



## Home Appliances





Lumberg [discover agility]

# Sustainability: Third Generation

| at Lumberg



We are an independent, family-run company based in Germany – for over 90 years. Our success is based on sustainable performance, technical solution competence – and our “passion for connections”.

With a track record of agile expertise, our products and systems solutions support an industrial environment – worldwide. We engineer and produce connectors and contact systems, electromechanical elements and mechatronic components of outstanding quality for your individual technical application. Our concentration on Automotive, Building Technology, Home Appliances and Communication Technology generates a high level of specialized user knowledge for your benefit.

DIN EN ISO 9001

IATF 16949

DIN EN ISO 50001

DIN EN ISO 14001

 **arçelik**

 **BOSCH**

**Brandt**

**CANDY**

 **DeLonghi**

 **Electrolux**



**gorenje**

**Haier**

**Hisense**

 **INDESIT**

 **LittleSwan**

**LIEBHERR**

**mabe**

 **Midea**

**Miele**

**SAMSUNG**



**SIEMENS**

 **smeg**

**VESTEL**

 **VORWERK**

 **Whirlpool**



Competence in Providing Solutions [connecting the world of tomorrow]



R & D:  
Value Creating Innovation

| by Lumberg

M1

M2





The right idea, a neat construction, fully-equipped laboratories and precise system measurements are the primary steps in our developing projects. With state-of-the-art methods and technologies, we mobilize our established development expertise and our passion for feasibility for your product. It is not only about the creation of unique quality products. It is also about finding an answer for challenges where others fail to find a solution.

With our engineering-based-on-partnership maxim we manifest detailed and integrated made-to-measure solutions for you. How? By applying our comprehensive Home Appliance know-how and pairing it with our electrical and electromechanical engineering profession.

From a first talk about technology to the development, the design and the construction of a pre-production prototype, we are a strong and reliable development partner. And we use creative thinking to turn even individual design and product requests into prime "Made by Lumberg" development quality at our R&D center.



Washers



Freezers

Ovens

Dryers

Small Household Appliances

Stoves

Hoods

Dishwashers

Refrigerators

Microwaves





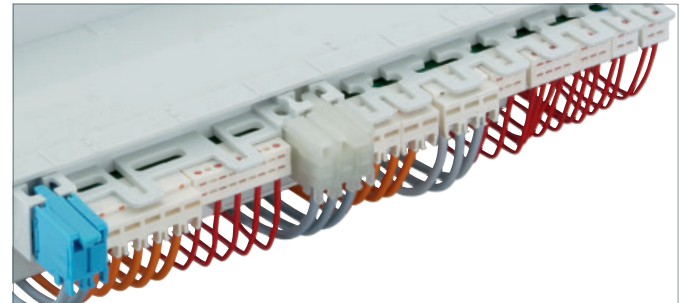
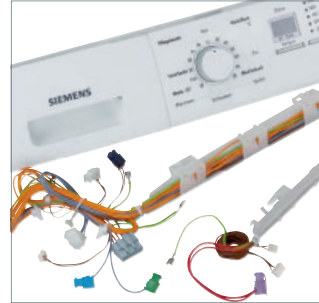
Advantage RAST [first choice in home appliances]

**Quality:  
No Compromises**  
| by Lumberg



Lumberg is the specialist for RAST. 30 years ago, we contributed significantly toward the development of the RAST connector, to support the industry with eliminating errors in the production process due to mismatched connections, or with simplifying the assembly when mounting end devices, to pave the way for conformity. This became and has remained a standard to this day. We have continuously advanced the development of RAST connectors ever since. Today, we offer the broadest product range the market has to offer – for RAST 2.5 and RAST 5 systems. And now also in the smallest pitch: RAST 1.5.

- Protected against mismatching keying according to RAST standards
- Insulation displacement technology (IDT) up to 25 A
- RAST connectors for direct and indirect mating of 1 to 27 poles in the standard range
- Optional color coding for easy installation
- Broad standard program
- Special IDT terminals for flexible foil or varnished wire connections
- IEC 60335-1-certified glow wire resistance
- Deep knowledge of customer specific system solutions







Advantage RAST

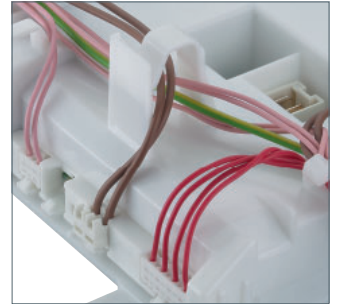
kobold  
VK200

More Speed, Greater Flexibility,  
Added Individuality

| by Lumberg

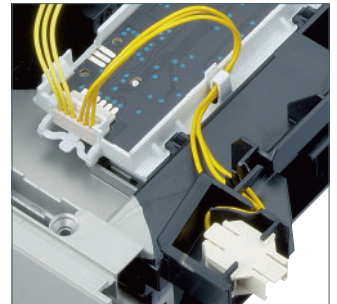
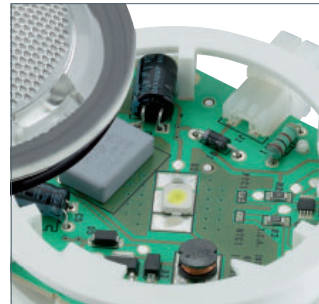
### ■ Quality Improvement in the Production Process

- No false connections during device assembly due to individual keying
- Quality improvement paired with lower costs
- Reliability due to automatic testing of short circuit, current continuity, high voltage
- Destruction of damaged cable harnesses



### ■ Cost Reduction

- Low labor costs because of highly-efficient, fully automatic production and keying at cable harness machines
- High flexibility for easy changeover of connectors or cables



### ■ Reduced Development Time

- Efficient development due to modular molding tools and keying options
- Increased flexibility
- Flexible harness concept for rapid start of production for new appliance versions

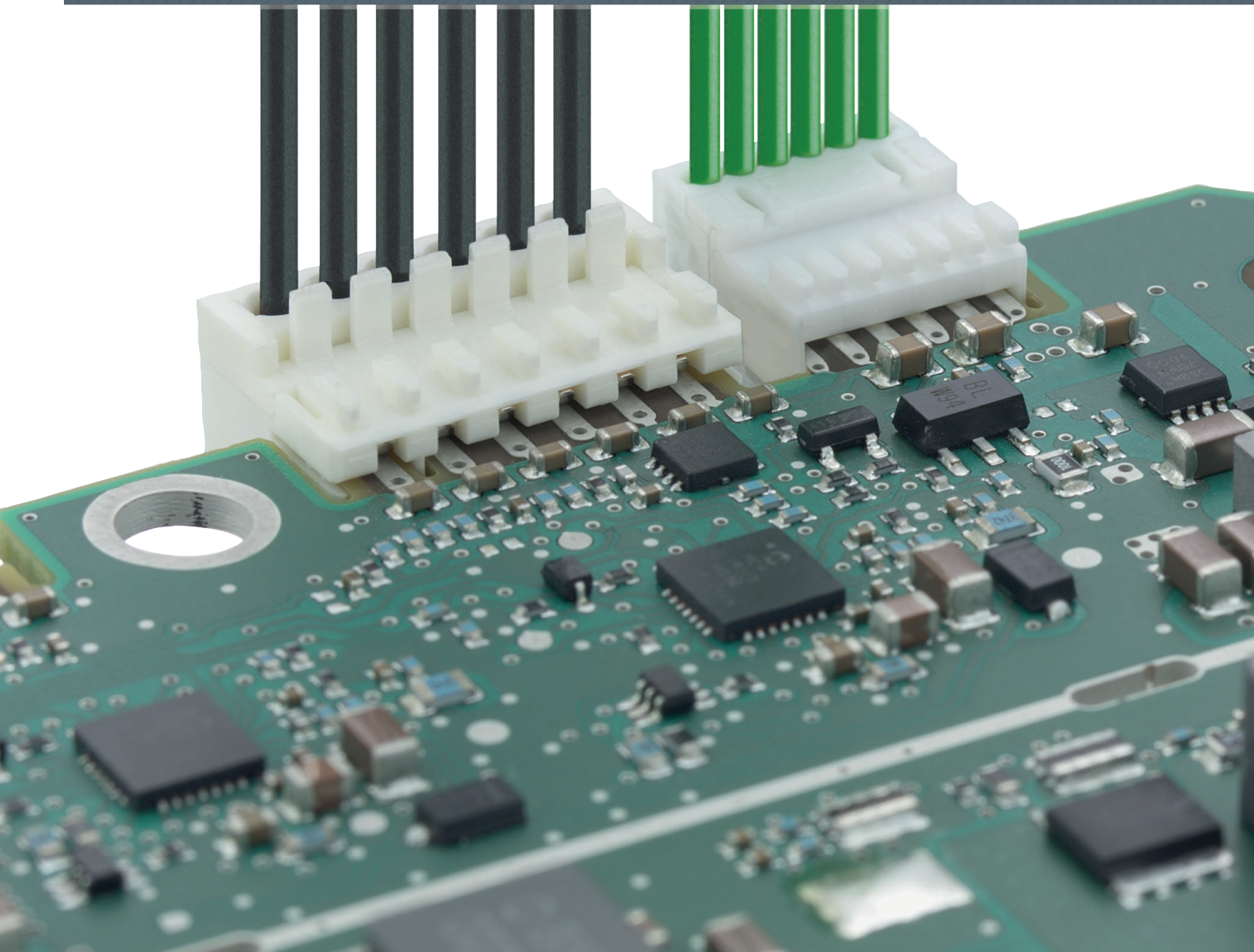
### ■ Reduced Conductor Diameter

- Due to division into power and signal areas (RAST 1.5/RAST 2.5 and RAST 5)
- Due to smaller connector size (RAST 1.5/RAST 2.5) and direct mating





RAST Rethought [when installation space really counts]





## RAST 1.5: Top Miniaturization Achieved | new by Lumberg

„Home of the RAST Connector“ – Lumberg stands for this like no other connector manufacturer. RAST systems are the foundation of the company's success in automotive technology as well. In 1986, RAST 5 with a contact pitch of 5.0 mm made its debut. In the course of miniaturization, the RAST 2.5 system was introduced in 1993, which saved 72 % in size and opened up new applications, especially in home appliances.

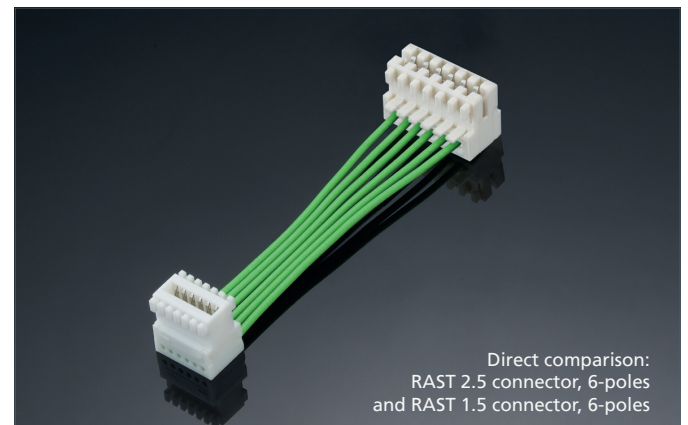
Now, for the first time, RAST 1.5 in IDT is being launched. Compared to RAST 2.5, it saves another 43 % in size.

The characteristic RAST coding is available as well as the option of fully automated cable assembly. The weight saving due to reduced conductor cross-sections is then 40 %.

## RAST 2.5 for 1 mm PCBs | new by Lumberg

Consistent: The RAST-2.5 connector, which has proven itself a billion times over and can be used up to 4 A, has also been further developed. Increasingly, 1 mm PCBs are being used where there are challenges in terms of confined installation spaces, desired weight savings or optimization of cooling. It can be a good alternative to the common 1.6 mm PCB, which stores more thermal energy.

The connector now comes with a familiar layout: with contact spacing of 2.5 mm, with secure latching on the 1 mm PCB – and of course with the great advantage of economical and efficient automated cable assembly using IDT.





Evolution meets Revolution [IDT meets SKEDD]

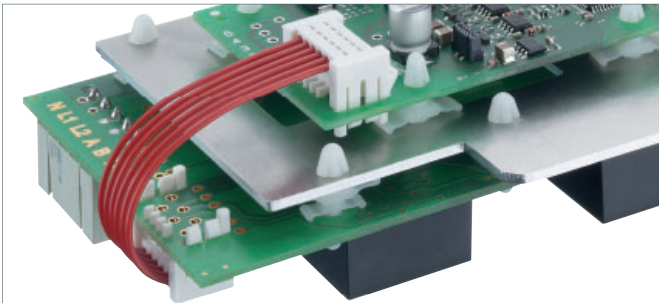
SMART IDT  
**SKEDD**  
Direct Plug-in

Reversible Direct  
Connector for Arbitrary  
Mating with the PCB

| by Lumberg only

SmartSKEDD: While direct contacting on the edge of the printed circuit board with RAST connectors is one of our domains, and press-fit technology as an irreversible, solderless connection is our compulsory program, a new type of connector has been added to this line-up: the direct connector for multiple plug-ins and plug-outs that can mate without a corresponding part anywhere on the printed circuit board using Insulation Displacement Technology.

SKEDD technology makes this possible. The individual contact comprises two contact tongues which, when inserted into a plated-through hole in the PCB, retract evenly and produce a solderless, reliable mechanical electrical connection.

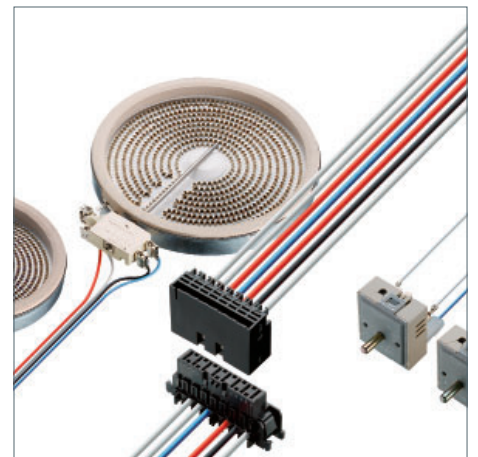
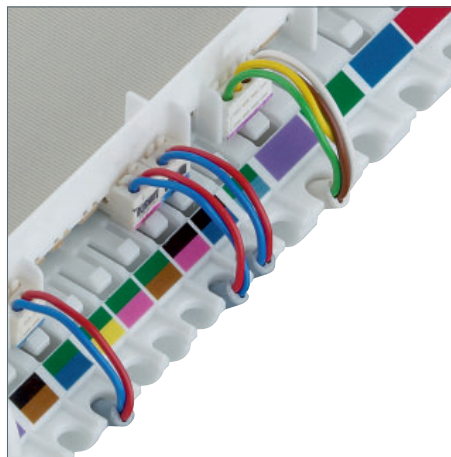
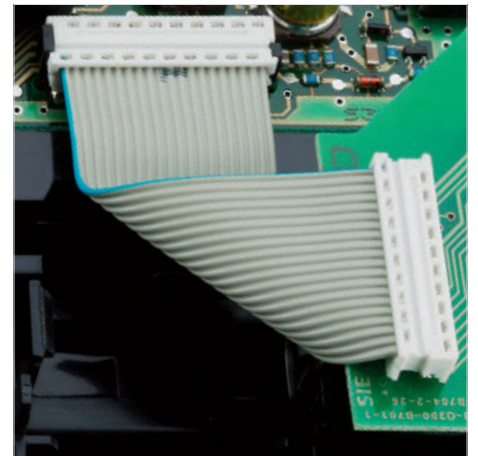
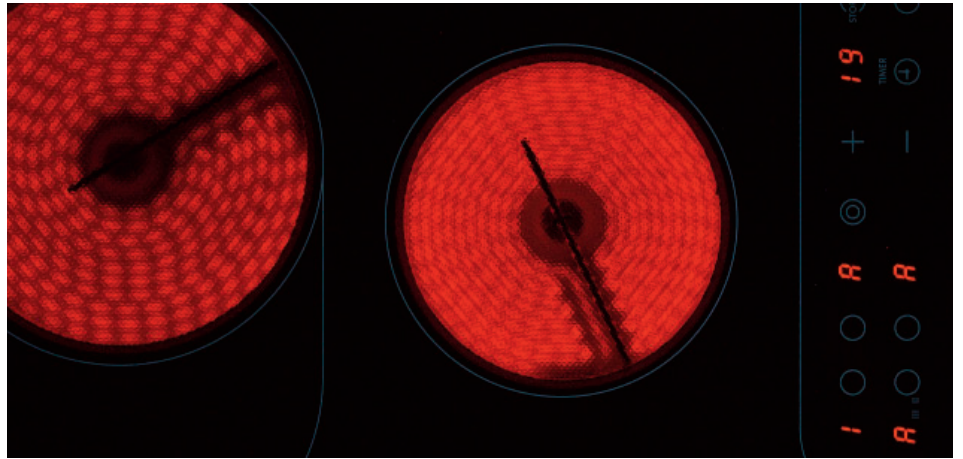


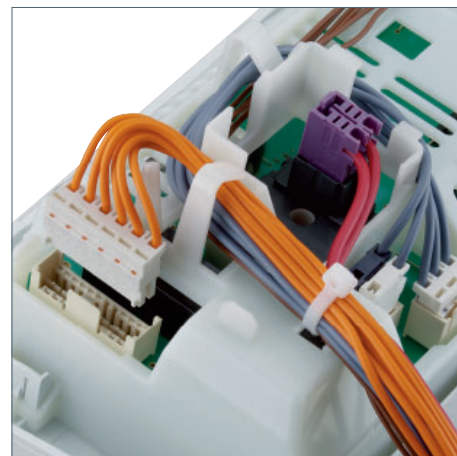
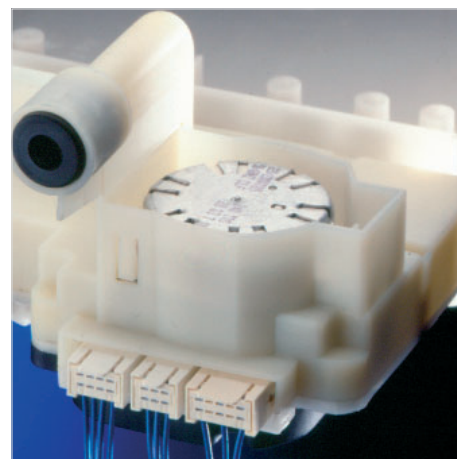
Extra robust and reliable:  
SnapFit locking

Three solid pins on each casing guarantee a secure positioning and prevent mismating. And there is more: each side of the connector features two snap-fits that lock – or rather: snap – the connector tightly onto the PCB. To release the connector, simply press on the primary lock.

Connectors can be mated without tools, for total convenience when mounting entire sub-assemblies. This enables completely new designs since they can be used right in the middle of a printed circuit board, even on the reverse. Here, reversible mating also facilitates for the first time a simple exchange of components as is required, for example, during servicing. In combination with Insulation Displacement Technology which draws on all advantages offered by automated cable assembly and vouches for the convenient production of even large quantities, our unparalleled solution that literally centers your ideas on the PCB is really smart – or simply: SmartSKEDD.







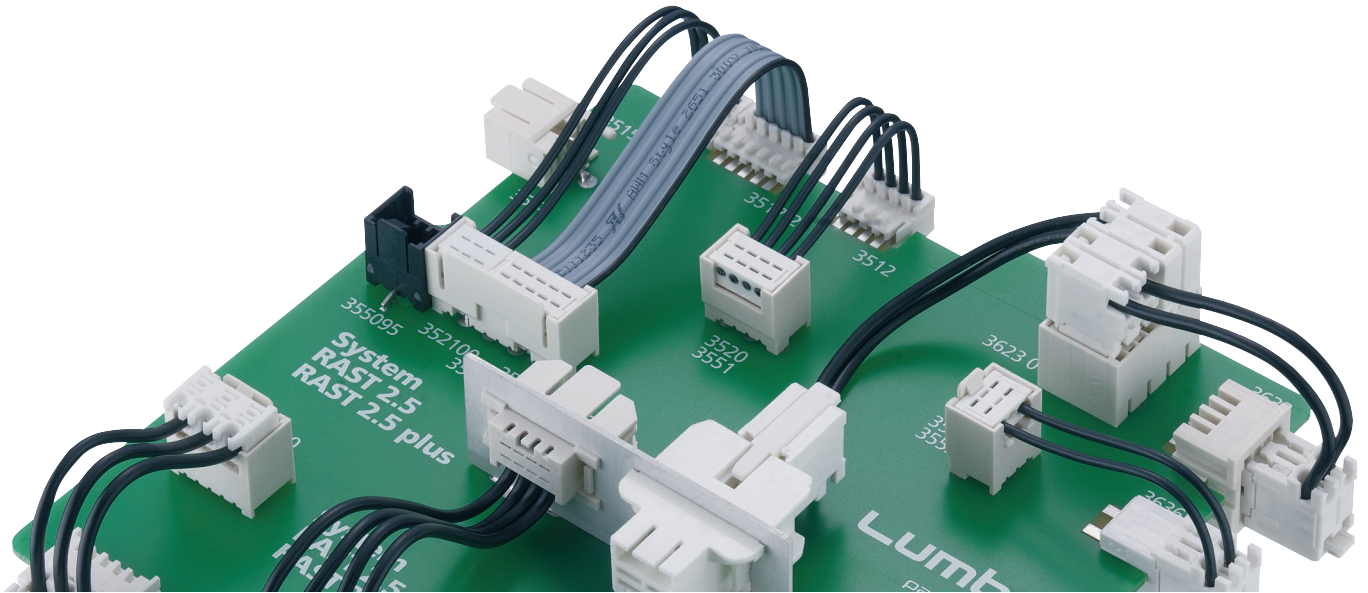




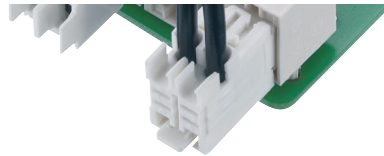
**Your success**  
is based on  
their skills.



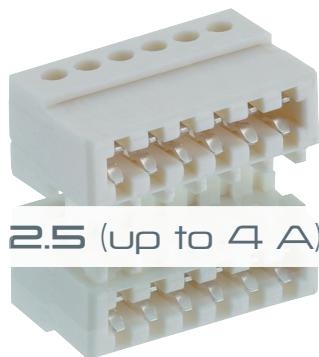




## Home Appliances Connector Systems

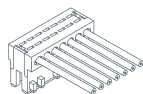


## RAST 2.5 (up to 4 A)

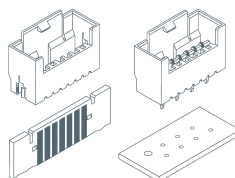


- Direct and indirect mating
- Insulation Displacement Technology (IDT)
- Keying to avoid mismatching according to RAST 2.5 standards, single or double-row
- Locking options

### RAST 2.5 connectors, insulation displacement technology



■ Direct mating with or without guide frame

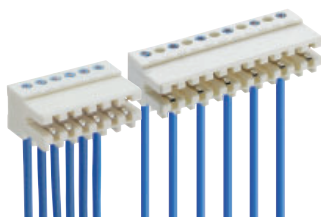


■ Indirect mating with pin header

### 3520–3523

RAST 2.5 connectors, direct and indirect mating, insulation displacement technology  
pitch 2.5/5.0 mm

**3521 · 3523** standard version  
**3520 · 3522** with interior locking

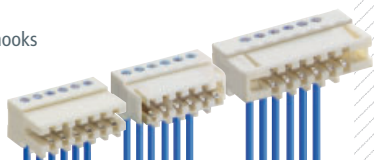


4 A – 32/250 V AC – GWT 750 °C – 2-20 poles

### 3510–3518

RAST 2.5 connectors, direct mating, insulation displacement technology, with/without keying rib and closed sides  
pitch 2.5/5.0 mm

**3510 · 3511** standard version  
**3512 · 3513** locking by lateral locking hooks  
**3515 · 3516** locking by locking hooks  
**3517 · 3518** locking by locking toes  
**3517-4** enhanced locking toes  
**3517-5** for 1.0 mm PCBs

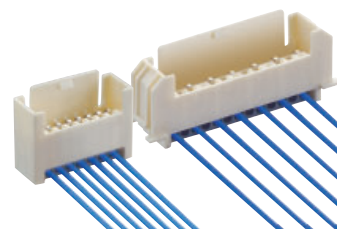


4 A – 32/250 V AC – GWT 750 °C – 2-20 poles (**3514-4** 2-16, **3517-5** 3-9)

### 3541–3546

RAST 2.5 (chassis) tab headers, insulation displacement technology, with locking latch  
pitch 2.5/5.0 mm

**3541 · 3542** standard version  
**3545 · 3546** for panel mounting

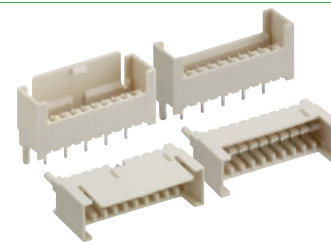


4 A (6A with **3570**) – 32/250 V AC – GWT 750 °C – 2-20 poles

### 3550–3557

RAST 2.5 pin headers  
pitch 2.5/5.0 mm

upright with spigot  
**3550 · 3552** with locking latch  
**3551 · 3553** with interior locking  
angular  
**3554 · 3556** with locking latch  
**3555 · 3557** with interior locking

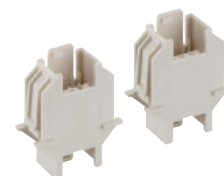


4 A (**355...****V167** up to 10 A) – 32/250 V – GWT 750 °C – 2-20 poles

### 83545 · 83546

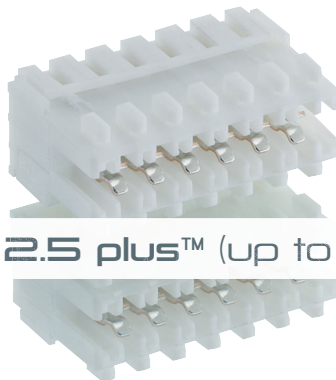
RAST 2.5 double chassis pin headers, with locking latches  
pitch 2.5/5.0 mm

**83545** 2.5 mm  
**83545** 5 mm



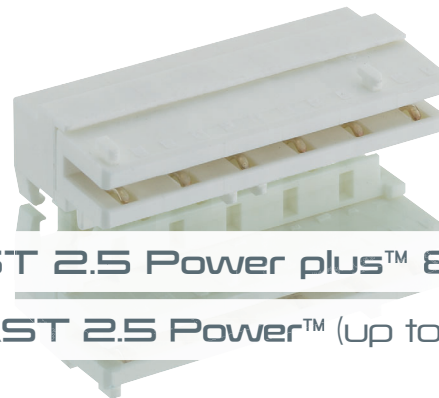
4 A – 160/400 V AC – GWT 750 °C – 3-4 (**83545**), 2 (**83546**) poles

PITCH  
2.5/5 mm



**RAST 2.5 plus™** (up to 4 A)

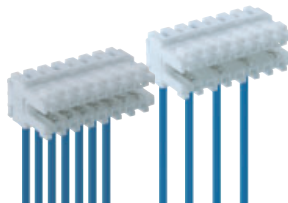
PITCH  
5 mm



**RAST 2.5 Power plus™ &  
RAST 2.5 Power™** (up to 10 A)

### 352100 · 352300

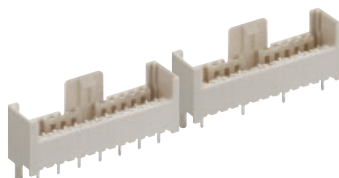
RAST 2.5 plus™ connectors, direct and indirect mating, insulation displacement technology, with double-sided keying pitch 2.5/5.0 mm



4 A – 80/250 V AC – GWFI 850 °C/GWIT 775 °C – 3-11 poles

### 355099 · 355299

RAST 2.5 plus™ pin headers, upright, with locking latch and positioning spigots, with double-sided keying pitch 2.5/5.0 mm



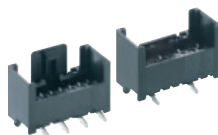
4 A – 32/250 V AC – GWT 750 °C – 3-11 poles

### 355095–355395

RAST 2.5 plus™ pin headers, upright, in surface mount technology (SMT), with one or two positioning spigots, with double-sided keying pitch 2.5/5.0 mm

**355095 · 355295** with locking latch

**355195 · 355395** with interior locking



4 A – 250/500 V AC – GWT 750 °C – 3-7 poles

### 357000 · 357600

RAST 2.5 Power plus™ connector, direct and indirect mating, insulation displacement technology, with double-sided keying

**357000** direct and indirect mating

**357600** direct mating, with/without locking, with/without keying rib and closed sides



6 A (10 A indirect mated 2-4-pole) – 400 V AC – GWFI 850 °C/GWIT 775 °C – 2-8 poles

### 357099

RAST 2.5 Power connector, direct and indirect mating, insulation displacement technology, with double-sided keying



6 A (10 A indirect mated 2-5-pole) – 400 V AC – GWT 750 °C – 2-10 poles

### 3570 · 3575

RAST 2.5 Power connector, insulation displacement technology

**3570** direct and indirect mating

**3575** direct mating, with/without locking, with/without keying rib and closed sides



6 A (**3570** 10 A indirect mated 2-5-pole) – 400 V AC – GWT 750 °C – 2-10 poles



PITCH  
25<sup>m</sup>



**SmartSKEDD** (up to 4 A)

PITCH  
1.5<sup>m</sup>

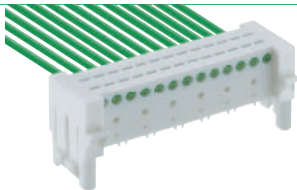


**RAST 1.5** (up to 3 A)

- Direct mating
- Insulation displacement technology (IDT)
- Multiple pluggable
- Exceptional retaining forces
- For signal and load currents up to 4 A

#### **733500 · 733520**

SmartSKEDD connector, direct mating, insulation displacement technology, with keying pins, positioning spigot and (double) locking on the printed circuit board



4 A – 50 V AC – poles 3-11 (**733520** 3-13)

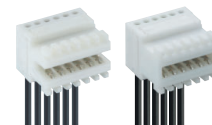
- Direct and indirect mating
- Insulation displacement technology (IDT)
- Keying to avoid mismating, double-sided keying
- For signal and low load currents up to 3 A

#### **332100 · 331000**

RAST 1.5 connectors, insulation displacement technology

**332100** direct and indirect mating

**331000** direct mating, with/without closed sides



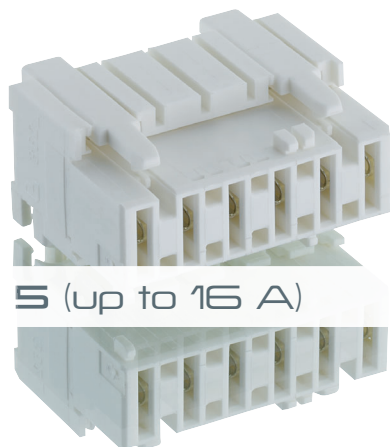
3 A – 50 V – poles 2-12

#### **335095**

RAST 1.5 pin headers, upright, in surface mount technology (SMT) (in preparation)

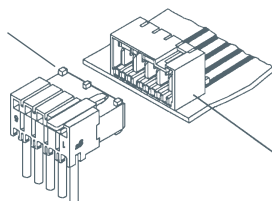


3 A – 50 V – poles 2-12



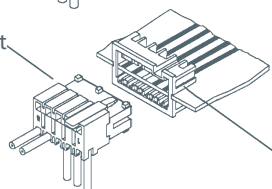
## RAST 5 (up to 16 A)

■ Connector for indirect mating, insulation displacement technology



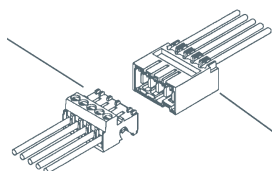
■ Tab header

■ Connector for direct mating, insulation displacement technology



■ Guide frame

■ Connector for indirect mating with screw terminals



■ Tab header for indirect mating, insulation displacement technology

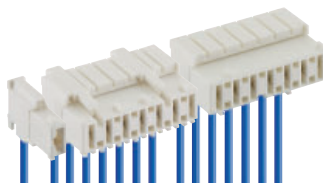
### 3623–3628

RAST 5 connectors, insulation displacement technology

**3623 · 3625** with exterior locking

**3626 · 3627** with interior locking

**3628** chassis connector with interior locking



10 A (**3625 · 3627** 16 A, **3628** 12 A) – 250 V AC – GWT 750 °C (except **3628**) – 1-12 (**3625 · 3627** 1-4, **3628** 8) poles

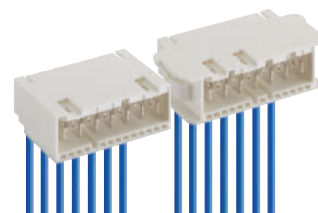
- Direct and indirect mating
- Insulation displacement technology (IDT) or screw clamp
- Keying to avoid mismating according to RAST 5 standards
- Color keying facilitates assembly and servicing
- Special versions for higher ambience temperatures

### 3647 · 3648

RAST 5 (chassis) tab headers, insulation displacement technology

**3647** standard version

**3648** for panel mounting



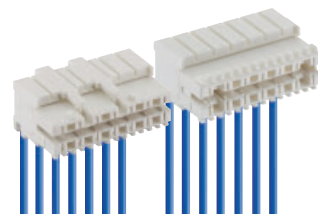
10 A – 250 V AC – GWT 750 °C – 2-8 poles

### 3633 · 3636

RAST 5 direct connectors, insulation displacement technology

**3633** with exterior locking on guide frame

**3636** with/without keying rib and closed sides, with/without locking on printed circuit board



6 A – 250 V AC – GWT 750 °C – 2-12 poles

### 3641–3645

RAST 5 tab headers

**3641** upright with spigot

**364197** pottable version

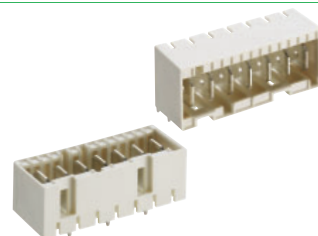
**3642** angular with upper side locking

angular with lower side locking

**3643** standard version

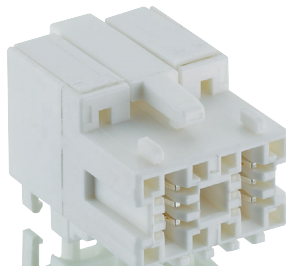
**3644** higher version with spigot

**3645** higher version without spigot

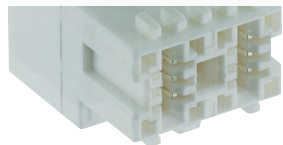


10 A (**364...V167** 16 A) – 250 V AC – GWT 750 °C – 2-12 poles

PITCH  
7.5<sub>m</sub>



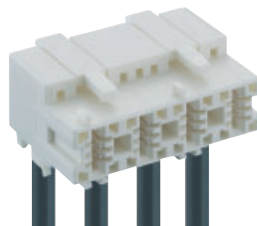
**RAST 7.5 Power™** (up to 25 A)



- Indirect mating
- Insulation displacement technology (IDT), AWG 14/2.5 mm<sup>2</sup>
- For load currents up to 25 A

### 3723

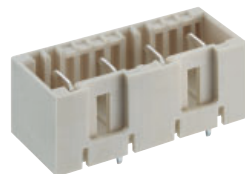
RAST-7.5-Power™ connector, indirect mating, insulation displacement technology, with exterior locking



25 A – 500 V AC – GWT 750 °C – poles 2-4

### 3741

RAST-7.5-Power™ tab header, upright with spigot



25 A – 630 V AC – GWT 750 °C – poles 2-5

PITCH  
1.27<sub>m</sub>



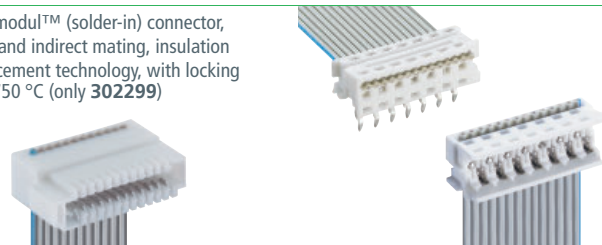
**Micromodul™** (up to 1,2 A)



- Direct and indirect mating
- Ideal for space saving cable-to-board connections
- Insulation displacement technology (IDT)
- Tab headers for THT or SMT soldering
- For signal and low load currents up to 1.2 A

### 302299 · MICAL... · MICA

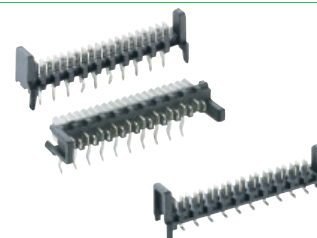
Micromodul™ (solder-in) connector, direct and indirect mating, insulation displacement technology, with locking GWT 750 °C (only **302299**)



1.2 A – 32 V AC (**302299** 125 V AC) – poles 4-22 (all even) and 26

### MICS... · MICS/SMD

Micromodul™ tab headers, upright/angular, with/without retaining hooks and press-fit spigots



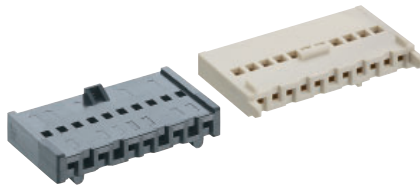
1.2 A – 160 V AC (**MICS/SMD** 80 V AC) – poles 4-20 (all even) and 26





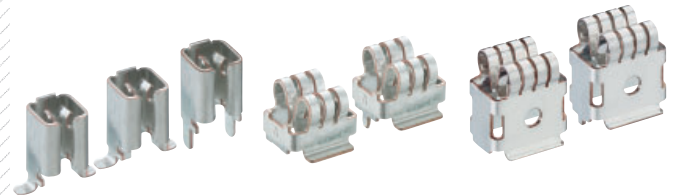
More Systems (diversity)

#### Minimodul™ · Multimodul™



- Pitch 2.5 mm
- Insulation displacement and crimp technology
- For signal and low load currents up to 5 A

#### High-Current Contacts



- High-current contact sockets
- Power phase connectors
- For printed circuit boards or busbars
- For load currents up to 200 A

#### USB and Modular Connectors



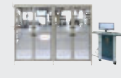
- Data transmission rates up to 10 Gbit/s
- According to USB 3.1 specification
- For signal and low load currents up to 5 A/2 A

#### Circular Connectors



- Circular connectors with threaded joint M16, IP68, AISG
- DIN circular connectors

## Series 97

Harnessing  
Equipment**VARICON 7000****VARICON 7000-RD (CR\*)****VARICON 7000-Eco (CR\*)****VARICON 7000-Inline (CR\*)**

Versatile, fully automatic harnessing machine for termination of RAST connectors,  
for flexible harness configurations

Required state of delivery  
of connectors

Processable conductor

Stroke capacity

Specifications

Additional specifications

RAST 2.5 (351..., 352..., 354...)

RAST 2.5 plus™ (352...00)

RAST 2.5 Power (357...)

RAST 2.5 Power plus™ (357...00)

RAST 5 (362..., 363...)

in chain (354... in bar stock carrier)

discrete conductor, twisted pair wires on request

ca 16,200 contacts per hour

ca 10,400 contacts per hour

ca 6,500 contacts per hour

ca 6,500 contacts per hour

2 different RAST systems loadable in parallel (3 optional), loading modules exchangeable

1 RAST system loadable

Detaching of connectors and cutting of RAST keyings

Number of cable barrels that can be mounted in parallel

24

12

6

6

Number of parallel loadable cables (6 different types, sections, colors)

8

4

2

2

1-to-n (U-type) and 1-to-1 (Z-type) harnesses

Crossed cables, bridged contacts and varying pitches in one harness

Possible cable lengths (lengths down to 30 mm and up to 4,000 mm possible on request)

250–3,000 mm

60–3,000 mm

60–3,000 mm

60–3,000 mm

Various cable lengths possible within one harness

Mechanical testing units including RAST keying and cable position tests

Electrical testing units, including continuity, high-voltage/short-circuit tests

Scrap cutting station for faulty harnesses

Cable bending unit for RAST 2.5 Power, RAST 2.5 Power plus™ and RAST 5

Produced harnesses hanging straight or in loop for manual unloading. Packaging station possible on request.

- Main process units duplicated for maximum performance and output

\*-CR

- Termination of crimp contacts as specified by customer
- Up to 3 crimping stations possible
- With crimp force analyzer
- Double crimp possible
- Block loader station optionally



**VARICON 7000-DC (CR\*)**

RAST 2.5 (351..., 352..., 354...)

**VARICON 1000-Eco**

Fully automatic harnessing machine for termination of Micromodul™ connectors

302299

MICA

MICAL

MICALD

		in reel, in bar stock carrier
		ribbon cable
	ca 20,000 contacts per hour	ca 800 harnesses per hour
		2 feeder modules incl., additional ones optional
		Processing modules for mass termination
	6	Test station for color detection
	8	
		Type U, type Z, hybrid
	Jumper: 250–3,000 mm Daisy Chain: 315–2,000 mm	Possible cable lengths 35–1,000 mm
		Mechanical testing units for cable position detection
		Electrical testing units
		Scrap cutting station for faulty harnesses
	—	
		Produced harnesses for manual unloading
	■ Daisy chain harnesses with up to 6 connectors per cable ■ Common harnesses also possible	

**HZ...**

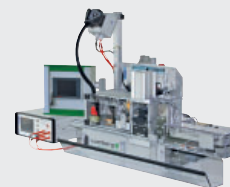
Manual tongs for termination, keying, extending and decollecting of RAST and Micromodul™ connectors and connector chains

Stroke capa. up to 370 discrete conductor/h

**KHP...**

Knuckle-joint press for termination of RAST and Micromodul™ connectors

Stroke capacity ca 450 discrete conductor/h

**HA...e...****HA...f...**

Semi-automatic harnessing machines for termination of RAST and Micromodul™ connectors, modular set-up, flexible extendible stroke capa. up to 1,200 discrete conductor/h

	small base machine	larger base machine
Description	<ul style="list-style-type: none"> <li>These options are free configurable and upgradeable</li> </ul>	
Storage of insertion patterns	•	•
Verification of insertion pattern and cable end positions	•	•
Automatic feeding of connectors	•	•
Removal Kit: cutting and vacuum extraction of connector chain inter-links		• (not HA36f...)
Cable color detection – 16 colors	•	•
Key cutting		•
Key test		•
Cable bending		•
High-voltage test		•

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