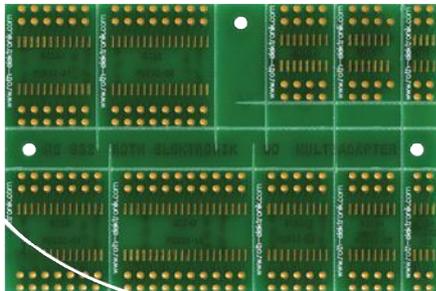


## Latest Products from...

### SMD ADAPTOR



See page 1008

### PROTOTYPING BOARDS



See page 1014

### WIRING SYSTEMS



See page 1005

### PCB-SUPPORT SPACER



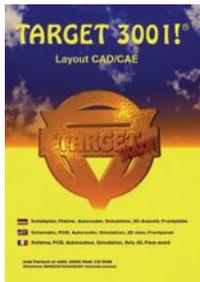
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CAD Software Systems

Target 3001!

Board layout software for Windows



TARGET 3001! represents a new generation of CAD/CAE software for circuit design. TARGET 3001! has been created to meet the requirements of professional design engineers. TARGET 3001! incorporates the functions of schematic capture, simulation, PCB layout, autoplacer, autorouter and EMC analysis all through one Windows user interface. In addition the integration of the entire project data in one common database accelerates the development process enormously. Easy generation of all required manufacturing data minimises your projects time-to-market.

TARGET 3001! includes:

- \* Schematic
- \* Mixed Mode Simulation
- \* Shape Based Contour Autorouter

- \* PCB Layout
- \* AutoPlacer
- \* EMC Analysis
- \* Frontpanel engraving tool

- Circuit diagram and board software especially for developers
- Circuit diagram, mixed-mode simulation, layout with auto-placer, auto-router, EMC analysis and front panel tool in one program
- All the functions are based on a project file
- Vector graphics with a resolution of 1 nm
- 50 step return/repeat (Undo/Redo)
- Transfer of projects from Protel\* and Eagle\*, reading-in of network lists in OrCAD\* Multiwire and Mentor\* format, TARGET ASCII and Gerber\* format
- Reading-in of Bitmaps (company logos etc.)
- Administration of layout variants
- Multilayer with blind and buried Vias
- BGAs and COB technology is supported
- Starr-Flex designs possible
- Isolation milling
- Output to all Windows printers in Gerber\*, XGerber\*, Excellon\*, S&M, DXF, PostScript\* and TARGET-ASCII (\*Protel, Eagle, OrCAD, Gerber, Excellon and PostScript are registered trademarks belonging to their respective owners)
- New hybrid auto router
- Setting a panel
- Generate test points
- Solder stop/solder paste can be set individually per pad/DuKo
- Selection assistant (selection of elements with definite properties)
- Eagle export
- List of the last 20 components used
- Revised component and model libraries
- On-line DRC (Design Rule Check)
- Export format \*.idf for transfer into 3D-CAD design programs

System requirements:

- Operating system Windows 98/ME/NT4/2000/XP/VISTA
- Processor AMD Athlon or Intel Pentium III
- Main memory 64 MB
- Graphics At least 1024 x 768 points and 256 colours
- CD-ROM drive
- Internet access Required for certain functions: Program updates, library updates, on-line library, datasheets, further supplier information etc.

Light version: max. 400 pins/pads, max. 2 layers, simulation: max 30 signals

Smart version: max 700 pins/pads, max. 2 layers, simulation: max 50 signals

Economy version: max 1,000 pins/pads, max 4 layers, simulation: max 75 signals

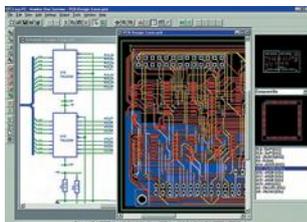
Professional version: Pins/Pads unlimited, max 100 layers, simulation: max 100 signals

Design Station version: Unlimited number of Pins/Pads and signals for simulation, max 100 layers.

453603

	Mfrs. List No.	Order Code	Price Each			
			1+	5+	25+	50+
Light version	F13_LIG	142-5147	35.70	34.50	33.45	32.40
			1+	5+	10+	
Smart version	F13_SMA	142-5148	82.00	80.00	78.00	
			1+	3+	5+	
Economy version	F13_ECO	142-5149	295.00	287.00	279.00	
Professional version	F13_PRO	142-5150	942.06	915.87	891.27	
Design Station version	F13_DS	142-5151	1,554.00	1,510.00	1,470.00	

Easy PC for WINDOWS™  
Electronic CAD



NUMBER ONE SYSTEMS

The Easy-PC For Windows product family is a modern 32 bit Windows based product running under Windows® 95 to XP. Each software module can be used together as an integrated electronics design environment.

Overview:

Easy-PC For Windows is an advanced professional Schematic and PCB design system. Easy-PC allows the user to draw the schematic and simulate it using the Easy-Spice A/D mixed mode simulator. The Schematic editor enables easy modification of the components and values to check the performance of the circuit as required. Once the circuit is correct, within the same environment and using the same libraries, the schematic is translated to the PCB design editor and the printed circuit board is laid out. The Easy-Router II autorouter enables the conversion from the "rats-nest" into copper tracks. At all times the connectivity and design rules can be checked automatically to ensure that the PCB matches the schematic and that all the rules set have been obeyed. The software is available in four different levels of functionality ranging from a low cost edition with 500 pins to a full "unlimited pins" version.

System Features

- Fully integrated 32 bit Windows program
- Schematic and PCB design editors included as standard
- Supplied with libraries and easy editing library manager
- Library wizards for easy creation of library items
- Project browser maintains projects
- Unlimited Undo and Redo
- Link to optional integrated Spice based A/D mixed mode simulator
- Support true mixed imperial and metric design units, resolution down to 1/100th micron
- Rotation steps of all design items to 1/10th degree
- Comprehensive design rules checking between schematic and PCB designs at all times
- True connective database, everything stays connected when moved or edited
- Supports TrueType fonts - makes drawings look professional
- Export Windows Metafile format
- Optional integrated "autorouter" available for 500 pin version (supplied with 1000 and 2000 pin versions)
- Supplied on CDROM and with a 300+ page Users Guide

Professional PCB Layout

- A professional PCB design package capable of dense complex PCBs or simple single sided designs
- Pin limited variants available for 500, 1000, 2000 and unlimited pins
- Unlimited Layers (of any type)
- Supports through-hole and SMD technology on both sides of the board
- True shape based copper pour partial or full power planes, also supports split power planes
- Integrated with Easy-PC Schematics
- Accepts netlists from other systems such as OrCAD and EWB
- Nets dynamically optimized as components are moved on-screen
- Full design rules checking online and dialogue driven checks
- Customisable report writer for Parts and Net lists
- Measure gap tool
- Integrated "Autoplace" of components
- Import and Export to DXF
- Import of Gerber files (optional)
- Output to Gerber RS-274-D and extended Gerber RS-274-X formats available
- Plotting of Solder and Paste masks, and other special plots
- Output to Pen plotters and Excellon NC Drill
- Output to all Windows printers - colour and B/W, any scale
- Parts lists and Bill-of-Materials in report format and CSV format

Professional Schematic Capture

- Flat or project based multi-sheet schematics
- Forward and back annotation from PCB
- Cross probe designs between SCM / PCB and vice versa
- Dynamic drag and drop move of items
- Drag and drop of Components to/from Component Bin
- Intelligent busses
- Supports off-sheet nets, global nets and automatic power rails
- System defined and user defined net names
- Find facility of X,Y, Components, Nets, and Relative origin
- Automatic updating of PCB design from Schematics
- User defined Colours of design items
- Schematic symbol wizard for fast symbol creation

System requirements: Pentium PC with at least 64MB of RAM, 50MB of hard drive space, runs under WINDOWS® 95 to WINDOWS® XP.

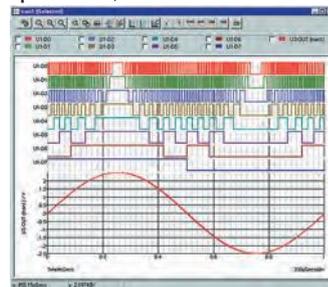
338659

Mfrs. List No.	Description	Order Code	Price Each	
			1+	2+
EPCWIN-UNLIMITED*	Full Version	489-4080	412.97	361.22
EPCWIN-UNLIMITED*	2000 pin Version	489-4091	255.65	248.40
EPCWIN-UNLIMITED*	1000 pin Version	489-4108	309.47	258.75

\* Includes Easy Router II - Autorouter

Easy Spice

Spice based A/D mixed mode simulator



NUMBER ONE SYSTEMS

Based on a high performance Spice engine, the Easy-Spice simulator is capable of analogue, digital and mixed-mode designs.

System Features

- Simple to understand and use
- Supplied complete with a 400 page comprehensive Users Guide, including a step-by-step guide to getting you started
- In-depth analysis of the Schematic circuit using rich set of features



- Spice engine highly modified and tuned, based on XSpice core
- Full Integration into the Easy-PC For Windows Schematics environment
- True mixed-mode simulation
- Graphs of circuit voltages, currents and device powers are produced by attaching probes to the Schematic circuit
- Overlay graphs without rerunning simulation
- Convergence performance trials exceed results from other vendors, successfully simulating 98% of industry standard benchmarks
- 25,000 Spice model definitions and over 15,000 actual models supplied
- Models can be downloaded from external vendors web sites and added
- Analyses - Operating point, DC Sweep, Transient, AC Small signal, Transfer function, Sensitivity, Poles and Zeros
- Advanced waveform analysis viewer with multi-pole grid and axis, cursor measurements and zoom feature

**System requirements:** Pentium PC with at least 64Mb RAM, 35Mb of hard drive space for Easy-Spice, Runs under Windows 95/98/ME/NT4.0/2000/XP (Win XP recommended)  
**Note:** Easy-Spice requires Easy-PC For Windows

338676

Mftrs. List No.	Description	Order Code	1+	Price Each	2+
EASY-SPICE	Spice simulator add-in	489-4121	258.75		248.08

**Easy Router II**

**NUMBER ONE SYSTEMS**

**Autorouter**

**Easy-Router II** is an integrated autorouter for use with Easy-PC For Windows. Using a shape based algorithm it takes the work out of the design process by taking the electrical connection points in the PCB design (the "rats-nets") and converting them into copper tracking. Once routed, the tracks may then be edited manually to achieve the final PCB layout. This process saves many hours of time and effort compared to the usual manual layout method.

**System Features**

- Available as a cost option if you already have Easy-PC
- Fully integrated with Easy-PC For Windows
- Full 32 bit application
- Shape based, uses true representation of the design items
- Gridless for maximum track packing
- Uses Easy-PC design resolution of 1/100th Micron
- Employs rip-up and retry technology
- Automatic and auto-interactive routing modes
- Supports SMD, through-hole and mixed technology
- Easy-to-use with minimal setup
- Fully configurable
- View progress in real time on-screen
- Allows interrupt and restart
- Automatic insertion of track stubs to power planes

338680

Mftrs. List No.	Description	Order Code	1+	Price Each	2+
EASY-ROUTER II	Autorouter add-in	489-4133	108.68		105.57

**Note:** Easy-Router II requires Easy-PC For Windows

**Gerber Import Facility**

**NUMBER ONE SYSTEMS**

The **Gerber Import** option is an integrated feature for use with Easy-PC For Windows. It is capable of reading in Gerber files produced by Easy-PC For Windows or outside systems. Use this option to check Gerber files before being sent to be manufactured, or for minor modifications where the original PCB design does not exist or has not been supplied.

**System Features:**

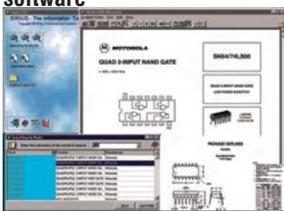
- Integrated within Easy-PC For Windows
- Easy to use
- Auto-detects and Imports RS-274-X format
- Rebuilds drill hole data automatically from RS-274-X format files
- Imports RS-274-D format files with aperture table entry
- Provides flash to pad style conversion
- Imports electrical and non-electrical Gerber data e.g. Silk screen, and component/solder layers
- Imports and rebuilds board outline from Gerber file
- Import preferences can be set up e.g. Data origin, units and file format

338681

Mftrs. List No.	Description	Order Code	1+	Price Each	2+
GERB	Gerber file import add-in	489-4145	79.82		71.84

**Note:** Gerber Import requires Easy-PC For Windows

**CIAO4 Windows® - The most popular PCB design software**



The CIAO4 software allows you to design both single as double sided PCB's with help of a computer. It creates automatically layouts of components, (files for printing, export, duplication, etc.)

- Working area maximum 800 x 800 mm
- Grid adjustable from 2,54 mm to 0,0254 mm
- Accuracy of cursor positioning at 2,54mm to 1/100 of 2,54 mm
- 8 different models of components in rectangular, octagonal or square shape, adjustable from 1,2 mm to 8,8 mm, all SMT-device models or free-to-design-models.
- 6 different models of circular connections in 0,3 mm, 0,5 mm, 1 mm, 1,5 mm, 2 mm, 2,5 mm or free-to-design-models
- Positioning, rotation, inverting, mirroring, duplication, (extension with free choice of component library)
- Export of documents with HPGL, HPPCL5, DMP or other Windows orientated printing formats.
- Printed files on plan tracing paper or transparencies are direct usable on UV-exposure systems to create PCB's.

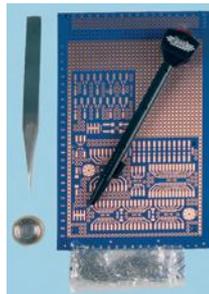
481255

Mftrs. List No.	Order Code	1+	+	+
DDCIAO	420-8870	95.41	--	--

**Wiring Systems**

**Wiring System Kits**

Oktapad™ SMD, Strip or Pad format



- Designed for prototyping, pre-production and repair
- Provides a quick and easy prototyping method
- Especially suited for training environments

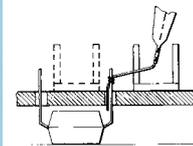
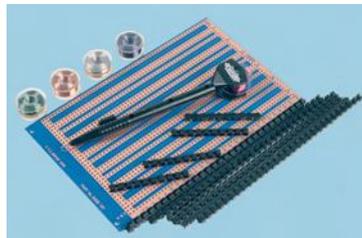
Kit contents	Order Code	Order Code
Double sided Oktapad™ PCB	849-8776	849-8784
Solder Pin (pack of 100)	Side "B" = Pads	Side "B" = Strips
Stainless steel Tweezers	Yes	Yes
Wiring Pencil with brake and Solderable Enamel Wire	Yes	Yes
Wire Bobbin with Tinned Copper Wire	Yes	Yes

"Strip" format kit Board = 100 x 160mm

382700

Mftrs. List No.	Order Code	1+	5+	10+	50+	+
SMT-C- K1	849-8776	33.11	30.40	27.86	25.40	--
SMT-C- K2	849-8784	25.72	23.62	21.64	19.73	--

**Wiring System**



Feed wire into distribution strip

- Quick and easy prototyping method
- For prototypes, repair and pre-production
- Castellated strips keep wiring neat
- Strips are glue fix or press fix for 1.02 holes on 2.54 pitch
- Wiring pencil is well balanced and easy to use
- High quality cost effective
- Quick and easy in use

QSE polyurethane covered copper wire:	Current Rating	
Insulation thickness	38SWG	82mA
38SWG	0.012mm	36SWG
36SWG	0.014mm	
	Spool length	34 metre nominal, 24m tinned copper
	Colours available	Pink, Copper, Green, tinned copper
Resistance	0.967Ω/m typ	Soldering temperature
Insulation breakdown voltage	1500Vrms min	≥400°C

**BS6811 Section 3.1**

145-222 Roadrunner Kit

A starter kit is available and comprises the following:-

- 1 off wiring pencil
- 7 off glue-in strips (152mm)
- 30 off press-in strips (51mm)
- 100 off solder pins (100 x 160mm)
- With brake and bobbin of solderable enamel wire
- 1 off green wire, 34m spool (38SWG)
- 1 off pink wire, 34m spool (38SWG)
- 1 off copper coloured wire, 34m spool (38SWG)
- 1 off Eurocard (100 x 160mm)
- 1 off tinned copper wire, 24m spool (33SWG), non insulated

The individual items are available separately

221764

	Quantity Per Pack	Order Code	Price Per Pack
<b>Roadrunner Kit</b>	Each	145-222	54.93
<b>Castellated Strips</b>			
Glue-in (152mm)	20	145-224	11.55
Glue-in high density (152mm)	20	146-800	8.92
Press-in (51mm)	20	145-225	10.97

Wiring Systems - continued

Wiring System - continued

	Quantity Per Pack	Order Code	Price Per Pack	
			1+	5+
<b>Wire 1/0.15 (38SWG) (39m Spools)</b>				
Copper coloured	4	146-182●	7.41	6.27
Green	4	146-183●	7.41	6.27
Pink	4	146-184●	7.41	6.27
Violet	4	501-7221	7.18	6.04
Assorted	4	501-7233	7.26	6.10
<b>Wire 1/0.19 (36SWG) (36m Spools)</b>				
Violet	4	148-731●	7.29	6.54
Copper coloured	4	148-732●	7.41	6.27
Green	4	148-733●	7.77	6.48
Pink	4	148-734●	7.41	6.27
<b>Wire 1/0.25 (33SWG) (36m Spools) Non-Insulated Wire</b>				
Tinned Copper	2	130-7796●	3.10	2.69
Solder Pins	100	145-282	2.48	2.10

Wiring Pencil kits



- Two starter kits for experimentation or repair
- Beginners Kit - Wiring of discrete components
- Repair Kit - Low cost PCB track repair/modification

Beginners Kit	Repair Kit
Wiring pencil with brake	Wiring pencil with brake
Tinned copper wire	Tinned copper wire (TCW)
SRBP matrix board 105 x 65 hole dia 1mm, 0.1 inch grid	Solderable enamel wire (QSE)
100 x 1mm double sided solder pins	Tweezers
	Modelling knife

204639

	Order Code	1+	5+	10+
Beginners Kit	967-361	19.56	16.92	14.32
Repair kit	967-373●	20.44	17.04	14.97

Wiring Pencils



- Wiring pencils for PCB prototyping, repair and circuit modification
- Two types with finger operated brake to control wire tension
- Supplied with a full bobbin of either tinned copper wire (TCW) or polyurethane covered copper wire (QSE)

204640

Wiring Pencil Description	Order Code	1+	5+	10+
With brake, QSE wire	967-348	12.25	11.26	10.12
With brake, TCW wire	967-350	11.98	10.90	9.82
Standard	145-223	10.46	9.72	9.30

Wiring Pencil Wire (Non-insulated)

Tinned Copper Wire 1/0.25 (33SWG)



- Suitable for discrete wiring, shorting links and PCB track repairs
- Conforms to BS4109

Current Rating 228mA

204642

2 x 24m Long - Spools Per Pack	Order Code	1+	5+	10+	25+
	130-7796●	3.10	2.69	2.39	2.15

Wiring Pencil Wire (Insulated)

1/0.15mm (38SWG)



- Solderable Enamelled Copper Wire
- Coated in self fluxing polyurethane
- Coating conforms to BS4520 Grade 2 (Incorporated within BS6811 Section 1, Pt. 3)
- Suitable for prototype wiring, PCB track repair, shorting links and coil forming
- Assorted pack contains one of each colour: Gold, Green, Pink and Violet
- Requires a temperature of 400°C + to remove enamel

Wire Diameter (38 SWG)	1/0.15mm	Current rating (38 SWG)	82mA
Wire Diameter (36 SWG)	1/0.19mmmm	Current rating (36 SWG)	131mA
Insulation thickness (38 SWG)	0.012mm	Continuous Temperature (max.)	120°C
Insulation thickness (36 SWG)	0.014mm	Insulation breakdown	1500V ac RMS
Resistance (Typ.)	0.967ohm/meter	Soldering Temperature	400 - 480°C

338911

1/0.15mm, (4 x 39m Long Spools Per Pack)		Price Per Pack	
Colour	Mfrs. List No.	Order Code	1+ 5+
Copper (Gold)	RRP-C-105	146-182●	7.41 6.27
Green	RRP-G-105	146-183●	7.41 6.27
Pink	RRP-P-105	146-184●	7.41 6.27
Violet	RRP-V-105	501-7221	7.18 6.04
Assorted	RRP-A-105	501-7233	7.26 6.10
1/0.19mm, (4 x 32m Long Spools Per Pack)		Price Per Pack	
Copper (Gold)	RRW-C-105 PK 4	148-732●	7.41 6.27
Green	RRW-G-105 PK4	148-733●	7.77 6.48
Pink	RRW-P-105	148-734●	7.41 6.27
Violet	RRW-V-105 PK 4	148-731●	7.29 6.54
Assorted	RRW-A-105	501-7245	7.33 6.10

**Warning:** During the soldering process the polyurethane coating can produce small amounts of (T.D.I.) toluene di-isocyanate. Fume extraction may be required to ensure permitted safety levels are not exceeded, i.e. (0.02 ppm).

Bread Boards

Bread Boards - WB-1xx series



147-2855



147-2854



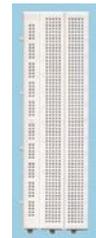
147-2851



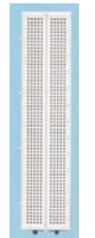
147-2852



147-2853



147-2846



147-2850



147-2848

Features of WISHBOARD WB-1XX series:

- Board base use processed aluminium plate to stand high frequency and low static interference
- Spring contact use phosphor bronze/nickel silver, can stand operation more than 10,000 times
- Allow more application of DIP IC pins insertion.
- Insertion Range: 20-29AWG(Ψ0.3-Ψ0.8mm) wire all dip size components acceptable. (special design over 10,000 insertion cycles.)
- Material - ABS plastic

Man. part	nostrips	holes	Knob	post	Food pads
147-2848	—	2	200	—	—
147-2850	1	640	—	—	—
147-2846	1	640	1	100	—
147-2853	2	12804	400	3	4
147-2852	2	12803	300	3	4
147-2851	2	12801	100	2	4
147-2854	3	19205	500	4	5
147-2855	4	25607	700	4	5

485602

Size	Man. part no	Order Code	1+	5+	10+
175 x 15 x 10 mm	WB-DJ	147-2848●	2.07	1.72	1.47
175 x 42 x 10 mm	WB-TJ	147-2850●	3.74	3.11	2.67
175 x 53 x 10 mm	WB-101J	147-2846●	4.73	3.94	3.39
185 x 110 x 10 mm	WB-102L	117-3684●	14.82	13.70	12.19
220 x 150 x 31 mm	WB-104+J	147-2853●	11.84	10.76	9.87
220 x 150 x 31 mm	WB-104-1+J	147-2852●	11.13	10.10	9.27
220 x 120 x 31 mm	WB-104-3+J	147-2851●	9.41	8.56	7.83
240 x 195 x 31 mm	WB-106+J	147-2854●	12.78	12.30	11.85
260 x 240 x 31 mm	WB-108+J	147-2855●	16.98	16.32	15.73

Electronics Design World

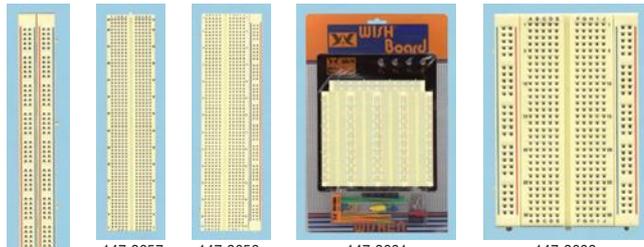


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[www.electronicdesignworld.com](http://www.electronicdesignworld.com)

**Bread Boards - WBU-2xx series**



147-2857 147-2858 147-2861 147-2862

	Terminal Man. part	Distribution nostrips	holes	strips	holes	Knob post	Food pads
147-2856	—	—	2	200	—	—	—
147-2857	1	630	—	—	—	—	—
147-2858	1	630	1	100	—	—	—
147-2861	4	25207	700	4	5	—	—
147-2862	1	300	2	100	—	—	—

**Features of WISHBOARD WBU-2XX series:**

- Exquisite color coordinates for easy recognition
- Comfortable color to help operator for longer time and to avoid eye fatigue
- Body use high class POM plastic steel material to avoid static interference and insertion hole can stand continuous
- Spring contact use phosphor bronze/nickel silver, can stand operation more than 10,000 times
- Allow more application of DIP IC pins insertion
- Insertion Range: 20-29AWG(Ψ0.3-Ψ0.8mm) wire all dip size components acceptable. (special design over 10,000 insertion cycles.)
- Material - POM Plastic

485604

Size	Mftrs. List No.	Order Code	Price Each		
			1+	5+	10+
166 x 9.5 x 11 mm	WBU-DJ	147-2856●	2.61	2.18	1.86
166 x 35.5 x 11 mm	WBU-TJ	147-2857●	4.49	3.73	3.20
166 x 45 x 11 mm	WBU-201J	147-2858●	5.69	4.73	4.06
240 x 210 x 31 mm	WBU-208+J	147-2861●	19.71	18.95	18.25
84 x 56.5 x 11 mm	WBU-301J	147-2862●	3.51	2.94	2.52

**Bread Board**



117-3681  
166 x 54.5

- Two bread boards mounted on an aluminium base
- Supplied with 140 piece jumper wire kit
- Extender board to provide a larger work area

Nickel silver contacts 0.1 pitch  
Lead size 0.3 to 0.8 (20-29 AWG)

204699

	Order Code	1+	5+	20+
Prototyping board	WBU204-3+J 117-3680●	24.84	21.66	18.51
Extender Board	WBU202 117-3681●	11.19	10.19	9.25

**Mounted Bread Board**



230 x 175

- Three bread boards mounted on an aluminium base
- Supplied with 140 piece jumper wire kit

Nickel silver contacts 0.1 pitch  
Lead size 0.3 to 0.8 (20-29 AWG)

204700

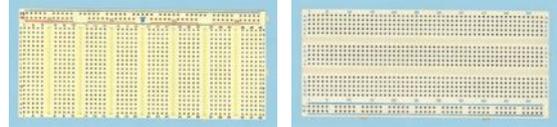
	Order Code	1+	5+	20+
WBU-206+J	117-3679●	43.24	36.53	31.05

**Bread Boards - WBU-5xx series**



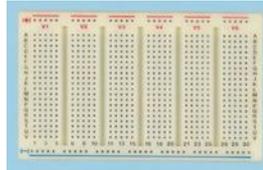
147-2863

147-2864



147-2849

147-2865



147-2866

	Terminal Man. part	Distribution nostrips	holes	strips	holes	Knob post	Food pads
147-2849	1	800	1	85	—	—	—
147-2863	1	800	2	170	4	—	—
147-2864	4	3200	6	510	4	5	—
147-2865	1	795	1	90	—	—	—
147-2866	1	30 / 352	300	—	—	—	—

**Features of WISHBOARD WBU-5XX series:**

- High-class acetal material allows insertion hole to withstand wear and tear without easily deforming, also ideal for high frequency and low static
- Horizontal assembly corresponds to the operation flow design of the PC boards for handy operation
- The power distribution strip provides 4 sections of positive voltage terminals handy for using different voltage at the same time, also 45 connected tie points for negative circuit
- Exquisitely printed coordinates for easy recognition and calculation
- Easy-on-the eyes color for longer operation without eye fatigue
- Durable base stand aluminum nameplate means no static interference
- The dovetail protrusions and recesses designed to connect two adjacent boards tightly together (i.e. perfect size distance from one board to another) and forming a V-shaped cross-sectional groove which allows DIP IC pins inserting across two parts and to increase the rate of utilization
- Insertion Range: 20-29AWG(Ψ0.3-Ψ0.8mm) wire all dip size components acceptable. (special design over 10,000 insertion cycles.)
- Material - POM Plastic steel

485603

Size	Mftrs. List No.	Order Code	Price Each		
			1+	5+	10+
141.6 x 64.4 x 8.2 mm	WBU-501J	147-2849●	6.53	5.45	4.66
125 x 160 x 31 mm	WBU-502L+J	147-2863●	9.04	8.22	7.55
190 x 305 x 31 mm	WBU-508L+J	147-2864●	21.65	20.81	20.03
143 x 64 x 8.2 mm	WBU-57J	147-2865●	7.58	6.31	5.41
115 x 70 x 8.2 mm	WB-601J	147-2866●	6.73	5.63	4.83

**Mounted Bread Board**



160 x 190

250 x 160

- Horizontally mounted bread boards
- Ideal for use with ICs or where multiple power rails are needed
- Two or three boards mounted on sturdy aluminium base plate
- Four colour coded terminals

Nickel silver contacts 0.1 pitch  
Lead size 0.3 to 0.8 (20-29 AWG)

204641

	Order Code	1+	5+	10+
Two mounted bread boards	WBU-504117-3682●	27.76	24.74	21.81
Three mounted bread boards	WBU-506117-3683●	40.21	34.11	28.02

**Bread Boards**



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**Bread Boards - continued**

**Bread Boards - continued**

- Three bread boards mounted on an aluminium base
- Four power or signal connection terminals
- Bracket for mounting switches, potentiometers, etc.
- Extender board to increase work area

204623

	Order Code	1+	10+	20+
Mounted Breadboard	147-177	75.22	69.11	62.06
Prototype board	147-175	16.63	13.84	11.23
Extender Board	147-176	4.80	3.94	3.69

**Jumper Wire Kit**



- WJW-60B - 25 pieces per wire - over all 350 assorted colour coded jumper wires
- WJW-70B - 10 pieces per wire - over all 140 assorted colour coded jumper wires
- Wide range of lengths
- PVC insulated 22AWG preformed wires

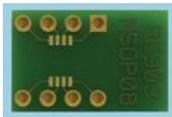
Kit contents:  
25 pieces each  
0.1", 0.2", 0.3", 0.4", 0.5", 0.6", 0.7", 0.8", 0.9",  
1.0", 2.0", 3.0", 4.0", & 5.0"

204696

Mfrs. List No.	Order Code	1+	10+	50+
WJW-70B	147-2867●	4.46	3.89	3.30
WJW-60B	117-3677●	9.65	8.03	7.05

**SMD Adaptor**

**SMD Adapter - MSOP**

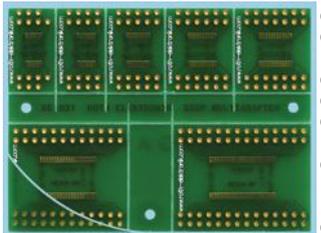


- FR4 EPOXY fibre-glass 1.50 mm double-sided 35 µm CU (pth)
- Solder and component side with chem. NI/AU surface and solder stop mask
- hole dia 1.00 mm
- adapter for 1 x MSOP-8 or 1 x MSOP-10

448734

Mfrs. List No.	Connector Type	Order Code	1+	10+	100+
RE903	MSOP-8	128-7740●	5.09	4.64	4.08
RE904	MSOP-10	128-7741●	5.09	4.64	4.08

**SSOP-SMD Multiadapter**



- Pitch 065 mm / 0.635 mm
- EPOXY fibre glass FR4 1.5 mm double-sided 35 µm CU
- Through plated holes 1.00 mm Ø
- Adapter for 7 different SSOP
- Solder and component side with chem. NI/AU surface and solder stop mask
- pre-scratched rated break points for the separation of individual modules from the board
- Size: 61.40 x 81.70 mm

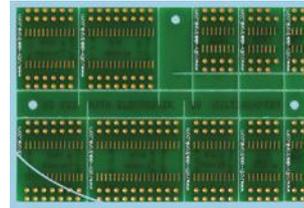
447238

Pitch (mm)	mil	No. of Pins	Size (mm)
0.65	22.5	14	5.3 (208 mil)
0.65	22.5	16	5.3 (208 mil)
0.65	22.5	20	5.3 (208 mil)
0.65	22.5	24	5.3 (208 mil)
0.65	22.5	28	5.3 (208 mil)
0.635	25.7	48	7.5 (300 mil)
0.635	25.7	56	7.5 (300 mil)

Mfrs. List No.	Order Code	1+	10+	50+	
RE931	117-2129●	9.64	--	--	
Case Style					
SSOP-14	RE931-01	142-6161●	3.60	3.48	3.33
SSOP-16	RE931-02	142-6162●	3.60	3.48	3.33
SSOP-20	RE931-03	142-6164●	3.60	3.48	3.33
SSOP-24	RE931-04	142-6165●	3.60	3.48	3.33
SSOP-28	RE931-05	142-6166●	3.60	3.48	3.33
SSOP-48	RE931-06	142-6167●	3.60	3.48	3.33
SSOP-56	RE931-07	142-6168●	4.14	4.00	3.82

447238

**SO / SOJ-SMD Multiadapter**



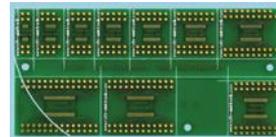
- EPOXY fibre-glass FR4 1.50 mm double-sided 35 µm Cu
- Through plated holes Ø 1.00 mm
- Adapter for 10 different SOs
- Solder and component side with chem. NI/AU surface and solder stop mask
- pre-scratched rated break points for the separation of individual modules from the board
- Size: 58 x 88.00 mm

Pitch (mm)	mil	No. of Pins	Size (mm)
1.27	0.5	8	3.9 (153 mil)
1.27	0.5	8 - w	7.5 (295 mil)
1.27	0.5	14	3.9 (153 mil)
1.27	0.5	16	3.9 (153 mil)
1.27	0.5	16 - w	7.5 (295 mil)
1.27	0.5	20 - w	7.5 (295 mil)
1.27	0.5	24 - w	7.5 (295 mil)
1.27	0.5	28 - w	7.5 (295 mil)
1.27	0.5	32	7.5 (295 mil)
1.27	0.5	40 (SOJ)	10.16 (400 mil)

447237

Mfrs. List No.	Order Code	1+	10+	50+	
RE932	117-2131●	10.15	--	--	
Case Style					
SO-8	RE932-01	142-6169●	3.18	3.05	2.93
SO-8W	RE932-02	142-6170●	3.18	3.05	2.93
SO-14	RE932-03	142-6171●	3.18	3.05	2.93
SO-16	RE932-04	142-6172●	3.18	3.05	2.93
SO-16W	RE932-05	142-6173●	3.18	3.05	2.93
SO-20W	RE932-06	142-6174●	3.18	3.05	2.93
SO-24W	RE932-07	142-6176●	3.18	3.05	2.93
SO-28W	RE932-08	142-6177●	3.18	3.05	2.93
SO-32	RE932-09	142-6178●	3.18	3.05	2.93
SOJ 40	RE932-10	142-6179●	3.18	3.05	2.93

**TSSOP-SMD Multiadapter**



- Pitch 0.65 mm / 0.50 mm
- FR4 EPOXY fibre-glass 1.50 mm double-sided 35 µm CU
- Through plated holes Ø 1.00 mm
- Adapter for 10 different TSSOP

- Solder and component side with chem. NI/AU surface and solder stop mask
- Pre-scratched rated break point for the separation of individual modules from the board
- Size: 58.90 x 120.10 mm

Pitch (mm)	mil	No. of Pins	Size (mm)
0.65	22.5	8	4.4 (173 mil)
0.65	22.5	14	4.4 (173 mil)
0.65	22.5	16	4.4 (173 mil)
0.65	22.5	20	4.4 (173 mil)
0.65	22.5	24	4.4 (173 mil)
0.65	22.5	28	4.4 (173 mil)
0.65	22.5	32	6.1 (240 mil)
0.5	19.6	38	4.4 (173 mil)
0.5	19.6	48	6.1 (240 mil)
0.5	19.6	56	6.1 (240 mil)

447238

Mfrs. List No.	Order Code	1+	10+	50+	
RE933	117-2132●	12.43	--	--	
Case Style					
TSSOP-8	RE933-01	142-6180●	4.34	4.20	4.03
TSSOP-14	RE933-02	142-6181●	4.34	4.20	4.03
TSSOP-16	RE933-03	142-6182●	4.34	4.20	4.03
TSSOP-20	RE933-04	142-6183●	4.34	4.20	4.03
TSSOP-24	RE933-05	142-6184●	4.34	4.20	4.03
TSSOP-28	RE933-06	142-6185●	4.34	4.20	4.03
TSSOP-32	RE933-07	142-6186●	4.34	4.20	4.03
TSSOP-38	RE933-08	142-6188●	4.34	4.20	4.03
TSSOP-48	RE933-09	142-6189●	4.34	4.20	4.03
TSSOP-56	RE933-10	142-6190●	4.34	4.20	4.03

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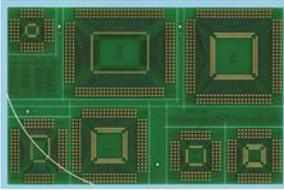


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**SMD/QFP Multiadapter Prototyping Board RE 470**

For 23 different SMD/QFP-ICs



- Chemical Ni/AU with solder stop mask
- Prescratched rated break point for the separation of individual modules from the board
- Gerber data for manufacture of the solder resist masks and the soldering paste imprint will be provided free of charge on request
- Size 123 x 203 mm
- Epoxy fibre-glass FR4 1.50 mm double-sided 35 µm CU

- Plated through holes  $\varnothing$  1.00mm
- Pad spacings 0.40mm (15.7mil) and 0.50mm (19.7 mil.)
- Adaption board for 23 different SMD-QFPs

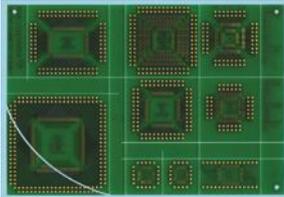
Pitch (mm)	(mil)	Pin	Size (mm)	Pitch (mm)	(mil)	Pin	Size (mm)
0.4	15.7	80	10 x 10	0.5	19.7	40	07 x 07
0.4	15.7	100	10 x 14	0.5	19.7	48	07 x 07
0.4	15.7	100	12 x 12	0.5	19.7	72	10 x 10
0.4	15.7	108	10 x 14	0.5	19.7	80	12 x 12
0.4	15.7	108	12 x 12	0.5	19.7	100	14 x 14
0.4	15.7	120	14 x 14	0.5	19.7	120	14 x 20
0.4	15.7	184	20 x 20	0.5	19.7	128	14 x 20
0.4	15.7	224	20 x 28	0.5	19.7	144	20 x 20
0.4	15.7	232	20 x 28	0.5	19.7	176	24 x 24
0.4	15.7	264	20 x 28	0.5	19.7	208	28 x 28
				0.5	19.7	240	32 x 32
				0.5	19.7	256	28 x 40
				0.5	19.7	264	28 x 40

238540

Mfrs. List No.	Order Code	1+	10+	25+	100+
RE470 - Epoxy FR4	117-2124●	26.37	24.79	23.74	22.68

**SMD Multiadapter Prototyping Board RE460**

For 23 different SMD-ICs



- Chemical Ni/AU and solder stop mask
- Prescratched rated break point for the separation of individual modules from the board
- Manual soldering
- For the SMD individual processing in the laboratory area a freehanded coating of 100 to 200 single spots with precise metering hoppers is possible with grids from 0.50 mm to 1.27 mm
- Reflow soldering by means of purpose made separate SMD templates

Size: 120 x 175 mm  
 Material: Epoxy FR4FR4 1.50 mm, double-side 35 µm CU (pth)  
 Plated through holes:  $\varnothing$  1.0mm  
 Pitch: from 0.5mm to 2.54mm

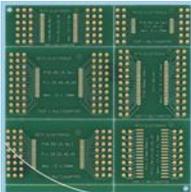
Adaption board for 23 different SMD-ICs  
 Pitch and pin assignment:  
 0.5mm pitch: 64, 100 Pin  
 0.635mm pitch: 164, 132, 120, 100 Pin  
 0.8mm pitch: 32, 44, 64, 80 Pin  
 1.27mm pitch: 18, 20, 28, 32, 44, 52, 68, 84 Pin

238545

Mfrs. List No.	Order Code	1+	5+	10+	50+
RE460	117-2184●	20.85	20.01	18.65	16.99

**SMD/TSOP-I/II Multiadapter Prototyping Board RE 900**

For 14(I) and 7 (II) different SMD/TSOP-ICs



- Pitch spacings: 0.40mm (15.7 mil); 0.50mm (19.7 mil); 0.65mm (26.5 mil); 0.80mm (30 mil); 1.27mm (50 mil)
- FR4 EPOXY fibre-glass FR4 1.50 mm double-sided 35 µm CU
- Plated through holes  $\varnothing$  1.00mm
- Solder and component side with chemical Ni/AU surface and solder stop mask

- Prescratched rated break point for the separation of individual moduls from the board
- Gerber data for manufacture of the soldering paste imprint will be provided free of charge on request

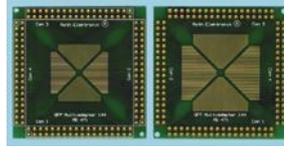
- Size: 72.60 x 76.20 mm
- adaption board for 14 different SMD TSOP I and 7 different SMD TSOP II Chips

Chip	Pitch	Pins	Size max/mm
TSOP I	0.4	28, 40, 48, 60	12 x 18
TSOP I	0.5	28, 32, 40, 48	12 x 20
TSOP I	0.5	20, 24	6 x 16
TSOP I	0.65	16,24,28,36	12 x 14
TSOP II	0.8	40,44	11.5 x 18.8
TSOP II	1.27	20,24,26,28,32	11.5 x 21.3

238542

Mfrs. List No.	Order Code	1+	10+	25+	100+
RE900	117-2125●	9.18	7.51	6.87	5.90
Case Style					
TSOP-1, 28-60 Pin	RE900-01	142-6155●	5.50	5.30	5.09
TSOP-1, 28-48 Pin	RE900-02	142-6156●	5.50	5.30	5.09
TSOP-1, 20-24 Pin	RE900-03	142-6157●	5.50	5.30	5.09
TSOP-1, 16-36 Pin	RE900-04	142-6158●	5.50	5.30	5.09
TSOP-2, 40-44 Pin	RE900-05	142-6159●	5.50	5.30	5.09
TSOP-2, 20-32 Pin	RE900-06	142-6160●	5.50	5.30	5.09

**QFP Multiadapter 144**



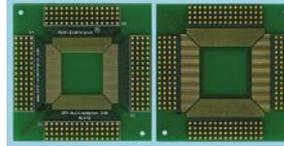
- EPOXY resin FR4 1.50 mm double-sided 35 µm CU (pth)
- chem. Ni/AU
- Two universal QFP layouts for various housing sizes and pin numbers: LQFP, PQFP, TQFP
  - Layer 1: 24 - 144 pins, 0.50 mm pitch, sq.
  - Layer 2: 24 - 144 pins, 0.65 mm pitch, sq.

- Component sides with solder resist mask
- Four pin rail rows 2 x 18 pole, basic grid 2.54 mm, borings 1.00 mm  $\varnothing$
- Size 57,2 x 57,2 mm

333814

Mfrs. List No	Order Code	1+	+	+	+
RE471	117-2126●	16.98	--	--	--

**QFP Multiadapter 240**



- EPOXY resin FR4 1.50 mm double-sided 35 µm CU (pth)
- chem. Ni/AU
- Two universal QFP layouts for various housing sizes and pin numbers: LQFP, PQFP, TQFP
  - Layer 1: 144 - 240 pins, 0.50 mm pitch, sq.
  - Layer 2: 144 - 240 pins, 0.65 mm pitch, sq.

- Component sides with solder resist mask
- Four pin rail rows 4 x 15 pole, basic grid 2.54 mm, borings 0.90 mm  $\varnothing$
- Size 70.00 x 70.00 mm

333815

Mfrs. List No.	Order Code	1+	+	+	+
RE472	117-2127●	17.85	--	--	--

**SMD/SOT-23 Multiadapter Prototyping Board RE 901**

Also for SOT-23/8, SOT-223, SOT-89, TO-252 and SC-75



Multiadapter circuit board with six micro-miniature semiconductor circuits. The PCB can be equipped with twenty different types of semiconductors: **SOT-23** (with SOT-23/3, SOT-23/5, SOT-23/6, SC59, SC74, SC74A, SMT3, SMT5 and SMT6), **SOT-223, TO-252/D-PAK, SOT-89, SOT-23/8** (with SC70, SC88A, UMT3, UMT5 and UMT6) and **SC75** (with EMT3 and SC75A). The board layouts meet the industry standard of the respective semiconductor case size.

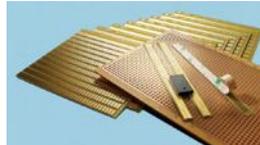
Measurements for	SOT-23/6	SOT-23/8
Pad-Size (mm)	0.71 x 1.0	0.46 x 1.1
Pad-Pitch (mm)	0.95	0.56
Size (mm)	2.54	2.54
Configuration	2 rows x 3	2 rows x 4
Board size	22.86 x 46.72mm	
Board thickness	1.5mm	
Board material	FR4 (single sided 35 µm Cu)	
Components side	Chemical nickel/goldsolder stop-off mask and board assembly print	
Connections	8 pole pin terminal connection spacing 2.54 mm, boring $\varnothing$ 1.00 mm	
Break off lines	Pre notched to separate the modules	
Gerber Data	Tanning data (format Gerber) for production of the solder stop-off mask and the solder paste print are available free of charge on request	

242013

Mfrs. List No.	Order Code	1+	+	+	+
RE901	117-2113●	3.48	--	--	--

**Self-adhesive SMT contact strips**

Glass reinforced epoxy laminate FR4 0.80 mm one-sided 35 µm CU



We recommend you to mount the self-adhesive contact strips on a grounding point motherboard (such as RE201-LFDS or RE334-LF) for optimum use and reduction of interference fields.

The underside mounted double-sided adhesive tape also allows high flexibility in contact strip positioning. It is possible to solder components up before or after mounting the contact strips. Circuits can also be constituted free of grid-related limits.

The greatest advantage, however, that this contact strip system offers is to allow the user independency of package sizes. The self-adhesive contact strips are available with any current pitch spacing.

- scribed predetermined breaking point
- Surface area made from Au
- Size 90 x 100 mm

**SMD Adaptor - continued**

**Self-adhesive SMT contact strips - continued**

Glass reinforced epoxy laminate FR4 0.80 mm one-sided 35 µm CU - continued

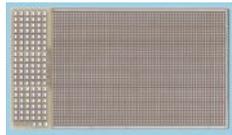
498274

Mfrs. List No.	Pitch	Order Code	1+	5+	10+	25+
RE1010	2.54	153-3013●	12.05	11.57	11.15	10.75
RE1020	1.27	153-3014●	12.05	11.57	11.15	10.75
RE1030	1	153-3015●	12.05	11.57	11.15	10.75
RE1040	0.8	153-3016●	12.05	11.57	11.15	10.75
RE1050	0.65	153-3017●	12.05	11.57	11.15	10.75
RE1060	0.635	153-3018●	12.05	11.57	11.15	10.75
RE1070	0.5	153-3019●	12.05	11.57	11.15	10.75
RE1080	0.4	153-3020●	12.05	11.57	11.15	10.75

**Prototyping Boards**

**SMD-PCB RE435**

53 x 95 mm



Grid: 39 x 59  
Pitch: 1.27mm x 1.27mm  
Material: Epoxy  
Pad area: 1.00mm<sup>2</sup>  
Hole dia: 0.35mm

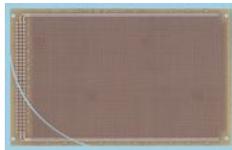
- EPOXY fibre-glass FR4 0.70 mm double-sided 35 µm CU (pth)
- chem. SN
- SMD breadboard 1.27 x 1.27 mm (1/40")
- 39 x 59 single-hole conductors 1.0 mm<sup>2</sup>
- hole dia 0.35 mm
- suitable for all SMD components
- size 53 x 95 mm

For connection with DIN 41612 C and R Connectors.

246711

Mfrs. List No.	Order Code	1+	5+	10+	50+
RE435-LF	117-2133●	9.34	8.61	8.18	6.91

**Experimental Board RE437**



- Experimental board for SMT
- Solder pads are drilled for through hole appliances
- Euro size 160 x 100mm
- Double sided plating 35µm copper free rings pre-tinned
- Two connector channels for 31 way DIN41612
- 4 outside tracks for earth or potential

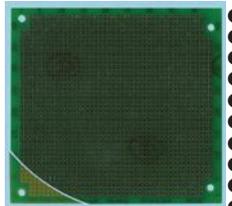
Layout 107 x 69 solder pads  
Pitch 1.27mm x 1.27mm  
Material Epoxy fibre glass  
Thickness 1.5mm  
Hole ∅ 0.35mm

232042

Mfrs. List No.	Order Code	1+	5+	10+	50+
RE437-LF	117-2111●	15.80	13.65	13.28	12.02

**Metric Prototyping Board**

With 2.0 mm Hole Spacing



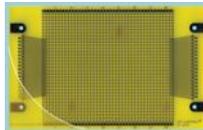
- Hole spacing 2.00 x 2.00mm
- 44 x 42 lines of holes
- Single-hole conductors 1.60 mm<sup>2</sup>
- hole dia 0.8mm
- Soldering stop mask at the solder side
- Size 90.17 x 95.89mm
- Working temperature: max. 150°C
- Soldering bath proof: 260°C max. 50 sec
- EPOXY fibre-glass FR 4 1.5 mm single-sided 35 µm CU
- Hot air leveling (HAL-leadfree)

238504

Mfrs. List No.	Order Code	1+	10+	25+	100+
RE130-LF	117-2114●	3.48	3.10	2.78	2.48

**Prototyping Board for D-Sub connector DIN 41652**

RE226 Series



- EPOXY fibre-glass FR4 1.50 mm single-sided 35 µm CU
- hot air levelling (HAL-leadfree)
- connector D-Sub DIN 41652
- 2 x 37- channel
- 35 x 42 single hole conductor 2.1 mm ∅
- hole spacing 2.54 x 2.54 mm

- hole dia 1.0 mm
- 2 potential strips
- size 100 x 160 mm

449584

Mfrs. List No.	Order Code	1+	5+	10+
RE226-LF	122-1145●	6.63	5.67	4.96

**Double side test boards for SMT components**



- AL 441 - Epoxy thickness: 1,6 mm
- Fully SMD padded with DIN 41612 C.
- Drilling 0,4 mm.
- Double sided 8475 plated holes.

481181

Format	Mfrs. List No.	Order Code	1+	5+	10+
100x160	AL441	126-7766●	24.53	23.32	22.12

**Eurocard Single-Sided Stripboard**



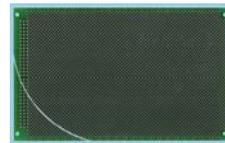
- Pre-grilled eurocard SRBP (synthetic resin bonded paper)
- Flame retardant to UL94V-0
- DIN41612 connector mounting holes at each end
- Manufactured to BS4584 Section 102.7

Matrix Pitch 0.1"  
Strips mm 36 x 1.9  
Rows 62  
L=160, W=100, Th=1.6

204692

Order Code	1+	10+	20+	50+
451-058	4.53	4.45	3.96	3.64

**PGA PCB RE440**



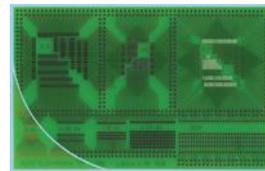
- Experimental board for PGA sockets and housings
- Euro size 160 x 100mm
- Through hole
- Single side plating 35µm copper
- Connector channel for 32/64/96 way DIN41612

Layout 4304 holes  
Pitch 2.54mm x 2.54mm  
Material Epoxy fibre glass  
Thickness 1.5mm  
Hole ∅ 0.80mm  
Pad ∅ 1.4mm

232044

Mfrs. List No.	Material	Order Code	1+	5+	10+	50+	100+
RE440-LF	Epoxy	117-2181●	16.02	15.43	14.34	12.09	10.42

**SMD PCB RE450**



- Experimental board for SMD
- Euro size 100 x 160mm
- Single side plating 35µm copper solder pads pre-tinned
- No through holes
- Pattern for 40 different semiconductor housings

Housing Pitch Number of Pins  
QFP 0.80mm 44, 56, 64, 72, 80, 94, 100, 120  
QFP 0.85mm 48, 54, 56, 64, 68, 80, 100  
QFP 0.50mm 48, 64, 72, 80, 100, 120, 144, 160  
SOP 1.27mm max. 44 - pin in 225, 300, 375, 450, 525, 600 mil  
SOP 1.00mm max. 36 - pin in 225, 300, 375 mil  
SSOP 0.80mm max. 42 - pin in 300, 450 mil  
SSOP 0.65mm max. 30 - pin in 225, 300 mil  
SDIP 1.778mm max. 64 - pin in 300, 400, 500, 600, 750 mil

232059

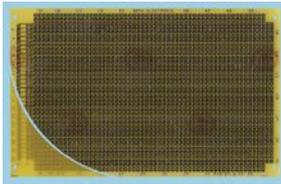
Mfrs. List No.	Order Code	1+	5+	10+	50+
RE450-LF	117-2110●	9.71	9.14	8.74	8.45

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**Experimental Board RE319**



- Experimental board with rings
- Euro size 160 x 100mm
- Through hole Single side plating 35µm copper
- Connector channel 32 way **DIN41612 type C**

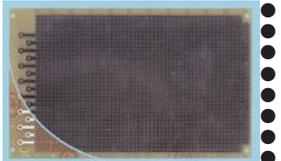
Layout 37 x 55 holes  
 Pitch 2.54mm x 2.54mm  
 Material Phenol paper or epoxy fibre glass  
 Thickness 1.5mm  
 Hole ∅ 1.0mm  
 Pad ∅ 2.0mm

232065

Mfrs. List No.	Order Code	1+	5+	10+	50+	100+
RE319-HP	<b>117-2107</b>	3.51	3.00	2.64	2.10	1.92
RE319-LF	<b>117-2108</b>	4.30	3.95	3.63	3.51	3.43

**Eurocard Prototyping Board RE 526**

DIN 41612/H - 15 Channel/5.08mm Hole Spacing



- Connector DIN 41612 Typ H 15-channel
- Hole spacing 5.08 mm
- Additional print at the component side
- 36 continuous strips with 56 holes
- Hole spacing 2.54 x 2.54 mm
- Hole diameter 1.00mm
- Size 100 x 160mm
- SRBP-paper FR2 1.50 mm single-sided 35µm CU

- Covered with solderable lacquer
- EPOXY fibre-glass FR4 1.50 mm single-sided 35µm CU
- Hot air levelling (HAL-leadfree)

238510

Mfrs. List No.	Order Code	1+	10+	25+	100+
RE526-HP	<b>117-2120</b>	2.58	2.29	2.07	1.85
RE526-LF	<b>117-2121</b>	4.04	3.58	3.23	2.88

**Eurocard Prototyping Board RE 527**

DIN 41612/B(D) - 32 Channel 2.54 (5.08)mm Hole Spacing



- Additional print at the component side
- 38 continuous strips with 57 holes
- Hole spacing 2.54 x 2.54 mm
- Hole diameter 1.00mm
- connector: 32-channel DIN 41612 type C a 2.54 mm 32-channel DIN 41612 type D a+c 5,08 mm
- Size 100 x 160mm

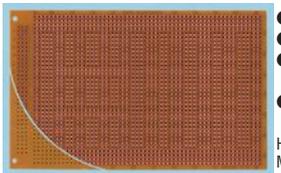
- SRBP-paper FR2 1.50 mm single-sided 35µm CU (RE527HP)
- Covered with solderable lacquer
- EPOXY fibre-glass FR4 1.50 mm single-sided 35µm CU (RE527EP/LF)
- Hot air levelling (HAL-leadfree)

238511

Mfrs. List No.	Order Code	1+	10+	25+	100+
RE527-HP	<b>117-2122</b>	2.51	2.22	2.02	1.80
RE527-LF	<b>117-2123</b>	4.68	4.16	3.75	3.36

**Prototyping Board RE 315**

Eurocard 100 x 160mm



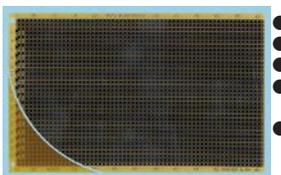
- 37 x 56 holes
  - 1.5 mm single-sided 35 µm CU
  - SRBP-paper boards are covered with solderable lacquer
  - Epoxy glass fibre solder pads have hot air levelling (HAL-leadfree)
- Hole spacing: 2.54 x 2.54mm Hole Diameter: 1mm  
 Material: SRBP-paper  
 Epoxy glass fibre

238527

Mfrs. List No.	Order Code	1+	5+	10+	50+	100+
RE315-HP	<b>117-2140</b>	3.31	3.10	2.88	2.57	2.49
RE315-LF	<b>117-2142</b>	5.85	5.01	4.39	3.51	3.19

**Prototyping Board RE 524**

Eurocard 100 x 160mm



- 1.5 mm single-sided 35 µm CU
- Connector 32-channel DIN 41612
- Grid 5.08 mm type D
- SRBP-paper boards are covered with solderable lacquer
- Epoxy glass fibre solder pads have hot air levelling (HAL-leadfree)

Hole matrix: 36 continuous strips with 61 borings  
 Hole spacing: 2.54 x 2.54mm  
 Material: SRBP-paper  
 Epoxy glass fibre

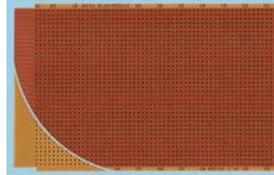
Strip width: 2 mm  
 Hole diameter: 1mm

238526

Mfrs. List No.	Order Code	1+	5+	10+	50+	100+
RE524-HP	<b>117-2176</b>	3.44	2.92	2.57	2.06	1.87
RE524-LF	<b>117-2178</b>	5.46	4.68	4.10	3.27	2.98

**Prototyping Board RE 523**

Eurocard 100 x 160mm



- 1.5 mm single-sided 35 µm CU
- Direct connectors 37-channel
- SRBP-paper boards are covered with solderable lacquer
- Epoxy glass fibre solder pads have hot air leveling (HAL-leadfree)

Hole matrix: 37 continuous strips with 57 borings  
 Hole spacing: 2.54 x 2.54mm  
 Material: SRBP-paper  
 Epoxy glass fibre

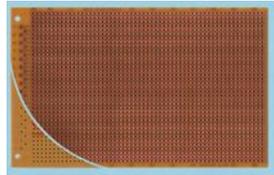
Strip width: 2mm  
 Hole diameter: 1mm

238525

Mfrs. List No.	Order Code	1+	5+	10+	50+	100+
RE523-HP	<b>117-2112</b>	3.03	--	--	--	--
RE523-LF	<b>117-2175</b>	3.74	3.60	3.34	2.94	2.83

**Prototyping Board RE 522**

Eurocard 100 x 160mm



- 1.5 mm single-sided 35 µm CU
- Connector 31-channel DIN 41617
- SRBP-paper boards are covered with solderable lacquer
- Epoxy glass fibre solder pads have hot air leveling (HAL-leadfree)

Hole matrix: 37 continuous strips with 57 borings  
 Hole spacing: 2.54 x 2.54mm  
 Material: SRBP-paper  
 Epoxy glass fibre

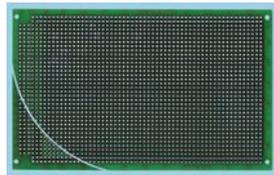
Strip width: 2 mm  
 Hole diameter: 1mm

238524

Mfrs. List No.	Order Code	1+	5+	10+	50+	100+
RE522-HP	<b>117-2173</b>	3.31	3.10	2.88	2.57	2.49
RE522-LF	<b>117-2174</b>	4.89	4.71	4.38	3.85	3.71

**Prototyping HF-Board RE 334**

Eurocard 100 x 160mm



Hole matrix: 32 x 53 single-hole conductors  
 Hole spacing: 2.54 x 2.54mm  
 Material: Epoxy glass fibre

- 1.5mm thick
- Double-sided 35 µm CU , through plated
- Hot air leveling (HAL-leadfree)
- Connector 32/64/96-channel
- DIN 41612 type C
- The component side is totally laminated by CU

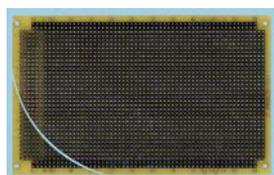
- The through-holes are etched free so that a conducting connection to the other component side is impossible
- If the CU-coating is connected to ground the electrical components are optimally shielded against the solder side
- By this HF, digital and analog circuits can be built up with high reliability
- The component and solder side are laminated with solder lacquer and additional print

238522

Mfrs. List No.	Order Code	1+	5+	10+	50+
RE334-LF	<b>117-2159</b>	14.83	13.94	13.36	12.76

**Prototyping Board RE 321**

Eurocard 100 x 160mm



- 1.5mm thick
- Double-sided 35 µm CU
- Through plated and hot air leveling (HAL-lead-free)
- Connector 32/ 64/ 96-channel DIN 41612

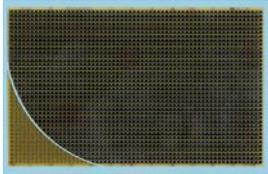
Hole matrix: 36 x 55 single-hole conductors  
 Hole spacing: 2.54 x 2.54mm  
 Material: Epoxy fibre glass FR4

238521

Mfrs. List No.	Order Code	1+	5+	10+	50+	100+
RE321-LF	<b>117-2152</b>	8.19	7.26	6.54	5.45	5.02

Prototyping Boards - continued

Prototyping Board RE 520  
Eurocard 100 x 160mm



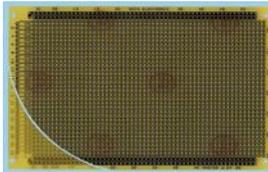
- 1.5 mm single-sided 35 µm CU
- 38 continuous strips with 61 borings
- SRBP-paper boards are covered with solderable lacquer
- Epoxy fibre glass boards - hot air leveling (HAL-leadfree)

Hole spacing: 2.54 x 2.54mm  
Material: SRBP-paper  
Epoxy glass fibre  
Hole diameter: 1mm

238515

Mftrs. List No.	Order Code	1+	5+	10+	50+	100+
RE520-HP	117-2154	2.74	2.58	2.48	2.37	1.80
RE520-LF	117-2155	4.20	3.95	3.78	3.52	2.92

Prototyping Board RE 318  
Eurocard 100 x 160mm



- 1.5mm thick
- single-sided 35 µm CU
- 33 x 55 single-hole conductor 2.2 mm ∅
- Hole spacing 2.54 x 2.54 mm
- Hole dia 1.0 mm
- Connector 64-channel
- DIN 41612
- Grid 2.54 mm type C

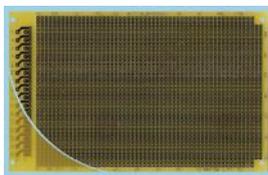
- SRBP-paper boards are covered with solderable lacquer
- The epoxy fibre glass solder pads are tinned
- In addition to the soldering points there are two continuous conducting strips down each side for power supply tasks

Hole matrix: 33 x 55 single-hole conductors  
Drill holes: 37 x 55  
Hole spacing: 2.54 x 2.54mm  
Material: SRBP-paper  
EPOXY fibre-glass  
Pad area: 2.20 mm ∅mm  
Hole diameter: 1.0 mm

238514

Mftrs. List No.	Order Code	1+	5+	10+	50+	100+
RE318-HP	117-2171	2.65	2.48	2.37	2.06	1.98
RE318-LF	117-2172	5.02	4.84	4.50	3.95	3.82

Prototyping Board RE 317  
HF Board Eurocard 100 x 160mm



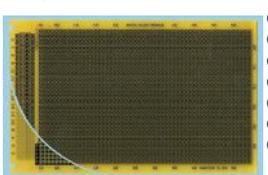
- 1.5mm thick
- Single-sided 35 µm CU
- Connector 32-channel
- DIN 41612
- Grid 5.08 mm type D
- SRBP-paper board is covered with solderable lacquer
- The epoxy fibre glass board solder pads are tinned

Hole matrix: 37 x 55 single-hole conductors  
Hole spacing: 2.54 x 2.54mm  
Material: SRBP-paper  
EPOXY fibre-glass  
Pad area: 2.00 mm<sup>2</sup>  
Hole diameter: 1mm

238513

Mftrs. List No.	Order Code	1+	5+	10+	50+	100+
RE317-HP	117-2169	3.96	3.43	2.99	2.40	2.18
RE317-LF	117-2170	5.46	4.68	4.10	3.27	2.98

Prototyping Board RE 201  
HF Board Eurocard 100 x 160mm



- 34 x 54 single-hole conductor 2.0 mm<sup>2</sup>
- Hole spacing 2.54 x 2.54 mm
- Hole dia 1.0 mm
- Connector 32/ 64/ 96-channel
- DIN 41612 type C
- The component side is totally laminated by copper
- Only the through-holes are etched free so that a conducting connection to the component side is impossible

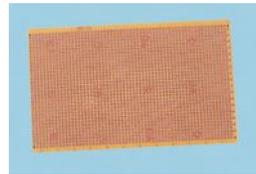
- If the copper coating is connected to ground the electrical components are optimally shielded against the solder side
- By this HF, digital and analog circuits can be built up with high reliability
- EPOXY fibre-glass FR4 1.5 mm double-sided 35 µm CU
- SRBP-paper FR2 1.5 mm double-sided 35 µm CU

Hole matrix: 34 x 54 single-hole conductors  
Hole spacing: 2.54 x 2.54mm  
Material: SRBP-paper  
EPOXY fibre-glass  
Pad area: 2.00 mm<sup>2</sup>  
Hole diameter: 1mm

238512

Mftrs. List No.	Order Code	1+	5+	10+	50+	100+
RE201-LFDS	117-2158	7.43	6.98	6.70	6.39	5.24

Eurocard Prototyping Board  
Round Pad, Single-Sided



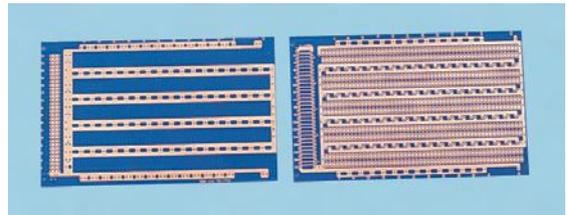
L=160, W=100, Th=1.6

221766

- Pre-drilled prototyping board
- Manufactured in SRBP to BS4584 Section 102.7
- Flame retardant to UL94V-0
- 2.2mm pads, 1mm holes at 2.54 matrix patch
- DIN41612 connector mounting holes

Order Code	1+	10+	20+	50+
451-060	5.99	5.88	5.74	5.56

Eurocard, Single Size (High Density)



Component side L=160, W=100

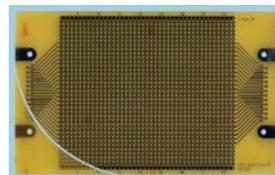
Wiring side

- Three plane high density board
- DIN41612 connector mounting holes at one end

204674

Order Code	1+	10+	20+	30+
147-905	18.60	18.21	16.49	15.09

Prototyping Board for D-Sub Connector RE 225  
DIN 41652 - 2 x 25 Channel



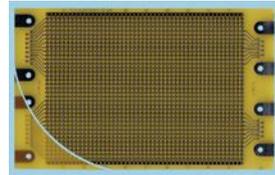
- 2 x 25 channel
- Connector D-Sub DIN 41652
- 35 x 42 single hole conductor 2.1 mm ∅
- Hole spacing 2.54 x 2.54 mm
- Hole diameter 1.00mm
- 2 potential strips
- Size 100 x 160mm
- SRBP-paper FR2 1.50 mm single-sided 35 µm CU

- Covered with solderable lacquer
- EPOXY fibre-glass FR4 1.50 mm single-sided 35µm CU
- Hot air levelling (HAL-leadfree)

238509

Mftrs. List No.	Order Code	1+	10+	25+	100+
RE225-HP	117-2118	2.86	2.55	2.29	2.06
RE225-LF	117-2119	4.68	4.16	3.75	3.36

Prototyping Board for D-Sub Connector RE 224  
DIN 41652 - 2 x 9- channel and 2 x 15- channel



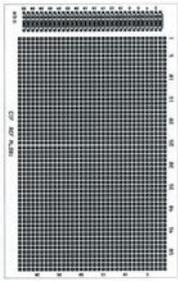
- Connector D-Sub DIN 41652
- 2 x 9- channel and 2 x 15- channel
- 48 x 35 single hole conductor 2.1 mm ∅
- Hole spacing 2.54 x 2.54 mm
- Hole diameter 1.0mm
- 2 potential strips
- Size 100 x 160mm

- SRBP-paper FR2 1.50 mm single-sided 35 µm CU
- Covered with solderable lacquer
- EPOXY fibre-glass FR4 1.50 mm single-sided 35 µm CU
- Hot air levelling (HAL-leadfree)

238508

Mftrs. List No.	Order Code	1+	10+	25+	100+
RE224-HP	117-2115	3.03	--	--	--
RE224-LF	117-2117	4.61	4.09	3.68	3.31

**High-Frequency Prototyping Board**



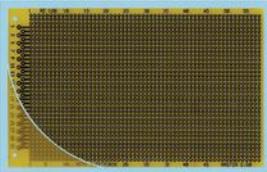
- Epoxy Board specifically designed for High Frequency Prototyping
- Double Sided Board
- Ground-Plane on one side with clearance around holes to avoid short circuits
- Pad Size 2mm with 1mm Ø Holes
- DIN 41612 Mounting Holes
- Eurocard size 100 x 160mm

241016

Description	Mfrs. List No.	Order Code	Price Each				
			1+	5+	10+	50+	
High Freq. Prototyping Board	AL201	120-1481●	10.59	9.43	8.57	7.69	6.92

**Prototyping Boards RE 120/RE 220**

Eurocard 100 x 160mm



- 1.5mm thick
- Single sided 35µm (Cu)
- connector 31-channel DIN 41617
- Covered with solderable lacquer
- Hot air leveling (HAL-leadfree)

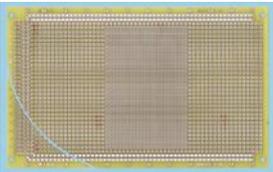
Hole matrix: 37 x 58 solder pads  
 Hole spacing: 25 x 2.5mm (RE 120)  
 2.54 x 2.54mm (RE 220)  
 Material: SRBP-paper  
 EPOXY fibre-glass

246619

Mfrs. List No.	Order Code	Price Each			
		1+	5+	10+	50+
RE120-HP	117-2143●	2.73	2.38	2.19	1.95
RE120-LF	117-2144●	4.34	3.98	3.68	3.33
RE220-HP	117-2145●	2.63	2.49	2.37	2.25
RE220-LF	117-2105●	4.32	3.98	3.79	3.59

**SMD Prototyping Board Typ RE 436**

Eurocard 100 x 160mm



- Mixed construction
- SMD breadboard 1.27 x 1.27 mm (1/40")
- 40 x 60 single-hole conductors 1.0 mm<sup>2</sup>
- Hole dia 0.35 mm
- Suitable for all SMD components
- Two breadboards 2.54 x 2.54 mm (1/20") 17 x 32 and 18 x 32 single-hole conductors 2.0 mm<sup>2</sup>
- Hole dia 1.0 mm

- Connector 32 / 64 / 96 - channel
- DIN 41612 type C
- Size 100 x 160 mm

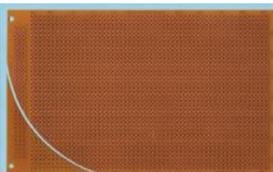
Hole matrix:	<b>Standard</b>	17 x 32 single-hole conductors	<b>SMD</b>	40 x 60 single-hole conductors
		18 x 32 single-hole conductors		
Hole spacing:	2.5 x 2.5mm		1.27 x 1.27mm	
Single-hole conductors:	2.00mm <sup>2</sup>		1.00mm <sup>2</sup>	
Hole diameter:	1.00mm		0.35mm	
Material:	EPOXY fibre-glass			

246708

Mfrs. List No.	Order Code	Price Each			
		1+	5+	10+	50+
RE436-LF	117-2135●	29.25	26.33	23.93	22.10

**Prototyping Board RE060**

Eurocard 100x160mm



- EPOXY fibre-glass FR4 1.5 mm single-sided 35 µm CU
- hot air leveling (HAL-leadfree)
- 37 x 56 single-hole conductor 2.1 mm Ø
- hole spacing 2.54 x 2.54 mm
- hole dia 1.0 mm
- connector 32/ 64/ 96 - channel DIN 41612 type C

246704

Mfrs. List No.	Order Code	Price Each			
		1+	5+	10+	50+
RE060-HP	117-2182●	3.09	2.69	2.49	2.20
RE060-LF	117-2180●	4.35	3.95	3.62	3.35

**Eurocard RE521**

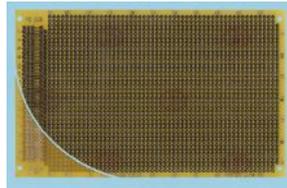


- EPOXY fibre-glass FR4 1.5 mm single-sided 35 µm CU
- hot air leveling (HAL-leadfree)
- 37 continuous strips with 57 borings
- hole spacing 2.54 x 2.54 mm
- hole dia 1.0 mm
- with additional print on component side
- connector 32-channel DIN 41612
- grid 5.08 mm type D
- size 100 x 160 mm

246645

Mfrs. List No.	Order Code	Price Each				
		1+	5+	10+	50+	
RE521-HP	SRBP FR2	117-2138●	2.60	2.46	2.35	2.24
RE521-LF	Epoxy FR4	117-2139●	4.01	3.71	3.48	3.35

**Eurocard RE320**

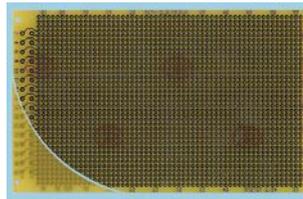


- 1.5 mm double-sided 35 µm CU (npth)
- Epoxy version: hot air leveling (HAL-lead-free)
- 37 x 53 single-hole conductor 2.2 mm Ø
- hole spacing 2.54 x 2.54 mm
- hole dia 1.0 mm
- connector 32/ 64/ 96-channel
- DIN 41612 type C
- size 100 x 160 mm

246642

Mfrs. List No.	Order Code	Price Each				
		1+	5+	10+	50+	
RE320-HP	SRBP FR2	117-2150●	3.55	3.07	2.67	2.13
RE320-LF	Epoxy FR4	117-2151●	4.54	4.17	3.83	3.62

**Eurocard Prototyping Board**



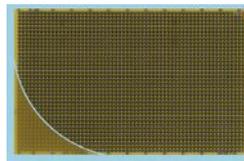
- EPOXY fibre-glass FR4 1.5 mm single-sided 35 µm CU
- hot air leveling (HAL-leadfree)
- 37 x 57 single-hole conductor 2.1 mm Ø
- hole spacing 2.54 x 2.54 mm
- hole dia 1.0 mm
- connector 32-channel DIN 41612
- grid 5.08 mm type D
- size 100 x 160 mm

204644

Mfrs. List No.	Order Code	Price Each				
		1+	5+	10+	50+	
RE525-HP	117-2136●	2.65	2.49	2.37	2.25	2.00
RE525-LF	117-2137●	4.32	3.98	3.79	3.21	2.96

**Eurocard RE200**

Size 100 x 160mm



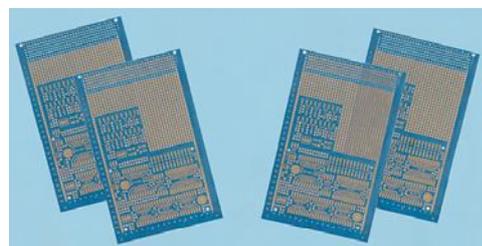
- 1.5 mm single-sided 35 µm CU
- Epoxy version: hot air leveling (HAL-leadfree)
- 38 x 61 single-hole conductor 2.2 mm Ø
- hole spacing 2.54 x 2.54 mm
- hole dia 1.0 mm

246634

Mfrs. List No.	Order Code	Price Each				
		1+	5+	10+	50+	
RE200-HP	SRBP FR2 single sided	117-2146●	2.72	2.63	2.50	2.19
RE200-LF	Epoxy FR4 single sided	117-2148●	4.32	4.15	3.97	3.33
RE200-LFDS	Epoxy FR4 double sided	117-2149●	8.43	7.73	7.10	5.73
RE200-C3	CEM3 single sided	122-1144●	3.70	3.16	2.73	2.38

**Eurocard Prototyping Board**

Surface Mount Technology (SMT-C) Eurocards



Prototyping Boards - continued

Eurocard Prototyping Board - continued

Surface Mount Technology (SMT-C) Eurocards - continued

Provision is made on all boards for the following Surface Mount Device footprints which are in addition to the Oktapad Stripboard connections:

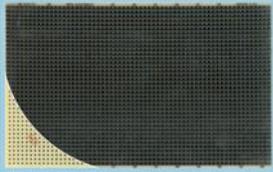
1 x SO-8	1 x SO-28	1 x TAJC	1 x TAJD
3 x SO-16	16 x 0805	2 x OCTAPOINT	2 x STARTPOINT
1 x SO-20W	8 x SOT23	1 x SOT23-5	

Specifications		Order Code	Mfrs. List No.
Material	Blue Epoxy Glass	849-8733	RRB-013
Board thickness	160mm	849-8750	RRB-015
Hole Matrix	2.54 x 2.54mm	849-8741	RRB-014
Hole size	1.02mm	849-8768	RRB-016
Copper thickness			

381524

SMT Format Sides A & B	Width x Depth	Order Code	1+	5+	10+	50+	+
<b>Single Sided</b>							
Oktapad / -	x 160mm	<b>849-8733</b>	12.62	11.59	10.62	9.71	--
Stripboard / -	x 160mm	<b>849-8750</b>	12.62	11.59	10.62	9.71	--
<b>Double Sided</b>							
Oktapad/Oktapad	x 160mm	<b>849-8741</b>	16.26	14.95	13.69	12.49	--
Stripboard/Stripboard	x 160mm	<b>849-8768</b>	16.26	14.95	13.69	12.49	--

Prototyping Board RE510 Serie

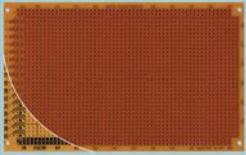


- CEM3 1,5 mm, single-sided 35 µm CU
- HAL-leadfree
- hole spacing 2,54 x 2,54 mm
- hole dia 1,0 mm

449588

Mfrs. List No.	Order Code	1+	5+	10+
RE510-S1 100 x 160mm	<b>122-1153</b>	5.48	4.70	4.12
RE510-S2 100 x 220mm	<b>122-1154</b>	5.36	4.76	4.27
RE510-S3 100 x 580mm	<b>122-1155</b>	10.88	9.91	9.07

Prototyping Board RE323 Size 100 x 160 mm

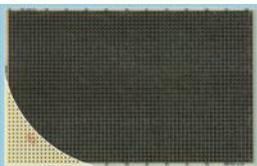


- 32 x 55 single-hole conductor 2.2 mm Ø
- hole spacing 2.54 x 2.54 mm
- hole dia 1.0 mm
- connector 32-channel /D DIN 41612
- connector 48-channel /E DIN 41612
- connector 48-channel /F DIN 41612

449586

Mfrs. List No.	Order Code	1+	5+	10+
RE323-HP SRBP FR2	<b>122-1147</b>	4.18	3.57	3.14
RE323-LF Epoxy FR4	<b>122-1148</b>	5.11	4.55	4.09

Prototyping Board CEM3 Size 100 x 160mm



- CEM3 1,5 mm single-sided 35 µm CU
- HAL-leadfree
- hole spacing 2,54 x 2,54 mm
- hole dia 1,0 mm

449583

Mfrs. List No.	Order Code	1+	5+	10+
RE210-S1	<b>122-1149</b>	3.91	3.34	2.92
RE210-S2	<b>122-1150</b>	5.26	4.67	4.20
RE210-S3	<b>122-1151</b>	12.33	11.22	10.29

Stripboard and Pad Prototyping Boards



Type	Material	Width (mm)	Length (mm)	Mfrs. List No.	Order Code
Strips	Epoxy Fibreglass	160	100	AGB10	120-1470
Strips	Epoxy Fibreglass	200	160	AGB20	120-1471
Strips	Epoxy Fibreglass	300	160	AGB30	120-1472
Strips	SRBP	160	100	AJB16	120-1473
Strips	SRBP	220	100	AJB22	120-1474
Strips	SRBP	580	100	AJB58	120-1476
Pads	SRBP	160	100	AJP16	120-1477
Pads	SRBP	100	200	AJP20	164-3102
Pads	SRBP	220	100	AJP22	120-1478
Pads	SRBP	580	100	AJP58	120-1479

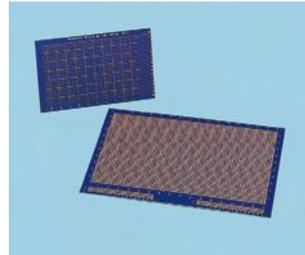
381502

- Single Sided Glass Fibre and SRBP prototype Boards
- Pre Drilled 1 mm Ø Holes
- 2.54mm Pitch

241014

Size (mm)	Mfrs. List No.	Order Code	1+	5+	10+	50+	100+
160 x 100	AGB10	<b>120-1470</b>	8.80	8.02	7.24	6.52	6.02
200 x 160	AGB20	<b>120-1471</b>	17.16	15.62	13.78	12.30	11.28
300 x 160	AGB30	<b>120-1472</b>	24.29	21.88	19.70	17.73	15.60
160 x 100	AJB16	<b>120-1473</b>	4.73	4.46	4.27	4.10	3.78
220 x 100	AJB22	<b>120-1474</b>	6.47	6.08	5.81	5.58	5.34
100 x 200	AJP20	<b>164-3102</b> <b>NEW</b>	5.82	5.42	--	--	--
580 x 100	AJB58	<b>120-1476</b>	15.87	14.93	14.30	13.62	12.50
160 x 100	AJP16	<b>120-1477</b>	4.92	4.39	3.98	3.58	3.22
220 x 100	AJP22	<b>120-1478</b>	7.61	6.76	6.14	5.54	4.97
580 x 100	AJP58	<b>120-1479</b>	15.33	13.62	12.37	11.14	10.00

Eurocard Prototyping Board OKTAPAD™ single and double height



- Single sided, single and double height
- Octagonal pads for design flexibility
- Can be used with Roadrunner, wire wrapping or discrete component wiring

Specifications	
Material	Epoxy Glass
Board Thickness	
Connector pattern to	<b>DIN41612</b>
Hole matrix	2.54 x 2.54
Hole size	1

204638

Order Code	1+	5+	10+	20+
Single height 160 x 100	<b>967-397</b>	12.63	11.28	10.73
Single height 220 x 100	<b>967-403</b>	18.52	16.02	14.50
Double height 160 x 233.4	<b>967-415</b>	30.44	26.59	24.10
Double height 220 x 233.4	<b>967-427</b>	37.03	33.76	30.38

Eurocard Prototyping Board OKTAPAD™ single and double height with ground plane



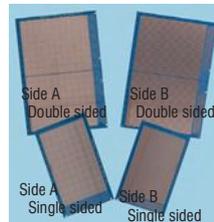
- Single sided, single and double height
- Octagonal pads for design flexibility
- Colander ground plane for maximum screening
- Can be used with Roadrunner, wire wrapping or discrete component wiring

Specifications:	
Material	Epoxy Glass
Board Thickness	
Connector pattern to	<b>DIN41612</b>
Hole matrix	2.54 x 2.54
Hole size	1

204637

Order Code	1+	5+	10+	20+
Single height 160 x 100	<b>967-439</b>	16.27	15.33	13.81
Single height 220 x 100	<b>967-440</b>	17.42	16.59	14.92
Double height 160 x 233.4	<b>967-452</b>	36.19	33.20	29.87
Double height 220 x 233.4	<b>967-464</b>	45.45	41.32	37.19

Eurocard Prototyping Board Oktapad™ Strip Eurocards



- Unique Oktapad™ strip format - Side B
- Octagonal style pads for design flexibility
- Can be used with wire wrapping or discrete component wiring
- DIN 41494 Compatible
- DIN 41612 connector pattern
- Silkscreen reference component side

Specifications		Order Code	Mfrs. List No.
Material	Blue Epoxy Glass	849-8695	RRB-003
Board thickness	160mm	849-8709	RRB-006
Hole Matrix	2.54 x 2.54mm	849-8717	RRB-009
Hole size	1.02mm	849-8725	RRB-012
Copper thickness			

381502

Height	Size Width x Depth	Order Code	1+	5+	10+	50+	+
<b>Single Sided</b>							
Single	x 160mm	<b>849-8695</b>	12.62	11.59	10.62	9.71	--
Single	x 233mm	<b>849-8709</b>	27.39	25.13	23.05	21.01	--
<b>Double Sided</b>							
Double	x 160mm	<b>849-8717</b>	16.26	14.95	13.69	12.49	--
Double	x 233mm	<b>849-8725</b>	34.84	31.98	29.32	26.73	--

FR4



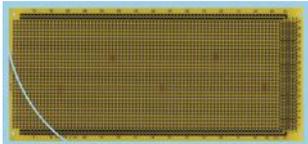
- Single and double sided
- Epoxy glass grade FR4
- Positive working photo-resist coating
- Protected by peel-off black crepe

Board thickness 1.6  
 Copper content 0.0356 (1oz/ft<sup>2</sup>)  
 Copper thickness 305 g/m sq (0.0014")  
 Conforms to **BS4584 Part 3** requirements 204653

Single Sided	Order Code	Price Each			
		1+	10+	25+	50+
100 x 160	141-300●	5.30	4.44	3.56	3.15
100 x 220	149-062●	6.38	5.80	5.30	4.90
233.4 x 160	141-302●	8.06	7.05	6.64	6.29
440 x 305	699-421●	21.93	19.49	19.09	18.16
Double sided					
100 x 160	141-301●	4.46	3.85	3.68	3.42
100 x 220	149-063●	7.55	6.89	6.31	5.80
233.4 x 160	141-303●	9.95	9.03	8.26	7.64
440 x 305	699-433●	24.72	21.96	21.52	20.41
Developer (1 litre bottle)					
	141-310	6.27	6.14	5.77	--

Prototyping Board RE 331/RE 332

Eurocard 100 x 220mm



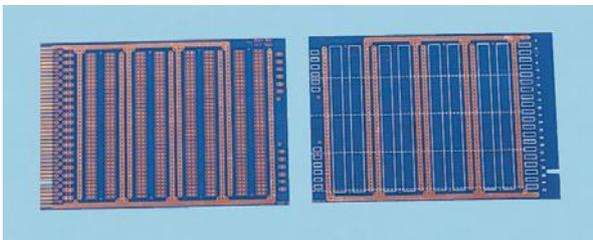
- 1.5 mm single-sided 35µm (Cu)
- Hot air leveling (HAL-leadfree)
- Connector 32/ 64/ 96-channel
- RE331 are double sided and through plated
- For Multibus II systems

Hole matrix: 32 x 81 single-hole conductors Hole diameter: 1mm  
 Hole spacing: 2.54 x 2.54mm Operating temperature: max. 150°C  
 Material: Epoxy glass fibre Solder bath temperature: 260°C > 50s  
 Pad area: 1.9mm 238535

Mftrs. List No.	Order Code	1+	5+	10+	50+	100+
RE331-LF	117-2160●	10.89	9.80	8.91	7.61	7.29
RE332-LF	117-2161●	15.06	13.57	12.32	10.72	10.07

Doubled-Sided

Plug-in



Component side L=165.1, W=114.3

Wiring side

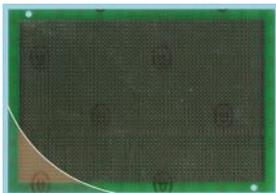
Up to 20 ICs can be mounted per card.

42 gold plated contacts. Matrix hole diameter 1mm, Connector fingers and DIP pads 1.9mm wide 204673

Order Code	1+	10+	20+	30+
147-904	17.75	15.77	13.78	11.97

HF Prototyping Board

Serie RE230, RE231, RE232, RE233



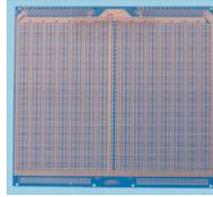
- EPOXY fibre-glass FR4 1.60 mm single-sided 35 µm CU
- hot air leveling (HAL-leadfree) with soldering stop mask
- hole spacing 2.54 mm x 2.54 mm (1/20")
- hole dia 1.02 mm (0.40")
- max working temperature 150° C (302° F)
- size 114.30 mm x 165.10 mm (4.5" x 6.5")

449585

Mftrs. List No.	Order Code	1+	5+	10+
RE230-LF	122-1156●	15.09	13.72	12.58
RE231-LF	122-1157●	24.79	22.54	20.67
RE232-LF	122-1158●	14.64	13.30	12.20
RE233-LF	122-1159●	19.90	18.09	16.58

Eurocard Prototyping Board

High Density, double sided



- Double sided, 3 plane
- Double height eurocard
- Copper pattern or ground plane marked "GND" on component side
- Wiring side pattern with two power rails marked "VCC" and "GND"
- Screen may be connected to the "GND" rail by pinning
- Can be used with wire wrapping or discrete component wiring
- DIN 41612 connector mounting holes at one end
- Grid reference

Specifications  
 Material Blue Epoxy Glass Hole Matrix 2.54 x 2.54mm  
 Board thickness 220mm Hole size 1.02mm  
 Copper thickness 382013

Size	Mftrs. List No.	Order Code	1+	5+	10+	50+	+
x 233.4mm	RRB-120	849-8792●	45.10	41.41	37.96	34.60	--

Single-Sided Stripboard



- Single Sided Bakelite
- Tin Plated Copper strips
- Track free border - Top & Bottom

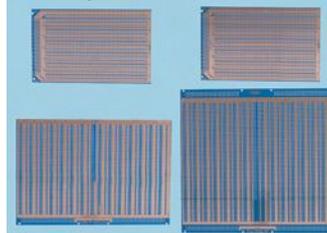
Matrix Pitch 0.1" L (mm) 117 W (mm) 368 T (mm) Strips (mm) 41 x 1.9 Rows (mm) 144 Order Code 942-3230 334592

Pitch	Order Code	1+	20+	50+
0.1"	942-3230●	8.98	7.54	6.19

Eurocard, Single and Double Size (High Density)



Single eurocard 233.4 160mm



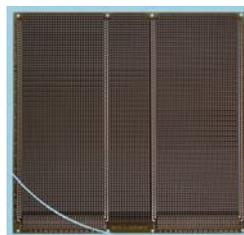
- Single and double size eurocard
- For use with Roadrunner, wire wrapping and hand wiring
- DIN41612 connector mounting holes at one end
- 1.0mm Dia. holes on 2.54mm matrix

Double eurocard 233.4 x 160mm 221763

	Order Code	1+	5+
Single Eurocard	145-230●	16.14	11.95
Double Eurocard	145-231●	31.98	28.89
Low cost SRPB Single eurocard	967-385●	11.67	11.10

Prototyping Board RE 333

Double Eurocard 233.4 x 220mm



- 1.5 mm double-sided 35 µm CU
- Hot air leveling (HAL-leadfree)
- Through plated
- Connector 32/ 64/ 96-channel

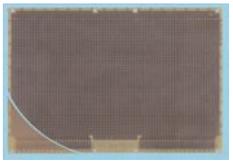
Hole matrix: 79 x 80 single-hole conductors Hole diameter: 1mm  
 Hole spacing: 2.54 x 2.54mm Operating temperature: max. 150°C  
 Material: Epoxy glass fibre Solder bath temperature: 260°C > 50s  
 Pad area: 1.9 mm 238530

Mftrs. List No.	Order Code	1+	5+	10+	50+	100+
RE333-LF	117-2162●	42.78	40.83	38.45	33.89	32.37

Prototyping Boards - continued

Prototyping Board RE 840

Double Eurocard 160 x 233mm



- Hole matrix: 53 x 89 single-hole conductors  
 Hole spacing: 2.54 x 2.54mm  
 Material: Epoxy glass fibre  
 Pad area: 2.2mm  
 Hole diameter: 1mm
- 1.5 mm single-sided 35 µm CU
  - Hot air leveling (HAL-leadfree)
  - Connector 32/ 64/ 96-channel
  - DIN 41612 type C



238532

Mfrs. List No.	Order Code	1+	5+	10+	50+	100+
RE 840 - Epoxy	117-2156●	17.05	15.35	13.96	11.90	11.78

Single-Sided Stripboard

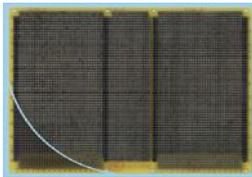


Matrix Pitch	L	W	Strips mm	Rows	Order Code
0.1"	114.3	365.8	41 x 1.9	144	147-899
0.2"	121.9	457.2	21 x 1.9	90	147-897

204670

Pitch	Order Code	1+	20+	50+
0.1"	147-899●	6.83	5.78	5.50
0.2"	147-897●	18.90	16.48	14.60

Experimental Board RE322



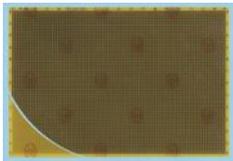
- Experimental board with rings
  - Double Euro size 160 x 233mm
  - Double side plating 35µm copper
  - Through hole
  - Connector channel for 32 way **DIN41612 type C**
- | Layout   | 55 x 88 solder pads | Thickness | 1.5mm |
|----------|---------------------|-----------|-------|
| Pitch    | 2.54mm x 2.54mm     | Hole ∅    | 1.0mm |
| Material | Epoxy fibre glass   | Ring ∅    | 2.0mm |



232054

Mfrs. List No.	Order Code	1+	5+	10+	50+
RE322-LF	117-2109●	24.31	21.88	19.88	16.83

Experimental Board RE240



- Experimental board
  - Double Euro size 160 x 233mm
  - Single side plating 35µm copper free rings pre-tinned
  - Through hole
  - Two connector channels for 31 way **DIN41612**
- | Layout   | 61 x 87 holes     | Thickness       | 1.5mm |
|----------|-------------------|-----------------|-------|
| Pitch    | 2.54mm x 2.54mm   | Hole ∅          | 1.0mm |
| Material | Epoxy fibre glass | Width of tracks | 2.0mm |



232058

Mfrs. List No.	Order Code	1+	5+	10+	50+
RE240-LF	117-2106●	17.16	15.46	14.04	13.34

Epoxy Glass Test Board with Galvanised Copper Pads 16/10th

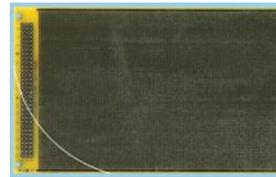


- Single-sided test board with tinned copper pads
- 2.54mm hole matrix
- 2mm square pads
- 0.54mm breaks over the whole surface

446120

Mfrs. List No.	Order Code	1+	5+	10+
AGP10	126-7761●	7.00	6.66	6.32
AGP20	126-7762●	13.44	12.78	12.15
AGP30	126-7763●	18.77	17.83	16.93

Prototyping Board



- EPOXY fibre-glass FR4 1.50 mm, double-sided 35 µm CU
- plated-through-holes
- HAL-leadfree
- hole spacing 1.27 x 1.27 mm (1/40")
- 113 x 76 single-hole conductor 1.0 mm<sup>2</sup> (8588 pads)



- size 100 x 160 mm
- connector 32/ 64/ 96-channel
- DIN 41612 type C

449587

Mfrs. List No.	Order Code	1+	5+	10+
RE438-LF	122-1146●	17.54	15.96	14.62

Double-sided Epoxy Breadboard for SMT



- Epoxy thickness: 0.7mm
- 39 x 59 SMT pads (1mm<sup>2</sup>) with 0.35mm holes and 1.27mm spacing
- 6 rows with 2.54mm spacing at one end
- Fully metal-plated holes



446121

Mfrs. List No.	Order Code	1+	5+	10+
AL435	126-7764●	12.17	11.57	10.99

Double Sided Study Board for Epoxy CMS



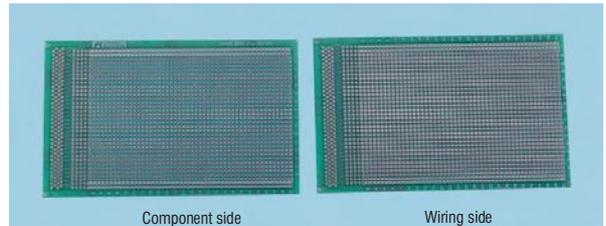
- Epoxy thickness: 1.5mm
- 40 x 60 SMT pads (1mm<sup>2</sup>) with 0.35mm holes and 1.27mm spacing on each side
- Pad spacing 2.54 x 32 pads (2mm<sup>2</sup>) with 1mm holes
- DIN 41612C connector
- Fully metal-plated holes



446122

Mfrs. List No.	Order Code	1+	5+	10+
AL436	126-7765●	15.30	14.55	13.80

Eurocard Prototyping Board Square Pad, Plated Through Hole

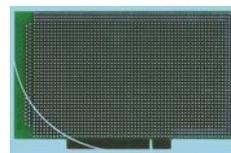


- For use with Yamaichi 90° PCB headers
- Standard 0.1 matrix pitch square pad format
- Accommodates DIL and SIL packages
- Colander ground plane for screening

204684

Mfrs. List No.	Order Code	1+	5+	10+
214-301709L	151-012	45.84	42.51	39.75

Experimental Board RE430



- Experimental board for PCI-Bus
- Size 167 x 106mm
- Double side plating 35µm copper solder pads pre-tinned
- Through hole
- Connector channel for SubD connectors

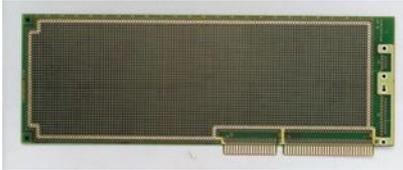


Layout	39 x 59 solder pads	Pad ∅	2.0mm
Pitch	2.54mm x 2.54mm		
Material	Epoxy fibre glass		
Thickness	1.5mm		
Hole ∅	1.0mm		

232056

Mfrs. List No.	Order Code	Price Each				
RE430-LF	117-2183●	19.22	18.07	17.30	16.53	15.51

**AT Prototyping Board RE 429**  
Size 114 x 333mm



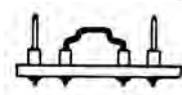
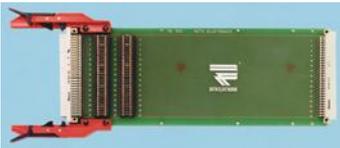
- microprocessor card for the establishment of PC extensions
- system card for the quick building-up of interfaces, data acquisition, memory expansion, graphic complements, etc.
- the micro-card can be provided with a 25 and 9 channel D-subminiature appliance plug for additional I/O transfer
- VACREL solderings stop mask at component and solder side
- potential path for VCC and GND
- all borings are plated through holes
- clear soldering dot screen field
- basic material: EPOXY fibre-glass reinforced laminated FR4, 1.5 mm double-sided 35 μm CU (pth)
- plug contacts:
  - direct 2 x 31 channel, screen 2.54 mm, gold-plated 1.5 μm
  - direct 2 x 18 channel, screen 2.54 mm, gold-plated 1.5 μm
- basic grid 2.54 x 2.54 mm
- working temperature max. 150° C.
- soldering bath proof: 260° C. ≥ 50 Sek.

238534

Mfrs. List No.	Order Code	1+	5+	Price Each		
RE429-LF	117-2179●	34.21	32.16	30.79	29.42	28.17

**Extender Cards**

19"-systems DIN 41612 C96 a+b+c & C64 a+c



- RE 920/C64/1 a+c
- RE 960/C96/1 a+b+c
- RE 920/D32/1 a+c

**Signal measurement area 1**

Removable jumpers and two measuring posts for each track signaling line 2 - 31, large signalling line 1 + 32, switching voltage 10mV - 60V, switching current 0.5A at 24V, rest current at 20°C, max 2 A contact resistance 20 mOhm 100% electronically tested

- RE 920/D32/2 a+c
- RE 960/C96/2 a+b+c

**Signal measurement area 2**

Microswitches soldered with two measuring posts for each track. Switching voltage 10mV - 60V, switching current 0.3 A at 24V.

Rest current at 20°C, max 6A  
Contact resistance 30mOhm  
100% electronically tested  
Material: Epoxy glass fibre FR 4 1.6mm stark, through plated, double sided  
Solder stop mask  
Additional print at component side

238556

Mfrs. List No.	Order Code	1+	5+	Price Each	
RE920C64/1LF	117-2164●	67.83	65.12	60.37	
RE960C96/1LF	117-2166●	80.10	75.29	70.77	
RE960C96/2LF	117-2167●	149.19	141.34	129.18	

**Board Connector RE 9175**

For Cards 920 and 960



Insert depth 175 mm, suitable for eurocards 160 mm; using an intermediate adapter the extender cards in eurosized can be combined with each other

to form in double-eurosize 160 x 233.40 mm  
Material: Steel sheet, aluminium coloured with protective lacquer  
Supplied with fixing screws.

238561

Mfrs. List No.	Order Code	1+	5+	Price Each	
RE9175	117-2168●	22.25	21.39	20.43	



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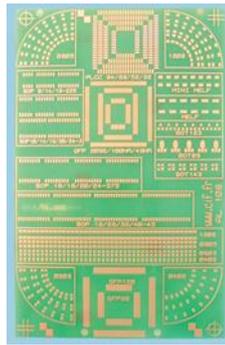
**RoHS** ● Compliant  
▲ Non-compliant

**08447 11 11 11**

Fax: 08447 11 11 12 1017

**SMD test card**

AL108



AL 108 is a test card, Europe size, for SMD components. With AL 108, you can test soldering and desoldering of SMDs. This card includes different aims to work also with automatic pick & place stations. Finish gets an excellent quality: gold plating and protective solder resist

**Key features:**

- Conceived for SMD
- Many available types
- Solder resist and gold plating
- Different usages

**Available types:**

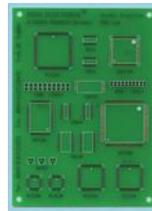
- PLCC 32 / 52 / 68 / 84
- QFP 208S / 100NR / 48NR / 120 / 60
- SOP 8 to 40-45
- MELF and MINI MELF
- CHIP 0402 à 1206
- SOT 143 / 123 / 89

403603

Mfrs. List No.	Order Code	1+	Price Each	
AL108	112-0341	17.34	+	+

**PCB for Soldering Practice**

100 x 140mm



**RE 710 001**

- PCB for solder practices for SMD standard and fine pitch components

- Suitable for pick-and-place

PLCC:	2x20, 2x44, 68	SOM16:	2x
QFP:	100 rect, 132 sq, 208 sq	SOL20:	2x
TSOP32:	1x	0805:	10x
SOT23:	3x	1206:	10x
S014:	2x		

**RE 711 001**

- PCB for solder practices for SMD components

- Suitable for pick-and-place

PLCC:	20, 68	Tantalum-Chip A:	1x	SOT89:	2x	1210:	6x
QFP:	84 rect	Tantalum-Chip B:	1x	SOT233:	1x	1812:	2x
TSOP:	1x	Tantalum-Chip C:	1x	SOM16:	1x	2220:	1x
SOT23:	3x	Tantalum-Chip D:	1x	SOL20:	1x	2308 MELF:	2x
S014:	1x	1206:	10x	DPAK:	1x	1206 MELF:	6x
SOT143:	1x	0805:	10x	Pot:	1x		

**RE 712 001**

- PCB for solder practices for SMD standard, fine pitch, and discrete components

- Suitable for pick-and-place

PLCC:	52,68,20
QFP:	44sq, 84sq, 132sq, 184sq

TSOP32:	1x
SOT23:	3x
SOT89:	2x
SOT143:	1x
SOT233:	1x
S014:	1x
SOM16:	1x
SOL20:	1x
DPAK:	1x
Pot:	1x
Capacitor 6.3mm:	1x
Capacitor 4.0mm:	1x

- All boards are EPOXY resin FR4 1.50 mm single-sided 35 μm CU
- Solder side hotair leveling coated (HAL-leadfree), solder stop mask and additional print

238547

Mfrs. List No.	Order Code	1+	5+	10+	50+
RE710001-LF	117-2185●	12.64	11.23	10.11	9.20
RE711001-LF	117-2186●	9.67	8.59	7.74	7.04
RE712001-LF	117-2187●	12.99	11.54	10.39	9.45

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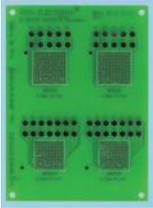
[www.electronicsdesignworld.com](http://www.electronicsdesignworld.com)



Prototyping Boards - continued

PCB for Soldering Practice

100 x 140mm



- PCB for Pick and Place Soldering Practice for BGA 169 and 225
- PCB for solder practices pick-and-place for BGA 169 and 225 grid 1.50 mm including daisychain test points
- introduction into trend-setting technology
- EPOXY resin FR4 1.50 mm single-sided 35 μm CU
- solder side hot air leveling coated (HAL-leadfree), solder stop mask and additional print
- BGA 169 : 2 x
- BGA 225 : 2 x



483428

Mfrs. List No.	Order Code	1+	5+	10+	50+
RE713001-LF	117-2192●	14.40	12.96	11.68	10.51

Special PCBs

Teflon (Duroïd) base PCB

16/10th - 35μ



- High frequency presensitised. 2 sides.
- Dielectric constant 2,4 - 2,6 (± 0,04).
- Positive resin blue coloured, without marbling
- Micro definition
- Resin thickness: 2,5μ.
- Adhesive anti UV protection.
- Gaarantee 5 years.
- Individual plastic packaging.

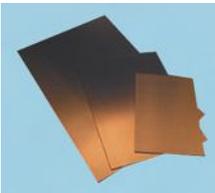


Format	2 sides	Format	2 sides
100 x 160	ABT16	200 x 300	ABT23

403167

Mfrs. List No.	Order Code	1+	+	+
ABT16	112-0336	43.80	--	--
ABT23	112-0337	135.26	--	--

Rough Coppered Plates 16/10e - 35μ



- High quality laminated
- 8 layers of fibreglass
- MIL 13949F Standard



446119

Mfrs. List No.	Order Code	1+	5+	10+
AD16	126-7751●	2.20	2.09	2.00
AD20	126-7752●	6.48	6.15	5.85
AE20	126-7754●	6.49	6.17	5.86
AE60	126-7755●	29.82	28.33	26.90

Non-coated



- Single and double sided copper clad epoxy glass FR4
- Suitable for direct transfer of artwork
- Note the board may need cleaning prior to use with eraser/cleaner (141-330)
- Exposed copper cladding is removed using feric chloride solution (Order Code 141-311 or 149-080)

Board thickness 1.6mm  
Copper content 305 g/m sq (1oz/ft<sup>2</sup>)  
Copper thickness (0.0014")305 g/m sq

Manufactured in accordance with BS4584 Part 3

204683

	Order Code	1+	10+	25+	50+
160 x 100	149-054●	2.75	2.50	2.30	2.11
220 x 100	149-055●	3.67	3.34	3.06	2.83
233.4 x 160	149-056●	6.33	5.70	5.18	4.94
457 x 305	149-057●	11.93	10.86	9.95	9.17
<b>Double sided</b>					
160 x 100	149-058●	3.32	3.01	2.75	2.54
220 x 100	149-059●	4.42	4.01	3.67	3.40
233.4 x 160	149-060●	8.15	7.44	6.82	6.30
457 x 305	149-061●	15.10	13.72	12.58	11.62

Positive Presensitised Board 8/10e - 35μ



- Blue positive resin without mottling
- 1 or 2-sided epoxy depending on model
- Resin thickness: 2.5μ
- Adhesive anti-UV protection
- Individually plastic-wrapped
- Guaranteed 5 years

446118

Mfrs. List No.	Order Code	1+	5+	10+
AAB16	126-7744●	3.72	3.53	3.36
AAB20	126-7745●	11.41	10.73	10.27
AAB60	126-7746●	32.74	30.77	29.47
ABB16	126-7748●	4.91	4.65	4.43
ABB20	126-7749●	15.52	14.44	13.83
ABB60	126-7750●	39.29	37.33	35.45

Low Cost CEM1



- Single sided copper clad
- Epoxy glass/paper grade CEM1
- Positive working photo-resist coating
- Easier to cut and drill than FR4
- Particularly suitable for education

Board thickness 1.6mm  
Copper foil 1oz/ft<sup>2</sup> (35 microns)

204698

Size x mm	Order Code	1+	10+	25+
440 x 305	710-143●	19.82	18.30	17.34
592 x 457	710-155●	38.42	34.59	31.55

Positive Presensitized Board 16/10th - 35μ



- Blue positive resin without mottling
- 1 or 2-sided epoxy depending on model
- Resin thickness: 2.5μ
- Adhesive anti-UV protection
- Individually plastic-wrapped
- Guaranteed 5 years

446117

	Mfrs. List No.	Order Code	1+	5+	10+
<b>Simple side</b>					
100x160mm	AA16	126-7738●	3.55	3.38	3.18
200x150mm	AA15	NEW 164-3086●	4.69	4.37	--
200x300mm	AA20	126-7739●	10.55	10.00	9.50
300x600mm	AA60	126-7740●	28.95	27.29	26.12
<b>Double sides</b>					
100x160mm	AB16	126-7741●	4.38	4.12	3.94
200x150mm	AB15	NEW 164-3089●	5.67	5.27	--
200x300mm	AB20	126-7742●	11.43	10.86	10.30
300x600mm	AB60	126-7743●	34.49	32.75	31.39

Presensitized PCB 8/10e - 35μ



Teflon glass (Duroïd)



- High frequency presensitised. 2 sides.
- Dielectric constant: 2.4 - 2.6 (± 0.04)

Format 200 x 300 mm  
Mfrs. List No. ABT18

469994

Mfrs. List No.	Order Code	1+	5+	10+
ABT18	133-2730●	90.48	86.24	82.24

Positive Presensitized Boards



16/10th - 70μ



- Blue positive resin without mottling
- 1 or 2-sided epoxy depending on model
- Resin thickness: 2.5μ
- Adhesive anti-UV protection
- Individually plastic wrapped
- Guaranteed 5 years

Format	1-sided	2-sided
100 x 160	AA716	AB716
200 x 300	AA720	AB720
300 x 600	AA760	AB760

403167

Mfrs. List No.	Order Code	1+	+	Price Each
<b>Single-sided</b>				
AA716	112-0328	5.09	--	--
AA720	112-0330	14.36	--	--
AA760	112-0331	42.50	--	--
<b>Double-sided</b>				
AB716	112-0332	7.20	--	--
AB720	112-0333	18.49	--	--
AB760	112-0334	54.64	--	--

**Photo-Resist Coated Boards**



- Single and double sided photo resist coated epoxy glass FR4
- Flexible Laminate
- High resolution positive working photoresist
- Photoresist contains a dye to aid inspection during developing
- Recommended cutting method shears

A range of high quality photo resist coated copper clad PCB boards. These boards have a coat-

ing resistant to edge cracking when cut. This eliminates wastage as artworks can make full use of the PCB laminate area.

The flexible laminate is made from a polyester base with a 35µ copper coating and a photosensitive layer on one side. This material is ideal for product prototyping with flexible laminate or for repairs where an existing section of material has to be replaced.

(The flexible laminate is supplied in a sealed black plastic bag and is **not** covered with protective film)

Board thickness	Flexible film thickness	.050
Copper content 305 g/m sq	Flexible Film Copper thickness	0.035
Copper thickness 0.035	Etchant	Ferric Chloride or Fine Etch crystals

204656

	Order Code	1+	10+	25+	50+	Price Each
<b>Single Sided</b>						
100 x 160	320-4911	3.88	3.67	3.58	3.38	
100 x 220	320-4923	5.69	5.28	5.18	4.45	
160 x 233.4	320-4935	8.36	8.15	7.44	6.65	
305 x 457	320-4947	26.09	24.51	23.26	20.86	
<b>Double sided</b>						
100 x 160	320-4959	5.18	4.65	4.13	3.81	
100 x 220	320-4960	6.22	5.81	5.63	5.01	
160 x 233.4	320-4972	9.36	8.83	8.21	7.27	
305 x 457	320-4984	26.09	25.56	24.00	22.95	
<b>Single Sided Flexible Film</b>						
305 x 500	413-7978	30.90	27.20	24.97	21.61	

**Photo-Resist Coated Boards**



- Low cost single sided copper clad
- Positive working photoresist
- Epoxy glass paper grade CEM1
- Easy to cut and drill
- Particularly suitable for education and prototypes

Board thickness	1.6	Copper thickness	0.035
Copper Content	305 g/m sq	Etchant	Ferric Chloride or Fine Etch crystals

Note: Not suitable for industrial applications

204656

	Order Code	1+	10+	25+	50+	Price Each
Single Sided						
305 x 457	320-5009●	24.94	23.38	21.11	20.90	

**Circuit on photosensitive aluminium**

Heat dissipation > 1°C/watt/mm



- Grip on copper > 22 N/cm
- Continuous operating temperature: 130°C
- Dielectric strength (for 100µ): 51 kV/mm
- Dielectric constant: 3 to 1 MHz
- Power dissipation: 0.35 watt/dm<sup>2</sup>/°C

Format	Mfrs. List No.
200 x 300MM	AAT20

469999

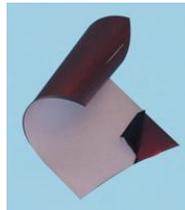
Mfrs. List No.	Order Code	1+	5+	10+	Price Each
AAT20	133-2729●	27.00	26.56	26.00	

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**Flexible PCB**



- Flexible PCB
- Isolating 50µ coppered 35 µ

Size	No. of side	Presensitised	Mfrs List No.	Order Code
600x100	1	No	AN10	126-7756
500x100	2	No	AN210	126-7757

481190

Mfrs. List No.	Order Code	1+	5+	10+	Price Each
AN10	126-7756●	27.30	25.93	24.62	
AN210	126-7757●	46.15	43.82	41.63	

**Aluminium and Flexible PCB Material**



4147996



4147984

**Photosensitised Flexible PCB Material**

- Flexible PCB prototyping
- 'Flexiprint' Repair
- 50µ base material with 35µ copper

**Aluminium Substrate**

- Insulated Metallic Substrate
- Ideal for Heatsinking SMD circuits
- Thermal Impedance 1.3°C/W
- 7kV Insulation Breakdown Voltage
- 130°C Operating Temperature

New ranges of specialist PCB material.

The flexible laminate consists of a 50µ polyester base material with a 35µ layer of copper which has a photosensitive coating. This material is ideal for product prototyping with flexible laminate or for repairs whereby an existing section of material has to be replaced.

The aluminium heat dissipating PCB material consists of a layer of 35µ copper attached to a 150µ ceramic filled, fibreglass reinforced polymer which forms a heat conductive layer with high electrical insulation properties. This is in turn bonded to a 1.5mm aluminium base to offer maximum heat dissipation from the copper side. The material is offered as a solution to heatsinking problems allowing simple PCB designs, it is intended for surface mount (SMD) power devices whereby the board dissipates the heat effectively from the component but also carries the circuit tracks and associated components thus overcoming interconnection difficulties.

Size L x W (mm)	Mfrs. List No.	Order Code
100150 x	AAT10	414-7984

241012

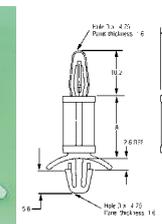
Description	Order Code	1+	5+	10+	50+	Price Each
Aluminium Substrate	414-7984	12.26	10.88	9.88	8.94	

**PCB Support**

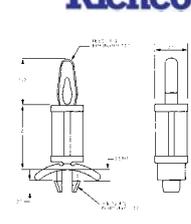
**Spacer**



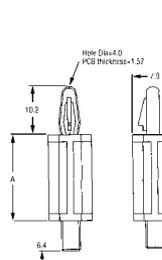
Snap to Board



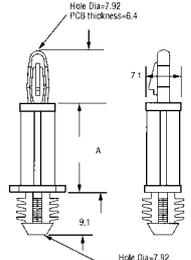
Locking



Studded



Blind Hole



- Natural colour, nylon 6.6
- Snap to Board
- Locking to chassis, snap to board
- Releasable for repairs

- Studded
- Chassis mounting M4 stud (M4 nuts should be ordered separately see 701-6955)



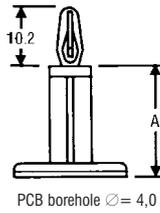


Mftrs. List No.	Length A	Order Code	1+	+	+
TEHCBS-6-01	9.5	147-167●	2.23	--	--
TEHCBS-10-01	15.9	147-168	3.01	--	--

**Spacer self-adhesive**



Spacer



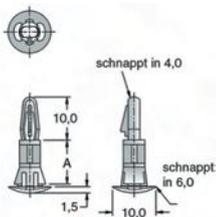
Spacer made of nylon with self-adhesive ground plate.

Dimensions in mm

242029

Mftrs. List No.	Length A	Order Code	1+	+	+
LCBSB-4-01A	6.4	147-164●	3.81	--	--
LCBSB-8-01A	12.7	147-165●	4.21	--	--
LCBSB-12-01A	19.1	147-166●	4.33	--	--

**Circuit Board Support Reverse Locking CRLCBSR / CRLCBSRE**



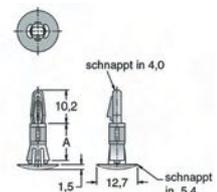
- For Through Hole Mounting from the bottom of the body
- With domed header, fixed hold on mounting plate and it clears thicknesses of materials and inaccuracy of borehole diameters
- Thickness of PCB 1.6 mm
- Borehole 3.2 und 4.0 mm
- Thickness of mounting plate 0.8 bis 2.0 mm
- Borehole 5.4 to 6.0 mm
- Material: Polyamide 6.6, RMS-01 UL94 V-2 yellow card E41938

Manufacturer description	CRLCBSR	CRLCBSRE
Thickness of PCB	1.6	1.6
Borehole of PCB	4.0	4.0
Thickness of mounting plate	0.8 - 1.2	1.2 - 2.0
Borehole of mounting plate	6.0	5.4

334950

Mftrs. List No.	Length A (mm)	Order Code	4+	24+	48+
<b>UL94 V-2 (CRLCBSR)</b>					
06.81.426	4.8	146-6966●	0.153	0.109	0.099
06.81.436	6.4	146-6967●	0.165	0.119	0.099
06.81.446	7.9	146-6968●	0.165	0.133	0.109
06.81.456	9.5	146-6969●	0.175	0.143	0.109
06.81.486	19.1	146-6970●	0.186	0.153	0.119
<b>UL94 V-2 (CRLCBSRE)</b>					
06.81.536	6.4	146-6971●	0.153	0.119	0.099
06.81.556	9.5	146-6972●	0.165	0.133	0.109
06.81.566	12.7	146-6973●	0.175	0.143	0.109

**Reverse Locking Circuit Support Mounting Hole**



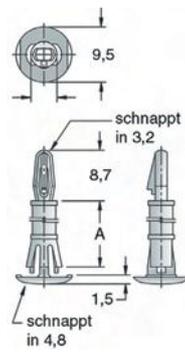
- For Through Hole Mounting from the bottom of the body
- Material: Polyamide 6.6, RMS-01 UL94 V-2 yellow card E41938

Dimensions in mm					PCB		Chassis		Manuf.Part No.
Length A	B	C	D	E	Thickness	Borehole-∅	Thickness	Hole	
7.3	10.2	2.0	5.0	6.0	1.6	4	1.0 - 1.5	5.5 ∅	06.81.907
7.9	9.5	1.5	5.8	6.3	1.6	4	1.6	6.3 <sup>3'</sup>	06.81.908
9.5	9.5	1.5	5.8	7.9	1.6	4	1.6	6.3y	06.81.909

334947

Mftrs. List No.	Order Code	4+	24+	48+
06.81.907	146-6974●	0.153	0.119	0.099
06.81.908	146-6976●	0.310	0.250	0.186
06.81.909	146-6977●	0.175	0.143	0.109

**Reverse Locking Circuit Board Support, Round Hole**



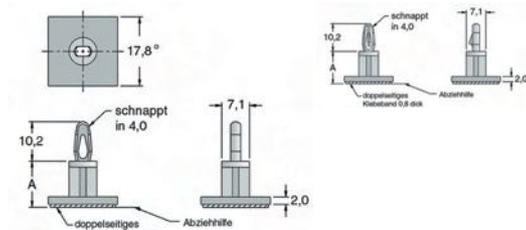
- For Through Hole Mounting
- With domed header, fixed hold on mounting plate and it clears material thicknesses
- Thickness of PCB 1.6 mm
- Borehole 3.2 and 4.0 mm
- Material: polyamide 6.6, RMS-01 UL94 V-2 yellow card E41938

Manufacturer description	RLCBSR
Thickness of PCB	1.6
Borehole of PCB	3.2
Thickness of mounting plate	1.5 - 1.6
Borehole of mounting plate	4.8

334944

Mftrs. List No.	Length A (mm)	Order Code	4+	24+	48+
06.81.116	6.4	146-6960●	0.153	0.119	0.099
06.81.126	7.9	146-6961●	0.165	0.119	0.099
06.81.136	9.5	146-6962●	0.165	0.133	0.109
06.81.146	11.1	146-6978●	0.165	0.133	0.109
06.81.156	12.7	146-6964●	0.175	0.143	0.109
06.81.176	15.9	146-6965●	0.186	0.143	0.119

**Circuit Board Support On Base With Double Adhesive Tape - LCBSB**



- Mounting socket with adhesive foil (0.8 mm thickness) made of polyurethane foam and double-sided acrylic glue (UL-listed Card File MH 16770)
- Thickness of PCB 1.6 mm
- Bore hole ∅ 4.0 mm
- Material: polyamide 6.6, 7 RMS-01 UL94 V-2 yellow card E41938

Manuf. description	LCBSB	CBSB
Thickness of PCB	1.6	1.6
Bore hole of PCB	4.0	4.0

334941

Mftrs. List No.	Length A (mm)	Order Code	4+	24+	48+
<b>with mounting socket</b>					
06.21.046	4.8	146-6936●	0.42	0.33	0.27
06.21.066	6.4	146-6937●	0.41	0.32	0.27
06.21.096	9.5	146-6939●	0.42	0.33	0.27
06.21.126	12.7	146-6941●	0.43	0.33	0.27
<b>without mounting socket</b>					
06.21.404	4.8	146-6942●	0.40	0.30	0.25
06.21.406	6.4	146-6943●	0.40	0.31	0.26
06.21.409	9.5	146-7008●	0.40	0.31	0.26
06.21.412	12.7	146-6944●	0.42	0.32	0.27

**Circuit Board Support LCBS 4,8**

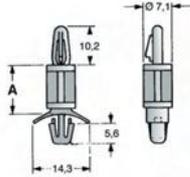


- Mounting socket with adhesive foil (0.8 mm thickness) made of polyurethane foam and double-sided acrylic glue (UL-listed Card File MH 16770)
- Thickness of PCB 1.6 mm
- Bore hole ∅ 3.2 mm
- Material: polyamide 6.6, 7 RMS-01 UL94 V-2 yellow card E41938

**PCB Support - continued**

**Circuit Board Support LCBS 4,8 - continued**

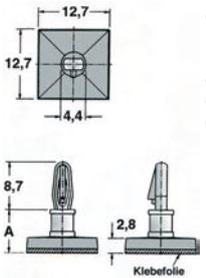
Manufacturer description	LCBS
Thickness of PCB	1.6
Borehole of PCB	4.0
Thickness of mounting plate	1.6
Borehole of mounting plate	4.8
Class of flammability	UL94V-2



334938

Mfrs. List No.	Length A (mm)	Order Code	4+	24+	48+	Price Each
06.02.046	4.8	146-6886	0.119	0.099	0.077	
06.02.066	6.4	146-6887	0.119	0.087	0.077	
06.02.096	9.5	146-6888	0.119	0.099	0.077	
06.02.126	12.7	146-6889	0.165	0.119	0.099	
06.02.156	15.9	146-6890	0.165	0.133	0.109	
06.02.196	19.1	146-6891	0.186	0.143	0.109	
06.02.256	25.4	146-6892	0.250	0.186	0.153	
06.02.346	34.9	146-6893	0.280	0.220	0.175	

**Spacer Adhesive Foil**



- Mounting socket with adhesive foil (0.8 mm thickness) made of polyurethane foam and double-sided acrylic glue (UL-listed Card File MH 16770)
- Thickness of PCB 1.6 mm
- Bore hole  $\varnothing$  3.2 mm
- Material: polyamide 6.6, 7 RMS-01 UL94 V-2 yellow card E41938

Length A in mm	Manuf. Part No. mit Rastrase	Order Code
7.9	06.21.807	146-6932
9.5	06.21.809	146-6933
12.7	06.21.812	146-6934
15.9	06.21.815	146-6935

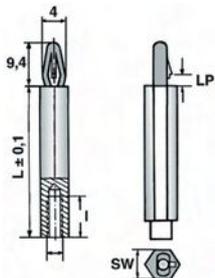
334934

Mfrs. List No.	Order Code	4+	24+	48+	Price Each
06.21.807	146-6932	0.290	0.220	0.175	
06.21.809	146-6933	0.300	0.220	0.186	
06.21.812	146-6934	0.310	0.250	0.186	
06.21.815	146-6935	0.320	0.250	0.197	

**Locking Circuit Board Support - Thread Female**



Spacer M3, M4 And Hole  $\varnothing$  3.0



- With on-sided snap-on pilot
- Stable hexagonal construction
- Thickness of PCB 1,8 to 2,1 mm
- Bore hole  $\varnothing$  4,0 mm + 0,1 mm

Material: Polyamide 6.6, black  
 Temperature constancy: -40°C to +110°C  
 Class of flammability: UL94 HB  
 Mounting: 1. Mounting with Befestigung mit thread screw (size depending on construction)  
 2. Snap-in to PCP (bore hole  $\varnothing$  4.0 mm + 0.1 mm)

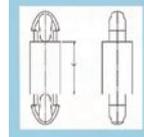
Hexagon	Wrenche size 6	Wrenche size 6	Wrenche size 8
Mounting screw	M 3	M 3	M 4
Thickness of PCB max.	1.8 mm	2.1 mm	1.8 mm
Length	Inside	Manuf. Part No.	
6	3.0	06.63.066	
8	4.0	06.53.086	06.53.086
10	5.0	06.53.106	06.53.106
12	6.0	06.53.126	06.53.126
15	7.5	06.53.156	06.53.156
17	8.5		06.84.176
18	9.0	06.53.186	

Hexagon	Wrenche size 6	Wrenche size 6	Wrenche size 8
Mounting screw	M 3	M 3	M 4
Thickness of PCB max.	1.8 mm	2.1 mm	1.8 mm
20	10.0	06.84.206	06.84.206
25	10.0		06.84.256
35	10.0		06.84.356
40	10.0		06.84.406
45	10.0	06.84.456	06.84.456
50	10.0	06.53.506	
max. Length		60 mm	60 mm

334893

Mfrs. List No.	Order Code	4+	24+	48+	Price Each
<b>Wrenche size 6 M3 (1.8 mm)</b>					
06.53.086	146-6945	0.250	0.186	0.153	
06.53.106	146-6946	0.250	0.186	0.153	
06.53.126	146-6947	0.250	0.186	0.165	
06.53.156	146-6948	0.250	0.186	0.165	
06.53.186	146-6949	0.250	0.186	0.165	
06.53.206	146-6950	0.250	0.186	0.165	
06.53.456	146-6952	0.420	0.330	0.270	
06.53.506	146-6953	0.420	0.330	0.270	
<b>Wrenche size 6 M3 (2.1 mm)</b>					
06.63.066	146-6954	0.250	0.186	0.153	
06.63.086	146-6955	0.250	0.186	0.153	
06.63.106	146-6956	0.250	0.186	0.153	
06.63.126	146-6957	0.250	0.186	0.153	
06.63.156	146-6958	0.250	0.186	0.153	
06.63.206	146-6959	0.250	0.186	0.153	
<b>Wrenche size 8 M4 (1.8 mm)</b>					
06.84.086	146-6979	0.200	0.165	0.133	
06.84.126	146-6980	0.250	0.186	0.153	
06.84.156	146-6981	0.250	0.186	0.153	
06.84.176	146-6982	0.250	0.186	0.153	
06.84.206	146-6983	0.250	0.186	0.153	
06.84.256	146-6984	0.320	0.250	0.197	
06.84.356	146-6985	0.340	0.270	0.220	
06.84.406	146-6986	0.340	0.270	0.220	
06.84.456	146-6988	0.380	0.300	0.250	
06.84.106	146-7009	0.200	0.165	0.133	

**Locking Support Posts**

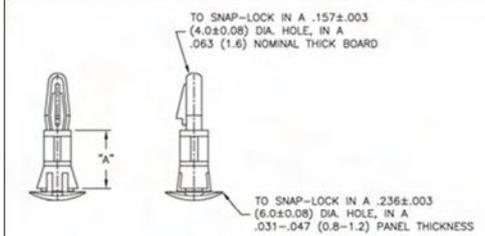
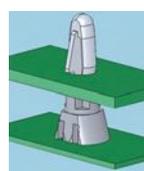


- Material: Nylon flame retardant, UL 94V-2 (RMS-01)
- Snap action

467685

Mfrs. List No.	Height Spacer (mm)	Order Code	1+	4+	20+	Price Each
MDLSP1-04M-01	4	132-5982	1.69	1.52	1.38	
MDLSP1-06M-01	6	132-5983	1.69	1.52	1.38	
MDLSP1-08M-01	8	132-5984	1.69	1.52	1.38	
MDLSP1-10M-01	10	132-5985	1.69	1.52	1.38	
MDLSP1-12M-01	12	132-5986	1.69	1.52	1.38	

**Cupped reverse locking circuit board support - CRLCBSR**



- Natural colour, material Nylon 66
- Top hole : Snap-lock :  $.157 \pm .003$  (4.00 ± 0.08)
- Panel thickness :  $.063$  (1.6)
- Bottom hole : Snap-lock :  $.236 \pm .003$  (6.00 ± 0.08)
- Panel thickness :  $0.31 - .047$  (0.8 - 1.2)
- Pack qty : 25

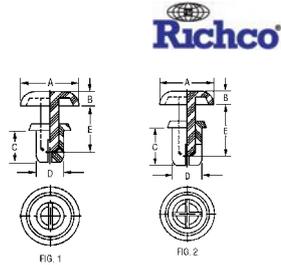
Mfrs. List No	Standoff Height "A" ± 0.15 (0.4)	Order Code
CRLCBSR-3-01	3/16 (4.8)	126-1761
CRLCBSR-4-01	1/4 (6.4)	126-1762
CRLCBSR-6-01	3/8 (9.5)	126-1763
CRLCBSR-8-01	1/2 (12.7)	126-1764
CRLCBSR-12-01	3/4 (19.1)	126-1760

446503, 445987



Mftrs. List No.	Order Code	1+	+	Price Per Pack			
CRLCBSR-3-01	126-1761●	1.79	---	+	+	+	+
CRLCBSR-4-01	126-1762●	1.95	---	---	---	---	---
CRLCBSR-6-01	126-1763●	2.06	---	---	---	---	---
CRLCBSR-8-01	126-1764●	2.17	---	---	---	---	---
CRLCBSR-12-01	126-1760●	2.33	---	---	---	---	---

**Snap Rivets, Plastic**



- No installation tool required
- To install, press head, which expands rivet base, locking it into position
- Manufactured in Nylon 6
- Available in Black or White

Ref.	Hole $\varnothing$ G	Grip Range	A	B	C	D	E	Fig.
1 & 22	2.6-2.7	1.0-2.0	5	1.4	3.2	2.6	4.5	1
2 & 23	2.6-2.7	2.0-3.0	5	1.4	4.2	2.6	4.5	1
3 & 24	2.6-2.7	2.7-3.6	5	1.4	4.8	2.6	6.1	1
4 & 25	2.6-2.7	3.4-4.3	5	1.4	5.5	2.6	6.1	1
5 & 26	3.1-3.2	1.0-2.0	6.4	1.6	3.5	3	5.1	1
6 & 27	3.1-3.2	2.0-3.0	6.4	1.6	4.5	3	6.1	1
7 & 28	3.1-3.2	3.0-4.0	6.4	1.6	5.5	3	6.1	1
8 & 29	3.1-3.2	4.0-5.0	6.4	1.6	6.5	3	7.1	1
9 & 30	3.1-3.2	5.0-6.0	6.4	1.6	7.5	3	9	1
10 & 31	3.1-3.2	5.5-6.5	6.4	1.6	8	3	9	1
11 & 32	3.6-3.7	1.2-2.1	6.4	1.6	3.5	3.5	5.1	2
12 & 33	3.6-3.7	2.1-3.0	6.4	1.6	4.5	3.5	6.1	2
13 & 34	3.6-3.7	2.7-3.6	6.4	1.6	5	3.5	6.1	2
14 & 35	3.6-3.7	3.0-4.0	6.4	1.6	5.5	3.5	7.1	2
15 & 36	3.6-3.7	4.5-5.5	6.4	1.6	6	3.5	7.1	2
16 & 37	4.1-4.2	2.5-3.5	8	1.8	5	4	7	2
17 & 38	4.1-4.2	3.5-4.5	8	1.8	6	4	7	2
18 & 39	4.1-4.2	4.5-5.5	8	1.8	7	4	9	2
19 & 40	4.1-4.2	5.5-6.5	8	1.8	8	4	9	2
20	4.1-4.2	6.5-7.5	8	1.8	9	4	11	2
21 & 41	4.1-4.2	7.5-8.5	8	1.8	10	4	11	2

213998

**100 Per Pack**

Color	Ref.	Order Code	Price Per Pack
Black	1	126-1670●	5.02
	2	126-1672●	5.12
	3	126-1675●	3.90
	4	126-1677●	2.99
	5	126-1685●	4.16
	6	126-1687●	4.26
	7	126-1689●	4.40
	8	126-1692●	4.52
	9	126-1694●	4.40
	10	126-1696●	4.75
	11	126-1702●	4.61
	12	126-1704●	4.40
	13	126-1706●	4.30
	14	126-1709●	3.61
	15	126-1714●	4.89
	16	126-1718●	4.60
	17	126-1720●	4.81
	18	126-1723●	5.02
	19	126-1726●	5.33
	20	126-1728●	5.52
	21	126-1730●	5.71
White	22	126-1671●	4.89
	23	126-1674●	5.02
	24	126-1676●	5.12
	25	126-1679●	5.12
	26	126-1686●	4.02
	27	126-1688●	4.16
	28	126-1690●	4.30
	29	126-1693●	4.40
	30	126-1695●	4.40
	31	126-1697●	4.52
	36	126-1715●	4.59
	37	126-1719●	4.40
	38	126-1722●	4.64
	39	126-1725●	4.84
	40	126-1727●	5.11
	41	126-1731●	5.51

**Self Lock**

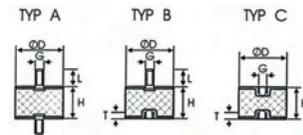


- Manufactured from nylon 6.6
- Meets UL94V-2 standard
- Type 1 – Wide ribs with locking fingers secure rigid fit with extra stability
- Type 2 – Small footprint, designed to use minimum board area – Suitable for 1.6mm thick boards
- Type 3 – Screw fixing at one end snap in self lock at the other – Attached chassis by No.6. Self tapping screw (not supplied)
- Type 4 – Suitable for fixing through the underside of the chassis

213994

Length (mm)	Mftrs. List No.	Order Code	Price Each
<b>Type 1</b>			
4.8	R6405F00	861-522●	1.50
6.4	R6406F00	861-534●	1.58
9.6	R6410F00	861-546●	1.66
19.1	R6419F00	861-558●	2.12
35	R6435F00	861-560●	2.42
<b>Type 2</b>			
3.2	R6003F00	861-571●	1.48
6.3	R6006F00	861-583●	1.63
9.5	R6009F00	861-595●	1.90
10.5	R6010F00	861-601●	1.51
12.7	R6013F00	861-613●	2.03
<b>Type 3</b>			
5	R6505-00	957-331●	1.47
9.6	R6510-00	957-343●	1.61
12.7	R6513-00	957-355●	1.51
19.1	R6519-00	957-367●	2.09
<b>Type 4</b>			
6.4	R6706-00	957-379●	1.47
8	R6708-00	957-380●	1.98
9.6	R6710-00	957-392●	2.03
14	R6714-00	957-409●	2.57

**Vibration Mount Cylindrical / Outside/Outside Thread**



- For absorption of surges and vibrations.
- The buffer can be loaded to compression, to surge and combined.
- Material: Rubber, Shorehardness 57, and on demand Shore 43 or Shore 68

Type A	Type B	Type C	Rubber		Thread		
			H	$\varnothing$ D	Size	D	L
71.33.321	71.35.313	71.34.333	7	6	M 3	-	6
			6	8	M 3	3	6
71.33.444	71.35.444	71.34.444	8	8	M 4	4	10
			15	15	M 4	4	13
71.33.476			20	15	M 4	4	13

334959

Mftrs. List No.	Order Code	4+	Price Each	24+	48+
<b>Type A</b>					
71.33.321	146-6989●	1.22	0.96		0.78
71.33.444	146-6990●	1.79	1.40		1.13
71.33.476	146-6991●	1.90	1.48		1.21
<b>Type B</b>					
71.35.313	146-6995●	1.72	1.35		1.09
71.35.333	146-6996●	1.50	1.16		0.96
71.35.444	146-6997●	1.45	1.11		0.92
71.35.466	146-6998●	1.33	1.03		0.84
<b>Type C</b>					
71.34.333	146-6992●	1.89	1.48		1.21
71.34.444	146-6993●	1.74	1.37		1.10
71.34.466	146-6994●	1.73	1.36		1.10

**Nylon Insulating Transpillars**

**Hexagonal**



Style 1    Style 2    Style 3

**Metric**

Mftrs. List No.	Thread Size	Length	Insulator (Across Flats)	Length of Stud	Depth of Bush	Overall Length	Order Code
TPI 7 13 M3 SS	M3	13	7	6.5	—	26	147-937
TPI 7 25 M3 SS	M3	25	7	6.5	—	38	
TPI 9.5 22 M4 SS	M4	22	9.5	9.5	—	41	
TPI 12.5 22 M5 SS	M5	22	12.5	12.5	—	47	
TPI 16 32 M6 SS	M6	32	16	12.5	—	57	
TPI 16 38 M6 SS	M6	38	16	12.5	—	63	
TPI 7 13 M3 IS	M3	13	7	6.5	—	19.5	
TPI 7 25 M3 IS	M3	25	7	6.5	—	31.5	
TPI 9.5 16 M4 IS	M4	16	9.5	9.5	—	25.5	
TPI 9.5 25 M4 IS	M4	25	9.5	9.5	—	34.5	
TPI 9.5 38 M4 IS	M4	38	9.5	9.5	—	47.5	
TPI 12.5 22 M5 IS	M5	22	12.5	12.5	—	34.5	
TPI 12.5 25 M5 IS	M5	25	12.5	12.5	—	37.5	
TPI 12.5 38 M5 IS	M5	38	12.5	12.5	—	50.5	

PCB Support - continued

Nylon Insulating Transpillars - continued

Hexagonal - continued

			Length	Depth	
TPI 12.5 51 M5 IS	M5	51	12.5	12.5	63.5
TPI 16 32 M6 IS	M6	32	16	12.5	44.5
TPI 16 38 M6 IS	M6	38	16	12.5	50.5
TPI 16 51 M6 IS	M6	51	16	12.5	63.5
TPI 7 13 M3 II	M3	13	7		13
TPI 7 25 M3 II	M3	25	7		25
TPI 7 32 M3 II	M3	32	7		32
TPI 7 38 M3 II	M3	38	7		38
TPI 9.5 16 M4 II	M4	16	9.5		16
TPI 9.5 19 M4 II	M4	19	9.5		19
TPI 9.5 25 M4 II	M4	25	9.5		25
TPI 12.5 51 M4 II	M4	51	12.5		51
TPI 12.5 22 M5 II	M5	22	12.5		22

213919

Insulator Length	Thread Size	Order Code	1+	+	Price Each	+	+
<b>Style 1</b>							
TPI 7 13 M3 SS	M3	147-937	1.05	--	--	--	--
TPI 7 25 M3 SS	M3	147-938	0.91	--	--	--	--
TPI 9.5 22 M4 SS	M4	147-939	1.07	--	--	--	--
TPI 12.5 22 M5 SS	M5	147-940	1.18	--	--	--	--
TPI 16 32 M6 SS	M6	147-942	1.19	--	--	--	--
TPI 16 38 M6 SS	M6	147-943	0.32	--	--	--	--
TPI 7 13 M3 IS	M3	147-944●	1.50	1.31	1.07	0.87	0.82
TPI 7 25 M3 IS	M3	147-945●	1.09	--	--	--	--
TPI 9.5 16 M4 IS	M4	147-946	1.09	--	--	--	--
TPI 9.5 25 M4 IS	M4	147-947	1.11	--	--	--	--
TPI 9.5 38 M4 IS	M4	147-948	1.20	--	--	--	--
TPI 12.5 22 M5 IS	M5	147-949	1.29	--	--	--	--
TPI 12.5 25 M5 IS	M5	147-950●	1.26	--	--	--	--
TPI 12.5 38 M5 IS	M5	147-951	1.27	--	--	--	--
TPI 12.5 51 M5 IS	M5	147-953	1.33	--	--	--	--
TPI 16 32 M6 IS	M6	147-954	1.51	--	--	--	--
TPI 16 38 M6 IS	M6	147-955	1.53	--	--	--	--
TPI 16 51 M6 IS	M6	147-956	1.47	--	--	--	--
TPI 7 13 M3 II	M3	147-957	1.62	--	--	--	--
TPI 7 25 M3 II	M3	147-958●	1.17	--	--	--	--
TPI 7 32 M3 II	M3	147-959	1.07	--	--	--	--
TPI 7 38 M3 II	M3	147-960●	1.27	--	--	--	--
TPI 9.5 16 M4 II	M4	147-961	1.16	--	--	--	--
TPI 9.5 19 M4 II	M4	147-962	0.70	--	--	--	--
TPI 9.5 25 M4 II	M4	147-963●	1.18	--	--	--	--
TPI 12.5 51 M4 II	M4	147-964	1.43	--	--	--	--
TPI 12.5 22 M5 II	M5	147-965●	1.29	--	--	--	--

Hexagonal and Circular



PVC ‡ AF=6.5, ID=3.0



Nylon OD=5.0, ID=3.2  
OD=6.5, ID=4.3



Aluminium OD=5, ID=3.3

Hexagonal, PVC

- Rigid
- Non-conductive
- Hard wearing

Fixing  
Hexagonal, PVC  
Circular, Nylon OD=6.35  
Circular, Nylon OD=8.0  
Circular, Aluminium

Circular, Nylon

- Non-conductive
- Cost effective

Self Tapping Screw  
No.6

Circular, Aluminium

- Heat and electrically conductive

Clearance Screw  
6BA/M2.5  
6BA/M3/4.40 UNC  
4BA/4BA/6.32 UNC  
6BA/M3

214132

25 Per Pack	Length (mm)	Order Code	Price Per Pack
<b>PVC Hexagonal</b>			
	3	359-154●	1.89
	5	359-166●	1.96
	6.4	359-180●	1.99
	8	359-191●	2.10
	18	359-270●	2.31
	25	359-312●	1.36
<b>Nylon Circular</b>			
OD=5.0	3	666-865●	1.21
	5	666-877●	1.33
	8	666-889●	1.47
	10	666-890●	1.52
	15	666-907●	1.69
OD=6.5	3	666-919●	1.36
	5	666-920●	1.48
	8	666-932●	1.53
	10	666-944●	1.57
	15	666-956●	1.81
<b>Aluminium Circular</b>			
	3	151-044●	2.62
	6	146-322●	2.53
	8	151-045●	2.83
	12	146-323●	3.83
	20	146-324●	7.39



Nylon Insulating 'Transpillars' Circular



Style 1 Style 2 Style 3

Metric	Insulator Length (mm)	Thread Size	Length of Th'd'd Stud (mm)	Depth of Th'd'd Bush (mm)	Insulator Diameter (mm)	Overall Length (mm)	Mfrs. List No.	Order Code
<b>Style 1</b>								
	13	M3	6.5	—	7	26	9831.31	147-937
	25	M3	6.5	—	7	38	9832.51	147-938
	22	M4	9.5	—	9.5	41	9842.21	147-939
	22	M5	12.5	—	12.5	47	9852.21	147-940
	38	M5	12.5	—	12.5	63	9853.81	147-941
	32	M6	12.5	—	16	57	9863.21	147-942
	38	M6	12.5	—	16	63	9863.81	147-943
<b>Style 2</b>								
	13	M3	6.5	4.5	7	19.5	9831.32	147-944
	25	M3	6.5	4.5	7	31.5	9832.52	147-945
	16	M4	9.5	6.5	9.5	25.5	9841.62	147-946
	25	M4	9.5	6.5	9.5	34.5	9842.52	147-947
	38	M4	9.5	6.5	9.5	47.5	9843.82	147-948
	22	M5	12.5	8	12.5	34.5	9852.22	147-949
	25	M5	12.5	8	12.5	37.5	9852.52	147-950
	38	M5	12.5	8	12.5	50.5	9853.82	147-951
	45	M5	12.5	8	12.5	57.5	9854.52	147-952
	51	M5	12.5	8	12.5	63.5	9855.12	147-953
	32	M6	12.5	12.5	16	44.5	9863.22	147-954
	38	M6	12.5	12.5	16	50.5	9863.82	147-955
	51	M6	12.5	12.5	16	63.5	9865.12	147-956
<b>Style 3</b>								
	13	M3	—	4.5	7	13	9831.33	147-957
	25	M3	—	4.5	7	25	9832.53	147-958
	32	M3	—	4.5	7	32	9833.23	147-959
	38	M3	—	4.5	7	38	9833.83	147-960
	16	M4	—	6.5	9.5	16	9841.63	147-961
	19	M4	—	6.5	9.5	19	9841.93	147-962
	25	M4	—	6.5	9.5	25	9842.53	147-963
	51	M4	—	6.5	12.5	51	9690.01	147-964
	22	M5	—	8	12.5	22	9852.22	147-965
	64	M5	—	8	12.5	64	9856.43	147-966
	32	M6	—	12.5	16	32	9863.23	147-967
	51	M6	—	12.5	16	51	9865.13	147-968

214133

Insulator Length (mm)	Thread Size	Order Code	Price Each
<b>Style 1</b>			
13	M3	147-937	1.05
25	M3	147-938	0.91
22	M4	147-939	1.07
22	M5	147-940	1.18
38	M5	147-941	0.45
32	M6	147-942	1.19
38	M6	147-943	0.32
<b>Style 2</b>			
13	M3	147-944●	1.50
25	M3	147-945●	1.09
16	M4	147-946	1.09
25	M4	147-947	1.11
38	M4	147-948	1.20
22	M5	147-949	1.29
25	M5	147-950●	1.26
38	M5	147-951	1.27
45	M5	147-952	1.31
51	M5	147-953	1.33
32	M6	147-954	1.51
38	M6	147-955	1.53
51	M6	147-956	1.47
<b>Style 3</b>			
13	M3	147-957	1.62
25	M3	147-958●	1.17
32	M3	147-959	1.07
38	M3	147-960●	1.27
16	M4	147-961	1.16
19	M4	147-962	0.70
25	M4	147-963●	1.18
51	M4	147-964	1.43
22	M5	147-965●	1.29
64	M5	147-966	1.55
32	M6	147-967	1.67
51	M6	147-968	1.49

Nylon Insulating Transpillars Hexagonal



Style 1 Style 2 Style 3



Metric	Insulator Length (mm)	Th'd Size	Length of Th'd Stud (mm)	Depth of Thr'd Bush (mm)	Insulated Dia. (across flats) (mm)	Overall Length (mm)	Order Code
<b>Style 1</b>							
13	M3	6.5	—	7	26	627-100	
25	M3	6.5	—	7	38	627-112	
22	M4	9.5	—	10	41	627-124	
22	M5	12.5	—	13	47	627-136	
32	M6	12.5	—	16	57	627-148	
<b>Style 2</b>							
13	M3	6.5	4.5	7	19.5	627-150	
25	M3	6.5	4.5	7	31.5	627-161	
16	M4	9.5	6.5	10	25.5	627-173	
25	M4	9.5	6.5	10	34.5	627-185	
38	M4	9.5	6.5	10	47.5	627-197	
22	M5	12.5	8	13	34.5	627-203	
25	M5	12.5	8	13	37.5	627-215	
38	M5	12.5	8	13	50.5	627-227	
45	M5	12.5	8	13	57.5	627-239	
51	M5	12.5	8	13	63.5	627-240	
32	M6	12.5	8	16	44.5	627-252	
38	M6	12.5	8	16	50.5	627-264	
51	M6	12.5	8	16	63.5	627-276	
<b>Style 3</b>							
13	M3	—	4.5	7	13	627-288	
25	M3	—	4.5	7	25	627-290	
32	M3	—	4.5	7	32	627-306	
38	M3	—	4.5	7	38	627-318	
16	M4	—	6.5	10	16	627-320	
19	M4	—	6.5	10	19	627-331	
25	M4	—	6.5	10	25	627-343	
51	M4	—	6.5	10	51	627-355	
22	M5	—	8	13	22	627-367	
64	M5	—	8	13	64	627-379	
32	M6	—	8	16	16	627-380	
51	M6	—	8	16	51	627-392	

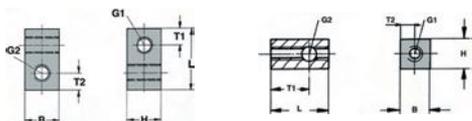
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Insulator Length (mm)	Thread Size	Order Code	Price Each
<b>Style 1</b>			
13	M3	627-100	1.15
25	M3	627-112	1.21
22	M4	627-124	1.16
22	M5	627-136	1.23
32	M6	627-148	1.34
<b>Style 2</b>			
13	M3	627-150	1.20
25	M3	627-161	1.20
16	M4	627-173	1.22
25	M4	627-185	1.22
38	M4	627-197	1.27
22	M5	627-203	1.39
25	M5	627-215	1.39
38	M5	627-227	1.37
45	M5	627-239	1.44
51	M5	627-240	1.45
32	M6	627-252	1.65
38	M6	627-264	1.65
51	M6	627-276	1.67
<b>Style 3</b>			
13	M3	627-288	1.22
25	M3	627-290	1.28
32	M3	627-306	1.28
38	M3	627-318	1.33
16	M4	627-320	1.27
19	M4	627-331	1.29
25	M4	627-343	1.24
51	M4	627-355	1.59
22	M5	627-367	1.42
64	M5	627-379	1.71
32	M6	627-380	1.83
51	M6	627-392	1.84

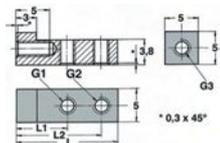
**Cube Standoff Threaded**



- Material: Brass, nickel-plated
- Production tolerances according to DIN 7168 medium



Dimensions in mm							Mftrs.
G 1	G 2	T 1	T 2	B	H	L	List No.
M2.5	M 2.5	2.5	2.5	6	6	8	05.60.125
M2.5	M 3	5.7	-	5	5	9	05.60.223
M3	M3	8,0	-	6	6	12	05.60.233

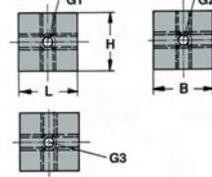


Dimensions in mm						Mftrs.
G 1	G 2	G 3	L	L 1	L 2	List No.
M 2,5	M 2,5	M 2,5	12	6,5	10,0	05.60.422

334931

Mftrs. List No.	Order Code	4+	Price Each 24+	48+
05.60.125	146-6864	0.300	0.250	0.186
05.60.223	146-6865	0.250	0.186	0.165
05.60.233	146-6866	0.430	0.330	0.270
05.60.422	146-6867	0.500	0.400	0.320

**Cube Standoff Threaded**



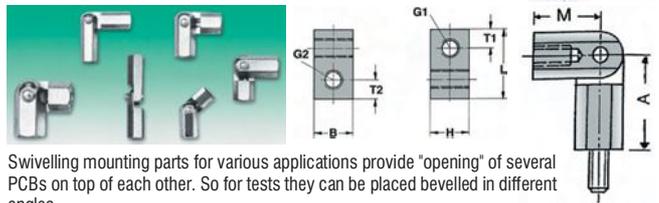
- Material: Brass, nickel-plated

Dimensions in mm						Mftrs.
G 1	G 2	G 3	L	B	H	List No.
M3	M3	-	10	10	10	05.60.533

334932

Mftrs. List No.	Order Code	4+	Price Each 24+	48+
05.60.533	146-6868	0.58	0.45	0.37

**Hinged Standoffs**



Swivelling mounting parts for various applications provide "opening" of several PCBs on top of each other. So for tests they can be placed bevelled in different angles.

**Hinged standoffs with two female threads**

Thread size	Length	Dimensions in mm				Steel	Order code
		M	P	Wrench size	Depth of thread	Zinc-plated	
M 3	10					05.23.203	146-6789
M 3	20	10.0	10.0	5.5	5	05.23.201	146-6779
M 3	25	10.0	15.0	5.5	5 - 7	05.23.251	146-6799
M 4	25	12.5	12.5	7.0	8 - 8	05.24.251	146-6809
M 5	30	15.0	15.0	10.0	10 - 10	05.25.301	146-6820
M 6	30	15.0	15.0	10.0	10 - 10	05.26.301	146-6830

**Hinged standoffs with male and female threads**

Thread size	Length	Dimensions in mm					Steel	Order Code
		M	A	Wrench size	Depth of thread	Half point dog	Zinc-plated	
M 3	15	9.0	6.0	5.5	5	6	05.28.315	146-6840
M 3	20	10.0	10.0	5.5	6	6	05.28.320	146-6850
M 3	21	15.0	6.0	5.5	6	6	05.28.321	146-6861
M 3	25	15.0	10.0	5.5	6	6	05.28.325	146-6862
M 3	25	12.5	12.5	7.0	7	7	05.28.425	146-6863

334933

Mftrs. List No.	Order Code	4+	Price Each 24+	48+
<b>With Two Female Threads</b>				
05.23.203	146-6789	0.99	0.76	0.63
05.23.201	146-6779	1.74	1.37	1.10
05.23.251	146-6799	1.70	1.33	1.08
05.24.251	146-6809	1.78	1.40	1.13
05.25.301	146-6820	2.18	1.70	1.40
05.26.301	146-6830	2.10	1.64	1.35
<b>With Male and Female Threads</b>				
05.28.315	146-6840	1.39	1.07	0.88
05.28.320	146-6850	1.26	0.97	0.79
05.28.321	146-6861	1.49	1.15	0.95
05.28.325	146-6862	1.31	1.01	0.83
05.28.425	146-6863	1.13	0.88	0.72

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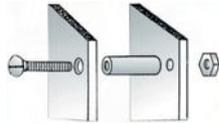
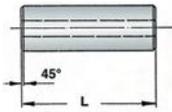


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PCB Support - continued

Round Spacer-Brass



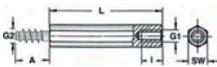
Material: Brass tubing, Nickel-plated



334775

Mfrs. List No.	Order Code	4+	Price Each 24+	48+
<b>M 2.5 ∅ D = 4.5; ∅ d = 2.6</b>				
05.52.013	146-6894	0.066	0.056	0.044
05.52.015	146-6895	0.100	0.074	0.063
05.52.023	146-6897	0.074	0.063	0.039
05.52.033	146-6898	0.066	0.044	0.033
05.52.053	146-6899	0.087	0.066	0.056
05.52.073	146-6900	0.087	0.066	0.056
05.52.103	146-6901	0.099	0.077	0.066
<b>M 3 ∅ D = 6.0; ∅ d = 3.2</b>				
05.53.013	146-6903	0.066	0.056	0.033
05.53.015	146-6904	0.066	0.056	0.044
05.53.023	146-6905	0.077	0.064	0.039
05.53.033	146-6906	0.087	0.066	0.056
05.53.043	146-6907	0.077	0.066	0.044
05.53.053	146-6908	0.077	0.066	0.044
05.53.063	146-6909	0.109	0.087	0.066
05.53.073	146-6910	0.109	0.087	0.077
05.53.083	146-6911	0.119	0.099	0.077
05.53.093	146-6912	0.119	0.087	0.077
05.53.103	146-6913	0.143	0.109	0.087
05.53.133	146-6915	0.109	0.087	0.077
05.53.153	146-6916	0.143	0.109	0.087
<b>M 4 ∅ D = 8.0; ∅ d = 4.3</b>				
05.54.023	146-6917	0.099	0.077	0.066
05.54.033	146-6918	0.087	0.066	0.056
05.54.043	146-6919	0.109	0.087	0.077
05.54.053	146-6920	0.109	0.087	0.066
05.54.063	146-6921	0.143	0.109	0.087
05.54.073	146-6922	0.133	0.099	0.087
05.54.083	146-6923	0.153	0.109	0.099
05.54.103	146-6924	0.153	0.119	0.099
05.54.123	146-6925	0.175	0.143	0.109
05.54.153	146-6927	0.186	0.153	0.119
05.54.183	146-6928	0.270	0.200	0.165
05.54.203	146-6929	0.340	0.270	0.220
05.54.303	146-6930	0.420	0.330	0.270
05.54.353	146-6931	0.580	0.450	0.360

Hex-Standoff With Selfcutting Thread / Male - Female  
For Thermoplastic Synthetics



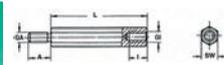
Material: Case-hardened steel  
Plating: Zinc-plated μm (A2E)

Screw thread			Dimensions in mm			Steel	Order Code
G 1	G 2	Wrench size	Length	Inside	Outside	Zinc-plated	
M 2.5	∅ 2.5	5	8.0	6	5	05.20.208	146-6870
M 2.5	∅ 2.5	5	10.0	7	5	05.20.210	146-6871
M 2.5	∅ 2.5	5	12.0	7	5	05.20.215	146-6873
M 2.5	∅ 2.5	5	15.0	7	5	05.20.218	146-6874
M 3	∅ 3	5.5	8.0	6	6	05.20.308	146-6875
M 3	∅ 3	5.5	10.0	8	6	05.20.310	146-6876
M 3	∅ 3	5.5	12.0	8	6	05.20.312	146-6877
M 3	∅ 3	5.5	20.0	8	6	05.20.320	146-6878
M 3	∅ 3	5.5	25.0	8	6	05.20.325	146-6879
M 3	∅ 3	5.5	30.0	8	6	05.20.330	146-6880

334771

Mfrs. List No.	Order Code	4+	Price Each 24+	48+
05.20.208	146-6870	0.35	0.28	0.24
05.20.210	146-6871	0.35	0.28	0.24
05.20.215	146-6873	0.37	0.30	0.25
05.20.218	146-6874	0.37	0.30	0.25
05.20.308	146-6875	0.34	0.27	0.22
05.20.310	146-6876	0.41	0.32	0.27
05.20.312	146-6877	0.40	0.31	0.26
05.20.320	146-6878	0.37	0.29	0.24
05.20.325	146-6879	0.50	0.40	0.32
05.20.330	146-6880	0.54	0.42	0.34

Hex-Standoff M 2,5  
Spacer Type B Male-Female



Material

- Steel 9SMnPb28K (according to DIN 1.0718)
  - Brass CuZn40Pb2 (according to DIN 2.0402)
- Plating according to DIN 267
- Zinc-plated 5 μm (A2E)
  - Nickel-plated 3 μm (E1E)

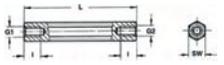
Production Tolerances

- Hex size according to DIN 7168 medium (medium ±0.15 mm)
- Length of half dog point ca. ±0.25 mm
- Screw thread according to DIN 13 part 13, cut
- Screw thread undercut according to DIN 76
- End of screw thread similar to DIN 85 (flat point)

334758

Mfrs. List No.	Order Code	4+	Price Each 24+	48+
05.12.053	146-6814	0.220	0.165	0.143
05.12.083	146-6825	0.133	0.099	0.087
05.12.103	146-6834	0.175	0.143	0.109
05.12.123	146-6844	0.186	0.143	0.119
05.12.173	146-6854	0.220	0.165	0.143

Hex-Standoff M 2,5



Steel			Brass		
Length, ext.	Length, thread	Order Code	Length, ext.	Length, thread	Order Code
5	5	146-7010	4	4	146-6721
8.5	4.2	146-7011	7	7	146-6730
10	5	146-7012	4	4	146-6740
12	6	146-7014	10	5	146-6750
15	6	146-7015	11	5.5	146-6760
20	6	146-6790	12	6	146-6771
30	6	146-6821	15	6	146-6780
			20	6	146-6801
			25	6	146-6810
			30	6	146-6831

334680

Mfrs. List No.	Order Code	4+	Price Each 24+	48+
<b>Steel</b>				
05.02.051	146-7010	0.109	0.087	0.066
05.02.081	146-7011	0.250	0.186	0.153
05.02.101	146-7012	0.165	0.133	0.109
05.02.121	146-7014	0.165	0.133	0.109
05.02.151	146-7015	0.197	0.165	0.133
05.02.201	146-6790	0.175	0.143	0.109
05.02.301	146-6821	0.450	0.340	0.290
<b>Brass</b>				
05.02.043	146-6721	0.099	0.077	0.066
05.02.073	146-6730	0.109	0.087	0.066
05.02.083	146-6740	0.119	0.087	0.077
05.02.103	146-6750	0.109	0.087	0.077
05.02.113	146-6760	0.175	0.143	0.109
05.02.123	146-6771	0.133	0.099	0.087
05.02.153	146-6780	0.143	0.109	0.087
05.02.203	146-6801	0.175	0.143	0.109
05.02.253	146-6810	0.186	0.143	0.119
05.02.303	146-6831	0.175	0.143	0.109

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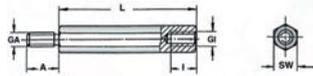


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**Hex-Standoff UNC / M 2,5; M 3 / Male-Female**  
**Spacer Type B Male - Female**



**Material**

- Steel 9SMnPb28K (according to DIN 1.0718)
- Rust-resistant Steel X12CrMoS17 (according to DIN 1.4104 (completely magnetic))

**Plating according to DIN 267**

- Zinc-plated 5 µm (A2E)
- Yellow-chromated 8 µm (A3G)

Screw thread	Dimensions in mm			Steel	Steel	Brass	Steel	Steel
	Length	Inside	Outside	Zinc-plated	Yellow chromated	Nickel plated	Stainless	Stainless
M 2.5 UNC 4-40	5.0	3.4	8.0	-	146-6758	-	-	-
M 2.5 UNC 4-40	5.4	3.8	7.5	-	146-6767	-	-	-
M 3 UNC 4-40	5.0	3.5	6.0	146-6778	-	-	-	-
M 3 UNC 4-40	5.0	3.4	6.0	-	146-6788	-	-	-
M 3 UNC 4-40	5.0	3.4	8.0	-	146-6798	-	-	-
M 3 UNC 4-40	6.1	4.0	5.5	-	146-6808	-	-	-
M 3 UNC 4-40	7.0	4.5	5.5	-	146-6819	-	-	-
UNC 4-40 M 3	5.0	3.3	6.0	-	146-6829	-	-	-
UNC 4-40 M 3	5.0	3.2	8.0	-	146-7034	-	-	-
UNC 4-40 UNC 4-40	4.9	3.4	7.9	-	-	-	146-6849	-
UNC 4-40 UNC 4-40	4.8	3.4	12.7	-	146-6759	-	-	-
UNC 4-40 UNC 4-40	5.0	3.4	6.0	-	146-6749	-	-	-
UNC 4-40 UNC 4-40	5.0	3.4	6.0	-	-	146-6839	-	-
UNC 4-40 UNC 4-40	5.0	3.4	8.0	146-6858	146-6739	-	-	-
UNC 4-40 UNC 4-40	5.0	3.4	8.0	-	-	146-6729	-	-
UNC 4-40 UNC 4-40	5.0	3.4	8.0	-	-	-	-	146-6769

334765

Mftrs. List No.	Order Code	4+	24+	48+
Steel Zinc-Plated Wrench size 5				
09.34.651	146-6778	0.175	0.143	0.109
05.17.451	146-6858	0.165	0.133	0.109
Steel Yellow Chromated Wrench size 5				
05.17.244	146-6758	0.280	0.220	0.175
05.17.254	146-6767	0.340	0.270	0.220
05.17.344	146-6788	0.220	0.165	0.143
05.17.354	146-6798	0.175	0.143	0.109
05.17.364	146-6808	0.200	0.165	0.133
05.17.374	146-6819	0.420	0.330	0.270
05.17.436	146-6829	0.197	0.153	0.133
05.17.438	146-7034	0.250	0.186	0.153
05.17.457	146-6759	0.175	0.143	0.109
05.17.456	146-6749	0.175	0.143	0.109
05.17.454	146-6739	0.175	0.143	0.109
Brass Nickel-Plated Wrench size 5				
05.17.443	146-6839	0.143	0.109	0.087
05.17.453	146-6729	0.143	0.109	0.087
Steel Stainless Wrench size 4.75				
05.17.449	146-6849	0.370	0.300	0.250
Steel Stainless Wrench size 5				
05.17.469 <sup>1</sup>	146-6769	0.380	0.300	0.250

**Hexagonal, Brass Nickel Plated**



Style 1  
 Hole=M3 Tapped  
 AF=5

Style 2  
 Hole/Stud=M3 Tapped  
 AF=5, Stud length=6  
 Hole/Stud=M4 Tapped  
 AF=7, Stud length=8

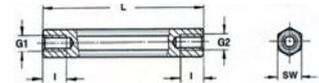
A range of threaded spacers available in 2 styles, female to female or male to female.

213886

25 Per Pack	Length (mm)	Price Per Pack			
		Order Code	1+	4+	10+
Style 1 M3	5	890-807	3.68	3.58	3.46
	6	517-525	1.89	1.84	1.79
	8	517-537	2.66	2.58	2.51
	10	517-549	2.52	2.43	2.37
	12	517-550	3.11	3.01	2.93
	14	517-562	3.00	3.20	3.12
	16	517-574	3.39	3.29	3.18
	18	517-586	3.17	3.07	2.99
	20	517-598	3.54	3.43	3.33

25 Per Pack	Price Per Pack					
Style 1	25.4	517-604	5.71	5.53	5.36	
	30	890-819	4.89	4.74	4.61	
M4	6	957-069	4.36	4.22	4.11	
	8	957-070	5.17	5.02	4.88	
	10	957-082	5.20	5.05	4.88	
	12	957-094	4.99	4.85	4.70	
	14	957-100	5.28	5.13	4.96	
	16	957-112	6.62	6.43	6.21	
	18	957-124	6.13	5.94	5.77	
	20	957-136	6.13	5.94	5.77	
	25	957-148	8.84	8.60	8.34	
	Style 2 M3	11	517-616	3.15	3.06	2.97
12		517-628	3.92	3.79	3.68	
M4	14	517-630	3.79	3.68	3.58	
	16	517-641	4.03	3.92	3.79	
	18	517-653	4.19	4.06	3.95	
	22	517-665	4.24	4.11	4.00	
	24	517-677	4.52	4.37	4.24	
	26	517-689	5.30	5.14	4.99	
	31	517-690	5.97	5.78	5.61	
	36	890-820	9.50	9.22	8.94	
	M4	14	890-832	5.82	5.63	5.48
		16	890-844	4.78	4.64	4.51
		18	890-856	4.58	4.44	4.30
		20	890-868	4.87	4.73	4.58
		24	890-870	7.55	7.32	7.11
		26	890-881	8.02	7.79	7.54
		28	890-893	7.64	7.41	7.19
		33	890-900	8.62	8.35	8.09
		38	890-911	9.09	8.82	8.57

**Hex-Standoff M 3**  
**Spacer Type A Female - Female**



**Material**

- Steel 9SMnPb28K (according to DIN 1.0718)
- Brass CuZn40Pb2 (according to DIN 2.0402)

**Plating according to DIN 267**

- Zinc-plated (chromate clear 5 µm (A2E))
- Nickel-plated 3 µm (E1E)

**Production Tolerance**

- Hex size according to DIN 7168 medium (medium ±0.15 mm)
- Length of half dog point ca. ±0.25 mm
- Screw thread according to DIN 13 part 13, cut

- Screw thread undercut according to DIN 76
- End of screw thread similar to DIN 85 (flat point)

Steel			Brass		
Length, ext.	Length, thread	Order Code	Length, ext.	Length, thread	Order Code
6	6	146-6851	5	5	146-6841
8	8	146-6731	7	7	146-6722
10	10	146-6751	8	8	146-6741
13.5	6.5	146-6791	10	10	146-6761
14	7	146-6802	12	6	146-6772
15	7	146-6822	13	6.5	146-6782
16	7	146-6842	14	7	146-6812
17	7	146-6852	15	7	146-6832
18	7	146-6733	17	7	146-6723
20	7	146-6752	18	7	146-6742
22	7	146-6773	20	7	146-6762
25	7	146-6783	25	7	146-6792
30	7	146-6803	30	7	146-6813
35	7	146-6824			
40	7	146-6833			

334698

Mftrs. List No.	Order Code	4+	24+	48+
Steel				
05.03.061	146-6851	0.175	0.143	0.109
05.03.081	146-6731	0.186	0.143	0.119
05.03.101	146-6751	0.165	0.119	0.099
05.03.137	146-6791	0.250	0.186	0.143
05.03.141	146-6802	0.186	0.143	0.119
05.03.151	146-6822	0.200	0.165	0.133
05.03.161	146-6842	0.200	0.165	0.133
05.03.171	146-6852	0.200	0.165	0.133
05.03.181	146-6733	0.220	0.175	0.143
05.03.201	146-6752	0.220	0.165	0.143
05.03.221	146-6773	0.250	0.186	0.165
05.03.251	146-6783	0.250	0.186	0.143
05.03.301	146-6803	0.260	0.197	0.165
05.03.351	146-6824	0.280	0.220	0.175
05.03.401	146-6833	0.310	0.250	0.186
Brass				



PCB Support - continued

Hex-Standoff M 3 - continued

Spacer Type A Female - Female - continued

Mfrs. List No.	Order Code	4+	Price Each 24+	48+
<b>Steel</b>				
05.03.053	146-6841	0.077	0.066	0.044
05.03.073	146-6722	0.099	0.077	0.066
05.03.083	146-6741	0.099	0.077	0.066
05.03.103	146-6761	0.109	0.087	0.066
05.03.123	146-6772	0.119	0.087	0.077
05.03.133	146-6782	0.143	0.109	0.087
05.03.143	146-6812	0.143	0.109	0.087
05.03.153	146-6832	0.143	0.109	0.087
05.03.173	146-6723	0.175	0.143	0.109
05.03.183	146-6742	0.165	0.133	0.109
05.03.203	146-6762	0.165	0.119	0.099
05.03.253	146-6792	0.175	0.143	0.109
05.03.303	146-6813	0.175	0.143	0.109

Hex Standoff Metric M3

Spacer Type B Male - Female



- Material**
- Steel 9SMnPb28K (according to DIN 1.0718)
  - Brass CuZn40Pb2 (according to DIN 2.0402)
- Plating according to DIN 267**
- Zinc-plated 5 µm (A2E)
  - Nickel-plated 3 µm (E1E)
- Production Tolerances**
- Hex size according to DIN 7168 medium (medium ±0.15 mm)

- Length of half dog point ca. ±0.25 mm
- Screw thread according to DIN 13 part 13, cut
- Screw thread undercut according to DIN 76
- End of screw thread similar to DIN 85 (flat point)

Steel				Brass nickel-plated			
L	I	A	SW 5,5	L	I	A	SW 5,5
5	2.5	6	146-6725	5	2.5	6	146-6735
6	2.5	6	146-6745	6	2.5	6	146-6754
7	4.5	6	146-6764	7	4.5	6	146-6775
8	5	6	146-6785	8.0	5	6	146-6795
10	6.5	6	146-6815	8.5	6	6	146-6805
12	7	6	146-6836	10	6.5	6	146-6826
14	7	6	146-6855	12	7	6	146-6845
15	7	6	146-6726	15	7	6	146-6869
18	7	6	146-6755	16	7	6	146-6736
20	7	6	146-6765	17	7	6	146-6746
25	7	6	146-6786	20	7	6	146-6776
28	7	8	146-6806	30	7	6	146-6827
30	7	6	146-6817	30	7	6	146-6827
35	7	6	146-6837				
38	7	6	146-6846				
40	7	6	146-6856				
45	7	6	146-6727				
50	9	8	146-6737				
60	7	6	146-6747				
70	7	6	146-6757				

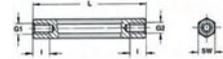
334759

Mfrs. List No.	Order Code	4+	Price Each 24+	48+
<b>Steel Zinc-plated SW 5.5</b>				
05.13.051	146-6725	0.175	0.143	0.109
05.13.061	146-6745	0.200	0.165	0.133
05.13.071	146-6764	0.200	0.165	0.133
05.13.081	146-6785	0.220	0.175	0.143
05.13.101	146-6815	0.165	0.133	0.109
05.13.121	146-6836	0.200	0.165	0.133
05.13.141	146-6855	0.270	0.200	0.165
05.13.151	146-6726	0.220	0.165	0.143
05.13.181	146-6755	0.220	0.175	0.143
05.13.201	146-6765	0.220	0.165	0.143
05.13.251	146-6786	0.270	0.200	0.165
05.13.281	146-6806	0.300	0.240	0.186
05.13.301	146-6817	0.250	0.186	0.165
05.13.351	146-6837	0.250	0.186	0.153
05.13.381	146-6846	0.340	0.270	0.220
05.13.401	146-6856	0.310	0.250	0.186
05.13.451	146-6727	0.410	0.320	0.270

Mfrs. List No.	Order Code	4+	Price Each 24+	48+
<b>Steel Zinc-plated SW 5.5</b>				
05.13.501	146-6737	0.410	0.320	0.270
05.13.601	146-6747	0.350	0.280	0.220
05.13.701	146-6757	0.450	0.340	0.290
<b>Brass nickel-plated SW 5.5</b>				
05.13.053	146-6735	0.143	0.109	0.087
05.13.063	146-6754	0.165	0.133	0.109
05.13.073	146-6775	0.153	0.119	0.099
05.13.083	146-6795	0.153	0.119	0.099
05.13.087	146-6805	1.710	1.350	1.080
05.13.103	146-6826	0.165	0.133	0.109
05.13.123	146-6845	0.165	0.133	0.109
05.13.153	146-6869	0.186	0.143	0.109
05.13.163	146-6736	0.197	0.165	0.133
05.13.173	146-6746	0.197	0.153	0.119
05.13.203	146-6776	0.186	0.153	0.119
05.13.253	146-6796	0.220	0.175	0.143
05.13.303	146-6827	0.220	0.165	0.143

Hex-Standoff M 4

Spacer Type A Female - Female



- Material**
- Steel 9SMnPb28K (according to DIN 1.0718)
  - Brass CuZn40Pb2 (according to DIN 2.0402)
- Plating according to DIN 267**
- Zinc-plated 5 µm (A2E)
  - Nickel-plated 3 µm (E1E)
- Production Tolerances**
- Hex size according to DIN 7168 medium (medium ±0.15 mm)
  - Length of half dog point ca. ±0.25 mm
  - Screw thread according to DIN 13 part 13, cut

- Screw thread undercut according to DIN 76
- End of screw thread similar to DIN 85 (flat point)

Steel			Brass		
Length, ext.	Length, thread	Order Code	Length, ext.	Length, thread	Order Code
10	10	146-6843	5	5	146-7016
12	12	146-6724	8	8	146-7017
15	7	146-6734	10	10	146-6853
17	8	146-6743	12	12	146-7018
20	9	146-6753	15	7	146-7019
25	9	146-6763	17	8	146-7020
30	9	146-6774	20	9	146-7021
35	9	146-6784	25	9	146-7022
40	9	146-6794	30	9	146-7023
50	9	146-6804	35	9	146-7024

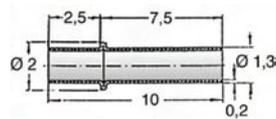
334750

Mfrs. List No.	Order Code	4+	Price Each 24+	48+
<b>Steel</b>				
05.04.101	146-6843	0.200	0.165	0.133
05.04.121	146-6724	0.220	0.175	0.143
05.04.151	146-6734	0.197	0.153	0.119
05.04.171	146-6743	0.220	0.175	0.143
05.04.201	146-6753	0.270	0.200	0.165
05.04.251	146-6763	0.290	0.220	0.186
05.04.301	146-6774	0.300	0.240	0.186
05.04.351	146-6784	0.320	0.260	0.200
05.04.401	146-6794	0.310	0.250	0.186
05.04.501	146-6804	0.420	0.320	0.270
<b>Brass</b>				
05.04.053	146-7016	0.153	0.109	0.099
05.04.083	146-7017	0.270	0.200	0.165
05.04.103	146-6853	0.165	0.133	0.109
05.04.123	146-7018	0.186	0.143	0.119
05.04.153	146-7019	0.186	0.153	0.119
05.04.173	146-7020	0.310	0.250	0.186
05.04.203	146-7021	0.270	0.200	0.165
05.04.253	146-7022	0.300	0.220	0.186
05.04.303	146-7023	0.320	0.260	0.200
05.04.353	146-7024	0.330	0.270	0.220

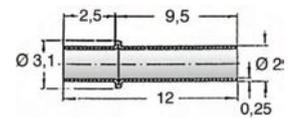
Collar Sleeves



- Type: Solder Terminals Turret
- Model: Rolled pins
- Design: Rivet Shaft
- Type 67 Brass, tin or silver plated
- 1 Pack=100 pcs



133-6238



133-6239

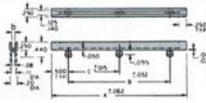
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Mftrs. List No.	Plating	Bohrung	Dimensions in mm					Order Code	Price per Pack	
			d	∅ d2	L	L1	L2		1+	5+
13.15.329	silver	1.3	1.3	2.0	10.0	7.0	2.5	<b>133-6238</b>	4.44	3.89
13.15.655	tin	2.0	2.0	3.1	13.5	10.0	2.5	<b>133-6239</b>	4.87	4.25

Insulator Length	Thread Size	Length of Th'd'd Stud	Depth of Th'd'd Bush	Insulator Dia.	Overall Length	Mftrs. List No.	Order Code	BA	
								Price Each	Price Each
<b>Style 2</b>									
1 1/4"	0BA	1/2"	1/2"	5/8"	1 3/4"	9703.12	142-008		
1 1/2"	2BA	1/2"	1/2"	1/2"	2"	9723.82	142-012		

Insulator Length	Thread Size	Order Code	Price Each
<b>Style 2</b>			
1 1/4"	0BA	<b>142-008</b>	1.16
1 1/2"	2BA	<b>142-012</b>	0.89

Card Guides DC horizontal



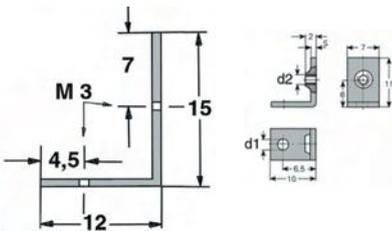
- Safe track of PCB through slot depth of 5.1 mm for PCB with thickness of max. 2.0 mm.
- Mounting: Borehole ∅ 4,8 mm in material with 1.2 to 2.3 mm thickness
- Material: Polyamide GV, black
- Class of flammability: UL 94 V-0

Dimensions in mm				Mftrs.
A	B	C	Slot width	List No.
63.5	38.1	-	1.6	75.53.125
114.3	88.9	-	1.6	75.53.145
152.4	127.0	-	1.6	75.53.160
203.2	177.8	88.9	1.6	75.53.180
114.3	88.9	-	2.4	75.53.245
152.4	127.0	-	2.4	75.53.260
203.2	177.8	88.9	2.4	75.53.280

Mftrs. List No.	Order Code	4+	24+	48+
75.53.125	<b>146-7000</b>	0.92	0.70	0.58
75.53.145	<b>146-7002</b>	1.19	0.94	0.77
75.53.160	<b>146-7003</b>	1.47	1.13	0.94
75.53.180	<b>146-7004</b>	1.72	1.35	1.09
75.53.245	<b>146-7005</b>	1.35	1.03	0.85
75.53.260	<b>146-7006</b>	1.47	1.13	0.94
75.53.280	<b>146-7007</b>	1.72	1.35	1.09

Mounting Brackets With Thread

For mounting of components

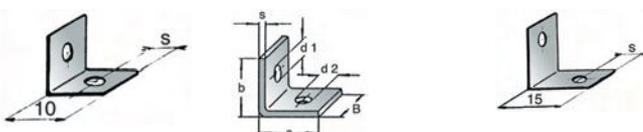


Dimensions in mm						Mftrs.
a	b	B	s	d1	d2	List No.
10.0	11.0	7.0	1.0	∅ 3,2	M 3	14.86.313
12.0	15.0	10.0	1.5	M 3	M 3	14.86.353

Mftrs. List No.	Order Code	4+	24+	48+
14.86.313	<b>146-6883</b>	0.175	0.143	0.109
14.86.353	<b>146-6885</b>	1.330	1.020	0.830

Mounting Brackets Without Thread

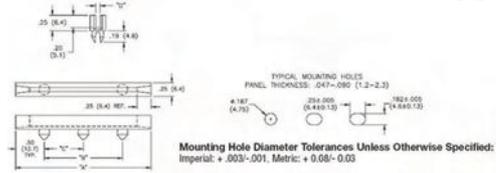
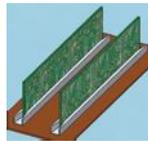
All-purpose use for mounting of components



Dimensions in mm						Mftrs.
a	b	B	s	d1	d2	List No.
10.0	10.0	10.0	1.0	3.2	3.2	14.86.103
15.0	15.0	10.0	1.0	3.2	3.2	14.86.153

Mftrs. List No.	Order Code	4+	24+	48+
14.86.103	<b>146-6881</b>	0.46	0.36	0.30
14.86.153	<b>146-6882</b>	0.90	0.69	0.58

RDC deep channel card guide



Allows for maximum board retention for high vibration, shock applications and wide boards.

Funnel entry for board insertion.

Material: Glass Filled Nylon UK94 V0, RMS66

Pack quantity: 25

Colour: Black

Mftrs. List No.	"A" ref	"B" ± 0.025 (± 0.63)	"C" ± 0.015 (± 0.38)	Normal Board Thickness	"D" ± .005 (± 0.13)	Order Code
RDC-250	2.5 (63.5)	1.5 (38.1)	-	1/16 (1.6)	.080 (2.0)	126-1806
RDC-450	4.5 (114.3)	3.5 (88.9)	-	1/16 (1.6)	.080 (2.0)	126-1807
RDC-600	6.0 (152.4)	5.0 (127.0)	-	1/16 (1.6)	.080 (2.0)	126-1808
RDC-800	8.0 (203.2)	7.0 (177.8)	3.5 (88.9)	1/16 (1.6)	.080 (2.0)	126-1809

Order Code	1+	+	+	+	+	+
<b>126-1806</b>	14.00	--	--	--	--	--
<b>126-1807</b>	14.54	--	--	--	--	--
<b>126-1808</b>	15.09	--	--	--	--	--
<b>126-1809</b>	15.62	--	--	--	--	--

Contact and Test Pins

Uninsulated Shorting Plugs

Gold Plated Brass



H=9.0, Pin dia=1.0

Mftrs. List No. D3082F05 =175-318, D3082F05 =175-319,

25 Per Pack	Order Code	1+	25+	50+	100+	500+
5.08mm (0.2")	<b>175-318</b>	2.69	2.43	2.25	2.00	1.96
10.16mm (0.4")	<b>175-319</b>	3.28	3.02	2.78	2.49	2.38

PCB Shorting Links



- Uninsulated shorting links which have precision 1mm contact point
- Made of brass with gold finish

Pins, L=9, Dia.=1.00

Mftrs. List No. D3080F05=175-318, D3082F05=175-319

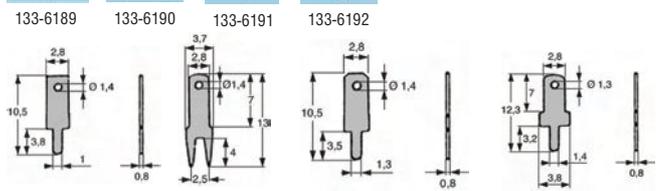
ALTERNATIVE SHORTING LINKS AVAILABLE

25 Per Pack	Order Code	1+	25+	50+	100+	500+
5.08mm (0.4")	<b>175-318</b>	2.69	2.43	2.25	2.00	1.96
10.16mm (0.4")	<b>175-319</b>	3.28	3.02	2.78	2.49	2.38

PC Quick-Fit Terminals 2.8 x 0.8mm



- DIN 46244
- tin plated
- 1 Pack = 100 pieces



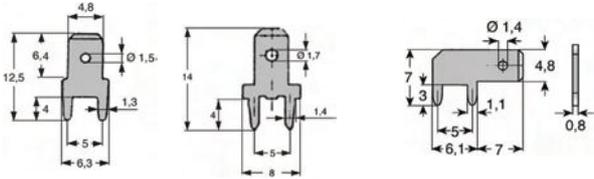
Mftrs. List No.	for Hole ∅	Dimensions in mm W D L L1	Gap Material	Order Code	Price Per Pack
19.28.041	0.9	1.0 3.8 6.7 10.5	- Bronze	<b>133-6189</b>	4.34 3.81
19.28.051	1.0	1.1 4.0 7.0 13.0	2.5 Brass	<b>133-6190</b>	5.58 4.90
19.28.071	1.2	1.3 3.8 6.7 10.5	- Brass	<b>133-6191</b>	2.68 2.37
19.28.084	1.3	1.4 3.2 7.0 12.0	- Brass	<b>133-6192</b>	5.16 4.53

Contact and Test Pins - continued

PC Quick-Fit Terminals 4.8 x 0.8mm



- DIN 46244
- tin plated
- 1 Pack = 100 pieces



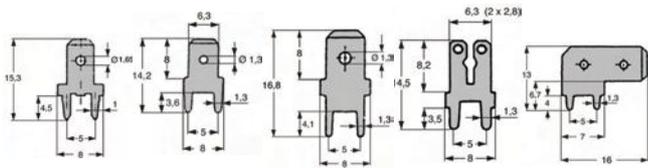
462824

Mfrs. List No.	for Hole $\varnothing$	W	D	L	L1	B1	Gap	Material	Order Code	Price Per Pack 1+	Price Per Pack 5+
19.48.071	1.2	1.3	4.0	8.2	-	6.3	5.0	Bronze	133-6193	6.82	5.98
19.48.074	1.2	1.3	4.0	8.0	-	6.3	5.0	Brass	133-6194	5.16	4.53
19.48.151	1.0	1.1	3.0	7.0	7.0	5.0	5.0	Brass	133-6195	6.61	5.79

PC Quick-Fit Terminals 6.3 x 0.8mm



- DIN 46244
- tin plated
- 1 Pack=100 pcs



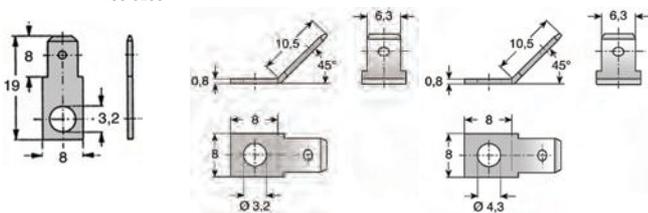
462826

Mfrs. List No.	for Hole $\varnothing$	W	D	L	L1	B1	Gap	Material	Order Code	Price Per Pack 1+	Price Per Pack 5+
19.68.041	1.1	1.0	4.5	10.8	-	8.0	5.0	Brass	133-6196	10.22	8.96
19.68.061	1.3	1.2	3.6	10.8	-	8.0	5.0	Bronze	133-6197	6.93	6.06
19.68.063	1.3	1.2	4.1	12.6	-	8.0	5.0	Brass	133-6199	6.00	5.25
19.68.064	1.3	1.3	3.5	8.2	14.5	8.0	5.0	Brass	133-6200	7.60	6.64
19.68.173	1.3	1.3	4.0	9.0	8.8	7.0	5.0	Brass	133-6201	10.22	8.96

PC Quick-Fit Terminals 6.3 x 0.8mm



- 133-6202 nach DIN 46342
- tin plated
- 1 Pack=100 pcs



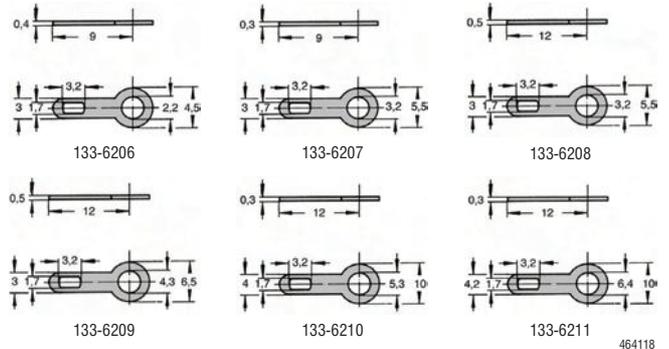
463408

Mfrs. List No.	Dimensions in mm b1	d2	L1	L2	Material	Order Code	Price Per Pack 1+	Price Per Pack 5+
19.68.231	8	3.2	19	8	Brass	133-6202	6.39	5.60
19.68.331	8	3.2	19	8	Brass	133-6203	5.79	5.07
19.68.342	8	4.3	19	8	Brass	133-6205	5.48	4.79

Solder Terminal Lugs



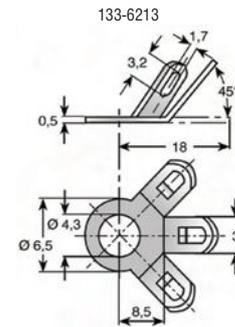
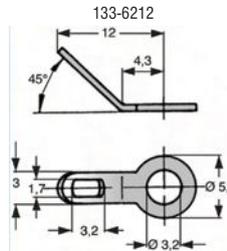
- Silver plated brass
- DIN 46215 / DIN 46216
- 1 Pack=100 pcs



464118

Mfrs. List No.	DIN Norm	$\varnothing$ in	$\varnothing$ ex	W	L	n	t	D	Order Code	Price Per Pack 1+	Price Per Pack 5+
19.05.018	2x9A1	2.2	4.5	3.0	9.0	1.7	3.2	0.4	133-6206	2.39	2.08
19.05.037	-	3.2	5.5	3.0	9.0	1.7	3.2	0.3	133-6207	2.68	2.37
19.05.039	3x12A1	3.2	5.5	3.0	12.0	1.7	3.2	0.5	133-6208	2.07	1.81
19.05.049	4x12A1	4.3	6.5	3.0	12.0	1.7	3.2	0.5	133-6209	2.99	2.62
19.05.059	-	5.3	10.0	4.0	12.0	1.7	3.2	0.3	133-6210	3.93	3.45
19.05.069	-	6.4	10.0	4.2	12.0	1.7	3.2	0.3	133-6211	3.93	3.45

Solder Eyelets

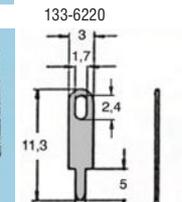
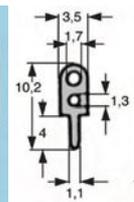
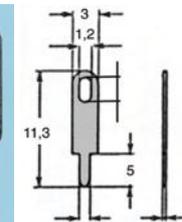
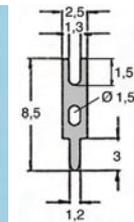


- 133-6212: silver plated brass
- 133-6213: tin plated brass
- 45° angle
- 1 Pack=100 pcs

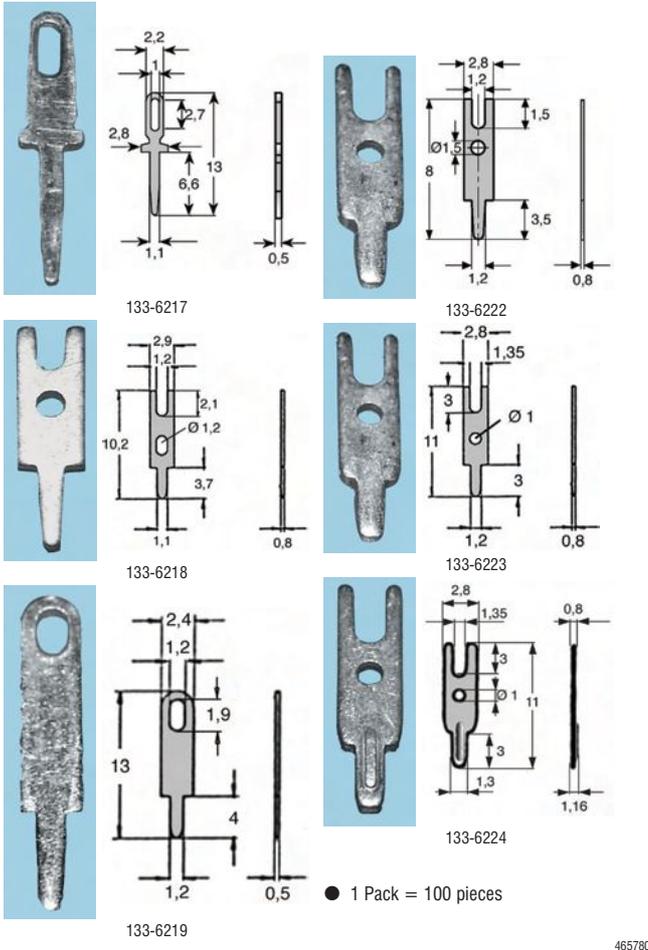
464124

Mfrs. List No.	DIN Norm	$\varnothing$ in	$\varnothing$ ex	W	L	n	t	e	D	Order Code	Price Per Pack 1+	Price Per Pack 5+
19.05.839	3x12B1	3.2	5.5	3.0	12.0	1.7	3.2	4.3	0.5	133-6212	3.61	3.17
19.05.745	4x12B3	4.3	6.5	3.0	12.0	1.7	3.2	5.5	0.5	133-6213	7.75	6.78

Terminals Stampets

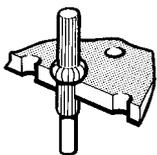


133-6221



Mftrs List No.	for Hole $\varnothing$	Dimensions in mm						Material / Plating	Order Code	Price Per Pack		
		W	W1	L	H	d2	D		1+	5+	10+	
13.13.519	1.0	1.0	2.5	8.5	3.0	1.3	0.5	Brass/Ag	133-6214	2.48	2.17	
13.13.525	1.1	1.1	3.5	10.2	4.0		0.6	Bronze/Sn	133-6215	4.75	4.17	
13.13.539	1.1	1.1	2.8	13.0	6.7		0.5	Brass/Ag	133-6217	4.04	3.53	
13.13.639	1.2	1.2	2.9	10.2	3.5		0.5	Brass/Ag	133-6218	3.52	3.09	
13.13.649	1.2	1.2	2.4	13.0	4.0		0.5	Brass/Ag	133-6219	2.80	2.45	
13.13.655	1.2	1.2	3.0	11.3	5.0		0.6	Brass/Sn	133-6220	2.89	2.53	
13.13.669	1.2	1.2	3.0	11.3	5.0		0.6	Brass/Ag	133-6221	3.71	3.25	
13.13.715	1.3	1.3	2.8	8.0	3.5		0.8	Bronze/Sn	133-6222	4.14	3.61	
13.13.725	1.3	1.3	2.8	11.0	3.0		0.8	Bronze/Sn	133-6223	3.83	3.35	
13.13.755	1.3	1.3	2.8	11.0	3.0		0.8	Bronze/Sn	133-6224	4.14	3.61	

Terminal Pins



- Terminal pins designed to have a constant height above the board when inserted

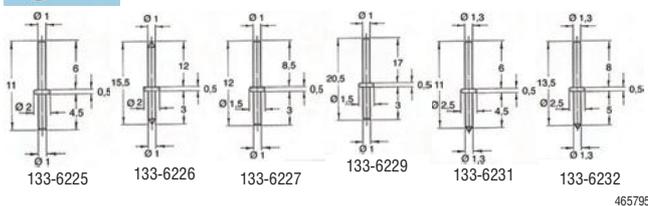
PCB Hole Dia.	Minimum Matrix	Order Code
1.02	2.54(0.1")	120-9347
1.32	3.8(0.15")	120-9348

1000 Per Pack PCB Hole Dia.	Order Code	1+	10+	25+	50+
1.02	120-9347	27.05	24.05	19.67	16.65
1.32	120-9348	35.84	32.17	26.06	22.27

Terminal Pins, round fitting termination



- Contact pins for PCBs
- press-fit, round
- 1 Pack = 100 pieces



Mftrs List No.	Dimensions in mm				Material	Order Code	Price Per Pack		
	$\varnothing$ 1L	L1	L2	$\varnothing$ 2			1+	5+	
<b>For PCB Hole <math>\varnothing = 1.0</math> mm</b>									
13.14.119	1.0	11.0	4.5	6.0	2.0	Brass, silver plated	133-6225	4.04	3.53
13.14.145	1.0	15.5	3.0	12.0	1.5	Brass, tinned	133-6226	8.68	7.60
13.14.125	1.0	12.0	3.0	8.5	1.5	Brass, tinned	133-6227	3.32	2.89
13.14.195	1.0	20.5	3.0	17.0	1.5	Brass, tinned	133-6229	6.61	5.79
<b>For PCB Hole <math>\varnothing = 1.3</math> mm</b>									
13.14.229	1.3	11.0	4.5	6.0	2.5	Brass, silver plated	133-6231	3.83	3.35
13.14.239	1.3	13.5	5.0	8.0	2.5	Brass, silver plated	133-6232	3.11	2.72

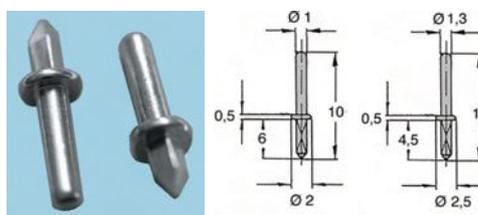
Contacts for Plugs



- Contacts for round pins with cross-section between 0.12mm<sup>2</sup> and 0.5mm<sup>2</sup>
- Phosphor Bronze, silver plated
- 1 Pack=100 pcs

Mftrs List No.	For Plugs $\varnothing$	Connection Type	Order Code	Price Per Pack		
				1+	5+	10+
12.15.159	1.3mm	Soldering	133-6233	5.79	5.07	4.51
12.15.169	1.3mm	Crimping	133-6234	4.55	3.98	3.54
12.15.139	1.0mm	Soldering	133-6235	5.07	4.43	3.94

Contact Pins for PCBs



- Type: Solder Terminals Turret
- Design: Press Shaft Square
- Brass, tin or silver plated
- 1 Pack=100 pcs

Mftrs List No.	Plating	$\varnothing$ d1	Dimensions in mm				$\varnothing$ d3	Order Code	Price Per Pack	
			$\varnothing$ d2	L	L1	L2		1+	5+	
13.14.305	tin	1.0	2.0	10.0	3.5	6.0	1.1	133-6236	3.20	2.81
13.14.419	silver	1.3	2.5	11.0	4.5	6.0	1.4	133-6237	3.83	3.35

Track Pins



Hold second pin, detach from first pin

Mftrs. List No. T1559-01=143-738 & amp; 148-115, T1563-01=143-740 & amp; 148-116, Z1002-00=145-248

PCB Hole Dia.	Quantity Per Pack	Order Code	Price Per Pack			
			1+	10+	25+	50+
Pins						
0.84	500	114-3874	7.72	6.89	6.38	6.06
1	500	114-3877	6.44	5.74	5.33	5.05
0.84	1000	114-3879	12.84	11.68	11.01	10.50
1	1000	114-3880	13.66	12.70	12.47	11.61
Insertion tool	Each	145-248	150.96	147.96	143.17	140.39

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...it's where Design Engineers go!

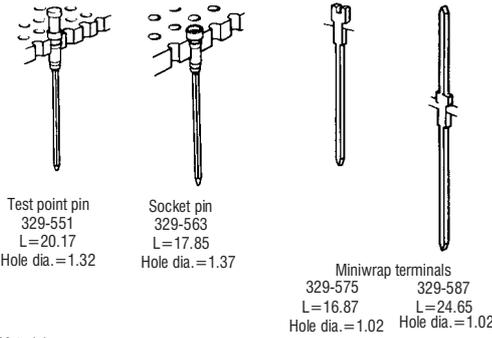
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[www.electronicsdesignworld.com](http://www.electronicsdesignworld.com)



Contact and Test Pins - continued

Miniwrap Terminals and Sockets



Material  
Test point, socket pins  
Miniwrap terminals  
Brass to **BS4249**, plated gold over copper nickel finish  
Phosphor bronze to **BS407 PB102**, bright electro-tinned over copper flash  
0.68 x 0.64mm, diagonal 0.89mm

Post Size  
Minimum Matrix  
Header, test point, socket pins 3.81mm (0.15")  
Miniwrap terminals 2.54mm (0.1")

	Quantity Per Pack	Mftrs. List No.	Order Code	Price Per Pack			
				1+	10+	25+	50+
<b>Pins</b>							
Test point	100	66 3532	<b>329-551</b>	16.05	14.27	11.67	9.89
Socket	100	663472	<b>329-563</b>	31.17	27.70	22.66	19.18
<b>Miniwrap Terminals</b>							
Single sided	500	18 0226	<b>120-9344</b>	36.69	32.93	26.69	22.80
Double sided	500	18 1657	<b>120-9345</b>	49.41	44.35	35.95	30.70

204633

Working travel: 4.0 mm  
Full travel: 5.0 mm  
Preload: 60cN  
Spring force at Working Travel: 150cN±20% (Standard and H-Version)  
300cN±20% (all Versions)  
Mechanical Life: 1.5 mill. cycles  
Pointing Accuracy: ±0.08mm  
Constant Current: 5.0 - 16.0A  
Typical Probe Resistance: 25mOhm

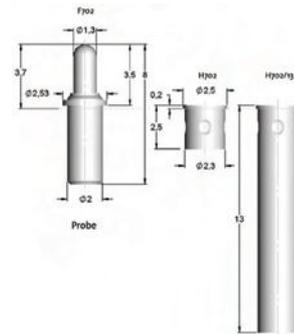
452816

Typ	Order Code	Price Each		
		1+	25+	50+
F77205B200G300	<b>131-3717</b>	1.95	1.64	1.30
F77206B200G300	<b>131-3718</b>	1.95	1.64	1.30
F77207S200L300	<b>131-3719</b>	1.95	1.64	1.30
F77215B200G300	<b>131-3720</b>	1.95	1.64	1.30
F77218B130G300	<b>131-3722</b>	1.67	1.38	1.05
H712 LA - Receptacle	<b>131-3723</b>	0.76	0.69	0.55
H772LA - Receptacle	<b>131-3724</b>	0.58	0.50	0.40

Spring contact pins

F620 F702 and F706 Family

Bare PCB Testing and Interfaces



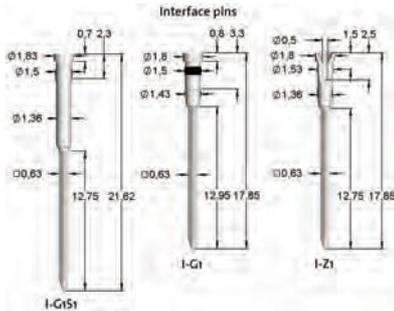
Has been developed for interface-applications. Low projection height combined with high spring force provide an ideal solution for adaptations with limited construction height.

Working travel: 1.0 mm  
Full travel: 1.2 mm  
Preload: 70cN  
Spring force at Working Travel: 200cN±20%  
Mechanical Life: 1.0 mill. cycles  
Pointing Accuracy: ±0.08mm  
Constant Current: 1.5A  
Typical Probe Resistance: 20mOhm  
Plunger: BeCu, Gold plated  
Barrel: Brass, Gold plated  
Spring: Music wire, Silver plated  
Receptacle: Bronze, Gold plated

452819

Typ	Order Code	Price Each		
		1+	25+	50+
F62001S120L075	<b>131-3725</b>	1.97	1.62	1.39
F62011S120L075	<b>131-3726</b>	2.01	1.65	1.42
F70611B130G200	<b>131-3727</b>	1.35	1.10	0.95
F70629B130G200	<b>131-3728</b>	1.35	1.10	0.95
F70211B130G130	<b>131-3729</b>	1.63	1.33	1.13
F70229B130G130	<b>131-3730</b>	1.64	1.34	1.14
H702 - Receptacle	<b>131-3731</b>	0.57	0.46	0.40
H702/13 - Receptacle	<b>131-3732</b>	0.74	0.61	0.53

Interface pins



**I-G1S1:** The barb avoids that the interface-pin is pushed out of the plate. The pin is wired by the wrap-post.

**I-G1:** A knurling on the interface-pin ensures, that it does not move even if the drilling-diameter in the plate is differing. The pin is wired by the wrap-post.

**I-G1:** The barb avoids that the interface-pin is pushed out of the plate. The inner drilling with the bevel can be used as point of contact as well as centering device for the contact pin. The pin is wired by the wrap-post.

Materials and Finishes:

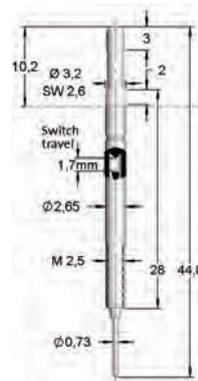
Brass, Gold plated

452814

Typ	Order Code	Price Each		
		1+	25+	50+
I-G1	<b>131-3679</b>	0.50	0.44	0.35
I-G1S1	<b>131-3681</b>	0.73	0.65	0.50
I-Z1	<b>131-3682</b>	0.50	0.44	0.35

Spring contact pins

F885 Family



The F885 is screwed into the receptacle in order to prevent ejection and to allow variable projection heights.

Switch travel: 1.7±0.2 mm  
Working travel: 4.0 mm  
Full travel: 5.0 mm  
Preload: 80cN  
Spring force at Working Travel: 350cN±20%  
Mechanical Life: 1.5 mill. cycles  
Pointing Accuracy: ±0.08mm  
Constant Current: 1.0A  
Typical Probe Resistance: 50mOhm

Barrel: Brass, Gold plated  
Spring: Music wire, Silver plated

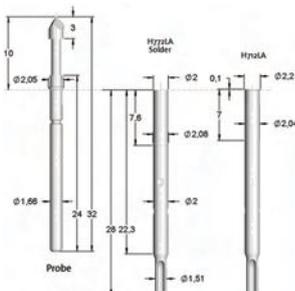
Switch Probe for Presence Testing

452820

Typ	Order Code	Price Each		
		1+	25+	50+
F88506B100G350SM	<b>131-3734</b>	5.87	5.32	4.76
F88506B230G350SM	<b>131-3735</b>	5.51	4.99	4.46
F88517B230G350SM	<b>131-3736</b>	5.87	5.32	4.76
F88517K230U350SM	<b>131-3737</b>	5.51	4.99	4.46

Spring contact pins

F772 Family

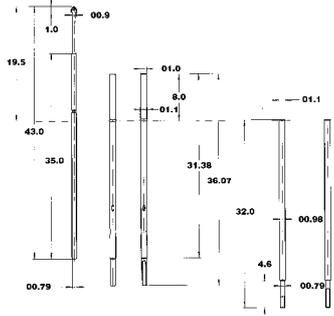


The F772 is used in dual-stage fixtures together with the F797. The receptacle H772 permits a variable projection height. The receptacle H712 is used for a fixed projection height of 10mm. This probe is identical to the threaded probe F732.

Barrel: Nickel Silver, Gold plated  
Spring: Music wire, Silver plated  
Receptacle: Nickel Silver, Gold plated

For In-Circuit- and Functional Test (ICT/FCT)

### Spring contact pins F788 Family



For populated boards, SMD.  
 Raster: 2,54mm  
 Assembly distance (min): 1,20mm  
 Height: 11,5-19,5mm (H787)  
 10,0mm (H768)  
 Max travel: 8,0mm  
 Recommended travel: 6,40mm  
 Bias: 40cN  
 Tension (@ recommended travel): 165cN ±20%  
 Life cycle: 1,0 Million  
 Accuracy: ±0,10mm  
 Op. temperature: -20° - +80°C  
 Constant current (max): 2,0A  
 Restistance: 35mΩ  
 Casing: Bronze, gilded  
 Clip: spring steel, silver plated  
 Socket: Bronze, gilded

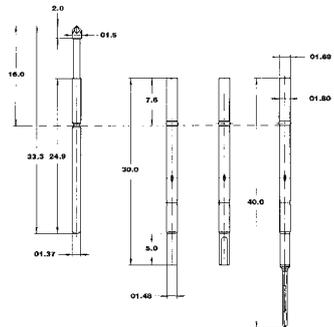
239764

Typ	Order Code	Price Each		
		1+	25+	50+
F78806B090G165	131-3696	1.90	1.56	1.36
F78807S090L165	131-3697	1.90	1.56	1.36
F78811B060G165	131-3698	1.73	1.42	1.21
F78818B060G165	131-3699	1.73	1.42	1.21
H787LA - Receptacle	131-3695	1.50	1.23	1.06

### Spring contact pins F585 Family



For populated and unpopulated boards.



Grid: 2,54mm  
 Assembly distance (min): 2,10mm  
 Height: 10,2-15,7mm (H885),  
 15,0-20,5mm (H885/5)  
 Max travel: 6,40mm  
 Recommended travel: 5,00mm  
 Bias: 50cN  
 Tension (@ recommended travel): 200cN ±20%  
 Life cycle: 1,5 Million  
 Accuracy: ±0,08mm  
 Op. temperature: -20° - +80°C  
 Constant current (max): 3,0A  
 Restistance: 30mΩ  
 Casing: Silver, gilded  
 Clip: spring steel, silver plated  
 Socket: Silver, gilded

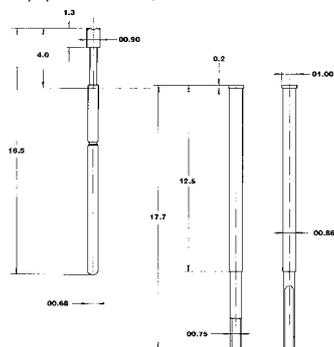
239779

Typ	Order Code	Price Each		
		1+	25+	50+
F58505B150G200	131-3707	0.700	0.590	0.500
F58506B150G200	131-3709	0.700	0.590	0.500
F58507S150L200	131-3711	0.910	0.750	0.650
F58511B105G200	131-3712	0.980	0.800	0.690
F58515B150G200	131-3713	0.700	0.590	0.500
F58518B105G200	131-3714	0.660	0.550	0.470
F58534S080L200	131-3715	1.210	1.050	0.800
H585LA - Receptacle	131-3716	0.260	0.210	0.183

### Spring contact pins F111 Family



For populated Boards, SMD.



Grid: 1,27mm  
 Assembly distance (min): 1,20mm  
 Height: 4,0mm  
 Max travel: 2,50mm  
 Recommended travel: 2,00mm  
 Bias: 30cN  
 Tension (@ recommended travel): 85cN ±20%  
 Life cycle: 1,5 Million  
 Accuracy: ±0,09mm  
 Op. temperature: -20° - +80°C  
 Constant current (max): 1,5A  
 Restistance: 65mΩ  
 Casing: Silver, gilded  
 Clip: spring steel, silver plated  
 Socket: Silver, gilded

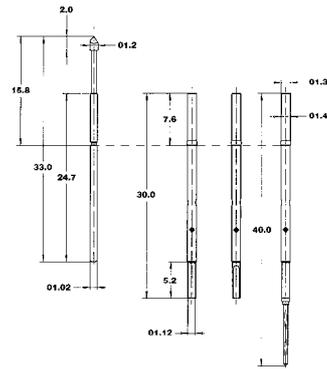
239774

Typ	Order Code	Price Each		
		1+	25+	50+
F11101S053N085	131-3683	1.35	1.10	1.00
F11103S053N085	131-3684	1.39	1.13	1.04
F11106S090L085	131-3685	1.35	1.10	1.01
F11107S090N085	131-3686	1.78	1.46	1.25
F11109S090N085	131-3687	1.75	1.44	1.24
F11112S090L085	131-3688	1.64	1.34	1.14
F11114S090N085	131-3689	1.73	1.42	1.21
F11118S053N085	131-3690	1.35	1.10	1.01
F11118S053R085	131-3692	1.35	1.10	1.07
F11121S053N085	131-3693	1.73	1.42	1.21
H111LA - Receptacle	131-3694	0.68	0.56	0.48

### Spring contact pins F703 Family



For populated and unpopulated boards, SMD.

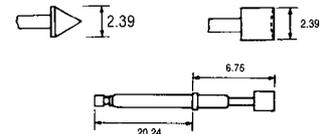


Grid: 1,90mm  
 Assembly distance (min): 1,80mm  
 Height: 8,2-15,8mm  
 Max travel: 6,30mm  
 Recommended travel: 5,00mm  
 Bias: 30cN  
 Tension (@ recommended travel): 180cN ±20%  
 Life cycle: 1,5 Million  
 Accuracy: ±0,08mm  
 Op. temperature: -20° - +80°C  
 Constant current (max): 3,0A  
 Restistance: 30mΩ  
 Casing: Silver, gilded  
 Clip: spring steel, silver plated  
 Socket: Silver, gilded

239773

Typ	Order Code	Price Each		
		1+	25+	50+
F70306B120G180	131-3700	1.17	0.97	0.83
F70311B078G180	131-3701	1.17	0.97	0.83
F70315B120G180	131-3702	1.17	0.97	0.83
F70318B078G180	131-3703	1.28	1.05	0.90
F70321S078L180	131-3706	2.16	1.81	1.45
H703LA - Receptacle	131-3704	0.57	0.46	0.40
H703WW Wire/Wrap Receptacle	131-3705	0.74	0.61	0.53

### Spring Loaded Contact



Mounting hole dia = 1.98 (press-fit), 2.16 (epoxy)

A range of spring loaded contact probes for multipoint testing of PCB boards during production. They are designed for either press or epoxy fitting to the test bed. The 143-742 has a gold plated brass concave probe for locating PCB pins and soldered joints, whereas the 143-743 has a stainless steel pointed probe for contact with PCB tracks. Connection is via solder posts.

Spring travel	56 to 114gf	Contact resistance	50mΩ max
Probe pressure	5A	Mechanical life	100000 operations
Maximum current			

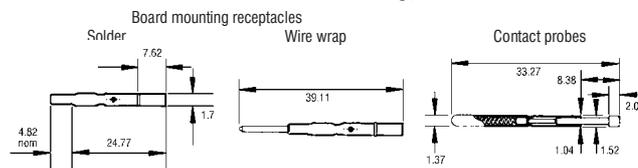
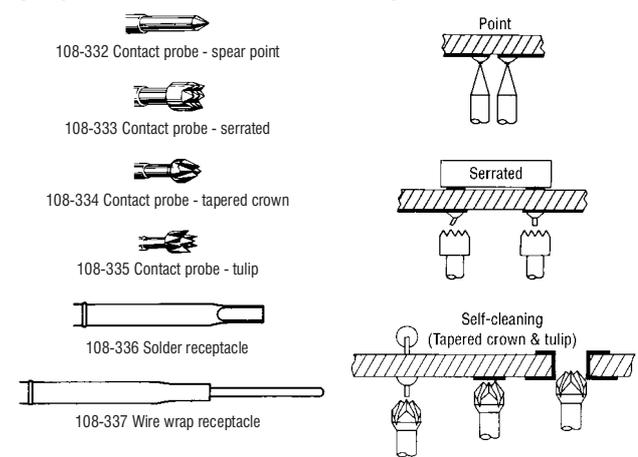
Mfrs. List No. P1113SS3 = 156-0084 P1113CA3 = 156-0083

209767

	Order Code	Price Each				
		1+	50+	100+	250+	500+
Point contact probe	156-0084	1.20	1.07	1.03	1.01	0.97
Concave contact probe	156-0083	1.20	1.07	1.03	1.01	0.97

### Spring Loaded Contact Probes and Receptacles

IDI



A range of professional spring loaded contact probes giving a full travel of 0.25" (6.35mm) designed to mate with either solder or wire-wrap receptacles. The probes are available with either a point, serrated or self cleaning tapered crown and tulip head styles and will suit most major manufacturers high speed vacuum ATE equipment.



Contact and Test Pins - continued

Spring Loaded Contact Probes and Receptacles - continued

IDI - continued

<b>Probes</b>		<b>Receptacles</b>	
Maximum current	3A dc	Material	Nickel/silver, Gold plated with gold plated post
Full travel	6.35mm	Mounting hole size	1.73 to 1.76mm
Spring pressure:			
Pre-load	45g		
1/3 travel	113g		
Barrel	Gold Plated, Nickel/silver		
Spring	Stainless steel		
Recom. min. spacing	2.54mm		

Mfrs. List No:	S25B4G = 108-332, S25H4G = 108-333,	S25X4G = 108-334, S25Y4G = 108-335,	R25SC = 108-336, R25WW = 108-337
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209768

Order Code	Price Each				
	1+	50+	100+	250+	500+
<b>Spring Loaded Contact Probes</b>					
Pointed <b>108-332</b>	1.62	1.34	1.02	0.87	0.79
Serrated <b>108-333</b>	1.62	1.34	1.02	0.87	0.79
Tapered crown <b>108-334</b>	1.62	1.34	1.02	0.87	0.79
Tulip <b>108-335</b>	1.62	1.34	1.02	0.87	0.79
<b>Receptacles for Contact Probes</b>					
Solder cup type <b>108-336</b>	0.52	0.42	0.33	0.29	0.25
Wire wrap type <b>108-337</b>	0.58	0.50	0.37	0.32	0.29

Spring Loaded Contact Probes and Receptacles



- A range of professional spring loaded contact probes, 6.3mm full travel
- Mates with solder or wire-wrap receptacles
- Available with either point, serrated, tapered crown and tulip head
- Ideal for ATE

<b>Probes</b>		<b>Receptacles</b>	
Maximum current	3A	Material:	Phosphor Bronze
Full travel	6.3mm	Mounting hole size	1.7mm
Spring pressure	Full 150g		

Mfrs. List No.	P25F0126=634-554, P25F4026=634-566	P253226=634-578	S25346=634-608
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209971

Order Code	Price Each				
	1+	50+	100+	250+	500+
<b>Spring Loaded Contact Probes</b>					
Pointed <b>634-554</b>	1.52	1.25	0.94	0.89	0.82
Serrated <b>634-566</b>	1.69	1.39	1.05	0.99	0.91
Tapered Crown <b>634-578</b>	1.52	1.25	0.94	0.89	0.82
<b>Receptacles for Contact Probes</b>					
Wire wrap type <b>634-608</b>	0.66	0.55	0.41	0.38	0.36



Suits to every use into electronic assembly. Each unit includes an built-in filter HEPA + Neutrafil, 2 speeds, a strong and very silent turbine (52 dbA). An on/off remote control without wire is available as an option for the 2 types.

Technical characteristics  
Powerful harness  
Number of possible connection  
Micro filter efficiency (HEPA)  
Gas filter efficiency (Neutrafil)  
2 filter speeds

Sound level at 1 meter  
Ext. Dimensions L x l x H mm  
Net weight  
Power  
Electrical supply

403607

Description	Mfrs. List No.	Order Code	Price Each		
			1+	3+	5+
Filtratec F Statio	I51025	<b>112-0357</b>	751.87	--	--
Flexible arm	I43310	<b>112-0361</b>	73.85	--	--
Mixed articulation arm	I43314	<b>112-0362</b>	127.12	--	--
articulation arm 360°	I43311	<b>112-0363</b>	172.95	--	--
Double flexible arm	I43312	<b>112-0364</b>	260.17	--	--
Alu. nozzle Ø 50 mm	I43410	<b>NEW 164-3123</b>	12.18	11.72	--
Black plastic nozzle Ø 32 mm	I43411	<b>NEW 164-3124</b>	13.04	12.56	--
Black plastic nozzle Ø 50 mm	I43412	<b>NEW 164-3126</b>	41.52	39.82	--

Processing Equipment

Suction/Filter unit  
FILTRATEC-F



Silent compressor  
CS25



CS25 compressor is dedicated to silent compressed air production for needs under 25 litres/min. Those compressors are perfect in areas loud noises are not allowed: laboratory, education, reserach centre etc.

- Very silent
- Easy to handle
- Compact
- Strong
- Equipped in serie with a manode-tender c/w 40 microns filter

Delivered in serie with quick coupling kit and 40 microns air filter

Technical characteristics  
Capacity  
Production  
Pressure maximum  
Power

Technical characteristics  
Sound level  
Dimensions L x l x H mm  
Net weight  
Electrical supply

403602

Description	Mfrs. List No.	Order Code	Price Each		
			1+	+	+
Compressor	F41045	<b>112-0346</b>	390.18	--	--

**PCB Tinning Machine**



112-0365

- Protects Tracks with a Layer of Solder
- Protection Against Oxidation
- Fast Release Roller System
- Fume Extraction Outlet
- Process PCBs up to 220mm
- 1 kW Heater
- 6kg Solder Bath Capacity

This manually operated roller tinning machine is an essential item for the production of professional PCBs. The machine coats the copper tracks of a new PCB with a thin layer of solder, this has the effect of stopping the copper oxidising and makes the PCB easier to solder components to. The unit works by transferring molten solder from a heated reservoir onto a roller, this in turn deposits a thin layer onto the PCB. To assist the depositing of the solder, the PCB must be clean and free of any oxides. Flux and tinning salts are available to assist with the transfer of solder onto the PCB.



Description	Mfrs. List No.	Order Code	1+	5+	10+
Manual roller tinning machine (European version)	DP63SP	<b>112-0365</b>	2,065.57	--	--
Organic Flux 1litre	BS150	<b>414-8060</b>	11.86	9.89	8.98
Tinning Salts 1 kg	BS200	<b>414-8071</b>	28.92	24.16	20.88
Granulated Solder 5kg	U800002	<b>141-8463</b>	124.21	122.26	120.43

241011

Heavy item, special delivery conditions apply

**PCB Production Tanks**



- Two individual process tanks for PCB production R&D and education
- **Bubble Etch** tank with thermostatically controlled heater and air pump for bubble agitation
- **Universal** tank with thermostatically controlled heater for developer, photo resist stripping or tin plating
- Internal tank constructed of one piece polypropylene with integral top surround
- Sturdy outer case of moulded polyethylene with front mounted control panel
- Splash proof lid with full length mesh PCB folder

External dimensions W=178 x H=375 x D=522 Tank capacity 5l  
 Max PCB size 320 x 260  
 Electrical specification **Bubble Etch & Universal Tank**  
 Operating Voltage 240V a.c  
 Heater 500W  
 Thermostat range +10°C to +65°C

Note: It is recommended that PCB production equipment is used in conjunction with RCCBs

204655

Tank	Order Code	Price Each
Bubble Etch	<b>120-1810</b>	227.22
Universal	<b>120-1812</b>	195.84

**PCB Production Tanks**



- Process tanks for PCB production R&D and education
- **Twin tank** combines Bubble Etch and Spray wash in one compact unit
- **Triple tank** combines Universal, Bubble Etch and Spray wash
- Internal tanks constructed of one piece polypropylene with integral top surround
- Sturdy outer cases of moulded polyethylene with front mounted control panel
- Splash proof lid with full length mesh PCB holder
- Spray wash tanks have solenoid controlled water inlet valve

External dimensions H=380 x D=525 x W=275 (Twin) 400 (Triple)  
 Tank capacity 5l  
 Max PCB size 320 x 260  
 Heater 500W  
 Operating Voltage 240V a.c IEC socket  
 Thermostat range +10°C to +65°C

**RoHS** ● Compliant ▲ Non-compliant

08447 11 11 11

Fax: 08447 11 11 12 1035

Note: It is recommended that PCB production equipment is used in conjunction with RCCBs

204654

Tank	Order Code	Price Each
Twin	<b>120-1813</b>	291.56
Triple	<b>120-1814</b>	462.47

**Grip to suspend PCB**



- Use with vertical etching machine
- 10 units per pack

477457

Mfrs. List No.	Order Code	1+	5+	10+
DCP47	<b>141-8466</b>	14.81	14.45	14.26

**Girojet Etching Machine**



- Rotary Spray Etching Action
- Etching Time at 30°C is only 2 Minutes
- Etches Single or Double sided PCBs
- Recommended for use with Super Activated Ferric Chloride
- Vertical Orientation of PCB Ensures Same Fine Resolution on Both Sides

A fast rotary etching machine which is capable of processing a PCB in approximately two minutes (with new super-activated ferric chloride at 30°C). The unit sprays the ferric chloride onto the PCB from two spinning arms, this action along with the vertical orientation of the PCB gives a uniform even finish.

Working Area	Tank Capacity	Weight	Supply Volts	Dims. H x W x D	Mfrs. List No.	Order Code
200 x 300mm	8 litres	10kg	220V ac	500x235x460	DP9(FR)	126-7770

241009

Description	Mfrs List No.	Order Code	Price Each 1+
Girojet Etching Machine (European version)	DP9(FR)	<b>126-7770</b>	2,026.72

**Foam Etching Machine**



- Welded PVC Construction with Plexiglass Cover
- Ceramic Diffuser to Produce Etchant Foam
- Membrane Pump
- Pyrex Coated Heaters
- Etching Time 10 -12 Min
- 3 Litre tank Capacity
- Temperature 18°C to 35°C

A foam etching machine in which the ferric chloride is agitated by being forced through a ceramic diffuser, the resulting foam evenly covers the PCB being etched. The PCB is mounted on an incline which keeps the etchant moving across the surface.

Working Area	Tank Capacity	Weight	Supply Volts	Dims. H x W x D	Mfrs. List No.	Order Code
180 x 240mm	3 litres	2.8kg	220V ac	190x210x430	BB2(UK)	120-1482
180 x 240mm	3 litres	2.8kg	220V ac	190x210x430	BB2(FR)	421-1406

241007

Description	Mfrs List No.	Order Code	Price Each 1+
Foam Etching Machine (UK version)	BB2(UK)	<b>120-1482</b>	257.87
Foam Etching Machine (European version)	BB2(FR)	<b>421-1406</b>	243.41

**Vertical etching machine with heater**



AIR PULSE - BB4



- Thermostated heater with digital thermometer
- complete welded PVC
- Strong, perfect for first and second grade education and laboratories
- Supervising of etching process thanks to transparency
- to be used with boosted ferric chloride
- Capacity to put 2 tanks (1 on each side of the machine)
- Fixing by pliers
- Anti-return nozzle



**Processing Equipment - continued**

**Vertical etching machine with heater - continued**

**AIR PULSE - BB4 - continued**

- small obstruction
- Small capacity
- Supervising of the process
- Etching acceleration thanks to bubbles
- Etching time 6 to 7 minutes with new boosted ferric chloride at 25°C

Working area mm	200 x 300
Dimensions (LxH) mm	460 x 145 x 380
Net weight	3Kg
Capacity	2.5 L
Power supply	220V

469945

Mfrs. List No.	Order Code	1+	Price Each	+
BB4	133-2733●	273.30	--	--

**Antifoam developer PCBs AR26**



- Positive developer for positive presensitised boards
- For development in machine, contains an anti-foam agent.
- Packaging : Jerrycan 5L for machine

469946

Mfrs. List No.	Order Code	1+	Price Each	5+	10+
AR26	133-2732	16.03	15.61	15.21	

**3 Tanks etching machine - GR serie**



Two models which allows etching, cleaning and developing in a single unit with 3 tanks. A complete clear tank arrangement of 100% welded PVC. Rigid, stable and compact units supplied with two thermostatic controlled heating elements and two air bubble pumps. The Serie GR units allow you to develop prototypes or other to be etched materials in combination with a rinsing tank for DI-water.

- 3 tanks with draining taps
- 3 in 1 : the most practical
- Can be installed anywhere
- No contact with ferric chloride
- Anti-return nozzle
- No need of current water

Working area	240 x 340mm	Working area	240 x 340mm
Etching tank capacity	3L	Etching tank capacity	3L
Development tank capacity	3L	Power	140W
Rinsing tank capacity	3L	Electrical supply	220VCA 50-60Hz

487369

Mfrs. List No.	Order Code	1+	Price Each	3+	5+
DP37	149-6371●	746.08	731.14	726.26	

**Spray Etch/Developer 'Rota-Spray'**



- Etches PCB's in less than 90 seconds
- 10" x 12" (254 x 305mm) board capacity
- Digital temperature control
- Digital timer control
- Integral Spray Wash tank
- Splash Hopper included
- 5 litre reservoir with low level sensor
- Bottom drain - no syphoning
- Optional Base Unit

The Processing Tank is designed to take multiple small boards or one panel up to a maximum of 10" x 12". It has a transparent case so that the panels can be examined after processing without removal. The lid is fitted with a safety cut-out to stop the motor if the lid is raised during etching. The optional Base Unit places the top of the Processing Tank at an efficient working height of 110cm.

311229

Processing Tank shown with optional Base Unit

Description	Order Code	Price Each
Processing Tank	120-1824 ●	890.90
Base Unit	440-2455	79.42

● Heavy item (≈29kg), special delivery conditions apply

**Single sided exposure unit**



- Single sided exposure unit with foam pressure pad for developing printed circuit boards, aluminium front panels, positive/negative films, labels, etched shields.
- Supplied with a mechanical timer from 0' to 7', safety switch when top cover is lifted during process cycle, 4 UV light tubes.

481240

Mfrs. List No.	Order Code	1+	Price Each	5+	10+
BC4	126-7767●	309.82	302.22	294.62	
DCF1	141-8447	7.07	6.89	6.71	

**Double sided UV-exposure units**



The first double sided UV-exposure unit is an economic version. Nevertheless it is equipped with a vacuum pump and a mechanical timer from 0' to 7'. The boards and film are securely fixed through a clear polyester sheet. Switching of top and bottom lighting can be done separately for the DFE 2340 model.

- Economic double sided unit
- Vacuum pump
- Iron unit epoxy paint
- Working area 235 x 400 mm

Working area	235 x 400mm	Working area	235 x 400mm
Dimensions L x w x H	605 x 310 x 190 mm	Dimensions L x w x H	605 x 310 x 190 mm
Net weight	16kg	Electrical supply	220VCA 50-60Hz
Power	120W		

481261

Mfrs. List No.	Order Code	1+	Price Each	3+	5+
DP134(FR)	126-7768●	785.26	765.58	745.89	

**Double Sided UV Exposure Unit**



- Double sided exposure, essential for accurate registration when working with double sided PCBs
- Integral vacuum pump ensures artwork contact with PCB material
- Electronic exposure timer 0-999 seconds with touch membrane controls
- Safety interlocked lid with tube status indication
- Steel case construction

Operating voltage a.c IEC inlet 240V

weight	Working Area	Case Size	Timer	Tubes	Mfrs List No.	Order Code
19 kg	260 x 355	170 x 550 x 485	0-999 seconds	8 x 15 watt	AZ210	120-1821

240748

Mfrs. List No.	Order Code	Price Each
AZ210	120-1821●	709.95

**UV Exposure Units**



- Mild steel case with hinged lid finished in black
- Front mounted mechanical or electronic timer

Operating voltage 240V a.c IEC inlet

Size	Working Area	Case Size	Timer	Tubes	Mftrs List No.	Order Code
Small	229 x 159	420 x 175 x 90	6 mins mechanical	2 x 8W	300-001	120-1817
Large	330 x 260	515 x 400 x 120	7.5 mins electronic	4 x 15W	300-002	120-1818

204652

Size	Order Code	Price Each		
		1+	5+	10+
Small	120-1817	132.59	--	--
Large	120-1818	239.00	--	--
8W Kit 2 x tubes and starters	120-1819	17.71	15.41	14.53
15W Kit 2 x tubes and starters	120-1820	20.34	19.36	18.24

**Manual SMT pick and place machine**  
**PRECITEC®**



The pick and place station PRECITEC® is a new manual system for the placement of SMT-components. It is a perfect ergonomic station including a lot of functions with an attractive price.

The unique feature of the PRECITEC® station is the small movement in the Z-axis whereas the X- and Y axis movement are realised by moving the portal construction on smooth gliders. This system improves its strength and accuracy. It increases also the working area giving to PRECITEC® place Nr 1 in the market (registered model).

The solid reliable construction provides a better grip for the operator with a larger working area of 350 x 400 mm.

- Perfect ergonomics
- Compact station with the best working area of the market
- Low cost machine
- Compact base but very efficient working area of 350 x 400 mm
- Can be used by either right or left handed operator without change in configuration
- A double arm support assures a comfortable position for the operator
- Sensitive head with 360° rotation of pipette
- Efficient lighting built-in the arm
- Vacuum pump integrated in the assembly unit
- Magnetic board supports
- Storage containers for SMD's with spring closing lid
- Optional support for a solder paste dispenser or soldering / desoldering stations

The Pick and Place station PRECITEC® is delivered complete with :

- Set of different needles
- Set of needles with different Ø of rubber discs for the prehension of big components
- 3 Magnetic boards
- 18 small storage containers for SMD's with spring closing lid.

Technical characteristics  
Working area  
Placement accuracy  
Rate  
Working temperature  
Sound level  
Ext. Dimensions L x l x H  
Net weight  
Electrical supply

423177

Description	Mftrs. List No.	Order Code	Price Each		
			1+	+	+
Precitec® Station	F31110	112-0348	3,020.90	--	--

£ € **40,000 PRICES REDUCED**

**Visual assistance through video**  
**HELIOS II**



Autonomous visual inspection system. Suits to verify solder paste, glue, different types of fluids and SMD installation before and after reflow.

The HELIOS II version adapts to pick and place equipment as PRECITEC® and SMT3000 to be used as a visual assistance during installation.

The HELIOS II version for PRECITEC® & SMT3000 includes:

- 1 colour television or a combined recorder/television (recommended for education)
- 1 high resolution camera mounted on handling arm with rotation around the prehension head.

The HELIOS II configuration is delivered with a audio/video cable. The camera can be connected to any kind of computer, recorder and television with a audio/video inlet. For the combines version television/recorder, the video outlet permits recording a video cassette of the work already done (recommended for education).

403600

Description	Mftrs. List No.	Order Code	Price Each		
			1+	+	+
HELIOS II	H41036	112-0349	715.77	--	--

**Professional manual dispensers**  
**CMS 350 DOTTY, CMS 450 DOTTY**



350 DOTTY



450 DOTTY

The professional units for dosing of glues, solder pastes as well as low viscosity products. The dispensers CMS 350 DOTTY and CMS 450 DOTTY can work autonomous or in combination with a pick & place unit. The CMS 450 DOTTY model can be connected to our 3 axes TECHNODRILL machine to make a automatic 3 axes dispenser assisted by computer.

- Facility of use
- Different functioning uses
- Light
- Best quality/price ratio for performance without equal
- Compacts
- 10 programmes (CMS 450 DOTTY)

The DOTTY dispensers can work under many different ways:

**Manual:** pushing on the pedal, the product deposit will be done when the control is done. Getting of the pedal will stop the deposit.

**Semi-automatic:** pushing on the pedal, a x quantity of deposit is done once. You need to push again on the pedal to start a new deposit.

**Automatic:** remaining on the pedal, a x quantity deposit is done every x repetitions until the pedal is getting of.

**Learning (for CMS 450 DOTTY model only):** This programme automatically defines deposit and repetition times according to work to do. You just need to make 10 manual deposits depending on the requested rate and the unit will analyse, making an average of appropriate times. Once learning mode is finished, the unit will get back to automatic mode.

The dispensers are delivered complete with a set of needles, a set of suction cups, a 10cc syringe, a foot pedal control.

To be connected to a compressed air network or on a compressor

Technical characteristics  
Pressure max.  
Power  
Sound level  
Using pressure  
Ext. Dimensions L x l x H  
Net weight  
Electrical supply

403601

Description	Mftrs. List No.	Order Code	Price Each		
			1+	3+	5+
CMS 350 DOTTY	F41014	112-0345	467.57	--	--
CMS 450 DOTTY	F41020	133-2738	567.57	552.63	528.52

**Need a better price?**

Buy more and save more with our volume pricing service.



Contact us now:  
Web: [www.farnell.co.uk](http://www.farnell.co.uk)  
Phone: 08447 11 11 11



Processing Equipment - continued

Reflow oven, forced convection for prototypes FT02



FT02 oven has been conceived to the reflow of solder paste and polymérisation of the glues for prototyping. FT02 oven is compatible with high temperature alloys and above all "lead free" ones thanks to its new heating system as well as its electronics.

It includes in line many functions as 10 programmes memorisation, information display upon LCD monitor, a wide viewing window to supervise the process.

For a better safety, FT02 includes a double window with air circulation to avoid any burning risk as well as a blocking door opening to avoid any unwanted opening.

- Complete view of the card thanks to a large window
- Compact model, but working area of 190 x 290 mm
- Heating through forced convection
- Temperature control by microprocessor
- Digital display of different advises: temperature and time
- Easy programmation for immediate control
- Safety: double window with air circulation, closing door access

Technical characteristics	Working temperature
Working area	Thermic stabilisation time
Heating	Ext. Dimensions L x l x H
Quartz heating elements	Net weight
Temperature control	Electrical supply

403604

Description	Mfrs. List No.	Order Code	1+	+	+
FT02 oven	F31114	112-0351	1,432.13	--	--

5

Reflow oven, forced convection - FT 05



The reflow oven FT05 is a new generation professional oven. It was created to work with the new high temperature alloys, including lead free alloys in force on the 1st of July 2006.

FT05 Key features: Complete view of the card through a large window Compact model but offering a reflow working area of 350 x 400 mm Display on LCD screen of the different advice Memorisation of 10 programmes in line Compatible for high temperature alloys, above all lead free Heat through forced convection. Temperature control by microprocessor. Compatible with SMTix® software Very easy programmation for a simple use Safety: double window with air circulation, locking of the access door, extraction pipe for solder fumes, filtration unit for solder fumes as an option

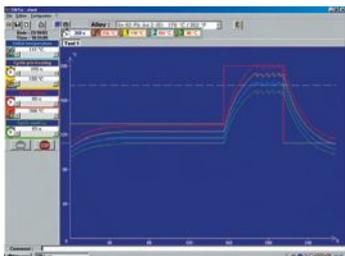
FT05 is suitable SMTix® software (option).

Technical characteristics	Working temperature
Working area	Thermic stabilisation time
Heating	Ext. Dimensions L x l x H
Quartz heating element	Net weight
Temperature control	Electrical supply

403605

Description	Mfrs. List No.	Order Code	1+	+	+
FT05 oven	F31112	112-0352	3,022.24	--	--
Filtration unit for solder fumes	I51025	112-0357	751.87	--	--

The SMTix® software For FT05 oven



The SMTix® software permits to profile the temperature of the FT05 reflow oven. It includes 2 modes: a "Test"-mode to create reflow profiles and a "Manufacturing"- mode to set the parameters of the oven. Very simple to use, the SMTix® software is a precious help.

Connected to the oven thanks to a simple RS232 link, SMTix® automatically detects the probes connected to the oven.

In the "Test"-mode: this software parameters the oven to test profiles on boards, to view the curve tracing, to validate the tests and to store the data in one of the 10 memories of the oven or computer. Possibility to print the tests done and to add comments to them.

In the "Manufacturing" mode: set of the parameters of the oven from validated and memorised tests. View of the oven probe and curve tracking.

The SMTix® software also detects the problems: broken lamps, dirty oven...

- Easy of use
- Is working in Test or manufacturing mode
- Tests printing in which you can add comments
- Pilot the oven from validated recorded tests
- View of the different temperature probes: 1 in the oven and 3 external

403606

Description	Mfrs. List No.	Order Code	1+	+	+
Logiciel SMTix®	F42302	112-0353	327.36	--	--

Sensitive drilling machine TECHNO 007 MR



- In line coupling for dust suction
- Large working area
- Integrated low tension light
- Flexible and precise chuck descent

Technical characteristics  
Adjustable rotation speed  
Capacity  
Work table  
Spindle travel  
Ext. dimensions  
Net weight  
Power  
Electrical supply

423170

Description	Mfrs. List No.	Order Code	1+	3+	5+
Drilling machine	DP593(FR)	126-7771	600.15	560.14	525.14

Drilling/milling machine TECHNODRILL



Protection cover



With TECHNODRILL, etch, drill and mill plastic, metal and PCBs. Drilling & milling at high accuracy of PC controlled. Also etches front faces made of aluminium or plastic. TECHNODRILL is the perfect tool to make cutting, etching, drilling, milling and manufacturing...

- Immediate training
- General-purpose: drilling, milling...
- Compatible with any kind of files
- Very accurate guiding of axis
- Real 3 axis
- Piloting in micro-step (avoids mechanical resonances)
- Piloting software GALAAD 3 (with free updating)
- Built-in electronic, microprocessor 32 bits
- Tool feeler
- Safety: mechanical and software fastening
- Built-in light
- Cover as an option

TECHNODRILL: Configurations

**A Education configuration** (item code C11 000). The machine is delivered with a 900 W spindle and the software GALAAD 3 (free updated and network version).

**A Industry configuration** (item code C11 020). The machine is delivered with a 900 W spindle and the software GALAAD 3 (free updating).

TECHNODRILL is a real 3 axes 3 D. The software GALAAD 3 is an open software allowing HPGL, ISO, EX-CELLON, GERBER, GCODE, DXF files. The software helps making milling PCBs.

Axis X, Y, Z	215 x 360 x 90 mm
Plate (working area)	215 x 320 mm
Resolution	0,0025 mm in microstep (0,1 mil *)
Repeatability	+ or - 0.005 mm (0,2 mil *)
Spindle power	900 W
Spindle speed	8000 à 26000 turns/min
Chargement d'outil	chuck 3.17 - 8 mm
Drilling rate	Semi-automatique
Track width min	120 holes/min (ø 0,8)
Insulation mini	0,2 mm (8 mil *)
Ø drilling mini	0,2 mm (8 mil *)
Moving speed	0,3 mm (12 mil *)
Linearity guiding	50 mm/s maxi
Motor X, Y, Z	Screw & ball screw (step 4 mm)
Frequency	Motors step by step 1/2 to 1/16 steps by adjustable turn (microstep)
Table	Ball vice and precise screw
Interpolation	Up to 50 KHz
Power Supply	Iron XC48 rectified 0,05
Net weight	3 axis
Ext. Dimensions L x l x H	220 V - 50 Hz - 0,8 A
Tool positioning	64 Kg
Protection cover	500 x 720 x 590 mm
Sound level (with cover)	Included
	In Option
	<65 dBA
	*1 mil = 25,4 mm / 100 = 0,0254 mm

403599

Description	Mftrs. List No.	Order Code	1+	5+	10+
Education Configuration	C11000	<b>112-0354</b>	4,621.35	--	--
Industry Configuration	C11020	<b>112-0355</b>	5,002.93	--	--
Protection cover	C12705	<b>133-2737</b>	818.47	--	--
10A Relay box	C12704	<b>133-2735</b>	160.52	149.81	140.45
Drilling plywood	EP116	<b>NEW 164-3116</b>	24.24	23.25	--

CNC Machine for Isolation Routing



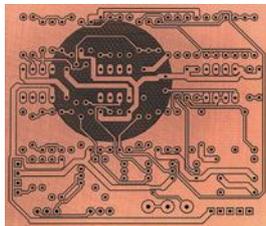
CCD2 CNC machine



CNC drilling



CNC Routing



Example surface milled PCB

- Rigid and flat construction with low moving weights and high quality bearings for high-speed positioning.
- Machine bed with universal fixture system, suitable for both clamps and ref. Pins.
- KaVo high speed, 60,000 rpm spindle motor, 150 W, including 1/8" (3.175 mm) chuck.
- Heavy-duty stepper motor on Z-axis for true milling capability and correct tool speed.
- Standard travel area: 320 x 270 x 30 mm, Sizes (mechanics) approx: 70 x 55 x 30 cm3 (WxDxH)
- Easy semi-automatic tool change, simultaneously 15 out of 99 tools per job.
- Smallest drill diameter: 0.3mm. Drill speed: 5 hits/s (= 18 000 holes per hour)
- Integral depth limiting device for (isolation) milling and engraving on uneven surfaces
- Driver software for Excellon, Sieb & Meyer or HP/GL data
- All machine parameters software controlled and configurable, including Z axis
- Step definition: 1 mil (= 0,0254 mm), precision +/- 1 step
- Maximum speed per axis: 93 mm/s (= 5.6 m/min)
- Sizes (mechanics) approx: 70 x 55 x 30 cm3 (W x D x H)
- Required desktop size: approx. 80 x 80 cm. Weight: approx. 23 kg

The CCD2 is a CNC machine with a processing area of 270mm x 320mm for drilling and routing PCBs and other materials. With additional 'IsoCam' software the machine can be used for 'Isolation Routing' whereby the unwanted copper to produce a PCB is removed mechanically rather than being chemically etched. The CCD2 includes a Kavo high frequency spindle (60,000 rpm) that accepts industry standard tools and has software controlled Z-Axis for optimum processing. Supplied with vacuum for dust extraction. A PC is required to run the machine.

ISOCAM isolation routing software.

Software to manipulate a Gerber photoplot file into a file suitable for isolation routing, the method of routing whereby the unwanted copper to produce a PCB is removed mechanically rather than being chemically etched.

CCD2 enclosure

A floor standing enclosure for the CCD2 that greatly helps contain the noise of the machine. A

clear plastic hinged lid enables easy access to the CCD2 machine. The enclosure has lockable wheels and also features a lockable storage cabinet where tools and accessories such as the vacuum extractor can be stored. Dimensions 620 x 770 x 1140mm.

Consumable accessories

13-111050 Hawera 846 Carbide router 30 tip for isolation routing and fine engraving  
700-013-8 60° Router for isolation milling and rub out

SC/FT Chip Breaker Routers

Tungsten Carbide printed circuit board routers with 1/8" (3.175mm) shank. The special geometry offers exceptional swarf removal, reduces radial load significantly and produces a very fine surface finish. Total length 38mm. Some popular sizes are offered below although other sizes from 0.8mm to 3.175mm are also available.

13-111160 SC/FT Chip Breaker Router 0.8mm  
13-111163 SC/FT Chip Breaker Router 1.5mm

Drill Entry / Exit Board

High quality drill entry and exit board for precision drilling with a CNC drilling machine  
400-265 0.8mm Entry board  
400-266 1.5mm Aluminium Exit Board

240790

Description	Mftrs. List No.	Order Code	1+	Price Each 10+	25+
CNC Drilling / Routing machine	700-001	<b>120-1822</b>	6,592.43	--	--
IsoCam - Isolation routing software	700-002	<b>413-8004</b>	752.60	--	--
30 degree router bit	13-111050	<b>413-8028</b>	12.85	12.40	11.90
60 degree router bit	700-013-8	<b>413-8030</b>	10.67	10.38	9.96
0.8mm phenolic entry board for CNC drill	400-265	<b>413-8041</b>	1.61	1.29	1.08
1.5mm phenolic exit board for CNC drill	400-266	<b>413-8053</b>	3.74	3.02	2.50
0.8mm chip breaker router bit	13-111160	<b>413-8065</b>	3.85	3.66	3.47
1.6mm chip breaker router bit	13-111163	<b>413-8077</b>	3.85	3.66	3.47

Heavy item, special delivery conditions apply

Low Cost CNC Kit



Note: PCB drill and power supply are not included

Milford Instruments

- Full 3-Axis motion
- Powerful 200 step/rev stepper motors
- Working area of approx 200x150x75mm
- Approx 20 holes per min drilling rate
- Resolution of up to 0.1mm on any axis
- 12-18v DC Power supply requirement at 2A (excluding drill)
- 10A relay for drill control plus spare relay
- Piezo alarm facility
- End-of-travel limit switches
- Comprehensive Windows Driver software
- Accepts standard Excellon Drill files
- Pre-built processor board
- Wooden components ready machined
- Diskette includes frame component details in AutoCad .dxf format
- Self calibration facility
- Detailed user manual

Build and develop your own CNC machine. This 3-Axis Machine will appeal to hobbyists and educational establishments alike. The design uses low cost but effective materials to achieve a standard drilling accuracy of up to 0.1mm (2.5 thou). All woodwork components are ready cut for accurate assembly and each of the 3 axes is driven by a powerful 200 steps/rev 12VDC stepper motor with tension cord for backlash free operation. The design has been developed to require minimal alignment during construction and uses limit switches on each axis for set-up and over-travel protection. Includes two software controlled 10A relays for drill control etc. Shipped with 3 Windows programmes (.exe and VBasic source code provided): PCBDrill, Replay and Plot-It.

Processor board is fully built and tested and uses a pre-programmed PIC. This may be changed out for a Parallax BASIC Stamp2 chip allowing the user to develop their own machine programme (the standard programme used in the machine is supplied on diskette. Kit includes all wooden components and hardware, stepper motors, slides, driver board PCB and components, software diskette and assembly manual.

Requires 12-18v DC @ 4A power supply and a suitable mini-drill.

240818

Description	Order Code	Price Each 1+
Low Cost 3 Axis CNC Machine	<b>414-0369</b>	273.77

Drill



- Hand held d.c. drill
- Supplied with four collets 0.5mm to 2.0mm
- Operates from a d.c. power source 6V to 16V
- No load speed 14,500 rpm and torque of 500g.cm

Processing Equipment - continued

Drill - continued

204685

Order Code	Price Each
142-035	1+ 14.95

"High Speed", 230V



Drill L=200, Dia.=50



- Multipro Model 3950 is a high speed multipurpose tool
- No transformer needed
- Powerful motor (10,000 rpm to 37,000 rpm)
- Light, compact and easy to handle
- Dual bearing shaft
- Precisely centred 3.2mm collet
- Shaft lock
- Supplied in a storage case with 40 accessories.

Accessories	Mftrs. List No.	Order Code
Collet 2.4mm (3/32")	481	109-136
Collet 1.6mm (1/16")	482	109-137
Collet 0.8mm (1/32")	483	109-138
Cut off disc 22.3. (7/8") dia. 0.64 (0.025") thick. Supplied as a pack of 36	409	109-139
Mandrel for cut off disc	402	109-140
60 grit sanding drum 12.7mm (1/2") dia.	407	109-141
Flexible drive shaft, 1 MTR	2.615.022.5PD	109-142

204686

	Order Code	1+	4+	20+
Collet 2.4mm	109-136	1.24	1.18	1.15
Collet 1.6mm	109-137	2.48	2.36	2.29
Collet 0.8mm	109-138	2.48	2.36	2.29
Cut-off Disc (pk 36)	109-139	6.21	5.90	5.75
Disc mandrel	109-140	1.06	1.01	0.97
Sanding drum 60 Grit 1/2 Diameter	109-141	1.82	1.73	1.69
Collet 2.4mm	109-136	1.24	1.18	1.15
Router Table	725-5688	34.60	31.14	29.41

5

Two Speed Production



H=390  
W=127  
D=410

- Production quality PCB drilling machine
- Robust construction continuous use
- Drill head has internal spring balance and adjustable endstops
- Internal fan to assist in swarf removal

Speed	14000 or 18000
Throat clearance	150mm
Height under chuck	44mm
Chuck	4mm maximum
Power	100W
Voltage	240/250V ac
Weight	12kg

No plug supplied

FOR SUITABLE REPLACEMENT BULB SEE ORDER CODE 113-9428

204695

	Order Code	Price Each
PCB Drill	457-656	1+ 424.56
Motor Brushes (pair)	457-668	4.50

Precision Drill/Grinder FBS 240/E

For Drilling, Milling, Grinding, Polishing, Brushing, Cutting and Engraving



- Complete with 40 quality inserts in a sturdy plastic case
- With keyless chuck with 0.5 - 3.2mm capacity
- Stable housing of POLYAMIDE with soft components in the finger grip area
- The maximum speed of 20,000rpm is continuously variable down to 5,000rpm
- The full wave electronic speed control results in virtually constant torque, even at lower speeds
- This facilitates micro drilling, brushing and polishing
- The spindle runs in a precision ball bearing and is fitted with a lock button
- 20mm collar fits MICROMOT drill stands and vices
- The machine is fitted with a quality, balanced, low noise motor with high life expectancy
- The FBS 240/E can also be used with the MICROMOT steel collets (Best-Nr. 107-5634)

**Technical Data:** 5000 - 20000rpm; Maximum power consumption 100W; Voltage 220 - 240 V; Length 200 mm; Weight: 450 g; Insulated according to class 2 requirements; keyless chuck with 0.5 - 3.2mm capacity

417487

Mftrs. List No.	Order Code	1+	18+	20+
FBS 240/E	107-5587	48.32	45.93	43.49

Professional drill/grinder IB/E

For Drilling, Milling, Grinding, Polishing, Cleaning, Cutting and Engraving.



- Ideal for mechanics, model builders, jewellers, opticians, artists and electronic enthusiasts
- Quiet, powerful 100W motor with full wave electronics for speeds between 5,000 and 20,000rpm
- Streamlined head of die-cast aluminium for exact bearing seats and optimal stability
- Ball bearing spindle, of ground steel, with lock button for rapid cutter changing
- Quality without compromise: isolation to class 2
- High concentric accuracy (max. 3/100 mm): no juddering or knocking
- With 34 bits & cutters of industrial quality. All shafts ø 2.35 mm. Complete with six triple slit steel collets covering 1.0 to 3.2 mm

**Technical Data:** 5.000 - 20.000rpm. Power consumption (max) 100W. Voltage 220- 240 V. Stable head of die-cast alu and POLYAMIDE main housing. Length 230 mm. Weight 500 g. Insulated to class 2. The 20mm collar allows fitting of optional drill stands, horizontal stands. Supplied with 34 bits and cutters in a stable plastic case.

417494

Mftrs. List No.	Order Code	1+	19+	21+
IB/E	107-5588	74.30	70.58	66.87

Precision Drill MICROMOT 50/E

For Drilling, Milling, Grinding, Polishing, Brushing, Cleaning, De-Rusting, Cutting, Engraving, Marking



MICROMOT 50/E

- Ideal for electronic hobbyists, model builders, tool and die makers, jewellers, opticians, artists, chiropractors, dental technicians, etc
- Useable on any workable material e.g. steel, precious metals, glass, ceramics, plastics, precious stones
- 12V supply allows the safe use of coolant, e.g. when grinding and cutting semi-precious stones
- Stable housing of fibreglass reinforced POLYAMIDE. With soft component in the finger grip area for extended use
- The diameter of only 35mm makes it easy to handle
- The weight of 230g, quietness and effortless drive via the special motor, ground spin-

dle and collar bearing all contribute to the ergonomic design

- The high quality steel collets ensure accurate clamping of the cutters
- No juddering or knocking
- MICROMOT transformers of at least 1A are recommended (**Order Code 107-5600**)

**Technical Data:** With thyristor electronic speed control. 5.000 - 20.000rpm. Phase angle control and feedback effect circuitry yield high torques, even at low speeds. Six MICROMOT collets for shanks (1.0 - 1.5 - 2.0 - 2.4 - 3.0 and 3.2 mm). Power consumption is 40W max. Length ca. 220 mm, Weight ca. 230 g.

417500

	Mftrs. List No.	Order Code	Price Each		
			1+	20+	22+
Precision Drill	MICROMOT 50/E	<b>107-5590</b>	26.39	25.07	23.75
Transformer	NG 2/S	<b>107-5600</b>	15.07	14.33	13.59

**Model Building and Engraving Set**



- Complete set with mains adapter, MICRO-MOT dill/grinder 50/E and 34 industrial quality cutters

With MICROMOT dill/grinder 50/E. Includes 34 industrial quality cutters: 1 diamond grinding bit, 1 fine miller, 0.5 and 1.0mm micro-drills, 1 brass brush, 4 carborundum grinding bits (cylinder, sphere, disc and cone shaped), 1 saw blade, 4grinding wheels 22 x 3.0mm (2 carborundum, 2 silicon carbide), 20 cutting discs, 1 arbor. 6 MICROMOT collets from 1.0 - 3.2mm are also included. With mains adapter for 220 - 240V operation (12V, 1.0A). Packed in an attractive plastic case,

417504

Mftrs. List No.	Order Code	Price Each		
		1+	21+	23+
28515	<b>107-5591</b>	52.82	50.18	47.54

**Tungsten Carbide Router Bits**

Kelan Circuits

3.175mm, 1/8" Shank



- "Fish Tail" end cut for high quality, predictable cutting

- Clean cut and longer life than diamond burr types

204643

Router Size	Order Code	Price Each		
		1+	+	+
1.00mm	<b>500-537</b>	8.11	--	--
1.20mm	<b>500-549</b>	8.11	--	--
1.30mm	<b>500-550</b>	8.11	--	--
1.60mm	<b>500-562</b>	8.11	--	--
2.40mm	<b>500-574</b>	8.11	--	--
3.175mm	<b>500-586</b>	8.11	--	--

**Tungsten Carbide Drill Bits**



3.175mm, 1/8" Shank



- For use in Single-Sided PCB drilling applications
- Designed for drilling small through-holes with good chip discharge
- Enlarged stainless steel shank for better centring and torque transfer

- Drill bit manufactured from solid tungsten carbide
- Overall length 38.1mm (1.5")

334521.343257

Drill Size	Order Code	Price Each		
		1+	10+	25+
0.5mm	<b>475-5200</b>	2.78	2.61	2.30

**Tungsten Carbide Drill Bits**

3.175mm, 1/8" Shank



- For use in Multi-layer PCB drilling applications
- Designed for drilling Glass Fibre based printed circuit boards
- Enlarged shank for better centring and torque transfer

- Drill bit manufactured from solid tungsten carbide
- Overall length 38.1mm (1.5")

334522.343276

Drill Size	Order Code	Price Each		
		1+	10+	25+
0.8mm	<b>475-5248</b>	2.88	2.69	2.39
1.0mm	<b>475-5250</b>	2.88	2.69	2.39
1.3mm	<b>475-5261</b>	3.07	2.90	2.57
1.6mm	<b>475-5273</b>	3.07	2.90	2.57
2.0mm	<b>475-5285</b>	3.30	3.07	2.73

**Tungsten Carbide Drill Bits**

3.175mm, 1/8" Shank



- For use in PCB drilling applications
- Enlarged shank for better centring and torque transfer
- Manufactured from solid tungsten carbide

204689.401160

Drill Size	Order Code	Price Each		
		1+	+	+
0.50mm	<b>500-513</b>	4.03	--	--
0.60mm	<b>500-525</b>	3.58	--	--
0.80mm	<b>222-290</b>	3.65	--	--
1.00mm	<b>222-306</b>	4.03	--	--

**Carbide drill bits**



- Monopiece. Queue reinforced 3,17
- In stock from 0,4 mm to 3,17 mm
- Minimum drilling speed 20 000 tr/min
- Most little is the diameter, higher will be the speed
- Descent speed from 1,6 to 4 m/min

477464

Diameter	Mftrs. List No.	Order Code	Price Each		
			1+	5+	10+
0.6mm	DU66	<b>141-8450</b>	2.92	2.88	2.84
0.7mm	DU67	<b>141-8451</b>	2.92	2.88	2.84
0.8mm	DU68	<b>141-8453</b>	2.92	2.88	2.84
0.9mm	DU69	<b>NEW 164-3108</b> ●	3.08	2.96	--
1mm	DU70	<b>141-8454</b>	2.92	2.88	2.84
1.1mm	DU71	<b>NEW 164-3109</b> ●	3.08	2.96	--
1.2mm	DU72	<b>141-8455</b>	2.92	2.88	2.84
1.3mm	DU73	<b>NEW 164-3110</b> ●	3.08	2.96	--
1.4mm	DU74	<b>141-8456</b>	2.92	2.88	2.84
1.5mm	DU75	<b>NEW 164-3111</b> ●	3.08	2.96	--
1.6mm	DU76	<b>141-8457</b>	3.00	2.96	2.92
2mm	DU80	<b>NEW 164-3112</b> ●	3.08	2.96	--
2.5mm	DU85	<b>NEW 164-3114</b> ●	3.08	2.96	--
3.17mm	DU91	<b>141-8458</b>	2.92	2.88	2.84

**Carbide diamond milling bits**



**CARBIDE MILLING BIT**

- Monopiece carbide tool
- Queue 3,17 mm - front face

Ømm	effective L (mm)	Rpm	Advance m/mm	Mftrs List No.
2.0	8,0	16 to 23 000	1.0 to 1.8	DUF01
2.5	9,5	16 to 23 000	1.0 to 1.8	DUF02

477539

Mftrs. List No.	Order Code	Price Each		
		1+	5+	10+
DUF01	<b>NEW 164-3115</b> ●	6.39	6.13	--
DUF02	<b>141-8459</b>	6.05	5.97	5.89

**Milling bit for marmer surfaces**



**DU202**

Special milling bit for marmer surface diameters Ø 16 mm, Ø queue 8 mm to be used with a special plier (Ref. EP1061).

477621

Mftrs. List No.	Order Code	Price Each		
		1+	5+	10+
DU202	<b>NEW 164-3117</b> ●	29.93	28.70	--

**Angled engraving bit**



- Monopiece carbide tool - Queue 3,17 mm - conical angle 90°
- Length external: DW101010 = 38mm and DU201 = 33mm
- High precision tool to etch tracks of 0,2 mm for DW101010 and 0,3mm for DU201

477627

Mftrs. List No.	Order Code	Price Each		
		1+	5+	10+
DW101010	<b>141-8460</b> ●	29.04	28.64	28.27
DU201	<b>NEW 164-3107</b> ●	23.42	--	--

Storage and Tools

PCB Rack



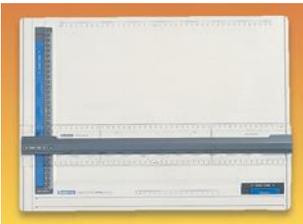
H=315  
W=320 (standard)  
D=200 (inc. handles)

The antistatic printed circuit rack moulded in carbon loaded polypropylene is designed for safely holding PC boards during all stages of assembly, cleaning and testing. The modules may be combined to give any size, height, width or depth and will accommodate any width of PCB from 15 to 290mm. Two front handles are used to hold the assembly. Supplied complete with two wall mounting hooks, four back strips to prevent the PCB's from sliding out and two 320mm aluminium extrusion rails with nuts and bolts. May be used for transporting PCBs, in plating, etching and washing applications (subject to acceptance of aluminium and steel nuts and bolts in the solutions).

211641

	Order Code	1+	5+	10+
Rack module	147-394	21.76	20.61	19.71

A3 Portable



H=376, W=517, D=22

- A slip proof DIN A3 drawing board manufactured in a break resistant washable material
- Supplied with a parallel motion draughting arm which is firmly locked in guide grooves at both ends, with a single handed operation, providing a rigid base line
- The draughting arm also features a protractor and a 1 to 16mm diameter circle template
- Paper is held in position by two sheet clamps

206856

Mfrs. List No.	Order Code	1+	5+	20+
661A3	177-014	52.59	47.36	44.29

Lightweight Aluminium



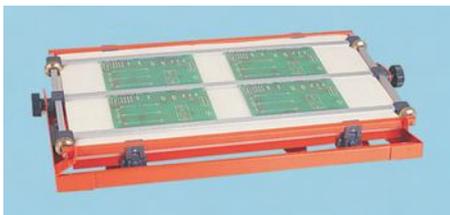
- Lightweight aluminium framed jig
- Removable centre bar and adjustable top and bottom rails
- Bench fixing via holes in corner mouldings or metal bracket supplied

204628

Mfrs. List No.	Maximum Board Sizes		Unit Weight (kg)	Order Code
	Single Row	Double Row		
WFO	1-230 x 280	2-110 x 280	0.04	439-757
WF1	1-230 x 280	2-110 x 510	4.54	439-769
WF2	1-230 x 280	2-175 x 510	5	439-770

Mfrs. List No.	Order Code	1+	3+	10+
WFO	439-757	166.95	147.56	125.81
WF1	439-769	157.64	133.41	113.62
WF2	439-770	200.36	170.01	145.72

Steel



- Steel construction PCB assembly jig
- Lid coated with 25mm of non-conductive foam
- Bench mounting
- Max board size 500 x 220mm
- Minimum board size 45mm using additional centre bar kit

204662

	Order Code	1+	3+	10+
500 x 350mm Jig	145-308	124.80	121.33	118.04
Centre bar kit	145-309	9.10	--	--

Rapid Assembly Circuit Board Holder



A very high quality, fully adjustable clamping mechanism, ideal for supporting circuit boards during repair. The holder features a four position, spring loaded locking mechanism, allowing the board, once clamped, to be simply moved in every direction through 36°. The vice is also fully height adjustable, allowing a board to be situated vertically between 50 to 340mm from the bench level. The board clamping arms are also adjustable and can be mounted on any of the four sides of the cross-supporting bar. The clamping arms are also fully adjustable in width from 11 to 245mm. The vice is manufactured from high grade, chrome vanadium steel with a cast base for weight and stability which can be bench mounted for added stability.

- Easy turn adjusting wheels for speedy adjustment
- Manufactured in the USA to precise, exacting standards
- The vice weighs 2.9kg

236114

Order Code	Price Each
394-9576	1+ 69.83

Assembly Jig PCSA with ESD secure spare foam

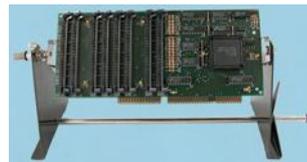


- The series PCSA assembly jigs are ideally supporting at assembling and soldering PCBs
- The jigs can easily be sectioned to its single components and mounted into other combinations
- Components will securely be fixed while cutting and soldering by proof cushion made of foam

334135

Mfrs. List No.	Useable size in mm	Order Code	1+	3+	5+
<b>Assembly Jig</b>					
PCSA-0	210 x 220	468-1733	57.44	54.56	51.70
PCSA-1	280 x 290	468-1745	88.84	84.40	79.96
PCSA-2	520 x 280	468-1757	113.16	107.45	101.80
PCSA-4	520 x 410	468-1769	150.85	143.26	135.72
<b>ESD secure spare foam</b>					
PCSA-0.2	for PCSA-0	468-1770	4.44	4.21	3.99
PCSA-1.2	for PCSA-1	468-1782	9.89	9.40	8.90
PCSA-2.2	for PCSA-2	468-1794	12.76	12.12	11.47
PCSA-4.2	for PCSA-4	468-1800	15.71	14.92	14.14

Board holder



- Versatile PCB-Holder
- Ideal for populating, desoldering and re-pairing printed circuit boards
- The board can be turned through 360°
- Dimensions: 300 x 120x 120 mm
- Max. board length: 250 mm
- The holder is supplied without the printed circuit board



473284

Mfrs. List No.	Order Code	1+	5+	10+
PC-40	136-0332	30.53	29.01	27.49

ESF120 mounting frame for printed circuit boards



L = 320 W = 160 H = 140

The mounting frame satisfies all requirements made when mounting, soldering and removing printed circuit boards, without the need for additional tools.  
 -Clamping area max. 160 x 235mm, Double European format  
 -Pivoting range 360° with 15° latching  
 -Side parts can be steplessly adjusted, with clamping  
 -Moveable arms with clamping pads for securing the components  
 -High degree of stability on account of integrated rubber feet  
 -Clamping of round and square parts on account of the multi-sided profile of the clamping jaws

Dimensions in mm

2466424

Mftrs. List No.	Order Code	1+	5+	10+
ESF120 anti-static	854-414	56.11	54.43	52.79

**PCB Storage Rack**



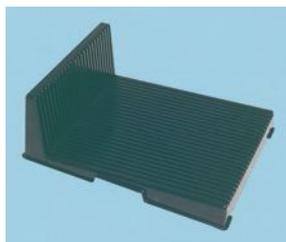
- Storage rack for printed circuit boards
- 25 board capacity

H=83, W=274, D=210

204668

Order Code	1+	10+	20+
141-322	15.07	12.13	10.47

**Conductive PCB Racks**



- Conductive polypropylene
- Holds up to 25 circuit boards
- Conforms to IEC 61340-5-1

H W D

175-835	125	265	350
175-836	93	272	208

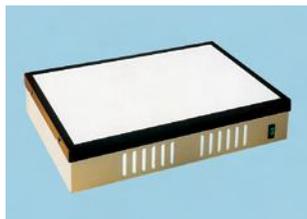
Mftrs. List No.  
 K 18 24=175-835, K 18 22=175-836



211656

Rack Depth	Order Code	1+	10+	50+	100+
350mm	175-835	26.26	25.06	23.80	18.77
208mm	175-836	20.15	19.76	17.08	12.49

**Artwork Lightboxes**



- High quality lightboxes
- Glass top with opal perspex diffuser
- Mild steel case

Operating voltage 240V a.c. IEC fused inlet

Size	Viewing Area	Tubes	Mftrs. List No.	Order Code
A3	304 x 454	2 x 15W	200-002	120-1816

204651

Size	Order Code	1+	5+	10+
A3	120-1816●	179.64	170.73	157.59

**Shears - PCB**



- Suitable for safely cutting PCB laminates
- Strong Perspex safety shield, safety latch
- Constructed from heavy gauge steel
- Bench mounting

Max cutting width	305
Base dimensions	440 x 245
Max cutting thickness	PCB laminates 2.0
Aluminium	1.5

204657

Shears 305mm	Order Code	Price Each
	320-5034	248.68

**PCB and Laminates, 457mm Cut**

**PC Drills**



H = 280, W = 645, D = 400

- A robust, bench mounting hand operated guillotine
- Cut width is 457mm
- Cuts a broad range of paper and plastic based products and laminates, aluminium and brass sheet
- The main structural parts are cast and all linear bearings are bushed for precise and easy movement
- The cutting area is protected on the material side by a transparent plastic guard. The blades are precision ground and accurately adjustable
- Spring loaded material clamp is fitted

Cutting capacity	Aluminium
Material	Brass
SRBP and Glass fibre PCB	

223274,401975

	Order Code	1+	+	+	+
Guillotine	483-930	498.00	--	--	--
Replacement blade set	483-941	75.01	--	--	--

**Bench Circular Saw KS 230**

For perfect straight cuts in wood, NF metals, plastic and PC cards



- The 58 mm diameter "Super-Cut" blade (included) cuts soft woods up to 8 mm, plastics (Pertinax too) up to approx 3 mm, NF metals up to approx 1.5 mm
- Fibreglass reinforced PC cards could be cut with the tungsten blade
- The 85 W VDE tested motor is quiet, operates off 220 - 240 V and has a prolonged life expectancy
- Power transmission by toothed belt via ball bearing, housed in sturdy casing, ensures the right blade speed for the job (approx. 5,000 rpm) with a doubling of torque and a good cutting depth
- Machined, die-cast aluminium table (160 x 160 mm)
- Adjustable fence with scale
- Graduated mitre stop
- The side door allows easy sawdust removal
- Overall size approx. 240 x 180 x 80 mm. Weight 1.8 kg

**Crosscut Blade "Super-Cut" NO 28 014**

58 mm diameter (10 mm bore). 80 alternately set teeth. Ideal for hard and soft wood as well as plastic and Pertinax. For fast, clean cuts. Teeth are individually set and sharpened. Superior cutting power!

**Solid Carbide Saw Blade NO 28 011**

50 mm diameter (10 mm bore). 0.5 mm thick fine toothed. Ideal for cutting fibreglass sheets, NF metals, duro-plastics and other difficult materials. **Diamond Blade NO 28 012**

50 mm diameter (10 mm bore). With 0.5 mm layer of class D107 diamond for cutting ceramics, as well as fibreglass sheets.

**Spring Steel Saw Blade NO 28 020**

50 mm diameter (10 mm bore). Fine teeth. Designed for precision cutting.



**Storage and Tools - continued**

**Bench Circular Saw KS 230 - continued**

For perfect straight cuts in wood, NF metals, plastic and PC cards - continued

**Tungsten Tipped Saw Blade NO 28 016**

50mm Ø x 1.1 mm (10 mm bore). 10 teeth. Used to cut hard and soft woods, PC cards, PERTINAX and Alu.

**Tungsten Tipped Saw Blade NO 28 017**

50mm Ø x 1.0 mm (10 mm bore). 20 teeth. For extremely clean cuts of balsa, plywood. Can also be used for cutting PC cards and POLYCARBONATE.

491268

Mfrs. List No.	Pack Qty.	Order Code	1+	Price Each	74+
Bench Circular Saw KS 230	1	<b>150-1077</b>	80.87	72+ 76.82	74+ 72.77
				<b>Price per Pack</b>	
Diamond Blade	28012	<b>150-1078</b>	23.05	21.89	20.73
Crosscut Blade "Super-Cut"	28014	<b>150-1079</b>	8.22	7.81	7.39
Solid Carbide Saw Blade	28011	<b>150-1080</b>	27.59	26.23	24.82
Spring Steel Saw Blade	28020	<b>150-1081</b>	6.20	5.91	5.58
Tungsten Tipped Saw Blade	28016	<b>150-1083</b>	12.35	11.73	11.11
Tungsten Tipped Saw Blade	28017	<b>150-1084</b>	14.00	13.30	12.60

**Cut-off / Mitre Saw KGS 80**

For clean, safe cutting to length of NF metals, plastic and wood



28 729



28 732

- This machine is ideal for mitre cuts: the round worktable with clamped work piece rotate, not the head-stock!
- Laterally moving saw head to minimize distance between vise holding the work piece and kerf. For cutting without vibration and chattering.
- The fence and 45° mitre capability ensure identical lengths for picture frames.
- Comfortable grip with built-in switch and saw head release button.
- Tungsten carbide blade for NF metals, wood and plastic. Direct drive via a toothed belt.
- Round table made of die-cast alu, rotates 45° left and right. Positive stops in 15° increments.
- Integrated clamping system with fixed jaws. V-slot for round work pieces. Front side slot allows thin pieces to be clamped

**Technical Data:** 220 - 240 V. 200 W. 50/60 Hz. 4,000 rpm. Table size 230 x 230 mm. Weight approx. 6 kg. Consult the table for cutting capacities.

**Cutting capacity at 90° (right angle cut):**

Material Depth (mm)	Material Width (mm)	Material Ø (mm)
10	65	max. 25
18	50	
21	40	
5	25	

**Cutting capacity at 45° (mitre cut):**

Material Depth (mm)	Material Width (mm)	Material Ø (mm)
5	36	max. 20
10	30	
15	25	
20	18	

491278

Mfrs. List No.	Pack Qty.	Order Code	1+	Price Each	83+
Cut-off / Mitre Saw KGS 80	1	<b>150-1088</b>	131.33	81+ 124.77	83+ 118.20
				<b>Price Per Pack</b>	
Cutting disc	28729	<b>150-1089</b>	2.19	2.07	1.98
Tungsten tipped blade	28732	<b>150-1090</b>	21.06	20.03	18.96

**Guillotine shears**



- Strong and very effective guillotines
- Guaranteed cut quality.
- Pressure of the part to cut ensured by 2 gas rams.
- High mechanical advantage
- Very low cutting effort
- Hundreds of laboratories are equipped with this machine.
- Special iron blades

Special iron blades 360 x 1.6  
Dimensions L x w x H 610 x 450 x 300 mm  
Net weight 22

481317

Mfrs. List No.	Order Code	1+	Price Each	+	+
DP50	<b>420-8687</b>	1,576.18	--	--	--

**Guillotine shears CG 100 & CG 300**



New range of high accuracy guillotine shears to shear a wide range of metal, epoxy glass, plastic, aluminium, paper pieces. Working width of CG 100 model is 100 mm and 300 mm for CG 300 model. Jades are made of special iron.

Each shear is delivered complete with an adjustable stop. Blades are equipped of a double protection to work in total safety and a graduated rule is built in on the table.

Technical characteristics	CG100	CG300
Working area	100mm	300mm
Cutting capacity brass	6/10 mm	6/10 mm
Cutting capacity aluminium	13/10 mm	13/10 mm
Cutting capacity iron	6/10 mm	6/10 mm
Cutting capacity epoxy glass	16/10 mm	16/10 mm
Dim. L x l x H in mm	260 x 410 x 260	370 x 650 x 280
Net weight	5kg	14kg

449882

Description	Mfrs. List No.	Order Code	1+	Price Each	5+
CG100	C52115	<b>129-8016</b>	472.46	469.58	466.83
CG300	C52110	<b>129-8017</b>	647.87	644.48	640.57

**Manual punching and notching tool**



**Tool capacity:**

- Epoxy & bakelite thickness 16/10th mm
- Aluminium thickness 15/10th mm
- Plastic thickness 15/10th mm
- Iron thickness 12/10th mm

481224

Mfrs. List No.	Order Code	1+	Price Each	+	+
AR137	<b>420-8675</b>	54.92	--	--	--

**Micro Drill**



- Ideal for cleaning out PCB holes it is similar to a bradawl but with a cutting action
- It will start a hole or re-bore an existing one quickly and simply

225013.401257

Mfrs. List No.	Order Code	1+	Price Each	+	+
HB40	<b>107-232</b>	11.25	--	--	--

**Spot Face Cutter**



This cutter will remove the copper strips locally to make a copper break.

204678

Order Code	1+	Price Each	10+	20+	30+
<b>329-538</b>	7.12	6.39	5.17	4.36	

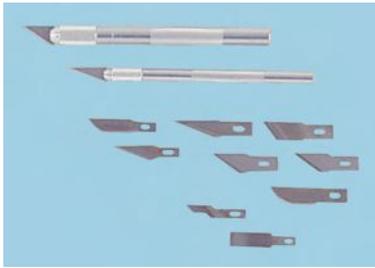
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Phone: **08447 11 11 11**

**Knife Set**



Knife set containing:- XN100 light duty and XN200 medium duty knives, 10 assorted blades, additional knives available. 204666

Mfrs. List No.	Order Code	1+	4+	20+	40+
XNS100	440-930	9.36	9.08	8.81	8.54

**Pens**



- Direct etching, acid resistant, refill tip, great ink tank.
- Ideal for prototyping application

481196

Mfrs. List No.	Order Code	1+	Price Each	+
AR20	420-8560	10.98	--	--
AR19	420-8572	1.74	--	--

**Chemicals**

**Cold chemical silver**



- Packaging 0.5 litres

423169

Mfrs. List No.	Order Code	1+	Price Each	+
AR18	112-0344	46.33	--	--

**Cold Chemical Tin**



- Pack Size: 0.5 litre

446123

Mfrs. List No.	Order Code	1+	Price Each	+
AR17	420-8584	9.79	--	--

**Tin Plating Powder**



- Chemical compound that will provide a bright plated finish on copper clad PCB
- Dissolves in water at 50°C
- Deposits 1.5 to 2 microns in the first half hour
- Highly solderable finish

Sufficient to make 5 litres (450g) board coverage 2.7m2 optimum processing temperature 20-22 C.

Full instructions supplied

204702

Order Code	1+	Price Each	5+	10+
450g (5 litres)	769-885	60.85	50.60	45.62

**pH-Meter, Densimeter AU51**



For monitoring the standard and boosted ferric chloride with a scale for etching with dishes and for foam etching machines as with a scale for spray and pulse etching machines in the same model.

Description Model 36/44 Mfrs. List No. AU51

477019

Mfrs. List No.	Order Code	1+	Price Each	5+	10+
AU51	141-8446	5.81	5.66	5.48	

**Etch Resist Strip Solution**



A photoresist stripper for removing unwanted photoresist from previously etched boards. Ideally it should be used at approximately 45 to 50°C in a heated process tank. 1 litre concentrate is sufficient to make up 5 litres of working solution.

311239

Mfrs. List No.	Order Code	1+	10+	25+	50+
600-019	440-2583	12.58	11.61	10.78	10.40

**PCB Cleaner**

**Abrasive Rubber**



- Eraser block for cleaning and degreasing copper-clad boards
- Abrasive rubber block cleans and polishes

204664

Order Code	1+	10+	Price Each	50+	100+
141-330	2.50	2.30	2.19	2.03	

**Developer/fixer AR15**



- AR15 Developer / Fixer: 1-litre bag
- For use with Posireflex film

469987

Mfrs. List No.	Order Code	1+	Price Each	5+	10+
AR15	133-2731	9.25	9.12	8.84	

**Remover / Developer**



- Positive developer for positive presensitization (AR45)
- Remover for machine stripping (AR61)
- Sachet to make 1 litre of product

446127

Mfrs. List No.	Order Code	1+	Price Each	+
AR45	420-8547	0.92	--	--
AR61	420-8559	2.05	--	--

**Chemicals - continued**

**Developing Trays**



- A pack of three plastic trays
- Use for developing photo-resist boards or etching copper clad boards

L=365, W=230, D=60

204667

3 Per Pack		Price Per Pack		
Order Code	1+	10+	50+	
141-321	14.59	13.27	10.44	

**Developing trays AR series**



- PVC tray - professional model for coppered plate

Dimensions mm	Mftrs. List No.	Order Code
240 x 300 x 60	AR 234	112-0342
300 x 400 x 80	AR 236	112-0343

403168

Mftrs. List No.	Order Code	1+	Price Each	
AR234	112-0342	9.25	+	+
AR236	112-0343	17.39	--	--

**5**

**Pumps for filling or emptying**



- Plastic syphon pumps, suitable for pumping acids, alkaline and caustic products, oils, thinners, etc.
- Output 6 l/min, suction tube 390 mm long, total length 527 mm, net weight 64 g, polyethylene material.

481237

Mftrs. List No.	Order Code	1+	Price Each	
BB7	126-7758	9.49	5+	10+
			9.02	8.58

**Ferric Chloride Stain Remover**



- Effective on sinks, plastics, lab coats, etc.
- Can also be used to clean machines
- 100gr tub

446124

Mftrs. List No.	Order Code	1+	Price Each	
AR36	420-8535	4.84	5+	10+
			4.51	4.51

**Iron Perchlorate Granules**



- Granules to be dissolved in water
- Sachet to make 1 litre

446125

Mftrs. List No.	Order Code	1+	Price Each	
AR37	420-8500	4.32	+	+
			--	--

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**Liquid Iron Perchloride**



- At 36° B for etching in a tank (AR412)
- At 41° B for bubble machines only (AR413)
- Superactivated ferric chloride (AR414) for spray machines or vertical machines
- 2.5 litre container

446126

Mftrs. List No.	Order Code	1+	Price Each	
AR412	414-8009	19.28	5+	10+
AR413	414-8010	19.73	16.51	14.61
			16.90	14.95

**Ferric Chloride Neutralising Kit**



Separates metals and acids. Neutralisation and control of the pH

**Contents:**

- 1 bag of product to neutralise 40 litres of saturated ferric chloride
- 5 pH meters for control
- 1 bag of gloves
- 1 pair glasses
- 1 set filters
- 1 bucket

241013

Description	Mftrs. List No.	Order Code	1+	Price Per Kit	
Ferric Chloride Neutralisation Kit	AU55	414-8034	26.87	5+	10+
				23.96	22.48

**Ferric Chloride Pellets, Liquid, Developer and Stain Remover**



- Ferric Chloride available as hexahydrus pellets, Liquid or Super Activated Liquid which includes a hydrochloric acid additive to speed up the etching time
- Fine etch crystals for cleaner etching
- For etching copper clad printed circuit boards
- 36°C, 41°C and Long Life Liquid in 2.5 Litres
- Ferric chloride stain remover
- Use as a scrubbing compound or cleaning solution
- Developer concentrate makes 5 litres

Hexahydrus pellets sufficient to make 1 litre (0.5kg) or 5 litres (2.5kg)  
Super activated liquid available in 5 litre containers  
1 litre concentrated developer makes 5 litres

204659

Ferric Chloride	Order Code	1+	Price Each	
Pellets 0.5kg (makes 1l)	141-311	6.04	10+	25+
Pellets 2.5kg (makes 5l)	149-080	20.25	5.07	4.52
Super Activated		1+	18.73	16.45
Liquid (5l)	413-8697	15.60	5+	10+
			12.99	11.99
PCB Processing Chemicals				
Fine Etch Crystals powder makes 5l	320-5022	1+	10+	25+
		30.33	27.19	24.35
Developer 1l makes 5l	320-4996	20.15	19.03	18.12
Stain Remover 1.0kg	769-897	25.32	22.79	20.29

**Polivit Gum**



- Cleaning of the circuits, connectors, contacts...
- Dimension : 25 x 40 x 20mm

481206

Mftrs. List No.	Order Code	1+	Price Each	
AR20	420-8560	10.98	+	+
AR19	420-8572	1.74	--	--



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PCB Processing Chemicals



**Ferric Chloride (FCC)**

- Sealed packet of ferric chloride hexahydrate for etching copper clad boards
- Dissolve the packet (250g) in warm de-mineralised water
- Makes up to 500ml
- Solution may be heated to lengthen life

**Photoresist Developer (PDN)**

- An alkaline, aqueous developer for positive photoresists particularly PRP200
- Dilute 1 to 4 with de-mineralised water and use at above 20° C

**Photoresist (PRP)**

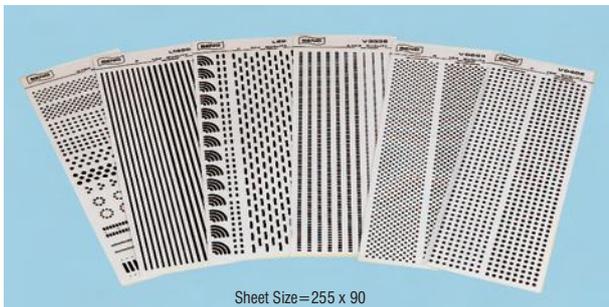
- Fast drying positive photoresist aerosol
- Use for one to one reproduction of circuits etc., on metal from transparent positive masters
- Intended for PCB prototyping but may be used for areas of technical or artistic reproduction

208728

Description	Size	Order Code	1+	5+	10+	20+	50+
Ferric Chloride	0.26kg	<b>130-539</b>	6.37	5.98	5.85	5.53	5.37
Developer	250ml	<b>130-540</b>	4.65	4.39	4.28	4.04	3.95
Photoresist	200ml	<b>130-552</b>	11.91	11.20	10.96	10.35	10.06

Accessories

Etch Resistant Transfers



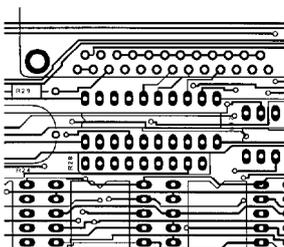
Sheet Size=255 x 90

- High quality etch resist transfers
- Use with draughting film or direct onto copper clad boards
- Wide range of popular track and pad shapes

204629

	Order Code	1+	5+	10+	25+	50+
Assorted Pads	<b>895-842</b>	4.72	3.92	3.35	3.07	2.82
Round Pads						
1.9 dia 0.45 hole /2.1 dia. 0.45 hole	<b>895-854</b>	4.72	4.16	3.71	3.35	3.07
2.5 dia 0.45 hole /2.8 dia. 0.45 hole	<b>895-866</b>	4.67	4.15	3.71	3.35	3.07
DIL Pads	<b>895-878</b>	4.72	4.15	3.71	3.35	3.07
Straight tracks 0.5/1.0	<b>895-880</b>	4.72	4.15	3.71	3.35	3.07
Straight tracks 1.5/2.0	<b>895-891</b>	4.72	4.15	3.71	3.35	3.07
Tracks and Curves 0.5	<b>895-908</b>	4.56	4.00	3.57	3.24	2.95
Tracks and Curves 1.0	<b>895-910</b>	4.72	4.15	3.71	3.35	3.07
Tracks and Curves 1.5	<b>895-921</b>	4.72	4.15	3.71	3.35	3.07
Tracks and Curves 2.0	<b>895-933</b>	4.72	4.15	3.71	3.35	3.07

Laser Film

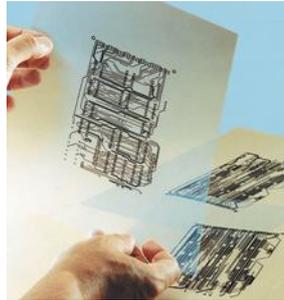


- Specially formulated translucent film for high resolution production of PCB artwork directly from any laser printer
- 75 micron base specially coated to allow keying and fixing of toner
- For laser printers and photocopiers enabling artworks to be produced from printed originals
- Available in A4 (210 x 297mm) or A3 (420 x 297mm)

204630

Quantity Per Pack	Order Code	1+	5+	10+	20+
A4 10	<b>895-945</b>	11.24	9.91	8.86	8.02
A3 10	<b>895-969</b>	21.42	18.89	16.90	15.30

JetStar Draughting Film



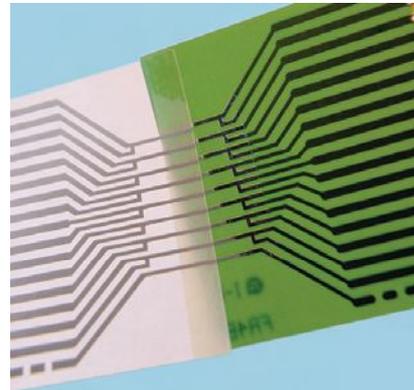
- For use exclusively with EPSON inkjet printers
- A4 (210x297mm) or A3(420x297mm)
- For master artwork production

A new specially formulated, inkjet film for the production of dense artwork photo tools. The film is designed for use with a wide range of EPSON ink jet printers. The coating on the film allows a dense image to be reproduced without the ink bleeding. available in A4 and A3 format (10 sheets per pack)

240765

Size	Quantity Per Pack	Order Code	1+	5+	10+	20+
A4 (210 x 297)	10	<b>413-8090</b>	6.26	5.84	5.65	5.41
A3 (420 x 297)	10	<b>413-8107</b>	11.65	11.33	11.19	10.81

Electrically Conductive Tape 9703



A permanently tacky system consisting of a pressure sensitive adhesive (PSA) matrix with aligned conductive particles, the PSA properties make it easy to handle and apply without the need for thermal bonding. Many applications require mechanical back-up to achieve long-term electrical reliability.

- Pressure sensitive adhesive (PSA) transfer tape with anisotropic electrical conductivity
- PSA tack properties provide an instant bond with minimal pressure and make for ease of use in assembly operations
- Good adhesion to common PCB substrates such as copper, gold, polyimide, polyester, Kapton™, FR-4 epoxy

Typically used for:

- Interconnection of silver ink/polyester flexible circuits
- A membrane touch switch to flex circuit attachment
- EMI/RFI shield attach

Adhesive:	Acrylic
Contact resistance/resistivity:	1.25 μΩ-inch <sup>2</sup> / 1.6Ω-cm
Minimum suggested gap between contacts:	0.4mm
Minimum suggested contact area (per pad):	0.005 inch <sup>2</sup>
Tape only thickness	0.05mm
Liner thickness	0.127mm
Conductive material	Particle
Operating temperature	15 to 70°C
Reel dimensions (LxW)	33m x 25mm

451721

Mftrs. List No.	Order Code	1+	3+	6+	9+
9703 25MM X 33MTR	<b>130-7064</b>	83.07	76.02	71.43	64.51

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Accessories - continued

XYZ Axis Tape



XYZ-Axis electrically conductive adhesive transfer tapes have all the qualities required for reliable and effective attachment of EMI/RFI shields and gaskets to electronic devices. 9712 tape is for applications with moderate electrical requirements. For critical electrical requirements use 9713 tape.

It's in the fibres:

- Wiping action creates good electrical contact
- Spring-loaded tension maintains electrical contact
- Reinforcement gives the tape excellent handling characteristics
- Eliminates gaps along device/shield interface to prevent emission leaks
- Isotropic conductance
- Non-corrosive adhesive increases life of shield and allows attachment of dissimilar metals. Long-lasting adhesion
- Low resistance for increased shielding effectiveness
- Fast assembly

Typically used for:

- Attaching foil laminate EMI shields to electronic and electrical devices
- Can be applied in strips or die-cut to specific shapes and sizes
- Compared to screws or other mechanical connector provides reduced assembly time and a solid bond-line with no gaps for EMI emission

Adhesive:

Contact  $\Omega$  (foil/rigid plate) using sample size 2.54mm<sup>2</sup> piece of adhesive:  
 Aluminium / Aluminium  
 Aluminium / Stainless steel  
 Copper / Stainless steel  
 Tape only thickness:  
 Liner thickness:  
 Conductive material:  
 Operating temperature:

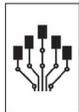
9712 Tape	9713 Tape
Acrylic	
< 24 $\Omega$	< 1 $\Omega$
< 24 $\Omega$	< 1 $\Omega$
-	< 0.5 $\Omega$
0.127mm	0.0762mm
	0.1mm
	Conductive fibres
	15 to 70°C

451739

Mfrs. List No.	Order Code	1+	3+	6+	9+
9712 12MM X 33MTR	130-7065	53.80	47.22	40.77	38.80
9712 25MM X 33MTR	130-7066	78.62	73.29	68.63	64.53
9713 25MM X 33MTR	130-7067	100.68	92.17	84.00	77.40

Posireflex Daylight Film

AR7



Format  
240 x 330 mm

Mfrs. List No.  
AR7

Obtains a positive film from a page of plans. Dish development, exposure to UV. Autoreversal daylight film, size 240 x 330 mm, item code AR 7

Characteristics :

0.1mm (0,004") polyester permanent antistatic silver based film (very high black density)  
 Great dimensional stability, Exposure coating against coating  
 Dimensions 240 x 300 mm

Applications

Direct copying of paper positive onto films, Reproduction and multiplication of films

477015

Mfrs. List No.	Order Code	1+	5+	10+
AR7	141-8445	10.20	9.90	9.67

SMT starter kit, LEAD FREE



Set including a selection of basic products and accessories dedicated to SMD dispensing, placement and repair. Those products are stored into a PVC rigid box to ease the storing operations.

Conform to European decrees 2002/95/CE of 01/27/03 and 2002/96/CE of 01/27/03.

A SMT starter kit, lead free dedicated includes :

- 1 syringe 10 cc of no clean solder paste Alloy Sn96,5Ag3Cu0,5
- 1 flux cleaner, 400 ml spray
- 1 syringe 10 cc of gel en gel for repair
- 1 set of 50 polyethylene needles  $\varnothing$  0,40 mm
- 10 SMD boxes, type B2
- 1 heating tweezers, SMD dedicated
- 1 roll of 0,50 kg solder wire of  $\varnothing$  0,5 mm Alloy Sn96,5Ag3Cu0,5.
- 1 universal cleaner for solder tips
- 1 tip/nozzle repair set
- 1 set of 25 high resistance dust cleaners

449861

Description	Mfrs. List No.	Order Code	1+	Price Each 3+	5+
SMT starter kit, LEAD FREE	F42310	129-8230	115.96	112.86	109.55

SMT repair kit, LEAD FREE



SMT repair kit, LEAD FREE dedicated Set including a selection of basic products for SMD repair. Those products are stored into a PVC rigid box to ease the storing operations.

Conform to European decrees 2002/95/CE of 01/27/03 and 2002/96/CE of 01/27/03.

A SMT repair kit, LEAD FREE dedicated includes:

- 1 syringe 10 cc of no clean solder paste Alloy Sn96,5Ag3Cu0,5.
- 1 flux cleaner, 400 ml spray
- 1 syringe 10 cc of gel en gel for repair
- 1 set of 50 polyethylene needles  $\varnothing$  0,40 mm
- 1 roll of 0,50 kg solder wire of  $\varnothing$  0,5 mm Alloy Sn96,5Ag3Cu0,5.
- 1 universal cleaner for solder tips
- 1 tip/nozzle repair set
- 5 rolls of desolder braids, width 1.5 mm
- 1 dust cleaner gas spray, any position, 520 ml spray
- 1 cleaner and lubricater for contact, 200 ml spray
- 1 set of 25 high resistance dust cleaners

449865

Description	Mfrs. List No.	Order Code	1+	Price Each 3+	5+
SMT repair kit, LEAD FREE	F42312	129-8229	147.83	143.85	140.53

SMT products kit, LEAD FREE



Set including a selection of basic products dedicated to SMD dispensing, placement and repair. Those products are stored into a PVC rigid box to ease the storing operations.

Conform to European decrees 2002/95/CE of 01/27/03 and 2002/96/CE of 01/27/03.

A SMT products kit, LEAD FREE dedicated includes:

- 1 syringe 10 cc of no clean solder paste Alloy Sn96,5Ag3Cu0,5.
- 1 flux cleaner, 400 ml spray
- 1 syringe 10 cc of gel flux for repair
- 1 set of 50 polyethylene needles  $\varnothing$  0,40 mm
- 1 roll of 0,50 kg solder wire of  $\varnothing$  0,5 mm Alloy Sn96,5Ag3Cu0,5.
- 1 tip/nozzle repair set
- 5 rolls of desolder braids, width 1,5 mm
- 1 set of 25 high resistance dust cleaners

449872

Description	Mfrs. List No.	Order Code	1+	Price Each 3+	5+
SMT products kit, LEAD FREE	F42311	129-8228	109.55	107.88	106.77

## Professional solder-resist mask Kit



## Kit composition:

- 1 x 1 kg lacker pot ref AR70A
- 1 x 250 g hardener pot ref AR70B
- 1 x litre developer ref AR72
- 1 x litre cleaning solvent ref AR71
- 1 x wire applying 250 mm ref AR68
- 1 x cleaning kit for wire applying ref AR69
- 1 x development plastic tray ref AR23
- 5 x mixing plastic tray
- 1 x cooking box ref AR69

For professional Printed Circuit Board without investment. This solder-resist mask is used as a pre-sensitised printed circuit. Design and characteristics are identical to serial production PCB.

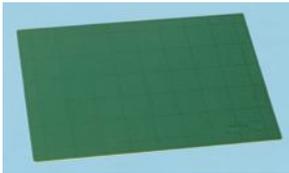
Better definition than screen-printing. No need to buy extra machine as for dry film (brusher, laminator). No PCB surface processing required.

Technical characteristics	Professional solder-resist mask kit
Colour	Green
Completion	Brilliant
Viscosity	240 Ps for 25°C
Storage	6 months in a cool area
Mixing using time	96 hours for 25° C
Welding in fusion resistance	260°C, 10 seconds, 6 times
Flame resistance	VO - UL 94V0 (290°C 20seconds)
Chemicals resistance	Boiling water, H <sub>2</sub> SO <sub>4</sub> , H Cl, Na OH à 20°C for 60min
Solvents	Alcool Isopropylique, Trichlorethane, MEK à 20°C 60min
Electrical insulation	1x10 Ohm
Dielectrical constancy	3,7 - 1MHz
Dissipation factor	0,03 - 1MHz
Straining tension	2,5 KV / mil.

449874

Description	Mfrs. List No.	Order Code	Price Each		
			1+	5+	10+
solder-resist mask Kit	U700001	<b>142-2906</b>	194.13	189.56	185.64

## Cutting Mats - Self Healing



383-3719

Sturdy cutting base made of laminated plastic. Hard intermediate layer prevents cutting through the mat, whilst the special coating ensures that no visible cuts remain on the surface. Double sided use with 5mm grid.

234184

	Dimensions	Order Code	Price Each	
			1+	5+
A4	30cm x 45cm	<b>383-3719</b>	12.35	12.10
A3	45cm x 60cm	<b>383-3720</b>	21.62	21.19
A2	60cm x 90cm	<b>383-3732</b>	39.98	38.95

## Polyester Draughting Film



- A4 (210x297mm) or A3(420x297mm)
- Polyester draughting film 0.003" thick
- For master artwork production



204660

Size	Quantity Per Pack	Order Code	Price Per Pack			
			1+	5+	20+	50+
A4	5	<b>141-331</b>	8.58	8.10	6.75	4.42
A3	10	<b>149-044</b>	15.82	14.71	13.56	12.13

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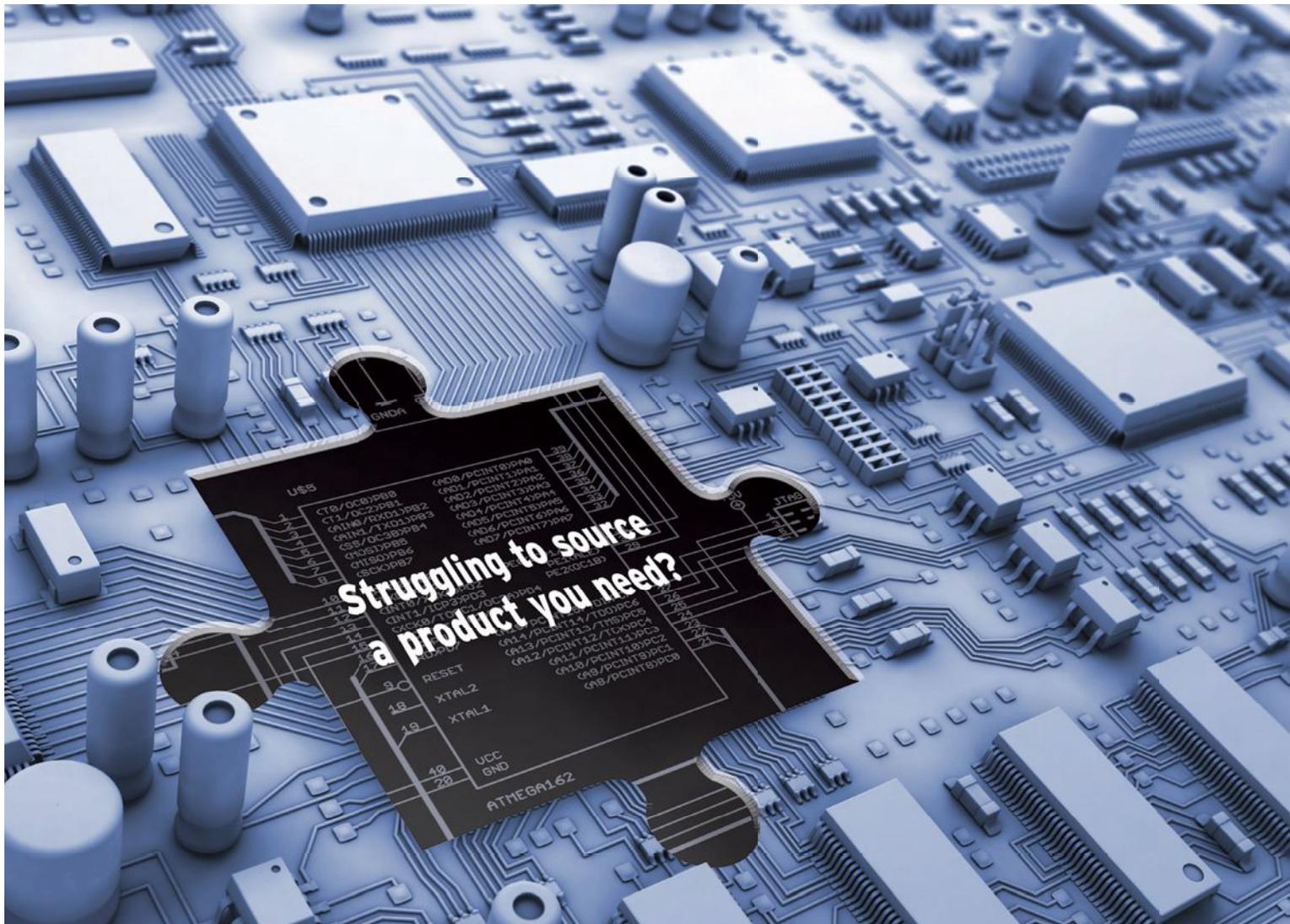


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