# PIEZOLUTION

PIEZO DRIVES

**Our patented piezo drives are highly efficient in miniaturized environments.**

They open new approaches in precision motion solutions. Piezo drives are widely used in code readers, opto-mechatronics, lab-on-a-chip applications, clean-rooms, aeronautics, life sciences, medical design, microfluidic dispensers, haptic devices and many more!

Features:

► Simple structure - less maintenance

► Small footprint - for compact systems

► Highly responsive

► High accuracy

► Consumes low power at rest

► No backlash

► Insensitive to electro-magnetic interference

► Single micro controller board as driver

Motor size versus efficiency
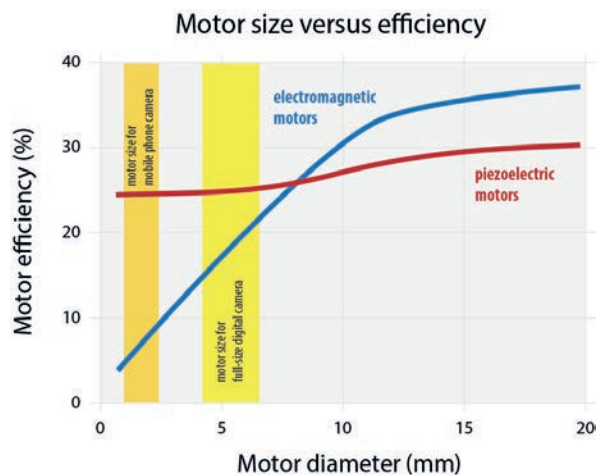
To build own modules for linear motion, you can begin with sliders in standard shape (below right or your individual design (examples below left).
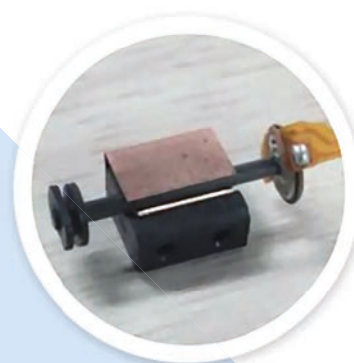
For necessary guiding-rods, optical position sensors, housing construction and controller board conception you can get full support from our engineer team. Or you just let us do the whole conceptual design according to your requirements.

Notes:

1. Shaft length can be modified in certain range.

2. Slider design and manufacturing available on demand. Examples see Technology.

3. One-chip controller board available on demand.

Specifications	PZM25S-xxx	PZM35BS-xxx	PZM35S-xxx	PZM50M-xxx	PZM70L-xxx
Slider speed(mm/s)	>3	>7	>10	>10	>10
Thrust force (g·f)	>3	>5	>10	>20	>50
Thrust force (mN)					
Stroke (mm)	<3	<6	<8	<10	<15
Driving voltage (V)	12–16	12–18	14–20	20–35	20~35
Driving frequency (kHz)	170–250	110–140	80–100	60–80	40–55
Operating conditions (°C)	–20 to +60				
Storage conditions (°C)	–30 to +80				
Huminidy (%)	15 to 90				

Mounting options

Gluing with Loctite5056(UV) or Three Bond 3164D (Shore A30).
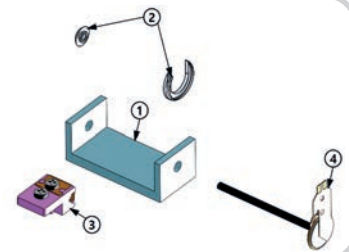
Rubber ring assembly
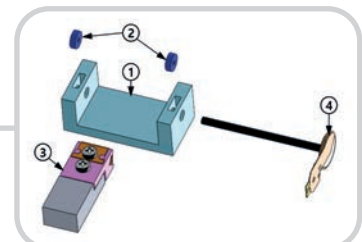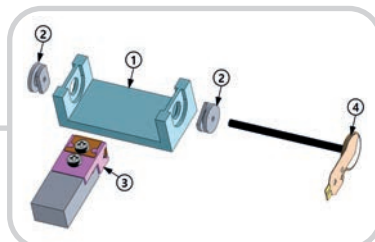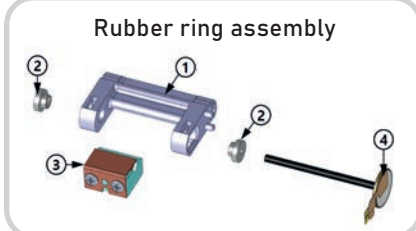
PIEZO FOCUS MODULE

Our piezo-driven focus modules for M12 lenses – controlled by embedded PCB, are compact, precise, quick-responsive, and easy to integrate.


1001.9 µm

| Specifications	Standard	Long Thread	Customizing on Demand	
Artikel Name	PZM-M12-06-ST	PZM-M12-06-DB	PZM-M12-06-GK	Dual-Drive Module
Lens Weight	max.15g	max.20g	max.15g	max.30g
Lens Holder (H)	8.8mm	14.7mm	8.8mm	8.5mm
Lens Mount	M12 x 0.5			Ø10
Travel Range	6mm			13mm
Dimension	26x26x25mm			31x33x31.5mm
Socket	Interchangeable for variable camera boards			
Speed	>10 mm/s at 6mm		Individual run modes	>10 mm/s
Resolution	0.1um		0.05um	0.1um
Repeatability	±3um		±0.5um	±3um
Input Voltage	5V DC			
Input Power	<2W			2.5W
Temperature	0-50°C			
Controller Board	PMC1901		PMC1902	PMC1907
Interface	Converter to USB-C			

4
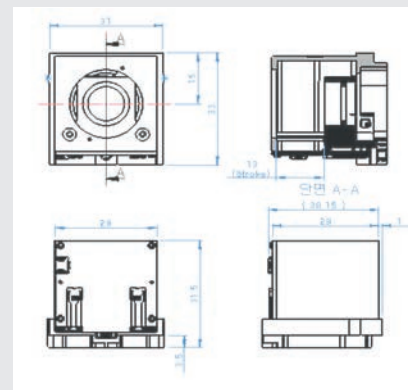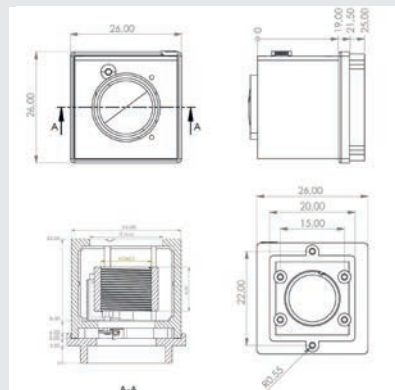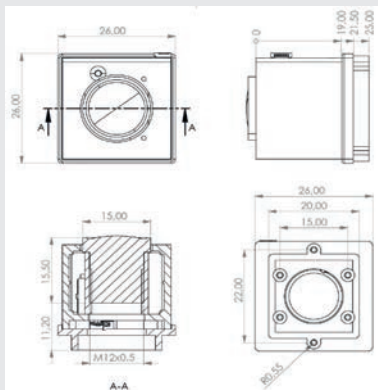
PIEZO STAGES

Whether in laboratory, automation or robotics, precise positioning with remote control plays an important role.
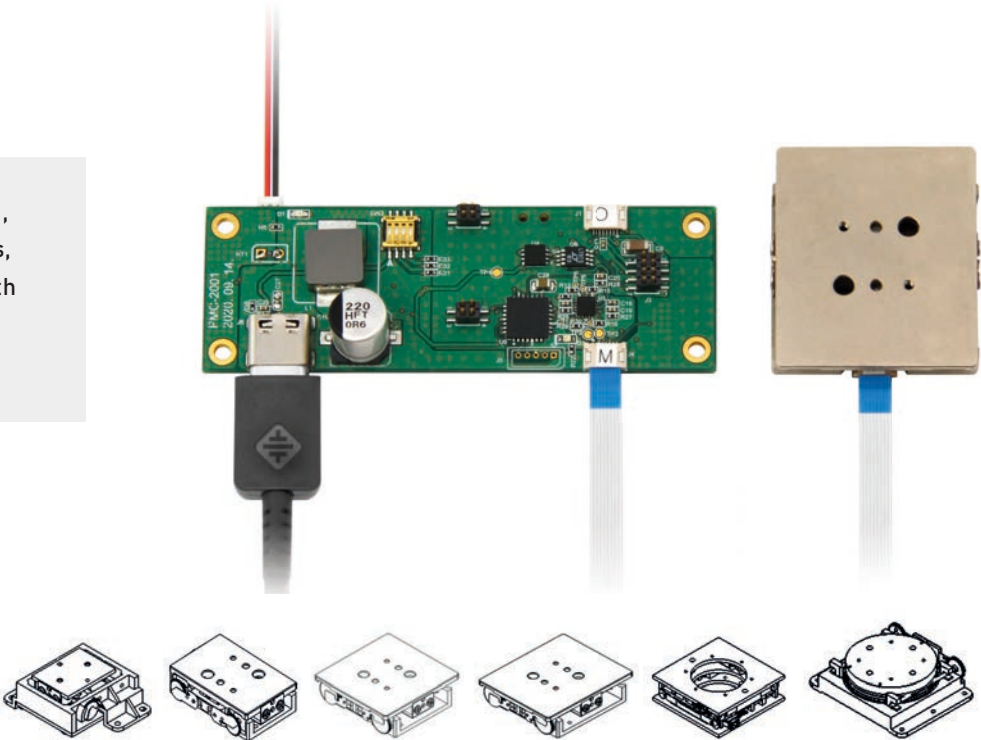
Specifications	PZS-X50 -06-BIB	PZS-X50 -05	PZS-X70 -10	PZS-X70 -15	PZS-HQ50 -04	PZS-THDT70 -300
Real Stroke	6mm	5mm	10mm	15mm	4mm	295° (TBD)
Resolution (with Incremental Encoding)	0.1μm					
Repeatability	±2μm					<0.1° (TBD)
Thrust Force	≤ 10 g	≤ 15 g	≤ 20 g	≤ 20 g	≤ 10 g	–
Holding Force	150 ± 10gf	> 250 gf				> 50gfcm(TBD)
Speed (full stroke)	>10mm/s					–
Application Driver	embedded	Multi channel Master PMC2001				
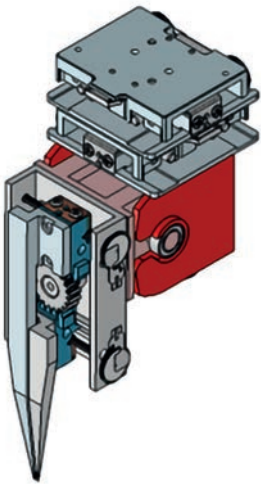
Either configurate an existing closed loop package, ready to mount, wire, and run, or alternatively just choose the components to develop individual motorized solutions.

Depending on load, stroke, accuracy demand, control interface and so forth, you can work out your optimal system design with full support from our engineer team.

PIEZO PAN-TILT MODULE
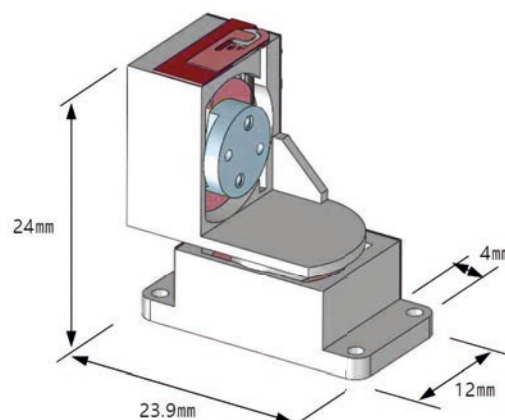
For precise, Low-dynamic Light-path changes, such as in lidar module, or pan-tilt cameras in surveillance applications.

"Pan" stands for horizontal motion (left-right) while "Tilt" for vertical motion (up-down).
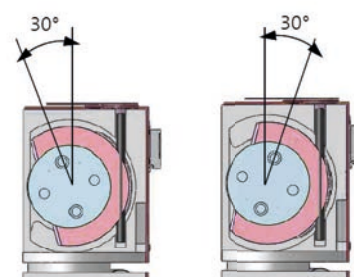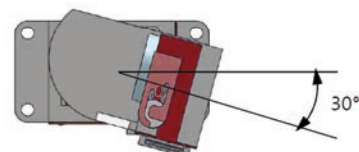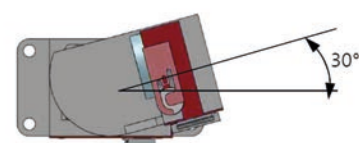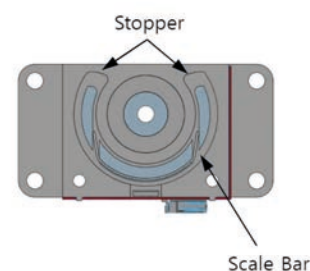
Specifications   PZS-PT35-30

Size	23.9 x 12 x 24 mm
Weight	TBD
Piezo Drive	PZM-35S dual
Operating Temperature	-10°C to +60°C
Operating Frequency	135 kHz
Power Consumption	TBD
Driving Voltage	14 ± 1V
Speed	TBD
Angle (Pan)	± 30°
Angle (Tilt)	± 30°
Repeatability (Encoder value)	TBD

PIEZO FILTER SWITCHER

As one of the first solutions our filter switches support large sensors. Shape can be customized.
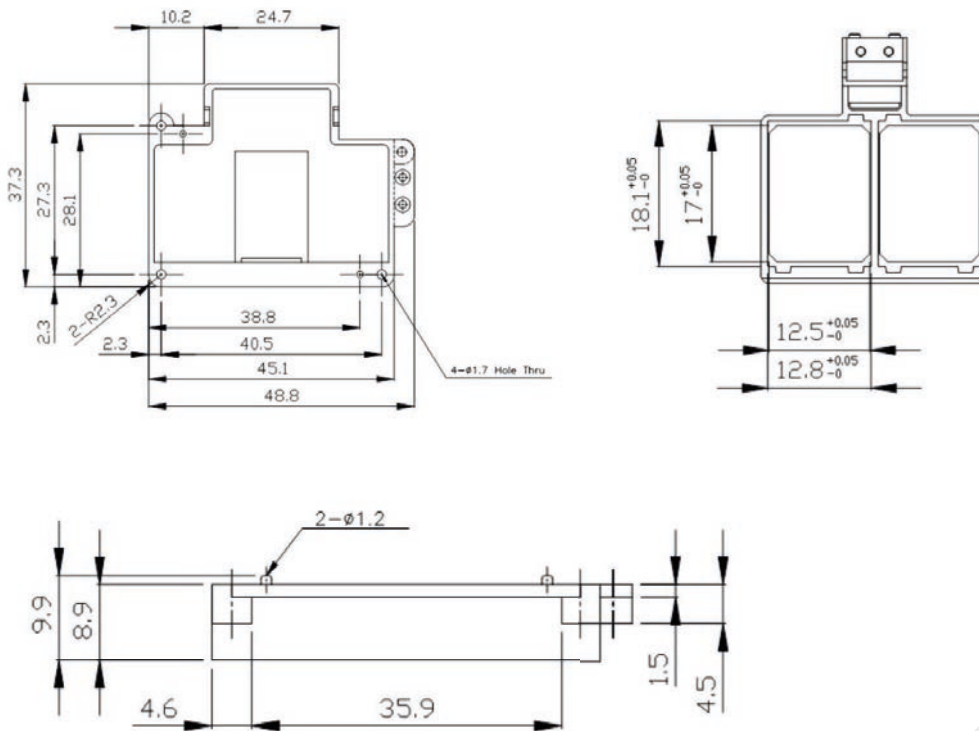
Specifications **FC002**

AC Type	Filter Switcher
Max. speed	>10mm/s
Resolution	On-Off System (open loop)
Power Consumption	< 700 mW
Driving Frequency	40±10% kHz
Operating Temperature	-15°C ~ 70°C
Dimension (WxLxH)	Customizable
Actuator	PZM-70L-220_1
Filter Size	18.1 x 12.8 mm

PIEZO Z-STAGE FOR NANO POSITIONING

Piezo Z-stage for fast
and nano positioning,
e.g. for microscope stack
scanning, interference,
3D imaging etc.

Cable length 1.5m

M (Type)	D
M26×0.75	Ø21
M26×1/36"	Ø21
M27×0.75	Ø22
M25×0.75	Ø20
W0 8×1/36"	Ø15
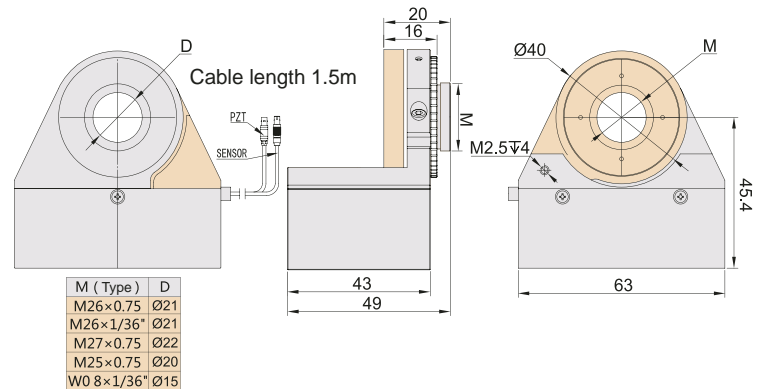
Type (C = Closed loop)	73.Z500C	73.Z500	Units
Active axis	Z	Z	
Travel range(0~120V)	400	400	µm±20%
Travel range(0~150V)	500	500	µm±20%
Integrated position sensor	SGS	-	
Resolution	13.5	4	nm
Linearity	0.1	-	%F.S.
Repeatability	0.05	-	%F.S.
Push/pull force	80/10	80/10	N
Stiffness	0.2	0.2	N/µm±20%
Unloaded resonant frequency	170	170	Hz±20%
Unloaded step time	20	10	ms±20%
Load capacity	0.4	0.4	kg
capacitance	14	14	µF±20%
Operating temperature[1]	-20~80	-20~80	°C
Material	Steel, Al	Steel, Al	
Mass	450	450	g±5%
Cable length[2]	1.5	1.5	m±10mm
Sensor/voltage connector[2]	-	-	

Travel vs Voltage

— Open loop
— Closed loop

Linearity
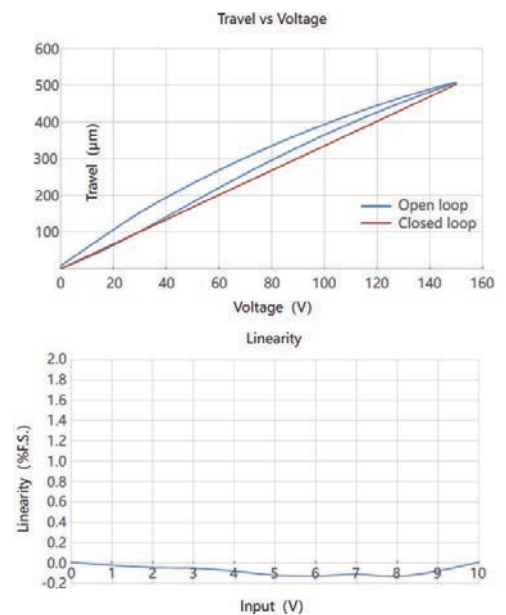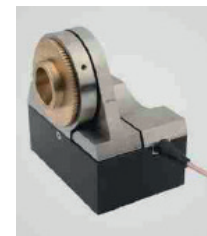
* Technical data are measured by piezo controller PZC-E00/
E01 series at room temperature of approx. 25° C.

* Max driving voltage recommended -20V~150V, 0~120V
for long-term and high-reliable operation.

* The parallelism of the moving platform is about 20µm,
and the roughness is about 1.6 to 3.2. Please contact the
sales engineer for confirmation before purchase.

[1] Customizable for ultralow temperature
and ultrahigh vacuum version.

[2] Customizable cable length and
connector on demand.

Specifications subject to change
without notice. Errors excepted.

Microscope Adapter

Microscope Adapter clamp

Wrench

Lock screw

Objective Adapter

Objective
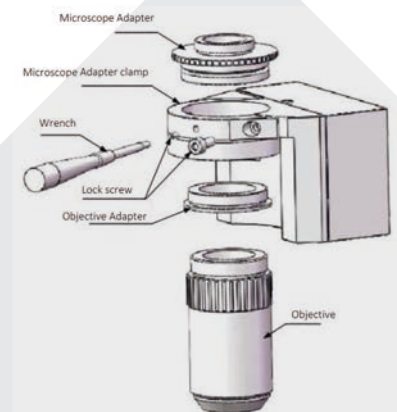
PIEZO CONTROLLERS

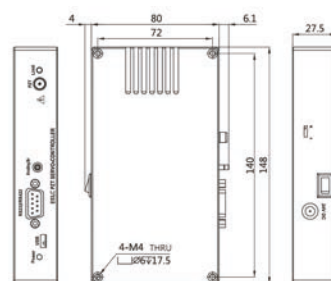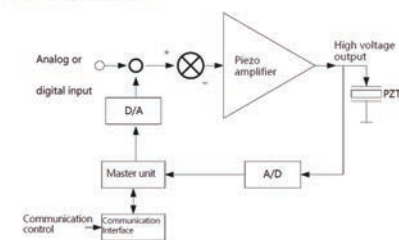Compact piezo controller for single channel, analog or digital signal control. API for C/Matlab/Labview.

C1K

Driving Principle

D1S

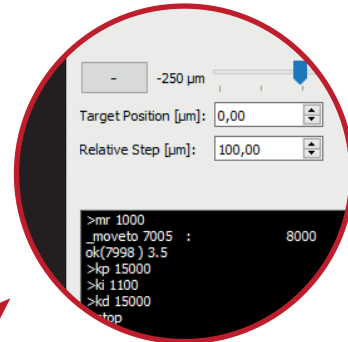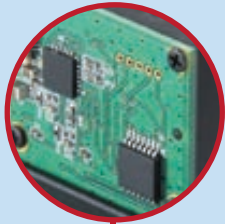| Type	PZC-73-E53.C1K	PZC-73-E53.D1S
Channels	1	1
Analog input(V)	-1.67~10	-1.67~10
Output voltage(V)	-20~120 (optional -20~150)	-20~120 (optional -20~150)
Peak current(A)	1	1
Ave. current(mA)	60	60
Bandwidth(kHz)	10	10
Output voltage ripple(mVpp)	10 (@2.2µF)	10 (@2.2µF)
PZT connector	EPG.0B.306.HLN	EPG.0B.306.HLN
Control input connector	SMB	SMB
Communication interface	USB (micro USB), RS-422 (D-SUB 9), RS-232 (D-SUB 9)	USB (micro USB), RS-422 (D-SUB 9)
Baudrate	9600, 19200, 38400, 115200	9600, 19200, 38400, 115200
Secondary development baud rate	9600, 19200, 38400,57600, 76800, 115200, 128000, 230400, 256000	9600, 19200, 38400,57600, 76800, 115200, 128000, 230400, 256000
Processor	32Bit 168MHz	32Bit 168MHz
D/A converter	16Bit	16Bit
A/D converter	16Bit	16Bit
Operating temperature(° C)	0~50	0~50
Output current, short-circuit(mA)	60	60
Overcurrent indicator	On when output ave. current >60mA	On when output ave. current >60mA
Static power(W)	< 5	< 5
Size(mm)〔L×H×D〕	148×27.5×90.1	148×27.5×90.1
Weight (kg)	0.35	0.35

No.	Function	Description
①	Power indicator	Green, lights when power's on
②	USB port	MicroUSB port
③	RS-232/422	See interface pin definition
④	Analog input	Analog voltage input interface
⑤	Servo integral	Adjust step response
⑥	Sensor monitor	0 ~ 10V
⑦	Target	Lights when the controlled displacement deviates from the target value
⑧	Zero	Zero adjustment of sensor signal
⑨	Sensor connector	Piezo actuator sensor connector
⑩	Drive connector	Piezo drive connector
⑪	Limit	Over-current indicator

Specifications subject to change without notice. Errors excepted.

CUSTOMIZING

HW & SW engineering available on demand for individual drive modes and higher precision.


```
        -          -250 µm
Target Position [µm]:  0,00
Relative Step [µm]:    100,00

>mr 1000
_moveto 7005  :                    8000
ok(7998 ) 3.5
>kp 15000
>ki 1100
>kd 15000
>top
```

Mount customizable
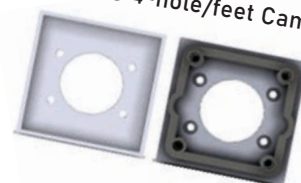for M8/M10/M12/M14/M16

Socket interchangeable

for Basler Dart Cameras

for IDS 3-feet Cameras

for IDS 4-hole/feet Cameras

...and others

We provide interchangeable sockets for a variety of board cameras. Our in-house 3D printing service helps clients quickly prove a concept.

Target-oriented solutions frequently include designing complete modules in accordance with specifications. We are happy to support you with mechanical, electrical, hardware, and software engineering assistance.

PUMR (PIEZOELECTRIC ULTRASONIC MOTOR OF ROTARY TYPE)

As this ultrasonic motor uses ultrasonic vibration (20 KHz or above) as its driving source, it comprises an elastic body (piezoelectric ceramic + stator) and a dynamic body (rotor) to generate the needed vibrations.

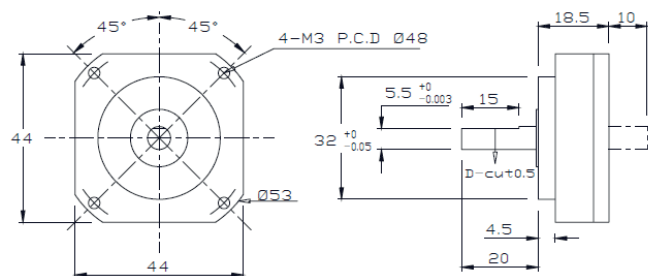'PUMR' developed by PIEZOLUTION is the abbreviation of Piezoelectric Ultrasonic Motor of Rotary type.

The PUMR do not use coils or magnets. It is a motor with a new concept that does not use magnetic force as driving source. Namely, this motor overturns the principle of the conventional motors.
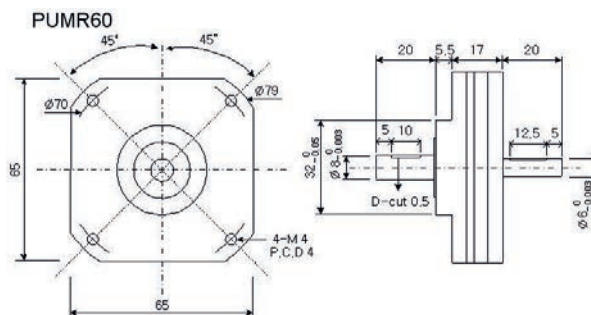
Characteristics of the PUMR

► Low speed and high torque

► Simple structure

► No gear required

► Linear design possible

► Quick response time

► Silent operation

► Precise positioning

► High holding torque, no breaking required

► No EMI/RFI

PIEZOLUTION.COM

PUM-R-40E

PUM-R-60E

PIEZOLUTION

we like to move it.

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PIEZOLUTION is a joint venture company, which strengthens our customer consulting in Europe with innovator-spirited engineering support and cost-effective production in Asia.

This fusion is an ideal way for customers to benefit from two decades of expertise in piezo-driven OEM-applications in precision motion, laboratory-automation, medical design, sub-micron positioning and more.

Together with our customers we develop individual and reliable motion solutions for precise positioning in miniaturized environment, using our patented piezoelectric ultrasonic linear drives, compact and insensitive to electro-magnetic interference.

Our state-of-the-art production line ensures high quality and flexibility. We can produce prototypes and small charges of custom-engineered types in short runs.

Piezo-driven solutions are simpler and ingenious.

We like to move it!