

# Press Kit

Laser World of Photonics, Munich, 26 – 29 April 2022

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## Press release

Egelsbach, April 2022

### **SMC at Laser World of Photonics 2022: Innovative cooling and temperature control solutions to always keep it cool**

**Laser technology and photonics play a crucial role for a wide variety of applications in science and industry: from distance measurements to cutting and welding processes to message transmission. From 26 to 29 April, experts in the field will again gather at the world's leading trade fair Laser World of Photonics 2022 in Munich – and SMC will also be represented again.**

The leading manufacturer, partner and solution provider for pneumatic and electric automation technology and specialist for individual customer solutions will be at stand 259 in hall A5, presenting a broad product line for process cooling in industrial and high-end applications. The highlights at the SMC stand include the digital flow switch from the PF3W-Z/L series and the thermo-controllers in the HRLE, INR-244-831 and HRR series. In addition, SMC will be presenting a number of other products for the refrigeration circuit as well as automation concepts for laser applications – including optimum solutions that go beyond the process chain.

#### **Measuring with the digital diagnosis champion**

Precise measurements, for example of the circulating fluid for thermo-controllers, are essential to ensure a high level of process stability. With an applicable flow range for water of 0.5 to a maximum of 250 l/min and an integrated temperature sensor for the fluid temperature in the display range of -10 to +110 °C, the digital flow switch of the PF3W-Z/L series from SMC provides operators with the necessary measurement data. Thanks to the IO-Link interface, problems with the instrument can be identified in real time by means of cyclic and acyclic data, and remote access to data on the instrument and process status is easily possible. In addition, the two-line, three-colour display directly on the instrument shows the flow rate as well as the set value, cumulative value, and high and low values. The protection class IP65 also ensures greater safety, making the PF3W-Z/L series an ideal partner for use in the laser and photonics sector.

#### **Dual cooling and temperature control with one instrument**

With high-performance lasers for welding or cutting, the laser oscillator and optical system require separate temperature controls. Here, two thermo-controllers are used – or a dual system such as the HRLE series from SMC, which saves a good amount of space and offers other extensive advantages

as well. It permits individual control of two fluid cycles in just one instrument, which reduces procurement costs and space requirements. The series also scores points for its cooling power of 8 kW, heating power of 2 kW (channel 1 + channel 2 in each case) and temperature stability amounting to  $\pm 0.1$  °C (channel 1) or  $\pm 0.5$  °C (channel 2). The integrated triple inverter control for compressor, fans and pumps with the help of a frequency converter allows the waste heat of the compressor to be used for heating the circulating fluid. The energy consumption is thus reduced by 17 % compared to systems with a heater.

### **Particularly low noise level**

With its INR-244-831 series on show at the fair, SMC is presenting a thermo-controller for circulating fluid which delivers excellent energy and resource efficiency and which can be assimilated into a wide range of applications. Thanks to its compact design (W130 × D150 × H210 mm), the solution can be conveniently installed directly on the machine or on operators' work tables, even in confined plants. What's more, the series generates a noise level of only 58 dB even at high capacity, which can be optionally reduced to only 45 dB with an additional low-noise blower. In the refrigerant-free Peltier version, the INR-244-831 series also offers particularly low maintenance costs and eco-friendly operation. In high-performance sectors such as life science and manufacturing and processing of sensitive products, where employees are close to the application, it therefore represents an optimal solution for cooling and temperature control.

### **Ideal for 19-inch racks**

Available in both water- and air-cooled variations and with a height of only 310 mm, the thermo-controllers in the HRR series can be installed perfectly in 19-inch racks – partly so that several instruments can be accommodated in a space saving manner. All of the openings for the circulating fluid are located on the front side, from the discharge valve to the filling nozzle, which means servicing and maintenance can be carried out without the instrument having to be removed from the rack. At the same time, in the adjustable range of 10 to 35 °C with a cooling capacity of 1.2 to 3 kW, they precisely maintain the temperature with an accuracy of  $\pm 0.1$  °C. For the heating function, with a capacity of 450 to 550 W, the HRR series again relies on the waste heat from the compressor, eliminating the need for an additional heater.

Trade visitors can find SMC at Laser World of Photonics 2022 in Munich in hall A5, stand 259.



**Figure 1:**

The digital flow switch in series PF3W-Z/L from SMC offers digital communication and extensive instrument diagnostics, thanks to the IO-Link interface.

Photograph: SMC Deutschland GmbH



**Figure 2:**

The new HRLE series thermo chiller controls two individual media circuits in a small space, reduces energy consumption and is easy on its users, with its low noise levels when in operation.

Photograph: SMC Deutschland GmbH



**Figure 3:**

The new compact INR-244-831 series thermo-controllers save space and protect the environment, thanks to their refrigerant-free Peltier design and low-noise construction.

Photograph: SMC Deutschland GmbH



**Figure 4:**

Efficient and space-saving: the new HRR series thermo chillers by SMC fit perfectly into 19-inch racks and are about 50 percent smaller than comparable stand-alone instruments.

Photograph: SMC Deutschland GmbH

For more information, visit the SMC website at [www.smc.de](http://www.smc.de)

## Press release

Egelsbach, 21.04.2022

### Digital diagnostics champion: Make more use of data with the PF3W-Z/L flow switch

**Where processes are dependent on the flow rate of fluids, it all comes down to optimum measurement accuracy. Whether it's monitoring the cooling water from casting machines and welding tongs, or the circulating fluid from thermo-controllers, only with all the relevant data is it possible to guarantee that processes will work smoothly. With the new digital PF3W-Z/L flow switch from SMC, companies can ensure that this important task is carried out even more efficiently and cost-effectively, while at the same time achieving greater process stability.**

In the semiconductor, automotive and laser industries, process technicians need to ensure that fluids flow through their machinery and equipment smoothly and to the most critical elements. To do this, precise measurements are indispensable. To be able to guarantee process efficiency and safety, the engineers at SMC have added an IO-Link output to their digital flow switches in the series PF3W-Z/L. This enables continuous device diagnostics in real time, so that errors can be responded to immediately.

#### **All the data at a glance, and much more**

When it comes to cooling processes, precision is absolutely essential. If this is not guaranteed, it may result in unnecessary costs. In the worst case, however, this will result in process disruptions or complete failures. So that customers are always kept in the picture as to the flow rate in their plants and are able to intervene immediately in the case of failures, SMC has added to its digital flow switch series. Thanks to a new output for the open IO-Link communication interface, device problems can be detected in real time by using the cyclic and acyclic data. The two-line, three-colour indicator allows the data to be read directly on the device for target value, cumulative value and highest and lowest values, in addition to flow rate. Using the UP/DOWN buttons, the customer can simply switch between the parameters. The display can also be turned around, and can be aligned horizontally or vertically after installation without the need for tools, which makes it much easier to read the values, even from unfavourable positions. At the same time, the

IO-Link output enables remote access to the device and process status data: This increases process efficiency, improves process stability and reduces overall costs.

### High process stability with a comprehensive performance package

The IO-Link communication protocol offers a wide range of advantages, such as shorter commissioning times or the simple replacement of a device, as the parameters are saved in the master. The standard wiring via a M8 male connector type ensures that connection is completed within seconds. The PF3W-Z/L series achieves additional safety by satisfying protection class IP65, and this protects it against penetration by dust or water jets from any angle.

The new solution is similarly impressive to the other digital flow switches in series PF3W with smaller dimensions, which are around 40% smaller than their previous versions. The nominal flow range for water covers rates from 0.5 to a maximum of 250 l/min. An integrated temperature sensor for measuring the fluid temperature in the display range from -10 to +110 °C ensures additional diagnostic accuracy in the processes. The optional series PF3W-Z/L from SMC is available with a flow valve, expanding the range of applications.

### In detail – digital flow switch PF3W-Z/L from SMC

| Model                    | PF3W-Z/L                                |
|--------------------------|---|
| Description              | Digital flow switch                     |
| Flow rate ranges [l/min] | 0.5-4 / 2-16 / 5-40 / 10-100 / 50 - 250 |
| Fluid temperature[°C]    | 0 - 90                                  |
| Connections              | M8                                      |
| Accuracy                 | ± 3% F.S.                               |
| Repeat accuracy          | ± 2% F.S.                               |
| Electric output          | IO-Link; NPN / PNP, analogue            |



**Caption:**

The digital flow switch in series PF3W-Z/L from SMC offers a digital communication interface and extensive device diagnostics thanks to the IO-Link output.

Photos: SMC Deutschland GmbH

For more information on the PF3Q-Z/L, see the "New Products" section on the SMC website at [www.smc.eu](http://www.smc.eu)



## Press release

Egelsbach, 21.04.2022

### More efficient, smaller and quiet: Series HRLE dual thermo chiller regulates two individual media circuits

**Several thermo chillers are often required to control the temperatures of oscillators and optical systems in laser applications. Or instead dual solutions from SMC, which simultaneously regulate two applications with one system, are used: The automation specialist is now introducing one further slender thermo chiller in the form of the HRLE series, which scores points with its reduced size and improved energy efficiency. As usual, the dual system can control two individual media circuits, but it has a footprint that is roughly 21 % smaller in comparison to two HRS models. It also reduces energy consumption by 17 % and is kinder to its operators with its low-noise operation.**

Especially in applications with high-performance lasers, that are used for welding or cutting for example, laser oscillators and optical systems need to be temperature-controlled separately from one another. Two thermo chillers are often used, functions of which can be combined with the dual HRL model systems from SMC. With the HRLE series, the specialist in pneumatic and electrical automation is now adding an additional compact and energy-efficient solution to its portfolio, which reduces the footprint by 21 % compared to two models of the HRS series (for example: HRS012 and HRS090). The system also offers additional advantages when it comes to performance and cost efficiency.

#### **An efficient solution for two media circuits**

The new HRLE series dual thermo chiller delivers a cooling output of 8 kW (50 Hz), a heating output of 2 kW (50 Hz) (each CH1 + CH2) and temperature stability of  $\pm 0.1$  °C (CH1) or  $\pm 0.5$  °C (CH2). A significant advantage is seen with regard to cost and time savings: the HRLE series enables the individual control of two media circuits – and thus permits the use and operation of just one thermo chiller. For example, this allows a laser oscillator and an optical laser system to be individually temperature-controlled. It means that users only have to employ one device in their applications, which saves on both space and procurement costs. The two channels of the dual thermo chillers also use only one power supply system.

As with all SMC solutions, a high level of efficiency is also a main focus of the HRLE series: Compared to systems with a heating element, the energy consumption is reduced by 17 %. The

highlight here is the integrated triple inverter control for compressor, ventilator and pumps, with the aid of a frequency converter: This coordinates the motor speed of the components depending on load, reduces power consumption and ensures that the waste heat from the fan can be used to heat the circulating fluid.

### **Frees up space, generates less noise**

So that the dual thermo chiller can deliver optimum performance with security and reliability, it comes equipped with options such as a deionised filter, a by-pass valve and a controller for electrical conductivity as standard. In the case of laser applications, for example, this allows the cooling to be perfectly coordinated with a laser's water specification. It is also splash-proof or IPX4 compliant, which allows the installation outdoor. This saves space indoors, for example in factory buildings, and also reduces the generation of unwanted heat, depending on requirements. The adjustable fan speed ensures that the system operates with a noise level of just 65 dB(A) – and thus minimises acoustic stress for its users.

### **Saves space, costs and energy in many sectors**

The HRLE series dual thermo chillers can generally be used in all laser applications in which two different heat sources need to be controlled. Their strengths play out particularly well in automotive and semiconductor production, as well as in the medical and optical industries. Since the HRLE series combines the performance of two thermo chillers in one compact system, it particularly saves on the costs of procurement, operation and space, while still being highly efficient. It is also compatible with all standard power grids around the world, making it suitable for global use.



**Caption:**

The new HRLE series thermo chiller controls two individual media circuits in a small space, reduces energy consumption and is kind on its users with its low noise levels when in operation.

Photograph: SMC Deutschland Ltd

For more information, visit the SMC website at [www.smc.de](http://www.smc.de)

## Press release

Egelsbach, 21.04.2022

### Stay cool, save space: The new thermo chillers from SMC

#### HRR thermo chiller for 19-inch frames

State-of-the-art devices such as laser oscillators heat up quickly and have to be cooled in order to ensure good functionality in the long term. Since this often requires multiple cooling units, each individual unit must be small. The new thermo chillers in series HRR are just 310 mm in height. This makes them 305 mm smaller than comparable stand-alone devices, allowing them to fit perfectly into 19-inch frames and free up enough space to house several devices. Users can choose between water-cooled and air-cooled versions.

In designing the new HRR series thermo chillers, the experts at SMC utilised both their own experience and reports from industry practitioners. All of the openings for the circulating fluid are located on the front of the thermo chillers, from the drain port to the fill port. It is also possible to carry out all servicing and maintenance, such as replacing the particulate filter, without removing the thermo chiller from its rack. With the RS-232C/RS-485 communication interface, new devices can be conveniently connected to the facility's control system.

#### Precise, easily controllable temperature regulation

The new HRR series devices have a cooling capacity of 1.1 to 5.9 kW and maintain the temperature with an accuracy of  $\pm 0.1$  °C in an adjustable temperature range of 5 to 35 °C. What is particularly efficient about the series HRR thermo chillers is the heating function, with a capacity of 300 to 1200 W. Waste heat from the compressor is used, so there is no need for an additional heater. "The heating function ensures that a constant temperature is maintained," explains Kim Holy, Product Management at SMC.

The HRR series thermo chillers are operated via a colour LCD screen on the front of the unit. This makes it easy to read the current and set temperature during normal operation. In the event of a malfunction, the unit automatically identifies the problem with a built-in fault diagnosis system and displays one of the 23 preprogrammed malfunction codes on its LCD screen. This allows the operator

to solve the problem quickly and conveniently. The HRR series thermo chillers also automatically indicate maintenance intervals, enabling smooth operation in the long term.

The new HRR series thermo chillers are used for cooling UV lamps in drying systems, cooling laser-irradiated workpieces and providing temperature control for ultrasonic lasers and x-ray tubes, as well as in manufacturing applications in the laser, medical, chemical and electronic industries.

### Technical specifications – HRR012 – 018

| Model                     | HRR series         |
|---------------------------|--------------------|
| Cooling method            | Water or air       |
| Dimensions (w x h x d)    | 464 x 310 x 550 mm |
| Circulating fluid         | Water              |
| Temperature setting range | 10 to 35 °C        |
| Temperature stability     | ± 0.1 °C           |
| Cooling capacity          | 1.2 to 3 kW        |
| Heating capacity          | 450 to 550 W       |
| Weight                    | 40 to 46 kg        |



### Image caption:

Efficient and space-saving: the new HRR series thermo chillers by SMC fit perfectly into 19-inch frames and are about 50 percent smaller than comparable stand-alone units.

Photograph: SMC Deutschland Ltd

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## Press release

Egelsbach, 21.04.2022

### Compact and climate-friendly: new thermo-controller in the INR-244-831 series in a refrigerant-free Peltier design

**Efficient and sustainable temperature regulation is essential for process stability in industrial and research applications that generate heat — from packaging lines and welding equipment to injection moulding and laser applications. SMC, the automation specialist, known for its versatile portfolio, is now offering a particularly space-saving thermo-controller in the form of the INR-244-831 series. In a refrigerant-free, low-noise and low-maintenance Peltier design, the solution enables exceptionally environmentally friendly operation — in machines as well as on workbenches.**

In high-performance industries such as mechanical engineering the laser industry or life sciences, process engineering turns to high performance thermo-controllers for circulating media that maintain the set temperature, are energy-efficient and can be adapted for many applications. With the INR-244-831 series, SMC, the specialist in pneumatic and electric automation technology is expanding its portfolio with a thermo-controller that conserves resources, whilst also offering maximum performance with minimum unit dimensions. This saves on space, with compact dimensions of only W130 × D150 × H210 mm. Thanks to its low overall height and low weight, among other things, the power pack can be conveniently installed in confined spaces, directly on the machine itself or on user's workbenches. And since the Peltier design does not use a refrigerant, the INR-244-831 series can be easily maintained and is also environmentally friendly in operation possible circulating media: Tap water, Ethylene glycol aqueous solution (20 % or less).

#### High performance with low noise

The immediate environment of the installed thermo-controller is actually protected, in the broadest sense of the word. This is because the low-noise design allows the INR-244-831 series to be used in environments where low noise levels are required, even at high power levels. Users benefit directly from the advantages of the new INR-244-831 series, as it can be installed in machines close to the place of work, without high levels of noise pollution impacting people or the environment. The reason for this is the low noise level generated by the unit when in operation, just 58 dB, and it can also be equipped with a low-noise fan that reduces the noise level to 45 dB.

### Stable thermo-control

The key performance indicators of SMC's new thermo-controllers also speak for themselves: Suitable for ambient temperatures from 10 to 35 °C and with a set temperature range from 10 °C to 60 °C, the INR-244-831 series achieves a temperature stability of  $\pm 0.01$  to 0.03 °C as well as a cooling capacity of up to 220 W — and a heating power of up to 500 W. The front is equipped with a convenient touch screen display and control panel and with a level indicator for the circulating medium: stainless steel, EPDM, NBR, Ceramics, PPE, PPS, Carbon, PP, POM. This makes both operation and maintenance simpler, which is further facilitated by a replaceable dust filter.

### Versatility for high-performance industries

Tight temperature windows have to be maintained, especially in high-performance applications, or dramatic losses in terms of quality and quantity of products, for example, will result. The reliability of machinery can also seriously suffer when process temperatures deviate from the optimum range. With its new INR-244-831 series thermo-controllers, SMC is now providing another compact, space-saving powerhouse specifically for sectors such as mechanical engineering, the laser industry or life sciences. Not only does it offer impressive performance, but in its refrigerant-free, low-noise and low-maintenance Peltier version it also protects the environment, thereby scoring points for sustainability in both industrial and research applications.

### INR-244-831 series thermo-controller in detail

|                                  |   |
|----------------------------------|---|
| Cooling method                   | Thermoelectric device (Thermo-module)                       |
| Radiation method                 | Forced air cooling  |
| Circulating fluid                | Tap water, Ethylene glycol aqueous solution (20 % or less). |
| Ambient temperature [°C]         | 10 to 35  |
| Set temperature range [°C]       | +10.0 to +60.0 (No condensation)                            |
| Temperature stability [°C]       | $\pm 0.01$ to 0.03*   |
| Cooling capacity [W / Tap water] | 220   |
| Heating capacity [W / Tap water] | 500   |
| Power consumption [A]            | 12.5  |
| Weight [kg]                      | Approx. 4.5   |

\* The indicated values are when there is a stable load without turbulence. It may be out of this range depending on the operating conditions.



**Caption:**

The new compact INR-244-831 series thermo-control units save space and also protect the environment, thanks to their refrigerant-free Peltier design and low-noise construction.

Photograph: SMC Deutschland Ltd

For more information, visit the SMC website at [www.smc.de](http://www.smc.de)



# Company Profile

## About SMC Deutschland

Leading manufacturer, partner and solution provider for pneumatic and electrical automation technology – SMC Deutschland GmbH provides a comprehensive product range, from valves to temperature control devices, with more than 12,000 basic models and over 700,000 variations for all kinds of industrial sectors. The innovative automation solutions of the company based in Egelsbach near Frankfurt am Main can be found in the automotive, electric, photovoltaic, medical, packaging and food industries, among others, as well as in machine tool building, robotics and automation. SMC Deutschland generated a turnover of 152 million euros in the 2020/21 financial year and employs more than 750 people in Germany. In addition, a comprehensive expert service and distribution network is at the disposal of all customers.

SMC Deutschland GmbH is part of the SMC Corporation, which can be found in 83 countries worldwide with over 31 production locations. The global market leader for pneumatic automation technology, with a market share of 38 per cent, generated a turnover of 4.5 billion euros in the 2020/21 financial year and employs some 20,619 employees worldwide.