

### Leak testing

The Sentinel M24 from **Cincinnati Test Systems** is a compact and versatile leak test instrument that provides repeatable, high-resolution tests, fast cycle times, vacuum fluorescent graphic display, and an embedded operator interface. The instrument can function in single- or multiple-station configurations to eliminate numerous instruments by managing up to four stations, and it reduces part fill and exhaust times by 80%. Features include automatic calibration, correction for temperature changes, a modular design, tooling control functions, 16 x 14 x 8 in (406 x 356 x 203 mm) size, and a Quik Test function that further decreases the test cycle time. The M24 can communicate directly to the factory or to other networks via Ethernet, conventional ports, or through PDAs or e-mail alerts.



### Small motoring dynamometers

**Sakor Technologies'** MicroDyne small motoring dynamometers test small rotary devices such as motors, pumps, generators, and compressors. The four-quadrant dynamometer is designed for low-power applications. Versions include sizes from 100 W to 5 kW (0.1 to 7 hp). For applications operating at 5 kW and above, the AccuDyne AC dynamometer system is compatible with larger rotary components as well as conventional engine and powertrain systems, hybrid vehicle drives, and electric motors. The devices offer precise speed and torque control. This feature is especially true in low-speed applications where full torque can be applied all the way to stall (zero speed). Modern drive technology also allows seamless crossover between motoring and loading modes. Advanced features include inertia simulation, engine simulation, and NVH testing capability.



### Electric oven

The No. 926 electrically heated 250° (121°C) shelf oven and environmental test chamber from **Grieve** is used for age testing electrical and electronic components and features 4-in (102-mm) insulated walls, aluminized steel interior and exterior, and a 20 x 56 in (508 x 1422 mm) double-pane Lexan window in each of the unit's two doors. Nichrome wire elements offer 12 kW (16 hp) to provide heat to the load, and a 1000 ft<sup>3</sup>/min (28,317 L/min), 1-hp (0.7-kW) recirculating blower provides horizontal airflow. The No. 926 oven includes a disposable fresh air filter, digital indicating temperature controller, manual reset excess temperature controller with separate contactors, workspace dimensions of 68 x 30 x 66 in (1727 x 762 x 1676 mm), airflow safety switch, and a remote control panel.



### Test equipment

The model PDC-20AC inline pinhole detection system from **Clinton Instrument** is a low-cost, nondestructive electronic system that instantly locates defects in plastic tubing on the production line. An extension of the extrusion tooling, metallic mandrel, or carrier functions can be used as the grounded electrode during the test. Sound material isolates the test module from the grounded electrode allowing no arc to form. However, if the material is defective, an arc will discharge to the grounded electrode through the fault site. The test equipment detects this discharge and indicates the fault.



### Material analysis

The ElectroForce 3450 test instrument from **Bose** is designed for high-frequency dynamic mechanical analysis (DMA) and quality assurance testing of viscoelastic materials such as elastomers, polymers, and composites. Its high-performance load frame is a clean, quiet, and low-maintenance solution for a wide variety of material and component testing needs. With a maximum dynamic force capacity of ±6 kN (1350 lb), the ElectroForce 3450 can measure dynamic properties from 0.001 to 200 Hz. A hot/cold chamber can be added to the system to provide temperature control, and an optional automatic creep compensation system is available. Applications include: DMA of vibration isolation components; dynamic characterization of elastomeric materials; fatigue and durability evaluation of engineered plastics and polymer composites, and crack growth and creep/stress relaxation.





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### Rotary torque sensor

TORKDISC rotary torque sensor system from **PCB Piezotronics** is a compact inline rotary torque sensor suited for spindle qualification testing of machining centers, dynamometer testing of gasoline and diesel engines, transmissions, transfer cases, and differentials, and torque studies on pumps, fans, and electric motors. The sensor aids in selecting proper spindle sizes by comparing rated power to actual torque delivered to cutting tools. It features high torsional stiffness and low sensitivity to axial and thrust bending moments. Its telemetry system consists of an onboard electronic module that converts torque signals into a high-speed digital representation. Once in digital form, data are transmitted to a noncontacting pick-up loop.

A remote receiver unit converts the digital data to a high-level analog output voltage, frequency output, and serial digital output. The unit offers capacities from 165 to 18,735 lb-ft (226 to 25,400 N·m) full scale and maximum speeds to 15,000 rpm.



### High-resolution display drivers

**Texas Instruments** has expanded its 32-bit TMS470 microcontroller platform, offering new devices for instrument cluster host controller applications. The TMS470PLFx MCUs are targeted for systems with up to six stepper motors and are tightly coupled with the firm's OMAP33x and DaVinci TMS320DM64x based graphics controller to drive high-resolution LCD and thin-film transistor displays. The MCUs can

directly drive small-segment LCDs through its embedded 128-segment LCD controller, while the use of peripheral modules such as the high-end timer, direct-memory access controller, and multi-buffered serial peripheral interface allow the instrument cluster MCU family to drive other types of digital displays directly with no CPU load impact.



### Electronic warning system

The driver attention system from **Siemens VDO** detects the signs of a drowsy or inattentive driver and quickly warns her or him. The warning system uses an IR digital camera that is installed in the vehicle's dashboard and is barely visible to the driver. The camera continuously monitors the driver's face both day and night by illuminating it with invisible IR light. A software program evaluates the recordings in real time, and based on the driver's viewing direction and blinking patterns, it can determine the driver's alertness and attentiveness. If the electronics detect signs of drowsiness, the driver is warned at two levels: first, if concentration slackens, a vibration of the seat prompts the driver to turn his or her attention back to the road; then, if the camera registers critical drowsiness, a signal tone of increasing intensity is sounded.

select and enter the CAN messages to be retrieved, including parsing, down-sampling, and time-stamping to control data transfer. Select CAN message data are then transferred periodically or on demand in near real time from the vehicle equipped with the Proemion 2101 CAN module to the host for viewing on demand, or transferred to the customer's server for later analysis. Built-in 8-MB data flash and large SRAM resources enable CAN data logging and lossless data buffering when connectivity is interrupted. GPS location with mapping is optional. The system can be used to reprogram vehicle ECUs or its own module firmware remotely in-field, or to analyze or diagnose demo vehicle fleets.



### Floor-mounted pedals

TCF Series electronic floor mounted industrial foot pedals from **Tuthill Controls Group** were designed for the control of modern diesel and gasoline powered vehicles with complex electronic management systems. The pedals feature a noncontact angular displacement sensor, and the design offers consistent pedal assemblies that can be incorporated into any type of vehicle. The sensor is available with a range of different signal outputs and is compatible with most electronic engine management systems. The versatile foot pedal design is also suited for controlling electric vehicles and modern hydraulic systems; pedal assemblies can be designed to meet specific customer requirements. Typical applications include trucks, buses, and construction, farm, and material handling equipment.

### Remote CAN diagnostics

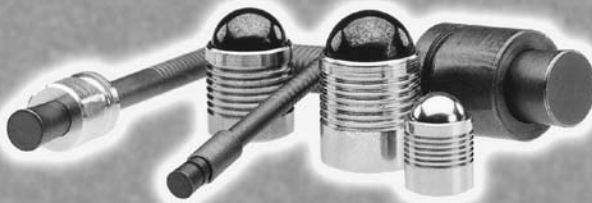
Proemion remote wireless tools for CAN bus information from **RM Michaelides** allow engineers to retrieve, record, and analyze CAN bus information from a vehicle located nearly anywhere in the world using an Internet portal. The GSM/GPRS cellular infrastructure provides the transfer. The engineer uses an Internet- or PC-based configuration tool to

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# The MH-2 From WIKA Is One Tough Transducer.



Photo courtesy of Manitowoc Crane Group

Off-road equipment manufacturers face difficult challenges. They need a pressure transducer that can handle dust, dirt, shock and temperature extremes while maintaining long-term stability and performance. Choosing the right partner can make your life a lot easier. The best fit is a company with a long history of transducer experience and a wide range of sensor technologies.

## Metal Thin Film Technology

Partnering with WIKA means you will always have the best transducer for your application. The WIKA thin film sensor features low hysteresis, excellent repeatability and high accuracy. In the rugged world of mobile hydraulics, sputtered metal thin film sensors are the hands-down choice of design and application engineers.



## Next Generation Transmitter Technology

The MH-2 utilizes next generation materials, electronic components and production technologies. To meet increasing demand with competitive pricing, the MH-2 is manufactured on proprietary, automated high-volume production equipment. OEM customers needing to ramp-up quickly to large quantities can count on reliable production capacity and fast delivery from WIKA.

## Capillary Dampening System (CDS)

Every CDS-equipped MH-2 features a tapered pressure channel that virtually eliminates cavitation and micro-diesel effects. It's a big improvement over transducers that use screw-in or press-in restrictors that may come loose during operation.

## Shock and Vibration Resistance

An irregular landscape may create shocks that affect pressure transmitter performance and longevity. The MH-2 handles shocks to 500g. Off-road engines also generate extreme vibration. Comparably, a jet engine under maximum thrust is on average only 10g. The MH-2 is designed to withstand vibration up to 20g.

## Washdown Protection

The MH-2 with integrated cable electrical connections meets IP69k ingress protection criteria and is resistant to high pressure steam cleaning procedures. Electrical components inside the plug and case are potted with sealants that will not crack, craze or fatigue from heat, stress or moisture.

## Stability

Any manufacturer can write specifications that will perform in the laboratory. When demanding conditions occur in the real world, failure is not an option. WIKA transducers are engineered to provide long-term stability and cycle life even when subjected to dynamic pressure changes and spikes.

## Customization

The MH-2 is available with a wide variety of output signals, pressure and electrical connections. WIKA can work with your design team to provide a custom configuration for specific design-in requirements.

Contact us at 1-888-WIKA-USA, extension 2660 or [tronicinfo@wika.com](mailto:tronicinfo@wika.com) to learn more about the dependable, flexible and rugged next generation family of MH-2 pressure transducers.



Common MH-2 configurations

## WIKA Instrument Corporation

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### Crystal oscillator

**Bliley Technologies'** low-noise, 100 MHz ovenized crystal oscillator features low-profile packaging (0.53 in [13.5 mm] maximum). The NV45G1480 device is suited for phase-locked microwave signal sources including dielectric resonator oscillators, test equipment, microwave communication systems, and military and Doppler radar. The device contains carefully matched crystals and oscillators achieving optimal performance for noise, packaging nearly 50% smaller than previous generations, low power consumption, and tight stability. Specifications include 100 MHz operating frequency,

typical phase noise -130 dBc at 100 Hz offset, stabilities as tight as  $\pm 50$  ppb over temperature, high power output of 15 dBm, lower power consumption (1 W typical at 25°C [77°F]), and long-term aging at 20 years.



### Die presses

S Series die presses from **Schuler** are designed with standardized modules to control capital investment costs while meeting production demands for output, up-time, and quality. A link drive offered for all transfer presses allows a lower drawing speed in the working range for parts that require complex forming. An eccentric drive is present in all progressive die presses to yield higher output rates. Air tanks and power units are mounted onto the press body, leaving

the pit free for scrap conveyor positioning. These features enable a standardized pit design and reduce the space and cost required for installation. The presses are heat treated to relieve welding stress and provide higher structural stability, higher dimensional precision, and longer equipment life. They are equipped with double helical (Herringbone) gear sets made of nodular cast iron and gas-nitrided forged steel for extended die life, improved part quality, and reduced ambient operating noise. Other features include user-friendly HMI control design, central slide locking system, eight-point slide guiding system, and 2-in (51 mm) overload travel.



### Rocker switch

The above panel sealed vehicle rocker (SVR) switch from **Eaton** features an umbrella styled rocker button and bezel-less frame, designed to deflect moisture and debris from under the button. The SVR also offers up to 250,000 cycle mechanical life, available LED lighting, standard and over-voltage protected LEDs, 10-terminal construction, front-to-back enclosure seal, and a large surface. Tested to IP68 seal level and submersible under water, the switch is suitable for use in the marine, heavy-duty truck, specialty, utility, agriculture, and construction vehicle markets.



### Coolant filter

The **Donaldson** Endurance Plus Coolant filter is a simple filtration system that maintains coolant quality in diesel engines. The extended service life coolant filters are equipped with additive replenishment technology that uses a controlled chemical release

process and Synteq filtration media and are suited to replace standard coolant filters. Designed for standard coolants ethylene glycol and propylene glycol, the replenishing additive extends coolant life, offers maintenance intervals of once a year or 150,000 mi (241,400 km), and protects against corrosion, cavitation erosion, scale deposits, and inhibitor drop.



### Ergonomic seating

Double-decker train seats from **Grammer** offer improved comfort, design, and modularity and a 540 mm (21.3 in) width. The ergomechanics backrest adjustment mechanism automatically modifies the backrest's contours when the angle changes so passengers can alter the sitting position while continuously receiving backrest support. A lumbar hump changes shape to suit the natural curvature of the spine, and the V-shaped head cushion is suitable for passengers of all sizes. Second-class trains use Grammer's D 3000 seats (pictured) with ergonomically designed cushion contours, seat attachment systems, and rod construction for improved strength and surface quality.



### Lock-out relays

Type WL-2 and WL lock-out relays (LORs) from **Electroswitch** are manual reset devices used to automatically trip and lock out circuit breakers to protect critical equipment from damaging electrical faults. Available with or without handle-trip capability, the LORs are used where simultane-

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### Signal conditioners

The **CyberResearch** DSC series of signal conditioners accepts a range of inputs and includes four models that provide 3000 V dc of isolation on inputs, outputs, and power source. DIN-mount DSC modules offer a choice of output

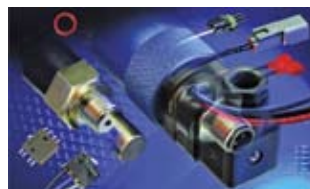
ranges and are powered from unregulated 10 to 30 V dc. DSC TCA is a thermocouple module that accepts inputs from 12 standard thermocouple types. DSC SGA is a 950 Hz bandwidth strain-gauge conditioner that accepts five different input voltage ranges. DSC DCV is a voltage module that accepts four input voltage ranges, and DSC DCA is a current module that accepts 0 to 20 or 4 to 20 mA.



### Plate heat exchangers

**Tranter's** all-welded, plate heat exchangers were designed to improve operations in high-capacity biodiesel plants. The gasketless units are compatible with liquids, gases, and aggressive media and can be designed for less than a 1°C (34°F) temperature approach. The Supermax

Shell & Plate standard unit handles pressures up to 69 bar (1000 psi) and temperatures up to 538°C (1000°F); the line is offered in three different circular plate diameters. The Ultramax All-Welded Plate Heat Exchanger features six plate lengths and was designed for pressures up to 45 bar (653 psi) and temperatures up to 345°C (653°F). Large capacity or multi-pass configurations are available.



### Pressure switches

**Mico** supplies a broad range of switches as an OEM distributor for **Nason** and incorporates switching capabilities into its custom-designed brake systems. Mico pressure switch types range from 2 to 5000 psi (0.14 to 345 bar), while Nason vacuum switches range from 1 to 30 in Hg (3.4 to 101 kPa) and temperature switches from 40 to 300°F (4 to 149°C). The braking products feature switches integrated into the components and are custom-designed based on customer needs. Nason switches are used in hydraulic and pneumatic applications in the aviation, marine, machine tools, military, agricultural, construction, and industrial vehicle industries.

variety of welding processes including stick, TIG, MIG, flux-cored, and pipe welding as well as arc gouging.



### Onboard video system

The CAM50 Color Dome Camera from **Raymarine** features a low profile wall or ceiling mount and is suitable for monitoring indoor, enclosed areas such as a boat's wheelhouse, salon, or engine room. The CAM50 is a plug-and-play device that enables boaters to view output in full screen or alongside their radar, chart plotter, or fish finder. Up to four cameras can be connected to create a total view of the vessel and its surroundings. Features include clear color reproduction, manual pan and tilt adjustments, and a sensitive IR sensor for use in low light. High-resolution options are available.



### High-performance components

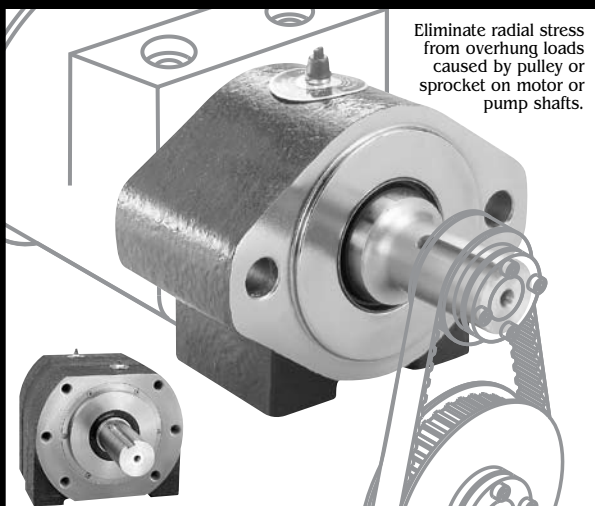
**Sauer-Danfoss** PLUS+1 compliant components including pumps, motors, valves, joysticks, and graphical display terminals are engineered for electronic interface and are available for work, propel, and control functions in mobile off-highway machinery. Using PLUS+1 GUIDE, programmers drop and drag the components' software icons on the computer screen workspace and connect them without the need for fine tuning. A user manual and technical notes provide step-by-step guides to wiring the components to a microcontroller. Benefits include reduced time-to-market for product development, improved machine productivity, and minimized operator fatigue.



### Engine-driven welder

**Lincoln Electric's** Ranger line of engine-driven welders includes an additional 1 to 5 hp (0.75 to 3.7 kW) on most engines as well as higher generator power ratings and improved reserve engine power for welding. The line features 200 to 300 A of welding and 9000 to 11,000 W of ac generator power capabilities and is suitable for light construction, maintenance, and repair applications. Rugged Rangers deliver a high-output, smooth arc for a

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