



Airports





An introduction

Who we are

Cavotec is a multi-national group of companies serving the following industries: mining and tunnelling, ports and maritime, steel and aluminium, energy and offshore, airports, general industry and automation. In the early 1960's our main focus was the design and production of motorised cable reels primarily for manufacturers of tower cranes, harbour cranes and mining equipment. Today, Cavotec is connecting mobile equipment around the world in many diverse applications.

Where we are

The Cavotec Group consists of 7 manufacturing "Centres of Excellence" located in Canada, France, Germany, Italy, New Zealand, Norway and Sweden and by 5 local manufacturing units located in Australia, China, Germany and the USA. For the distribution of products and providing support to customers Cavotec has 27 sales companies which, together with a network of distributors, serve more than 30 countries in five continents. The ultimate objective is to be perceived as "local everywhere".

How we work

Our aim is to work closely with our customers in order to build long-term partnerships. To achieve this aim we have created a working environment that attracts the best people, encourages them to stay and brings out their best qualities. By producing totally reliable systems and backing them with efficient service, we strive to create true customer satisfaction.



Our experience in airports

During the year 2000 we started the development of a new application of Cavotec technology which introduced us into the airport industry. The result was the Cavotec Caddy, a mobile unit for the supply of 400Hz power, water and pre-conditioned air to aircraft. During testing at Frankfurt Airport, Cavotec people first encountered the Fladung company. We were new in the airport industry with just one experimental system; Fladung, on the other hand, was well-known in many airports around the world with a range of proven and accepted systems.

In 2002 the two companies entered into a strategic alliance which resulted in the acquisition of the Fladung company in 2004. It now operates under the new name of Cavotec Fladung GmbH.

Our major customers in this market segment are:

- Aeroport de Bruxelles
- Aeroport de Paris
- Anchorage Int'l Airport
- Beijing Airport
- Boeing
- Dubai Airport
- Frankfurt Airport
- Hong Kong Airport
- London Heathrow
- Madrid Airport
- SEA Milano Malpensa & Linate
- München Airport
- SAS
- Shanghai Airport



Local throughout the world

The Cavotec Group is organized to support its customers around the world through its manufacturing units and sales companies. Each Cavotec manufacturing company, no matter where it is located, aims at being a market leader in its field by providing innovative and reliable products to Group customers. Each Cavotec sales company, in the 27 countries where they operate, aims at better serving its local market following the Group philosophy "to be local everywhere".

MANUFACTURING NETWORK

Centres of Excellence

France

Cavotec RMS
Spring Driven Reels

Germany

Cavotec Alfo
Spring Driven Reels
Slipring Columns

Cavotec Fladung GmbH
Aircraft Support Systems
Security Systems

Italy

Cavotec Specimas
Motorized Cable Reels
Panzerbelt Cable Protection
Slipring Columns

Norway

Cavotec Micro-control
Radio Remote Controls

Sweden

Cavotec Connectors
Electrical Plugs & Sockets

Local Manufacturing

Australia

Cavotec Australia
Motorized Cable Reels

China

Cavotec China
Product Assembly

Germany

Cavotec MoorMaster
Automated Mooring Systems

Sweden

Cavotec Sweden
Product Assembly

USA

Cavotec USA
Product Assembly

Group Partners

Belgium

Gantry
Crane Rail Systems

Italy

Brevetti Stendalto
Cable Chains
Prysmian (Pirelli)
Flexible Cables
Tratos Cavi
Flexible Cables

New Zealand

Mooring Systems Ltd
Automated Mooring Systems

SALES NETWORK

Cavotec Sales Companies

Cavotec Australia
Cavotec Belgium*
Cavotec BeNeLux
Cavotec Brazil*
cavotec Canada
Cavotec Chile
Cavotec China
Cavotec Denmark
Cavotec Finland

Cavotec France
Cavotec Germany
Cavotec Hong Kong
Cavotec India
Cavotec Italy
Cavotec Korea
Cavotec Latin America
Cavotec Mexico
Cavotec Middle East

Cavotec Norway
Cavotec Russia*
Cavotec Singapore
Cavotec South Africa
Cavotec Sweden
Cavotec Turkey*
Cavotec UK & Ireland
Cavotec USA

* Branch Office





Caddy's

The Cavotec Group entered the airport industry in 2002 with an innovative, environment friendly system with the aim to supply aircraft with power, water and pre-conditioned air while reducing costs and time. These reductions are achieved by eliminating many traditional time-consuming servicing methods which take up a lot of apron space. Cavotec's approach leaves the apron free for other services vehicles to operate.

Currently there are 3 different types of Power Caddy and a special PCAir Caddy which delivers pre-conditioned air to aircraft without using diesel or Freon gases.



The PCAir Caddy connects the compressed air hose to the connection point and drives (battery driven) to the wing root about 5m away from the PCAir inlet. The operator connects the PCAir hose and turns on the PCAir unit with the expander. Since we produce the cold air (-35 deg.) just under the airplane we have no losses and the efficiency factor is very high. The same PCAir Caddy can also produce hot air to heat the plane in winter time.

To complete the range of electrically driven Caddy's, Cavotec Fladung also supplies a single reel unit that can supply 400Hz through 30m of special power cable.



The Power Caddy's are essentially motorized cable reel trolleys fitted with one or two cable reels. The drive unit is a 24 VDC motor which allows the Caddy to be driven in both directions while automatically reeling in or out the cables. Thanks to the onboard battery the Caddy 2x90 has about two hours of continuous operational autonomy after which the Caddy must be recharged at the parking bay.

The Caddy 180 has all the features already mentioned with Caddy 2x90 but with some important differences. The Caddy 180 has only one reel and an onboard 180 kVA-400Hz converter. The battery loader is mounted onboard and automatically recharges when connected to the main power cable.

The PCAir Caddy is a motorized cable reel trolley with an integrated air pre-conditioning system. The hose reel, fitted with the compressed air hose, is fully automatic in reeling in and out. The hose reel uses a 400VAC 3 phase frequency controlled motor, giving an even and constant tension to the hose handling. The conditioned air output hose is located on top of the Caddy, allowing for easy access and replacement.

The PCA Caddy is fitted with a towing eye and the drive unit can be disengaged if longer transportation of the unit is required.

The manual Power Caddy has been designed for use in hangars and aircraft workshops. It is fitted with one reel for up to 35m of 400Hz cable.





Underfloor Solutions

To supply aircraft with fuel, power, water and pre-conditioned air while on the ground, typically large trucks, heavy diesel generators, cables and hoses cover most of the apron around the aircraft. To solve this problem Cavotec Fladung has developed an underground system that supplies the aircraft through pop-up systems located very near the parking line. After operation these pop-up units can recede back flush into the apron so that it is free for any crossing traffic.



Pop-up systems extend vertically to working height and close flush with the apron after operation. As a safety precaution the unit can only be extended after turning the cover handle and can only be retracted after pressing on a foot pedal.

These pop-up systems are rated for 90 ton loads and are pre-wired for installation.

Hangar solutions have been developed to take up a minimum of space while supplying all necessary services from a central point close to the aircraft.



To resolve the ever increasing problem of apron congestion, Cavotec Fladung has developed a revolutionary underground pit system which supplies utility services to the aircraft through pop-up units located very near the parking line. After operation these systems will recede back into the apron. Since they close completely flush with the apron, it is left free for any crossing traffic.

The main services that can be provided through these underfloor systems are:

- Pre-conditioned Air (PCA)
- Waste water and blue water
- 400Hz/28VDC services
- Other utilities

Pre-conditioned Air

The PCA hose is directly mounted on the pit systems and is just 1/10th of its original length when stored. Buttons located on the pop-up allow the air-conditioning equipment to be switched on and off manually. A specially designed circuit ensures activation or deactivation of the air-conditioning unit only when the PCA pit is fully extended and a proximity switch has been released. The system can also be fitted with an outlet for potable water, in which case the hose reel is also located inside the pit.

Waste water and blue water

These services can be provided through hoses stored on drums in the pit. When the pit is fully extended, the drums are released, making it possible to connect the hoses to the aircraft.

400Hz/28VDC

400Hz/28VDC services are provided through Cavotec Fladung's flexible cables and superior aircraft connectors. The connectors and cables are presented above ground, thereby greatly reducing the burden of pulling out the cable to the aircraft. All systems are designed to meet US and European EX norms.

Other utilities

The Cavotec systems can also be equipped with a wide range of auxiliary utilities, such as shop air, 50/60Hz electric power, ground, data and communications cables, eliminating clutter around the aircraft.

Hatch-type systems are accessed by lifting the counterbalanced cover. These units can be fitted with all available types of services and are rated for 90 ton loads.





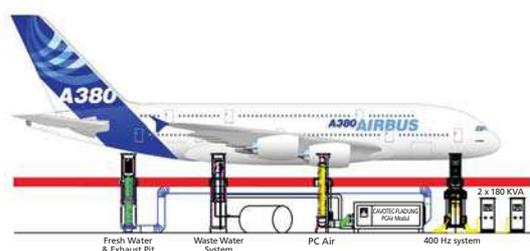
Tunnel Systems

Ground support utilities are often sourced far away from the point of use at the aircraft. This means that essential services such as 400Hz power supply, PCAir and water supply and disposal often restrict access to the apron with their supply cables and hoses. A further downside is that in countries with extreme ground temperature PCAir services must be heavily insulated and shielded to avoid condensation and temperature loss.



The result of using a full scale GSS tunnel installation from Cavotec Fladung is that all essential ground support services, such as 400Hz Power Supply, PCAir and water supply and disposal, are located very close to the parked aircraft. When an aircraft comes into the gate area, these services can be reached through pop-up systems that rise up out of the apron allowing easy connection to the aircraft, without cluttering up the surrounding apron.

Increasing dimensions of aircraft require systems that allows complete flexibility for the airport operator. With the introduction of aircraft such as the Airbus A380, existing traditional supply systems are no longer up to the job. However, thanks to its innovative design, the Cavotec Fladung GSS Tunnel System can easily handle any type of aircraft, no matter its dimensions or service need.



The Cavotec Fladung GSS Tunnel System has been designed to service all types of aircraft, including "super-carriers" like the new A380.



Cable Coils

Airports around the world often have very different views on how best to service an aircraft. The decision to work with a specific type of system depends on many internal and external influences and variables. One aspect that every airport operator in the world can agree on is that every system should take up as little space as possible.

To this end, Cavotec Fladung has since many years manufactured cable coiling systems. These systems can either be hung under the gate bridge or placed on the ground as a stand-alone cable reel with a limited footprint. Each individual system can of course be designed to meet any user requirement.



The Cavotec Fladung automatic cable coil is designed to unwind the 400Hz cable when in operation and to wind it up and store it when not in use. The standard cable coil can store up to 28 meters of single jacket 400Hz cable, and a smaller version can hold up to 10 meters. The cable is wound up or unwound automatically by using buttons on the aircraft connector. Power is transferred between the terminal housing and the extension cable by a cable harness or a Cavotec Fladung 400Hz coupling.

In order to ensure safe operation of the system, the drum is secured by a patented system of compression rollers around the drum, which in turn is fitted

with ball bearings. Power is transferred through a PLC controlled motor, which is fitted with a gearwheel and chain-drive system. A limit switch, or initiator, controls the end-of-travel cut-off in both directions. As an extra security measure the drum is fitted with an overload fuse that switches off the drum in case of malfunction.

In addition to these cable coils, Cavotec Fladung also produces a range of cable winders with manual or automatic operation. These winders can be fitted with a variety of aircraft cables. The useful length of these cables is typically 20 meters and all commands of the cable winder are transmitted over integrated control wires.

Cable coils can also be placed on the ground as a stand-alone cable reel with limited footprint.





Special Cables

Cavotec Fladung provides a broad range of special cables specifically designed and tested for airport use. These cables are manufactured by carefully selected suppliers who share the Group's quality and customer service objectives.



The use of the correct cable is very important to assure the proper functioning of equipment, particularly in harsh working environments, such as airports, where the cables are subjected to daily use in all kinds of weather conditions.

Each Cavotec Fladung cable is thoroughly tested and conforms to all applicable regulations and standards, ensuring maximum safety. All cables are highly flexible and resistant to mineral oils, kerosene and defrosting liquids and abrasion.



400Hz Cable 1 x 120 mm² + 4 x 1 mm²



400Hz Cable 7 x 35 mm² + 6 x 4 x 1 mm²



400Hz Cable 4 x (1 x 50 mm² + 4 x 1 mm²)



400Hz Cable 4 x (1 x 70 mm² + 4 x 1 mm²)



Aircraft Connectors

Connectors play a very important role in the day to day servicing of aircrafts. Without good connectors expensive equipment stands still, and, aircraft cannot be serviced, or worse, be damaged.

To ensure maximum lifetime and security of operation Cavotec Fladung has designed its own line of aircraft connectors. These connectors have changeable plugs and contacts, and a divided housing for easy on-site repair. A special sealing resin ensures complete protection from water and forms a very strong and long-lasting connection to the cable.

All connectors are all made from high shock resistant material which is abrasion-proof and non-flammable. As an option, all connectors can be fitted with a pilot contact and an LED indicator for 80% contact. Integrated temperature sensing is also available.



Cavotec Fladung supplies two main types of aircraft connectors: 400Hz connector and 28V/DC connector, both available with push button control. The 400Hz connector can be used with many different types of cable whereas the 28V connector is ideally suited for 2x120 mm² cable but can also be fitted with other types on request. Both connectors carry IP67 classification.

A new development from Cavotec Fladung is the integrated temperature sensor. This device is specially designed to monitor the temperature for the power contacts. The built-in sensor measures the temperature of the 400Hz contacts directly at the place of contact, giving a very accurate reading. This reading can also be presented as a warning signal if overtemperature is detected.



400Hz Connectors



28V Connectors

All connectors are made from high shock resistant material which is abrasion proof and non flammable.

Optionally a pilot contact can be fitted to indicate secure connection.





Towbars

Cavotec Fladung's high quality towbars are in use in airports around the world providing secure and accurate towing of all types of aircraft. Recently, to meet new developments in the aircraft market, Cavotec Fladung has designed and manufactured a special towbar that can be used for towing the new Airbus A380 aircraft. Because the designs are completely modular, towbars can be made to meet any requirement a customer may have.



Specially designed aircraft towbars have for many years been an integral part of the complete Cavotec Fladung range. Thanks to their innovative design features and high quality manufacturing, the Cavotec Fladung towbars are capable of towing all types of aircraft from all major manufacturers such as Boeing, Airbus, Tupolev, Ilushyn, Saab, Bombardier and Embraer. The standard available tube lengths are 3510mm, 4430mm and 6885mm. Each towbar has the capability to be fitted with optional features such as torsion adapters, shock absorbers and a pivoting towing eye.

Mini-Towbars

The Cavotec Fladung mini-towbar is specially designed for towing small aircraft with a maximum of 2000 kg nosewheel weight (or 15% maximum takeoff weight). It features a steel tube mounted with a height adjustable drawbar eye, an undercarriage with soft tires and an overall length of 3800mm.



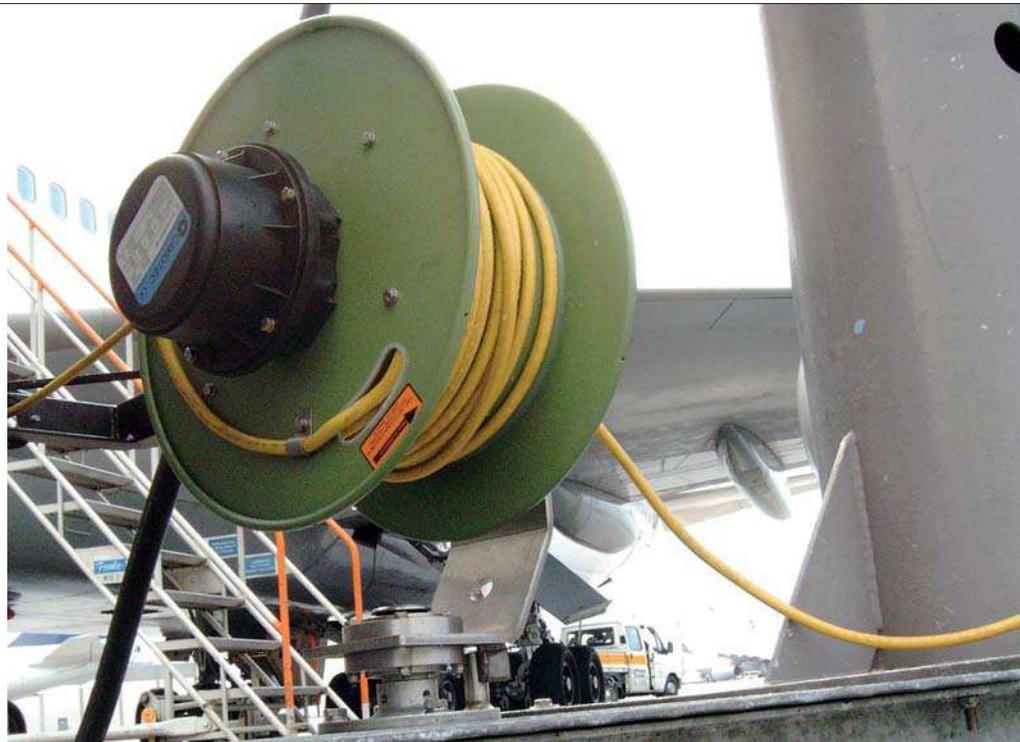
All Cavotec Fladung towbars are designed and produced in accordance with the most stringent quality requirements. They come equipped with a NATO towing eye and a shearpin overload protection.



Spring Driven Cable Reels

Cavotec Alfo was established in 1991 to manufacture spring driven reels and slipping columns. In just five years the company became a leading manufacturer in its sector and market-leader in Germany.

Such success is the result of combining high quality components, cost-effective management, use of standard materials, and products produced in large numbers. This effective combination enables Cavotec Alfo to serve the market and meet both standard and special requirements at competitive prices and with short delivery times.



The Cavotec Alfo standard spring reels are built from modular components which allow a great number of combinations covering most common requirements. The clever design of the Cavotec Alfo spring driven cable reels guarantees the highest reliability even in the most difficult and demanding applications. Each unit features a well dimensioned shaft and bearings which accommodates an easy and fast exchange of springs. The cable feeding point can be placed on either side of the drum allowing for easy adaptation for horizontal or vertical applications. The springs are made from high-grade

special steel and are mounted inside a housing in order to avoid friction and wear. The slipping assembly is mounted in a solid glass-fibre reinforced plastic housing which withstands corrosion and mechanical wear.

Every unit meets all applicable IEC norms and standards and follows the latest EU requirements (CE-marking). All reels and slippings have a protection grade of IP65/66.

The Cavotec Group also supplies high quality hose reels manufactured by Cavotec RMS in France. For more information please consult our product specific brochure.





Radio Remote Controls

Cavotec Micro-control, a full member of the Cavotec Group since 2004, has been involved since 1984 in the development and production of advanced radio remote control systems, including the latest unit for use in areas where explosions could occur. All systems have a high level of flexibility and are made from standard modules allowing for full customisation to meet specific customer requirements.

Cavotec Micro-control radio remote control systems meet the most stringent safety and quality controls and are fully ATEX and IEC approved.



The MC 3000Ex provides a secure and flexible control of many different types of machinery in complete safety. Everything, from simple control functions to complete process supervision, can be done from the same system. This unit can solve most of the direct hydraulic and electric control functions, and provide serial communication with most known PLC and frequency converters, if necessary, using the TCP/IP protocol. In addition, this unit has the option of cable control besides the standard radio control, providing an extra failsafe against shutdown.

All units can be delivered with simplex or duplex communication.

The base unit can be delivered with a serial interface for the most common bus standards on the market today. The base unit comes standard with EEx protection and with an intrinsically safe battery.

The MC 3000Ex is the first ever explosion proof RRC to obtain a full ATEX approval.





Power Connectors

The Cavotec Power Connectors, manufactured in Sweden, have been present in the field of industrial power supply for more than 20 years starting in the harsh environment of the Scandinavian mines and hydro-electric tunnels.

Today the high quality, robustness and integral safety of the Cavotec Connectors have set the standard for high and low voltage power supply to many different types of equipment used not only in mining and tunnelling, but also in hundreds of airport, offshore, general industry and automation applications around the world.



Cavotec Connectors for low and high voltage applications are robustly designed, with a standard IP 66 protection and a standard maximum temperature of 80°C. The range of low voltage power connectors, available in a variety of sizes, are made in two different operation systems:

1. The "Push & Pull" system is preferred when the connectors have to be disconnected manually or automatically several times a day.
2. The "Screw Ring" system has special connectors fitted with screw rings for applications with manual disconnections on a day-to-day or weekly basis.

The easy to use Push & Pull system guarantees a safe and reliable connection, even in the most extreme working conditions.



Head Office

Cavotec MSL Holdings Ltd.

Cavotec MSL is listed on the 

Corporate Office

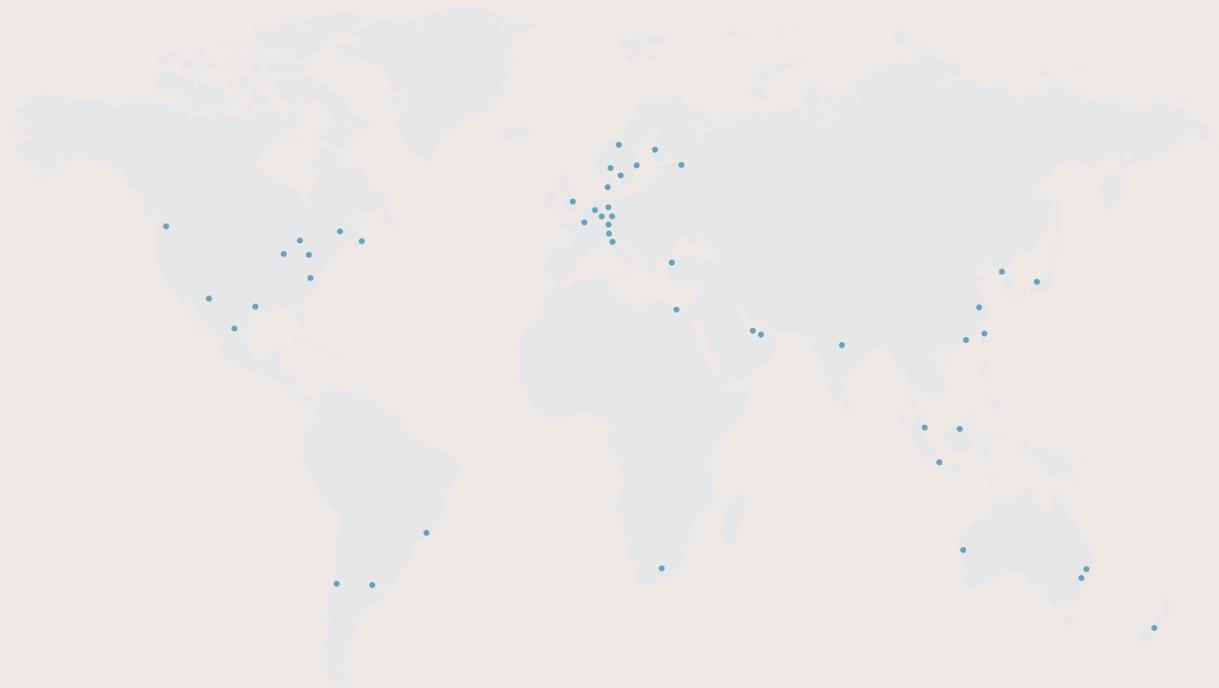
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Indonesia
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