



Professional Sound Component Provider

A central graphic consisting of three overlapping diamonds. The top diamond is magenta, the middle one is dark blue with a green-to-blue gradient, and the bottom one is blue. The text 'APPLICATION GUIDES' is centered in the middle diamond. Surrounding this central graphic are various icons: a portable CD player (top left), a mobile phone (top left), a satellite dish (top right), a barcode (middle right), a gear (bottom left), a speaker (bottom left), a wireless signal icon (bottom center), a hard drive (bottom left), and a subwoofer (bottom right). A large grey diamond is also present in the bottom right area. The background is a light grey network of dots and lines.

APPLICATION GUIDES

PREFACE

01

FLEZON brand under Flexxon Pte Ltd, serving as a professional acoustic components provider. Flexxon cooperate with 40 years Research and Development team to design and manufacture some of the leading components that are currently used in the world market. We have over 5,000 different models and the number is still growing every day. We believe that by combining the human hearing sensation and electronics together, we will assist customer to create a strong marketing position by feeling the sound with technology. By integrating this new concept into our product and services, it will help significantly to our customers and enhance their competitiveness in the world market.

With FLEZON brand product, you receive superior services, a wide and comprehensive range of products of selection, professional technical advice and overall value which will exceed your expectation. You are welcome to contact our team for your requirement or we could design the **"SOUND"** to your application.

Each application guide will contain a unique electrical application of different kind and nature; we will help you to understand the functions and uses of different acoustic components on different applications.

Contact your responsible salesmen today to find out more about our products and services.

BLUE TOOTH HEADSET FOR THE ACOUSTIC COMPONENTS


02


Microphone
It is used for receiving
speech voice



Receiver
It is used for emitting
speech voice

Hands-free Bluetooth earpiece for a phone is a very common application using blue tooth technology. There are two types of Bluetooth headset in current market. Bluetooth headsets often are a single monaural earpiece. Depending on the phone's operating system, this type of headset will either play music at a very low quality (suitable for voice), or will be unable to play music at all. Some headsets can play stereo music with acceptable quality. Some headsets automatically de-activate the microphone function while playing music; if these headsets are paired to a computer via Bluetooth connection, the headset may disable either the stereo or the microphone function.

 Receiver	Suggested Item	FDR13C		FDR15C		
	Size(LxWxH) (mm)	Ø 13 x 2.7		Ø 15 x 3.3		
	Sensitivity (dB)	114		114		
	Impedance(Ω)	32		32		

 Microphone	Suggested Item	FBM04C	FBM06C	FBM06C	FMM03R	FMM04R	FMM04S
	Size (mm)	Ø 4 x 1.5	Ø 6 x 2.2	Ø 6 x 2.7	Ø 3.76x2.95x1.1	4.72x3.76x1.25	4.5x4.5x1.45
	Product Type	ECM	ECM	ECM	MEMS	MEMS	MEMS

CONFERENCE CALL SYSTEM FOR THE ACOUSTIC COMPONENTS

03

Microphone

It is used for receiving speech voice





Speaker

It is used for emitting speech voice



A conference call is a telephone call in which the calling party wishes to have more than one called party listen in to the audio portion of the call. The conference calls may be designed to allow the called party to participate during the call, or the call may be set up so that the called party merely listens into the call and cannot speak. It is sometimes called ATC (Audio Tele-Conference).


 Speaker	Suggested Item	FLS40C	FLS45C	FLS50C	FLS66C
	Size(LxWxH) (mm)	Ø 40 x 6.55	Ø 45.2 x 9.7	Ø 50 x 12.2	Ø 66 x 12.5
	Rated Power(W)	0.5	0.5	1	0.5
	Impedance(Ω)	8	8	8	8
 Microphone	Suggested Item	FOM08C	FOM09C	FOM09C	FOM09C
	Size (mm)	Ø 8 x 5.2	Ø 9.4 x 6.5	Ø 9.7 x 4.5	Ø 9.7 x 6.7
	Product Type	ECM	ECM	ECM	ECM


CORDLESS PHONE FOR THE ACOUSTIC COMPONENTS


04




A cordless telephone or portable telephone replaces the handset cord with a radio link. The handset communicates with a base station connected to a fixed telephone line. The range is limited usually to the same building or some short distance from the base station. The base station attaches to the telephone network the same way a corded telephone does. When the phone is mis-placed somewhere, a button can be pressed on the base station to activate the phone's alarm for user to find the phone.

 Receiver	Suggested Item	FDR25C	FDR31C	FDR38C
	Size(LxWxH) (mm)	Ø 25 x 7.3	Ø 31 x 11	Ø 38 x 21.2
	Sensitivity (dB)	93	93	96
	Impedance(Ω)	150	150	150

 Microphone	Suggested Item	FOM06C	FOM08C	FOM09C	FOM09C	FOM09C
	Size (mm)	Ø 6 x 5.2	Ø 8 x 5.2	Ø 9.4 x 6.5	Ø 9.7 x 4.5	Ø 9.7 x 6.7
	Product Type	ECM	ECM	ECM	ECM	ECM

 Element	Suggested Item	FPE41C	FPE50C
	Size (mm)	Ø 41 x 0.41	Ø 50 x 0.41
	Frequency(Hz)	1500	1100
	Capacitance(pF)	40000	60000


 Transducer	Suggested Item	FMT12C	FET34C
	Size (mm)	Ø 12 x 8.5	Ø 34.5 x 9
	Sound Pressure Level (dBA)	85	70
	Product Type	Magnetic	Piezo
	Type	Pin	Leadwire


DIGITAL AUDIO PLAYER FOR THE ACOUSTIC COMPONENTS


05



A portable digital audio player is a consumer electronics device that is capable of storing and playing digital media such as audio, images, video, documents, etc. the data is typically stored on a hard drive, micro drive, or flash memory. Often digital audio players are sold as MP3 players, even if they support other file formats. Other types of electronic devices like cell phones, internet tablets, and digital cameras are sometimes referred as portable media player because of their playback capabilities. Such players are typically much less expensive than either the hard drive or flash-based players. Many players have a built-in electret microphone which allows recording. There are professional-quality recorders suitable for high-quality music recording.

 Microphone	Suggested Item	FBM04C	FBM06C	FBM06C
	Size (mm)	Ø 4 x 1.5	Ø 6 x 2.2	Ø 6 x 2.7
	Product Type	ECM	ECM	ECM

 Transducer	Suggested Item	FMT04R	FMT05S
	Size (mm)	4 x 3 x 1.9	5 x 5 x 2
	Sound Pressure Level (dBA)	68	78
	Product Type	Magnetic	Magnetic
	Type	SMD	SMD

 Element	Suggested Item	FPE15C	FPE20C
	Size (mm)	Ø 15 x 0.22	Ø 20 x 0.22
	Frequency(Hz)	4100	4000
	Capacitance(pF)	9000	26000

DIGITAL CAMERA FOR THE ACOUSTIC COMPONENTS

06

Microphone
It is used for receiving
speech voice



Speaker
It is used for emitting
sound etc



Element
A signal sound is
emitted when button
is pressed or alarm
is set.

A digital camera is a camera that takes video or still photographs by recording images on an electronic image sensor. Most cameras sold today are digital, and digital cameras are incorporated into many devices ranging from mobile phones to vehicles. Digital cameras contain an optical system, typically using a lens with a variable diaphragm to focus light onto an image pickup device. The diaphragm and shutter admit the correct amount of light to the imager,

Digital cameras can display images on a screen immediately after being recorded, and store and delete images from memory. Most digital cameras can also record moving video with sound. Some digital cameras can crop and stitch picture and perform other elementary image editing.

 Microphone	Suggested Item	FBM04C	FBM06C	FBM06C	FMM06C	FMM06C
	Size (mm)	Ø 4 x 1.5	Ø 6 x 2.2	Ø 6 x 2.7	Ø 6 x 2.2	Ø 6 x 2.7
	Product Type	ECM	ECM	ECM	Digital	Digital

 Speaker	Suggested Item	FMS20R	FMS13C	FMS17R
	Size(LxWxH) (mm)	20 x 14 x 3.5	Ø 13 x 3.5	17 x 13 x 3.35
	Rated Power(W)	0.6	0.5	0.8
	Impedance(Ω)	8	8	8

 Element	Suggested Item	FPE15C	FPE20C
	Size (mm)	Ø 15 x 0.22	Ø 20 x 0.22
	Frequency(Hz)	4100	4000
	Capacitance(pF)	9000	26000

EBOOK READER FOR THE ACOUSTIC COMPONENTS

07




Speaker

It is used to emit sound when button is pressed or user wants the text to voice.

An e-book reader, also called an e-book device or e-reader, is a mobile electronic device that is designed primarily for the purpose of reading digital e-books and periodicals.

Any device that can display text on a screen may act as an e-book reader, but specialized e-book reader designs may optimize portability, readability (especially in sunlight), and battery life for this purpose. A single e-book reader is capable of holding the digital equivalent of hundreds of printed texts with no added bulk or measurable mass.

 Speaker	Suggested Item	FMS13C	FMS17C	FMS20C	FMS28C
	Size(LxWxH) (mm)	Ø 13 x 48	Ø 17 x 3.4	Ø 20 x 3	Ø 28 x 4.9
	Rated Power(W)	0.5	0.8	0.3	1
	Impedance(Ω)	8	8	8	8

ACTION CAMERA FOR THE ACOUSTIC COMPONENTS

08



Action cameras often used in extreme action video photography. They are known for being lightweight, rugged, wearable or mountable in unusual places such as outside planes, cars, boats or army tanks.

Microphone	Suggested Item	FOM06C	FOM06C	FOM06C	FOM09C	FOM09C
	Size (mm)	Ø 6 x 2.2	Ø 6 x 2.7	Ø 6 x 2.7	Ø 9.7 x 4.5	Ø 9.7 x 4.5
	Product Type	ECM	ECM	ECM	ECM	ECM

Transducer	Suggested Item	FMT09C	FMT12C	FET14C	FET14C
	Size (mm)	Ø 9 x 4	Ø 12 x 9	Ø 14 x 6.7	Ø 13.8 x 6.4
	Sound Pressure Level (dBA)	82	85	80	85
	Product Type	Magnetic	Magnetic	Piezo	Piezo
	Type	Pin	Pin	Pin	Pin

Element	Suggested Item	FPE15C	FPE20C
	Size (mm)	Ø 15 x 0.22	Ø 20 x 0.22
	Frequency(Hz)	4100	4000
	Capacitance(pF)	9000	26000

HANDHELD GAME CONSOLE

FOR THE ACOUSTIC COMPONENTS

09




Speaker

It is used for emitting music or sound etc

A handheld game console is a lightweight, portable electronic device with a built-in screen, game controls, speakers and replaceable and/or rechargeable batteries or battery pack. Handheld game consoles are run on machines of small size allowing people to carry them and play them at any time or place. Unlike video game consoles, the control, screen and speakers are all part of a single unit.

For some high technology is developed by some popular handheld electronic game company in 2010s, OLED multi-touch capacitive touch screen, and supports Bluetooth, Wi-Fi, optional 3G and auto stereoscopic. The auto stereoscopic device is able to project stereoscopic three-dimensional effects without requirement of active shutter or passive polarized glasses, which are required by most current 3D televisions to display the 3D effect.

 Speaker	Suggested Item	FMS15R	FMS16R	FMS18R	FMS20R	FMS13C	FMS17R
	Size(LxWxH) (mm)	15 x 11 x 3.5	16 x 9 x 3	18 x 13 x 3.7	20 x 14 x 3.5	Ø 13 x 3.5	17 x 13 x 3.35
	Rated Power(W)	0.5	0.5	0.7	0.6	0.5	0.8
	Impedance(Ω)	8	8	8	8	8	8

HEADPHONES

FOR THE ACOUSTIC COMPONENTS

10




Receiver

It is used for emitting music, song or speech voice.

Headphones are a pair of small loudspeakers which are designed to be held in place close to a user's ears. Headphones have wires which allow them to be connected to a signal source such as a portable media player. They are also known as stereo phones. The in-ear versions are known as earphones or ear buds.

Cordless headphones are not connected via a wire, receiving a signal encoded using a transmission link, like Bluetooth or Wi-Fi. These are powered receiver systems of which the headphone is only a component. Cordless headphones are used with events such as a Silent disco.

 Receiver	Suggested Item	FDR23C	FDR27C	FDR27C
	Size(LxWxH) (mm)	Ø 22.8 x 4.6	Ø 26.8 x 8	Ø 26.8 x 5.7
	Sensitivity (dB)	119	118	110
	Impedance(Ω)	32	100	300

HEADSET

FOR THE ACOUSTIC COMPONENTS

11

Microphone
It is used for receiving
speech voice





Receiver
It is used for emitting
speech voice

A headset is headphones combined with a microphone, or one headphone with a microphone. Headsets provide the equivalent functionality of a telephone handset with hands-free operation. They have many uses including in call centers.

Headsets are available in single-earpiece and double-earpiece designs. Single-earpiece headsets are known as monaural headsets. Double-earpiece headsets may support stereo sound, or use the same audio channel for both ear-pieces.

For audio applications, where the sources offer two-channel output, stereo headsets are the norm; use of a headset instead of headphones allows use for communications in addition to listening to stereo sources.

 Microphone	Suggested Item	FOM06C	FOM06C	FOM06C	FOM06C
	Size (mm)	Ø 6 x 2.2	Ø 6 x 3	Ø 6 x 5.2	Ø 6 x 5.2
	Product Type	ECM	ECM	ECM	ECM

 Receiver	Suggested Item	FDR23C	FDR27C	FDR27C
	Size(LxWxH) (mm)	Ø 22.8 x 4.6	Ø 26.8 x 8	Ø 26.8 x 5.7
	Sensitivity (dB)	119	118	110
	Impedance(Ω)	32	100	300

SMART PHONE FOR THE ACOUSTIC COMPONENTS

12

Microphone
It is used for receiving
speech voice



Receiver
It is used for emitting
speech voice



Speaker
It is used for emitting
sound etc



Smart phones are used for a variety of purposes, including keeping in touch with family members, conducting business, and having access to a telephone in the event of an emergency. Some people carry more than one cell phone for different purposes, such as for business and personal use. Multiple SIM cards may also be used to take advantage of the benefits of different calling plans—a particular plan might provide cheaper local calls, long-distance calls, international calls, or roaming.

Microphone	Suggested Item	FBM04C	FBM06C	FBM06C	FMM03R	FMM04R	FMM04S
	Size (mm)	Ø 4 x 1.5	Ø 6 x 2.2	Ø 6 x 2.7	3.76x2.95x1.1	4.72x3.76x1.25	4.5x4.5x1.45
	Product Type	ECM	ECM	ECM	MEMS	MEMS	MEMS

Receiver	Suggested Item	FDR15R	FDR15R	FDR15R
	Size(LxWxH) (mm)	15 x 6 x 2.5	15 x 6 x 2.2	15 x 6 x 2.2
	Sensitivity (dB)	107	18	110
	Impedance(Ω)	32	32	32

Speaker	Suggested Item	FMS15R	FMS16R	FMS18R	FMS20R	FMS13C	FMS17R
	Size(LxWxH) (mm)	15 x 11 x 3.5	16 x 9 x 3	18 x 13 x 3.7	20 x 14 x 3.5	Ø 13 x 3.5	17 x 13 x 3.35
	Rated Power(W)	0.5	0.5	0.7	0.6	0.5	0.8
	Impedance(Ω)	8	8	8	8	8	8

VIDEO CAMERA FOR THE ACOUSTIC COMPONENTS

13

Microphone
It is used for receiving
speech voice



Speaker
It is used for emitting
sound etc

A video camera is a camera used for electronic motion picture acquisition, initially developed by the television industry but now common in other applications as well.

Video cameras are used primarily in two modes. The first is live television, where the camera feeds real time images directly to a screen for immediate observation. A few cameras still serve live television production, but most live connections are for security and industrial operations where surreptitious or remote viewing is required. In the second mode the images are recorded to a storage device for archiving or further processing. Nowadays, optical disc media, hard disk, and flash memory in tapeless camcorders are all increasingly used. Recorded video is used in television and film production, and more often surveillance and monitoring tasks where unattended recording of a situation is required for later analysis.

 Microphone	Suggested Item	FBM06C	FMM06C	FMM06C	FMM03R	FMM04R	FMM04S
	Size (mm)	Ø 6 x 2.7	Ø 6 x 2.2	Ø 6 x 2.7	3.76x2.9	4.72x3.7	4.5x4.5x1
	Product Type	ECM	Digital	Digital	MEMS	MEMS	MEMS

 Speaker	Suggested Item	FMS20R	FMS13C	FMS17R
	Size(LxWxH) (mm)	20 x 14 x 3.5	Ø 13 x 3.5	17 x 13 x 3.35
	Rated Power(W)	0.6	0.5	0.8
	Impedance(Ω)	8	8	8

VIDEO PROJECTOR

FOR THE ACOUSTIC COMPONENTS


14



Transducer

A signal sound is emitted when button is pressed or a signal which is transmitted from remote control is received.

A video projector is an image projector that receives a video signal and projects the corresponding image on a projection screen using a lens system. All video projectors use a very bright light to project the image, and most modern ones can correct any curves, blurriness, and other inconsistencies through manual settings. Video projectors are widely used for many applications such as, conference room presentations, classroom training, home theatre and concerts. Projectors are widely used in many schools and other educational settings, sometimes connected to an interactive whiteboard to interactively teach pupils.

 Transducer	Suggested Item	FMT12C	FET12C	FET14C	FET14C
	Size (mm)	Ø 12 x 9	Ø 12.6 x 6.3	Ø 14 x 6.7	Ø 13.8 x 6.4
	Sound Pressure Level (dBA)	85	80	80	85
	Product Type	Magnetic	Piezo	Piezo	Piezo
	Type	Pin	Pin	Pin	Pin

WALKIE-TALKIE FOR THE ACOUSTIC COMPONENTS

15



Speaker

A signal sound is emitted when user presses the talk button.

A walkie-talkie (more formally known as a handheld transceiver) is a hand-held, portable, two-way radio transceiver. Its development during the Second World War has been variously credited to Donald L. Hings, radio engineer Alfred J. Gross, and engineering teams at Motorola. Similar designs were created for other armed forces, and after the war, walkie-talkies spread to public safety and eventually commercial and jobsite work. Major characteristics include a half-duplex channel (only one radio transmits at a time, though any number can listen) and a "push-to-talk" (PTT) switch that starts transmission. Typical walkie-talkies resemble a telephone handset, possibly slightly larger but still a single unit, with an antenna mounted on the top of the unit. Where a phone's earpiece is only loud enough to be heard by the user, a walkie-talkie's built-in speaker can be heard by the user and those in the user's immediate vicinity. Hand-held transceivers may be used to communicate between each other, or to vehicle-mounted or base stations.



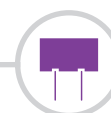
Speaker

Suggested Item	FMS30C	FMS36C	FMS40C
Size(LxWxH) (mm)	Ø 30 x 3.3	Ø 36 x 3.2	Ø 40 x 6.6
Rated Power(W)	0.5	0.25	1
Impedance(Ω)	8	16	8

DASHBOARD

FOR THE ACOUSTIC COMPONENTS

16




Transducer

A signal sound is emitted when you signal the turn.

A dashboard is a control panel placed in front of the driver of an automobile, housing instrumentation and controls for operation of the vehicle. Items located on the dashboard included the steering wheel and the instrument cluster. The instrument cluster pictured to the right contains gauges such as a speedometer, tachometer, odometer and fuel gauge, and indicators such as gearshift position, parking-brake-engagement warning light, seat belt warning light and an engine-malfunction light. There may also be indicators for low fuel, low oil pressure, low tire pressure and faults in the airbag system. Heating and ventilation controls and vents, lighting controls, audio equipment and automotive navigation systems are also mounted on the dashboard.

The top of a dashboard may contain vents for the heating and air conditioning system and speakers for an audio system. A glove compartment is commonly located on the passenger's side. There may also be an ashtray and a cigarette lighter which can provide a power outlet for other low-voltage appliances.

 Transducer	Suggested Item	FMT12C	FMT13R	FMT13R	FMT16C	FMT16C	FMT25C
	Size (mm)	Ø 12 x 9	12.8 x 7.1	12.8 x 10	Ø 16 x 12	Ø 16 x 14.5	Ø 25 x 12.5
	Sound Pressure Level (dBA)	85	87	85	85	85	85
	Product Type	Magnetic	Magnetic	Magnetic	Magnetic	Magnetic	Magnetic
	Type	Pin	SMD	SMD	Pin	Pin	Pin

GOLF CART

FOR THE ACOUSTIC COMPONENTS

17

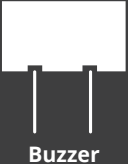


Buzzer

A signal sound is emitted when electric power is run out or nearly run out.

A golf cart is a small vehicle designed originally to carry two golfers and their golf clubs around a golf course or on desert trails with less effort than walking.

Originally golf cars were electrically powered, but in time gasoline-powered variants started to occur. Electric golf cars were the first mass-produced electric vehicles for private consumer use. This variety is now used in many communities where their lack of pollutants, lack of noise, and safety for pedestrians and other cars (due to slow speeds) are beneficial.

	Suggested Item	FPB43C	FPB26S	FPB26C
	Size (mm)	Ø 43.5 x 34.5	25.9 x 25.9 x 25.9	Ø 26 x 22
	Sound Pressure Level (dBA)	90 / 95	88	92 / 98
	Product Type	Piezo	Piezo	Piezo
	Type	Pin	Pin	Pin

GPS NAVIGATION DEVICE FOR THE ACOUSTIC COMPONENTS

18



Speaker

It is used to emit a signal sound or navigation directive when button is pressed or navigation directive is shown.

A GPS navigation device is any device that receives Global Positioning System (GPS) signals for the purpose of determining the device's current location on Earth. GPS devices provide latitude and longitude information, and some may also calculate altitude, although this is not considered sufficiently accurate or continuously available enough to rely on exclusively to pilot aircraft. GPS devices are used in military, aviation and consumer product applications.

GPS devices may also have additional capabilities such as containing all types of maps, like streets maps, which may be displayed in human readable format via text or in a graphical format, providing suggested directions to a human in charge of a vehicle or vessel via text or speech, providing information on nearby amenities such as restaurants, fueling stations, etc.



Speaker

Suggested Item	FMS30C	FMS36C	FMS40C
Size(LxWxH) (mm)	Ø 30 x 3.3	Ø 36 x 3.2	Ø 40 x 6.6
Rated Power(W)	0.5	0.25	1
Impedance(Ω)	8	16	8

LAWN MOWER

FOR THE ACOUSTIC COMPONENTS

19




Buzzer
A signal sound is emitted when the grass bag is full.

A lawn mower is a machine that uses a revolving blade or blades to cut a lawn at an even height.

Lawn mowers employing a blade that rotates about a vertical axis are known as rotary mowers, while those employing a blade assembly that rotates about a horizontal axis are known as cylinder or reel mowers.

Many designs have been made, each suited to a particular purpose. The smallest types, pushed by a human, are suitable for small residential lawns and gardens, while larger, self-contained, ride-on mowers are suitable for large lawns, and the largest, multi-gang mowers pulled behind a tractor, are designed for large expanses of grass such as golf courses and municipal parks.

 Buzzer	Suggested Item	FPB45C	FPB60C
	Size (mm)	Ø 45 x 26	Ø 60 x 38
	Sound Pressure Level (dBA)	100	105
	Product Type	Piezo	Piezo
	Type	Leadwire	Leadwire

PARKING SENSOR SYSTEM FOR THE ACOUSTIC COMPONENTS

20




Ultrasonic

It is used for detecting distance etc

Parking sensor systems use ultrasonic proximity detectors embedded in the front and/or rear bumpers, to measure the distances to nearby objects at low level. The sensors measure the time taken for each sound pulse to be reflected back to the receiver. Depending on the speed of the vehicle and the distance to the obstacle, the system will warn the driver by visual and/or audible means about the risk of collision. The feedback to the driver will generally indicate the direction and proximity of the obstacle.

Sensors are usually fitted to the rear of a vehicle but may also fit to the front. Rear sensors are activated when reverse gear is selected and then deactivated as soon as any other gear or neutral is selected. Front sensors are generally activated by pressing a button and then automatically deactivated when the vehicle exceeds a certain speed, this is to avoid nuisance warnings in slow moving traffic.

 Ultrasonic	Suggested Item	FAU12C	FAU14C	FAU15C	FSU14C	FSU16C	FSU18C
	Size (mm)	Ø 12 x 8	Ø 14 x 9	Ø 15 x 9	Ø 14 x 9	Ø 16 x 12	Ø 18 x 12
	Product Type	Waterproof	Waterproof	Waterproof	Waterproof	Waterproof	Waterproof


BARCODE READER FOR THE ACOUSTIC COMPONENTS


21



A barcode reader (or barcode scanner) is an electronic device for reading printed barcodes. Like a flatbed scanner, it consists of a light source, a lens and a light sensor translating optical impulses into electrical ones. Additionally, nearly all barcode readers contain decoder circuitry analyzing the barcode's image data provided by the sensor and sending the barcode's content to the scanner's output port.

The reader can be divided as many types, such as pen-type readers, laser scanners, camera-based readers. For laser scanners, it work the same way as pen type readers except that they use a laser beam as the light source and typically employ either a reciprocating mirror or a rotating prism.

 Buzzer	Suggested Item	FMB12C	FMB12C	FPB14C
	Size (mm)	Ø 12 x 6.5	Ø 12 x 7.5	Ø 13.8 x 7.5
	Sound Pressure Level (dBA)	85	83	80
	Product Type	Magnetic	Magnetic	Magnetic
	Type	Pin	Pin	Pin

 Transducer	Suggested Item	FMT12C	FET13C	FET14C	FET14C
	Size (mm)	Ø 12 x 9	Ø 12.6 x 6.3	Ø 14 x 6.7	Ø 13.8 x 6.4
	Sound Pressure Level (dBA)	85	80	80	85
	Product Type	Magnetic	Piezo	Piezo	Piezo
	Type	Pin	Pin	Pin	Pin

FAX MACHINE FOR THE ACOUSTIC COMPONENTS

22



In telecommunication, fax machines sometimes called telecopying, is the telephonic transmission of scanned printed material (both text and images), normally to a telephone number connected to a printer or other output device. The original document is scanned with a fax machine (or a telecopier), which processes the contents (text or images) as a single fixed graphic image, converting it into a bitmap, and then transmitting it through the telephone system. The receiving fax machine reconverts the coded image, printing a paper copy. For many decades before digital technology became widespread the scanned data was transmitted as analog.

Microphone	Suggested Item	FOM06C	FOM08C	FOM09C	FOM09C	FOM09C
	Size (mm)	Ø 6 x 5.2	Ø 8 x 5.2	Ø 9.4 x 6.5	Ø 9.7 x 4.5	Ø 9.7 x 6.7
	Product Type	ECM	ECM	ECM	ECM	ECM

Receiver	Suggested Item	FDR25C	FDR31C	FDR35C	FDR38C
	Size(LxWxH) (mm)	Ø 25 x 7.3	Ø 31 x 11	Ø 35 x 17.6	Ø 38 x 21.2
	Sensitivity (dB)	93	93	93	96
	Impedance(Ω)	150	150	150	150

Speaker	Suggested Item	FMS20C	FMS28C	FMS30C	FLS40C	FLS45C	FLS50C
	Size(LxWxH) (mm)	Ø 20 x 3	Ø 28 x 4.9	Ø 30 x 4.8	Ø 40 x 6.55	Ø 45.2 x 9.7	Ø 50 x 12.2
	Rated Power(W)	0.4	1	0.5	0.5	0.5	1
	Impedance(Ω)	8	8	8	8	8	8

IP CAMERA FOR THE ACOUSTIC COMPONENTS


23


Microphone
It is used for receiving
speech voice



Speaker
It is used for emitting
ring tone etc

Closed-circuit television (CCTV) is the use of video cameras to transmit a signal to a specific place, on a limited set of monitors. A growing branch in CCTV is internet protocol cameras (IP camera). IP camera use the Internet Protocol (IP) used by most Local Area Networks (LANs) to transmit video across data networks in digital form. IP can optionally be transmitted across the public internet, allowing users to view their cameras through any internet connection available through a computer or a 3G phone. For professional or public infrastructure security applications, IP video is restricted to within a private network or VPN, or can be recorded onto a remote server.

 Microphone	Suggested Item	FOM08C	FOM09C	FOM09C	FOM09C
	Size (mm)	Ø 8 x 5.2	Ø 9.4 x 6.5	Ø 9.7 x 4.5	Ø 9.7 x 6.7
	Product Type	ECM	ECM	ECM	ECM

 Speaker	Suggested Item	FMS20C	FMS28C	FMS30C
	Size(LxWxH) (mm)	Ø 20 x 3	Ø 28 x 4.9	Ø 30 x 4.8
	Rated Power(W)	0.4	1	0.5
	Impedance(Ω)	8	8	8

PRINTER FOR THE ACOUSTIC COMPONENTS

24

Speaker





A signal sound is emitted when the button is pressed and the process is finished.

Transducer



Printer is a peripheral which produces a text or graphics of documents stored in electronic form, usually on physical print media such as paper or transparencies. Many printers are primarily used as local peripherals, and are attached by a printer cable or, in most new printers, a USB cable to a computer which serves as a document source. Some printers, commonly known as network printers, have built-in network interfaces, typically wireless or Ethernet based, and can serve as a hard copy device for any user on the network. Individual printers are often designed to support both local and network connected users at the same time. In addition, a few modern printers can directly interface to electronic media such as memory cards, or to image capture devices such as digital cameras and scanners; some printers are combined with scanners or fax machines in a single unit, and can function as photocopiers.

 Speaker	Suggested Item	FLS40C	FLS50C	FLS56C
	Size(LxWxH) (mm)	Ø 40 x 6.55	Ø 50 x 17.5	Ø 56.7 x 19.5
	Rated Power(W)	0.5	0.5	0.2
	Impedance(Ω)	8	16	8

 Transducer	Suggested Item	FMT12C	FET12C	FET14C
	Size (mm)	Ø 12 x 9	Ø 12.6 x 6.3	Ø 14 x 6.7
	Sound Pressure Level (dBA)	85	80	80
	Product Type	Magnetic	Piezo	Piezo
	Type	Pin	Pin	Pin

MOTHERBOARD

FOR THE ACOUSTIC COMPONENTS

25

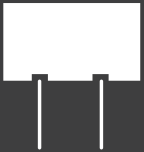


Transducer

A signal sound is emitted when motherboard is turned on.

In personal computers, a motherboard is the central printed circuit board in many modern computers and holds many of the crucial components of the system, providing connectors for other peripherals. The motherboard is sometimes alternatively known as the main board, system board and planar board. A motherboard, like a backplane, provides the electrical connections by which the other components of the system communicate, but unlike a backplane, it also connects the central processing unit and hosts other subsystems and devices.

A typical desktop computer has its microprocessor, main memory, and other essential components connected to the motherboard. Other components such as external storage, controllers for video display and sound, and peripheral devices may be attached to the motherboard as plug-in cards or via cables, although in modern computers it is increasingly common to integrate some of these peripherals into the motherboard itself.

 Transducer	Suggested Item	FMT12C	FMT12C	FMT12C	FMT16C
	Size (mm)	Ø 12 x 9	Ø 12 x 9.5	Ø 12 x 10	Ø 16 x 14
	Sound Pressure Level (dBA)	85	85	85	85
	Product Type	Magnetic	Magnetic	Magnetic	Magnetic
	Type	Pin	Pin	Pin	Pin

PERSONAL COMPUTER FOR THE ACOUSTIC COMPONENTS

26

Microphone
It is used for receiving
speech voice



Speaker
It is used for emitting
sound etc

Easy to carry and connect to networks, high-mobility personal computers are attracting increasing attention as Internet-connection and cloud-computing services spread rapidly. FLEZON increases the performance and functionality of personal computers through such technologies as downsizing, high-density packaging, and sensing for electronic components. Our components for thermal countermeasures that ensure safety of devices, wireless communication modules that offer low-power-consumption connectivity, and sensors that improve operating comfort are contributing to a new age of computing.

 Microphone	Suggested Item	FMM06C	FMM06C	FMM03R	FMM04R	FMM04S
	Size (mm)	Ø6x2.2	Ø6x2.7	3.76x2.95x1.1	4.72x3.76x1.25	4.5x4.5x1.45
	Product Type	Digital	Digital	MEMS	MEMS	MEMS

 Speaker	Suggested Item	FNS25R	FNS35R	FNS35R	FNS40R
	Size(LxWxH) (mm)	24.9 x14.9 x5	35 x16 x5.5	35 x20 x8.0	40 x20 x5.8
	Rated Power(W)	0.5	0.5	1.0	1.0
	Impedance(Ω)	8.0	4.0	8.0	8.0

POS SYSTEM FOR THE ACOUSTIC COMPONENTS

27


Buzzer


A signal sound is emitted when button pressed or printing finished.

Transducer



Point of sale (also called POS or checkout, during computerization later becoming electronic point of sale or EPOS) is the place where a retail transaction is completed. It is the point at which a customer makes a payment to the merchant in exchange for goods or services. At the point of sale the retailer would calculate the amount owed by the customer and provide options for the customer to make payment. The merchant will also normally issue a receipt for the transaction.

 Buzzer	Suggested Item	FMB12C	FMB12C	FPB14C
	Size (mm)	Ø 12 x 6.5	Ø 12 x 7.5	Ø 13.8 x 7.5
	Sound Pressure Level (dBA)	85	83	80
	Product Type	Magnetic	Magnetic	Magnetic
	Type	Pin	Pin	Pin

 Transducer	Suggested Item	FMT12C	FET12C	FET14C	FET14C
	Size (mm)	Ø 12 x 9	Ø 12.6 x 6.3	Ø 14 x 6.7	Ø 13.8 x 6.4
	Sound Pressure Level (dBA)	85	80	80	85
	Product Type	Magnetic	Piezo	Piezo	Piezo
	Type	Pin	Pin	Pin	Pin

TABLET FOR THE ACOUSTIC COMPONENTS

28

Microphone
It is used for receiving
speech voice



Speaker
It is used for emitting
ring tone, music etc

A tablet computer, or a tablet, is a mobile computer, larger than a mobile phone or personal digital assistant, integrated into a flat touch screen and primarily operated by touching the screen rather than using a physical keyboard. It often uses an onscreen virtual keyboard, a passive stylus pen, or a digital pen. The term may also apply to a variety of form factors that differ in position of the screen with respect to a keyboard. The standard form is called slate, which does not have an integrated keyboard but may be connected to one with a wireless link or a USB port. Convertible notebook computers have an integrated keyboard that can be hidden by a swivel joint or slide joint, exposing only the screen for touch operation. Hybrids have a detachable keyboard so that the touch screen can be used as a stand-alone tablet. Booklets include two touch screens, and can be used as a notebook by displaying a virtual keyboard in one of them.

 Microphone	Suggested Item	FMM06C	FMM06C	FMM03R	FMM04R	FMM04S
	Size (mm)	Ø6x2.2	Ø6x2.7	3.76x2.95x1.1	4.72x3.76x1.25	4.5x4.5x1.45
	Product Type	Digital	Digital	MEMS	MEMS	MEMS

 Speaker	Suggested Item	FNS25R	FNS35R
	Size(LxWxH) (mm)	24.9 x14.9 x5	35 x16 x5.5
	Rated Power(W)	0.5	0.5
	Impedance(Ω)	8.0	4.0

UNINTERRUPTIBLE POWER SUPPLY (UPS) FOR THE ACOUSTIC COMPONENTS

29

Buzzer





A signal sound is emitted when button is pressed or the battery is run out.

Transducer



An uninterruptible power supply, also uninterruptible power source, UPS or battery/flywheel backup, is an electrical apparatus that provides emergency power to a load when the input power source, typically mains power, fails. A UPS differs from an auxiliary or emergency power system or standby generator in that it will provide near-instantaneous protection from input power interruptions, by supplying energy stored in batteries or a flywheel. The on-battery runtime of most uninterruptible power sources is relatively short (only a few minutes) but sufficient to start a standby power source or properly shut down the protected equipment.

 Buzzer	Suggested Item	FMB12C	FMB12C	FPB14C
	Size (mm)	Ø 12 x 7.5	Ø 12 x 9.5	Ø 13.8 x 7.5
	Sound Pressure Level (dBA)	83	85	80
	Product Type	Magnetic	Magnetic	Piezo
	Type	Pin	Pin	Pin

 Transducer	Suggested Item	FMT12C	FMT12C	FET14C
	Size (mm)	Ø 12 x 9	Ø 12 x 10	Ø 14 x 6.7
	Sound Pressure Level (dBA)	85	85	80
	Product Type	Magnetic	Magnetic	Piezo
	Type	Pin	Pin	Pin

EXERCISE BICYCLE FOR THE ACOUSTIC COMPONENTS

30

Buzzer


A signal sound is emitted when button is pressed, time is up and target distance is completed.


Transducer



An exercise bicycle is usually a special-purpose exercise machine resembling a bicycle without true wheels, but it is also possible to adapt an ordinary bicycle for stationary exercise by placing it on bicycle rollers or a trainer. Rollers and trainers are often used by racing cyclists to warm up before racing, or to train on their own machines indoors.

Exercise bikes are used for exercise, to increase general fitness, and for training for cycle events. The exercise bike has long been used for physical therapy because of the low-impact, safe, and effective cardiovascular exercise it provides. The low-impact movement involved in operating an exercise bike does not put much stress on joints and does not involve sporadic motions that some other fitness equipment may require.

 Buzzer	Suggested Item	FMB12C	FMB12C	FPB14C
	Size (mm)	Ø 12 x 7.5	Ø 12 x 9.5	Ø 13.8 x 7.5
	Sound Pressure Level (dBA)	83	85	80
	Product Type	Magnetic	Magnetic	Magnetic
	Type	Pin	Pin	Pin

 Transducer	Suggested Item	FMT12C	FET12C	FET14C	FET14C
	Size (mm)	Ø 12 x 9	Ø 12.6 x 6.3	Ø 14 x 6.7	Ø 13.8 x 6.4
	Sound Pressure Level (dBA)	85	80	80	85
	Product Type	Magnetic	Piezo	Piezo	Piezo
	Type	Pin	Pin	Pin	Pin

ROWING MACHINE

FOR THE ACOUSTIC COMPONENTS

31


Buzzer


A signal sound is emitted when button is pressed, time is up and the target distance is completed

Transducer



A rowing machine, is a machine used to simulate the action of watercraft rowing for the purpose of exercise or training for rowing. Rowing machine with a digital display calculate the user's power by measuring the speed of the flywheel during the stroke and then recording the rate at which it decelerates during the recovery. Using this and the known moment of inertia of the flywheel, the computer is able to calculate speed, power, distance and energy usage. Some rowing machine can be connected to a personal computer using software, and data on individual exercise sessions can be collected and analyzed. In addition, some software packages allow users to connect multiple rowing machines either directly or over the internet for virtual races and workouts.

 Buzzer	Suggested Item	FMB12C	FMB12C	FPB14C
	Size (mm)	Ø 12 x 7.5	Ø 12 x 9.5	Ø 13.8 x 7.5
	Sound Pressure Level (dBA)	83	85	80
	Product Type	Magnetic	Magnetic	Piezo
	Type	Pin	Pin	Pin

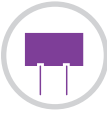
 Transducer	Suggested Item	FMT12C	FET12C	FET14C	FET14C
	Size (mm)	Ø 12 x 9	Ø 12.6 x 6.3	Ø 14 x 6.7	Ø 13.8 x 6.4
	Sound Pressure Level (dBA)	85	80	80	85
	Product Type	Magnetic	Piezo	Piezo	Piezo
	Type	Pin	Pin	Pin	Pin

TREADMILL

FOR THE ACOUSTIC COMPONENTS

32

Buzzer




A signal sound is emitted when button is pressed or time is up.


Transducer



A treadmill is a device for walking while staying in the same place. Treadmills were introduced before the development of powered machines, to harness the power of animals or humans to do work, often a type of mill that was operated by a person or animal treading steps of a treadwheel to grind grain.

More recently treadmills are not used to harness power, but as exercise machines for running or walking in one place. Rather than the user powering the mill, the machine provides a moving platform with a wide conveyor belt driven by an electric motor or a flywheel. The belt moves to the rear requiring the user to walk or run at a speed matching that of the belt. The rate at which the belt moves is the rate of walking or running. Thus, the speed of running may be controlled and measured. The more expensive, heavy-duty versions are motor-driven (usually by an electric motor). The simpler, lighter and less expensive version passively resist the motion, moving only when walkers push the belt with their feet. The latter are known as manual treadmills.

 Buzzer	Suggested Item	FMB12C	FMB12C	FPB14C
	Size (mm)	Ø 12 x 7.5	Ø 12 x 9.5	Ø 13.8 x 7.5
	Sound Pressure Level (dBA)	83	85	80
	Product Type	Magnetic	Magnetic	Piezo
	Type	Pin	Pin	Pin

 Transducer	Suggested Item	FMT12C	FET12C	FET14C	FET14C
	Size (mm)	Ø 12 x 9	Ø 12.6 x 6.3	Ø 14 x 6.7	Ø 13.8 x 6.4
	Sound Pressure Level (dBA)	85	80	80	85
	Product Type	Magnetic	Piezo	Piezo	Piezo
	Type	Pin	Pin	Pin	Pin

AIR CONDITIONER

FOR THE ACOUSTIC COMPONENTS

33




Transducer

A signal sound is emitted when button of remote control is pressed.

An air conditioner is a home appliance, system, or mechanism designed to dehumidify and extract heat from an area. The cooling is done using a simple refrigeration cycle.

Room air conditioners come in two forms: unitary and PTAC (packaged terminal air conditioner) systems. Unitary systems, the common one room air conditioners, sit in a window or wall opening, with interior controls. Interior air is cooled as a fan blows it over the evaporator. Exterior air is heated as a second fan blows it over the condenser. In this process, heat is drawn from the room and discharged to the environment. A large house or building may have several such units, permitting each room be cooled separately. PTAC systems are also known as wall split air conditioning systems or ductless systems. These PTAC systems which are frequently used in hotels have two separate units, the evaporative unit on the interior and the condensing unit on the exterior, with tubing passing through the wall and connecting them.

 Transducer	Suggested Item	FMT12C	FET12C	FET14C	FET14C
	Size (mm)	Ø 12 x 9	Ø 12.6 x 6.3	Ø 14 x 6.7	Ø 13.8 x 6.4
	Sound Pressure Level (dBA)	85	80	80	85
	Product Type	Magnetic	Piezo	Piezo	Piezo
	Type	Pin	Pin	Pin	Pin


AIR PURIFIER FOR THE ACOUSTIC COMPONENTS


34



An air purifier is a device which removes contaminants from the air. These devices are commonly marketed as being beneficial to allergy sufferers and asthmatics, and at reducing or eliminating second-hand tobacco smoke. Commercial grade air purifiers are manufactured as either small stand-alone units or larger units that can be affixed to an air handler unit (AHU) or to an HVAC unit found in the medical, industrial, and commercial industries.

Air purifiers are becoming increasingly capable of capturing a greater number of bacterial and virus. Air purifiers are used to reduce the concentration of these airborne contaminants and are very useful for people who suffer from allergies and asthma.

 Buzzer	Suggested Item	FMB12C	FMB12C	FPB14C	FPB12C
	Size (mm)	Ø 12 x 7.5	Ø 12 x 9.5	Ø 13.8 x 7.5	Ø 12 x 8.5
	Sound Pressure Level (dBA)	83	85	80	85
	Product Type	Magnetic	Magnetic	Piezo	Piezo
	Type	Pin	Pin	Pin	Pin

 Transducer	Suggested Item	FMT12C	FET12C	FET14C	FET14C	FET17C
	Size (mm)	Ø 12 x 9	Ø 12.6 x 6.3	Ø 14 x 6.7	Ø 13.8 x 6.4	Ø 16.8 x 7.2
	Sound Pressure Level (dBA)	85	80	80	85	80
	Product Type	Magnetic	Piezo	Piezo	Piezo	Piezo
	Type	Pin	Pin	Pin	Pin	Pin

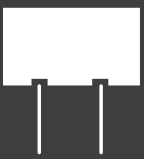
BREAD MACHINE FOR THE ACOUSTIC COMPONENTS

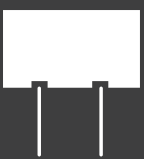
35



A signal sound is emitted when user presses the button.

A bread making machine or bread maker is a home appliance for baking bread. It consists of a bread pan (or "tin"), at the bottom of which are one or more built-in paddles, mounted in the center of a small special-purpose oven. This small oven is usually controlled by a simple built-in computer, the settings for which are inputted at a control panel. Most bread machines have different cycles for different kinds of dough—including white bread, whole grain, European-style (sometimes labelled "French"), and dough-only (for pizza dough and shaped loaves baked in a conventional oven). Many also have a timer to allow the bread machine to activate without operator attendance, and some high-end models allow the user to program a custom cycle.

 Buzzer	Suggested Item	FMB12C	FMB12C	FPB14C
	Size (mm)	Ø 12 x 7.5	Ø 12 x 9.5	Ø 13.8 x 7.5
	Sound Pressure Level (dBA)	83	85	80
	Product Type	Magnetic	Magnetic	Piezo
	Type	Pin	Pin	Pin

 Transducer	Suggested Item	FMT12C	FET12C	FET14C	FET14C	FET16C
	Size (mm)	Ø 12 x 9	Ø 12.6 x 6.3	Ø 14 x 6.7	Ø 13.8 x 6.4	Ø 16.5 x 6.7
	Sound Pressure Level (dBA)	85	80	80	85	75
	Product Type	Magnetic	Piezo	Piezo	Piezo	Piezo
	Type	Pin	Pin	Pin	Pin	Pin

COFFEE MAKER FOR THE ACOUSTIC COMPONENTS

36

Speaker





It is used to emit a signal sound when process is finished.

Transducer



Coffeemakers or coffee machines are cooking appliances used to brew coffee without having to boil water in a separate container. While there are many different types of coffeemakers using a number of different brewing principles, in the most common devices, coffee grounds are placed in a paper or metal filter inside a funnel, which is set over a glass or ceramic coffee pot, a cooking pot in the kettle family. Cold water is poured into a separate chamber, which is then heated up to the boiling point, and directed into the funnel. This is also called automatic drip-brew.

 Speaker	Suggested Item	FMS20C	FMS28C	FMS30C
	Size(LxWxH) (mm)	20 x 3	Ø 28 x 4.9	Ø 30 x 3.3
	Rated Power(W)	0.4	1	0.5
	Impedance(Ω)	8	8	8

 Transducer	Suggested Item	FMT12C	FET12C	FET14C	FET14C	FET22C
	Size (mm)	Ø 12 x 9	Ø 12.6 x 6.3	Ø 14 x 6.7	Ø 13.8 x 6.4	Ø 22 x 7
	Sound Pressure Level (dBA)	85	80	80	85	80
	Product Type	Magnetic	Piezo	Piezo	Piezo	Piezo
	Type	Pin	Pin	Pin	Pin	Pin

CLOTHING DRYER

FOR THE ACOUSTIC COMPONENTS

37




Transducer

It is used to emit a signal sound when process is start and finished.

A clothes dryer, tumble dryer, or drying machine is a household appliance that is used to remove moisture from a load of clothing and other textiles, generally shortly after they are cleaned in a washing machine.

Most dryers consist of a rotating drum called a tumbler through which heated air is circulated to evaporate the moisture from the load. The tumbler is rotated to maintain air space between the articles in the load.

Using these machines may cause clothes to shrink or become less soft (due to loss of short soft fibers/lint). For these reasons, as well as to save energy, many people use open air methods such as a clothes line and clotheshorse.

 Transducer	Suggested Item	FMT14R	FET22C	FET22C	FET30C	FST24C
	Size (mm)	14 x 11 x 3	Ø 22 x 7	Ø 22 x 10.5	Ø 30 x 10	Ø 24 x 11
	Sound Pressure Level (dBA)	87	80	85	90	90
	Product Type	Magnetic	Piezo	Piezo	Piezo	Piezo
	Type	SMD	Pin	Pin	Pin	Pin

CLOTHING IRON

FOR THE ACOUSTIC COMPONENTS

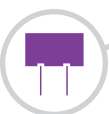
38

Element





A signal sound is emitted when iron is turn on or error occur such as overheat problems.

Transducer



A clothing iron, also called a flatiron or simply an iron, is a small appliance: a handheld piece of equipment with a flat, roughly triangular surface that, when heated, is used to press clothes to remove creases. It is named for the metal of which the device is commonly made, and the use of it is generally called ironing. Ironing works by loosening the ties between the long chains of molecules that exist in polymer fiber materials. With the heat and the weight of the ironing plate, the fibers are stretched and the fabric maintains its new shape when cool. Some materials, such as cotton, require the use of water to loosen the intermolecular bonds. Many materials developed in the twentieth century are advertised as needing little or no ironing.

 Element	Suggested Item	FPE15C	FPE20C	FPE27C
	Size (mm)	Ø 15 x 0.22	Ø 20 x 0.22	Ø 27 x 0.41
	Frequency(Hz)	4100	4000	3500
	Capacitance(pF)	9000	26000	18000

 Transducer	Suggested Item	FET12C	FET14C	FET14C
	Size (mm)	Ø 12.6 x 6.3	Ø 14 x 6.7	Ø 13.8 x 6.4
	Sound Pressure Level (dBA)	80	80	85
	Product Type	Piezo	Piezo	Piezo
	Type	Pin	Pin	Pin

DEHUMIDIFIER FOR THE ACOUSTIC COMPONENTS

39

Buzzer


A signal sound is emitted when button is pressed or time is up.


Transducer



A dehumidifier is typically a household appliance that reduces the level of humidity in the air, usually for health reasons. Humid air can cause mold and mildew to grow inside homes, which pose various health risks. Very humid climates or air make some people extremely uncomfortable, causing excessive sweating that can't evaporate in the already-moisture-saturated air.

By their operation, dehumidifiers produce an excess of water which has been removed from the conditioned air. This water, usually called condensate in its liquid form, must be collected and disposed of. Some dehumidifier designs dispose of excess water in a vapor, rather than liquid form. Energy efficiency of dehumidification processes can vary widely.

 Buzzer	Suggested Item	FMB12C	FMB12C	FPB14C	FPB12C
	Size (mm)	Ø 12 x 7.5	Ø 12 x 9.5	Ø 13.8 x 7.5	Ø 12 x 8.5
	Sound Pressure Level (dBA)	83	85	80	85
	Product Type	Magnetic	Magnetic	Piezo	Piezo
	Type	Pin	Pin	Pin	Pin

 Transducer	Suggested Item	FMT12C	FET12C	FET14C	FET14C	FET17C
	Size (mm)	Ø 12 x 9	Ø 12.6 x 6.3	Ø 14 x 6.7	Ø 13.8 x 6.4	Ø 16.8 x 7.2
	Sound Pressure Level (dBA)	85	80	80	85	80
	Product Type	Magnetic	Piezo	Piezo	Piezo	Piezo
	Type	Pin	Pin	Pin	Pin	Pin

DISHWASHER

FOR THE ACOUSTIC COMPONENTS

40


Buzzer


A signal sound is emitted when button is pressed or process is finished.

Transducer



A dishwasher is a mechanical device for cleaning dishes and eating utensils. Dishwashers can be found in restaurants and private homes. Unlike manual dishwashing, which relies largely on physical scrubbing to remove soiling, the mechanical dishwasher cleans by spraying hot water, typically between 55 to 75 °C (130 to 170 °F) at the dishes, with lower temperatures used for delicate items. A mix of water and detergent is used for cleaning purposes, followed by clean water to remove the detergent residue, then a drying period with hot, circulated air. Some dishwashers have multiple wash and rinse periods within the complete cycle. In some dishwashers, a rinsing aid (also called rinse aid) can be added to the rinse cycle to improve drying and avoid water spots remaining on dry items.

 Buzzer	Suggested Item	FMB12C	FMB12C	FPB14C
	Size (mm)	Ø 12 x 7.5	Ø 12 x 9.5	Ø 13.8 x 7.5
	Sound Pressure Level (dBA)	83	85	80
	Product Type	Magnetic	Magnetic	Piezo
	Type	Pin	Pin	Pin


 Transducer	Suggested Item	FMT12C	FET12C	FET14C	FET14C
	Size (mm)	Ø 12 x 9	Ø 12.6 x 6.3	Ø 14 x 6.7	Ø 13.8 x 6.4
	Sound Pressure Level (dBA)	85	80	80	85
	Product Type	Magnetic	Piezo	Piezo	Piezo
	Type	Pin	Pin	Pin	Pin


ELECTRIC CLOCK FOR THE ACOUSTIC COMPONENTS

41



An electric clock is a clock that is powered by electricity, as opposed to a mechanical clock which is powered by a hanging weight or a mainspring. The term is often applied to the electrically powered mechanical clocks that were used before quartz clocks replaced them in the 1980s. The first experimental electric clocks were constructed around 1840, but they were not widely manufactured until mains electric power became available in the 1890s. In the 1930s the synchronous electric clock replaced mechanical clocks as the most widely used type of clock.

 Speaker	Suggested Item	FMS20C	FMS28C	FMS30C	FLS40C	FLS45C
	Size(LxWxH) (mm)	20 x 3	Ø 28 x 4.9	Ø 30 x 4.8	Ø 40 x 6.55	Ø 45.2 x 9.7
	Rated Power(W)	0.4	1	0.5	0.5	0.5
	Impedance(Ω)	8	8	8	8	8

 Transducer	Suggested Item	FMT12C	FET12C
	Size (mm)	Ø 12 x 5.4	Ø 12 x 8.5
	Sound Pressure Level (dBA)	70	85
	Product Type	Magnetic	Magnetic
	Type	Pin	Pin

ELECTRIC RAZORS FOR THE ACOUSTIC COMPONENTS

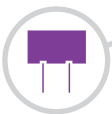
42

Element




A signal sound is emitted when the razor is being charged.

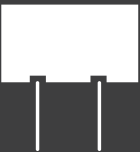
Transducer



The electric razor (also known as the electric dry shaver) has a rotating or oscillating blade. The electric razor usually does not require the use of shaving cream, soap, or water. The razor may be powered by a small DC motor, which is either powered by batteries or mains electricity. Many modern ones are powered using rechargeable batteries. Alternatively, an electro-mechanical oscillator driven by an AC-energized solenoid may be used. Some very early mechanical shavers had no electric motor and had to be powered by hand, for example by pulling a cord to drive a flywheel.

Early versions of electric razors were meant to be used on dry skin only. Many recent electric razors have been designed to allow for wet/dry use, which also allows them to be cleaned using running water or an included cleaning machine, reducing cleaning effort. Some patience is necessary when starting to use a razor of this type, as the skin usually takes some time to adjust to the way that the electric razor lifts and cuts the hairs. Moisturizers designed specifically for electric shaving are available.

 Element	Suggested Item	FPE15C	FPE20C
	Size (mm)	Ø 15 x 0.22	Ø 20 x 0.22
	Frequency(Hz)	4100	4000
	Capacitance(pF)	9000	26000

 Transducer	Suggested Item	FET12C	FET14C	FET14C
	Size (mm)	Ø 12.6 x 6.3	Ø 14 x 6.7	Ø 13.8 x 6.4
	Sound Pressure Level (dBA)	80	80	85
	Product Type	Piezo	Piezo	Piezo
	Type	Pin	Pin	Pin

ELECTRIC TOOTHBRUSH

FOR THE ACOUSTIC COMPONENTS

43

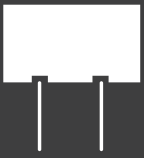


Transducer

A signal sound is emitted when battery is run out or the timer is set.

An electric toothbrush is a toothbrush that uses electric power supplied usually by a battery to move the brush head rapidly, either oscillating side to side, or rotation-oscillation. When using vibrating toothbrush, a brushing technique similar to that used with a manual toothbrush is recommended, whereas with rotating-oscillating brushes the recommended cleaning technique is to simply move the brush slowly from tooth to tooth.

Many modern electric toothbrushes have a timer which buzzes or briefly interrupts power, typically after two minutes, and sometimes every 30 seconds. This is associated with a customary recommendation to brush for two minutes, 30 seconds for each of the four quadrants of the mouth.

 Transducer	Suggested Item	FET12C	FET14C	FET14C
	Size (mm)	Ø 12.6 x 6.3	Ø 14 x 6.7	Ø 13.8 x 6.4
	Sound Pressure Level (dBA)	80	80	85
	Product Type	Piezo	Piezo	Piezo
	Type	Pin	Pin	Pin

ELECTRONIC PEST CONTROL FOR THE ACOUSTIC COMPONENTS

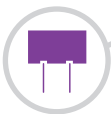
44

Element




A signal sound is emitted when the device is turn on for repelling pest.

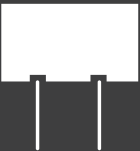
Transducer



Electronic pest control is the name given to the use of any of the several types of electrically powered devices designed to repel or eliminate pests, usually rodents or insects.

Numerous electronic pest control devices are readily available throughout the world. Hardware stores and garden centers usually stock some sort of electronic device advertised to repel a variety of pests and one can also find them on the internet. Although these devices have been around for at least 20 years, they have only recently become popular and widely advertised, probably due to their environmental friendliness claims.

 Element	Suggested Item	FPE06C	FPE12C
	Size (mm)	Ø 6.5 x 0.23	Ø 12 x 0.41
	Frequency(Hz)	13500	16500
	Capacitance(pF)	2600	6000

 Transducer	Suggested Item	FET16C	FET41C
	Size (mm)	Ø 16.5 x 6.7	Ø 41 x 12.5
	Sound Pressure Level (dBA)	75	95
	Product Type	Piezo	Piezo
	Type	Pin	Plate


EXTRACTOR HOOD FOR THE ACOUSTIC COMPONENTS


45



An extractor hood or range hood is a device containing a mechanical fan that hangs above the stove or cooktop in the kitchen. It removes airborne grease, combustion products, smoke, odors, heat, and steam from the air by evacuation of the air and filtration.

Extractor hoods controls are typically electronic, though some low-end models use electromechanically controls. Extractor hoods with electronic controls can offer remote control, motorized height adjustment, thermal sensor, overheat protection, boost mode, delayed shut-off, filter cleaning reminder, active noise cancellation, temperature display, user presets (memory), and so on.

 Buzzer	Suggested Item	FPB14C
	Size (mm)	Ø 13.8 x 7.5
	Sound Pressure Level (dBA)	80
	Product Type	Piezo
	Type	Pin

 Transducer	Suggested Item	FET12C	FET14C	FET14C
	Size (mm)	Ø 12.6 x 6.3	Ø 14 x 6.7	Ø 13.8 x 6.4
	Sound Pressure Level (dBA)	80	80	85
	Product Type	Piezo	Piezo	Piezo
	Type	Pin	Pin	Pin

INDUCTION COOKER FOR THE ACOUSTIC COMPONENTS

46

Buzzer

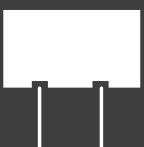
A signal sound is emitted when button is pressed or time is up.

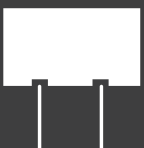
Transducer



Induction cooking uses induction heating to directly heat a cooking vessel, as opposed to using heat transfer from electrical coils or burning gas as with a traditional cooking stove. In an induction cooker, a coil of copper wire is placed underneath the cooking pot. An alternating electric current flows through the coil, which produces an oscillating magnetic field. This field induces an electric current in the pot. Current flowing in the metal pot produces resistive heating which heats the food.

Induction ranges may be applicable in commercial restaurant kitchens. Electric cooking avoids the cost of natural gas piping and in some jurisdictions may allow simpler ventilation and fire suppression equipment to be installed. Drawbacks for commercial use include possible breakages of the glass cook-top, higher initial cost and the requirement for magnetic cookware.

 Buzzer	Suggested Item	FMB12C	FMB12C	FPB14C
	Size (mm)	Ø 12 x 7.5	Ø 12 x 9.5	Ø 13.8 x 7.5
	Sound Pressure Level (dBA)	83	85	80
	Product Type	Magnetic	Magnetic	Piezo
	Type	Pin	Pin	Pin

 Transducer	Suggested Item	FMT12C	FET12C	FET14C	FET14C	FET16C
	Size (mm)	Ø 12 x 9	Ø 12.6 x 6.3	Ø 14 x 6.7	Ø 13.8 x 6.4	Ø 16.5 x 6.7
	Sound Pressure Level (dBA)	85	80	80	85	75
	Product Type	Magnetic	Piezo	Piezo	Piezo	Piezo
	Type	Pin	Pin	Pin	Pin	Pin

KETTLE

FOR THE ACOUSTIC COMPONENTS

47




Transducer

A signal sound is emitted when water starts to boil and finishes.

Electric kettles are normally constructed of durable plastic or steel (with a plastic handle) and powered by mains electricity.

In modern designs, once the water has reached boiling point, the kettle automatically deactivates, preventing the water from boiling away and damaging the heating element. A bimetallic strip thermostat is commonly used as the automatic shut-off mechanism. The thermostat is isolated from the water in the kettle and is instead heated by the steam created when the water boils, which is directed through a duct onto the bimetallic strip. This allows the thermostat to be coarsely calibrated, which in turn allows the kettle to function normally at a wide range of altitudes. A consequence of this design is that the kettle may fail to deactivate if the lid is left open, due to an insufficient amount of steam being ducted onto the bimetallic strip.

Electric kettles were introduced as means to boil water without the necessity of a stove top.

 Transducer	Suggested Item	FMT12C	FET12C	FET14C	FET14C
	Size (mm)	Ø 12 x 9	Ø 12.6 x 6.3	Ø 14 x 6.7	Ø 13.8 x 6.4
	Sound Pressure Level (dBA)	85	80	80	85
	Product Type	Magnetic	Piezo	Piezo	Piezo
	Type	Pin	Pin	Pin	Pin

MICROWAVE OVEN

FOR THE ACOUSTIC COMPONENTS

48




Transducer

It is used to emit a signal sound when process is finished or button is pressed.

A microwave oven is a kitchen appliance that heats food by dielectric heating accomplished with radiation used to heat polarized molecules in food. Microwave ovens heat foods quickly and efficiently, because excitation is fairly uniform in the outer 1 inch (25 mm) to 1.5 inches (38 mm) of a dense (high water content) food item; food is more evenly heated throughout (except in thick, dense objects) than generally occurs in other cooking techniques.

Microwave ovens are popular for reheating previously-cooked foods and cooking vegetables. They are also useful for rapid heating of otherwise slowly-prepared cooking items, such as hot butter and fats, and melted chocolate. Unlike conventional ovens, microwave ovens usually do not directly brown or caramelize food, since they rarely attain the necessary temperatures to do so.

 Transducer	Suggested Item	FMT12C	FET26R	FET30C
	Size (mm)	Ø 12 x 9	26.5 x 22 x 7	Ø 30 x 10
	Sound Pressure Level (dBA)	85	85	90
	Product Type	Magnetic	Piezo	Piezo
	Type	Pin	Pin	Pin

MIXER

FOR THE ACOUSTIC COMPONENTS

49

Buzzer

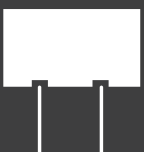
A signal sound is emitted when button is pressed or time is up.


Transducer



A mixer is a kitchen appliance intended for mixing, folding, beating, and whipping food ingredients. Mixers come in two major variations, hand mixers and stand mixers.

A hand mixer, as the name implies, is a hand-held mixing device. The modern electrically powered type consists of a handle mounted over a large enclosure containing the motor, which drives one or two beaters. The beaters are immersed in the food to be mixed. A simpler manually operated type, which preceded electric mixers and is still used today, consists of a handle with a hand-operated crank on the side, geared to two beaters. The handle is held with one hand and the crank is turned with the other, turning the beaters.

 Buzzer	Suggested Item	FMB12C	FMB12C	FPB14C
	Size (mm)	Ø 12 x 7.5	Ø 12 x 9.5	Ø 13.8 x 7.5
	Sound Pressure Level (dBA)	83	85	80
	Product Type	Magnetic	Magnetic	Piezo
	Type	Pin	Pin	Pin


 Transducer	Suggested Item	FMT12C	FET12C	FET14C	FET14C	FET16C
	Size (mm)	Ø 12 x 9	Ø 12.6 x 6.3	Ø 14 x 6.7	Ø 13.8 x 6.4	Ø 16.5 x 6.7
	Sound Pressure Level (dBA)	85	80	80	85	75
	Product Type	Magnetic	Piezo	Piezo	Piezo	Piezo
	Type	Pin	Pin	Pin	Pin	Pin


MODERN TOILET FOR THE ACOUSTIC COMPONENTS

50



The modern toilet is one of the most advanced types of toilet worldwide, showing a dazzling array of features. As of 2002, almost half of all private homes in Japan have such a toilet, exceeding the number of households with a personal computer. While the toilet looks like a Western-style toilet at first glance, there are numerous additional features—such as blow dryer, seat heating, massage options, water jet adjustments, automatic lid opening, automatic flushing, wireless control panel, room heating and air conditioning for the room—included either as part of the toilet or in the seat. These features can be accessed by an (often wireless) control panel attached to the seat or mounted on a nearby wall.

 Buzzer	Suggested Item	FMB12C	FMB12C	FPB14C
	Size (mm)	Ø 12 x 7.5	Ø 12 x 9.5	Ø 13.8 x 7.5
	Sound Pressure Level (dBA)	83	85	80
	Product Type	Magnetic	Magnetic	Piezo
	Type	Pin	Pin	Pin

 Transducer	Suggested Item	FMT12C	FET12C	FET14C	FET14C
	Size (mm)	Ø 12 x 9	Ø 12.6 x 6.3	Ø 14 x 6.7	Ø 13.8 x 6.4
	Sound Pressure Level (dBA)	85	80	80	85
	Product Type	Magnetic	Piezo	Piezo	Piezo
	Type	Pin	Pin	Pin	Pin

OVEN

FOR THE ACOUSTIC COMPONENTS

51



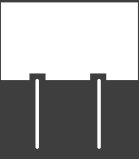
Transducer

It is used to emit a signal sound when process is finished or button is pressed.

In cooking, the conventional oven is a kitchen appliance used for roasting and heating. Food normally cooked in this manner includes meat, casseroles and baked goods such as bread, cake and other desserts. In modern times, the oven is used to cook and heat food in many households across the globe.

Modern ovens are fueled by gas or electricity. When an oven is contained in a complete stove, the fuel used for the oven may be the same as or different from the fuel used for the burners on top of the stove.

Ovens usually can use a variety of methods to cook. The most common may be to heat the oven from below. This is commonly used for baking and roasting. The oven may also be able to heat from the top to provide broiling. In order to provide faster, more-even cooking, convection ovens use a small fan to blow hot air around the cooking chamber. An oven may also provide an integrated rotisserie.

 Transducer	Suggested Item	FMT12C	FET26R	FET30C	FET22C
	Size (mm)	Ø 12 x 9	26.5 x 22 x 7	Ø 30 x 10	Ø 22.1 x 7
	Sound Pressure Level (dBA)	85	85	90	90
	Product Type	Magnetic	Piezo	Piezo	Piezo
	Type	Pin	Pin	Pin	SMD

RADIO FOR THE ACOUSTIC COMPONENTS

52



Speaker

A signal sound is emitted when user turn on the radio.

Radio is the wireless transmission of signals through free space by electromagnetic radiation of a frequency significantly below that of visible light, in the radio frequency range, from about 30 kHz to 300 GHz. These waves are called radio waves. Electromagnetic radiation travels by means of oscillating electromagnetic fields that pass through the air and the vacuum of space.

Information, such as sound, is carried by systematically changing (modulating) some property of the radiated waves, such as their amplitude, frequency, phase, or pulse width. When radio waves strike an electrical conductor, the oscillating fields induce an alternating current in the conductor. The information in the waves can be extracted and transformed back into its original form.



Speaker

Suggested Item	FMS36C	FMS40C	FLS34S
Size(LxWxH) (mm)	Ø 36 x 3.2	Ø 40 x 6.6	34 x 34 x 19.5
Rated Power(W)	0.25	1	2
Impedance(Ω)	16	8	8

REFRIGERATOR

FOR THE ACOUSTIC COMPONENTS

53

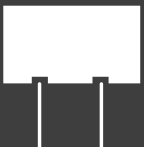


Transducer

A signal sound is emitted when button is pressed or the door is not close.

A refrigerator (colloquially fridge) is a common household appliance that consists of a thermally insulated compartment and a heat pump (mechanical, electronic, or chemical) that transfers heat from the inside of the fridge to its external environment so that the inside of the fridge is cooled to a temperature below the ambient temperature of the room. Cooling is a popular food storage technique in developed countries and works by decreasing or even arresting the reproduction rate of bacteria. The device is thus used to reduce the rate of spoilage of foodstuffs.

Newer refrigerators may include a power failure warning, alerting the user by flashing a temperature display. The maximum temperature reached during the power failure may be displayed, along with information on whether the frozen food has defrosted or may contain harmful bacteria.

 Transducer	Suggested Item	FMT12C	FMT08S	FMT13S	FET12C	FET14C	FET14C
	Size (mm)	Ø 12 x 9	8.5 x 8.5 x 3.6	13 x 13 x 6.8	Ø 12.6 x 6.3	Ø 14 x 6.7	Ø 13.8 x 6.4
	Sound Pressure Level (dBA)	85	85	88	80	80	85
	Product Type	Magnetic	Magnetic	Magnetic	Piezo	Piezo	Piezo
	Type	Pin	SMD	SMD	Pin	Pin	Pin

REMOTE CONTROL

FOR THE ACOUSTIC COMPONENTS

54




Element

A signal sound will be emitted when the button is pressed etc.

A remote control is a component of an electronics device, most commonly a television set, DVD player and home theater systems originally used for operating the television device wirelessly from a short line-of-sight distance. Remote control has evolved and advanced over recent years to include Bluetooth connectivity, motion sensor enabled capabilities and voice control.

The main remote control technology used in the home is infrared. The signal between a remote control handset and the device it is controlling are infrared pulses, which are invisible to the human eye. The transmitter in the remote control handset sends out a pulse of infrared light when a button is pressed on the handset. A transmitter is often a LED which is built into the pointing end of the remote control handset. The infrared light pulse represents a binary code that corresponds to a certain command. The receiver passes the code to a microprocessor, which decodes it and carries out the command.

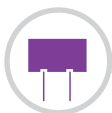
 Element	Suggested Item	FPE15C	FPE20C
	Size (mm)	Ø 15 x 0.22	Ø 20 x 0.22
	Frequency(Hz)	4100	4000
	Capacitance(pF)	9000	26000

RICE COOKER

FOR THE ACOUSTIC COMPONENTS

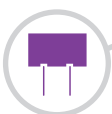
55

Buzzer





A signal sound is emitted when button is pressed or time is up.

Transducer



A rice cooker or rice steamer is a container or kitchen appliance dedicated to cooking rice. Electric rice cookers automate the process by mechanically or electronically controlling heat and timing, thus freeing up a heating element on the cooking range that had to be occupied, otherwise for rice cooking. Although the rice cooker does not necessarily speed up the cooking process, with an electric rice cooker the cook's involvement in cooking rice is reduced to simply measuring the rice, preparing the rice properly and using the correct amount of water. Once the rice cooker is set to cook, the rice will be cooked with no further attention. Many modern cookers have heat insulating casing and a warming mechanism. When the rice is determined to be fully cooked, the unit will automatically switch to the "keep warm" cycle, thus preventing the rice from being overcooked and keeping the rice warm until it is ready to be served.

 Buzzer	Suggested Item	FMB12C	FMB12C	FPB14C
	Size (mm)	Ø 12 x 7.5	Ø 12 x 9.5	Ø 13.8 x 7.5
	Sound Pressure Level (dBA)	83	85	80
	Product Type	Magnetic	Magnetic	Piezo
	Type	Pin	Pin	Pin

 Transducer	Suggested Item	FMT12C	FET12C	FET14C	FET14C	FET16C
	Size (mm)	Ø 12 x 9	Ø 12.6 x 6.3	Ø 14 x 6.7	Ø 13.8 x 6.4	Ø 16.5 x 6.7
	Sound Pressure Level (dBA)	85	80	80	85	75
	Product Type	Magnetic	Piezo	Piezo	Piezo	Piezo
	Type	Pin	Pin	Pin	Pin	Pin

ROBOTIC MASSAGE CHAIR

FOR THE ACOUSTIC COMPONENTS

56

Buzzer


A signal sound is emitted when button is pressed, time is up.


Transducer



A robotic massage chair is a chair that contains internal electronic motors and gears designed to massage the person sitting in them. Most robotic massage chairs have some form of controller to vary the type, location, or intensity of massage.

Massaging chairs most frequently resemble recliners. There are many different types and brands, including office-style chairs that operate from internal batteries. A less expensive option is a separate massaging pad that may be used with an existing chair.

 Buzzer	Suggested Item	FMB12C	FMB12C	FPB14C
	Size (mm)	Ø 12 x 7.5	Ø 12 x 9.5	Ø 13.8 x 7.5
	Sound Pressure Level (dBA)	83	85	80
	Product Type	Magnetic	Magnetic	Piezo
	Type	Pin	Pin	Pin

 Transducer	Suggested Item	FMT12C	FET12C	FET14C	FET14C
	Size (mm)	Ø 12 x 9	Ø 12.6 x 6.3	Ø 14 x 6.7	Ø 13.8 x 6.4
	Sound Pressure Level (dBA)	85	80	80	85
	Product Type	Magnetic	Piezo	Piezo	Piezo
	Type	Pin	Pin	Pin	Pin

TELEPHONE FOR THE ACOUSTIC COMPONENTS

57



The telephone is a telecommunications device that transmits and receives sounds, usually the human voice. Telephones are a point-to-point communication system whose most basic function is to allow two people separated by large distances to talk to each other.

The microphone converts the sound waves to electrical signals and then these are sent through the telephone network to the other phone and there converted by an earphone, or speaker, back into sound waves. Telephones are a duplex communications medium, meaning they allow the people on both ends to talk simultaneously. The telephone network, consisting of a worldwide net of telephone lines, fiberoptic cables, microwave transmission, cellular networks, communications satellites, and undersea telephone cables connected by switching centers, allows any telephone in the world to communicate with any other. Each telephone line has an identifying number called its telephone number.

Receiver	Suggested Item	FDR25C	FDR31C	FDR35C	FDR38C
	Size(LxWxH) (mm)	Ø 25 x 7.3	Ø 31 x 11	Ø 35 x 17.6	Ø 38 x 21.2
	Sensitivity (dB)	93	93	93	96
	Impedance(Ω)	150	150	150	150

Speaker	Suggested Item	FMS20C	FMS28C	FMS30C	FLS40C	FLS45C	FLS50C
	Size(LxWxH) (mm)	Ø 20 x 3	Ø 28 x 4.9	Ø 30 x 4.8	Ø 40 x 6.55	Ø 45.2 x 9.7	Ø 50 x 12.2
	Rated Power(W)	0.4	1	0.5	0.5	0.5	1
	Impedance(Ω)	8	8	8	8	8	8

TELEPHONE FOR THE ACOUSTIC COMPONENTS

58

Microphone

It is used for receiving speech voice



Receiver

It is used for emitting speech voice



Transducer


A signal sound is emitted when the button is pressed.




Speaker

It is used for emitting ring tone etc



 Microphone	Suggested Item	FOM06C	FOM08C	FOM09C	FOM09C	FOM09C
	Size (mm)	Ø 6 x 5.2	Ø 8 x 5.2	Ø 9.4 x 6.5	Ø 9.7 x 4.5	Ø 9.7 x 6.7
	Product Type	ECM	ECM	ECM	ECM	ECM

 Transducer	Suggested Item	FMT12C	FMT12C
	Size (mm)	Ø 12 x 5.4	Ø 12 x 8.5
	Sound Pressure Level (dBA)	70	85
	Product Type	Magnetic	Magnetic
	Type	Pin	Pin

TOASTER

FOR THE ACOUSTIC COMPONENTS

59

Buzzer


A signal sound is emitted when button is pressed or time is up.


Transducer



The toaster is typically a small electric kitchen appliance designed to toast multiple types of bread products. A typical modern two-slice toaster draws from 600W to 1200W and makes toast in 1 to 3 minutes. There are also non-electrical toasters that can be used to toast bread products over an open fire or flame.

Toaster ejects the toast after toasting it could brown bread on both sides simultaneously, set the heating element on a timer, and eject the toast when finished.

 Buzzer	Suggested Item	FMB12C	FMB12C	FPB14C
	Size (mm)	Ø 12 x 7.5	Ø 12 x 9.5	Ø 13.8 x 7.5
	Sound Pressure Level (dBA)	83	85	80
	Product Type	Magnetic	Magnetic	Piezo
	Type	Pin	Pin	Pin

 Transducer	Suggested Item	FMT12C	FET12C	FET14C	FET14C
	Size (mm)	Ø 12 x 9	Ø 12.6 x 6.3	Ø 14 x 6.7	Ø 13.8 x 6.4
	Sound Pressure Level (dBA)	85	80	80	85
	Product Type	Magnetic	Piezo	Piezo	Piezo
	Type	Pin	Pin	Pin	Pin

VACUUM CLEANER

FOR THE ACOUSTIC COMPONENTS

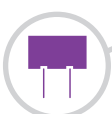
60

Buzzer




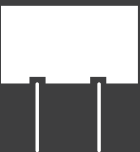
A signal sound is emitted when button is pressed.

Transducer



A vacuum cleaner is a device that uses an air pump to create a partial vacuum to suck up dust and dirt, usually from floors, and optionally from other surfaces as well. The dirt is collected by either a dust bag or a cyclone for later disposal. Vacuum cleaners, which are used in homes as well as in industry, exist in a variety of sizes and models— small battery-operated hand-held devices, domestic central vacuum cleaners, huge stationary industrial appliances that can handle several hundred liters of dust before being emptied, and self-propelled vacuum trucks for recovery of large spills or removal of contaminated soil.

 Buzzer	Suggested Item	FMB12C	FMB12C	FPB14C
	Size (mm)	Ø 12 x 7.5	Ø 12 x 9.5	Ø 13.8 x 7.5
	Sound Pressure Level (dBA)	83	85	80
	Product Type	Magnetic	Magnetic	Piezo
	Type	Pin	Pin	Pin

 Transducer	Suggested Item	FMT12C	FET12C	FET14C	FET14C
	Size (mm)	Ø 12 x 9	Ø 12.6 x 6.3	Ø 14 x 6.7	Ø 13.8 x 6.4
	Sound Pressure Level (dBA)	85	80	80	85
	Product Type	Magnetic	Piezo	Piezo	Piezo
	Type	Pin	Pin	Pin	Pin

WASHING MACHINE

FOR THE ACOUSTIC COMPONENTS

61



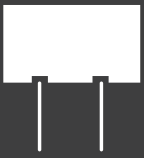
Transducer

It is used to emit a signal sound when process is finished.

A washing machine (laundry machine, clothes washer, or washer) is a machine designed to wash laundry, such as clothing, towels, and sheets. In the early 1990s, up market machines incorporated microcontrollers for the timing process. These proved reliable and cost-effective, so many cheaper machines now incorporate microcontrollers rather than electromechanical timers.

Features available in most modern consumer washing machines:

1. Predefined programs for different laundry types
2. Variable temperatures, including cold wash
3. Rotation speed settings
4. Delayed execution: a timer to delay the start of the laundry cycle
5. Child lock
6. Time remaining indication
7. Steam

 Transducer	Suggested Item	FMT14R	FET22C	FET22C	FET30C	FST24C
	Size (mm)	14 x 11 x 3	Ø 22 x 7	Ø 22 x 10.5	Ø 30 x 10	Ø 24 x 11
	Sound Pressure Level (dBA)	87	80	85	90	90
	Product Type	Magnetic	Piezo	Piezo	Piezo	Piezo
	Type	SMD	Pin	Pin	Pin	Pin

BLOOD PRESSURE METER FOR THE ACOUSTIC COMPONENTS

62



Transducer

It is used to emit a signal sound when button is pressed or process is finished.

A blood pressure meter is a device used to measure blood pressure, composed of an inflatable cuff to restrict blood flow, and measure the pressure. It is always used in conjunction with a means to determine at what pressure blood flow is just starting, and at what pressure it is unimpeded.

Blood pressure meter, using oscillometric measurements and electronic calculation rather than auscultation. They may use manual or automatic inflation. These are electronic, easy to operate without training by anybody, and can be used in noisy environments. They measure systolic and diastolic pressures by oscillometric detection, using a piezoelectric pressure sensor and electronic components including a buzzer. They do not measure systolic and diastolic pressures directly, but calculate them from the mean pressure and empirical oscillometric parameters. Most instruments also display pulse rate.

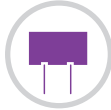
 Transducer	Suggested Item	FET11R	FET11R	FET12S	FET12C	FET14C	FET14C
	Size (mm)	11 x 9 x 1.7	11 x 9 x 1.7	12 x 12 x 3	Ø 12.6 x 6.3	Ø 14 x 6.7	Ø 13.8 x 6.4
	Sound Pressure Level (dBA)	70	75	70	80	80	85
	Product Type	Piezo	Piezo	Piezo	Piezo	Piezo	Piezo
	Type	SMD	SMD	SMD	Pin	Pin	Pin

DEFIBRILLATORS

FOR THE ACOUSTIC COMPONENTS

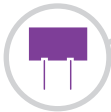
63

Buzzer





A signal sound is emitted when button is pressed or battery is fully charged.

Transducer



Defibrillation is a common treatment for life-threatening cardiac dysrhythmias, ventricular fibrillation, and pulseless ventricular tachycardia. Defibrillation consists of delivering a therapeutic dose of electrical energy to the affected heart with a device called a defibrillator. This depolarizes a critical mass of the heart muscle, terminates the dysrhythmia, and allows normal sinus rhythm to be reestablished by the body's natural pacemaker, in the sinoatrial node of the heart. Defibrillators can be external, transvenous, or implanted, depending on the type of device used or needed. Some external units, known as automated external defibrillators (AEDs), automate the diagnosis of treatable rhythms, meaning that lay responders or bystanders are able to use them successfully with little, or in some cases no training at all.

 Buzzer	Suggested Item	FMB12C	FMB12C	FPB14C
	Size (mm)	Ø 12 x 7.5	Ø 12 x 9.5	Ø 13.8 x 7.5
	Sound Pressure Level (dBA)	83	85	80
	Product Type	Magnetic	Magnetic	Piezo
	Type	Pin	Pin	Pin

 Transducer	Suggested Item	FMT12C	FET12C	FET14C	FET14C
	Size (mm)	Ø 12 x 9	Ø 12.6 x 6.3	Ø 14 x 6.7	Ø 13.8 x 6.4
	Sound Pressure Level (dBA)	85	80	80	85
	Product Type	Magnetic	Piezo	Piezo	Piezo
	Type	Pin	Pin	Pin	Pin

ELECTRONIC THERMOMETER FOR THE ACOUSTIC COMPONENTS

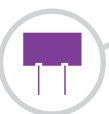
64

Element




It is used to emit a signal sound when process is finished

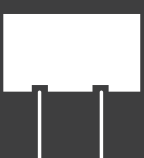
Transducer



Electronic thermometers have already been used popularly. They are used for measuring human body temperature, they display numeric values. For example, a typical inexpensive electronic ear thermometer is used for home use.

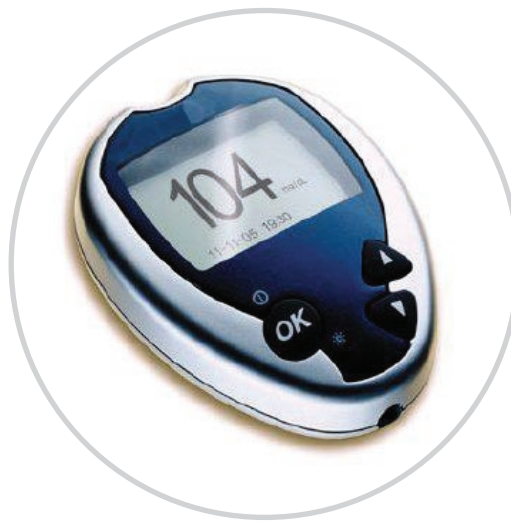
Other kinds of medical thermometers exist, such as the tympanic thermometer that measures the temperature of the tympanum by infrared measurement. The thermometer has a projection (protected by a one-time hygienic sheath) which contains the infrared probe; the projection is gently placed in the ear canal and a button pressed; the temperature is read and displayed within about a second. These thermometers are used both in the home and in medical facilities.

 Element	Suggested Item	FPE15C	FPB20C
	Size (mm)	Ø 15 x 0.22	Ø 20 x 0.22
	Frequency(Hz)	4100	4000
	Capacitance(pF)	9000	26000

 Transducer	Suggested Item	FET12C	FET11R	FET11R	FET12S	FET14C
	Size (mm)	Ø 12.6 x 6.3	11 x 9 x 1.7	11 x 9 x 1.7	12 x 12 x 3	Ø 13.8 x 6.4
	Sound Pressure Level (dBA)	80	70	75	70	85
	Product Type	Piezo	Piezo	Piezo	Piezo	Piezo
	Type	Pin	SMD	SMD	SMD	Pin

GLUCOMETER FOR THE ACOUSTIC COMPONENTS

65



Transducer

It is used to emit a signal sound when process is finished.

A glucose meter (or glucometer) is a medical device for determining the approximate concentration of glucose in the blood. It is a key element of home blood glucose monitoring (HBGM) by people with diabetes mellitus or hypoglycemia. A small drop of blood, obtained by pricking the skin with a lancet, is placed on a disposable test strip that the meter reads and uses to calculate the blood glucose level.

All meters now include a clock that is set by the user for date and time and a memory for past test results. The memory is an important aspect of diabetes care, as it enables the person with diabetes to keep a record of management and look for trends and patterns in blood glucose levels over days and weeks.

 Transducer	Suggested Item	FET11R	FET11R	FET12S
	Size (mm)	11 x 9 x 1.7	11 x 9 x 1.7	12 x 12 x 3
	Sound Pressure Level (dBA)	70	75	70
	Product Type	Piezo	Piezo	Piezo
	Type	SMD	SMD	SMD

GPS WATCHES

FOR THE ACOUSTIC COMPONENTS


66



Element

A signal sound is emitted when user pressed a button.

A GPS watch is a device with integrated GPS receiver that is worn as a single unit strapped onto a wrist, in the manner of a watch. The watch can have other features and capabilities depending on its intended purpose. GPS watches are most often used for sports and fitness purposes. Many can connect to external sensors by the wireless ANT+ protocol, and/or to a computer by USB to transfer data and configuration. Common sensors used are heart rate monitors and foot pods (running cadence and speed sensor). A footpod can be used to supplement or replace GPS data, such as providing treadmill speed and distance for the watch to log and share. Recharging by USB is commonplace.

 Element	Suggested Item	FPE15C	FPE20C	FPE27C
	Size (mm)	Ø 15 x 0.22	Ø 20 x 0.22	Ø 27 x 0.38
	Frequency(Hz)	4000	4000	3300
	Capacitance(pF)	9000	26000	35000

MAGNETIC RESONANCE IMAGING FOR THE ACOUSTIC COMPONENTS

67

Speaker





It is used to emit a signal sound before and after process.

Transducer



Magnetic resonance imaging (MRI) is a medical imaging technique used in radiology to investigate the anatomy and function of the body in both health and disease. MRI scanners use strong magnetic fields and radio waves to form images of the body. The technique is widely used in hospitals for medical diagnosis, staging of disease and for follow-up without exposure to ionizing radiation.

 Speaker	Suggested Item	FMS28C	FMS30C	FMS40C
	Size(LxWxH) (mm)	Ø 28 x 4.9	Ø 30 x 3.3	Ø 40 x 5
	Rated Power(W)	1	0.5	1
	Impedance(Ω)	8	8	8

 Transducer	Suggested Item	FMT12C	FMT16C	FET14C	FET14C
	Size (mm)	Ø 12 x 9	Ø 16 x 14	Ø 14 x 6.7	Ø 13.8 x 6.4
	Sound Pressure Level (dBA)	85	85	80	85
	Product Type	Magnetic	Magnetic	Piezo	Piezo
	Type	Pin	Pin	Pin	Pin

BURGLAR ALARM


FOR THE ACOUSTIC COMPONENTS


68



Burglar alarms are systems designed to detect unauthorized entry into a building or area. They consist of an array of sensors, a control panel and alerting system, and interconnections. Sensors detect intruders by many methods such as monitoring door and window contacts, by passive infrared motion detectors, ultrasound, vibration, electric or magnetic fields, or microwaves. Sensors may be directly wired to a control panel that provides sensor power, or may communicate wirelessly.

Burglar alarms are used in residential, industrial, and commercial properties for protection against theft or property damage. Mobile alarm systems protect vehicles and their contents. Prisons and military facilities use intrusion detection systems for security and control of access. There is hundreds of alarm monitoring companies providing real-time monitoring services for varieties of users on monthly contractual obligations.

 Element	Suggested Item	FFE34C	FFE35C
	Size (mm)	Ø 34.55 x 0.52	Ø 35 x 0.48
	Frequency(Hz)	3200	2600
	Capacitance(pF)	Cm : 37000 / Cf : 4600	Cm : 36000 / Cf : 4000


 Buzzer	Suggested Item	FPB84R	FPB52C	FPB44R
	Size (mm)	84.5 x 37.5 x 54.5	Ø 52 x 50	44.5 x 40 x 57.5
	Sound Pressure Level (dBA)	106	105	105
	Product Type	Piezo	Piezo	Piezo
	Type	Leadwire	Leadwire	Leadwire

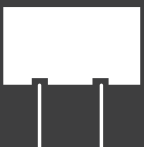
DOOR WARNING SYSTEM FOR THE ACOUSTIC COMPONENTS

69



A door warning system comprising a sensor adapted to sense the presence of persons immediately adjacent a first side of a swinging door; an audio or visual alarm responsive to the sensor adapted to advise a person on a second side of the door being opposite the first side of the presence of a person on the first side of the door.

 Element	Suggested Item	FFE34C	FFE35C
	Size (mm)	Ø 34.55 x 0.52	Ø 35 x 0.48
	Frequency(Hz)	3200	2600
	Capacitance(pF)	Cm : 37000 / Cf : 4600	Cm : 36000 / Cf : 4000

 Transducer	Suggested Item	FST39C
	Size (mm)	Ø 39 x 15.8
	Sound Pressure Level (dBA)	85
	Product Type	Piezo
	Type	Pin

ELECTRONIC ARTICLE SURVEILLANCE

FOR THE ACOUSTIC COMPONENTS


70



Buzzer

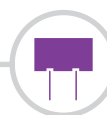
A signal sound is emitted when active tag was sensed.

Electronic article surveillance (EAS) is a technological method for preventing shoplifting from retail stores or pilferage of books from libraries. Special tags are fixed to merchandise or books. These tags are removed or deactivated by the clerks when the item is properly bought or checked out. At the exits of the store, a detection system sounds an alarm or otherwise alerts the staff when it senses active tags. Some stores also have detection systems at the entrance to the bathrooms. For high-value goods that are to be manipulated by the patrons, wired alarm clips may be used instead of tags.

 Buzzer	Suggested Item	FPB43C	FPB43C	FPB52C
	Size (mm)	Ø 43 x 33	Ø 43.5 x 34.5	Ø 52 x 50
	Sound Pressure Level (dBA)	90	90	105
	Product Type	Piezo	Piezo	Piezo
	Type	Plug / Plate	Plate	Leadwire

FINGER PRINT KEY LOCK FOR THE ACOUSTIC COMPONENTS


71



Transducer

It is used to emit a signal sound when door unlock or button is pressed.

A fingerprint key lock is an electronic device used to capture a digital image of the fingerprint pattern. The captured image is called a live scan. This live scan is digitally processed to create a biometric template (a collection of extracted features) which is stored and used for matching. This is an overview of some of the more commonly used fingerprint sensor technologies.

 Transducer	Suggested Item	FMT09C	FMT09C	FMT09C	FMT12C
	Size (mm)	Ø 9 x 4	Ø 9 x 5.5	Ø 9.6 x 5	Ø 12 x 9
	Sound Pressure Level (dBA)	82	85	85	85
	Product Type	Magnetic	Magnetic	Magnetic	Magnetic
	Type	Pin	Pin	Pin	Pin

FIRE ALARM CONTROL PANEL

FOR THE ACOUSTIC COMPONENTS


72



Buzzer

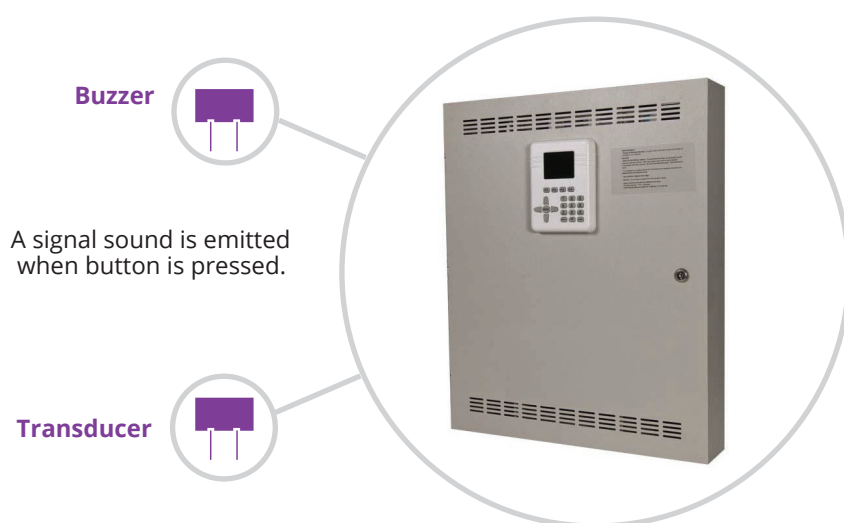
A signal sound is emitted when the button is pressed.

A Fire Alarm Control Panel (FACP), or Fire Alarm Control Unit (FACU), is the controlling component of a Fire Alarm System. The panel receives information from environmental sensors designed to detect changes associated with fire, monitors their operational integrity and provides for automatic control of equipment, and transmission of information necessary to prepare the facility for fire based on a predetermined sequence. The panel may also supply electrical energy to operate any associated sensor, control, transmitter, or relay. There are four basic types of panels: coded panels, conventional panels, addressable panels, and multiplex systems.

 Buzzer	Suggested Item	FPB43C	FPB43C	FPB45C	FPB52C
	Size (mm)	Ø 43 x 33	Ø 43.5 x 34.5	Ø 45 x 26	Ø 52 x 50
	Sound Pressure Level (dBA)	90	90	100	105
	Product Type	Piezo	Piezo	Piezo	Piezo
	Type	Plug / Plate	Plate	Leadwire	Leadwire


LIGHTING CONTROL PANEL FOR THE ACOUSTIC COMPONENTS


73



A lighting control console (also called a lightboard, lighting board, or lighting desk) is an electronic device used in theatrical lighting design to control multiple lights at once. They are used throughout the entertainment industry and are normally placed at the Front of House (FOH) position or in a control booth.

All lighting control consoles can control dimmers which control the intensity of the lights. Many modern consoles can also control Intelligent lighting (lights that can move, change colors and gobo patterns), fog machines and hazers, and other special effects devices.

 Buzzer	Suggested Item	FMB12C	FMB12C	FPB14C
	Size (mm)	Ø 12 x 7.5	Ø 12 x 9.5	Ø 13.8 x 7.5
	Sound Pressure Level (dBA)	83	85	80
	Product Type	Magnetic	Magnetic	Piezo
	Type	Pin	Pin	Pin

 Transducer	Suggested Item	FMT12C	FET12C	FET14C	FET14C
	Size (mm)	Ø 12 x 9	Ø 12.6 x 6.3	Ø 14 x 6.7	Ø 13.8 x 6.4
	Sound Pressure Level (dBA)	85	80	80	85
	Product Type	Magnetic	Piezo	Piezo	Piezo
	Type	Pin	Pin	Pin	Pin

LIGHTING CONTROL SYSTEM FOR THE ACOUSTIC COMPONENTS

74

Element




A signal sound is emitted when button is pressed.


Transducer



A lighting control system consists of a device that controls electric lighting and devices, alone or as part of a daylight harvesting system, for a public, commercial, or residential building or property, or the theater. Lighting control systems are used for working, aesthetic, and security illumination for interior, exterior, and landscape lighting, and theater stage lighting productions. They are often part of sustainable architecture and lighting design for integrated green building energy conservation programs.

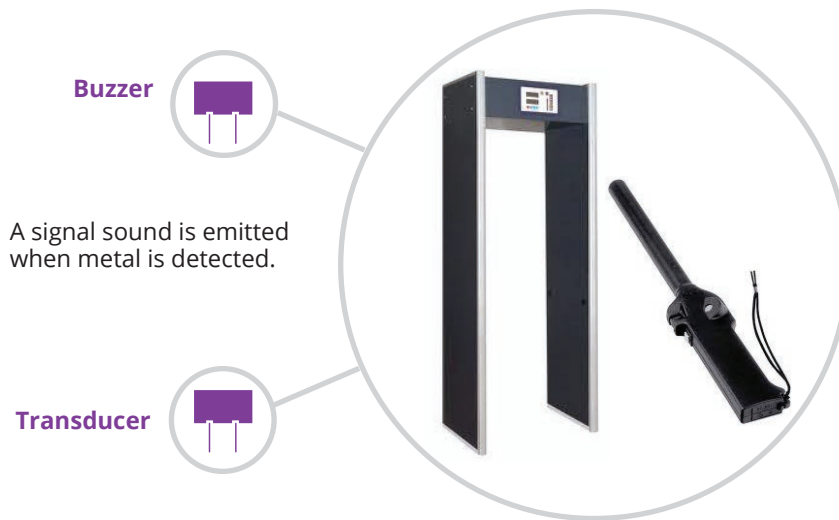
Lighting control systems, with an embedded processor or industrial computer device, usually include one or more portable or mounted keypad or touchscreen console interfaces, and can include mobile phone operation. These control interfaces allow users the ability to remotely toggle (on-off) power to individual or groups of lights, operate dimmers, and pre-program space lighting levels.

 Element	Suggested Item	FPE15C	FPE20C
	Size (mm)	Ø 15 x 0.22	Ø 20 x 0.22
	Frequency(Hz)	4100	4000
	Capacitance(pF)	9000	26000

 Transducer	Suggested Item	FET12C	FET14C	FET14C
	Size (mm)	Ø 12.6 x 6.3	Ø 14 x 6.7	Ø 13.8 x 6.4
	Sound Pressure Level (dBA)	80	80	85
	Product Type	Piezo	Piezo	Piezo
	Type	Pin	Pin	Pin

METAL DETECTOR FOR THE ACOUSTIC COMPONENTS


75




Metal detector is a device which responds to metal that may not be readily apparent. Metal detectors are used in the immigration, pharmaceutical, food, beverage, textile, garment, plastics, chemicals, lumber, and packaging industries.

Contamination of food by metal shards from broken processing machinery during the manufacturing process is a major safety issue in the food industry. Metal detectors for this purpose are widely used and integrated into the production line.

Current practice at garment or apparel industry plants is to apply metal detecting after the garments are completely sewn and before garments are packed to check whether there is any metal contamination (needle, broken needle, etc.) in the garments. This needs to be done for safety reasons.

 Buzzer	Suggested Item	FMB12C	FMB12C	FPB14C
	Size (mm)	Ø 12 x 7.5	Ø 12 x 9.5	Ø 13.8 x 7.5
	Sound Pressure Level (dBA)	83	85	80
	Product Type	Magnetic	Magnetic	Piezo
	Type	Pin	Pin	Pin

 Transducer	Suggested Item	FMT12C	FET12C	FET14C	FET30C	FET14C
	Size (mm)	Ø 12 x 9	Ø 12.6 x 6.3	Ø 14 x 6.7	Ø 30 x 10	Ø 13.8 x 6.4
	Sound Pressure Level (dBA)	85	80	80	90	85
	Product Type	Magnetic	Piezo	Piezo	Piezo	Piezo
	Type	Pin	Pin	Pin	Pin	Pin

PERSONAL ALARM

FOR THE ACOUSTIC COMPONENTS

76



Element


A signal sound is emitted when user unplug the pin.

A personal alarm is a small hand-held electronic device with the functionality to emit a loud siren-like alarming sound. It is activated either by a button, or a tag that, when pulled, sets the siren off.

It is used to attract attention in order to scare off an assailant. The sound emitted can also have the effect of distracting, disorienting, or surprising the assailant.

The volume varies from model to model, with some models having 130 decibels. Some personal alarms are also outfitted with an LED light for normal lighting purposes or to help deter an assailant.

Some personal safety apps emit a loud intermittent "shrill whistle", in the manner of a personal alarm.

 Element	Suggested Item	FFE20C	FFE27C
	Size (mm)	Ø 20 x 0.22	Ø 27 x 0.37
	Frequency(Hz)	3900	3300
	Capacitance(pF)	Cm : 25000 / Cf :3000	Cm : 30000 / Cf : 3500

PERSONAL EMERGENCY LINK SERVICE FOR THE ACOUSTIC COMPONENTS

77



Emergency Service :

The only non-profit making charitable organization that collaborates with Hospital Authority in transferring electronic patient records to A&E Departments; calling the ambulance centre for medical assistance, calling the police, notifying the emergency contact person to report the latest status of service user, follow-up services after users' hospitalization.

Care and Appointment Reminder Service :


Call assurance, volunteer visit and escort to hospitals, caring reminder, making appointments with out-patient clinics by phone.


Community Service/ Information and Referral :

Referrals to other social service resources such as home and healthcare services.

Emotional Counseling Service :

Short-term emotional counseling and support.

 Microphone	Suggested Item	FOM06C	FOM08C	FOM09C	FOM09C	FOM09C
	Size (mm)	Ø 6 x 5.2	Ø 8 x 5.2	Ø 9.4 x 6.5	Ø 9.7 x 4.5	Ø 9.7 x 6.7
	Product Type	ECM	ECM	ECM	ECM	ECM

 Speaker	Suggested Item	FMS28C	FMS30C	FMS40C	FLS45C	FLS50C
	Size(LxWxH) (mm)	Ø 28 x 4.9	Ø 30 x 4.8	Ø 40 x 6.55	Ø 45.2 x 9.7	Ø 50 x 12.2
	Rated Power(W)	1	0.5	0.5	0.5	1
	Impedance(Ω)	8	8	8	8	8

PERSONAL EMERGENCY LINK SERVICE FOR THE ACOUSTIC COMPONENTS

78

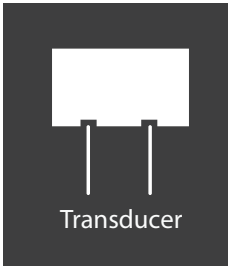
Microphone
It is used for emitting
ring tone etc



Speaker
It is used for emitting
speech voice



Transducer
It is used for receiving
speech voice



Suggested Item	FMT12C	FET12C	FET14C	FET14C	FET16C
Size (mm)	Ø 12 x 9	Ø 12.6 x 6.3	Ø 14 x 6.7	Ø 13.8 x 6.4	Ø 16.5 x 6.7
Sound Pressure Level (dBA)	85	80	80	85	75
Product Type	Magnetic	Piezo	Piezo	Piezo	Piezo
Type	Pin	Pin	Pin	Pin	Pin


PRODUCT DEMO SECURITY FOR THE ACOUSTIC COMPONENTS


79



A very loud siren sound will be emitted when product detached from docking.

It is mainly designed for secure displays of live merchandises such as mobile phones, mp3/mp4, PDA, GPS, electronic shavers and other valuable products. Attached with 3M adhesive tape connecting the samples which effectively prevent showing products from being stolen in exhibition, supermarket, shops and so on. Allowing customers to take the sample on hands and try it freely. Magnet in shell let the displaying items return in place accurately and quickly. Take full advantage of the shop wall space to expand the actual exhibit space Reduce costs: the cost of shop space saving, sales personnel costs, cost management, and other aspects. Secure & neat displays of merchandises, interactions between consumers and merchandises are realized with this product, thus better promote sales of open merchandises.

 Element	Suggested Item	FFE34C	FFE35C
	Size (mm)	Ø 34.55 x 0.52	Ø 35 x 0.48
	Frequency(Hz)	3200	2600
	Capacitance(pF)	Cm : 37000 / Cf : 4600	Cm : 36000 / Cf : 4000

 Transducer	Suggested Item	FST39C
	Size (mm)	Ø 39 x 15.8
	Sound Pressure Level (dBA)	85
	Product Type	Piezo
	Type	Pin

PROXIMITY SENSOR FOR THE ACOUSTIC COMPONENTS

80




A proximity sensor is a sensor able to detect the presence of nearby objects without any physical contact.

A proximity sensor often emits an electromagnetic field or a beam of electromagnetic radiation (infrared, for instance), and looks for changes in the field or return signal. The object being sensed is often referred to as the proximity sensor's target. Different proximity sensor targets demand different sensors. For example, a capacitive photoelectric sensor might be suitable for a plastic target; an inductive proximity sensor always requires a metal target.

The maximum distance that this sensor can detect is defined "nominal range". Some sensors have adjustments of the nominal range or means to report a graduated detection distance. Proximity sensors can have a high reliability and long functional life because of the absence of mechanical parts and lack of physical contact between sensor and the sensed object.

Proximity sensors are also used in machine vibration monitoring to measure the variation in distance between a shaft and its support bearing. This is common in large steam turbines, compressors, and motors that use sleeve-type bearings.

 Element	Suggested Item	FPE15C	FPE20C
	Size (mm)	Ø 15 x 0.22	Ø 20 x 0.22
	Frequency(Hz)	4100	4000
	Capacitance(pF)	9000	26000

PROXIMITY SENSOR FOR THE ACOUSTIC COMPONENTS

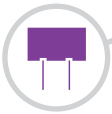
81

Element




A signal sound is emitted when user press the button.


Transducer



Ultrasonic

Ultra sonic sensors are used to measure the distance of objects.

 Transducer	Suggested Item	FET12C	FET12S	FET14C
	Size (mm)	Ø 12.6 x 6.3	12 x 12 x 3	Ø 13.8 x 6.4
	Sound Pressure Level (dBA)	80	70	85
	Product Type	Piezo	Piezo	Piezo
	Type	Pin	SMD	Pin


 Ultrasonic	Suggested Item	FAU12C	FAU14C	FAU15C	FSU14C
	Size (mm)	Ø 12 x 8	Ø 14 x 9	Ø 15 x 9	Ø 14 x 9
	Product Type	Waterproof	Waterproof	Waterproof	Waterproof


SECURES EZOOM FOR THE ACOUSTIC COMPONENTS

82



The eZoom is a small device that can be placed into your child's backpack or permanently mounted in the car. Using your PC and smartphone, you can check your child's location, create "safe" zones that will alert you if the device leaves these areas and even monitor the speed of the car your child in which your child is riding.

 Buzzer	Suggested Item	FMB12C	FMB12C	FPB14C
	Size (mm)	Ø 12 x 6.5	Ø 12 x 7.5	Ø 13.8 x 7.5
	Sound Pressure Level (dBA)	85	83	80
	Product Type	Magnetic	Magnetic	Piezo
	Type	Pin	Pin	Pin

 Transducer	Suggested Item	FMT12C	FET12C	FET14C	FET14C
	Size (mm)	Ø 12 x 9	Ø 12.6 x 6.3	Ø 14 x 6.7	Ø 13.8 x 6.4
	Sound Pressure Level (dBA)	85	80	80	85
	Product Type	Magnetic	Piezo	Piezo	Piezo
	Type	Pin	Pin	Pin	Pin

SMART CARD SYSTEM FOR THE ACOUSTIC COMPONENTS

83



A contactless smart card is any pocket-sized card with embedded integrated circuits that can process and store data, and communicate with a terminal via radio waves. There are two broad categories of contactless smart cards. Memory cards contain non-volatile memory storage components, and perhaps some specific security logic. Contactless smart cards can be used for identification, authentication, and data storage. They also provide a means of effecting business transactions in a flexible, secure, standard way with minimal human intervention.

Contactless smart card readers use radio waves to communicate with, and both read and write data on a smart card. When used for electronic payment, they are commonly located near PIN pads, cash registers and other places of payment. When the readers are used for public transit they are commonly located on fare boxes, ticket machines, turnstiles, and station platforms as a standalone unit. When used for security, readers are usually located to the side of an entry door.

Speaker	Suggested Item	FMS28C	FMS30C	FMS32C
	Size(LxWxH) (mm)	Ø 28 x 4.9	Ø 30 x 3.3	Ø 32 x 5.15
	Rated Power(W)	1	0.5	1.5
	Impedance(Ω)	8	8	8

Transducer	Suggested Item	FMT12C	FET12C	FET14C	FET14C
	Size (mm)	Ø 12 x 9	Ø 12.6 x 6.3	Ø 14 x 6.7	Ø 13.8 x 6.4
	Sound Pressure Level (dBA)	85	80	80	85
	Product Type	Magnetic	Piezo	Piezo	Piezo
	Type	Pin	Pin	Pin	Pin

SMOKE DETECTOR

FOR THE ACOUSTIC COMPONENTS

84





A very loud signal sound will be emitted when smoke is detected.

A smoke detector is a device that detects smoke, typically as an indicator of fire. Commercial, industrial, and mass residential devices issue a signal to a fire alarm system, while household detectors, known as smoke alarms, generally issue a local audible or visual alarm from the detector itself.

Smoke detectors are typically housed in a disk-shaped plastic enclosure about 150 millimeters in diameter and 25 millimeters thick, but the shape can vary by manufacturer or product line. Most smoke detectors work either by optical detection (photoelectric) or by physical process (ionization), while others use both detection methods to increase sensitivity to smoke.

Some smoke alarms use a carbon dioxide sensor or carbon monoxide sensor to detect extremely dangerous products of combustion. However, not all smoke detectors that are advertised with such gas sensors are actually able to warn of poisonous levels of those gases in the absence of a fire.

 Element	Suggested Item	FFE34C	FFE35C
	Size (mm)	Ø 34.55 x 0.52	Ø 35 x 0.48
	Frequency(Hz)	3200	2600
	Capacitance(pF)	Cm : 37000 / Cf : 4600	Cm : 36000 / Cf : 4000

 Transducer	Suggested Item	FST39C
	Size (mm)	Ø 39 x 15.8
	Sound Pressure Level (dBA)	85
	Product Type	Piezo
	Type	Pin

SMOKE DETECTOR FOR DEAF PEOPLE

FOR THE ACOUSTIC COMPONENTS

85



Speaker

Low frequency sound (vibration) is produced when smoke is detected.

One in seven people may not be woken up by a conventional smoke alarm system due to a hearing disability. Special smoke alarms for the deaf and hard of hearing feature high-intensity strobe light, vibration pads and low frequency sound to wake the deaf person during the night if there is a fire alarm.



Speaker

Suggested Item	FMS50C	FMS64C
Size(LxWxH) (mm)	Ø 50 x 18	Ø 64 x 19.4
Rated Power(W)	1	2
Impedance(Ω)	8	8

ATM SYSTEM FOR THE ACOUSTIC COMPONENTS

86




Speaker

A beep sound is emitted when user press the button.

An automated teller machine or automatic teller machine (ATM), is an electronic telecommunications device that enables the customers of a financial institution to perform financial transactions without the need for a human cashier, clerk or bank teller.

On most modern ATMs, the customer is identified by inserting a plastic ATM card with a magnetic stripe or a plastic smart card with a chip that contains a unique card number and some security information such as an expiration date or CVVC (CVV). Authentication is provided by the customer entering a personal identification number (PIN).

 Speaker	Suggested Item	FMS30C	FMS40C	FLS50C	FLS66C
	Size(LxWxH) (mm)	Ø 30 x 3.3	Ø 40 x 5	Ø 50 x 12.2	Ø 66 x 12.5
	Rated Power(W)	0.5	1.0	1.0	0.5
	Impedance(Ω)	8	8	8	8

CREDIT CARD TERMINAL FOR THE ACOUSTIC COMPONENTS

87




Transducer

A signal sound is emitted when user press the button.

A credit card terminal is a type of a Point of sale (POS) terminal that can do transactions with a credit card. A couple of types of credit card terminals are available to merchants. Most have the same basic purpose and functions. They allow a merchant to insert, swipe, or key in manually the required credit card information and transmit such data to the merchant service provider for authorization and then later on the transfer the fund to the merchant.

Most new models not only process credit and debit cards but can also handle gift cards, checks and so on. The majority of card terminals transmit data over a standard telephone line or an Internet connection (either wired or wireless). Some also have the ability to cache transactional data and transmit the data to the gateway processor when a connection becomes available; immediate authorization is not available at the time the card was processed which can subsequently result in failed payments. Remote wireless terminals can transmit card data using either cellular or satellite networks.

 Transducer	Suggested Item	FET16C	FET12S
	Size (mm)	Ø 16.5 x 4.0	12 x 12 x 3
	Sound Pressure Level (dBA)	80	70
	Product Type	Piezo	Piezo
	Type	Leadwire	SMD

DARTBOARD

FOR THE ACOUSTIC COMPONENTS

88



Speaker

A signal sound is emitted when darts hit the dartboard.

Quality dartboards are made of sisal fibres; less expensive boards are sometimes made of cork or coiled paper. However, several types of sisal fibre are used in dartboards today, originating from East Africa, Brazil, or China. The widespread belief that some dartboards are constructed using pig bristles, camel hair, or horse hair, is incorrect. Apparently no such boards have ever been produced commercially.

Recently, some companies have produced electronic dartboards. These dartboards have electronic scoring computers that are preprogrammed with a wide variety of game types. The board is made of plastic facings with small holes. The holes slant out, allowing the plastic-tipped darts to stick inside. When a dart strikes the board, the section makes contact with a metal plate, telling the computer where the player has thrown.



Speaker

Suggested Item	FLS77C	FLS77C
Size(LxWxH) (mm)	Ø 77 x 22.5	Ø 77 x 15.5
Rated Power(W)	0.5	0.3
Impedance(Ω)	8	8

DJ MIXER

FOR THE ACOUSTIC COMPONENTS

89


Microphone
It is used for receiving
speech voice




Element
A signal sound is emitted
when button is pressed.

A DJ mixer is a type of audio mixing console used by disc jockeys. DJs playing music for dancers at a club use the mixer to make smooth transitions between different songs which are played on sound sources that are plugged into the mixer. These sound sources could be turntables, CD players, or iPods. A "scratching" DJ uses the mixer in combination with turntables or specialized DJ CD players to create unique sound effects.

The key features that differentiate a DJ mixer from other types of audio mixers are the ability to redirect (cue) a non-playing source to headphones, in order to find the desired part of a song and the presence of a cross fader, which allows for an easier transition between two sources. DJ mixers are also used to create DJ mixes, which are recorded and sold.

 Microphone	Suggested Item	FOM09C	FOM09C	FOM09C
	Size (mm)	Ø 9.4 x 6.5	Ø 9.7 x 4.5	Ø 9.7 x 6.7
	Product Type	ECM	ECM	ECM

 Element	Suggested Item	FPE27C	FPE31C
	Size (mm)	Ø 27 x 0.3	Ø 31 x 0.23
	Frequency(Hz)	3300	2900
	Capacitance(pF)	35000	23000

ELECTRONIC CALCULATOR FOR THE ACOUSTIC COMPONENTS

90




Element
A signal sound is emitted when user press the button.

An electronic calculator is a small, portable, often inexpensive electronic device used to perform both basic and complex operations of arithmetic.

The first solid state electronic calculator was created in the 1960s, building on the extensive history of tools such as the abacus, developed around 2000 BC; and the mechanical calculator, developed in the 17th century. It was developed in parallel with the analog computers of the day.

Pocket sized devices became available in the 1970s, especially after the invention of the microprocessor developed by Intel for the Japanese calculator company Busicom.

Modern electronic calculators vary from cheap, give-away, credit-card sized models to sturdy desktop models with built-in printers. They became popular in the mid-1970s as integrated circuits made their size and cost small. By the end of that decade, calculator prices had reduced to a point where a basic calculator was affordable to most and they became common in schools.

 Element	Suggested Item	FPE15C	FPE20C
	Size (mm)	Ø 15 x 0.22	Ø 20 x 0.22
	Frequency(Hz)	4100	4000
	Capacitance(pF)	9000	26000

ELECTRONIC DICTIONARY FOR THE ACOUSTIC COMPONENTS

91



Speaker

A signal sound is emitted when user hit the buttons or user press the pounce button.

Most types of dictionary are available in electronic form. These include general-purpose monolingual and bilingual dictionaries, historical dictionaries such as the Oxford English Dictionary, monolingual learner's dictionaries, and specialized dictionaries of every type, such as medical or legal dictionaries, thesauruses, travel dictionaries, dictionaries of idioms, and pronunciation guides.

Most of the early electronic dictionaries were, in effect, print dictionaries made available in digital form: the content was identical, but the electronic editions provided users with more powerful search functions. But soon the opportunities offered by digital media began to be exploited. Two obvious advantages are that limitations of space (and the need to optimize its use) become less pressing, so additional content can be provided; and the possibility arises of including multimedia content, such as audio pronunciations and video clips.

Electronic dictionary databases, especially those included with software dictionaries are often extensive and can contain up to 500,000 headwords and definitions, verb conjugation tables, and a grammar reference section. Bilingual electronic dictionaries and monolingual dictionaries of inflected languages often include an interactive verb conjugator, and are capable of word stemming and lemmatization.



Speaker

Suggested Item	FMS30C	FMS36C	FMS40C
Size(LxWxH) (mm)	Ø 30 x 3.3	Ø 36 x 3.2	Ø 40 x 6.6
Rated Power(W)	0.5	0.25	1
Impedance(Ω)	8	16	8

ELEVATOR FOR THE ACOUSTIC COMPONENTS

92

Buzzer

A signal sound is emitted when the elevator reach designating levels.




Ultrasonic


It is used for detecting distance etc



The elevator (or lift in the Commonwealth excluding Canada) is a type of vertical transport equipment that efficiently moves people or goods between floors (levels, decks) of a building, vessel or other structures. Elevators are generally powered by electric motors that either drive traction cables or counterweight systems like a hoist, or pump hydraulic fluid to raise a cylindrical piston like a jack.

In agriculture and manufacturing, an elevator is any type of conveyor device used to lift materials in a continuous stream into bins or silos. Several types exist, such as the chain and bucket bucket elevator, grain auger screw conveyor using the principle of Archimedes' screw, or the chain and paddles/forks of hay elevators.

 Buzzer	Suggested Item	FCB23R	FCB23R	FCB26S
	Size (mm)	23 x 17 x 15.5	23 x 17 x 15.5	26 x 26 x 19.7
	Sound Pressure Level (dBA)	75	75	95
	Product Type	Mechanical	Mechanical	Mechanical
	Type	Leadwire	Pin	Pin

 Ultrasonic	Suggested Item	FOU16C	FOU16C	FOU16C
	Size (mm)	Ø 16.2 x 12.2	Ø 16.2 x 12.2	Ø 16.2 x 12
	Product Type	Open	Open	Open

EXPLOSIVE DETECTION FOR THE ACOUSTIC COMPONENTS

93

Buzzer


A signal sound is emitted
when explosive is detected.


Transducer



Explosive detection is a non-destructive inspection process to determine whether a container contains explosive material. Explosive detection is commonly used at airports, ports and for border control.

Several types of machines have been developed to detect trace signatures for various explosive materials. The most common technology for this application, as seen in US airports, is ion mobility spectrometry (IMS). This method is similar to mass spectrometry (MS), where molecules are ionized and then moved in an electric field in a vacuum, except that IMS operates at atmospheric pressure. The time that it takes for an ion, in IMS, to move a specified distance in an electric field is indicative of that ion's size to charge ratio: ions with a larger cross section will collide with more gas at atmospheric pressure and will therefore be slower.

 Buzzer	Suggested Item	FMB12C	FMB12C	FPB14C
	Size (mm)	Ø 12 x 7.5	Ø 12 x 9.5	Ø 13.8 x 7.5
	Sound Pressure Level (dBA)	83	85	80
	Product Type	Magnetic	Magnetic	Piezo
	Type	Pin	Pin	Pin

 Transducer	Suggested Item	FMT12C	FET12C	FET14C	FET14C	FET16C
	Size (mm)	Ø 12 x 9	Ø 12.6 x 6.3	Ø 14 x 6.7	Ø 13.8 x 6.4	Ø 16.5 x 6.7
	Sound Pressure Level (dBA)	85	80	80	85	75
	Product Type	Magnetic	Piezo	Piezo	Piezo	Piezo
	Type	Pin	Pin	Pin	Pin	Pin

HEAVY DUTY KITCHEN FOR FAST FOOD

FOR THE ACOUSTIC COMPONENTS

94




Transducer

It is used to emit a signal sound when process is finished or button is pressed.

Automatic fried chicken machine is used for frying snacks, chips, peanut, meat, and fish etc, which is divided into electrical heating or burning coal to heat the machine. Saving 50% oil and 40% electric and coal, with stainless steel, safe and health.

This Frying machine is used for frying different food stuff, such as pellets, nuts, and chips etc. The fryer could make timing frying, deoiling at the same time. The temperature, fry time and deoiling time are all controlled by PC. All kinds of food can be fired by this machine and get a stable and uniform result. The oil content of frying food could also be well controlled in deoiling device.

 Transducer	Suggested Item	FMT12C	FET26R	FET22C
	Size (mm)	Ø 12 x 9	26.5 x 22 x 7	Ø 22.1 x 7
	Sound Pressure Level (dBA)	85	85	90
	Product Type	Magnetic	Piezo	Piezo
	Type	Pin	Pin	SMD

MULTI-METER FOR THE ACOUSTIC COMPONENTS


95



Element
A signal sound is emitted when user turn on the machine.

A multi-meter or a multi-tester, also known as a VOM (Volt-Ohm meter), is an electronic measuring instrument that combines several measurement functions in one unit. A typical multi-meter would include basic features such as the ability to measure voltage, current, and resistance. Analog multi-meters use a micro-ammeter whose pointer moves over a scale calibrated for all the different measurements that can be made. Digital multi-meters (DMM, DVOM) display the measured value in numerals, and may also display a bar of a length proportional to the quantity being measured. Digital multi-meters are now far more common than analogue ones, but analogue multi-meters are still preferable in some cases, for example when monitoring a rapidly-varying value.

A multi-meter can be a hand-held device useful for basic fault finding and field service work, or a bench instrument which can measure to a very high degree of accuracy. They can be used to troubleshoot electrical problems in a wide array of industrial and household devices such as electronic equipment, motor controls, domestic appliances, power supplies, and wiring systems.

 Element	Suggested Item	FPE20C	FPE27C
	Size (mm)	Ø 20 x 0.22	Ø 27 x 0.38
	Frequency(Hz)	4000	3300
	Capacitance(pF)	26000	35000


OCTOPUS CARD (SMART CARD) FOR THE ACOUSTIC COMPONENTS


96




The Octopus card is a rechargeable contactless stored value smart card used to transfer electronic payments in online or offline systems in Hong Kong. Launched in September 1997 to collect fares for the territory's mass transit system, the Octopus card system is the second contactless smart card system in the world, after Upass, and has since grown into a widely used payment system for virtually all public transport in Hong Kong.

The Octopus is also used for payment at convenience stores, supermarkets, fast-food restaurants, on-street parking meters, car parks, and other point-of-sale applications such as service stations and vending machines.

 Buzzer	Suggested Item	FMB12C	FMB12C	FPB14C
	Size (mm)	Ø 12 x 6.5	Ø 12 x 7.5	Ø 13.8 x 7.5
	Sound Pressure Level (dBA)	85	83	80
	Product Type	Magnetic	Magnetic	Piezo
	Type	Pin	Pin	Pin

 Transducer	Suggested Item	FMT12C	FET12C	FET14C	FET14C
	Size (mm)	Ø 12 x 9	Ø 12.6 x 6.3	Ø 14 x 6.7	Ø 13.8 x 6.4
	Sound Pressure Level (dBA)	85	80	80	85
	Product Type	Magnetic	Piezo	Piezo	Piezo
	Type	Pin	Pin	Pin	Pin

 Speaker	Suggested Item	FMS28C	FMS30C	FMS32C
	Size(LxWxH) (mm)	Ø 28 x 4.9	Ø 30 x 3.3	Ø 32 x 5.15
	Rated Power(W)	1	0.5	1.5
	Impedance(Ω)	8	8	8

WEIGHING SCALE

FOR THE ACOUSTIC COMPONENTS

97

Buzzer

A signal sound is emitted when button is pressed.

Transducer



A weighing scale is a measuring instrument for determining the weight or mass of an object. A spring scale measures weight by the distance a spring deflects under its load. A balance compares the torque on the arm due to the sample weight to the torque on the arm due to a standard reference weight using a horizontal lever. Weighing scales are used in many industrial and commercial applications, and products from feathers to loaded tractor-trailers are sold by weight. Specialized medical scales and bathroom scales are used to measure the body weight of human beings.

In electronic versions of spring scales, the deflection of a beam supporting the unknown weight is measured using a strain gauge, which is a length-sensitive electrical resistance. The capacity of such devices is only limited by the resistance of the beam to deflection. The results from several supporting locations may be added electronically, so this technique is suitable for determining the weight of very heavy objects, such as trucks and rail cars, and is used in a modern weighbridge.

Buzzer	Suggested Item	FMB12C	FMB12C	FPB14C
	Size (mm)	Ø 12 x 7.5	Ø 12 x 9.5	Ø 13.8 x 7.5
	Sound Pressure Level (dBA)	83	85	80
	Product Type	Magnetic	Magnetic	Piezo
	Type	Pin	Pin	Pin

Transducer	Suggested Item	FMT12C	FET12C	FET14C	FET14C
	Size (mm)	Ø 12 x 9	Ø 12.6 x 6.3	Ø 14 x 6.7	Ø 13.8 x 6.4
	Sound Pressure Level (dBA)	85	80	80	85
	Product Type	Magnetic	Piezo	Piezo	Piezo
	Type	Pin	Pin	Pin	Pin

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