



# CASE STUDY

INDUSTRIAL SHIELDS



## HOW TO IMPROVE YOUR DATA CENTER PERFORMANCE

In a data centre there are multiple factors that affect the optimal performance of the installation.

The conditions of temperature, humidity and condensation compromise, on the one hand, the **operation** and **safety** of the elements that make up the data centre. On the other hand, they affect **energy consumption** since, in order to maintain optimum conditions, it is necessary to overload one or more of the elements that keep the installation at suitable thresholds, either temperature control by means of air flow, or air conditioning in a more generic term.

## SUMMARY

### Temperature and humidity of the environment

The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) recommends that:

- **the temperature in this type of installation should range between 65°F (18.3°C) and 80°F (26°C) and**
- **the relative humidity should be between 40% and 60%.**

The ambient temperature threshold between these values is optimal for reliable systems and for the operator to work in a comfortable environment. Although much computer equipment can operate within a wide temperature range, temperatures close to 71.6°F (22°C) are recommended to provide safe humidity levels.

When it comes to relative humidity, we move in the 40-60% range. It is important to keep the level above 30-35%, as electrostatic discharges can occur and affect the operation of the installation. By maintaining an adequate level of humidity, the durability of the equipment is also improved by protecting it against possible corrosion.

Our customer wants to **rationalise energy consumption**, as its energy cost has skyrocketed as the number of equipment in the data centre has increased.

The installation has almost doubled the number of equipment after winning new contracts:

- a major deal with a large tele-operator that is investing in the country, and
- the expansion of services for some of the country's largest banks, a sector in which the company specialises in data management.

The increase in volume is carried out in previously sized rooms, with a clear commitment to growth due to the strong demand detected.



# CASE STUDY

## SOLUTION

The historical data is analysed to find patterns that indicate points where the facility is not operating at an adequate level and is consuming excess energy.

A plus point is that the facility is generally modern and has a powerful and versatile HVAC solution. In the different rooms, there are sensors for environmental control at room level.

Once the analysis has been carried out and the HVAC system has been correctly sized, a more detailed measurement is chosen. Data is taken at the foot of the rack and critical points are identified which are overheating the whole room and lowering, in turn, the relative humidity, with the consequent risk of electrostatic discharges. After identifying the problem, more sensors are added to give a complete view of the room, both at a general level and in terms of the details of the spaces where each of the racks and fractions of them are installed.

The new installation of sensors provides very valuable information about where to act in order to keep all the elements at the right temperature and humidity. This new vision of the installation, together with the versatility and power of the HVAC installation, changes some of the parameters initially established. The air flow and the control of the refrigerators are adapted to be more efficient in the management of temperature and humidity.

## FINAL RESULT

Thanks to this fresh approach, significant improvements and benefits are achieved. The new range of installed sensors provides a large amount and quality of information. The **monitoring** of this information, together with the **analysis**, allows the creation of some automatisms and the configuration of a series of alerts and alarms when there are values out of range. Some of the most noteworthy points are:

✓ Control and reduction of high temperatures in some racks or equipment. On occasions, there were extreme temperatures that put the correct functionality of the service and the optimum durability of the hardware at risk. By reducing the temperature and controlling the humidity adequately, customer service is ensured by **avoiding system failures** or falls; moreover, the hardware works in adequate conditions without suffering overheating or possible effects from electrostatic discharges.

✓ As the customer has a powerful and versatile HVAC solution, it is configured appropriately based on the monitored values and thus acts on the areas in a specific way. This provides significant **energy savings**, as it avoids overloading or over-dimensioning the air conditioning system to maintain critical areas at the expense of the ones where more stable conditions exist.



The versatility of the installed PLCs and the freedom of programming —thanks to the fact that the equipment is based on Open Source Hardware— have been decisive for the customer to carry out the installation, complementing and improving the existing one.