

**The IP&E
Specialist**

Building Automation - HVAC & Heating Pumps Application Guide

TTI, Inc., – A Berkshire Hathaway Company



The IP&E Specialist

The Specialist in Electronics Component Distribution

Founded in 1971, TTI has steadily grown to become a world leading specialist distributor of electronic components. The company was founded on the premise that passive component purchasing could be made more efficient by offering product specialization, customer-driven service and proprietary supply chain solutions.

Why TTI?

- **Technical Experts** TTI's European team of field-based Sales Engineers and local Product and Technical Specialists are here to support you; from understanding component trends, sustainable sourceability and new product roadmaps, to in depth technical support for your design from our technical engineering experts.

- **Value Added Services** Connector assembly is one of the most important value-added services at TTI, Inc. – Europe. We are specialized in distributing manufacturer controlled and certified connectors and interconnect solutions from leading global suppliers. Thanks to a large inventory level of connector components, TTI, Inc. – Europe can serve any market requirements.

- **Global Distribution Centers** Our European headquarters is located just outside of Munich, Germany in Maisach-Gernlinden. In total, we have 45.000m² of dedicated warehouse space and local sales and technical support in over 40 locations across Europe. TTI has more than 195.000m² of automated warehousing in North America, Europe and Asia. All are linked into a global warehouse management system that provides superior customer service and overall business efficiencies. Wherever you are in the world, TTI can support you. Year after year, customers rate our inventory availability, on-time delivery and accuracy among the very best in the industry – contact us today to find out what a true specialist has to offer.

- **Quality and Reliability** TTI's global warehouses are all ISO-registered and have received certification to the ISO 9001 and ISO 14001 Standards. TTI Europe is also certified to EN9120/EN9100, IECQ-CECC and ISO/IEC 27001 Standards. Additionally, our European sales branches are ISO 9001 certified. TTI has one global documentation system that ensures that every TTI branch and warehouse in the world follows the same processes.





80+
Suppliers



45.000 m²
Warehousing Space



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40
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Applications

HVAC

- Air Handling
- Chillers
- Ventilation
- Humidifiers

Heating

- Solar Heating
- Geothermal Heating
- Regeneration Heating
- Oven & Fryers

Pumps

- Heat Pumps
- Booster Pumps
- Water Pumps

Boilers

- Water Boiler
- Steam Boiler



HVAC



Heating



Pumps



Boilers

Passives

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| <p>Oscillators</p> | <p>Semi Shielded Inductors</p> | <p>Slow Blow Fuse</p> | <p>DSF Supercapacitor</p> |
| <ul style="list-style-type: none"> • Continuous Vdd operation (1.6V ~ 3.6V) • Optimized for low current consumption • Package sizes as small as 1.6 x 1.2 x 0.6mm | <ul style="list-style-type: none"> • Semi-shielded construction • High rated current, up to 10A • Inductance selection 0.5 – 100µH • Footprint range: 3x3 to 8x8mm | <ul style="list-style-type: none"> • Slow blow thin film chip fuse for overcurrent protection • 3216 (EIA 1206) miniature footprint • Surface mount packaging for automated assembly | <ul style="list-style-type: none"> • Ultra-low self-discharge current • Capacitance Range 1.5 to 600 Farads • High energy density (24% more than 2.7V) • Low ESR |
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| <p>SuperCapacitor Module</p> | <p>5G Antenna</p> | <p>Power Film Capacitor</p> | <p>R52/R53 Film Capacitors</p> |
| <ul style="list-style-type: none"> • High power density to optimize system size and low operating costs • IP65 environmental rating for high dust areas and water jet washable | <ul style="list-style-type: none"> • Frequency Coverage: 600 MHz-5GHz • High performance and isolation characteristics • Small form factor • Wideband coverage 4G/5G/LPWAN | <ul style="list-style-type: none"> • Able to withstand harsh environmental conditions • High-performance DC filter • Low ESR, high peak, and RMS current | <ul style="list-style-type: none"> • Automotive (AEC-Q200) grade • Constructed of metallized polypropylene film • Harsh environment capability |
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| <p>MLCC</p> | <p>Shunt Resistors</p> | <p>EMC Shielding</p> | <p>HMOV Varistor</p> |
| <ul style="list-style-type: none"> • FlexiCap terminations are subject to bend tests to show they meet specification such as IEC 60384-1:2001, IEC 60068-2-21:2006 and AEC-Q200 | <ul style="list-style-type: none"> • 0.5mΩ to 20mΩ • 1W (0805 inch) to 5W (2512 inch) • Current ratings up to 100A • T.C.R.: ±50 / ±75ppm/K | <ul style="list-style-type: none"> • Surface Mount • Rigid Corner • Removable pick bridge (Two-piece) • Tight coplanarity tolerances | <ul style="list-style-type: none"> • 3-disc sizes available • High isolation voltage capability • High operating temperature • High surge current withstanding capability |
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|  <p>muRata INNOVATOR IN ELECTRONICS</p> |  <p>muRata INNOVATOR IN ELECTRONICS</p> | <p>Panasonic INDUSTRY</p> | <p>Panasonic INDUSTRY</p> |
| <p>NTC Thermistors</p> | <p>Power Inductor</p> | <p>Panasonic Oscon Capacitor</p> | <p>Hybrid Capacitor</p> |
| <ul style="list-style-type: none"> • Excellent solderability and high stability in environment • Excellent long time aging stability • High accuracy in resistance and B-Constant | <ul style="list-style-type: none"> • Accommodates a substantial rated current of up to 80A • Boasts a sleek and space-efficient surface-mount design | <ul style="list-style-type: none"> • A wide voltage range from 2.5 to 100 volts • High capacitance up to 2700μF • Low ESR down to 6.5mΩ | <ul style="list-style-type: none"> • 30g vibration proof types available • Large capacitance • AEC-Q200 compliant • 39μF up to 560μF |
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| <p>Industrial MLCC</p> | <p>Circuit Breakers</p> | <p>DC Link Capacitors</p> | <p>Power Inductor</p> |
| <ul style="list-style-type: none"> • Industrial Applications - indoor and outdoor • Capacitance values up to 100μF • Rated voltages up to 630V | <ul style="list-style-type: none"> • Ratings from 0.05 – 20A up to 400V • Panel and PCB mounting • Terminals: quick connect, screw clamp, solder, THT | <ul style="list-style-type: none"> • High reliability for severe ambient conditions • Long life - 50.000h (85$^{\circ}$C, rated voltage) • THB Test (60$^{\circ}$C/95% RH/1000h) | <ul style="list-style-type: none"> • 3 major technologies (metal composite, thin-film, magnetic shield wound) • Temperature range up to 125$^{\circ}$C • Low DCR characteristics |
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|  |  |  | <p>YAGEO</p> |
| <p>High Power Resistors</p> | <p>Metal Shunt Resistors</p> | <p>Polymer Capacitors</p> | <p>Thin Film Resistors</p> |
| <ul style="list-style-type: none"> • Anti-sulphur version available • Excellent pulse withstand performance • Improved power rating | <ul style="list-style-type: none"> • Proprietary processing technique produces low resistance values (5 mΩ to 500 mW) • Excellent frequency response to 50 MHz | <ul style="list-style-type: none"> • Wide capacitance range: 15μF to 470μF • Voltage ratings up to 75V • ESR down to 25mΩ; Multi-anode construction reduces ESR by 50% | <ul style="list-style-type: none"> • AEC-Q200 qualified • Full PPAP available • Capable of performing under the most demanding conditions |
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Discrete Semiconductors

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| <p>BSD Series - New SiC Schottky Barrier Diodes</p> | <p>BIDD05N60T - 600V IGBT</p> | <p>SP3213-01UTG - TVS Diode Array</p> | <p>IX4351NE -9A LoW Side SiC MOSFET & IGBT Driver</p> |
| <ul style="list-style-type: none"> • Low reverse leakage current • High peak forward surge current • Reduced EMI *No reverse recovery current | <ul style="list-style-type: none"> • 600V, 5A, Low VCE(sat) • Trench-Gate Field-Stop technology • Optimized for conduction • Robust • RoHS compliant* | <ul style="list-style-type: none"> • Low leakage current • Space efficient 0201 footprint • AEC-Q101 qualified | <ul style="list-style-type: none"> • Separate 9A peak source and sink outputs • Operating Voltage Range: -10V to +25V • Internal negative charge pump |
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| <p>SACB-Series 500mW TVS Diodes</p> | <p>PSMQC098N10LS2 - 100V N-CH MOSFET</p> | <p>TK7P60W5 - 600V Power MOSFET</p> | <p>TPD4202 High Voltage 3-phase motor driver IC</p> |
| <ul style="list-style-type: none"> • Low profile SMD package • Fast response tim • Excellent clamping capability • Low incremental surge resistance | <ul style="list-style-type: none"> • RDS(ON) < 9.8 mΩ at VGS = 10 V, ID = 30 A • RDS(ON) < 14.7 mΩ at VGS = 4.5 V, ID = 15 A • High switching speed • Low reverse transfer capacitance | <ul style="list-style-type: none"> • Fast reverse recovery time: trr = 75ns (typ.) • Low RDS(ON) 0.54 Ω (typ.) * DTMOS • Easy to control Gate switching • Enhancement mode | <ul style="list-style-type: none"> • 3-phase bridge output using MOSFETs. • Included over-current, under-voltage protection • SSOP30 package |
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| <p>VS-40MT160P-P - Three Phase Bridge Module</p> | <p>VS-3C10ET07S2L - SiC Schottky Diode</p> | <p>SiHR080N60E - 650V Power MOSFET</p> | <p>1.5SMC-Serie - 1.5KW TVS Diode</p> |
| <ul style="list-style-type: none"> • Low VF • Low profile package • Direct mounting to heatsink • Low junction to case thermal resistance • 3500 VRMS insulation voltage | <ul style="list-style-type: none"> • Improved VF and efficiency • Positive VF temperature coefficient • 175 °C maximum operating junction temperature | <ul style="list-style-type: none"> • Low figure of merit (FOM) • Low effective capacitance • Reduced switching and conduction losses • Avalanche energy rated (UIS) | <ul style="list-style-type: none"> • Low profile SMD package • Glass passivated junction • Low inductance • Excellent clamping capability • Fast response time |
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Optoelectronic Components

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| <p>CLY6D-FKC - RGB LED PLCC6</p> | <p>CLV1A-FKB - RGB LED PLCC4</p> | <p>556-Series 25mm LED PMI</p> | <p>621-Series 22mm PMI</p> |
| <ul style="list-style-type: none"> • PLCC6 • Red(619-624nm) • Green(520-540nm) • Blue(460-480nm) | <ul style="list-style-type: none"> • PLCC4 • Red (619-624nm) • Green (520-535nm) • Blue (460 75nm) | <ul style="list-style-type: none"> • DC and AC voltages • Flat & domed lens • Daylight viewable version • Constant intensity version • Explosive environment | <ul style="list-style-type: none"> • Nonmagnetic • Corrosion resistant for indoor & outdoor use • RoHS compliant • IP66/IP67 • IK10 |
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| <p>Light Pipe Solutions</p> | <p>KPBA-2006</p> | <p>KA-4040 -4x4mm Right Angle SMD LED</p> | <p>TLP5214A - Smart Gate Drive Coupler</p> |
| <ul style="list-style-type: none"> • Linking an SMD LED to a front panel • Different lengths and heights available • Stackable in arrays • Various versions available | <ul style="list-style-type: none"> • Side View Dual Color Chip LED, 0.6 mm thickness • Low power consumption • Wide viewing angle • Ideal for backlight and indicator | <ul style="list-style-type: none"> • Single color • Suitable for all SMD assembly and solder process Available on tape and reel • Ideal for backlighting | <ul style="list-style-type: none"> • SO16L • Peak Output current 4.0 A • Supply Current 3.8mA(max) • Power Supply Voltage 15-30V • Isolation Voltage 5000Vms(min) |
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| <p>VO3120 - IGBT and MOSFET Driver</p> | <p>VO4158D - Phototriac</p> | <p>VOH1016 - High Speed Optocoupler 1Mbd</p> | <p>IL300 - Linear Optocoupler</p> |
| <ul style="list-style-type: none"> • 2.5 A min peak output current • 25 kV/μs min common mode rejection • ICC = 2.5 mA max supply current • Wide operating VCC range | <ul style="list-style-type: none"> • High input sensitivity • 300mA on-state current • Zero voltage crossing detector • 800V blocking voltage • Isolation rated voltage 4420VRMS | <ul style="list-style-type: none"> • High data rate 2 MHz (NRZ) • Latch up and oscillation free • Low turn-on threshold current 2 mA • Logic compatible output | <ul style="list-style-type: none"> • Couples AC and DC signals • High gain stability • Low input-output capacitance • Isolation voltage 4420 VRMS |
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Connectors

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| <h2>Amphenol</h2> | <h2>Amphenol</h2> | <h2>Amphenol</h2> | <h2>Amphenol</h2> |
| <p>eco mate® Aquarius™</p> | <p>AnyteK</p> | <p>NQ SMT Spring Clamps</p> | <p>RotaConnect® WTB/BTB</p> |
| <ul style="list-style-type: none"> • Dynamic IP68/69K when mated • Flammability rating - UL94-VO • Temperature range extends from -40°C to +125°C • Max Current 23Amp | <ul style="list-style-type: none"> • Pluggable Terminal Blocks • Control Board Linking, Share Power & Signal • Spring or Screw Type Plugs | <ul style="list-style-type: none"> • Compact design • High wire retention forces • Low wire insertion force | <ul style="list-style-type: none"> • Board-to-Board connectors feature hermaphroditic “mates to itself” design, that eliminates the need for both a header and a receptacle |
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| <h2>Amphenol</h2> | <h2>Amphenol</h2> | <h2>Amphenol</h2> | <h2>Amphenol</h2> |
| <p>FLH Mini Sealed 2.50mm Connectors</p> | <p>Modular Jack RJ45 Connector Solutions</p> | <p>USB SOLUTIONS</p> | <p>USB 3.1 TYPE C CONNECTORS</p> |
| <ul style="list-style-type: none"> • Wire-to-wire IP67 sealing in mated and unmated conditions • Ensure waterproof and reliable connections in harsh environments | <ul style="list-style-type: none"> • Various shielding options and LEDs • Wide operating temperature: -55°C to +85°C • 750 mating and unmating cycles | <ul style="list-style-type: none"> • Customer design flexibility • Enhanced durability • Halogen-free housing material • High flammability rating | <ul style="list-style-type: none"> • Supports superspeed communication 10Gb/s • Terminal design enables high and reliable contact force |
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| <h2>Amphenol</h2> | <h2>Amphenol</h2> | <h2>HARWIN</h2> | <h2>HARWIN</h2> |
| <p>Minitek® 2.0mm</p> | <p>ECOMATE</p> | <p>Archer M50 (1.27mm pitch)</p> | <p>EMC Shield Cans</p> |
| <ul style="list-style-type: none"> • Double solder tail on each pitch for Single Row (SR) VerticalCard Connector (VCC) • 2Amps with more than one contact powered • Selective plating | <ul style="list-style-type: none"> • Quicklock fastener instead of bayonet (fast and secure connection) • Up to 45A transmittable, solutions for voltages up to 600V | <ul style="list-style-type: none"> • Industry-standard conventions for pin header and socket systems • Low profile | <ul style="list-style-type: none"> • Provides excellent RFI and EMI protection to sensitive circuitry at the PCB level • No hand soldering required • Fast and simple push-fit with SMT clips |
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Connectors

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|  | <h2 style="color: red;">molex</h2> | <h2 style="color: red;">molex</h2> | <h2 style="color: red;">molex</h2> |
| <p>WTB Low Profile IDC - Series</p> | <p>KK 254 and KK 396 Connectors</p> | <p>Easy-On FFC/FPC Connectors</p> | <p>DuraClik 2.00mm</p> |
| <ul style="list-style-type: none"> IDC connectors can be potted or over-molded to encapsulate electronic modules and provide environmental protection | <ul style="list-style-type: none"> Friction locking headers and receptacles ensure secure mating and prevent accidental disengagement Polarizing header backwalls, polarizing ribs on receptacles and polarizing pegs prevent accidental mis-mating during assembly | <ul style="list-style-type: none"> -40-125°C operating temperature range meets automotive requirements Cable retention force of 20N to withstand vibration and shock resistance Moveable terminals ensure secure contact retention | <ul style="list-style-type: none"> Positive inner-lock design Audible “click” when mated Wide solder tabs |
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| <h2 style="color: red;">molex</h2> | <h2 style="color: red;">molex</h2> | <h2 style="color: red;">molex</h2> | <h2 style="color: red;">molex</h2> |
| <p>SlimStack Board-to-Board Connectors</p> | <p>Squba Sealed Wire-to-Wire</p> | <p>Micro-Fit 3.0 Family</p> | <p>Spot-On Wire-to-Board Connector System</p> |
| <ul style="list-style-type: none"> Wide alignment guides Dual contact design Floating | <ul style="list-style-type: none"> Protected, low-profile positive latch Seal caps Sealed components with proven performance | <ul style="list-style-type: none"> Fully isolated contacts Fully polarized housing to prevent accidental mis-mating Positive latching to prevent accidental disconnects | <ul style="list-style-type: none"> Fully polarized and colour-coded receptacle housing Higher profile plug housing Positive inner lock |
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| <h2 style="color: red;">molex</h2> | <h2 style="color: red;">molex</h2> |  |  |
| <p>Combo Antennas</p> | <p>CP-6.5 Wire-to-Board Connectors, 2, 4 and 6 circuits</p> | <p>SKEDD</p> | <p>Lever-actuated PCB terminal blocks</p> |
| <ul style="list-style-type: none"> 2.4/5 GHz Combo GPS/Wi-Fi Ceramic Antenna: PCB-mounted (SMT), ultra-compact, high-gain Grounding and fixing pads Ceramic antenna housing | <ul style="list-style-type: none"> Wide spectrum of housing colors Polarization keys on housing rib Positive lock feature on housing Kinked soldertails | <ul style="list-style-type: none"> SKEDD direct connection technology enables flexible positioning on the PCB | <ul style="list-style-type: none"> Intuitive operation, thanks to color-coded actuating lever Tool-free lever principle enables time-saving connection and release of conductors with/without ferrules Distinct lever positions give a reliable feedback whether the clamp cage is opened or closed |
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Connectors

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|  <p>schaffner</p> |  <p>AUTHORIZED DISTRIBUTOR</p> |  <p>AUTHORIZED DISTRIBUTOR</p> |  <p>AUTHORIZED DISTRIBUTOR</p> |
| <p>IEC Inlet Filters</p> | <p>AMPMODU MTE</p> | <p>Heat Shrinkable Printable Tubing</p> | <p>CoolSplice Connectors</p> |
| <ul style="list-style-type: none"> Rated currents up to 10A Integrated single/dual fuse holders Optional reduced leakage current versions (A/B type) | <ul style="list-style-type: none"> XAssembly designs offer latching and polarization Coupling shrouds permit ganging of smaller receptacle and pin assemblies with guide ribs to form larger single or double row latching connectors | <ul style="list-style-type: none"> Identification Sleeves | <ul style="list-style-type: none"> Enable a waterproof solution with an IP rated splice 2-position connector Wire size: 22AWG to 18AWG (0.34mm² – 0.75mm²) stranded and solid wire |
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|  <p>AUTHORIZED DISTRIBUTOR</p> |  <p>AUTHORIZED DISTRIBUTOR</p> |  <p>AUTHORIZED DISTRIBUTOR</p> |  <p>AUTHORIZED DISTRIBUTOR</p> |
| <p>BUCHANAN WireMate</p> | <p>1.5 mm AMP Mini CT Connector</p> | <p>Micro-MaTch Connector Family</p> | <p>MATE-N-LOK Connectors</p> |
| <ul style="list-style-type: none"> Quick solderless poke-in connector design Slim contacts that have no covering housing Several solutions for solid and stranded wire from 16 AWG to 24 AWG | <ul style="list-style-type: none"> 2 kinds of termination method: IDC, crimp Discrete wire interconnect Circuits range from 2-20 single row, 22-40 dual row AWG 24~28 | <ul style="list-style-type: none"> Tin plated contact design One of the smallest systems available at 1.27mm UL-recognized: File No. E28476, Vol. 23, Section 4 | <ul style="list-style-type: none"> 250 [6.35] centerline 600VAC or VDC, 19A maximum 30 - 10 AWG wire range |
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|  <p>AUTHORIZED DISTRIBUTOR</p> |  <p>AUTHORIZED DISTRIBUTOR</p> |  <p>AUTHORIZED DISTRIBUTOR</p> |  <p>AUTHORIZED DISTRIBUTOR</p> |
| <p>P-Clamp</p> | <p>VAL-U-LOK Connectors</p> | <p>RF Solutions – Antennas</p> | <p>Power Versa-Lock</p> |
| <ul style="list-style-type: none"> Faster installation time than standard AS21919 P-Clamps Quick-lock feature allows operators to quickly open and close the clamp as needed Minimizes risk of FOD with hardware free locking mechanism | <ul style="list-style-type: none"> New high current types are rated up to 13A per line Discrete wire interconnect available in 2-24 position Wire-to-wire and wire-to-board pin and socket connector system | <ul style="list-style-type: none"> NEW standard portfolio on-demand in CRS and aluminum material Proven designed-in features | <ul style="list-style-type: none"> 5.0mm centerline spacing Flexible housing design for unsealed and sealed applications Current rating up to 15A Voltage rating: 600V |
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Relays & Switches

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| <p>CRE - 10 mm DIP Coded Rotary Switches</p> | <p>Anti-vandal Sealed Pushbutton</p> | <p>Surface mount Snap-acting Switch</p> | <p>D2F Basic Switch</p> |
| <ul style="list-style-type: none"> • Process sealed – withstands soldering and cleaning • Thru-hole and surface mount models • New designs with different actuators | <ul style="list-style-type: none"> • Momentary or Lock version • IP67 sealed & IK10 (Stainless steel bushing) • Capable of up to 3A resistive load • 50,000 life cycle at full load | <ul style="list-style-type: none"> • Fully process sealed • SPST NO contact configuration in a compact body size; ideal for space saving or restricted space applications • Ideally suited to low current signalling applications (0.1A) | <ul style="list-style-type: none"> • Small size enables downsizing of applications • Lineup of 5A type for high load applications • Insertion molded terminals prevent flux penetration |
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| <p>G2RL Low Profile General Purpose PCB Power Relay</p> | <p>G5NB Compact & High Capacity PCB Power Relay</p> | <p>DJ-H Latching Relay</p> | <p>DW - polarized RELAYS</p> |
| <ul style="list-style-type: none"> • Low profile: 15.7mm max in height • Conforms to VDE (EN61810-1), UL508 and CSA22.2 • IEC/EN 60335-1 conformed (-HA model) | <ul style="list-style-type: none"> • 3A, 5A & 7A Switching Capability • Compact Size & Low Power Consumption of 200mW • High Durability (200K operations) • Operating Temperature of up to 85 C° | <ul style="list-style-type: none"> • Size: 39 x 15 x 33mm (l x w x h) • Maximum switching voltage 480V AC at 25A • Reinforced insulation | <ul style="list-style-type: none"> • Low profile type available (height: 15.8 mm) • Reflow possible (Pin-in-Paste) • Conforms to various safety standards (UL/C-UL, VDE, CQC) |
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| <p>EL Series Solid State Relay</p> | <p>RT1 Inrush Power Relays</p> | <p>SCHRACK Power PCB Relays RZ Series</p> | <p>IM Signal Relays</p> |
| <ul style="list-style-type: none"> • DC & AC output Solid State Relay in an Industry standard EMR plug in package • Ratings of 1 to 5 Amps rms at 24 to 280 VAC, or 5 to 10 Amps DC | <ul style="list-style-type: none"> • 1 pole 16A • 1 form A (NO) contact (AgSnO2 or AgSnO2 + Tungsten pre-make contact) • 165A/20ms inrush peak current; 320A peak current of florescent lamps | <ul style="list-style-type: none"> • Designed to 16 Amp global standard platform for HVAC systems • Unique weld breaker mechanism to overcome micro welding and help improve life time • Single-pole relays with normally open or changeover contacts • The rated coil power is 400mW | <ul style="list-style-type: none"> • Slim line 10x6mm, low profile 5.65mm and min. board-space 60mm2 • Switching current 2/5A, switching power 60W/62.5VA and switching voltage 220VDC/250VAC • Low coil power consumption, 140mW standard, 100mW for high sensitive version, |
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Power

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| <p>GB10 series of open-frame AC-DC power supplies</p> | <p>PUC-2BG series Powering Gate Driver Circuits</p> | <p>HDR Din Rail Power Supply</p> | <p>IRM Series</p> |
| <ul style="list-style-type: none"> • 12W open frame and PCB-mount power supply • PCB-mount: 27 x 52 x 25mm • Chassis mount: 40.6 x 85.8 x 25.4mm • Universal input 90 - 264 VAC | <ul style="list-style-type: none"> • 2W Output • 6200Vdc input to output isolation • Safety Compliance EN62368-1 • High Efficiency 81% with full load | <ul style="list-style-type: none"> • Ultra slim design • Universal input 85~264VAC • No load power consumption <0.3W • Isolation class II | <ul style="list-style-type: none"> • AC-DC PCB-mount green power module • 1W-90W |
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| <p>MPM Series</p> | <p>MDR Series</p> | <p>UHP Series</p> | <p>HLG Series</p> |
| <ul style="list-style-type: none"> • AC-DC high reliable PCB-mount green medical power module • 5W-90W | <ul style="list-style-type: none"> • Single output industrial DIN RAIL • 10W-100W | <ul style="list-style-type: none"> • low profile design with PFC power supply • 200-2500W | <ul style="list-style-type: none"> • AC/DC constant voltage +constant current LED driver • 40W-600W |
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|  |  |  <p>INNOVATOR IN ELECTRONICS</p> |  <p>INNOVATOR IN ELECTRONICS</p> |
| <p>ELG Series</p> | <p>EPS Series</p> | <p>MGJ1 and MGJ2 Series DC/DC Converters</p> | <p>NXJ1/2 Series - Low Power DC-DC</p> |
| <ul style="list-style-type: none"> • AC/DC constant voltage +constant current LED driver • 75W-300W | <ul style="list-style-type: none"> • Single output power supply • 15W-120W | <ul style="list-style-type: none"> • 1W and 2W SMD gate drive DC-DC converters • AECQ104 – pending • Ideal for driving IGBT and SiC MOSFET | <ul style="list-style-type: none"> • UL60950 approved • High isolation to working voltage 200Vrms / 250Vrms • Ultra low isolation capacitance 2.5pF / 2.4pF |
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Power & Sensors

| | | | |
|---|--|--|---|
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| <p>NXE Series - Low Power DC-DC</p> | <p>AC/DC Encapsulated Power Modules - PAA Series</p> | <p>MIPS Series Heavy Duty Pressure Sensor</p> | <p>ABP Series Board Mount Pressure Sensors</p> |
| <ul style="list-style-type: none"> • UL60950 approved • Low cost , low profile • Ultra low isolation capacitance 2.5pF / 2.4pF | <ul style="list-style-type: none"> • Ultra Compact Size 1.46" x 1.08" • Universal Input Range 90-305VAC, 47-440Hz • I/O Isolation 4000VAC • Isolation Class II | <ul style="list-style-type: none"> • Compatible with a wide range of fluids and gases • Reliable performance over temperature range • Outstanding EMI/EMC performance | <ul style="list-style-type: none"> • Cost effective and energy efficient • Calibrated and temperature compensated • Small size 8 mm x 7 mm • Long-term stability of $\pm 0.25\%$ |
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|  |  <p>INNOVATOR IN ELECTRONICS</p> |  |  |
| <p>IPM Series Particulate Matter Sensor</p> | <p>Ioniser and Ozonizer modules -Ionissimo range</p> | <p>Airpax Circuit Breakers</p> | <p>Thermostat 3NT Series</p> |
| <ul style="list-style-type: none"> • Laser based (class 1) factory calibrated • Concentration range: 0 $\mu\text{g}/\text{m}^3$ to 1,000 $\mu\text{g}/\text{m}^3$ • Long life of up to 8 years with continuous operation | <ul style="list-style-type: none"> • Ozonizer - 2mg/H ozone amount • Ionizer -20M ions/cc ion output | <ul style="list-style-type: none"> • Sealed toggle circuit protectors • Rocket circuit protectors • Multi-pole circuit protectors | <ul style="list-style-type: none"> • Easy mount package • Innovative dry seal • Built in Automatic Reset • Ideal for remote location |
|  |  |  |  |
|  |  <p>AUTHORIZED DISTRIBUTOR</p> |  <p>AUTHORIZED DISTRIBUTOR</p> |  <p>AUTHORIZED DISTRIBUTOR</p> |
| <p>112CP Pressure and Temperature Sensor</p> | <p>First Sensors LMI Series Pressure Sensor</p> | <p>MSP100 Series Pressure Transducer</p> | <p>GA Series Pipe Probe Temperature</p> |
| <ul style="list-style-type: none"> • Precise superheat measurement • -40oC to 135oC • 0 to 150psi through to 0 to 650psi | <ul style="list-style-type: none"> • Ultra Low pressure ranges • Thermal Microflow measurement technology • High Immunity to dust | <ul style="list-style-type: none"> • 100% stainless steel for harsh chemical environment • Small profile solution • 14-bit Digital output available | <ul style="list-style-type: none"> • Flexible packaged probes assemblies • Clip on surface temperature or duct mount types |
|  |  |  |  |



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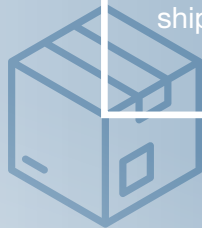
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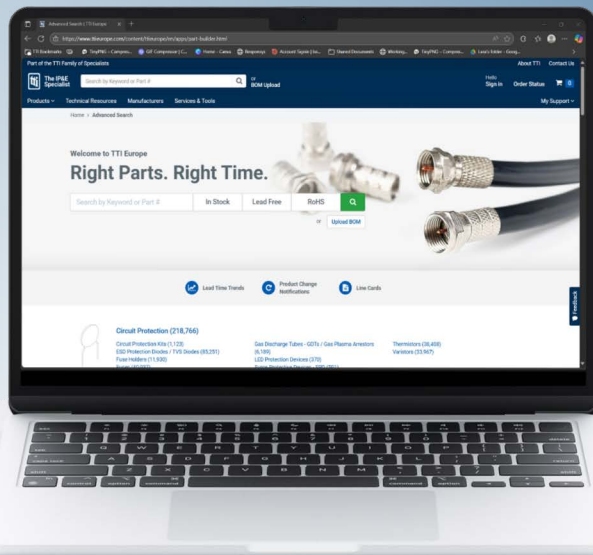
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Corporate Headquarters

TTI, Inc.
2441 Northeast Parkway, Fort Worth, Texas 76106 U.S.A.
T: +1 817 740 9000 | F: +1 817 740 9898
E: information@ttiinc.com

European Headquarters

TTI, Inc.
Ganghoferstr. 34, 82216 Maisach-Gernlinden Germany
T: +49 (0) 81 42 66 80 0 | F: +49 (0) 81 42 66 80 490
E: sales@de.ttiinc.com

European Sales Offices

Austria

Vienna
T: +43 (0) 18 79 85 90
E: sales.vienna@at.ttiinc.com

Belgium

Gent
T: +32 9 274 0670
E: sales.belux@nl.ttiinc.com

Bulgaria

Varna
T: +359 52 51 10 59
E: sales.varna@bg.ttiinc.com

Czech/Slovak Republic

Brno
T: +420 541 126 714
E: sales.brno@cz.ttiinc.com

Denmark

Brondbj
T: +45 (0) 43 29 35 35
E: sales.copenhagen@dk.ttiinc.com
Risskov
T: +45 (0) 38 41 31 00
E: sales.copenhagen@dk.ttiinc.com

Estonia

Tallinn
T: +372 664 81 00
E: sales.estonia@ee.ttiinc.com

Finland & Baltic Region

Espoo
T: +358 98 94 65 200
E: sales.finland@fi.ttiinc.com

France

Brive
T: +33 (0) 5 55 92 92 93
E: sales.france@fr.ttiinc.com
Bron
T: +33 (0) 472 81 2030
E: sales.lyon@fr.ttiinc.com
Bruz
T: +33 (0) 2 99 77 60 84
E: sales.rennes@fr.ttiinc.com
La Ciotat
T: +33 (0) 442 84 4142
E: sales.marseille@fr.ttiinc.com
Montigny Le Bretonneux
T: +33 (0) 130 13 7380
E: sales.paris@fr.ttiinc.com

Germany

Berlin
T: +49 (0) 30 8877 40 200
E: sales.berlin@de.ttiinc.com
Dortmund
T: +49 (0) 2301 91 304 0
E: sales.dortmund@de.ttiinc.com
Frankfurt
T: +49 (0) 6102 5999 100
E: sales.frankfurt@de.ttiinc.com
Hanover
T: +49 (0) 5 11 7 80 59 0
E: sales.hannover@de.ttiinc.com
Munich
T: +49 (0) 81 42 66 80 110
E: sales.munich@de.ttiinc.com
Pforzheim
T: +49 (0) 7231 14788 0
E: sales.stuttgart@de.ttiinc.com

Hungary

Budapest
T: +36 1 40 22 111
E: sales.budapest@hu.ttiinc.com

Ireland

T: +44 (0)1494 460000
E: sales.ireland@ie.ttiinc.com

Israel/Ray-Q Ltd.

Airport City
T: +972 3 975 3333
E: sales@ray-q.com

Italy

Civitanova Marche
T: +39 0733 81 8655
E: sales.milan@it.ttiinc.com
Florence
T: +39 (0) 55 094 63 76
E: sales.milan@it.ttiinc.com
Milan
T: +39 02 822 521
E: sales.milan@it.ttiinc.com
Naples
T: +39 081 4245719
E: sales.milan@it.ttiinc.com
Padova
T: +39 049 7802311
E: sales.milan@it.ttiinc.com
Rome
T: +39 0774 57 1302
E: sales.rome@it.ttiinc.com

Netherlands

Eindhoven
T: +31 (0) 40 290 1616
E: sales.belux@nl.ttiinc.com

Norway

Drammen
T: +47 (0) 92 66 87 66
E: sales.norway@no.ttiinc.com

Poland

Krakow
T: +48 605 475 479
E: sales.poland@pl.ttiinc.com
Kwidzyn
T: +48 55 279 67 57
E: sales.poland@pl.ttiinc.com

Portugal

Vila Nova de Famalicao
T: +351 252 493084
E: sales.barcelona@es.ttiinc.com

Romania

Cluj Napoca
T: +40 (0) 733 339 002
E: sales.romania@ro.ttiinc.com

South Africa

Pretoria
T: +27 86 111 2844
E: sales.southafrica@za.ttiinc.com

Spain

Barcelona
T: +34 (0) 93 645 25 75
E: sales.barcelona@es.ttiinc.com
Madrid
T: +34 (0) 91 416 11 90
E: sales.madrid@es.ttiinc.com
Vizcaya
T: +34 (0) 94 623 25 80
E: sales.bilbao@es.ttiinc.com

Sweden

Gothenburg
T: +46 (0) 31 741 12 90
E: sales.gothenburg@se.ttiinc.com
Stockholm
T: +46 (0) 8 594 11 800
E: sales.stockholm@se.ttiinc.com

Switzerland

Baar
T: +41 (0) 41 76741 90
E: sales.swiss@ch.ttiinc.com

Algeria, Egypt & Tunisia

T: +216 (0) 71 862 693
E: sales.tunis@fr.ttiinc.com

Morocco

T: +33(0) 555 92 92 93
E: sales.morocco@de.ttiinc.com

Turkey

Istanbul
T: +90 (0) 216 688 91 75 76
E: sales.turkey@tr.ttiinc.com

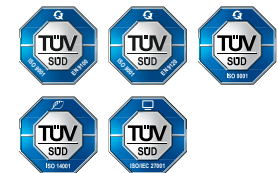
United Kingdom

High Wycombe
T: +44 (0)1494 460000
E: sales.london@uk.ttiinc.com
Manchester
T: +44 (0)161 872 2019
E: sales.london@uk.ttiinc.com

Resellers or Distributors

TTI Connect - Europe
T: +49 8142 6680 168
E: service@tticonnect.com

TTI, Inc. Headquarters Europe



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