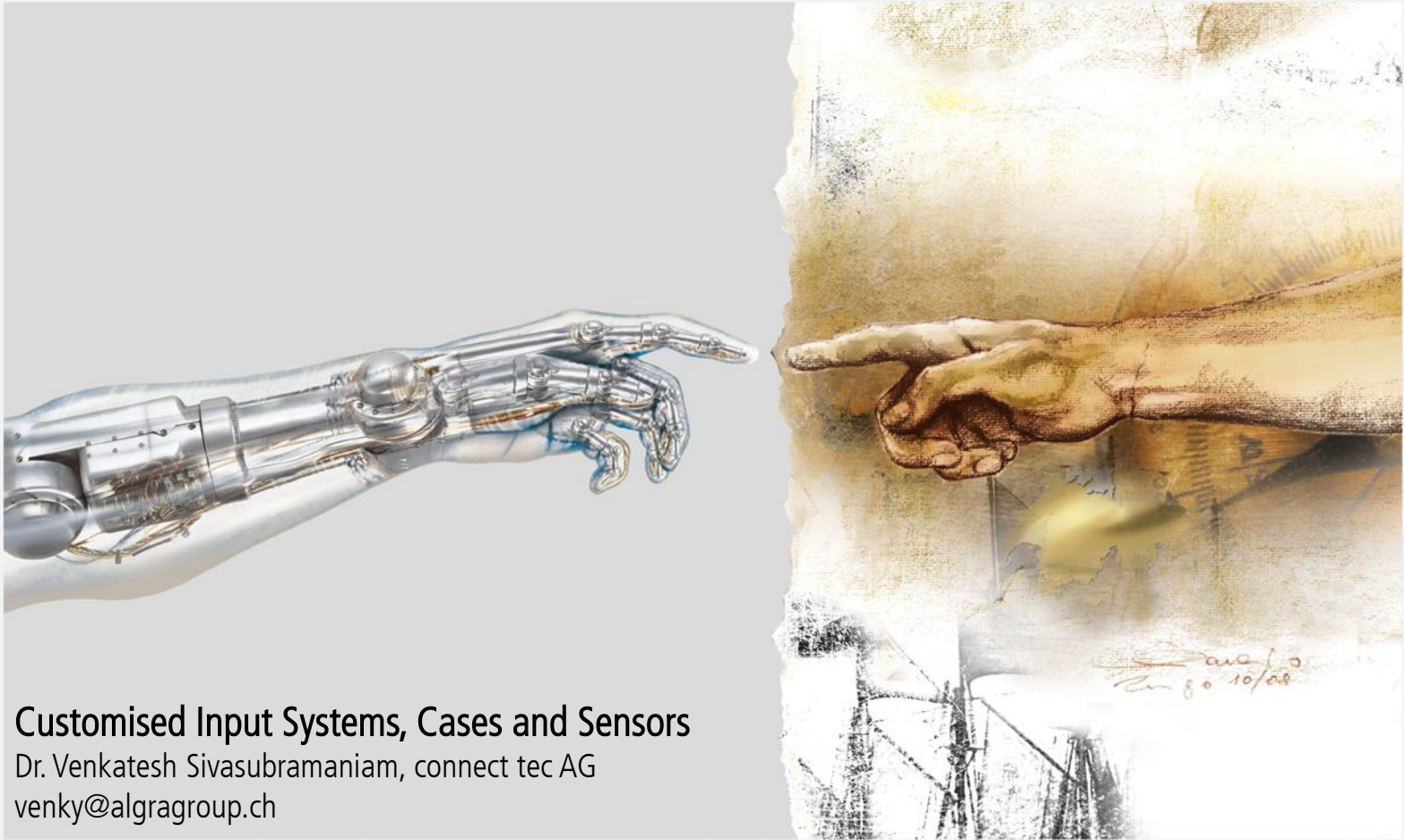


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Customised Input Systems, Cases and Sensors

Dr. Venkatesh Sivasubramaniam, connect tec AG
venky@algragroup.ch

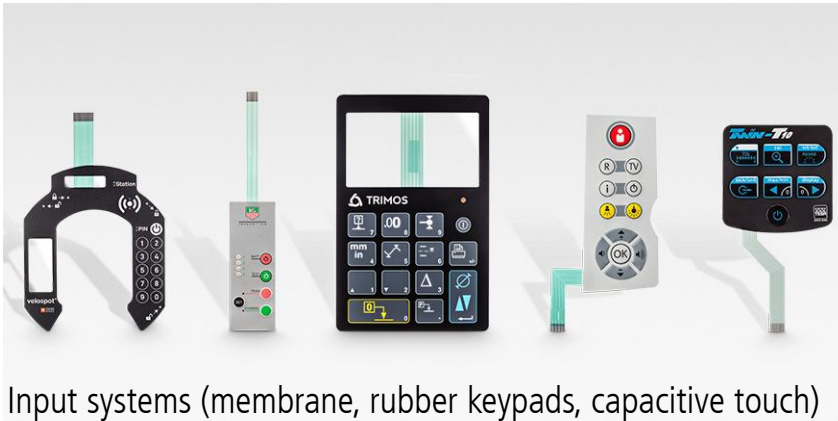
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Piezoelectric ceramics



Aluminium die-casted parts



Input systems (membrane, rubber keypads, capacitive touch)

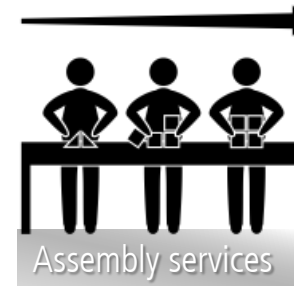
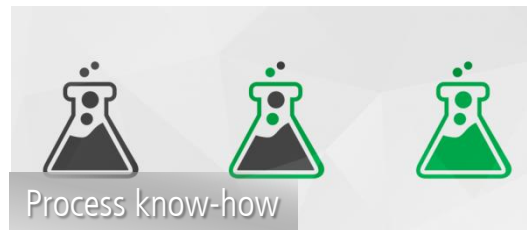
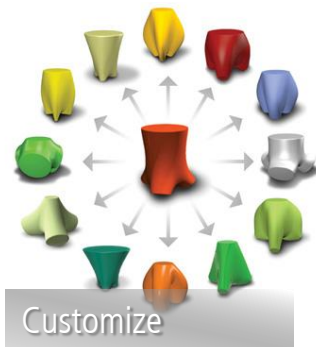
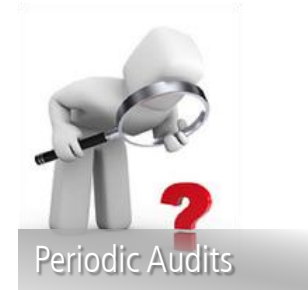


Plastic injection molded parts

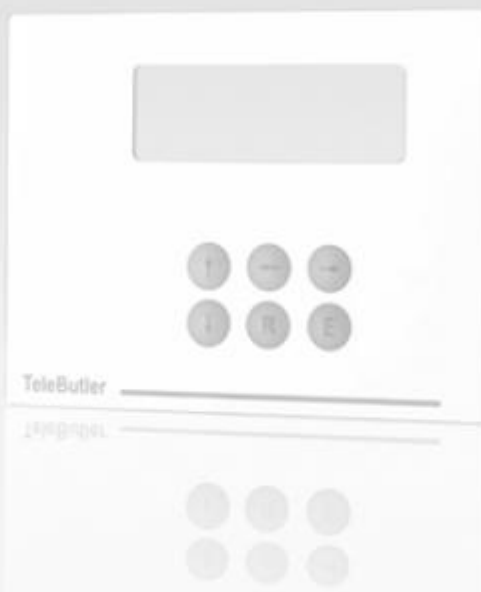
connect tec specializes in customized solutions from qualified suppliers all over the globe

ALGRA GROUP

- Connecting customers to suitable manufacturers worldwide right from concept to serial production



ALGRA GROUP



Folientastaturen mit Kupferleitertechnologie

Anwendung / Branche:	Metalldom Folientastatur / Haustechnik
Material:	Polyester mit integriertem Schnappscheiben Schaltpaket
Ausführung Schaltung:	Leitsilber, Kontaktflächen mit Graphit bedruckt
Beschriftung/Druck:	2-Farben Folienhinterdruck mit dekorativem Verlaufferaster
Schaltweg:	0.4 mm
Schaltkraft:	3 – 4N
Max. Schaltspannung:	DC 35 V, AC 20 V
Max. Schaltstrom:	100 mA
Max. Schalteistung:	1W
Betriebstemperatur:	- 30° C bis + 60° C
Max. Luftfeuchtigkeit:	70% bei 60°C im Innenbereich
Schutz:	bis IP 67 (von Vorderseite)
Anschluss:	Folienkabel für Nullkraftstecker

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Senstouch foil technology used for keyboards
All parts (Plastic and Keyboard) were produced in China
-Assembled in Switzerland

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E-BIKE customer in Switzerland



TAG HEUR- Membrane keyboard



TRIMOS Resistive touch



Hospital Media Keyboard (Backlit Keys)



Rubebr keypad with PU coating, TESA





Membrane keyboard was produced in China
-Assembled in Switzerland

Bediensysteme

Anwendung / Branche:

Anzeige-/Bediensystem /
Werkzeugmaschinen

Ausführung:

Eingabesystem kombiniert mit einer
Metallform Folientastatur

Schutz:

IP 52

ALGRA GROUP



Dekorfolie für Tastaturen

Anwendung / Branche:

Kurzhubtastaturfolie / Medizinaltechnik

Material:

Polyesterfolie mit Spacer und Klebstoff

Beschriftung/Druck:

5-Farben Folienhinterdruck



- Over 30 qualified piezoelectric producers from Asia
- Custom tailored piezoelectric components like sensors, transducers, actuators, flow meters, etc.
- Classic tape casting and sintered bulk product with very low residual porosity
- Specialized in multilayer stacks and ultrasonic applications
- Customised electrode design and various metallization possible (Ag, Au, Ni, Cu)
- PMN-PT single crystal, LYSO crystals and Technical ceramics like AlN and Alumina

We manufacture an extensive selection of piezoelectric elements from our specially formulated, highest purity lead zirconate / lead titanate ceramics. Use a soft (sensor) ceramic - 5A18, 5B23, or 5H32 - for low-power resonance or non-resonance devices, when high coupling and/or high charge sensitivity are important. Choose an hard (high power) ceramic - 4A11, 4D13, or 8010 - when high power characteristics are required.

5A18 is an excellent material for flow or level sensors, such as ultrasonic or Doppler flow meters, gas flow sensors, and ultrasonic level sensors, for ultrasonic NDT / NDE applications, or for accurate inspections of automotive, structural, or aerospace products (construction materials, structural welds, transmission lines, steel storage tanks). *5A18* also is ideal for high performance transducers for medical imaging applications. A high dielectric constant, high coupling, high charge sensitivity, high density with a fine grain structure, a high Curie point, and a clean, noise-free frequency response are characteristic of *5A18*.

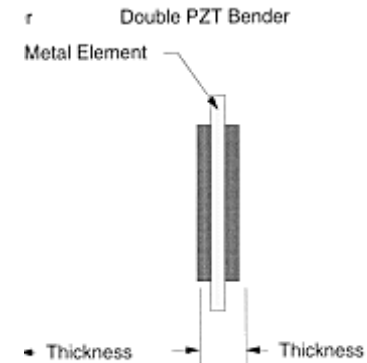
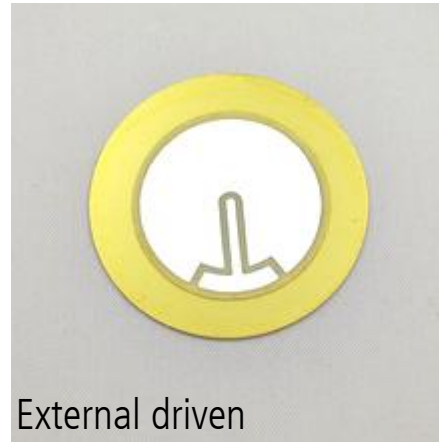
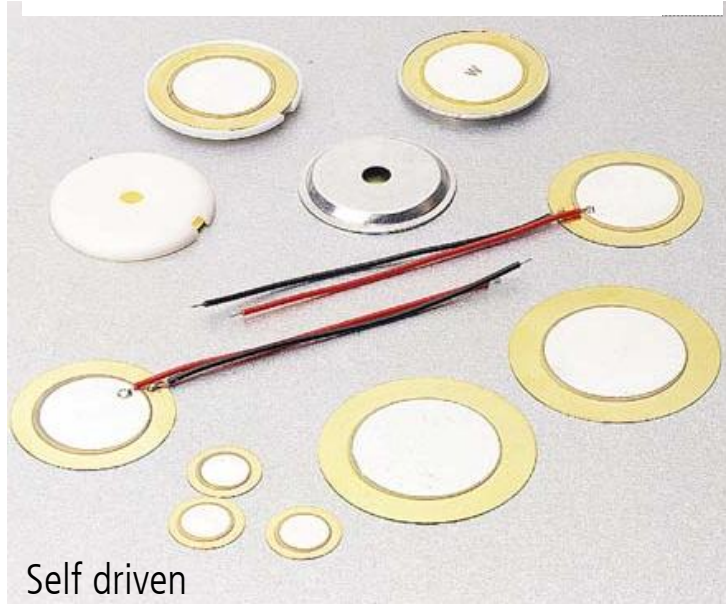
5B23 and *5H32* are suited to applications similar to those in which *5A18* is used, when high permittivity and high piezoelectric charge coefficients are required. Although its properties are somewhat different from those of *5A18*, *5H38* also is an excellent material for fluid flow sensors, level sensors, ultrasonic NDT / NDE applications, and medical imaging applications.

4A11 and *4D13* materials are widely used for generating ultrasonic or high-voltage energy in ultrasonic cleaners, sonar devices, etc. Important characteristics of *4D13* include a high piezoelectric charge constant (d_{33}) relative to reference values for this formulation, greater power output per volume of material, a high mechanical quality factor that reduces mechanical loss and allows a lower operating temperature, and a low dissipation factor that ensures cooler, more economical operation.

High dielectric stability and low mechanical loss under demanding conditions make *8010* an excellent choice when the highest electrical drive is required.

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connect tec®	4A11	8010	5A18	5H32	5J27	B8613
Navy	DOD-I	DOD-III	DOD-II	DOD-VI	DOD-V	..
Industry	PZT-4	PZT-8	PZT-5A	PZT-5H	PZT-5J	..
MOTOROLA	...	...	3195	3203	...	..
Morgan	4	8	5A	5H	5J	..
APC	840	880	850	856	855	..
ITT Exelis	EC-64	EC-67	EC-65	EC-70	.....	..
ENDEVCO	..	..	P8	..	..	P14



Bimorphs

Features

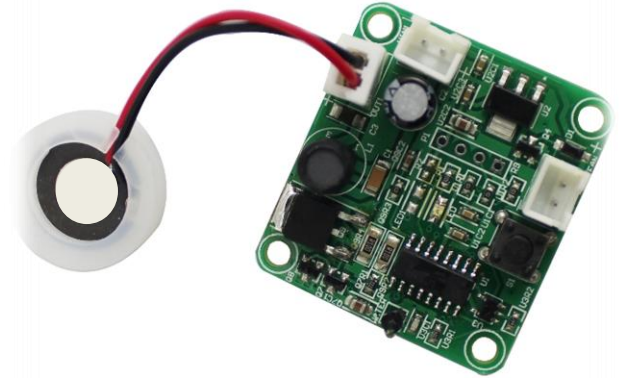
clear sound
high sound pressure
low power consumption
small and lightweight
5 mm to 50 mm diameter
single PZT layer or two PZT layers
low cost
custom design capability
Good solderability

Typical Applications

household appliance alarms and warning signals
watch alarms
smoke detectors
pressure sensors
keyboards / push-button devices
buzzers and speakers
toys / games
microvalves



ALGRA GROUP



Ultrasonic transducer is used for ultrasonic atomizer, Our products are made from the piezoelectric ceramic developed by ourselves, has the advantages of better temperature stability and superior piezoelectric effect. It also adopted an advanced membrane technology with electrode passivation, has a good acid, alkali-resistant performance and no silver migration.

Applications include: Flow meters, beauty, massage, nebulizers, NDT transducers and various electromedical applications



Customised rings, plates and hemispheres

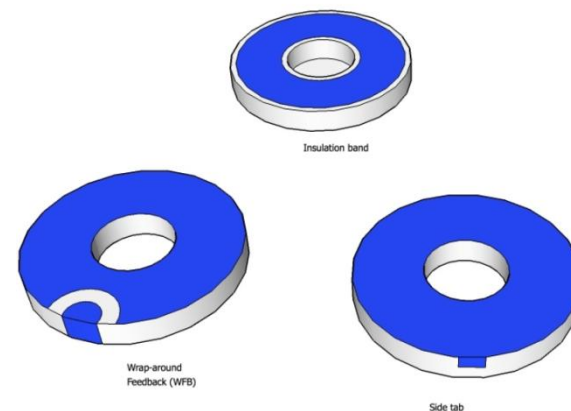
connect tec®

1
4

HIGH PERFORMANCE PIEZO DISC



ALGRA GROUP



common electrode patterns

Applications

- Ultrasonic welding and wire bonding
- Dental scalers
- Ultrasonic cleaning and sonification
- Sonar

Characteristics

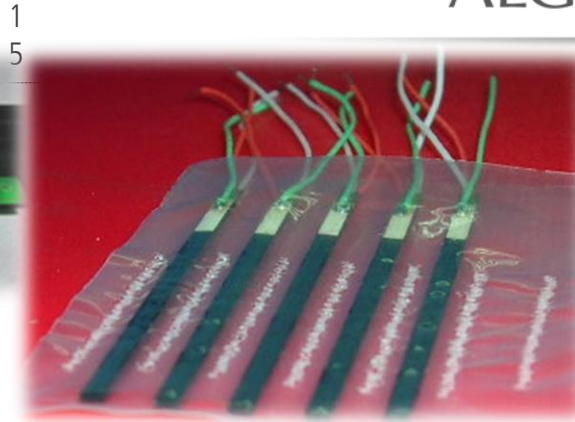
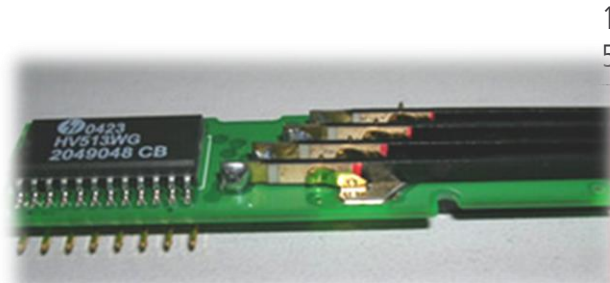
- Excellent frequency stability
- High power output, high efficiency
- High quality factor, low heat generation
- Excellent mechanical strength and durability

Specification sheet available based on requested target dimensions

ALGRA®
industrial technology

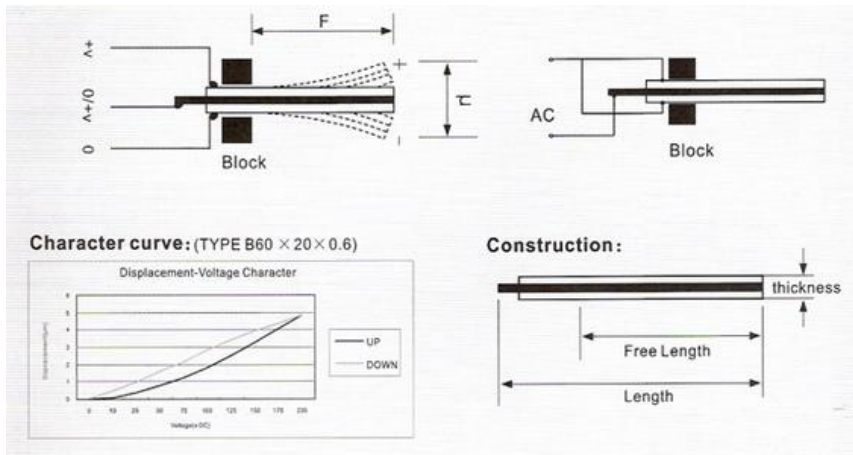
gravuretec®
precision works

connect tec®
worldwide technologies



Custom Design and Engineering Services

If the dimensions or performance characteristics of standard Stripe actuators do not fit your needs, we can custom-manufacture these actuators to your specifications. Before you request custom products, however, we recommend you evaluate standard Stripe actuators for your application by varying the free length, the method of mounting, and/or the applied voltage.



Applications

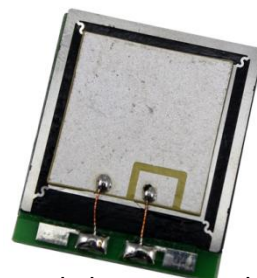
- Braille machines
- needle control in textile weaving
- accelerometers
- opening / closing valves / pumping devices
- switching applications - making / breaking electrical
- cooling devices for electronics (no electromagnetic noise)

Characteristics

- large deflection
- useful blocking forces
- surfaces passivation for environmental hazards



ALGRA GROUP



Multilayer speakers



Gas flow sensors



Proximity switch



Water and pressure proof



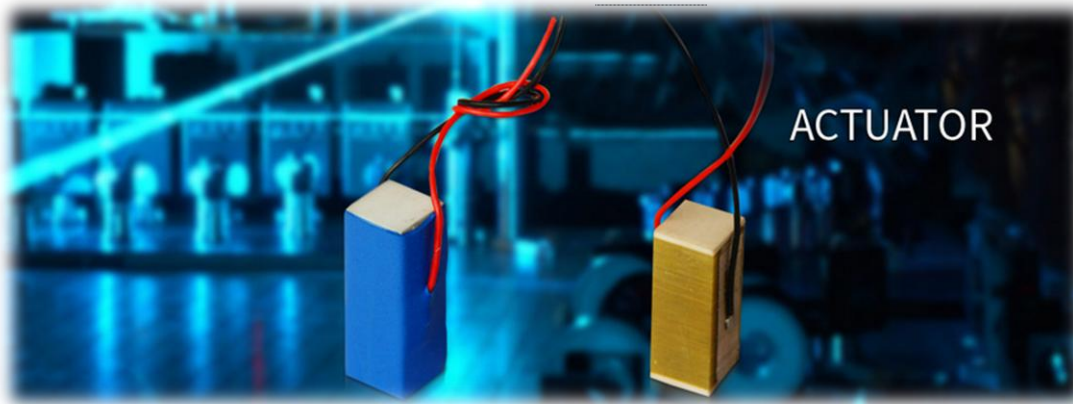
level sensors



Park sensor



Shock sensors

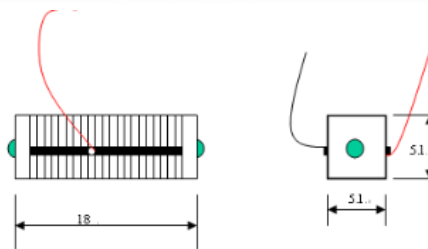
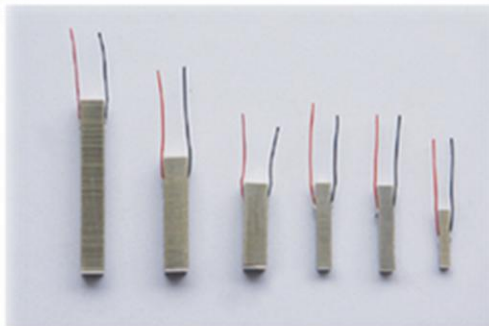


Applications

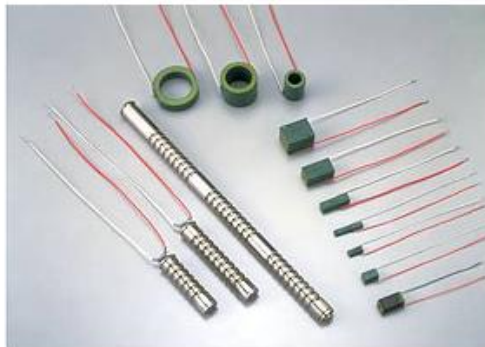
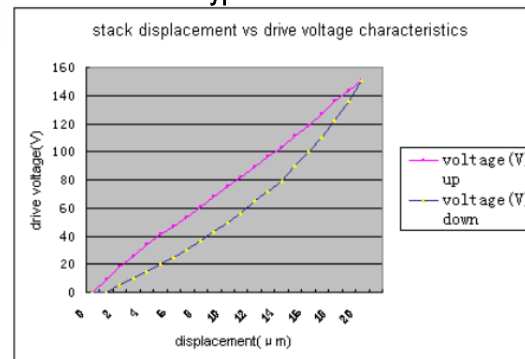
- nanopositioning
- printer/Magnetic head position
- optical positioning
- linear motors, pumps
- drive manipulators etc.

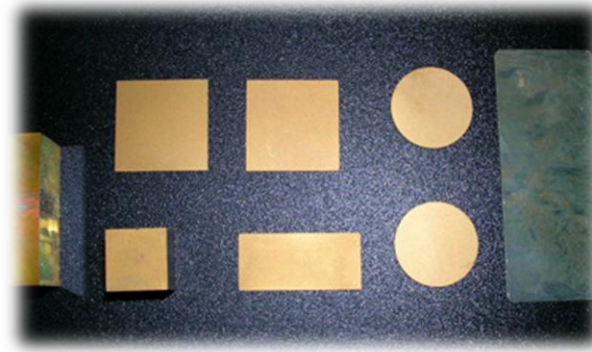
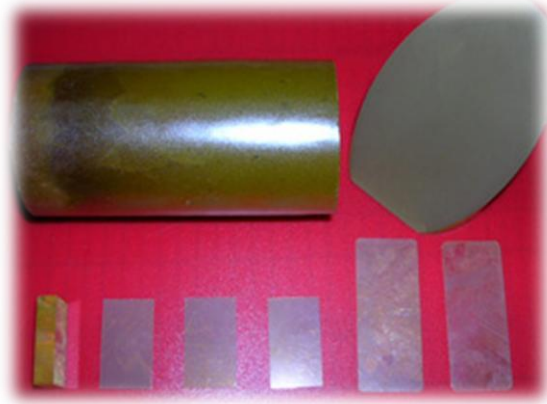
Characteristics

- precise displacement (PMN-PT)
- high blocking force
- proven long term stability
- various metallization (Cu/Ni/Au/Ag/Pd)
- low voltage version also available 50 V
- Metal sealed or resin coated



Typical data





The lead magnesium niobate-lead titanate (PMN-PT) exhibit high piezoelectric coefficient, large electric-mechanical coupling coefficient, high dielectric constants and low dielectric losses. This enables in improving bandwidth, sensitivity for your target applications

Application modes

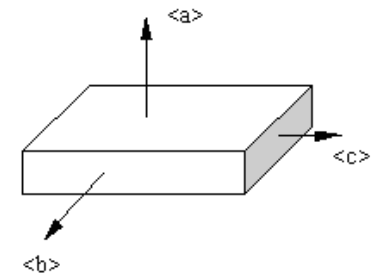
- Radial Extension
- Longitudinal Extension
- Transverse Extension
- Longitudinal Shear
- Transverse Shear

Electrodes

Ag 0.07um

Au (Cr or Ni/Au/Ag/Au)

Pt 0.07um



ALGRA GROUP



Features	Requirements of scintillation crystals
Stopping power	Dense and high absorption coefficient for gamma-ray.
Scintillation properties	High light output and short decay time, colorless and clear
Uniformities	Excellent energy resolution and uniform light output.
Temperature response	Small decrease in light output at 100°C
Radiation hardness	Almost no degradation in scintillation properties at 10*6 gray.

Applications

Gamma-ray and X-ray detectors such as Positron Emission tomography (medical imaging) and high energy physics.



We can produce crystals in high volume and can supply finished pixel or assembled customer specified array or module configurations.

High-series sensitivity with low dielectric loss

Name	PT105-071	PT140-071	PT180-071	PT200-071	PT280-071	PT300-071	PT350-071	PT400-072	PT450-071
K _p	0.63	0.63	0.64	0.65	0.65	0.65	0.63	0.62	0.62
K ₃₃	0.65	0.65	0.68	0.70	0.72	0.72	0.69	0.66	0.66
K ₃₁	0.33	0.33	0.35	0.36	0.36	0.37	0.36	0.36	0.35
d ₃₃	260	360	410	430	560	595	660	720	760
d ₃₁	-135	-185	-220	-240	-312	-316	-340	-360	-380
g ₃₃	28.0	29.1	25.7	24.3	22.6	22.4	21.3	20.3	19.1
g ₃₁	-14.5	-14.9	-13.8	-13.6	-12.6	-11.9	-11.0	-10.2	-9.55
N _p	2000	2000	2000	1990	1980	1980	1980	1990	1990
N _t	2000	2000	2000	2000	1990	1990	1990	2000	2000
N ₃₁	1480	1480	1470	1470	1460	1460	1460	1460	1460
$\epsilon_{33}^T/\epsilon_0$	1050	1400	1800	2000	2800	3000	3500	4000	4500
tgδ	0.008	0.008	0.010	0.012	0.013	0.015	0.015	0.016	0.018
Q _m	110	100	90	90	80	75	70	65	60
T _c	350	330	320	310	300	300	290	280	270
ρ	7.8	7.7	7.7	7.7	7.6	7.6	7.5	7.5	7.5

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Olivier Kuhn
Head of Sales Switzerland
Area Sales Manager
Western Switzerland



Alain Feierabend
Area Sales Manager
Mittelland Nord, Central
and Eastern Switzerland



Gerard Ercolani
Senior Sales Consultant
Ticino



Mirco Henseler
Head of Export / Area Sales
Manager Mittelland,
Northwest Switzerland



Markus Haas
International Sales Manager



Dr.-Ing. Marco Müller
Product Management
Deutschland, International

THANK YOU
FOR YOUR ATTENTION

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