

# RELIABLE COOLING, MAXIMUM UPTIME:

## SPIROTECH SOLUTIONS FOR DATA CENTERS



Improving efficiency and performance of cooling systems in tier 1-4 data centers



DATA CENTERS

# IMPACT OF WATER QUALITY IN DATA CENTER COOLING SYSTEMS

Modern data centers produce significant heat, making efficient cooling systems critical. An optimized setup not only prevents expensive downtime but also reduces energy and water consumption. Maintaining high water quality is essential, as poor management can quickly result in inefficiencies, equipment damage, and unexpected system failures.



## CORROSION

### Effect

Gradual deterioration of metal components, leading to leaks, weakened pipes, and potential system failures.

### Caused by

Design factors: improper material selection, poor system layout, dead legs.

### Physical factors

Low flow or turbulence, pressure fluctuations.

### Chemical factors

Incorrect pH, aggressive ions, high chloride levels.



## SCALING

### Effect

Mineral deposits build up inside pipes and heat exchangers, reducing cooling efficiency and forcing the system to work harder.

### Caused by

Design factors: improperly sized heat exchangers, low-flow areas.

### Physical factors

High water temperature, stagnant areas.

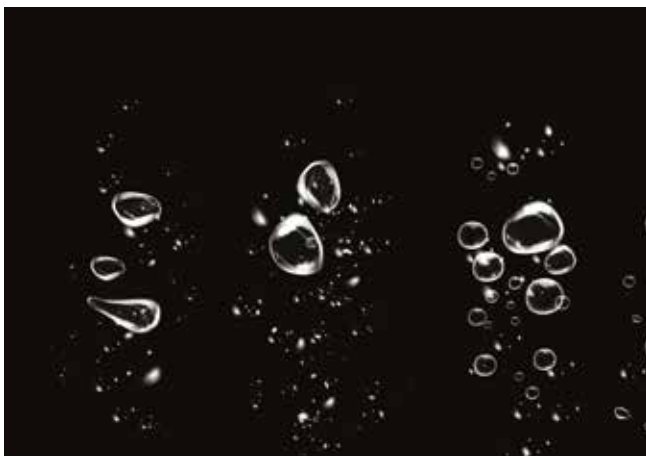
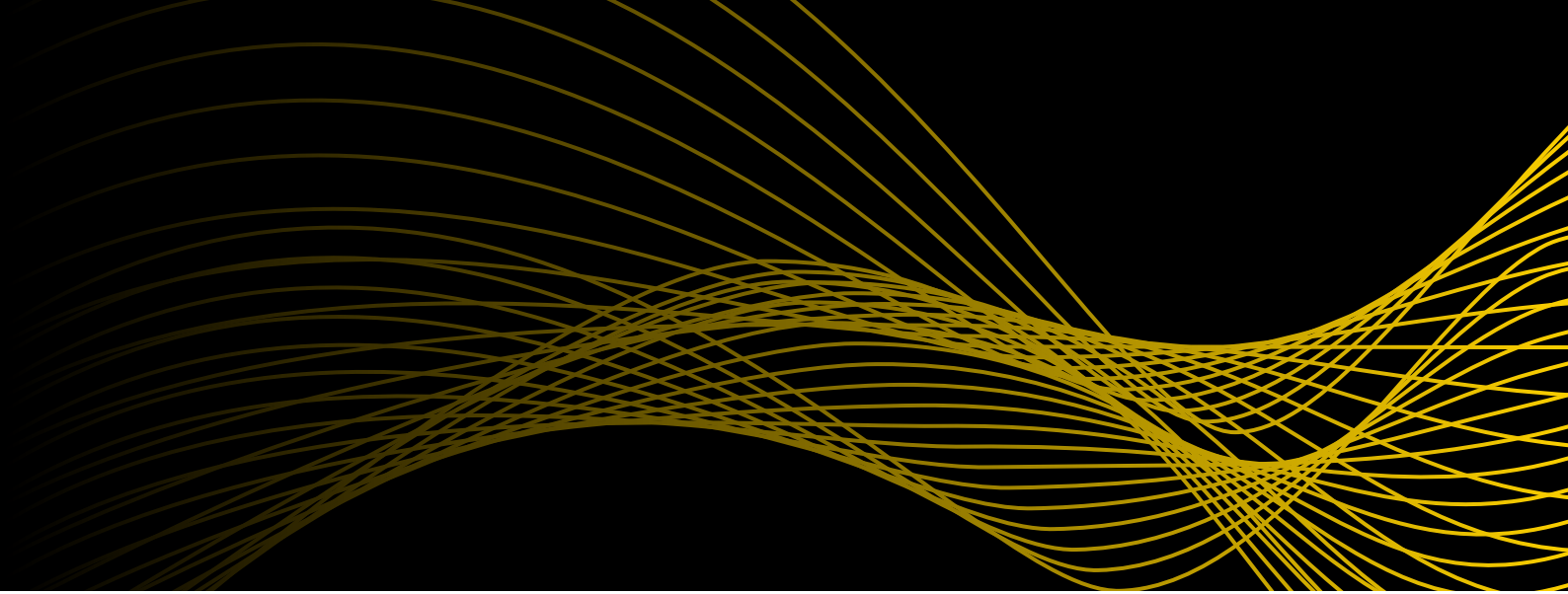
### Chemical factors

High dissolved solids, water hardness, imbalanced chemistry.

### Deep dive into system water quality

Want to gain deeper insight into system water quality and its impact on your data center? Scan the QR code and discover how to structurally prevent air, dirt, and pressure-related issues.





## AIR AND GAS ACCUMULATION

### Effect

Trapped air or gases form pockets that block water flow, reduce cooling efficiency, and can cause erratic system operation.

### Caused by

Design factors: poor system layout, dead legs.

### Physical factors

Pressure fluctuations, low flow velocities.

### Consequences of these issues:

- Increased unplanned downtime due to system failures.
- Higher energy consumption from reduced cooling efficiency.
- Shortened equipment lifespan and higher maintenance costs.



## BIOLOGICAL GROWTH

### Effect

Bacteria, algae, or other organisms proliferate, clogging pipes, fouling heat exchangers, and introducing contamination that damages equipment.

### Caused by

Physical factors: stagnant or warm water.

### Biological factors

Presence of nutrients or organic matter.

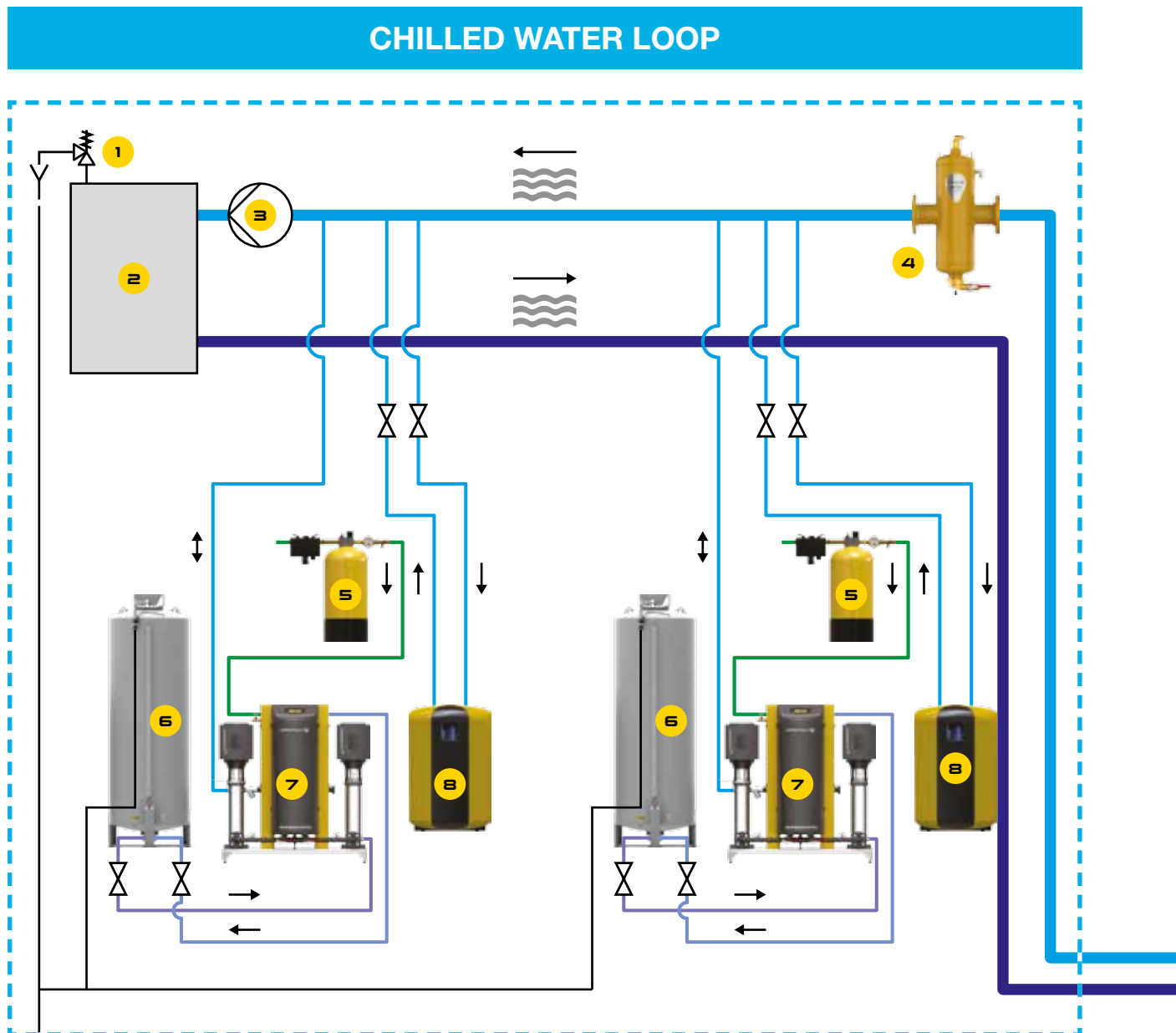
### Chemical factors

Imbalanced disinfectant or biocide levels.

Key takeaway: maintaining stable physical, chemical, and biological water conditions is essential to ensure continuous operation, optimal performance, and long-term protection of mission-critical data center assets.

# TRUSTED SOLUTIONS FOR DATA CENTER COOLING SYSTEMS

Data centers are the backbone of today's digital economy, supporting essential services like banking, cloud computing, and government operations. With uptime as the highest priority, maintaining reliable and efficient cooling systems is critical. Spirotech offers innovative solutions designed to meet the demanding requirements of tier 1 to tier 4 data centers, improving system reliability and sustainability metrics such as Power Usage Effectiveness (PUE) and Water Usage Effectiveness (WUE).

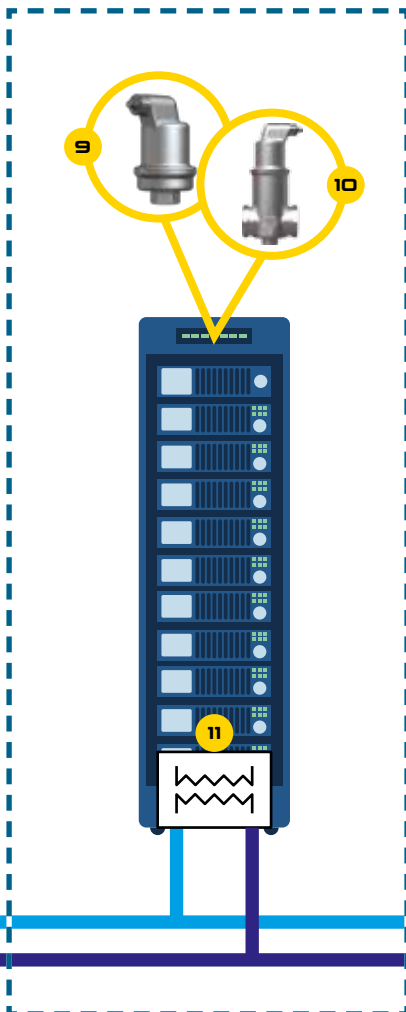


## LEGEND CONNECTION DIAGRAM

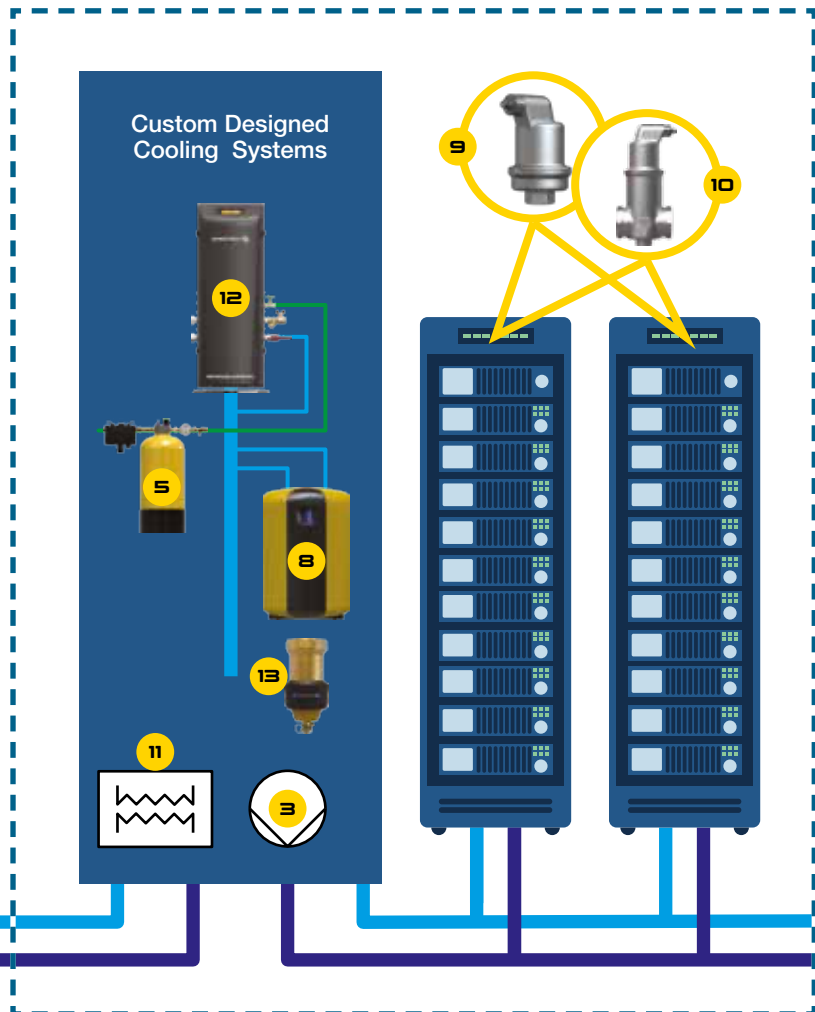
- |                                                                                           |                                         |
|-------------------------------------------------------------------------------------------|-----------------------------------------|
| 1. Safety valve                                                                           | 7. SpiroExpand - Expansion system       |
| 2. Heat exchanger                                                                         | 8. SpiroVent Superior - Vacuum degasser |
| 3. Circulation pump                                                                       | 9. SpiroTop - Automatic air vent        |
| 4. SpiroCombi (or SpiroTrap & SpiroVent) -<br>Dirt separator and/or microbubble deaerator | 10. SpiroVent - Microbubble deaerator   |
| 5. SpiroPure - Demineralization                                                           | 11. Heat exchanger                      |
| 6. SpiroExpand - Expansion vessel                                                         | 12. SpiroExpand - Expansion system      |
|                                                                                           | 13. SpiroTrap HPF - Dirt filter         |

## TECH WATER LOOP

### RACK COOLING



### ROW COOLING



# SOLUTIONS FOR CHILLED WATER SYSTEMS

### **System water quality for optimal performance**

Efficient chilled water systems are essential for modern data center cooling, ensuring reliable and energy-efficient heat removal from critical IT infrastructure. As thermal densities continue to increase, maintaining optimal water quality within the system is key to stable, long-term performance.

Spirotech water treatment and conditioning solutions protect chilled water systems against air ingress, corrosion, and contamination. Proper pressurization

ensures stable operation and consistent flow throughout the system. Air and gas separation removes dissolved and free gases that can cause corrosion, pump inefficiency, and flow disturbances. Dirt separation protects chillers, pumps, and heat exchangers from fouling, blockages, and premature wear.

To ensure reliable operation, Spirotech offers standardized and custom solutions designed for chilled water systems in data centers. These ready-to-install solutions help maintain consistent water quality, reduce operational risk, and support long-term system efficiency and stability.

### **Enhanced redundancy**

Spirotech solutions can be equipped with communication modules that integrate seamlessly into existing building management systems (BMS). Supporting redundant operation, they ensure reliable system monitoring, improved operational resilience and smooth integration within modern building and datacenter control environments.



## SPIROEXPAND<sup>®</sup>

### Pressure maintenance and performance

Stable pressure is essential in datacenter cooling systems to ensure consistent flow and prevent operational issues. Pump controlled expansion systems compensate for volume changes caused by temperature fluctuations. The modular SpiroExpand TopControl system automatically maintains stable pressure for safe and reliable operation.

*Also available in stainless steel*



## SPIROVENT<sup>®</sup> SUPERIOR

### Advanced vacuum degassing for system efficiency

Vacuum degassing is essential in datacenter cooling systems to remove dissolved gases from the system water. These gases can cause corrosion, cavitation and reduced cooling performance. The SpiroVent Superior ensures efficient gas removal, supporting stable and reliable system operation.

*Also available in stainless steel*



## SPIROCOMBI<sup>®</sup> / TRAP<sup>®</sup> / VENT<sup>®</sup>

### Efficient air and (magnetic) dirt removal for optimal performance

Air and dirt in system water can reduce cooling performance and cause corrosion and blockages. The SpiroCombi combines air and dirt separation in one compact unit. It continuously removes microbubbles and particles, ensuring clean water and reliable system operation.

*Also available in stainless steel*



## SPIROPURE<sup>®</sup>

### Improved system water quality

High water quality is critical in datacenter cooling systems, as dissolved salts can cause corrosion and reduce cooling performance. SpiroPure removes these impurities through demineralisation, ensuring low conductivity and stable water quality. This protects components and supports reliable operation.



# SOLUTIONS FOR RACK COOLING

### Improve water quality for optimal performance

Efficient rack- and row-based cooling is essential in modern data centers, where high thermal loads demand reliable performance and stable water quality. Spirotech water treatment and conditioning solutions help safeguard system performance. Proper pressurization ensures stable circulation and prevents cavitation, while degassing removes dissolved gases that can cause corrosion and reduce heat transfer efficiency. Air separation eliminates trapped air and microbubbles, and (magnetic) dirt separation protects components from fouling and blockages.

Poor water quality can lead to scaling, corrosion, and sludge formation, reducing efficiency and increasing energy consumption, maintenance needs, and system wear.

To support reliable operation, Spirotech offers standardized component kits for common rack cooling configurations. These ready-to-install solutions ensure consistent water quality, reduce risk, and support long-term system stability.

### Co-development solutions

Spirotech also provides co-development services for in-rack and row-based cooling applications. With deep expertise in water treatment and high-reliability cooling systems, we support customers in designing optimized solutions for demanding data center environments. Our co-development approach helps select and design the most suitable components for each installation, combining system knowledge with application expertise to deliver efficient, reliable, and tailored cooling solutions.



## SPIROTRAP® & SPIROVENT®

### Efficient air and (magnetic) dirt removal for optimal performance

Microbubble deaerators, automatic air vents, dirt filters and separators work seamlessly together to ensure optimal water quality in liquid cooling systems. By continuously removing air and dirt from the system water, they prevent blockages, corrosion and performance loss, which is critical for reliable liquid rack cooling.

*Also available in stainless steel*



## SPIROVENT® SUPERIOR

### Advanced vacuum degassing for system efficiency

The SpiroVent Superior vacuum degasser ensures optimal water quality by removing both free and dissolved gases from the system water. This prevents corrosion and improves system reliability, which is essential for liquid rack cooling in datacenters.

*Also available in stainless steel*



## SPIROEXPAND®

### Pressure maintenance and performance

Stable pressure control is essential in racks used as DCUs in liquid cooling systems. Pressure fluctuations can cause air ingress and reduced cooling performance, impacting reliability. The SpiroExpand pump controlled expansion systems automatically maintains system pressure for stable and efficient operation.

*Also available in stainless steel*



## SPIROPURE®

### Improved system water quality

High water quality is critical in CDUs, as dissolved salts and minerals can cause corrosion and reduce cooling performance. SpiroPure systems remove these contaminants through demineralisation and stabilise water quality. This helps protect components, reduce maintenance and ensure reliable system operation.



# TRUSTED BY LEADING DATA CENTERS WORLDWIDE

Spirotech solutions are installed in some of the most advanced and high-performing data centers across the globe. Our proven technology ensures reliability, efficiency, and protection for mission-critical cooling systems.

A selection of our references:

- **Europe** – Major cloud & colocation data centers
- **North America** – Large-scale enterprise and hyperscale facilities
- **Asia & Middle East** – High-tech and financial data centers

Proven solutions for:

- Pressure maintenance & expansion
- Air and dirt separation and vacuum degassing
- System water quality and monitoring

## SERVICE OFFERING FOR DATA CENTERS

Spirotech supports data centers with services and solutions that safeguard mission-critical cooling infrastructure, ensuring reliability, efficiency, and uptime.

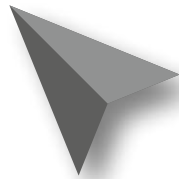
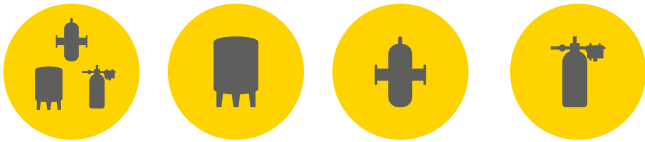
Through scalable service levels, local presence, and high spare-part availability, Spirotech ensures resilient operations, built-in redundancy, and rapid recovery for data center environments.

Contact your local Spirotech representative for a Service Level Agreement that meets your requirements.



# SPIROSELECT: SIMPLIFYING PRODUCT SELECTION

Choosing the right product for a project is critical, and Spirotech makes it easy with SpiroSelect, our intuitive product selection tool. Designed for installers and specifiers, SpiroSelect helps identify the most suitable components for your data center's specific requirements, ensuring optimal performance from the start.



Select the right solution now via  
[spiroselect.spirotech.com](https://spiroselect.spirotech.com)

## CONTACT US



For more information on how Spirotech can support your data center's heating and cooling needs, visit [www.spirotech.com](https://www.spirotech.com)

# MAXIMISING PERFORMANCE FOR YOU

Spirotech is a leading expert in improving the efficiency of heating and cooling systems. Our family business has over 60 years of experience in developing solutions for removing and preventing the accumulation of air and sludge deposits in energy systems. Our products save energy, increase comfort, avoid wear and tear and maximise operating periods. Reliable and customer-oriented products that help you get top performance and protect investment in capital assets. We develop high-value solutions with our partners and suppliers that improve the operation of residential and commercial properties. Our comprehensive network of selected importers in over 70 countries means there is always a Spirotech expert near to you.

Heating and cooling systems are highly complex, particularly when they are run in conjunction with other systems and installations. So locating and analysing faults when they occur is never easy, especially with the clock ticking in the event of a system failure. Spirotech is here to support you with practical advice and solutions, helping you to pinpoint causes and rectify them. Please feel free to contact us.

**IF YOU WOULD LIKE TO KNOW  
MORE ABOUT OUR SOLUTIONS,  
PLEASE VISIT OUR WEBSITE  
[WWW.SPIROTECH.COM](http://WWW.SPIROTECH.COM) OR  
[WWW.SPIROTECH.CO.UK](http://WWW.SPIROTECH.CO.UK)**

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