



Kele
insights

HVAC/R and BAS trade news | Volume 1 / 2019

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**CRACK THE HONOR ROLL
ON YOUR NEXT SCHOOL RETROFIT!**
20 ways to help schools earn better grades

Also featured in this edition: _____

Refrigerant Leak Hazards | What Is Dew Point and What Does It Matter? | Lighten Up: Timed Lighting Solutions

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KELE BEGINS STOCKING INVENTORY IN THE NORTHEAST

As Kele promised in 2018, we have begun to stock select inventory closer to our customers in the Northeast. This means faster shipments for many products our customers need on a regular basis. It is a first step in Kele's long-term plan to simplify our customers' supply chains and how they do business overall. Demand will inform how Kele expands the breadth and depth of inventory in the region. We look forward to sharing more in the coming months.



Sensors from Belimo offer trusted reliability, easy installation, and seamless integration with major building automation systems. They are designed with an innovative screwless snap-on cover housing that allows for easy commissioning and provides NEMA 4X / IP65 protection. The range includes accurate sensors for measuring temperature, humidity, pressure, CO₂, VOCs, and flow in pipe, duct, and outdoor applications.



[SHOP BELIMO SENSORS NOW](#)

KELE PRODUCT MATCHING SOLUTIONS EVOLVES

Kele recently expanded its product matching solution to nearly 1,000 frequently purchased items. Finding alternatives, accessories, and related parts is now even easier. The update also includes a “Customers Also Bought” section for products that have full cross-reference information. Customers see what other customers typically buy with the product they are viewing. Products without full cross-reference information now feature a “Top Sellers” section containing the top-selling products in the category of the product being viewed. Shop now and see how easy it is to find the products you need.

[VISIT KELE.COM](http://www.kele.com)

Top Sellers



HO30K-T24

Kele

3% OUTSIDE AIR RH XMTR W/TEMP SNSR 10K OHM 2 THMS

✓ In Stock

1

add to cart



HO20K-T24

Kele

2% OUTSIDE AIR RH XMTR W/TEMP SNSR 10K OHM 2 THMS

✓ In Stock

1

add to cart



GEH2-O

Amphenol Advanced Sensors
2% OSA RH XMTR

✓ In Stock

1

add to cart



HO31K-T24

Kele

3% OUTSIDE AIR RH XMTR W/TEMP SNSR 10K OHM 2 THMS

✓ In Stock

1

add to cart



HO20K

Kele

2% OUTSIDE AIR RH XMTR

✓ In Stock

1

add to cart

Customers Also Bought



SH2B-05

IDEC

DP RELAY SOCKET DIN RAIL MTD

✓ In Stock

1

add to cart



AFS-460

Cleveland Controls
0.4-12IN SPST SWITCH
W/ MANUAL RESET

✓ In Stock

1

add to cart



RH2B-ULAC24V

IDEC

RELAY W/LIGHT 24V

✓ In Stock

1

add to cart



RPS

Kele

ROOM STATIC PRESSURE SENSOR

✓ In Stock

1

add to cart



RIBXGTA

Functional Devices
SPLIT CURRENT SW,
ADJ TRIP, TERMINALS, LEADS

✓ In Stock

1

add to cart



KELE CAN FILL YOUR ENTIRE BOM

Kele offers 1.8 million parts from 300+ suppliers. With that inventory, we can meet your project needs beyond a last-minute delivery or hard-to-find product. Our support team can walk through a project with you from beginning to end and advise on the most cost-effective and efficient way to imbed parts into the job for your bid. Kele can be your one source!

If you are ready to shop for products on your own, the new product matching solution on kele.com displays alternatives, accessories, and related parts for nearly 1,000 products to make finding what you need much easier.

School project?

The Kele team can be the perfect resource for your school project! The season is fast approaching. Be sure to read "[20 Ways to Help Your School Earn Better Grades](#)" on the next page.

And keep in mind these hints as you plan your job. They will help you deal with the compressed timeframe inherent to all school projects.

- Plan your job now to minimize field work.
- Pre-package, tag, and stage materials to stay organized and efficient.
- Time deliveries based on your schedule to keep the project on track.
- Pre-fabricate, especially panels, so that all you need to do is hang it on the wall.

Kele's project services and panel team can help you with all of these.

CONTACT KELE TODAY!

TWENTY WAYS TO HELP SCHOOLS GET BETTER GRADES

Spend dollars on students, teachers, and resources instead of energy.

Ask a commercial HVAC contractor, “What are the best business opportunities for your company in 2019?” and “Retrofit.” will likely be one of the replies. Much of the HVAC retrofit business involves schools.

School facilities themselves have a direct effect on teaching and learning. Air quality, air temperature, humidity, ambient noise, and lighting are all factors that affect performance, attendance, and even the health of students and teachers. Improving the school’s grades in these areas can also give a school an A+ in energy savings.

When you are involved with a school retrofit job, consider the following money-saving, “value engineering” approaches:

LIGHTING

1. Simply turn lights off when an area is unoccupied and save a school up to 20 percent of its total lighting energy.
2. Use occupancy sensors or manual timers to turn lights off in areas like teachers’ lounges or storage rooms.
3. If classrooms are too bright, use de-lamping to lower the foot-candles but still meet the IES recommendation of 50 FC. De-lamp fixtures next to windows, and use the daylight instead of electricity. De-lamping could save up to 25 percent on lighting energy.
4. T-12 fluorescent lamps can be removed two at a time, and T-8 lamps can be removed one at a time. Replacing fixtures with ones that use T-8 lamps and energy efficient ballasts could generate a payback in less than three years.
5. Dimming ballasts adjust the light level based on daylight contribution or can be manually controlled. A lighting controller offers many options, including time scheduling, holiday scheduling, photo-sensor input, occupancy sensor input, and staged relay energizing for demand limiting.

VENTILATION AND AIR HANDLING/UNITARY EQUIPMENT

6. Inspect and/or install new filters, but also check ductwork for split seams and ineffective or missing insulation. In addition, install a differential pressure gauge or transmitter across filters to help school maintenance know when (or when not) to change or clean filters.
7. Dampers and linkages are often out of adjustment or not working at all. Fix dampers and make a huge difference in comfort and energy savings.
8. Install or verify the occupied/unoccupied control and sequence of operation for all HVAC equipment. Programmable thermostats or time clocks, if applicable, are well worth the money and return a quick payback. Remember, wiring is no problem with wireless controls.

AIR QUALITY

9. ASHRAE Standard 62 recommends a minimum of 20 CFM per occupant of outside air. If the outside air intake is based on full occupancy, significant energy is wasted on temperature conditioning the extra outside air. ASHRAE 62 now allows the use of CO₂ sensors to approximate the occupancy of an area, decreasing the energy load. An outside CO₂ reading may be necessary as ventilation should start when the inside is 700 ppm above the outside level.

10. Mold is a particular worry for schools because it builds up on coils, in condensate pans, or in walls. All of these should be checked and cleaned periodically. In addition, use a water detector in areas where water collects.
11. In many states, indoor parking garages require a CO/NO₂ gas monitoring system. It's a good idea to monitor these deadly gases anyway. There are whole multi-sensor systems for large garages or just single sensor for small parking garages.

CHILLER SYSTEMS

12. If the school has a chiller, use a portable refrigerant leak detector to check for costly leaks, and install a permanent detector in the mechanical room to meet ASHRAE Standard 15. Clean the chiller water tubes.
13. Check all control valves over a few years old and repair as necessary. Threaded or flanged globe valves might need packing kits if they are leaking around the stem. If an older globe valve is not shutting off tight, it may need a rebuild kit (new seat, plug, and packing). Repack and rebuild kits are readily available for most common globe valves and are a good option in many cases. Ball valves and zone valves are disposable and should be replaced when they wear out.
14. The cooling tower or compressors should be checked, cleaned, recharged, and repaired as needed with new refrigerant, sump temperature sensors, level sensors, and valve linkage adjustment per the control sequence.

BOILER SYSTEMS

15. If the school has a boiler, check that the boiler control has an OSA temperature shut down and supply water reset schedule to save energy and offer better temperature control.
16. Check that water pumps are operating smoothly with vibration switches and not leaking by installing a water detector in areas where water collects.
17. Check the combustion air damper to the boiler room for draft/automatic control and a tight fit.
18. Lastly, a CO and natural gas sensor in the boiler room monitors for poor combustion and gas line leaks then alerts outside the boiler room of the dangers within.

PNEUMATICS

19. There are still many pneumatic controls out there; we know and love them. Check the compressor cycle rate and the filter/dryer assembly. Check for oil or water in the lines. Rebuilding and/or replacing the pneumatic controls is certainly doable, and you can find the parts at Kele if you need them.
20. Encourage conversion to electronic/electric DDC controls if the school needs better/tighter control via the building automation system, or get electric-to-pneumatic (and vice-versa) transducers to tie the pneumatics to the BAS.

Kele has the in-house experience and expertise to help our customers, and we can provide all the energy-saving peripherals and devices needed for a school retrofit (and almost any other HVAC job). Together, we can help our schools reduce operating costs, improve indoor air quality, reduce liability, and even lessen the environmental impact. Help your school get better grades. Give Kele a call at **888.397.5353** or visit kele.com today!

SIEMENS

Ingenuity for life



567 SERIES ENCLOSURES

The 567 Series includes attractive, economical NEMA 1 enclosures designed to house controls and instruments in areas that do not require oil-tight and dust-tight ratings. The medium and large electrical boxes are over 9 inches deep, allowing the installation of larger components. The 567 Series NEMA enclosures are furnished with a perforated metal subpanel for easy mounting of components. No drilling or layout.

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PICV SERIES CONTROL VALVES

The Siemens PICV Series 1/2" to 1 1/4" Pressure Independent Control Valves have a 2.5, 5, or 5.5mm stroke and work with the SSD Series Electronic Actuators. The 1 1/2" to 2" Normally Open Valves have a 15mm stroke and work with the SAY Series Electronic Actuators. SAY Actuators for 1.5" and 2" Normally Open Valves can also be set for Normally Closed operation (reverse acting).

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RDY2000 SERIES THERMOSTAT

The Siemens Series RDY2000 Commercial Room Thermostat is designed for light commercial HVAC systems that utilize 24 VAC control circuitry. It is compatible with forced air, hydronic, or steam systems fired by gas, oil, or electricity. The thermostat can control up to three stages of heating and three stages of cooling in a conventional system.

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COMPTUS

The Comptus A70 Series Weather Instruments with signal conditioning provide a 4-20 mA output proportional to wind speed (A70-SL), wind direction (A70-DL), barometric pressure (A70-PL), or rainfall (A70-RL). The A70 Series provides the user with weather information that can be used for monitoring purposes or as an input to control systems.

Features:

- Rugged construction
- Reliable operation
- Industry standard 4-20 mA output
- Track-mounted transmitter

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A70 Series Weather Instrument

LIGHTEN UP

Tips for changing outdoor lights with changing seasons

by: Kele, Inc.

We have a customer whose parking lot lights are controlled by the building automation system using input from a light sensor. With the arrival of spring and daylight saving time, he has noticed that his parking lot lights are already on while it is still daylight. Knowing he is wasting money, he asked us to change the threshold so that the lights come on at dusk.

Clearly, the light sensor signal threshold that brings on the parking lot lights in the control program needs to be tweaked. What is the best way to go about doing this?

Although we live in a high-tech world, some things are best adjusted based on human perception. Whether the customer's light sensor is a precision unit calibrated in foot-candles or an inexpensive uncalibrated unit, we suggest the following approach:

- Schedule a meeting with the building owner at the building shortly before dusk to select the light level when he prefers the parking lot lights turn on. If he defers to you, use your "engineering judgment."
- Prior to the meeting, study the BAS control program to locate the place where the light sensor signal is checked against a threshold value to determine when to turn on the lights.
- Determine which controller AI input is receiving the light sensor signal, and be sure you know how to read the light sensor AI input value on the BAS system screen.
- Meet again with the building owner shortly before dusk. Ask him to watch the parking lot and tell you when he wants the lights to come on. When he gives the OK, read the light sensor value on the controller AI input. Modify the control program to use this new value for the light turn-on threshold.

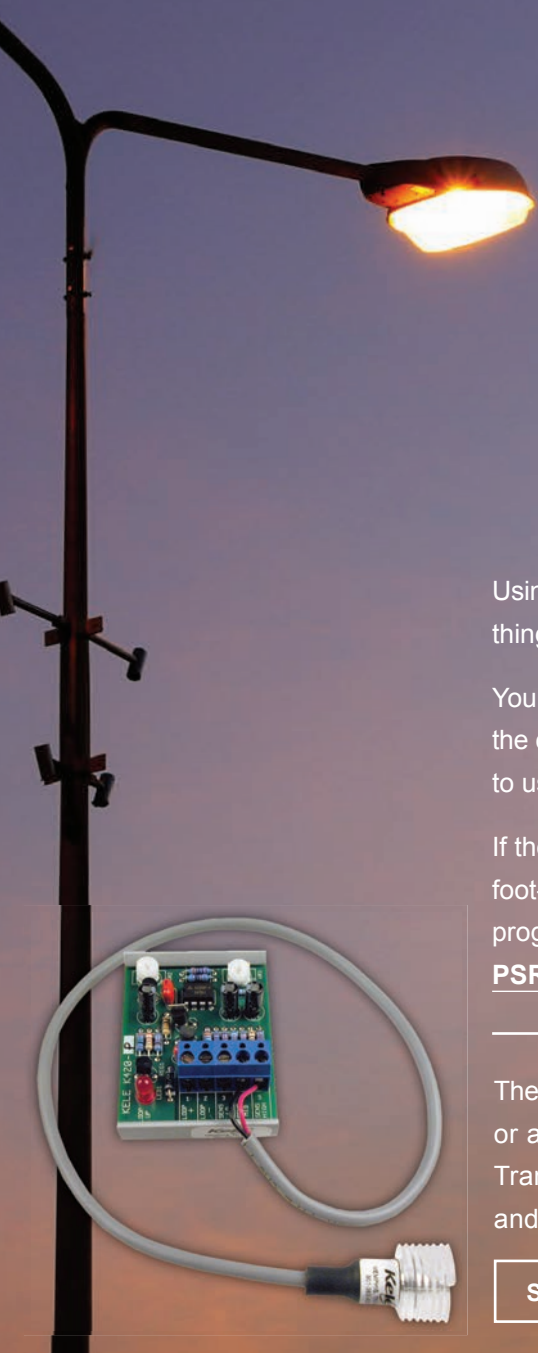
Using this approach, the actual precision of the light sensor is unimportant. The only important thing is that the signal value is repeatable for a given light level.

You might find that a different threshold is needed in the morning for light turn-off. If that is the case, repeat the above procedure at dawn and, if necessary, modify your control program to use the two different thresholds depending on whether it is dawn turn-off or dusk turn-on.

If the light level sensor ever needs to be replaced and it is a precision unit (calibrated in foot-candles from the factory), you should not need to change the thresholds in the control program. However, if you are using an inexpensive uncalibrated sensor, such as the Kele **PSR-1**, swapping the sensor will require a recalibration using the above procedure.

The **Model PSR-1 Photo-Sensitive Sensor** may be used as an input to indicate the presence or absence of light at the sensor location by a change in resistance. The Model PSR1-T Transmitter is a PSR-1 coupled with a 4-20 mA transmitter and is ideal for energy savings and cost savings in BAS applications.

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REFRIGERANT LEAK HAZARDS

by: Kele, Inc.

The standards for refrigerant safety require that chiller pressure relief devices (rupture disks) be piped outdoors so that a catastrophic overpressure is vented instead of being contained in the equipment room. Do you know the reasoning behind this?

When a pressurized refrigerant charge escapes, the refrigerant gas tends to push the air out of the room and dilute it to a very thin mixture. If the quantity of refrigerant is large enough, there may not be enough oxygen left to support respiration. Thus, a non-vented leak can be harmful or fatal to humans. Leaks due to blown rupture disks will normally be vented outdoors. However, non-vented leaks due to failed gaskets, o-rings, and even damaged piping can deplete the air from a room very quickly.

Non-vented refrigerant leaks can have another adverse effect in the mechanical room. Just as they deprive us of oxygen to breathe, leaks can also deprive a gas burner of the oxygen it needs for combustion. Larger boilers have optical (instantaneous) flame safeguards to prevent explosive conditions in the furnace when the flame is snuffed in this manner. However, smaller boilers and water heaters often rely on safety features with inherent time lags such as thermocouples. The gas will continue to flow without flame for some period of time, and if oxygen is restored before the firebox temperature falls below the ignition temperature of the mixture, a furnace explosion will result. In the best case, the result is a funny-shaped heater. In more severe cases, fire investigators stand around the empty slab and try to figure out what happened.

All of these potential adverse effects are reasons to invest in a Kele refrigerant monitor. On a rise in refrigerant level, these units can be connected to start ventilation fans and also to trip fuel shutoff valves until the furnaces can be manually purged of explosive mixtures. The **RLD-134A** refrigerant leak detector can help minimize the time that the room is starved of oxygen and can also help minimize the potential damage from a leak when the burners are firing.

Give Kele a call at **888.397.5353** or visit kele.com today to order these reliable sensors!



The Kele **RLD-134A HFC Refrigerant Leak Detector** is a solid-state HFC detector capable of detecting the presence of escaping refrigerant R-134A in building automation systems or HVAC and industrial applications. An analog output allows interfacing with computer monitoring equipment. An alarm relay is also provided with an adjustable set point and jumper-selectable time delay function to prevent nuisance alarms. Four LED's provide status indication for warm-up, ready, warning, and alarm. When properly installed and maintained, the RLD-134A is designed to be used as part of a control system that helps prevent the formation of a hazardous environment. For more information on the proper application and use of this product, please read **Environmental Safety Devices** in our technical reference section.

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WHAT IS DEW POINT, AND WHAT DOES IT MATTER?

by: Kele, Inc.

Dew point is the temperature to which a given parcel of air must be cooled, at constant barometric pressure, for the water vapor in that air to condense into liquid water.

For example, let's say we hear from the weather service that the air outside is 80°F and the dew point is 70°F. If nothing happens to change the water vapor content or the pressure of the air, and it cools down to 70°F after sundown, water vapor will begin to condense in the air. We call this phenomenon fog.

| | |
|----------------------------------|--|
| In degrees F: | $T_{\text{dew}} = T_{\text{ambient}} - \left(\frac{100 - \text{RH}\%}{2.78} \right)$ |
| In degrees C: | $T_{\text{dew}} = T_{\text{ambient}} - \left(\frac{100 - \text{RH}\%}{5} \right)$ |
| Example (80° F, 80% RH): | $T_{\text{dew}} = 80^{\circ} \text{ F} - \left(\frac{100 - 80\% \text{ RH}}{2.78} \right)$ $T_{\text{dew}} = 72.8^{\circ} \text{ F}$ (actual dew point for those conditions is 73.3° F) |

SIMPLIFIED DEW POINT CALCULATION

Valid $\pm 2^{\circ} \text{ F}$ ($\pm 1^{\circ} \text{ C}$) for temperatures 45° to 90° (7° to 32°C) and relative humidity above 50%.

For another example, consider the same weather condition – 80°F outside with a 70°F dew point. This time, we won't wait for the temperature to drop and make fog. Instead, we'll walk right up to an outdoor soft drink machine and purchase a can of our favorite fizzy beverage. When it drops out of the machine, we pick it up and immediately notice that the outside of the can is dripping wet. That's because the can of soda is probably about 40°F, much lower than the 70°F dew point of the air. Any air that comes in contact with our cool, refreshing drink will immediately be chilled below the dew point and its water vapor will condense on the can.

When it happens on a hard surface, we usually call this condensation, as opposed to fog that hangs in the air. It coats any object that is cooler than the dew point of the air that surrounds it. There is one other term for water materializing from thin air due to temperature changes, and it is the term for which the dew point is named. When it happens outdoors on the grass and flowers during the night, we call it dew.

Fog, condensation, and dew are all formed by the same mechanism. Now that we know how that mechanism works, how does it apply to BAS systems? Here is one way to apply a dew point sensor to prevent problems. Imagine a school building in a humid climate, maybe along the Gulf Coast. After a warm spring weekend with all the air conditioning

systems shut down to save energy, it wouldn't be unusual to find that some of the perimeter classrooms are at about the same condition that we discussed above – 80°F and 70°F dew point.

What do you think will happen when the air conditioning starts on Monday morning and begins blowing chilled supply air into those rooms? If supply air temperature is very far below the dew point (more than 5 to 10°F or so, depending on velocity), the air diffusers may get cold enough that their surface temperature drops below the dew point. If so, they'll behave just like our soda can did in the second example. At the very least, they will mist up and eventually corrode. If conditions are worse, they will become covered in condensation and drip on whatever happens to be under them.

An easy way to prevent this is to monitor the space dew point with [Telaire/Amphenol Advanced Model DP4 Dew Point Sensors](#) – and use the information to reset supply air temperature higher during morning cool-down. As the space gets cooler and the air conditioning system removes moisture from the air, the dew point will drop and the supply air temperature can be lowered in a controlled manner toward normal. At typical occupancy conditions, say 75°F and 50 percent RH, the dew point is 55°F, so condensation doesn't present an issue for supply air temperatures above about 50°F.



The [Telaire/Amphenol Advanced Model DP4 Dew Point Sensors](#) are rugged, compact, and ideally suited for monitoring dew point, wet bulb, or enthalpy in commercial HVAC/BAS applications. Using a capacitive RH sensor and an RTD temperature sensor, the unit's microprocessor computes the dew point, wet bulb, or enthalpy. Two linear outputs provide a 4-20 mA signal for dew point, wet bulb, or enthalpy, and a 4-20 mA signal for dry bulb temperature.

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The quick background on sensors is that dew point, temperature, and humidity are all related. If we know any two of these three values for a given parcel of air, the third value can be calculated or found on a chart. This is the science of psychrometrics. Dew point sensors generally contain both an accurate humidity or moisture level sensor and a high-precision temperature sensor. These values are used to compute dew point in an embedded computer. We won't get into the really complicated math that's involved in calculating accurate dew point values for a wide range of conditions. However, the simplified formula shown above will give you a good ($\pm 2^\circ\text{F}$ or $\pm 1^\circ\text{C}$) estimate of dew point as long as the relative humidity is above 50 percent and the temperature is in the range of 45° to 90°F (7° to 30°C).

Give Kele a call at **888.397.5353** or visit kele.com today for the dew point sensors you need to keep your customers dry and comfortable.



Kele and Dwyer Instruments are expanding our relationship in 2019. Soon, Kele customers will have access to nearly 2,500 SKUs through Kele – like the IEF Series



IEF SERIES | INSERTION ELECTROMAGNETIC FLOW TRANSMITTER

The IEF Series Insertion Electromagnetic Flow Transmitter is an adjustable insertion flowmeter featuring electromagnetic technology that accurately and reliably measures fluid velocity in addition to providing several continuous signal outputs. This series is specifically designed to offer superior performance paired with simple installation and use. One unit is adjustable to fit pipe sizes from 4" to 36" (102 to 914 mm) and offers several output options, including selectable BACnet MS/TP or Modbus® RTU communications protocol over 2-wire RS-485 in addition to the standard analog, frequency, and alarm outputs.

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RICK SCHNARR BECOMES MICONTROLS PRESIDENT AND GENERAL MANAGER



MIControls President and GM Rick Schnarr

Rick Schnarr has joined MIControls, Inc. as president and general manager. The move became effective on January 1st. Kele acquired MIControls last June to expand its presence in the western part of the country. Schnarr, an industry veteran with nearly 40 years' experience, will lead that effort moving forward.

“Rick’s addition is another step in support of Kele’s next-level growth strategy and mission to help our customers win,” said Kele President and CEO Richard Campbell. “His background, expertise, and customer relationships developed over four decades will only accelerate our success in the region.”

Steve Roe will become president emeritus following nearly 46 years with MIControls and the companies that preceded it. Roe became president and majority owner of MIControls in 2007.

“Steve has been a true partner during Kele’s acquisition of MIControls and over the past six months,” said Campbell. “He will play a vital role in this transition.”

Schnarr’s career includes a variety of customer-facing, sales management, and general management roles. Most recently, he was vice president of sales and marketing for Johnson Controls’ Commercial and Applied Ducted Systems organization. Over the years, Schnarr served as president of Johnson Air Products in Portland, Oregon, general sales manager of Trane’s Honolulu office, and in branch management with Carrier.

“I am extremely excited about leading MIControls and becoming part of the Kele senior leadership team,” said Schnarr. “I’m looking forward to leveraging the strong reputation of MIControls in the Seattle and Portland markets and supporting our team as we transition to meet future goals. We want to be the best solution for our customers in every facet of the business.”

Schnarr is a US Navy veteran, serving with the submarine force and earning an expeditionary medal and two Navy Commendation Medals for outstanding service as a ship diver and diving officer at sea.



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