



Eliwell Controls Srl

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ISO 9001



Our website, **www.eliwell.com**, provides up-to-date information on our products and solutions.
Our newsletter is our direct line to our clients, to keep them up-to-date with new developments and product improvements and evolutions.
Our website's reserved area gives easy access at any time to dedicated content and software upgrades.



Invensys Controls is a global provider of controllers, systems and services used in the domestic appliances, commercial refrigeration and heating, ventilation and air conditioning industries, and it enjoys a very strong position in its reference markets. In EMEA its main brands are: Drayton, Eberle, Eliwell and Ranco. Invensys Controls is a division of the Invensys Group, a technology group that operates worldwide, listed on the London Stock Exchange.

EWCM series

Compressor rack controllers



REFRIGERATION SYSTEMS



Features

- Dedicated energy-saving algorithms.
- Dedicated inverter-control algorithms.
- Suction and discharge setpoint management reflecting ambient conditions.
- Backup function in the event of inverter failure.



Eliwell

A leader in refrigeration and air conditioning technologies

Eliwell is a world leader in commercial refrigeration and air conditioning solutions. Established in 1980, the company is now part of the Invensys Controls Group.

At its production plant in Belluno in Italy, Eliwell develops and manufactures high-quality controllers and control systems for refrigeration units, used in the drinks and food industries. Eliwell also supplies controllers to well-known European air conditioning system manufacturers.

Eliwell drives developments

The defining features of Eliwell products are their unbeatable quality and reliability. Our products are backed by more than 25 years experience, combined with the expertise gained in working with the biggest Italian universities and major international manufacturers of air-conditioning systems. To meet the needs of its customers worldwide, Eliwell develops individual, future-orientated solutions that significantly improve our competitiveness.

Always on the customer's doorstep - worldwide

Eliwell places a high value on developing close relations with its customers. A global distribution network, involving distributors, partners and commercial representatives, ensures good contact and fast response times. Customers benefit from excellent service and all-round expert support from our highly qualified technical team.

Acting responsibly for future generations

Eliwell takes its responsibility for the environment and maintenance of a world fit for future generations very seriously. In all production processes we place a high priority on economical, sustainable use of resources. We create optimum requirements for the health and well-being of our employees. In addition, we also actively promote environmentally compatible production conditions at our suppliers.

Versatile solutions for demanding requirements

Eliwell implements innovative solutions with leading-edge technologies. Our diverse product range includes:

- high-quality electronic controllers and control systems for commercial refrigeration units in the food sector
- Controllers for air-conditioning systems
- Monitoring systems for refrigeration installations in supermarkets



Ten reasons to make it Eliwell

- Reliable products (returns under 0.025 per year)
- Assured quality in development and production, thanks to testing and the Six-Sigma system
- On-time delivery
- Exclusive „Made in Italy“ design, development and production
- Products conforming to European standards
- Compliance with ISO 9000 processing and ISO 14000 environmental certification
- Constant commitment to research and development, to guarantee optimal performance levels
- Significant investment in the development of new products
- Widespread presence throughout the world in terms of technical support, part replacement and customer service
- Part of a financially stable global organisation

The evolution of refrigeration



The current trends in commercial and industrial refrigeration continue to confirm the ever-growing need to provide reliable system solutions that offer the installer and the user real economic savings and comply with environmental standards.

Reliability

- Guaranteed safe cooling
- Maximum functionality

Simplicity

- Easy start-up
- Integrating with existing systems

Economic savings

- Initial investment
- Quick installation
- Reduced electrical consumption
- Minimum maintenance

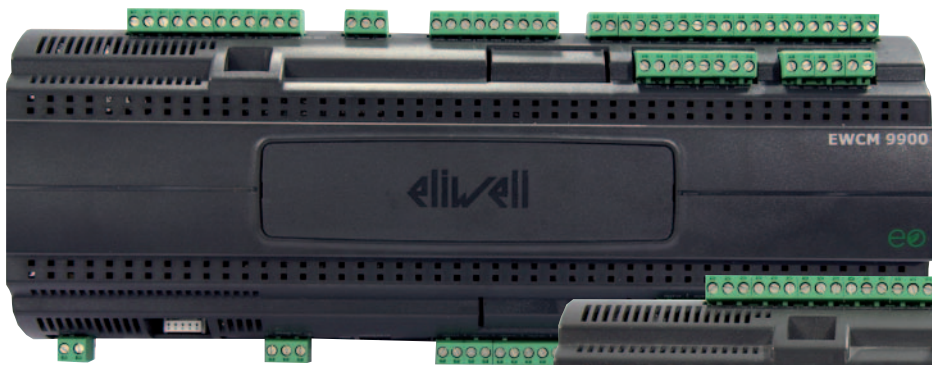
Compliance with environmental standards

Commercial and industrial refrigeration in terms of technological development requires:

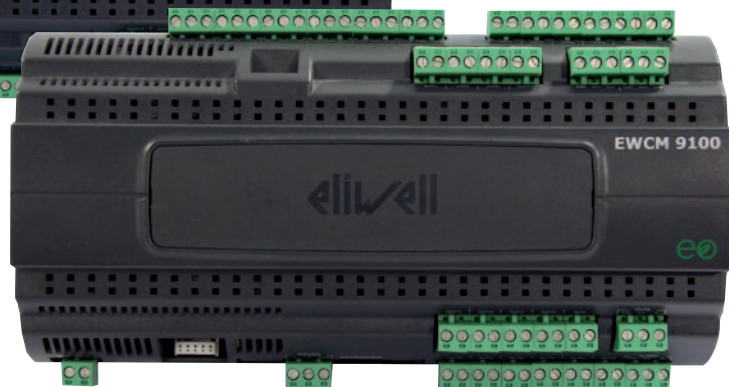
- Reduced refrigerants in new systems
- Adequate refrigerant performance
- Non-polluting ecological coolants (CO₂); using smaller compressors and lower consumption



Eliwell solutions for refrigeration units and industrial systems



EWCM 18 DIN



EWCM 13 DIN

A fundamental element of a refrigeration system is the compressor unit whilst a requirement is the optimal control of the compressors and of the condenser fans; factors which increase the performance of the system and ensure reduced energy consumption.

To meet these requirements and in line with the modern trends, Eliwell offers different levels of solutions.

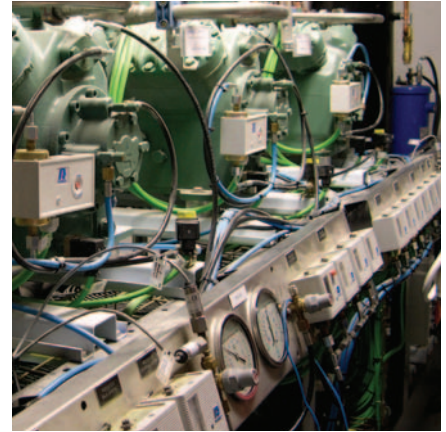
- EWCM DIN Rail controllers designed for the most complex system solutions with up to 12 compressors for BT and TN direct expansion units.
- EWCM 32x74 designed for small units with up to 4 compressors.



Keyboard EWCM 13-18 DIN



EWCM 4150



Reliability and technological solutions

The new EWCM represents the combination of 15 years of research and innovation that Eliwell has been conducting in the sector of controllers for compressor units. Regular updates, to developing solutions and product testing carried out with qualified partners make the new EWCM controllers a complete and flexible solution for the most diverse system configurations.

The new control algorithms, self-diagnostics and setting functions, the compatibility with a wide range of refrigerants and the Web connectivity for system remote control make the products in the EWCM family of instruments ideal for the management of systems designed for reliability, user friendliness and energy saving.

- Numerous inputs and outputs cover the needs of complex compressor groups such as dimensions, functionality and control algorithms.
- Complete configurability allows constructors of units to use new system technologies that use single-step or multiple-step compressors, compressors of various power or an inverter compressor even in mixed configurations.
- The new PID adjustment algorithms allow precise control of compressors allowing optimal floating condensation pressure, optimising use and avoiding useless start-ups or shutdowns
- Self-diagnosis is configurable; the registration of alarm and operation histories makes maintenance easier in the event of system failure.
- Dedicated control algorithms prevent possible alarms, reducing maintenance work.



Efficiency and flexibility in compressor room control

Easy start-up

- All of the inputs and outputs are independent and configurable, ensuring adaptation to most applications. This operation is facilitated by an automatic procedure that reduces commissioning times for new systems.
- The new keypad with backlit LCD graphic interface has a quick access menu for the simultaneous display of the status of the intake and delivery sections. This can be set by temperature or pressure with the possibility to quickly select the displayed unit of measure.

Integrating with existing systems

- The models EWCM 13 and 18 DIN supersede EWCM 800/900 making replacement easier for the installer.
- A reduced set of parameters, replicates the parameters of the EWCM 800/900 facilitating start-up and maintenance of standard installations

Economic savings

In a modern supermarket, the chiller may require up to 50 % of the energy consumed, becoming the most important item in the overall energy budget.

More in-depth analyses of the energy consumption of the chiller unit have provided more detailed information on the single parts of the unit itself.

In particular, the analysis shown that energy savings is divided as follows.

- 85 % Floating condensation
- 5 % Floating evaporation
- 10 % Inverter

Eliwell offers a solution for energy savings in its unit controllers of the highest range which aims to optimize the performance of the single components of the unit. Thanks to a series of innovative mathematical algorithms, the new EWCM DIN Rail are able to:

- Calculate the optimal condensation pressure based on ambient conditions, increasing the COP(system performance); in these conditions the temperature (/pressures) of condensation fluctuates with the outdoor temperature, leading to savings that increase as the outdoor temperature decreases. The presence of a temperature probe that monitors the refrigerant liquid also makes it possible to control undercooling, allowing control of any type of condenser.

- obtain floating control of the intake adjustment setpoint based on the indoor ambient temperature (typically the display area of the supermarket) with clear benefits during the night when it is possible to reduce the intake setpoint.
- manage frequency variation devices (inverter) for the control of compressors, obtaining optimal floating condensation pressure and optimizing its use, avoiding useless start-ups or shut-downs;

The benefits found in a test unit with intake control via three digital compressors and an inverter compressor and condensation control with frequency variation device were immediate operating savings:

- **up to 25 % thanks to reduced electrical consumption**
- additional energy savings thanks to the "condensation heat recovery" function, which makes it possible to use energy which is otherwise wasted in secondary systems (domestic water, floor heating) to improve comfort between refrigerator counters.

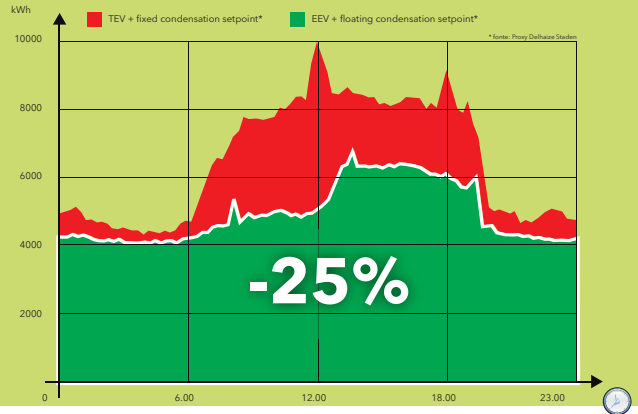
Energy Saving



Energy Saving through floating condensation

The chart represents the total consumptions of a supermarket* related to 24 hour energy consumption. The green area represents the consumption - 25% energy saving. The maximum energy saving can be obtained during opening hours

* Data source: Fieuw koeltechniek



In addition to the operating savings, you must calculate the savings made when purchasing the system:

- Improved price/performance ratio
- Sharp reduction in times for ROI thanks to greater operating savings
- In the event of retrofit of the controller, no modification is needed to the system, but it may be necessary to make minor modifications to the wiring in the electrical panels
- The integrated control of modulating loads via the TRIAC output for EWCM 32x74 compact controllers decreases the use of external accessories, reducing the overall installation cost

Minimum maintenance

- The possibility to manage start-up policies for compressors and fans based on actual operating hours allows efficient use of the system and increased durability of its components over time
- The possibility to select or deselect the compressors and to manually test the outputs allows complete control of all system resources

Compliance with environmental standards

The EWCM controllers are made of recyclable materials and produced in accordance with the most modern industrial canons:

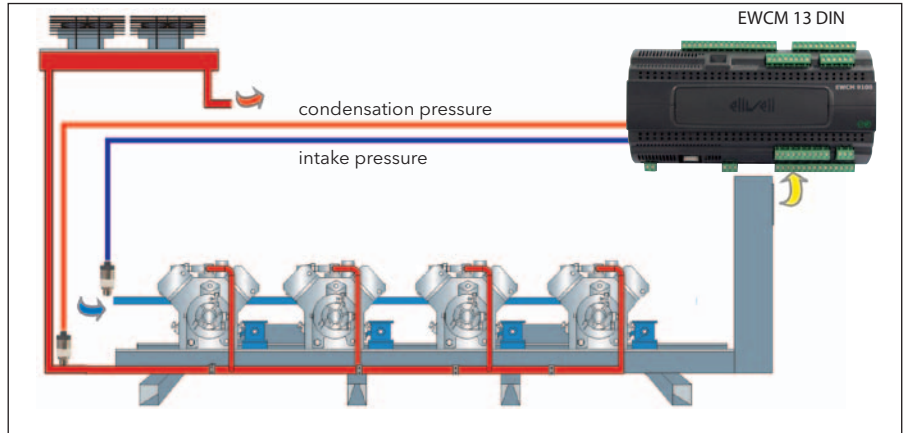
- They comply with the requirements of directive no. 2002/95/EC (RoHS - Reduction of Hazardous Substances) which aims to limit or ban the use of certain hazardous substances in electrical and electronic appliances
- They are compatible with a wide range of refrigerants including R417a (HFC), R717 (Ammonia - NH₃) and R744 (Carbon Dioxide - CO₂)
- The tables of refrigerants can also be updated

Typical application examples

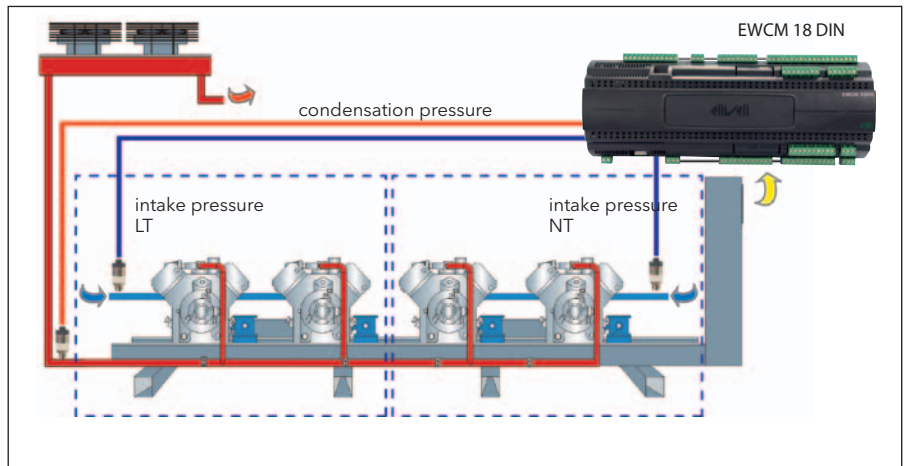
EWCM DIN Rail

EWCM 13 and 18 DIN Rail controllers have been designed for the most complex and evolved system solutions, providing solutions for LT and NT direct expansion units and for dual temperature unified units with single condensation.

They are however suitable also for controlling systems with indirect expansion and secondary fluids.



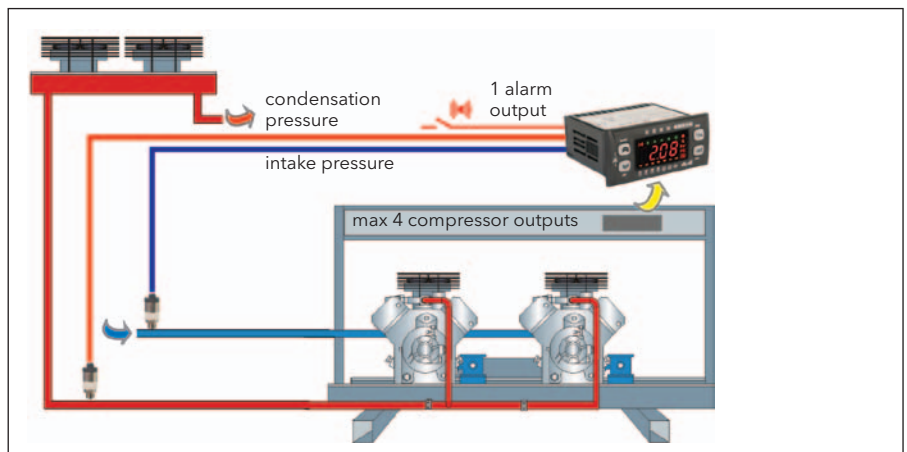
Schematic diagram of a combined refrigeration centre with a single circuit



Schematic diagram of a combined refrigeration centre with LT and NT circuits

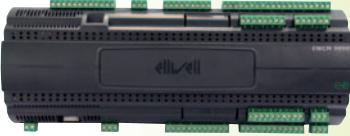


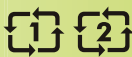












EWCM 32x74 compact controller

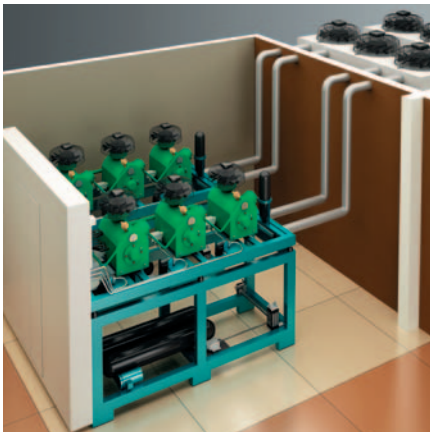
Ideal for management of smaller single-circuit refrigeration centres, with or without control of the liquefaction unit. It is designed for most applications with stepped or modulating control of the compressor and ventilator. Applications with stepped hot/cold temperature control or direct/reversing pressure control can also be implemented.



Schematic diagram of a refrigeration centre with a single circuit, two compressors and inverter-controlled fan

EWCM range

| | INVERTER | RELAYS | CIRCUITS | |
|---|---|--|---|--|
|  |  |  19 |  | EWCM 18 DIN-Rail (9900) Stepped-control compressors and/or inverter-controlled compressors and condensing units with up to 8 stepped control fans or inverter-controlled fan. |
|  |  |  13 |  | EWCM 13 DIN-Rail (9100) Up to 11 stepped-control compressors and/or inverter-controlled compressors and condensing units with stepped control fans or inverter-controlled fan. |
|  |  |  7 |  | EWCM 13 DIN-Rail (8900) Up to 9 stepped-control compressors and/or inverter-controlled compressor. |
|  |  |  5 |  | EWCM 4120-4150-4180 Ideal for small single-circuit refrigeration units with inverter-compressor or a maximum of 4 step compressors and condensing control with inverter fan or up to 4 digital fans. |
| COMPRESSORS | | 4 | 9 | 11 |
| | | | | 12 |



Connectivity - Innovation built in



The growing request for system solutions that are increasingly efficient and easy to use focuses even greater attention on the use of solutions of remote management and networking.

The accuracy of monitoring, both local and remote, is the guarantee of accurate operation of the control unit and therefore synonymous with high quality and durability.

The integration of controllers in the management systems also ensures constant service and support. Timely communication of possible errors of the system by means of advanced control technology and a remote communications network substantially reduce maintenance costs and precious time that is taken from staff.

The web-based system lets you manage and analyse all of the controller from remote positions without the use of additional software, using only an Internet browser.

The main benefits of a management system can be summarised as follows:

- Reduction of costs for installation and commissioning
- Ease of access and troubleshooting from a remote location resulting in a reduction in costly actions at the point of sale
- Simplification of the system for faster management and maintenance
- Reduced downtimes for optimal use of resources
- Ample advance notice in case of malfunction and/or reduced system performance

The opening of controllers with MODBUS protocol and the possibility to exchange data with third party systems make it possible to cover the needs of supervision and monitoring, also concerning industrial applications.

In this, Eliwell has always been the forerunner and has equipped the new EWCM with:

- connectivity to the Eliwell TelevisSystem supervision system for system monitoring, diagnostics management, operating parameters and energy savings functions, both locally and remotely via GSM/GPRS modem;
- web-based access via Ethernet and a web adapter module (external or integrated in the EWCM 13/18 DIN) to connect the controller to your company network or to the global network and monitor its operation on a daily basis;
- support of protocol ModBus RTU for integration of the EWCM in the supervision systems of third parties, providing access to all system variables



- The new Copy Card USB further enhances the new technology of the EWCM DIN Rail controllers, which can now interface with the PC without using other external accessories for immediate configuration and maintenance of the device.

Data » Real Time Table

Arrangement: 1 Column

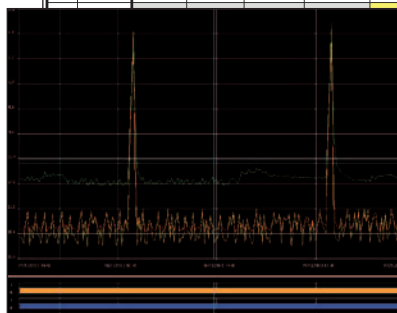
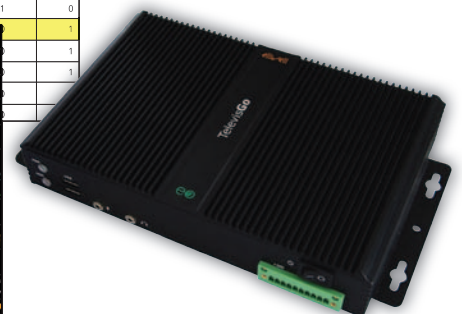
Select the resources: LanAdapterWiFi (192.168.0.1) - 2 instruments

0.02:00 ID 974LX

- Analog input 1 -3276,8 °C
- Door -Closed
- Alarm output -Active
- Compressor 1 -Inactive

Select the resources:

| Time of | Analog input 1 (°C) | Modified parameters | Device state | Keyboard enabling | Compressor | Defrost status |
|----------|---------------------|---------------------|--------------|-------------------|------------|----------------|
| 14.31.32 | 41,7 | 1 | 1 | 0 | 1 | 0 |
| 14.32.32 | 41,7 | 1 | 1 | 0 | 1 | 0 |
| 14.33.32 | 41,7 | 1 | 1 | 0 | 1 | 0 |
| 14.34.32 | 41,7 | 1 | 1 | 0 | 1 | 0 |



Applications of EWCM Products



Commercial refrigeration applications:

- Food Retail (Hypermarkets, Supermarkets, Convenience Stores, Food Shops)
- Catering (Hotels, Restaurants)

Industrial refrigeration applications:

- Food processing
- Food Wholesale
- Other industrial (Chemical, Pharmaceutical, Ice-skating rinks)

