ULTRASONIC MOTOR

Non-Magnetic Motor catalog

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Non-magneic Ultrasonic Motor

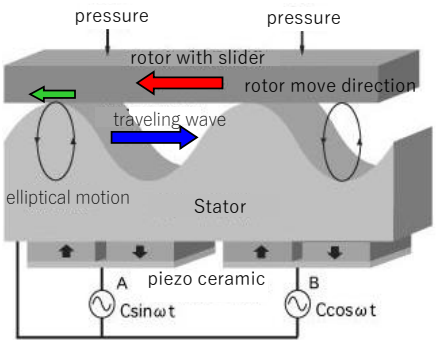
Ultrasonic motor constructed of non-magnetic materials.
It can be used in a strong magnetic field environment such as 3 [T]
Also, since the generated noise is small, it is suitable for equipment that dislikes noise.

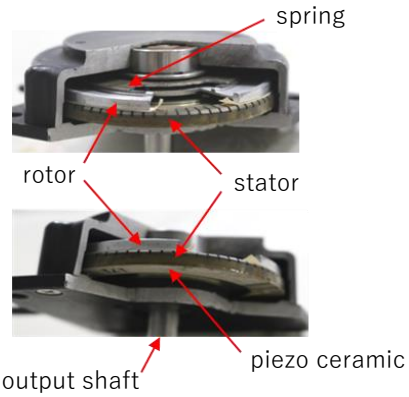
Ultrasonic motor without encorder

Ultrasonic motor with encorder

◆Structure of ultrasonic motor and How it works

Ultrasonic motors do not use coils or magnets.
A stator is attached to a piezo ceramic that is polarized in the thickness direction so that expansion and contraction alternate.
Two electrodes of piezoceramic are formed 1/4 wavelength apart.
When voltages with different phases (SIN wave and COS wave) are applied to each,the waves generated in both are combined to form a traveling wave on the stator surface.
When the rotor is brought into pressure contact with the surface of the stator,which is in elliptical motion due to the traveling wave, with a spring, it rotates in the direction opposite to the traveling wave due to frictional force.
The output shaft is self-supported by the frictional force between the stator and rotor





◆Characteristic

- Low speed, High torque
- Quick resonsive・Precision control
- Quiet operation
- Hollow structure and Ring shape are possible
- Holding power without electric power
- Non-magnetic available
- In vacum available
- Customize is available fit the cutomer requirement (such as encorder resolution)

◆Applications/Adoption results

- Equipment in the MRI environment
- NMR equipment
- Geomagnetism measuring device
- Semiconductor inspection equipment stage drive

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ULTRASONIC MOTOR

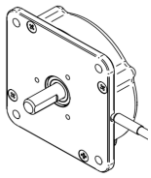
USR60-NM SERIES

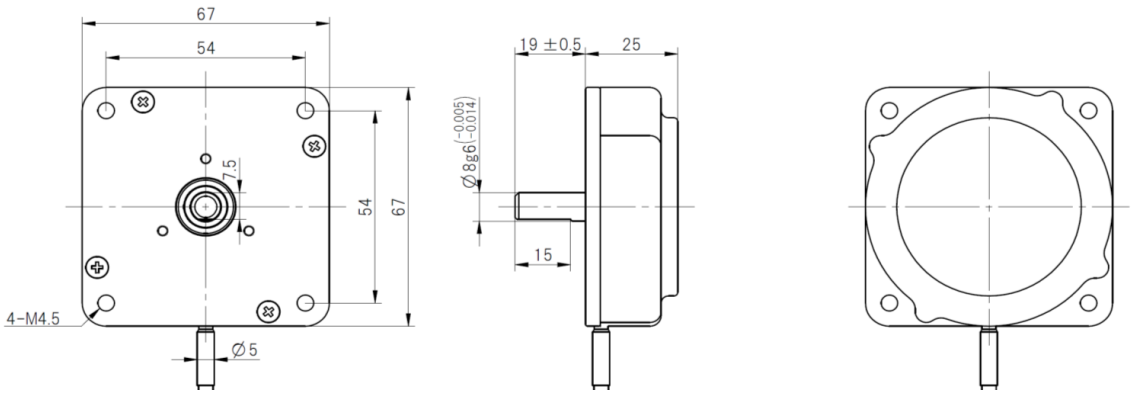
☐ Double Motor ☐ Over Drive ☑ Non-Magnetic ☐ Vacuum

DIMENSIONS

USR60-NM

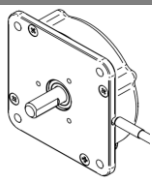
☐ Double Shaft ☐ Encoder

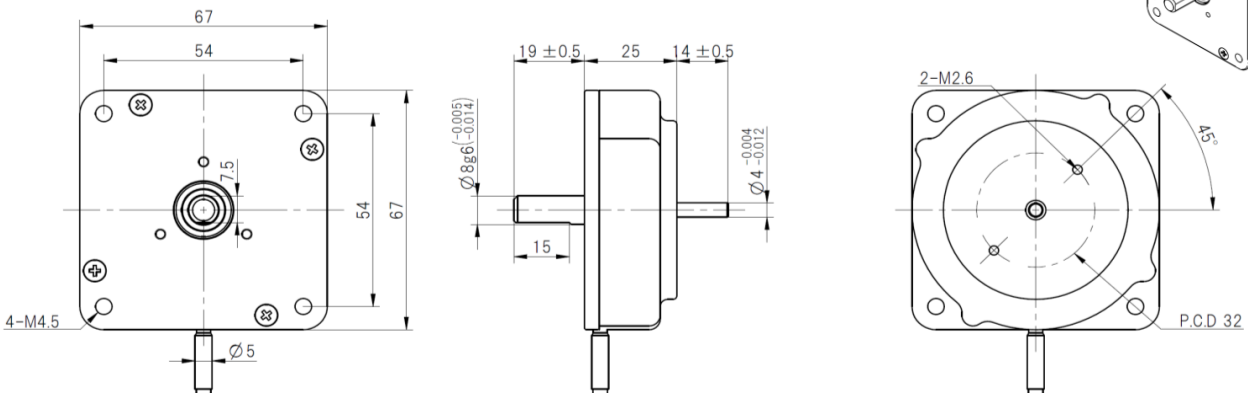




USR60-NM-B

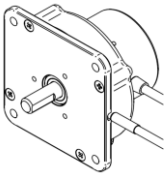
☑ Double Shaft ☐ Encoder

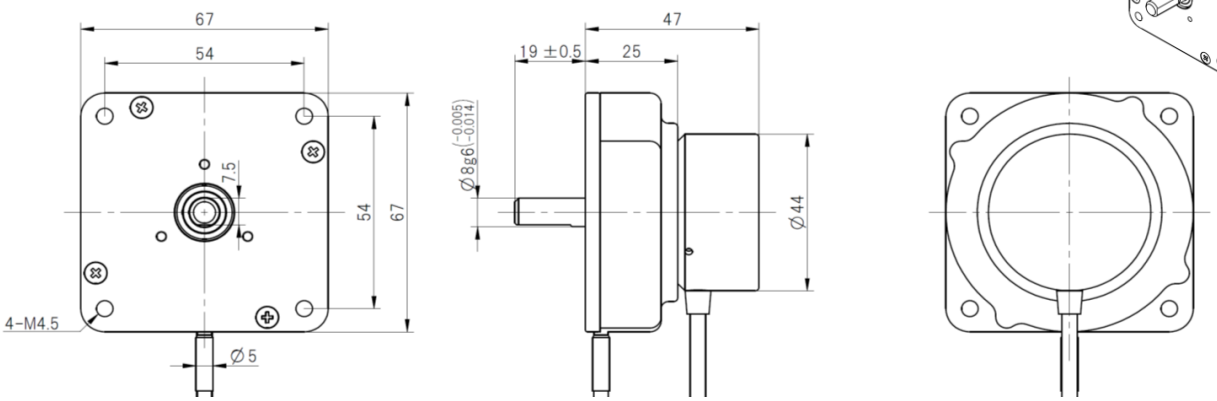




USR60-NM-E

☐ Double Shaft ☑ Encoder





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ULTRASONIC MOTOR

USR60-NM SERIES

☐ Double Motor ☐ Over Drive ☑ Non-Magnetic ☐ Vacuum

SPECIFICATIONS

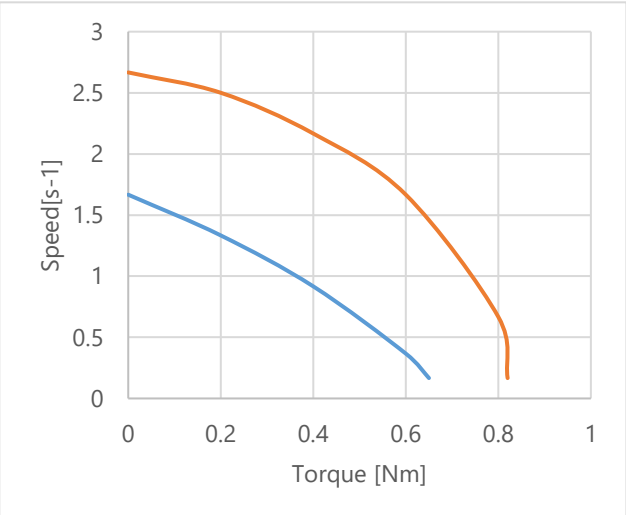
MOTOR	DRIVE VOLTAGE (2-PHASE)	AC 100	[Vrms]	
	FREQUENCY	39~45	[kHz]	
	PHASE DIFFERENCE	±90	[°]	(Between voltages)
	ABSOLUTE MAXIMUM INPUT VOLTAGE	AC 250	[Vrms]	
	RATED OUTPUT	1.6	[W]	
	MAXIMUM OUTPUT	6.3	[W]	(Instantaneous value)
	RATED SPEED	1.33	[s^{-1}]	
	MAXIMUM SPEED	2.67	[s^{-1}]	(No load, Instantaneous value)
	RATED TORQUE	0.2	[Nm]	
	MAXIMUM TORQUE	0.8	[Nm]	(Instantaneous value)
	HOLDING TORQUE	0.8	[Nm]	
	START-UP TIME	1 or less	[ms]	(No inertial load)
	ROTATION DIRECTION	CW, CCW		

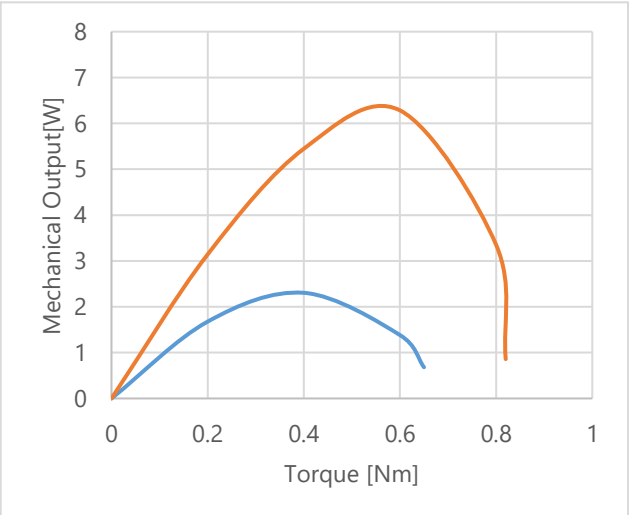
ENCODER (-E only)	SUPPLY VOLTAGE	DC 5~12	[V]	
	OUTPUT PULSE NUMBER	1000	[p/r]	
	OUTPUT CIRCUIT	SQUARE WAVE, OPEN COLLECTOR		
	OUTPUT PHASE	A, B, Z		

WEIGHT	240	[g]	
-B	260	[g]	
-E	340	[g]	
OPERATING TEMPERATURE RANGE	-20 ~ 60	[℃]	
HUMIDITY RANGE	0~95	[%]	(at 40℃ or less, No condensation)
STORAGE TEMPERATURE RANGE	-30 ~ 70	[℃]	

CHARACTERISTICS

Continuous drive time — long — short





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ULTRASONIC MOTOR

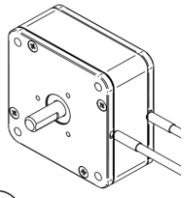
USR60W-NM SERIES

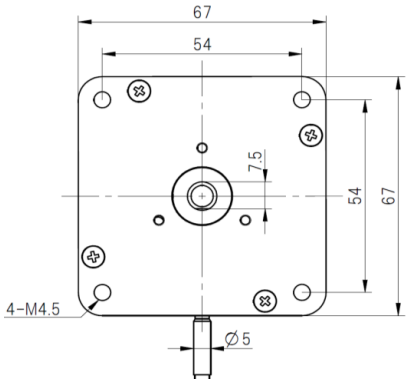
☑ Double Motor ☐ Over Drive ☑ Non-Magnetic ☐ Vacuum

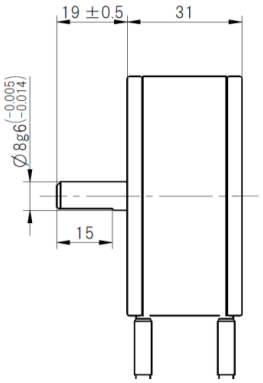
DIMENSIONS

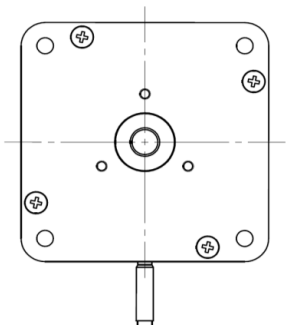
USR60W-NM

☐ Double Shaft ☐ Encoder



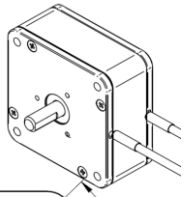


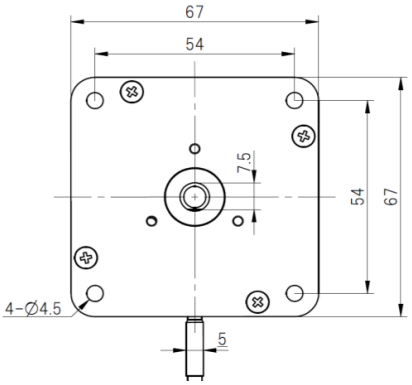


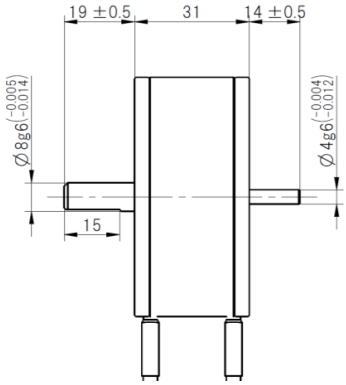


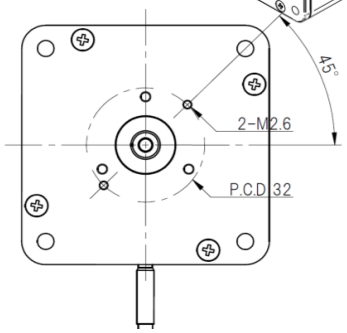
USR60W-NM-B

☑ Double Shaft ☐ Encoder



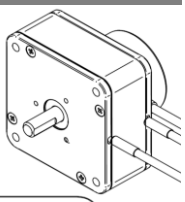


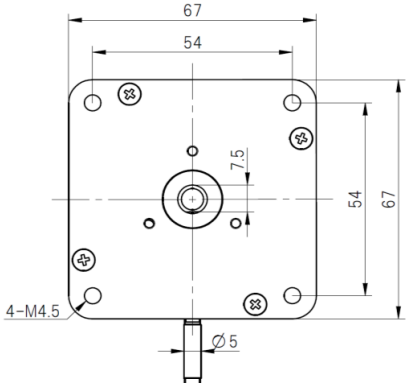


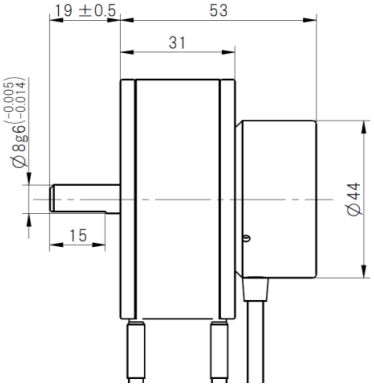


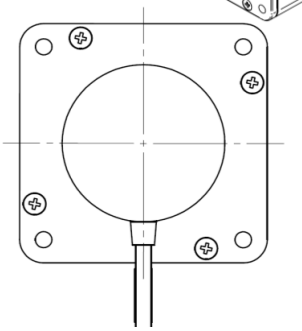
USR60W-NM-E

☐ Double Shaft ☑ Encoder









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ULTRASONIC MOTOR

USR60W-NM SERIES

☑ Double Motor ☐ Over Drive ☑ Non-Magnetic ☐ Vacuum

SPECIFICATIONS

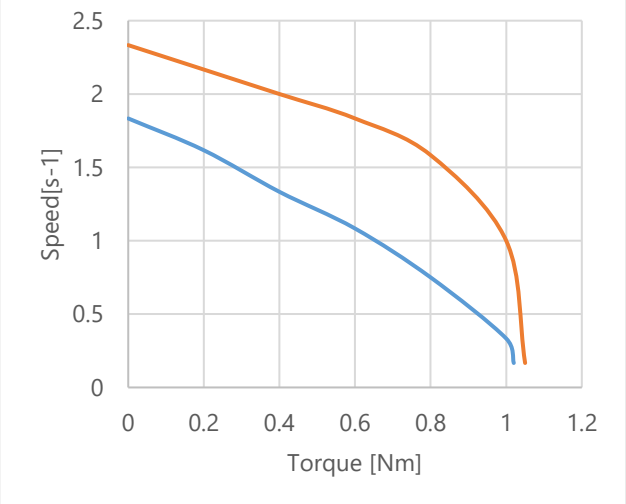
MOTOR	DRIVE VOLTAGE (2-PHASE)	AC 100	[Vrms]	
	FREQUENCY	39~45	[kHz]	
	PHASE DIFFERENCE	±90	[°]	(Between voltages)
	ABSOLUTE MAXIMUM INPUT VOLTAGE	AC 250	[Vrms]	
	RATED OUTPUT	3.3	[W]	
	MAXIMUM OUTPUT	8.0	[W]	(Instantaneous value)
	RATED SPEED	1.33	[s^{-1}]	
	MAXIMUM SPEED	2.33	[s^{-1}]	(No load, Instantaneous value)
	RATED TORQUE	0.4	[Nm]	
	MAXIMUM TORQUE	1.0	[Nm]	(Instantaneous value)
	HOLDING TORQUE	1.0	[Nm]	
	START-UP TIME	1 or less	[ms]	(No inertial load)
	ROTATION DIRECTION	CW, CCW		

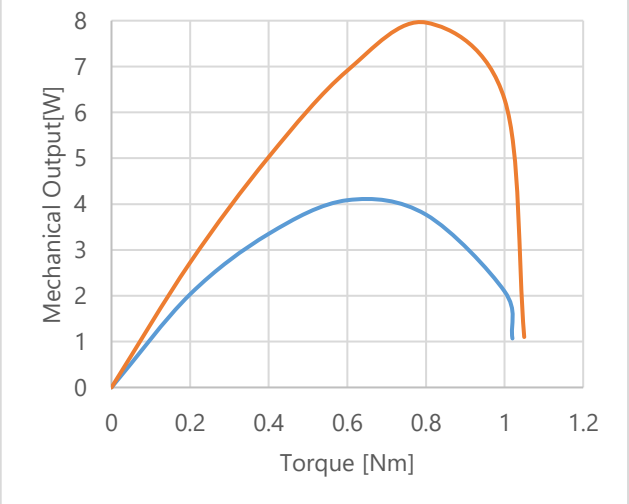
ENCODER (-E only)	SUPPLY VOLTAGE	DC 5~12	[V]	
	OUTPUT PULSE NUMBER	1000	[p/r]	
	OUTPUT CIRCUIT	SQUARE WAVE, OPEN COLLECTOR		
	OUTPUT PHASE	A, B, Z		

WEIGHT	450	[g]	
-B	470	[g]	
-E	550	[g]	
OPERATING TEMPERATURE RANGE	-20 ~ 60	[℃]	
HUMIDITY RANGE	0~95	[%]	(at 40℃ or less, No condensation)
STORAGE TEMPERATURE RANGE	-30 ~ 70	[℃]	

CHARACTERISTICS

Continuous drive time — long — short





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ULTRASONIC MOTOR

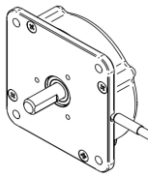
USR60H-NM SERIES

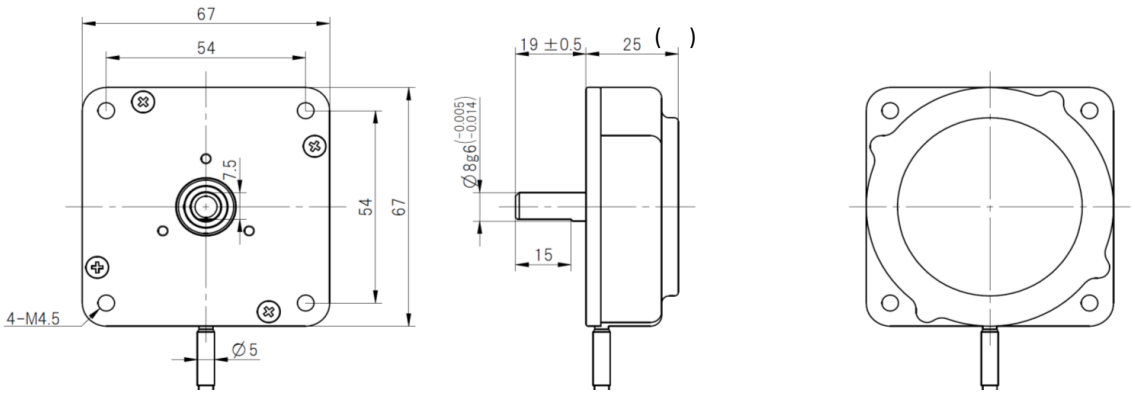
☐ Double Motor ☑ Over Drive ☑ Non-Magnetic ☐ Vacuum

DIMENSIONS

USR60H-NM

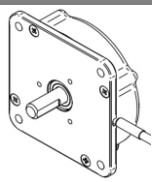
☐ Double Shaft ☐ Encoder

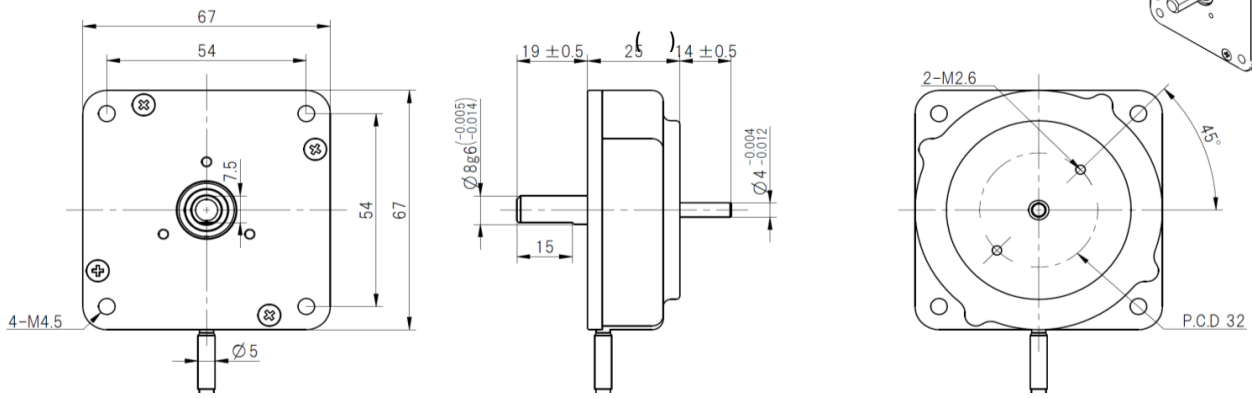




USR60H-NM-B

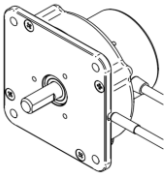
☑ Double Shaft ☐ Encoder

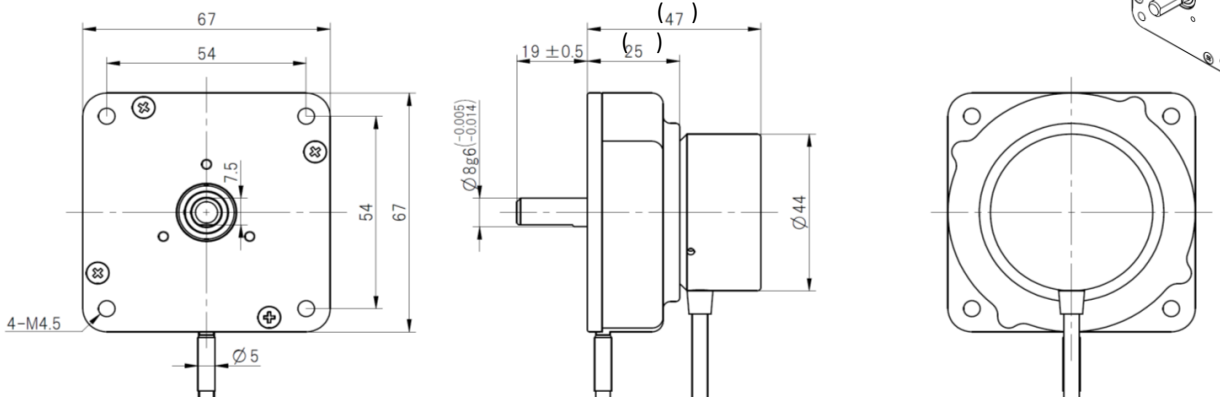




USR60H-NM-E

☐ Double Shaft ☑ Encoder





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ULTRASONIC MOTOR

USR60H-NM SERIES

☐ Double Motor ☑ Over Drive ☑ Non-Magnetic ☐ Vacuum

SPECIFICATIONS

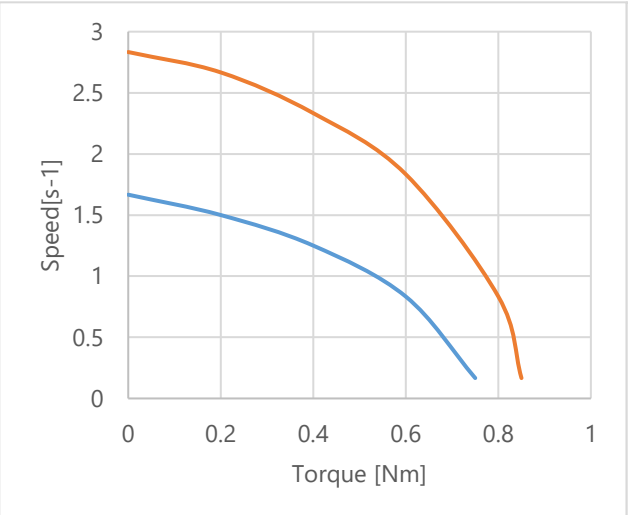
MOTOR	DRIVE VOLTAGE (2-PHASE)	AC 130	[Vrms]	
	FREQUENCY	39~45	[kHz]	
	PHASE DIFFERENCE	±90	[°]	(Between voltages)
	ABSOLUTE MAXIMUM INPUT VOLTAGE	AC 250	[Vrms]	
	RATED OUTPUT	2.5	[W]	
	MAXIMUM OUTPUT	7.0	[W]	(Instantaneous value)
	RATED SPEED	1.33	[s^{-1}]	
	MAXIMUM SPEED	2.83	[s^{-1}]	(No load, Instantaneous value)
	RATED TORQUE	0.3	[Nm]	
	MAXIMUM TORQUE	0.85	[Nm]	(Instantaneous value)
	HOLDING TORQUE	0.85	[Nm]	
	START-UP TIME	1 or less	[ms]	(No inertial load)
	ROTATION DIRECTION	CW, CCW		

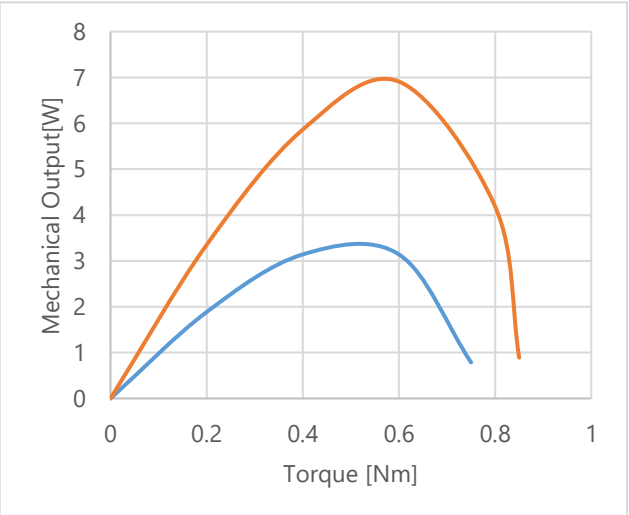
ENCODER (-E only)	SUPPLY VOLTAGE	DC 5~12	[V]	
	OUTPUT PULSE NUMBER	1000	[p/r]	
	OUTPUT CIRCUIT	SQUARE WAVE, OPEN COLLECTOR		
	OUTPUT PHASE	A, B, Z		

WEIGHT	240	[g]	
-B	260	[g]	
-E	300	[g]	
OPERATING TEMPERATURE RANGE	-20 ~ 60	[℃]	
HUMIDITY RANGE	0~95	[%]	(at 40℃ or less, No condensation)
STORAGE TEMPERATURE RANGE	-30 ~ 70	[℃]	

CHARACTERISTICS

Continuous drive time — long — short





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ULTRASONIC MOTOR

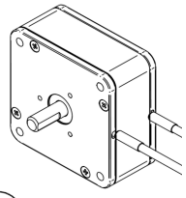
USR60WH-NM SERIES

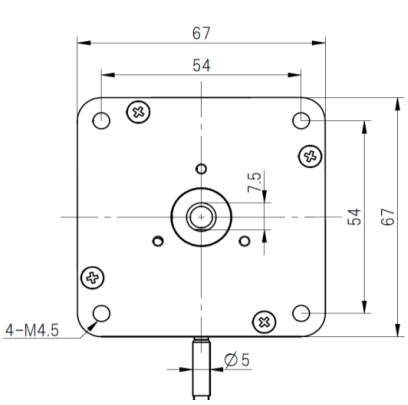
☑ Double Motor ☑ Over Drive ☑ Non-Magnetic ☐ Vacuum

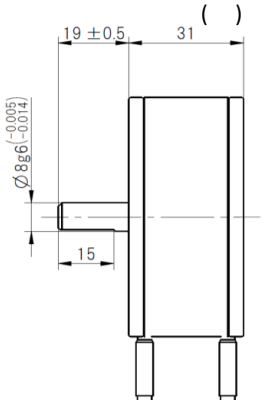
DIMENSIONS

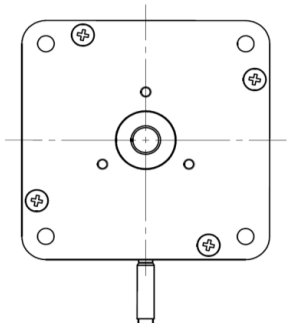
USR60WH-NM

☐ Double Shaft ☐ Encoder



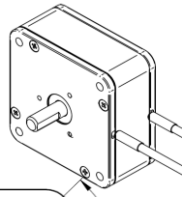


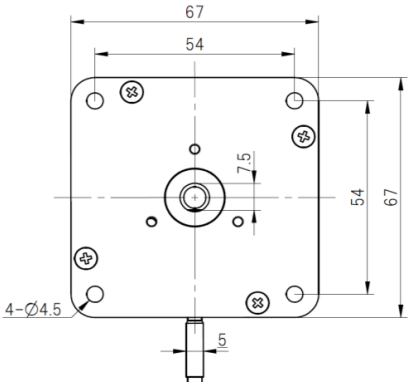


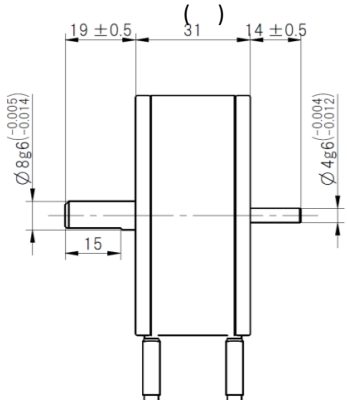


USR60WH-NM-B

☑ Double Shaft ☐ Encoder

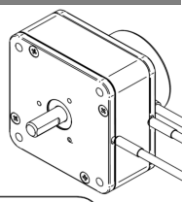


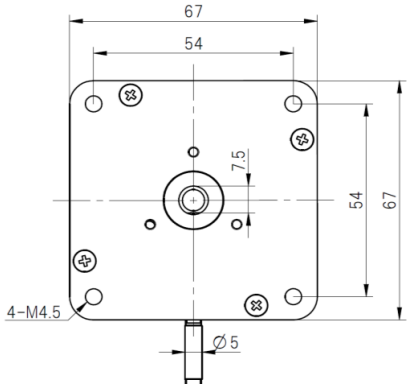


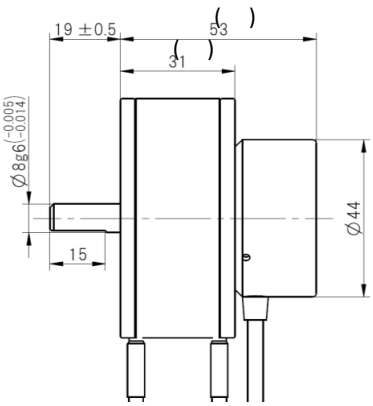


USR60WH-NM-E

☐ Double Shaft ☑ Encoder







FUKOKU

ULTRASONIC MOTOR

USR60WH-NM SERIES

☑ Double Motor ☑ Over Drive ☑ Non-Magnetic ☐ Vacuum

SPECIFICATIONS

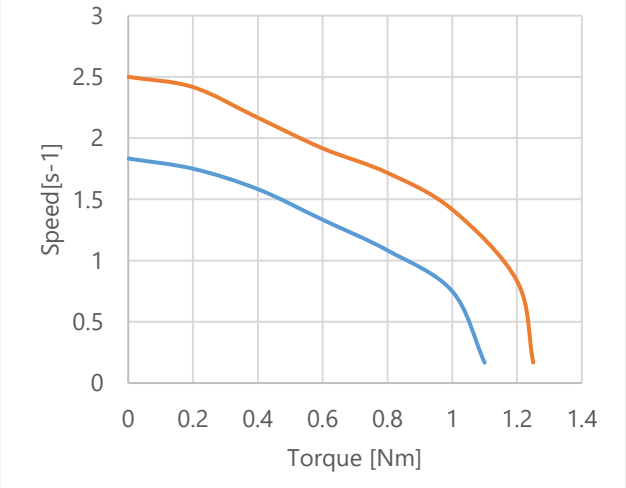
MOTOR	DRIVE VOLTAGE (2-PHASE)	AC 130	[Vrms]	
	FREQUENCY	39~45	[kHz]	
	PHASE DIFFERENCE	±90	[°]	(Between voltages)
	ABSOLUTE MAXIMUM INPUT VOLTAGE	AC 250	[Vrms]	
	RATED OUTPUT	4.9	[W]	
	MAXIMUM OUTPUT	9.0	[W]	(Instantaneous value)
	RATED SPEED	1.33	[s^{-1}]	
	MAXIMUM SPEED	2.50	[s^{-1}]	(No load, Instantaneous value)
	RATED TORQUE	0.6	[Nm]	
	MAXIMUM TORQUE	1.2	[Nm]	(Instantaneous value)
	HOLDING TORQUE	1.2	[Nm]	
	START-UP TIME	1 or less	[ms]	(No inertial load)
	ROTATION DIRECTION	CW, CCW		

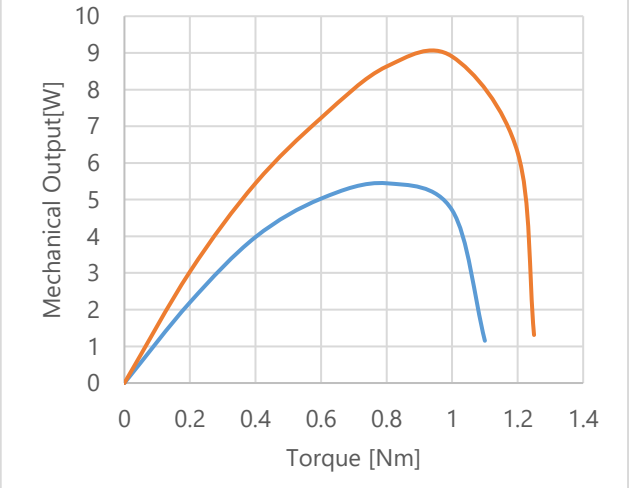
ENCODER (-E only)	SUPPLY VOLTAGE	DC 5~12	[V]	
	OUTPUT PULSE NUMBER	1000	[p/r]	
	OUTPUT CIRCUIT	SQUARE WAVE, OPEN COLLECTOR		
	OUTPUT PHASE	A, B, Z		

WEIGHT	450	[g]	
-B	470	[g]	
-E	550	[g]	
OPERATING TEMPERATURE RANGE	-20 ~ 60	[℃]	
HUMIDITY RANGE	0~95	[%]	(at 40℃ or less, No condensation)
STORAGE TEMPERATURE RANGE	-30 ~ 70	[℃]	

CHARACTERISTICS

Continuous drive time — long — short





FUKOKU

ULTRASONIC MOTOR

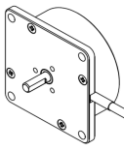
USR45-NM SERIES

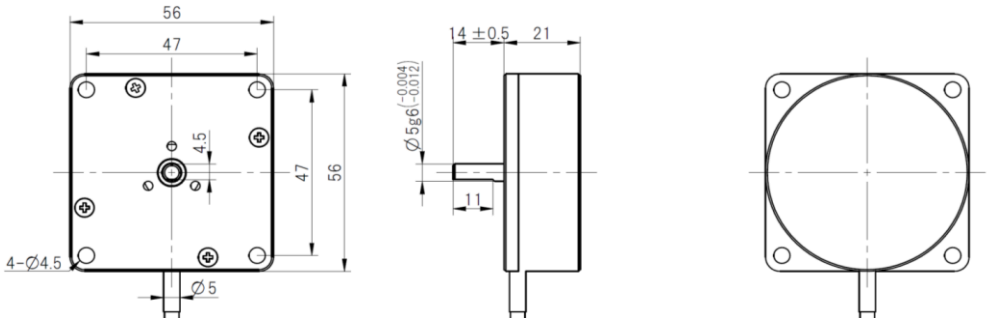
☐ Double Motor ☐ Over Drive ☑ Non-Magnetic ☐ Vacuum

DIMENSIONS

USR45-NM

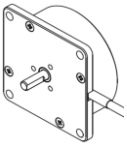
☐ Double Shaft ☐ Encoder

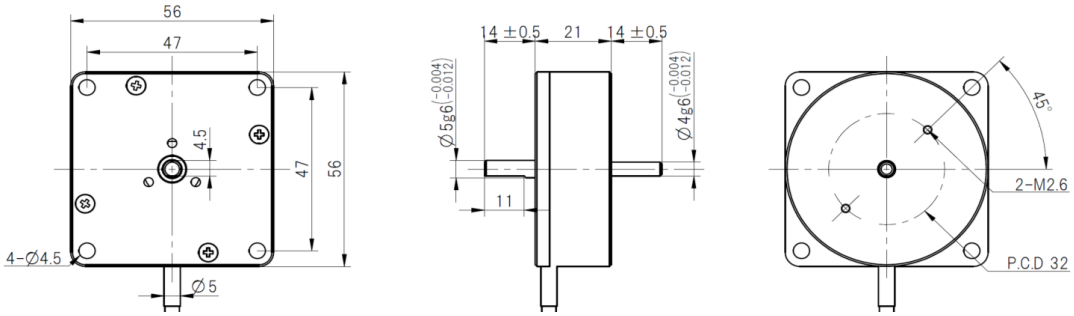




USR45-NM-B

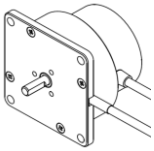
☑ Double Shaft ☐ Encoder

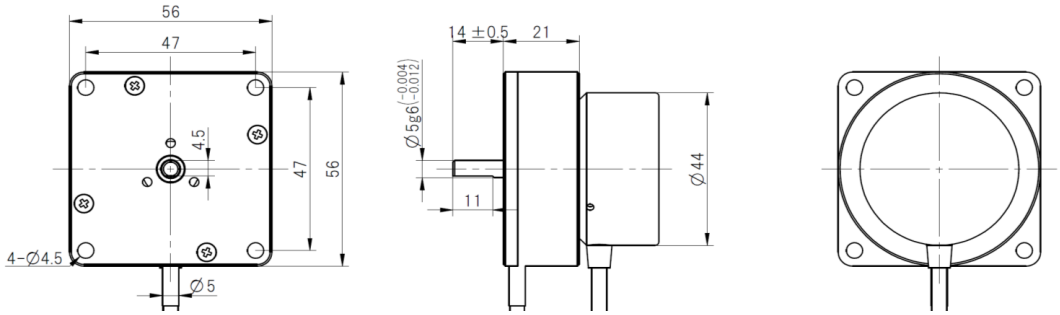




USR45-NM-E

☐ Double Shaft ☑ Encoder





FUKOKU

ULTRASONIC MOTOR

USR45-NM SERIES

☐ Double Motor ☐ Over Drive ☑ Non-Magnetic ☐ Vacuum

SPECIFICATIONS

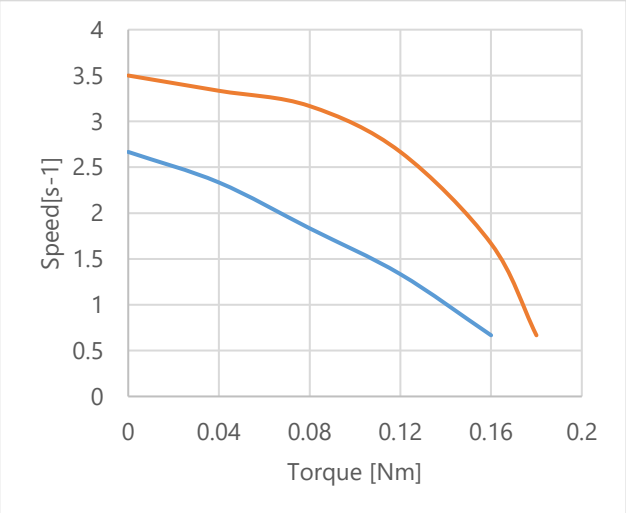
MOTOR	DRIVE VOLTAGE (2-PHASE)	AC 100	[Vrms]	
	FREQUENCY	42~47	[kHz]	
	PHASE DIFFERENCE	±90	[°]	(Between voltages)
	ABSOLUTE MAXIMUM INPUT VOLTAGE	AC 250	[Vrms]	
	RATED OUTPUT	0.9	[W]	
	MAXIMUM OUTPUT	1.5	[W]	(Instantaneous value)
	RATED SPEED	1.83	[s^{-1}]	
	MAXIMUM SPEED	3.50	[s^{-1}]	(No load, Instantaneous value)
	RATED TORQUE	0.08	[Nm]	
	MAXIMUM TORQUE	0.2	[Nm]	(Instantaneous value)
	HOLDING TORQUE	0.2	[Nm]	
	START-UP TIME	1 or less	[ms]	(No inertial load)
	ROTATION DIRECTION	CW, CCW		

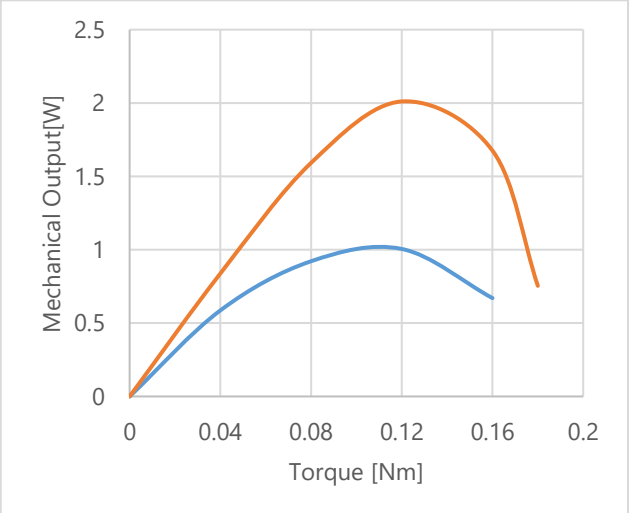
ENCODER (-E only)	SUPPLY VOLTAGE	DC 5~12	[V]	
	OUTPUT PULSE NUMBER	1000	[p/r]	
	OUTPUT CIRCUIT	SQUARE WAVE, OPEN COLLECTOR		
	OUTPUT PHASE	A, B, Z		

WEIGHT	160	[g]	
-B	170	[g]	
-E	250	[g]	
OPERATING TEMPERATURE RANGE	-20 ~ 60	[℃]	
HUMIDITY RANGE	0~95	[%]	(at 40℃ or less, No condensation)
STORAGE TEMPERATURE RANGE	-30 ~ 70	[℃]	

CHARACTERISTICS

Continuous drive time — long — short





FUKOKU

ULTRASONIC MOTOR

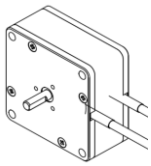
USR45W-NM SERIES

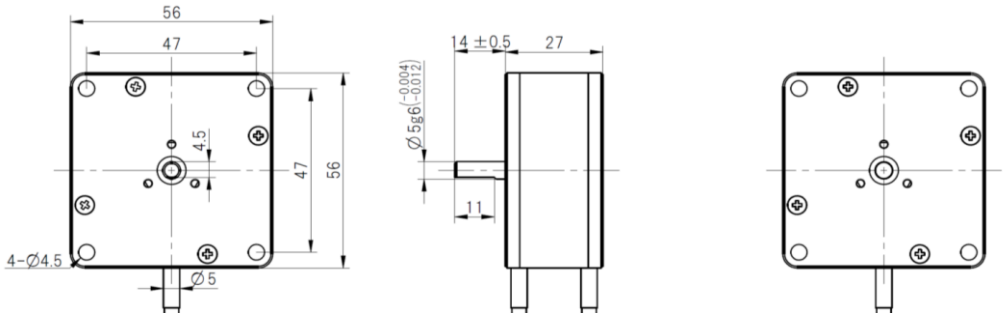
☑ Double Motor ☐ Over Drive ☑ Non-Magnetic ☐ Vacuum

DIMENSIONS

USR45W-NM

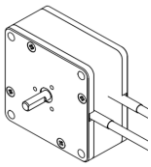
☐ Double Shaft ☐ Encoder

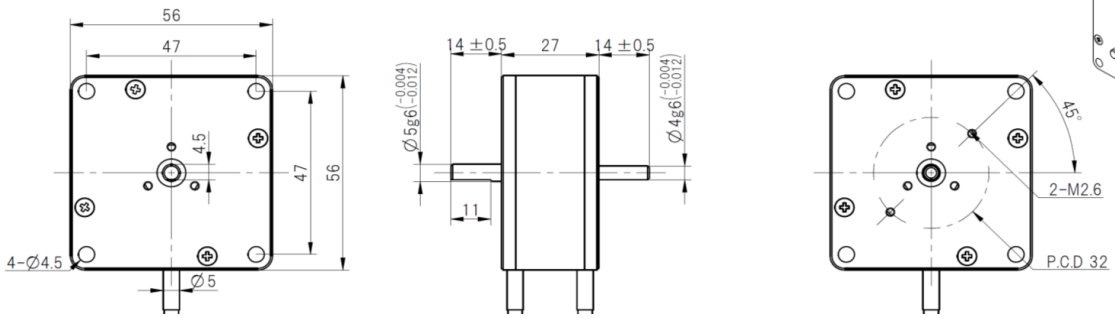




USR45W-NM-B

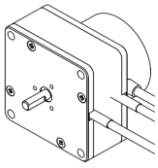
☑ Double Shaft ☐ Encoder

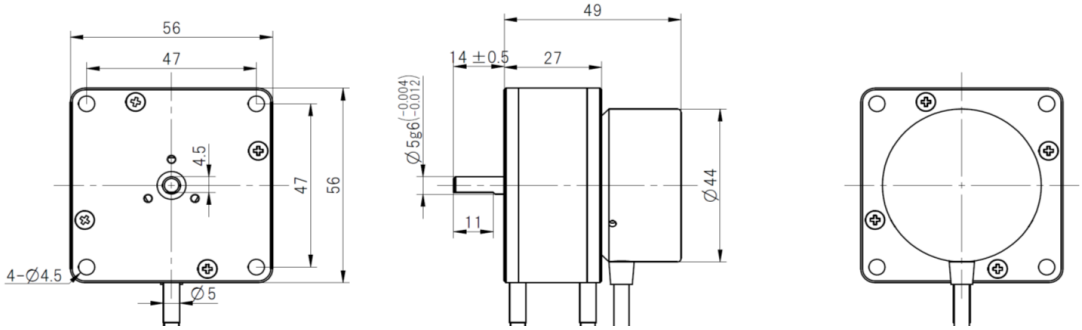




USR45W-NM-E

☐ Double Shaft ☑ Encoder





FUKOKU

ULTRASONIC MOTOR

USR45W-NM SERIES

☑ Double Motor ☐ Over Drive ☑ Non-Magnetic ☐ Vacuum

SPECIFICATIONS

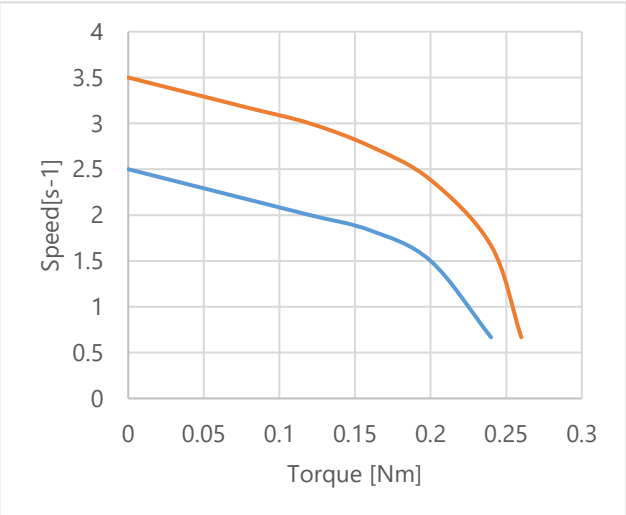
MOTOR	DRIVE VOLTAGE (2-PHASE)	AC 100	[Vrms]	
	FREQUENCY	39~45	[kHz]	
	PHASE DIFFERENCE	±90	[°]	(Between voltages)
	ABSOLUTE MAXIMUM INPUT VOLTAGE	AC 250	[Vrms]	
	RATED OUTPUT	1.81	[W]	
	MAXIMUM OUTPUT	3.0	[W]	(Instantaneous value)
	RATED SPEED	1.83	[s^{-1}]	
	MAXIMUM SPEED	3.50	[s^{-1}]	(No load, Instantaneous value)
	RATED TORQUE	0.16	[Nm]	
	MAXIMUM TORQUE	0.25	[Nm]	(Instantaneous value)
	HOLDING TORQUE	0.25	[Nm]	
	START-UP TIME	1 or less	[ms]	(No inertial load)
	ROTATION DIRECTION	CW, CCW		

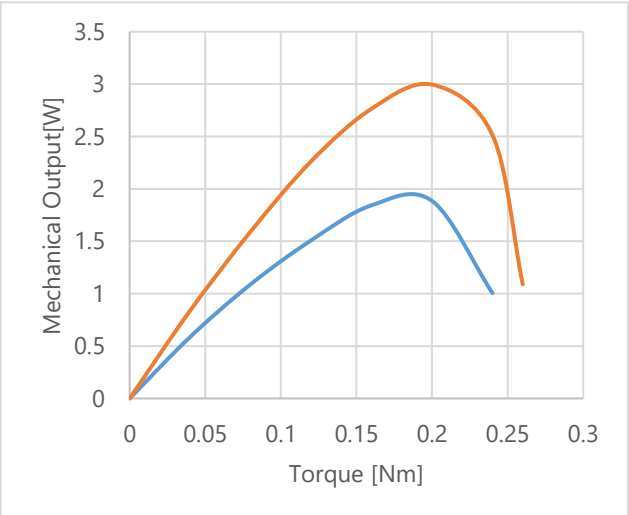
ENCODER (-E only)	SUPPLY VOLTAGE	DC 5~12	[V]	
	OUTPUT PULSE NUMBER	1000	[p/r]	
	OUTPUT CIRCUIT	SQUARE WAVE, OPEN COLLECTOR		
	OUTPUT PHASE	A, B, Z		

WEIGHT	250	[g]	
-B	260	[g]	
-E	340	[g]	
OPERATING TEMPERATURE RANGE	-20 ~ 60	[℃]	
HUMIDITY RANGE	0~95	[%]	(at 40℃ or less, No condensation)
STORAGE TEMPERATURE RANGE	-30 ~ 70	[℃]	

CHARACTERISTICS

Continuous drive time — long — short





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ULTRASONIC MOTOR

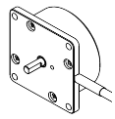
USR30-NM SERIES

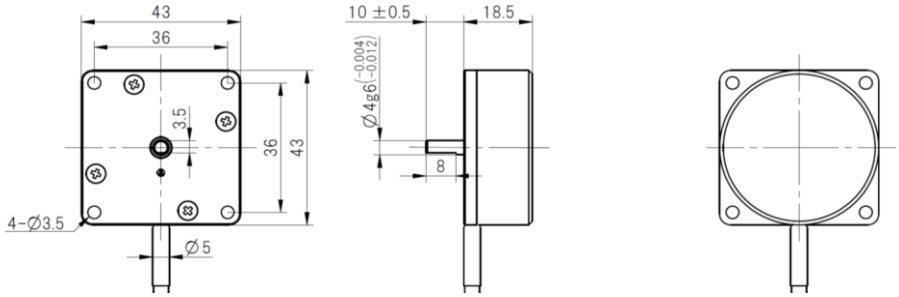
☐ Double Motor ☐ Over Drive ☑ Non-Magnetic ☐ Vacuum

DIMENSIONS

USR30-NM

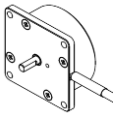
☐ Double Shaft ☐ Encoder

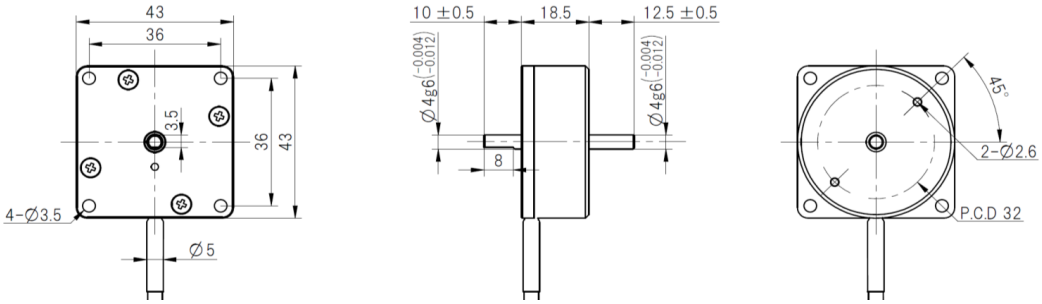




USR30-NM-B

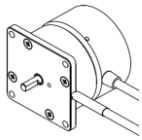
☑ Double Shaft ☐ Encoder

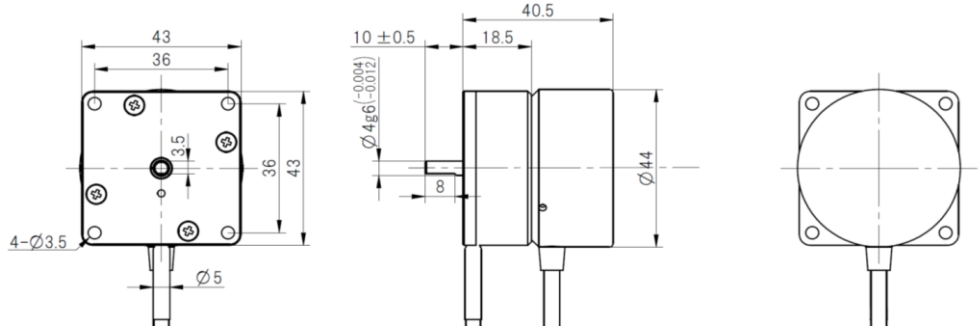




USR30-NM-E

☐ Double Shaft ☑ Encoder





FUKOKU

ULTRASONIC MOTOR

USR30-NM SERIES

☐ Double Motor ☐ Over Drive ☑ Non-Magnetic ☐ Vacuum

SPECIFICATIONS

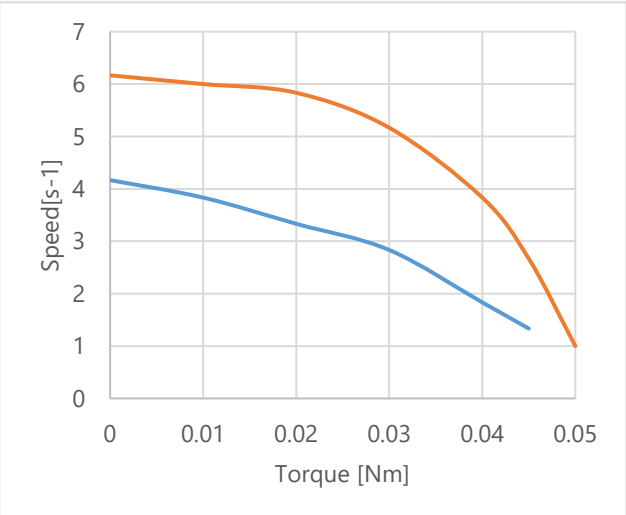
MOTOR	DRIVE VOLTAGE (2-PHASE)	AC 100	[Vrms]	
	FREQUENCY	39~45	[kHz]	
	PHASE DIFFERENCE	±90	[°]	(Between voltages)
	ABSOLUTE MAXIMUM INPUT VOLTAGE	AC 250	[Vrms]	
	RATED OUTPUT	0.4	[W]	
	MAXIMUM OUTPUT	1.0	[W]	(Instantaneous value)
	RATED SPEED	3.33	[s^{-1}]	
	MAXIMUM SPEED	5.50	[s^{-1}]	(No load, Instantaneous value)
	RATED TORQUE	0.02	[Nm]	
	MAXIMUM TORQUE	0.05	[Nm]	(Instantaneous value)
	HOLDING TORQUE	0.05	[Nm]	
	START-UP TIME	1 or less	[ms]	(No inertial load)
	ROTATION DIRECTION	CW, CCW		

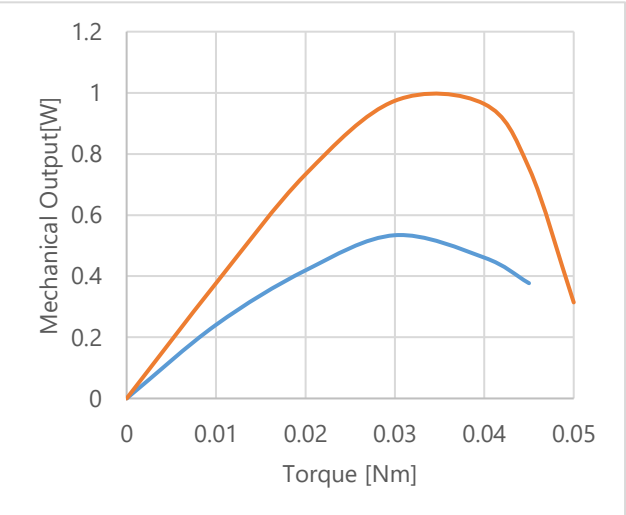
ENCODER (-E only)	SUPPLY VOLTAGE	DC 5~12	[V]	
	OUTPUT PULSE NUMBER	1000	[p/r]	
	OUTPUT CIRCUIT	SQUARE WAVE, OPEN COLLECTOR		
	OUTPUT PHASE	A, B, Z		

WEIGHT	120	[g]	
-B	125	[g]	
-E	205	[g]	
OPERATING TEMPERATURE RANGE	-20 ~ 60	[℃]	
HUMIDITY RANGE	0~95	[%]	(at 40℃ or less, No condensation)
STORAGE TEMPERATURE RANGE	-30 ~ 70	[℃]	

CHARACTERISTICS

Continuous drive time — long — short





FUKOKU

ULTRASONIC MOTOR

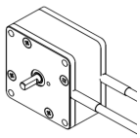
USR30W-NM SERIES

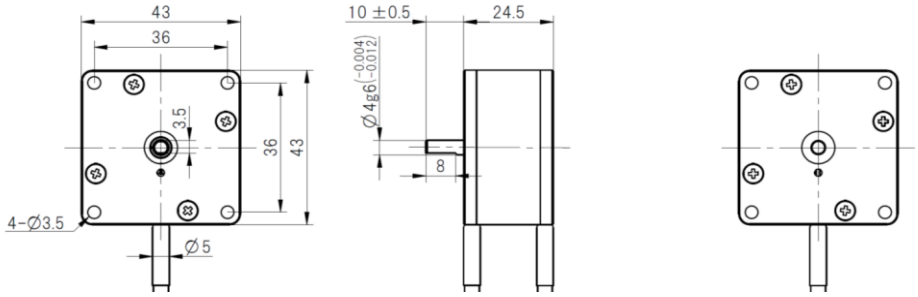
☑ Double Motor ☐ Over Drive ☑ Non-Magnetic ☐ Vacuum

DIMENSIONS

USR30W-NM

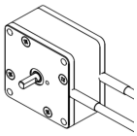
☐ Double Shaft ☐ Encoder

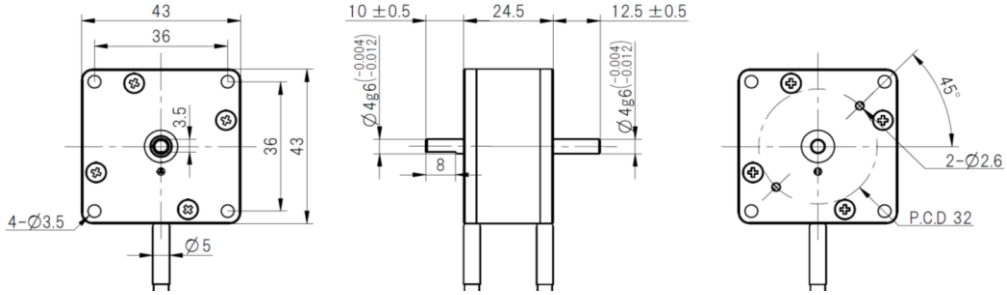




USR30W-NM-B

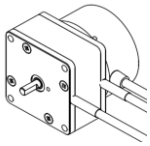
☑ Double Shaft ☐ Encoder

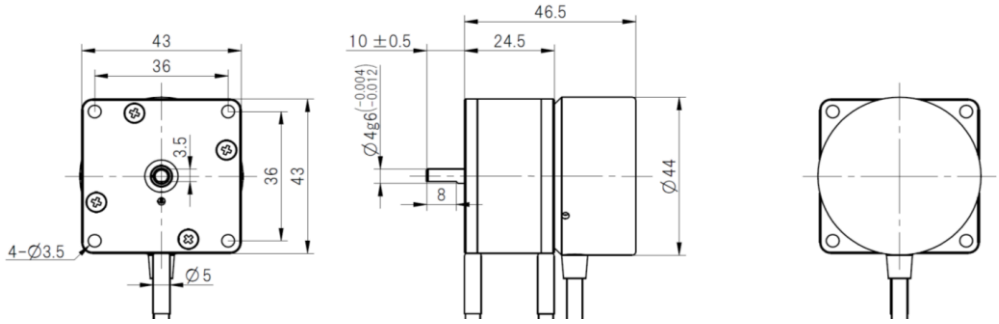




USR30W-NM-E

☐ Double Shaft ☑ Encoder





FUKOKU

ULTRASONIC MOTOR

USR30W-NM SERIES

☑ Double Motor ☐ Over Drive ☑ Non-Magnetic ☐ Vacuum

SPECIFICATIONS

MOTOR	DRIVE VOLTAGE (2-PHASE)	AC 100	[Vrms]	
	FREQUENCY	39~45	[kHz]	
	PHASE DIFFERENCE	±90	[°]	(Between voltages)
	ABSOLUTE MAXIMUM INPUT VOLTAGE	AC 250	[Vrms]	
	RATED OUTPUT	0.8	[W]	
	MAXIMUM OUTPUT	1.2	[W]	(Instantaneous value)
	RATED SPEED	3.33	[s^{-1}]	
	MAXIMUM SPEED	5.50	[s^{-1}]	(No load, Instantaneous value)
	RATED TORQUE	0.04	[Nm]	
	MAXIMUM TORQUE	0.065	[Nm]	(Instantaneous value)
	HOLDING TORQUE	0.065	[Nm]	
	START-UP TIME	1 or less	[ms]	(No inertial load)
	ROTATION DIRECTION	CW, CCW		

ENCODER (-E only)	SUPPLY VOLTAGE	DC 5~12	[V]	
	OUTPUT PULSE NUMBER	1000	[p/r]	
	OUTPUT CIRCUIT	SQUARE WAVE, OPEN COLLECTOR		
	OUTPUT PHASE	A, B, Z		

WEIGHT	200	[g]	
-B	205	[g]	
-E	285	[g]	
OPERATING TEMPERATURE RANGE	-20 ~ 60	[℃]	
HUMIDITY RANGE	0~95	[%]	(at 40℃ or less, No condensation)
STORAGE TEMPERATURE RANGE	-30 ~ 70	[℃]	

CHARACTERISTICS

Continuous drive time — long — short