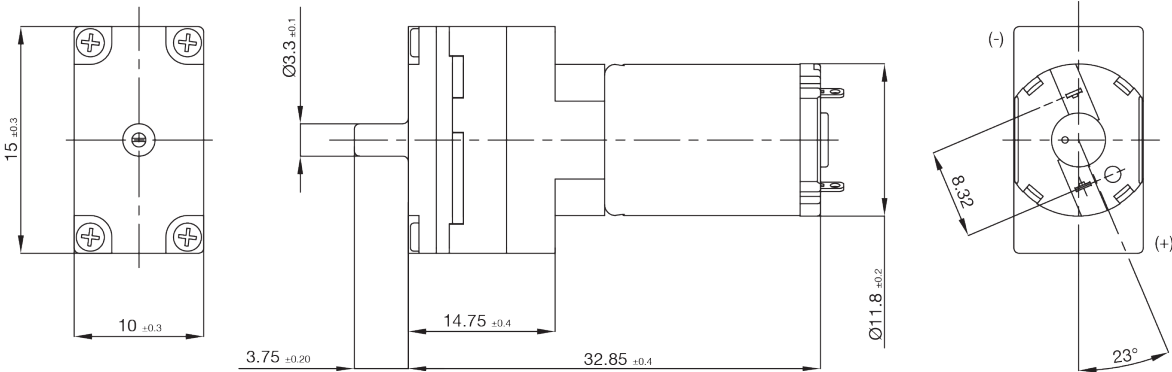
PUMP MOTOR

PUMP MOTOR | Ø14

Air Type



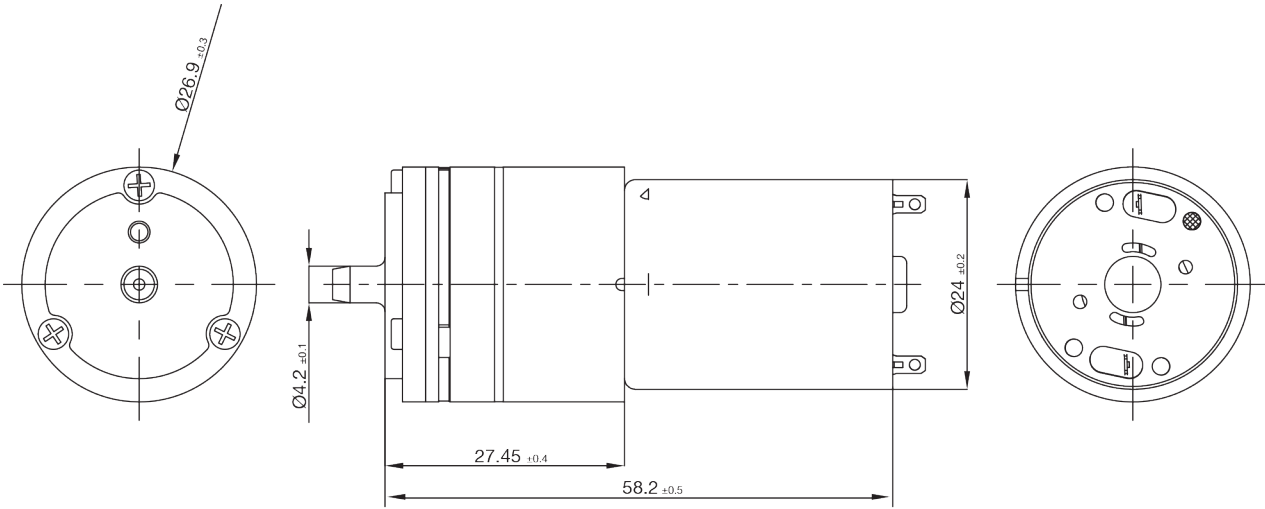
unit		TPM1420002						
Parameters								
Nominal Voltage	V	3						
Medium		Air						
Free Flow	ml/min	>800						
Max. Current	mA	<400						
Max. Pressure	mmHg	>350						
Noise	dB	<65						
Others								
Life Test	30,000 times (DC3V; 1cycle: connect to a 100cc pneumatic cylinder on 9s, off 5s)							
Working Environment	-20~60°C,80%RH							



73 PUMP MOTOR | Ø27
Air Type



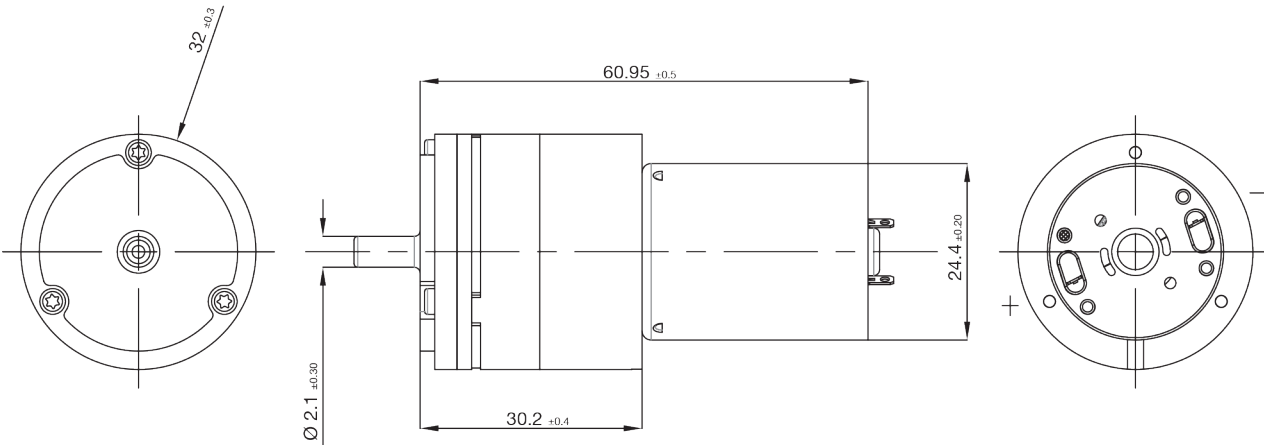
unit		BPO2430019						
Parameters								
Nominal Voltage	V	6						
Medium		Air						
Free Flow	ml/min	>1600						
Max. Current	mA	<400						
Max. Pressure	mmHg	>400						
Noise	dB	<55						
Others								
Life Test		30,000 times (DC3V; 1cycle: connect to a 500cc pneumatic cylinder on 9s, off 8s)						
Working Environment		-20~60°C,80%RH						



74 PUMP MOTOR | Ø32
Air Type



unit		TPM3261001						
Parameters								
Nominal Voltage	V	12						
Medium		Air						
Free Flow	ml/min	>3500						
Max. Current	mA	<390						
Max. Pressure	mmHg	>450						
Noise	dB	<65						
Others								
Life Test		50,000 times (DC12V; 1cycle: connect to a 500cc pneumatic cylinder on 9s, off 8s)						
Working Environment		-20~60°C,80%RH						



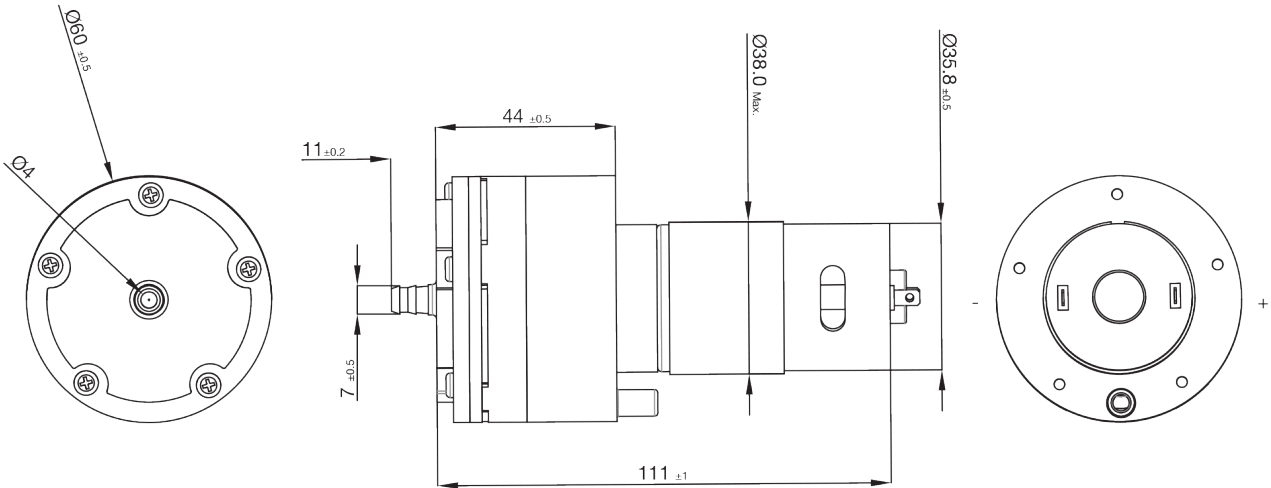
75

PUMP MOTOR | Ø36

Air Type



unit		TPM3657001	TPM3657003				
Parameters							
Nominal Voltage	V	12	24				
Medium		Air	Air				
Free Flow	ml/min	>15000	>15000				
Max. Current	mA	<15000	<800				
Max. Pressure	mmHg	>500	>500				
Noise	dB	<65	<65				
Others							
Life Test	100,000 times (DC12V; 1cycle: connect to a 1500cc pneumatic cylinder on 4s, off4s)						
Working Environment	-20~60°C,80%RH						



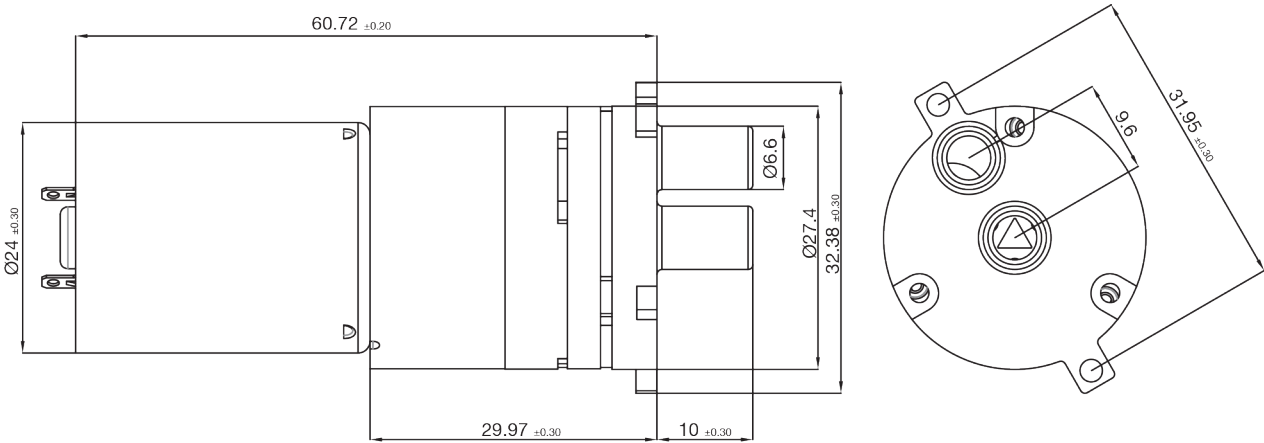
76

PUMP MOTOR | Ø27

Water Type



unit		TPW2761011	TPW2761007	TPW2700001	TPW2761035			
Parameters								
Nominal Voltage	V	12	12	12	3			
Medium		Water	Water	Water	Water			
Free Flow	ml/min	870	1000	1500	440			
Max. Current	mA	500	600	750	320			
Max. Pressure	Bar	>2	>2	>2	-			
Noise	dB	<60	<65	<65	<60			
Others								
Life Test	6000 times (DC3/12V; 1cycle: on 2min, off 1min)							
Working Environment	0~50°C, 75%RH							



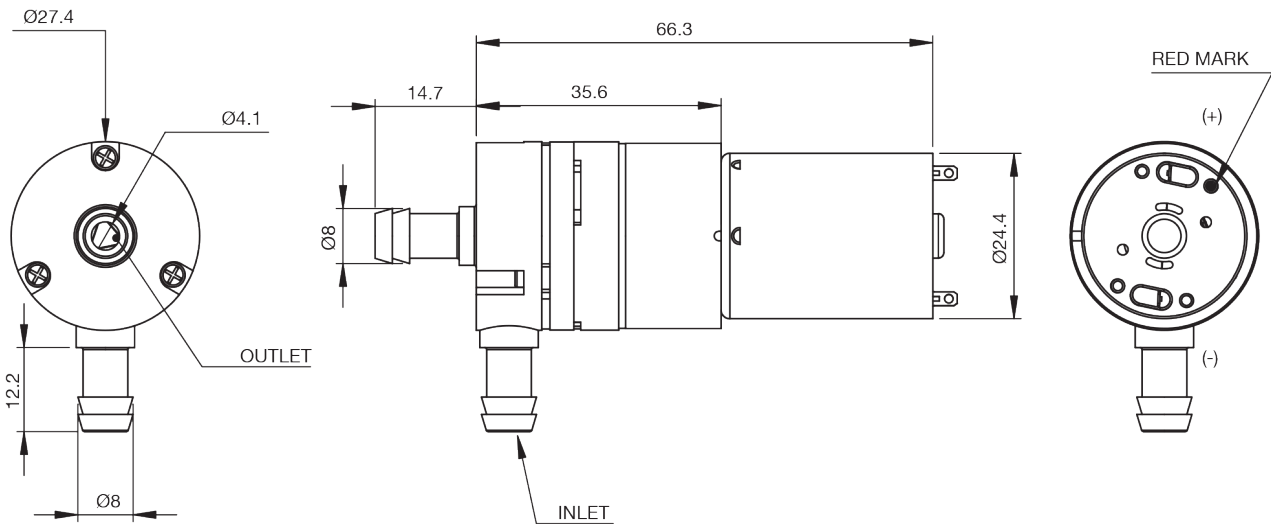
77

PUMP MOTOR | Ø27

Water Type



unit		TPW2761012	TPM2761017					
Parameters								
Nominal Voltage	V	12	18					
Medium		Water	Water					
Free Flow	ml/min	>1000	410					
Max. Current	mA	<1000	<600					
Max. Pressure	Bar	>2	-					
Noise	dB	<65	<65					
Others								
Life Test	10,000 times (DC12V/18V; 1cycle: on 1min, off 1min)							
Working Environment	0~95°C,80%RH							

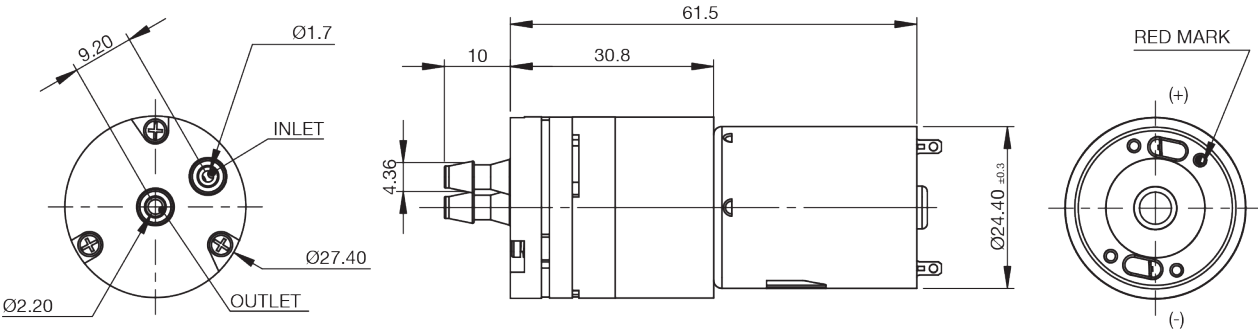


PUMP MOTOR | Ø27

Water Type



unit		TPW2761015	TPW2761016	TPW2761025	TPW27610024	TPW2761001	TPW2761019	
Parameters								
Nominal Voltage	V	12	12	12	12	24	24	
Medium		Water	Water	Water	Water	Water	Water	
Free Flow	ml/min	620	450	620	700	620	700	
Max. Current	mA	280	200	280	350	150	180	
Max. Pressure	Bar	>2	>0.5	>2	>2.5	>2	>2.5	
Noise	dB	<55	<55	<55	<60	<55	<60	
Others								
Life Test	10,000 times (DC12V / 24V; 1cycle: on 2min, off 1min)							
Working Environment	0~95°C, 75%RH							



PRODUCT CATALOG 2018

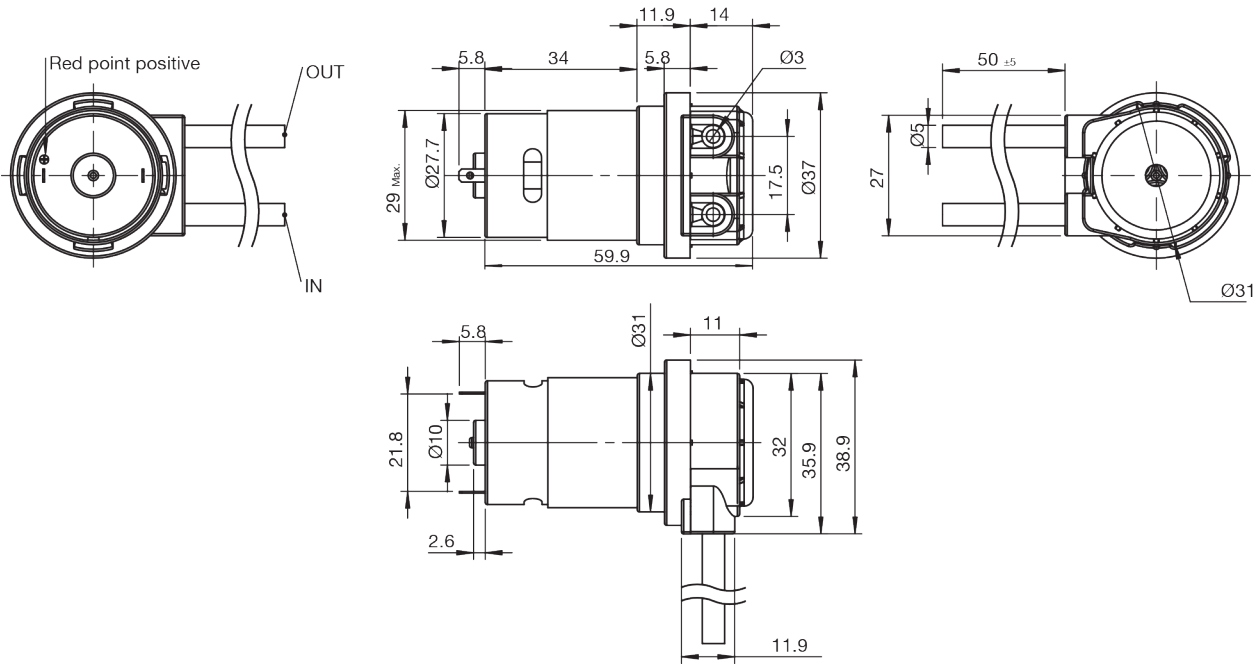
79

PERISTALTIC PUMP MOTOR | Ø28

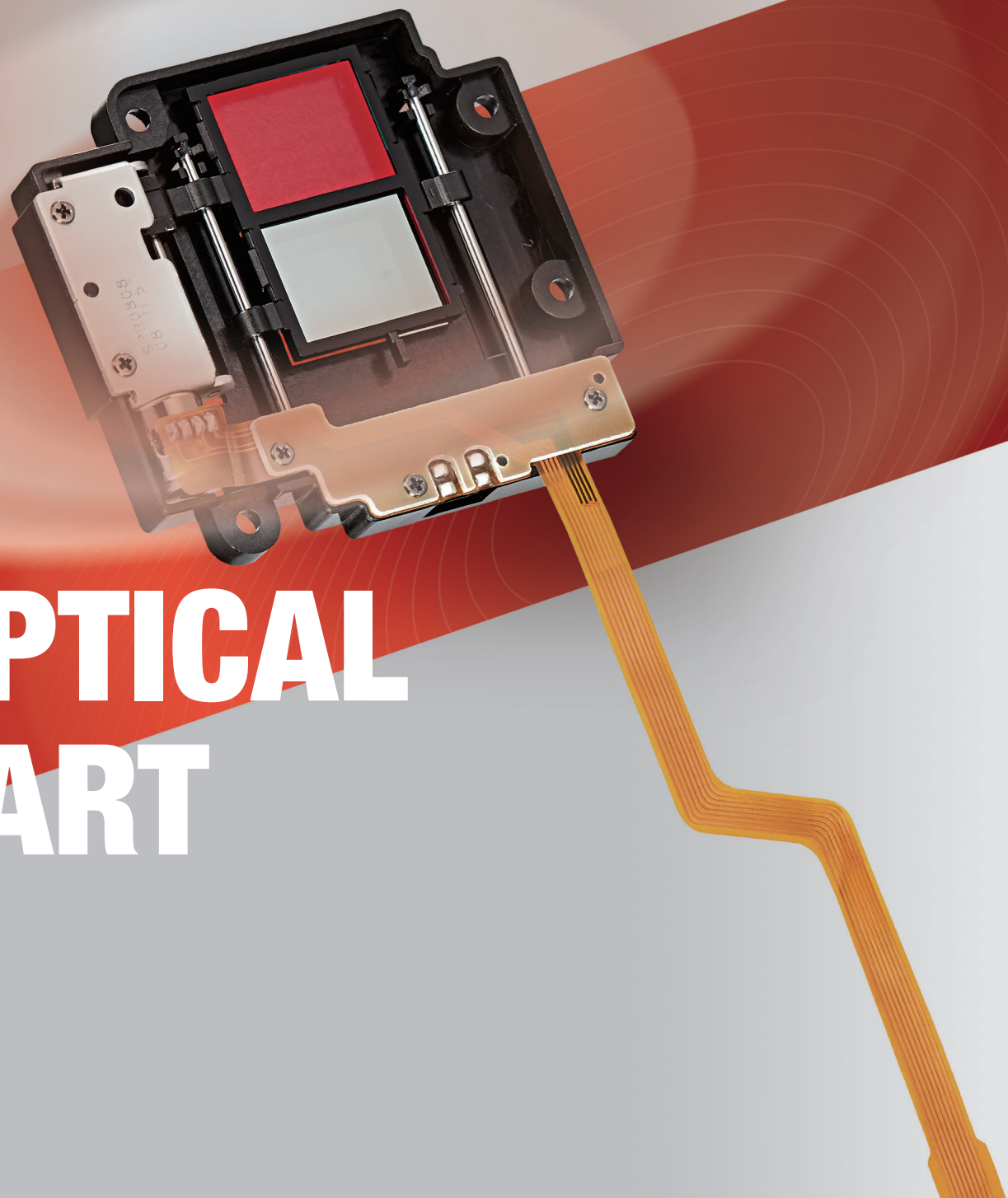
Water Type



unit		TPV2861001						
Parameters								
Nominal Voltage	V	6						
Medium		Water						
Free Flow	ml/min	80~110						
Max. Current	mA	<500						
Max. Pressure	Bar	>1						
Noise	dB	<60						
Others								
Life Test		200,000 times (DC6V; 1cycle: on 3s, off4s)						
Working Environment		0~60°C,80%RH						

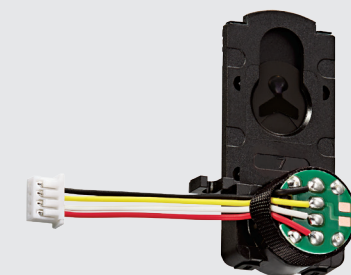


OPTICAL PART

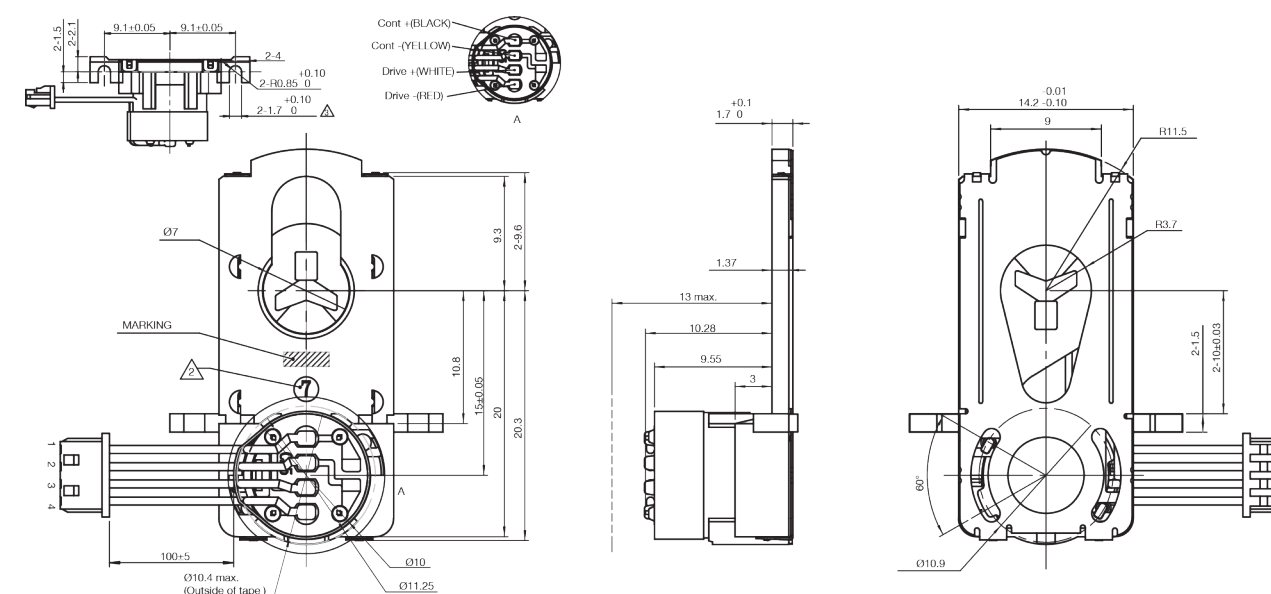


OPTICAL PART

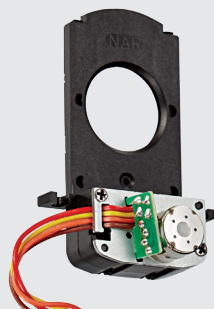
IRIS



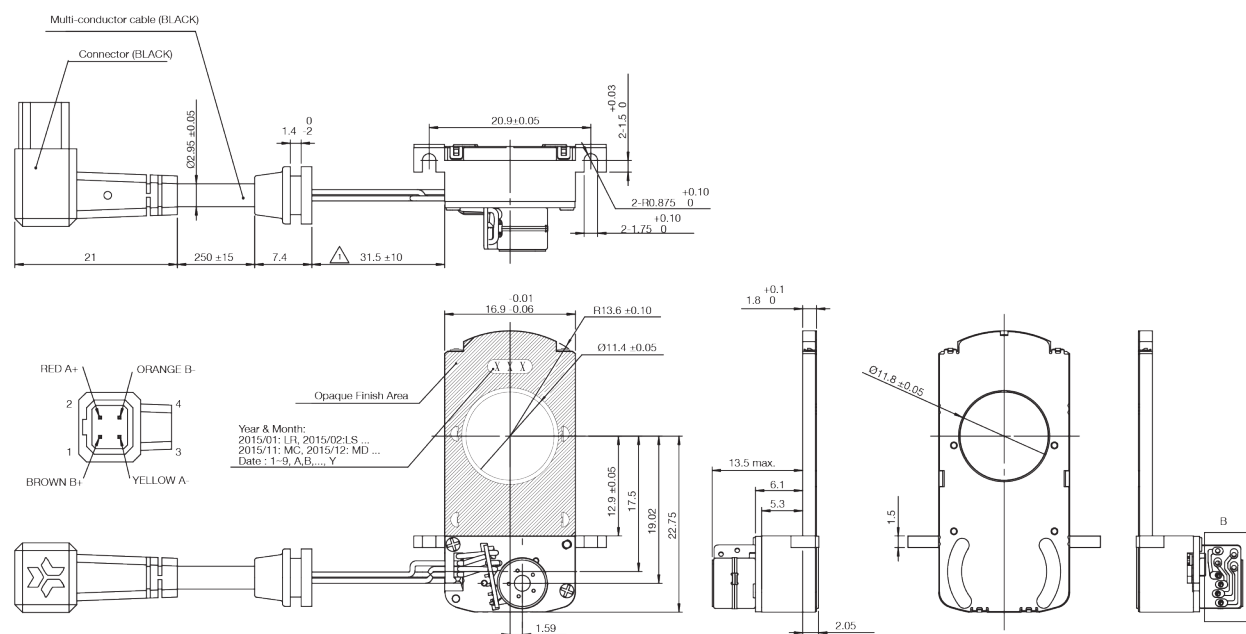
unit		PSI0700032	PSI32000041	PSI1800004				
		SA23210	SA23141	SA23224X				
Electrical Characteristic								
Max. Open Voltage	V	3.0	3.0	3.5				
Min. Close Voltage	V	0.5	0.5	0.5				
Driving Voltage	V	6	6	6				
Braking Resistance	Ω	190	190	190				
Driving Resistance	Ω	465	560	465				
Main Characteristic								
Engine Type		Solenoid	Solenoid	Solenoid				
Driving Mode		-	-	-				
Aperture Diameter	mm	6.7	7.0	20.1				



Precise-IRIS



unit		AON1100001	AON1600001	AON0900009				
		PI020	PI021	PI031				
Electrical Characteristic								
Voltage	V	3.3	3.3	3.3				
Driving Voltage	V	3.3	3.3	3.3				
Resistance	Ω	30	30	28.5				
Main Characteristic								
Engine Type		Solenoid	Stepping Motor	Solenoid				
Driving Mode		2-2	2-2	2-2				
Aperture Diameter	mm	11.4	16.0	8.0				

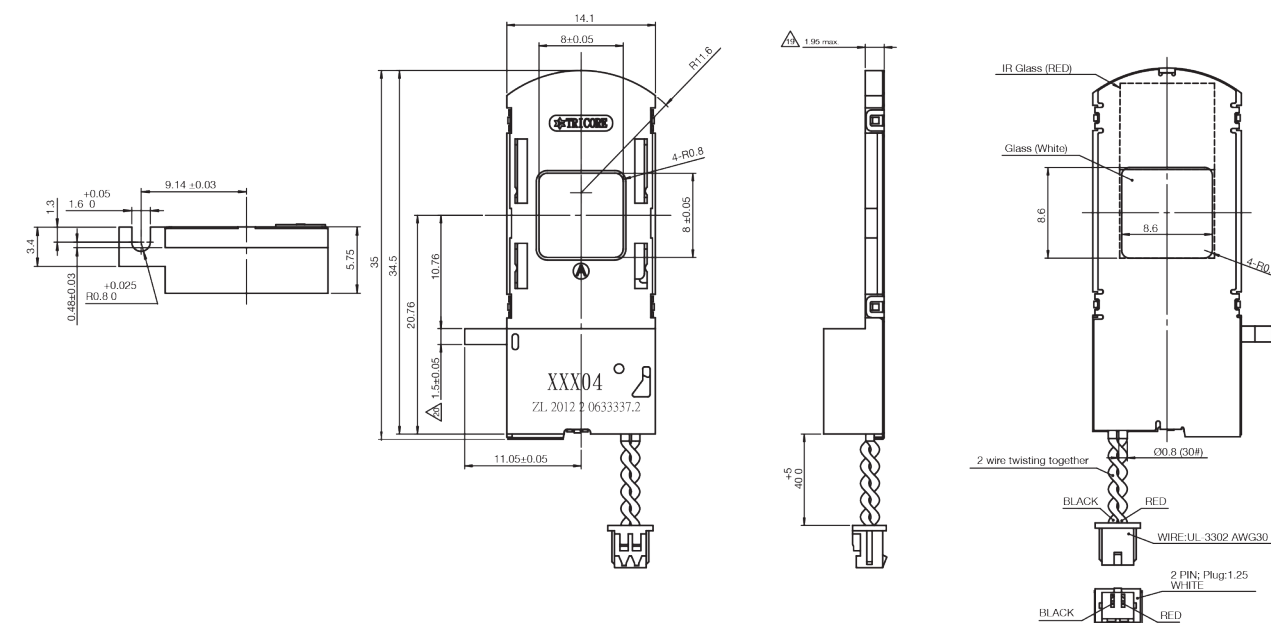


OPTICAL PART

IR-Cut

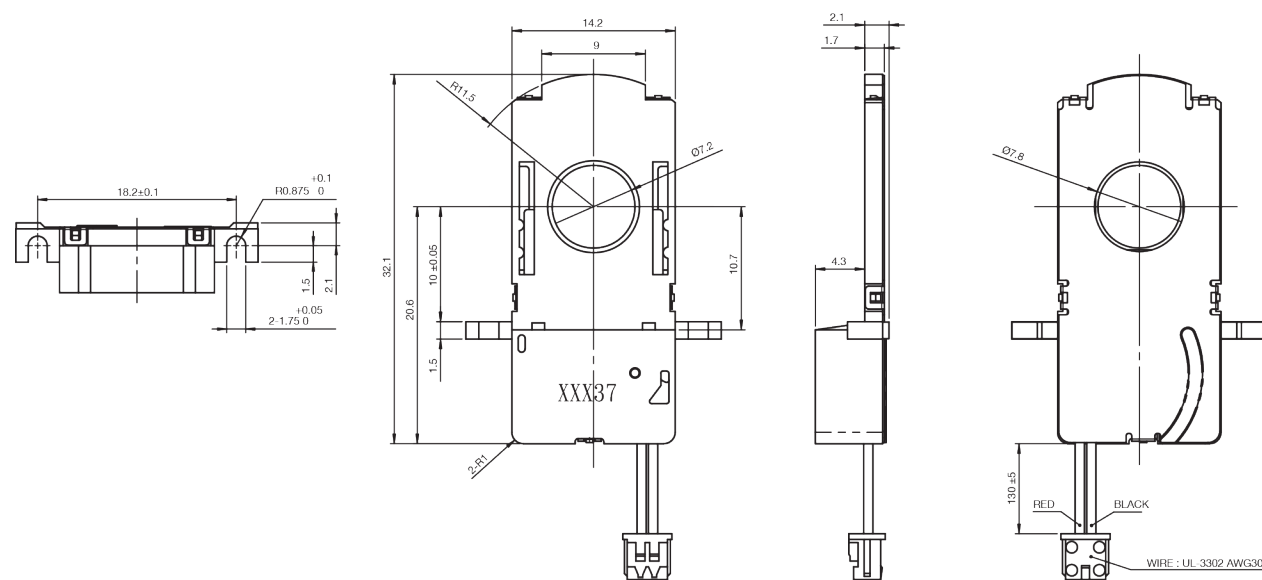


unit		AOF0700029	AOF0800019	AOF0800093	AOF0800119	AOF0800127	AOF0800129	PSR0500010
		PE317	PE148	PE246	PE286	PE298	PE299	PE004
Electrical Characteristic								
Voltage	V	3.5~5	3.6	3.6~5.0	3.5~5.0	3.6~5.0	3.0~4.5	3.6~5.0
Driving Voltage	V	3.3	3.3	3.3	3.3	3.3	3.3	3.3
Resistance	Ω	25	25	25	25	25	20	25
Main Characteristic								
Engine Type		Solenoid	Solenoid	Solenoid	Solenoid	Solenoid	Solenoid	Solenoid
Driving Mode		-	-	-	-	-	-	-
Aperture Diameter	mm	7*7	8*8	8*8	7*7	8*8	8*8	8*8





unit		PSR3200011	PSR3000017				
		PE037	PE053				
Electrical Characteristic							
Voltage	V	3.0~5.0	3.5				
Driving Voltage	V	3.3	3.3				
Resistance	Ω	25	25				
Main Characteristic							
Engine Type		Solenoid	Solenoid				
Driving Mode		-	-				
Aperture Diameter	mm	7.2	6.5				



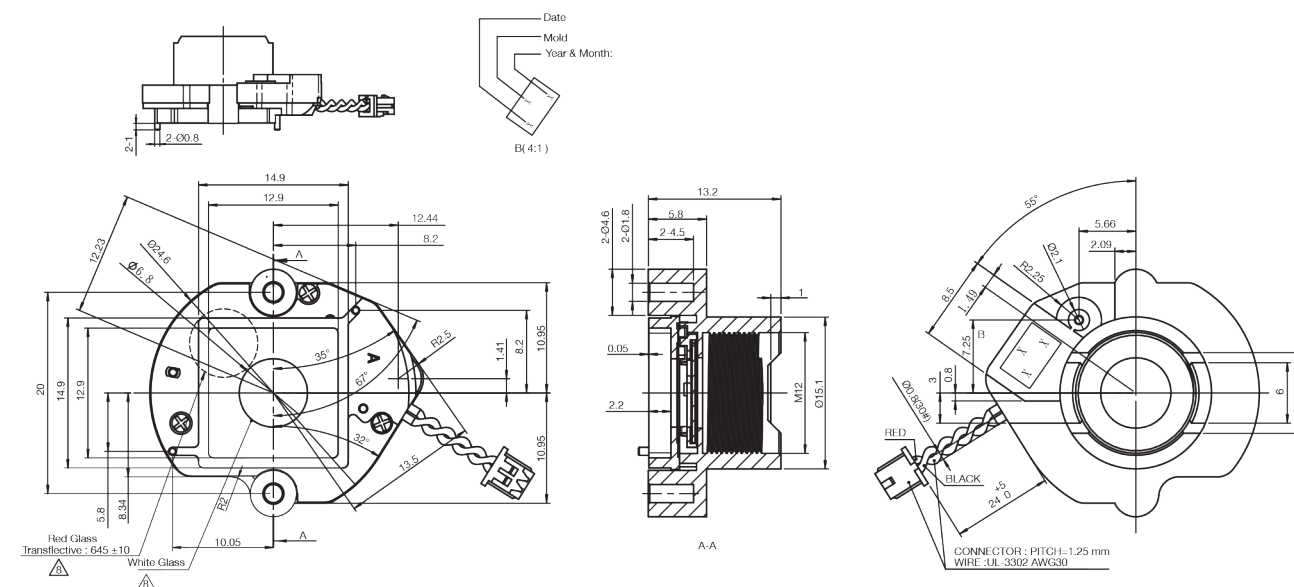
OPTICAL PART

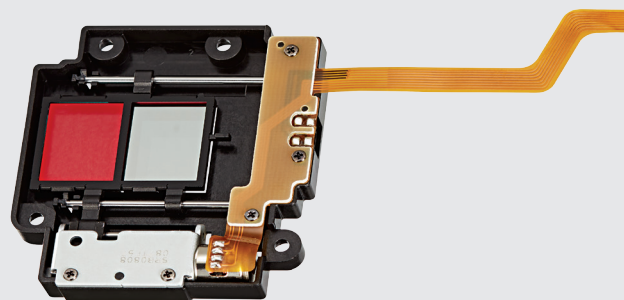
IR-Cut

(SWING TYPE)

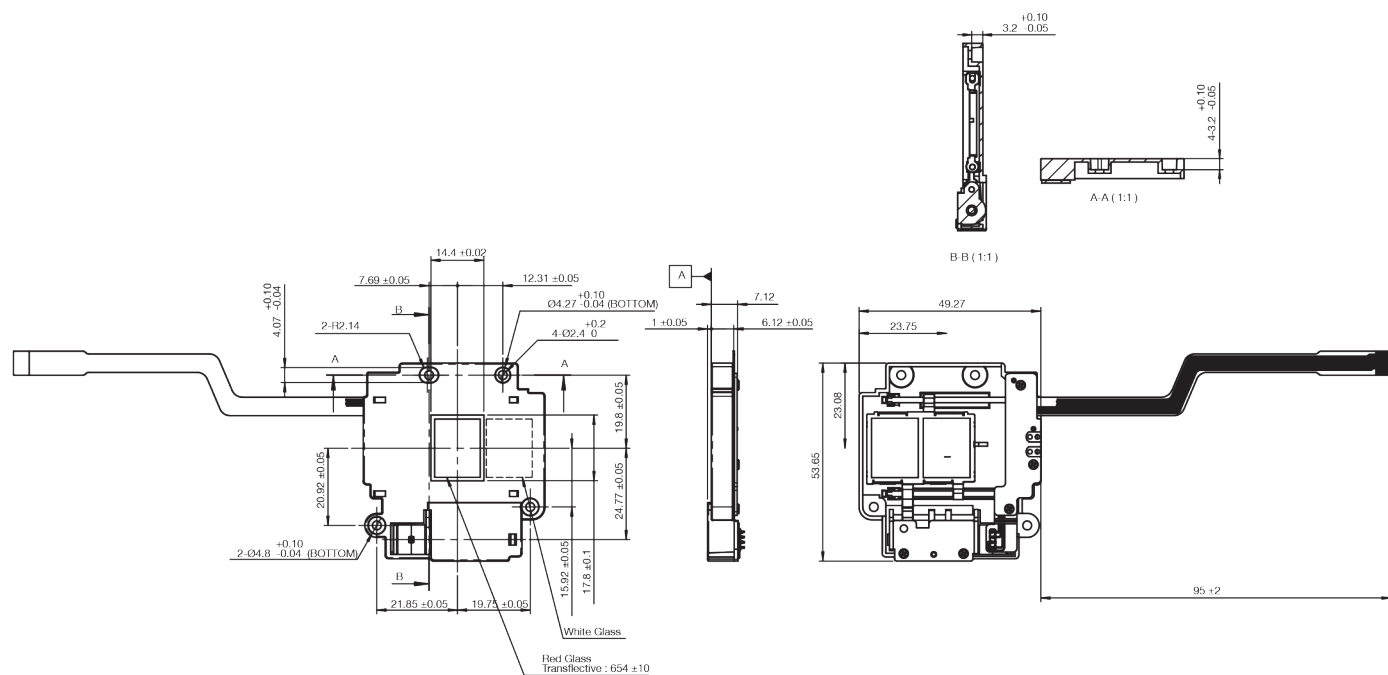


unit		AOF0700004	AOF0800100				
		PE127	PE258				
Electrical Characteristic							
Voltage	V	4.0	3.0				
Driving Voltage	V	3.3	-				
Resistance	Ω	25	15				
Main Characteristic							
Engine Type		Solenoid	Solenoid				
Driving Mode		-	-				
Aperture Diameter	mm	6.8	6.8				





unit		AOF1400001					
		PE232					
Electrical Characteristic							
Voltage	V	3.0~5.0					
Driving Voltage	V	3.3					
Resistance	Ω	20					
Main Characteristic							
Engine Type		Stepping Motor					
Driving Mode		2-2					
Aperture Diameter	mm	12.4*15.8					

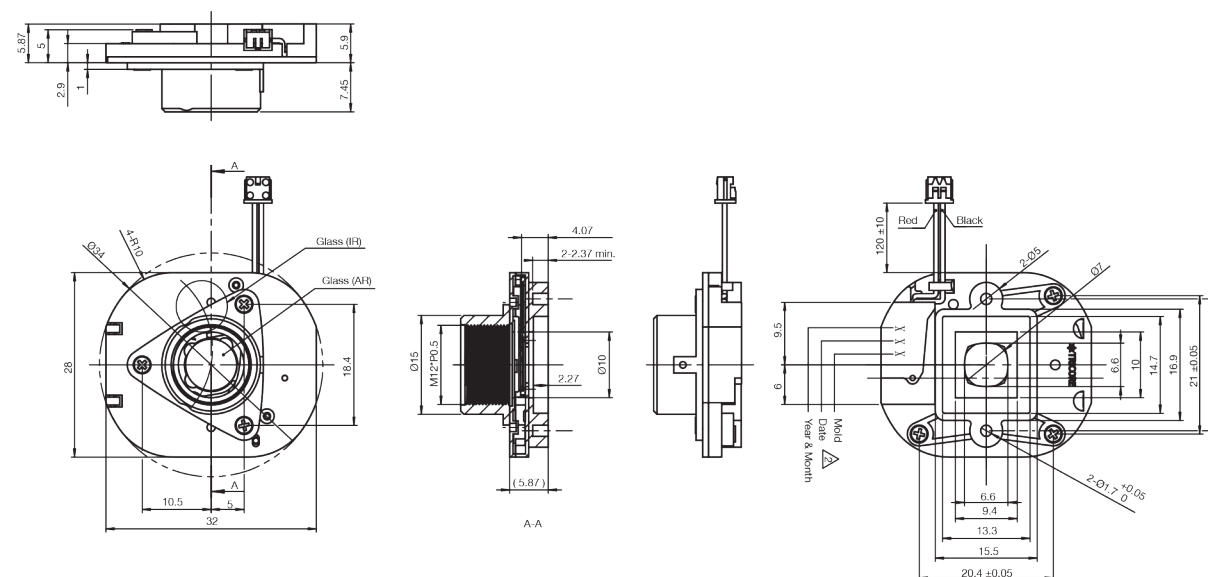


OPTICAL PART

IR-Cut



unit		PSR3200008					
		PE022					
Electrical Characteristic							
Voltage	V	6					
Driving Voltage	V	-					
Resistance	Ω	60					
Main Characteristic							
Engine Type		Solenoid					
Driving Mode		-					
Aperture Diameter	mm	6.6					

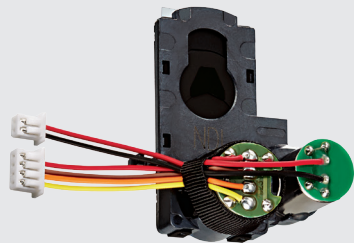


89

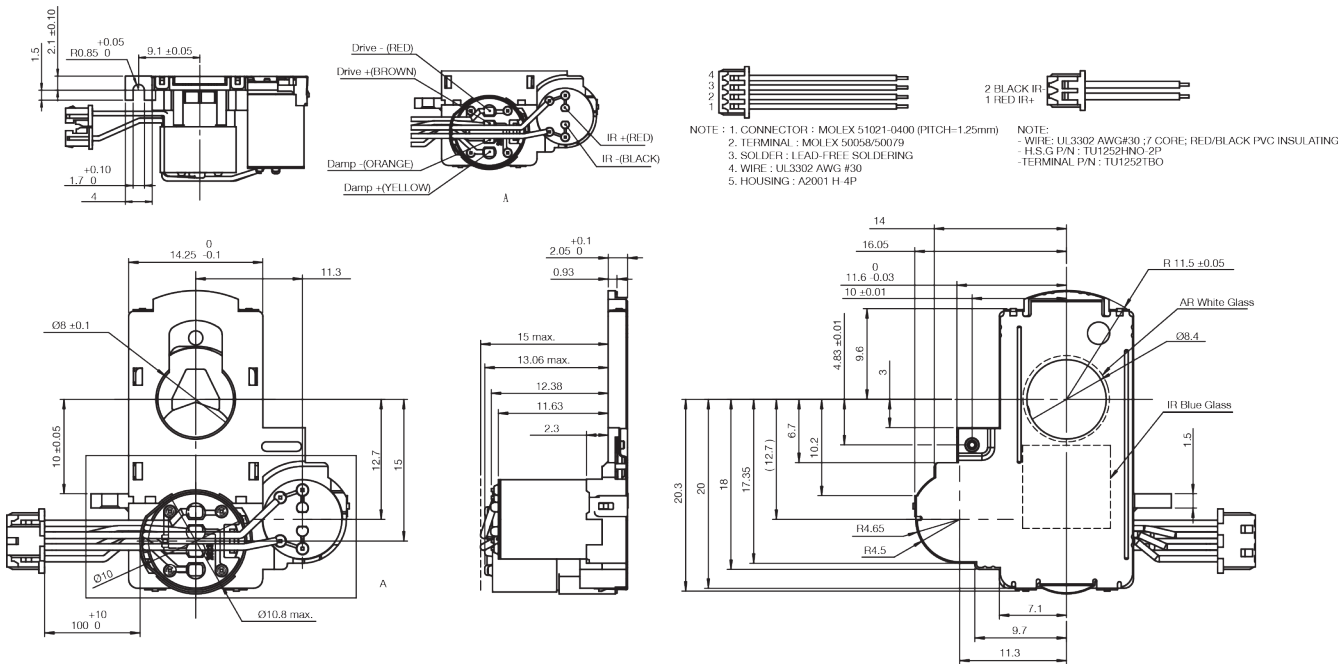
OPTICAL PART

IRIS & IR-Cut

(TWIN ENGINE TYPE)



unit	PSI4400010	PSI1300005	PSI0800029				
	DE018	DE104	DG005X				
Electrical Characteristic							
Max. Open Voltage	V	3.0	3.0	3.0			
Min. Close Voltage	V	0.5	0.5	0.5			
Driving Voltage	V	6	6	6			
Braking Resistance	Ω	190	120	190			
Driving Resistance	Ω	855	120	855			
Main Characteristic							
Engine Type	Solenoid	Solenoid	Solenoid				
Driving Mode	-	-	-				
Aperture Diameter	mm	7.0	13.6	8.0			

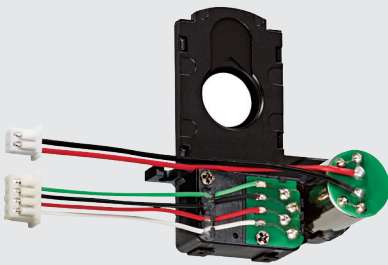


90

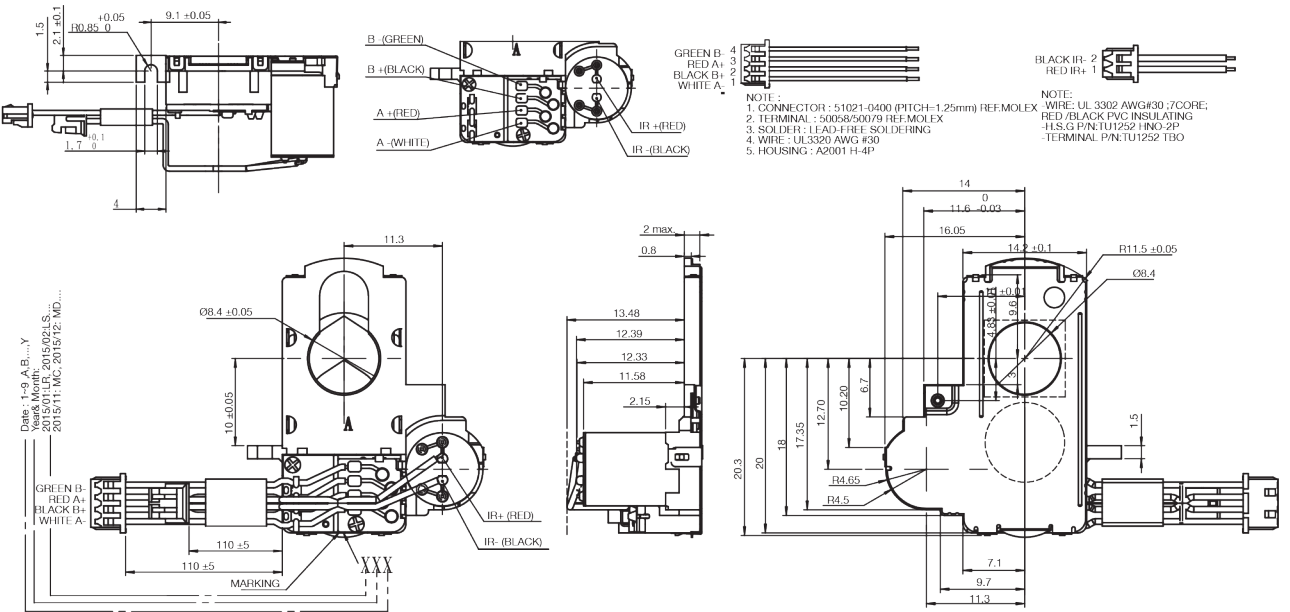
OPTICAL PART

IRIS & IR-Cut

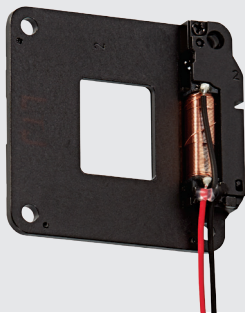
(TWIN ENGINE TYPE)



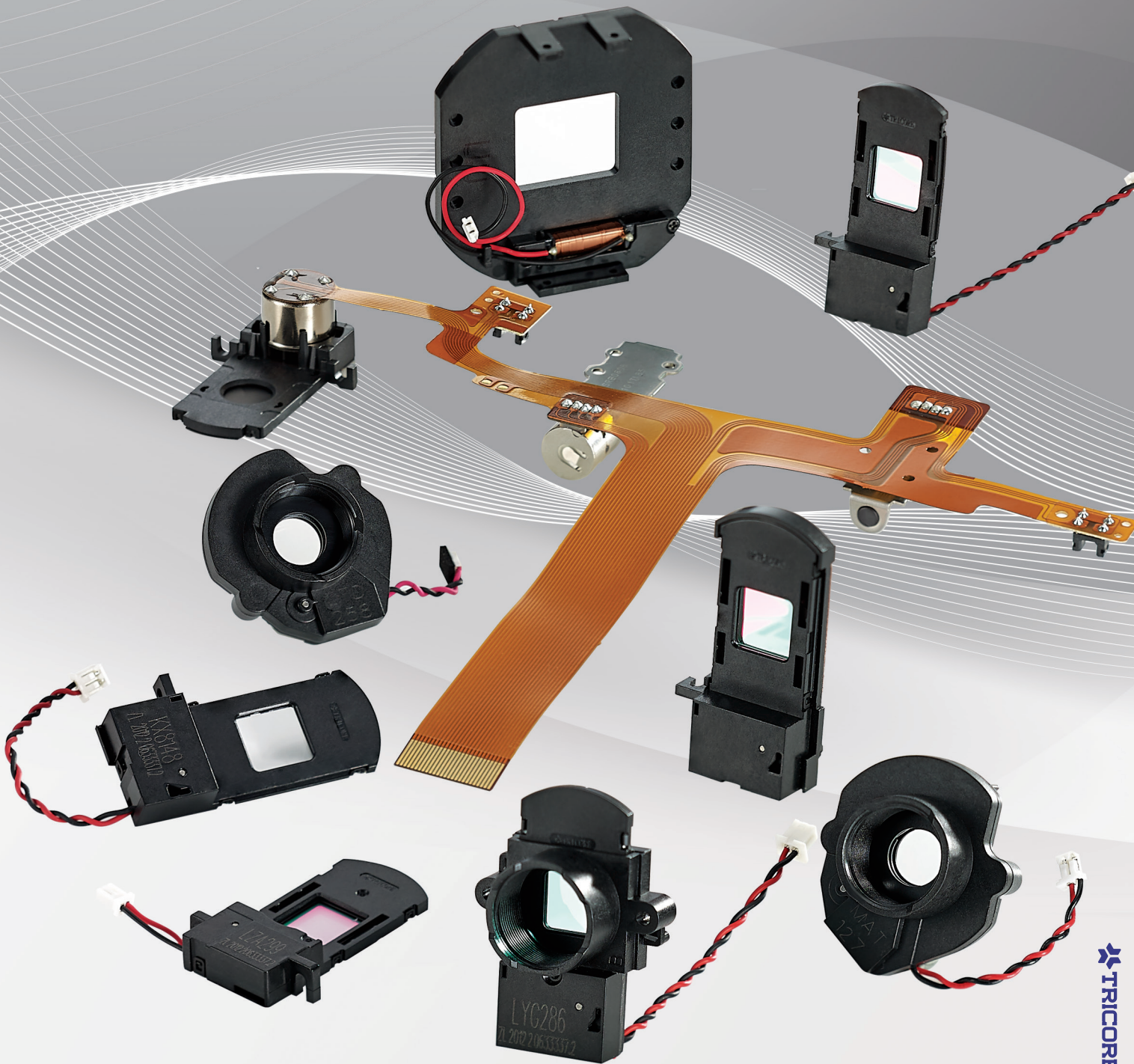
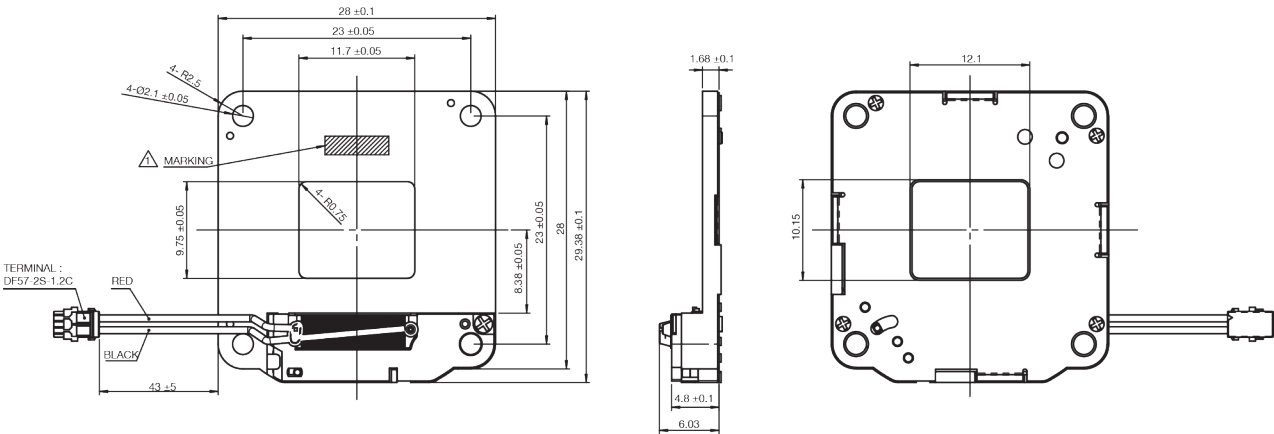
unit	AON0800007	AON0800008	AON0800010				
	PI032X	PI033X	PI040X				
Electrical Characteristic							
Voltage	V	3.3	3.3	3.3			
Driving Voltage	V	3.3	3.3	3.3			
Resistance	Ω	28.5	28.5	28.5			
Main Characteristic							
Engine Type	Solenoid	Solenoid	Solenoid				
Driving Mode	2-2	2-2	2-2				
Aperture Diameter	mm	8.0	8.0	6.9			

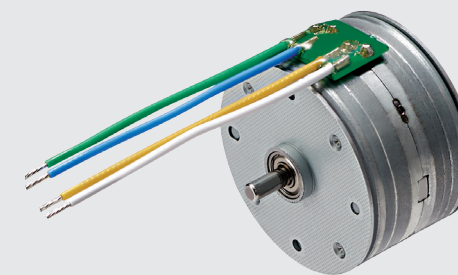
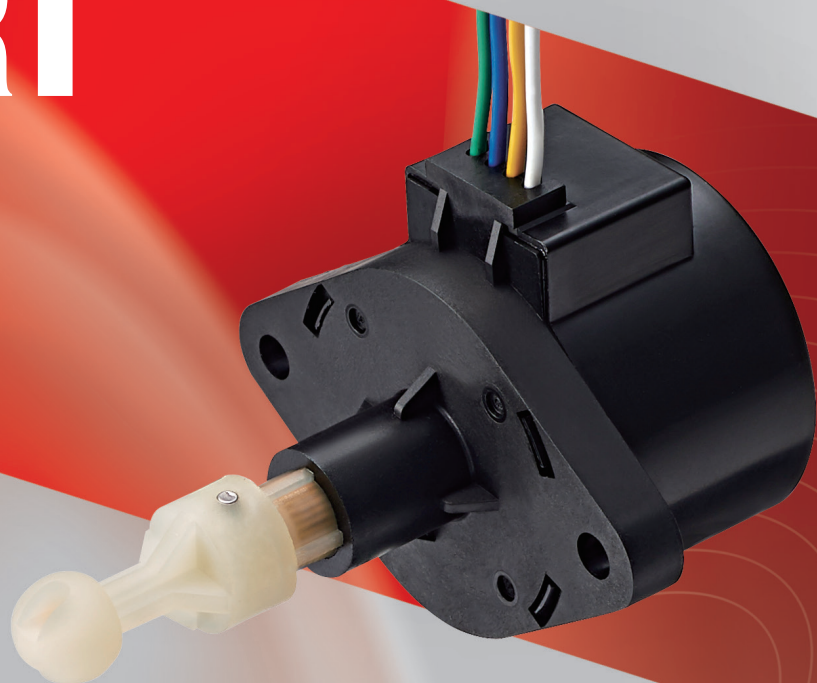
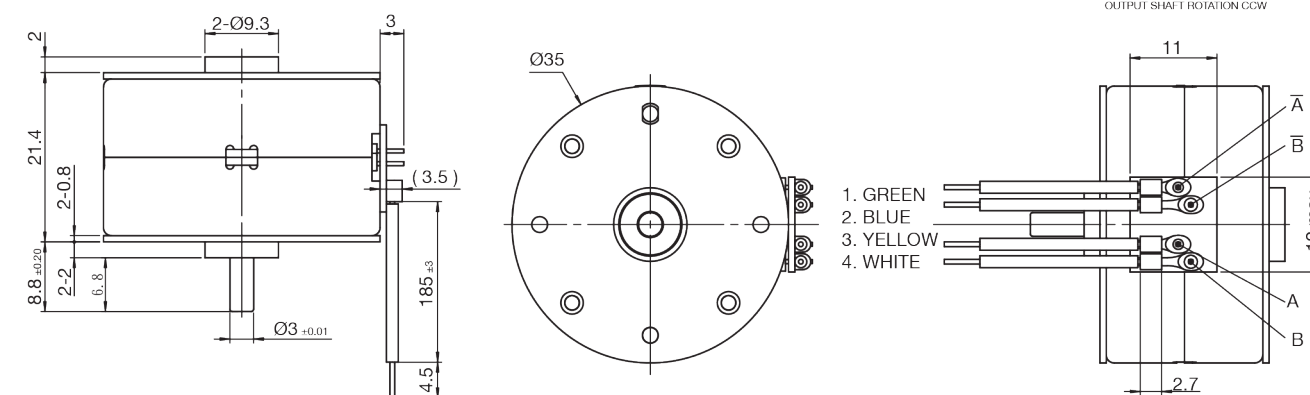
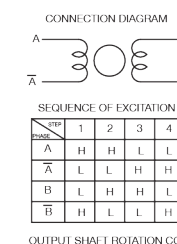


Thermal Shutter

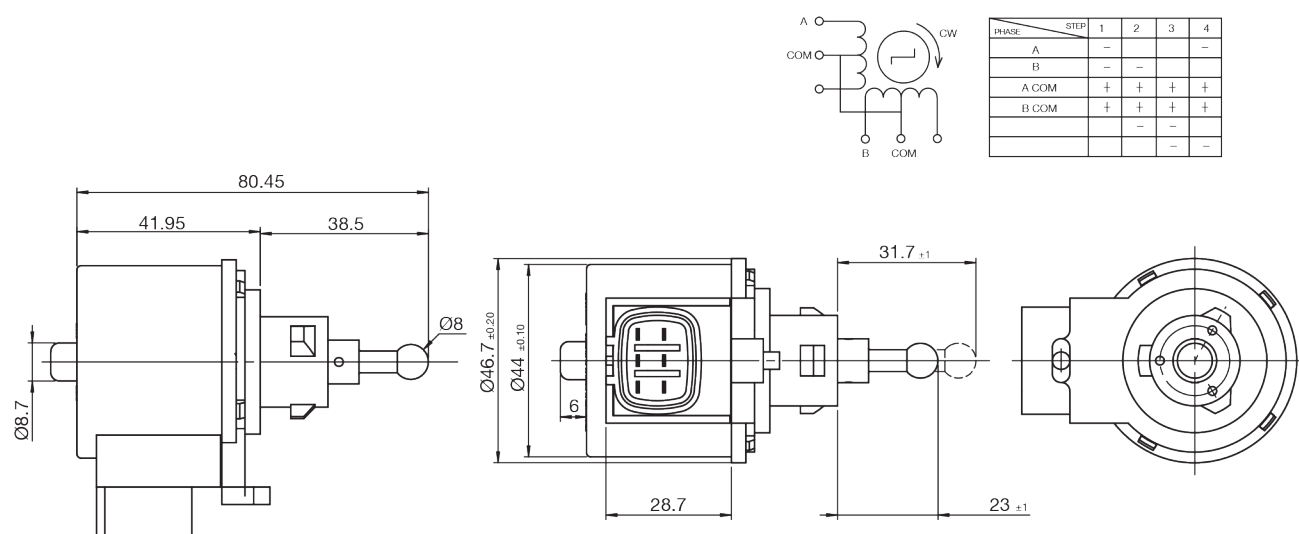


unit		AHB1600001	AHB1200004				
		SU040	SU055				
Electrical Characteristic							
Voltage	V	3.3	3.3				
Resistance	Ω	13	13				
Main Characteristic							
Motor Type		Rotary Solenoid	Rotary Solenoid				
Driving Mode		-	-				
Shutter Speed	ms	40	40				
Aperture Diameter	mm	13.0*15.6	11.7*9.75				



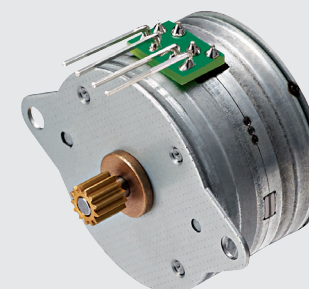
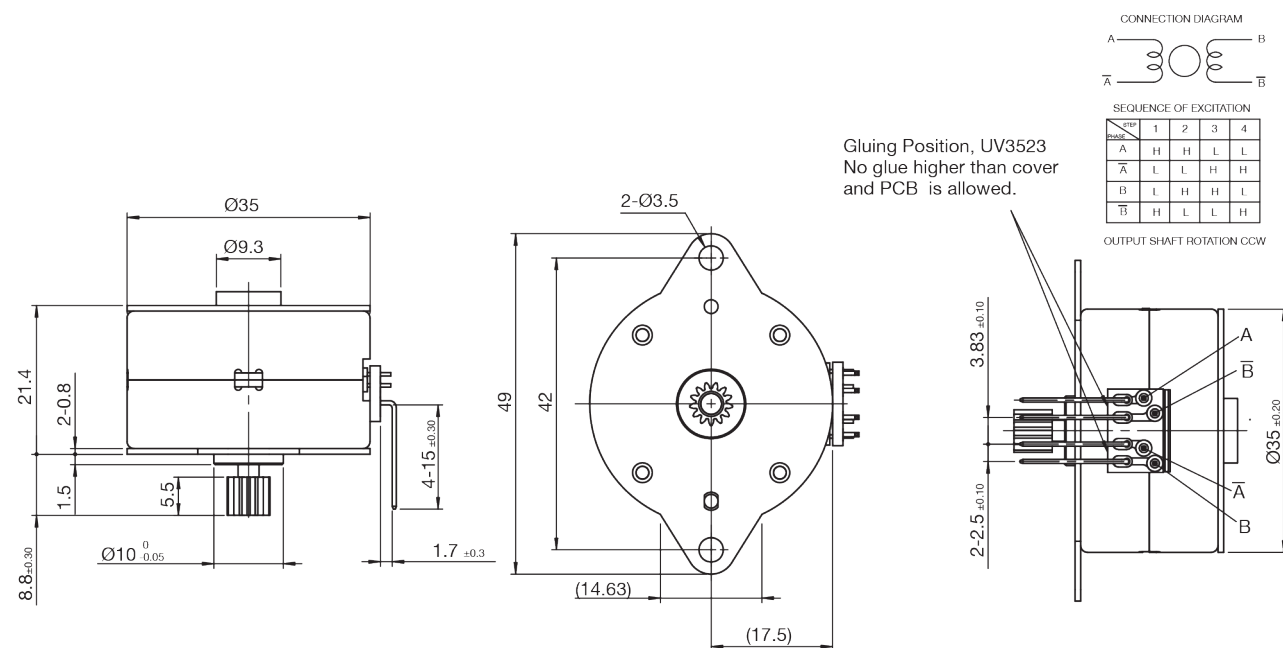
[illegible]

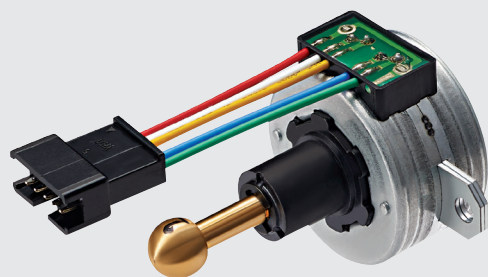
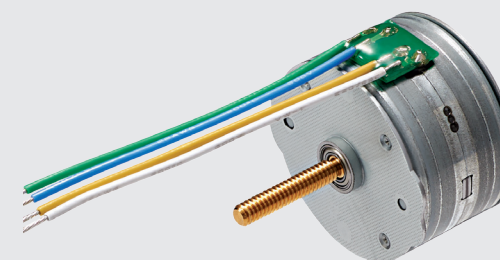
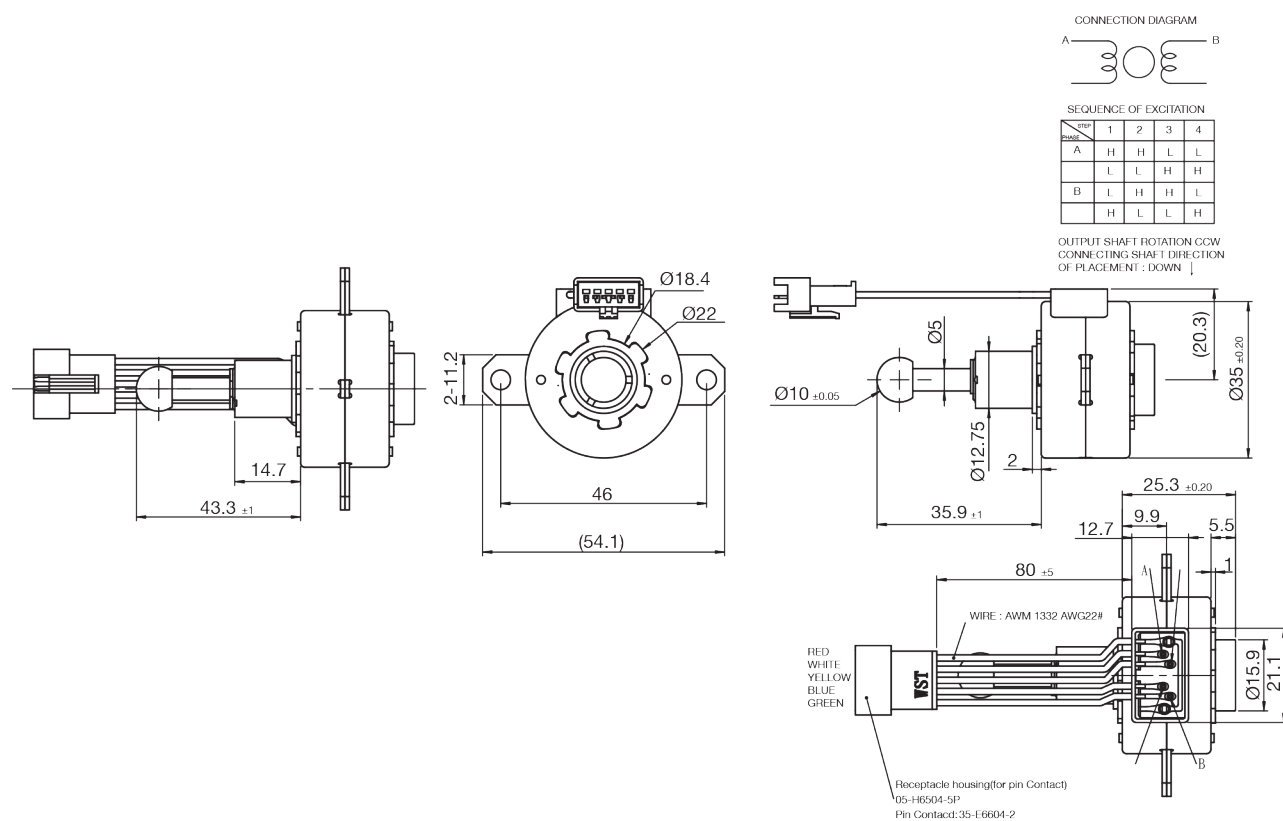
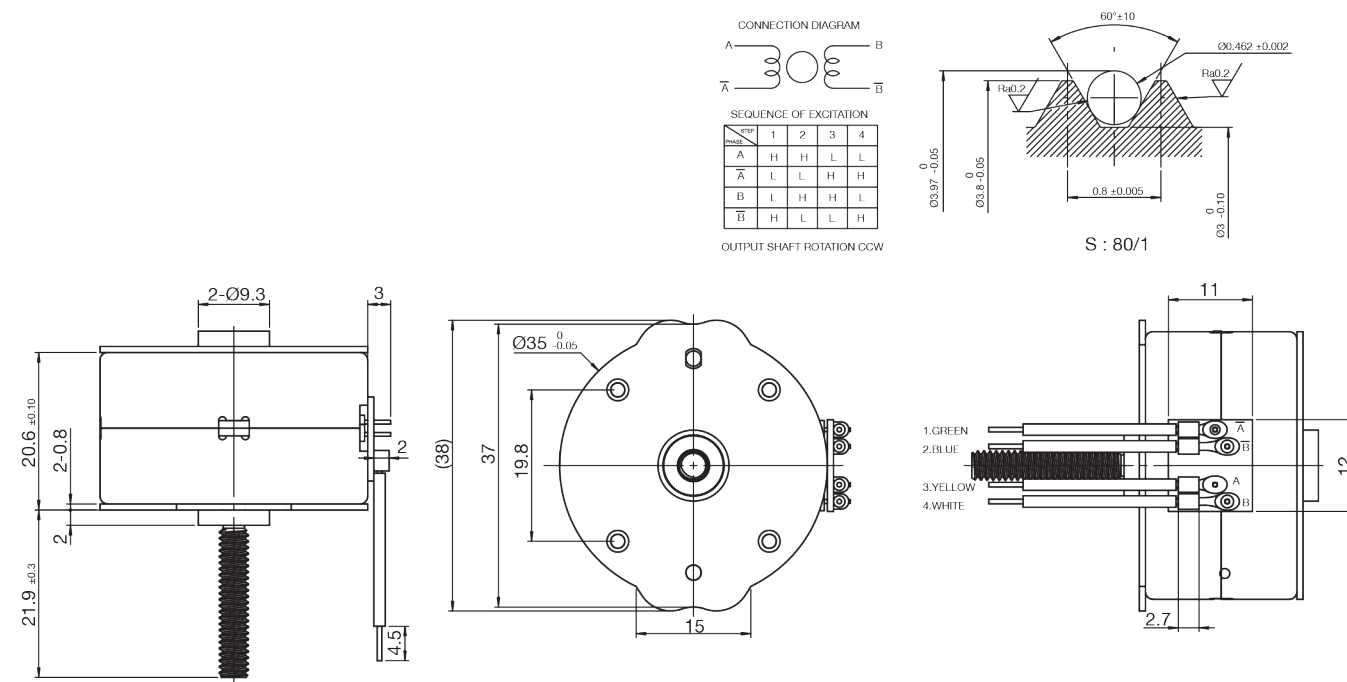
Stepping Motor

[illegible]

AUTOMOTIVE PART | Pinion Gear

Stepping Motor

[illegible]

[illegible][illegible]

99 AUTOMOTIVE PART | Leadscrew
Stepping Motor

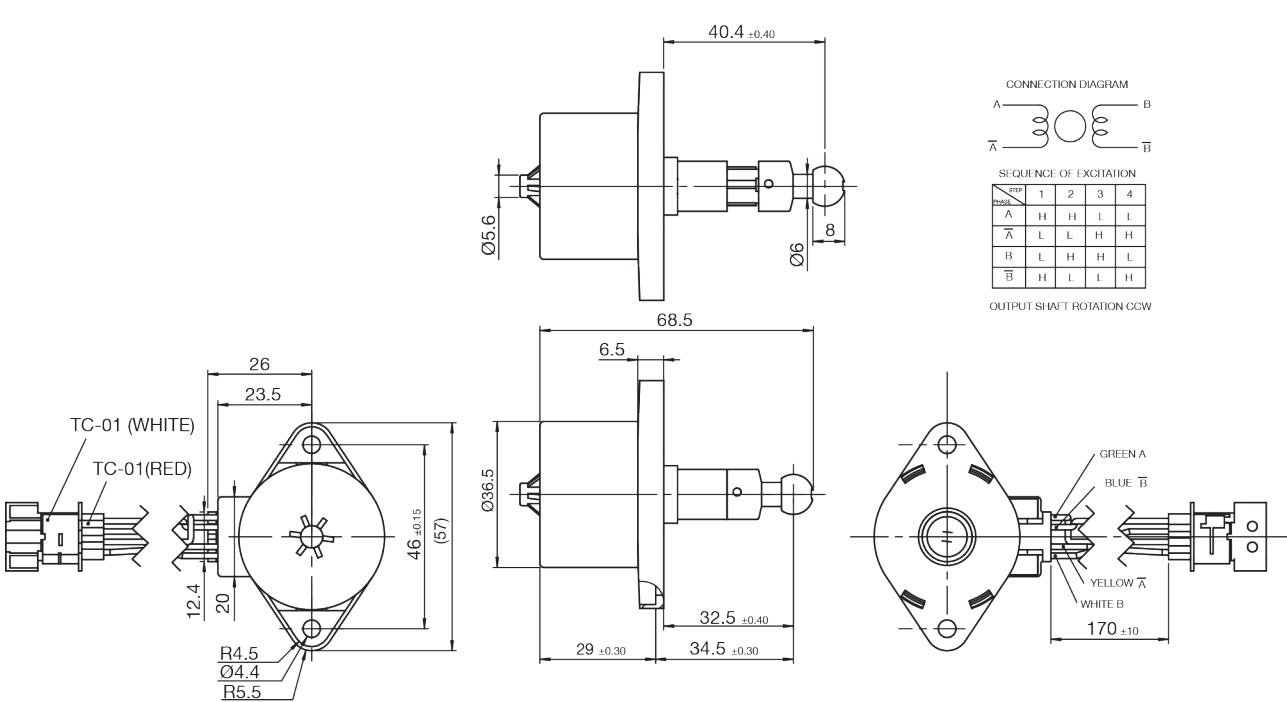
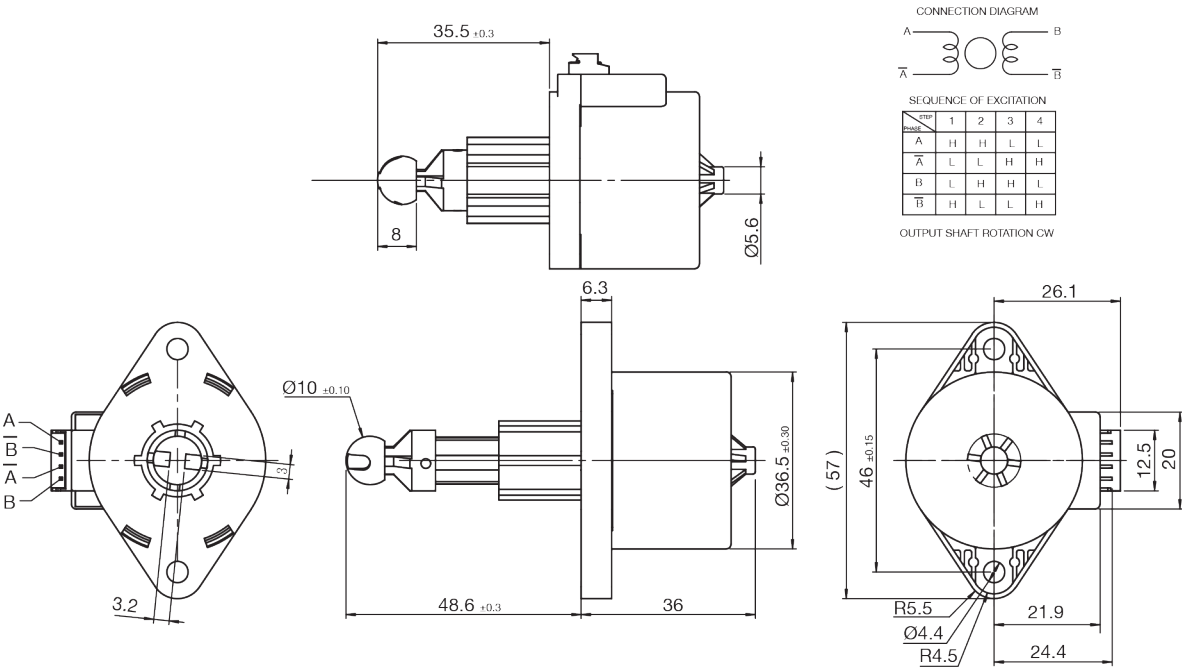


unit		SRL3524001	SRL3524003	SRL3524007	SRL3524013	SRL3524014	SRL3524015
Electrical Characteristic							
Nominal Voltage	V	12.8	12.0	12.8	12.8	12.8	12.8
Operating Range	V	9.0~16.0	9.0~16.0	9.0~16.0	9.0~16.0	9.0~16.0	9.0~16.0
Storage Temperature Range	°C	-40~120	-25~100	-40~120	-40~120	-40~120	-40~120
Operating Temperature Range	°C	-40~105	-25~85	-40~105	-40~105	-40~105	-40~105
Step Angle	°/Step	15	15	15	15	15	15
Nominal Frequency	PPS	400	450	400	400	400	400
Max. Starting Frequency	PPS	400	450	400	400	400	400
Push Force	kg	3.0	10.0	3.0	3.0	3.0	3.0

AUTOMOTIVE PART | Leadscrew
Stepping Motor



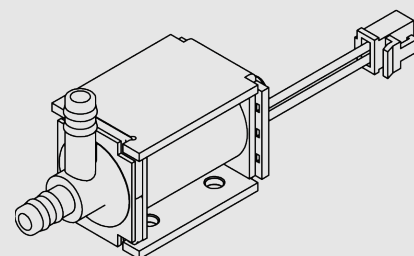
unit		SRL3524017	SRL3524023	SRL4233001
Electrical Characteristic				
Nominal Voltage	V	12.8	12.8	12.8
Operating Range	V	9.0~16.0	9.0~16.0	9.0~16.0
Storage Temperature Range	°C	-40~120	-40~120	-40~120
Operating Temperature Range	°C	-40~105	-40~105	-40~105
Step Angle	°/Step	15	15	11.25
Nominal Frequency	PPS	300	400	160
Max. Starting Frequency	PPS	400	400	160
Push Force	kg	3.0	3.0	2.0



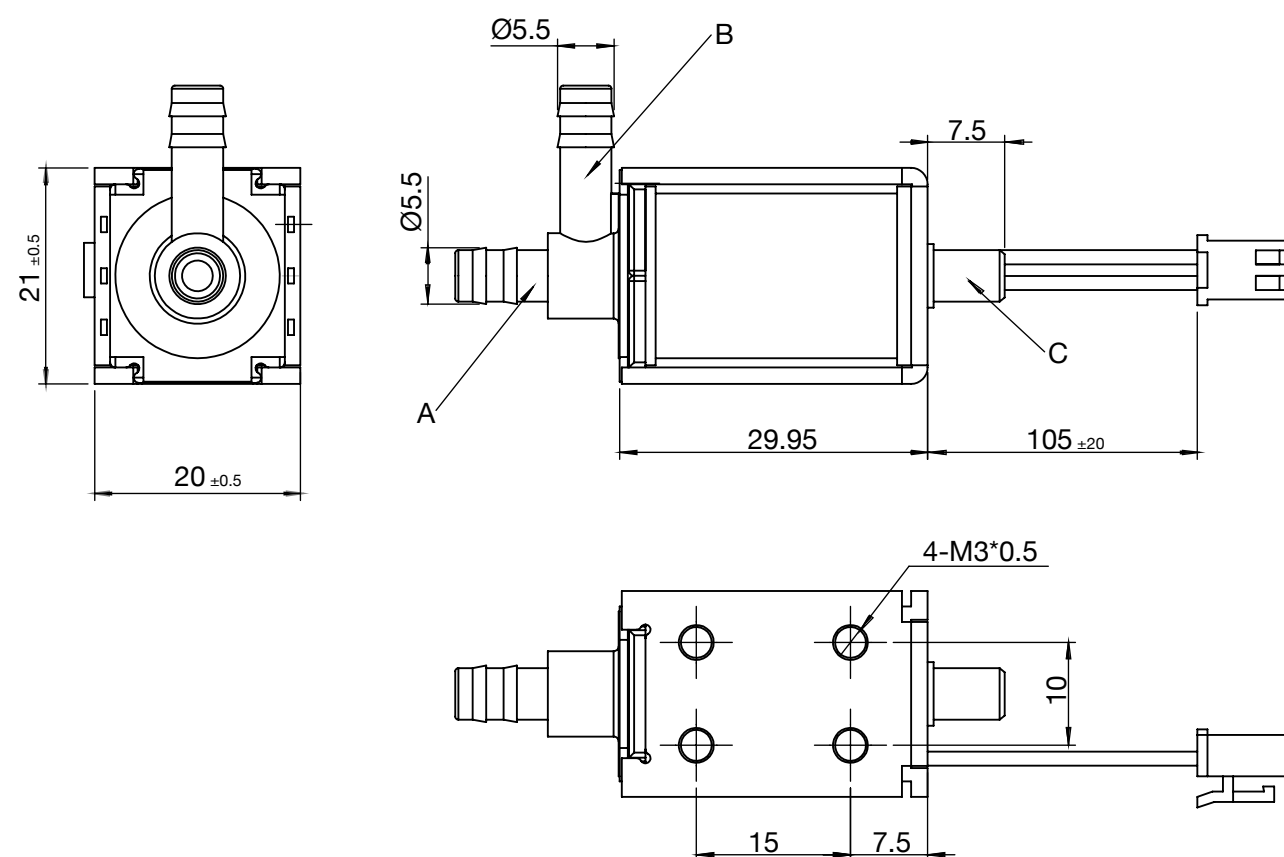
Soleniod

IS19 series

Application I Blood Pressure Meter

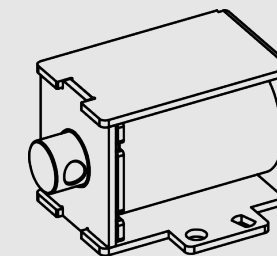
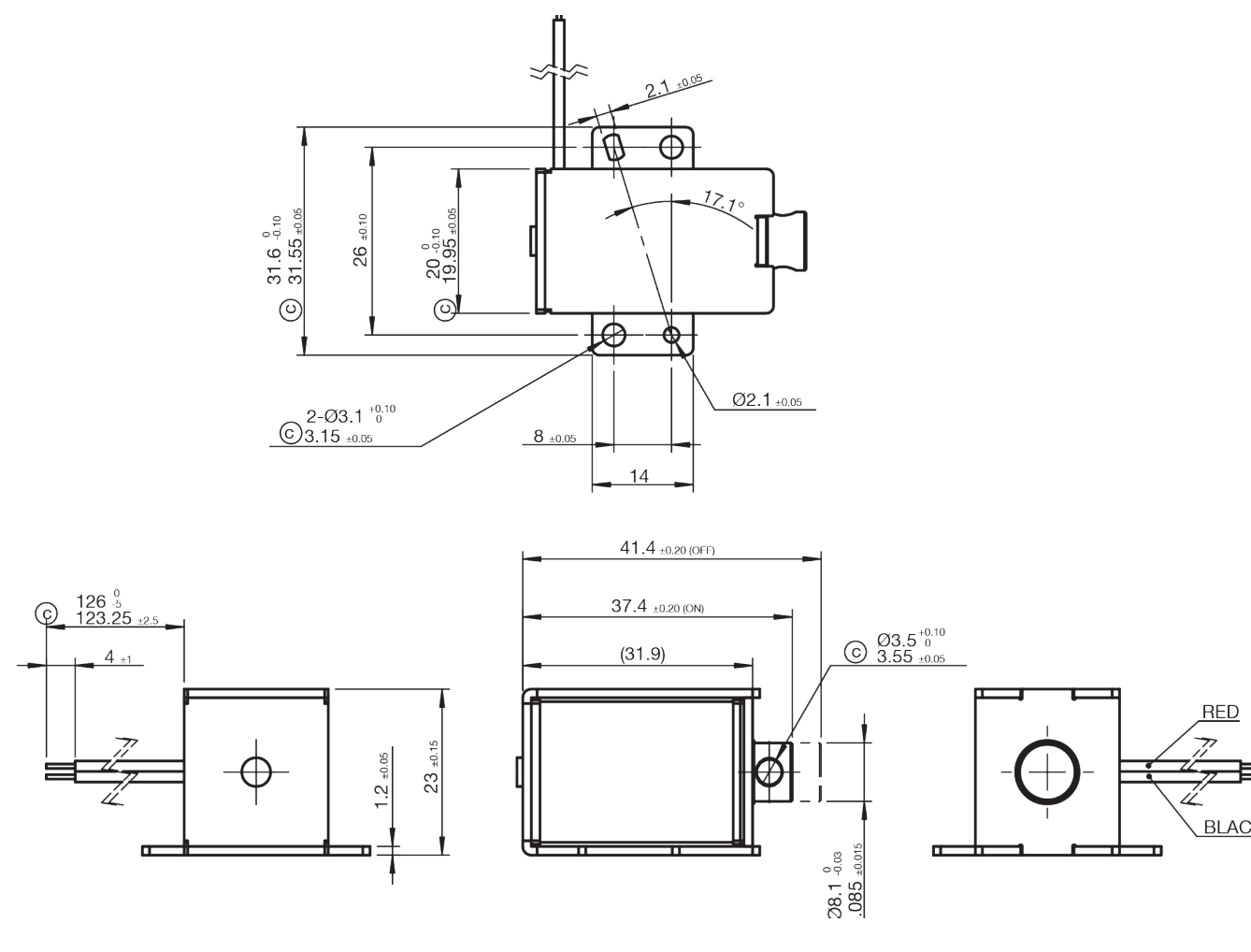


unit		TVC0300001						
Parameters								
Nominal Voltage	V	24						
Medium		Air						
Resistance	Ω	210						
Min. Starting Voltage	V	≤21.6						
Exhaust Velocity	Reduce 300 mmHg to 15mmHg at 500 cc of pneumatic cylinder : ≤ 6.0s							
Others								
Life Test	300,000 times (DC24V; 1cycle: on 0.5s, off 0.5s)							
Working Environment	0~45℃, 40-80%RH							



Soleniod

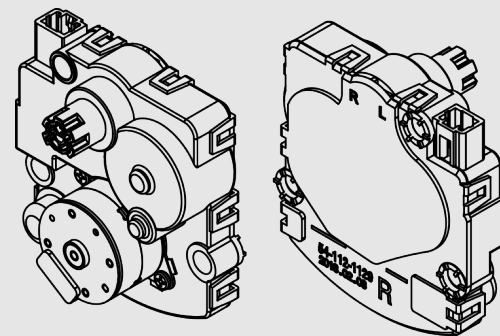
Application I Automotive

[illegible]

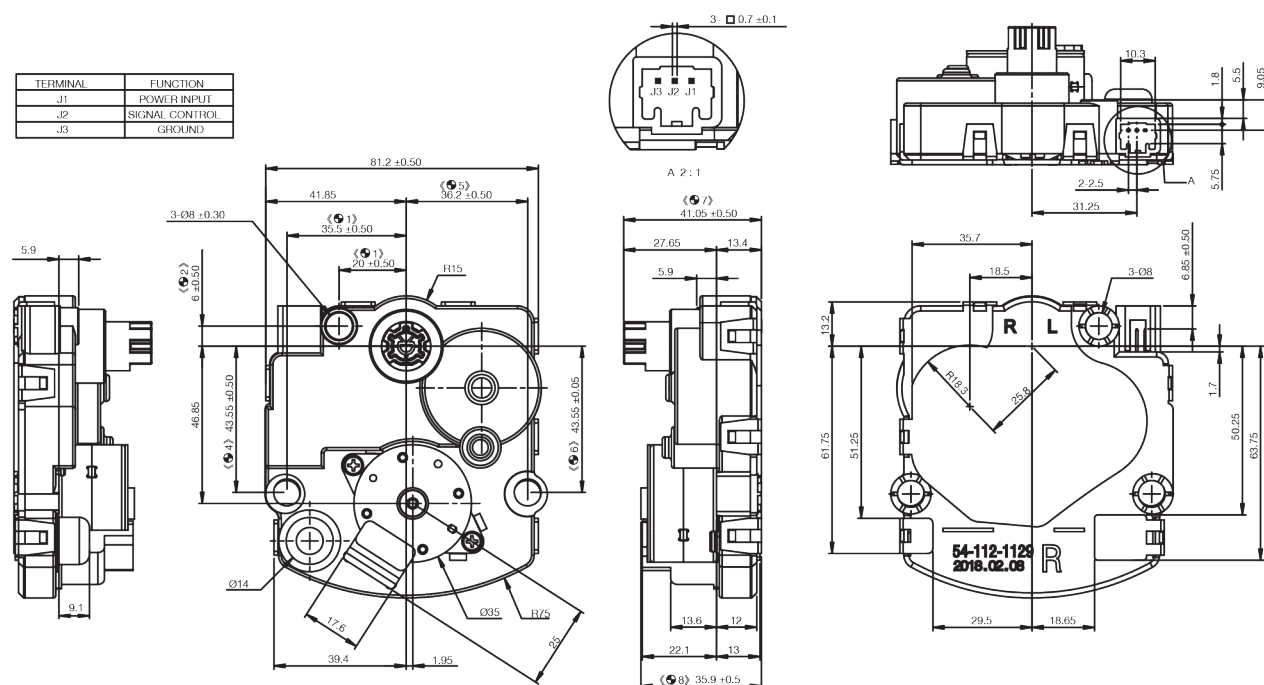
AFS Series

(Adaptive Front-lighting System)

Application | Automotive

[illegible]

TERMINAL	FUNCTION
J1	POWER INPUT
J2	SIGNAL CONTROL
J3	GROUND

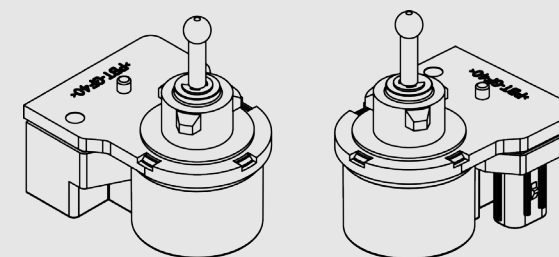
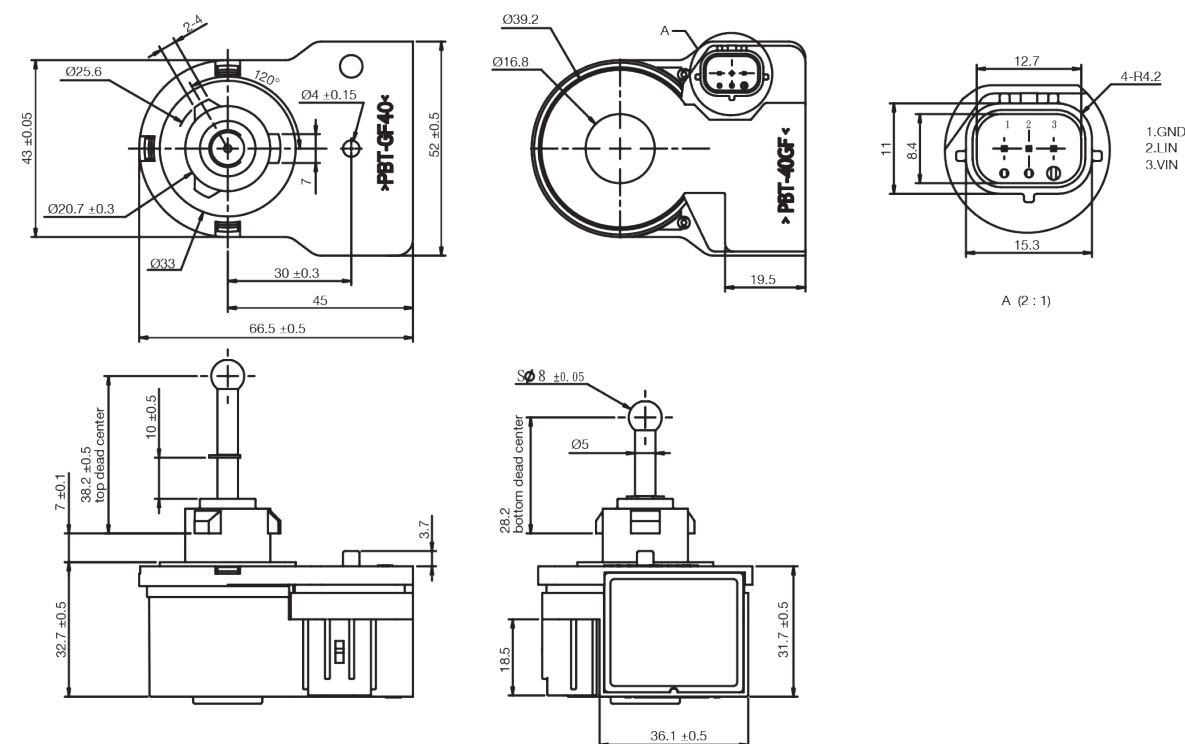


TRICORE INNOVATION

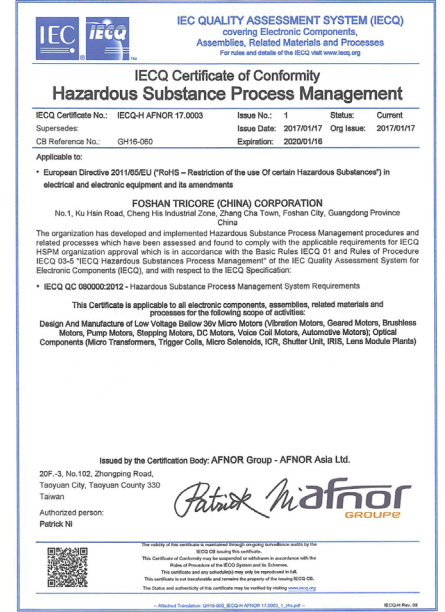
AFS Series

(Adaptive Front-lighting System)

Application I Automotive

[illegible]

In order to make quality the core of our management, we consider the customer's focus as the core in improving the quality and efficiency in our work performance. To sustain the insistence of quality, TRICORE's Quality Control department applies a variety of exclusive measuring work stations as an educational training platform. With this platform, we constantly carry out intensive educational training programs and assessments to nurture creative technical personnel and promote analysts' ability in product measurement in order to achieve superior quality, meeting and exceeding customers' expectations on products' quality requirements.



1999 We granted ISO9002:1999 international quality system certification.

2002 Passed the ISO9001 in 2002.

2003 ISO14001 in 2003.
We granted the SONY GP certification in 2003.

2004 We also granted OHSAS18001 certification in 2004.

2006 TS16949 certification in 2006.

2013 QC8000 certification in 2013.

2018 IATF 16949 certification in 2018.

ISO13485 is under applying.

