

Activity Report 2002





Contents

Commentary of the Management	1
Axima Management	5
Building Services	7
Engineering Contracting	13
Refrigeration	17
Axima companies	20



Sustainable customer relations

Axima is a member company of Tractebel Energy Services, formed in March 2002 as part of the publicly listed Suez

bear fruit.

Group, France. The acquisition of Sulzer Infra by Tractebel Belgium in August 2001, with resultant change of name,

required numerous structural and organizational adjustments. Thanks to the continuity of our market presence,

however, this in no way undermined the confidence of our customers or suppliers. As reflected by the further

growth of order intake of EUR 936 million in 2001, our long-term customer relations remain fruitful in spite of a



downturn in the economy. Order intake thus remained

stable in the first half of 2002 despite the flattening of

economic growth in Germany, Switzerland and other

countries compared with institutional forecasts.

However, we expect negative effects in these market

areas for the rest of the year.

Dear customers and business partners,

After approval by the European Antitrust Board in August 2001, Sulzer Infra (with 5000 employees in nine European countries and Brazil) was carefully and systematically integrated into the Tractebel organization. By upholding the social rights of employees, their motivation has been considerably enhanced, particularly in view of the excellent prospects – customer assurance now benefits from the financial strength of our new parent company Tractebel and the comprehensive offering of Tractebel Energy Services as a new business unit. By meeting our ongoing obligations and maintaining the high quality standards to which our business partners have always been accustomed, we have fulfilled all customer expectations.

Axima markets

The business year 2001 brought a flattening of the economy and an incipient price decline in several European countries, particularly in the construction sector. This was greatly accelerated by the stock market slump, and as a result, in many countries the industry is involved in restructuring. Stagnation of the German domestic economy has negatively affected the market situation not only in all EU countries, but also to a particular extent in Switzerland as an industrial provider. Although our companies in these market areas cannot entirely escape the resultant decline in margins and business volume, they are upheld to some extent by the innovative services they now provide. Over the last few years the Axima management has laid the foundations for a wider spectrum of activities to ward off

building in London's docklands, British Airways, Airbus Industries, and the Bank of England. Our contract for the New Tate Gallery, opened in 2001, was successfully concluded with the official handover of all installations. Axima's leading position was enhanced in particular by the installation time gains resulting from our aggregate pre-assembly concept, and by our well-proven project management competence for large contracts.

Cost pressure in the highly industrialized nations was combated by outsourcing production to areas with less sophisticated infrastructures. A key role was played here by the efforts of such countries toward greater domestic value-added and the expansion of export trading. Particularly interesting in this respect is the enclosed report on a contract executed for Osborne in Spain.

largely attributable to our ongoing experience in best-practice implementation.

Hospital modernization and shopping centre enhancement

Cost reduction is not the only reason for modernizing hospital facilities these days – after more than thirty years in some cases, renovation becomes indispensable. This particularly applies in the former East Germany, where Axima successfully completed such projects in Riesa and Rostock. New kinds of therapy also demand new infrastructures, such as we installed for the nuclear medicine and radiotherapy departments at Leipzig University Clinic. Axima's leadership in projects of this kind is also well proven in Great Britain and Switzerland, for example at Rampton hospital in England, and at the Limmattal (Zurich) and Lausanne hospitals.

By combining their offering with "adventure world" and recreation facilities, supermarkets and shopping centres can attract more customers. This traditional Axima speciality also includes restaurants, fun-and-fitness facilities, as well as modern cinema centres with 25 or more screening theatres. During the period under review we installed air-conditioning, energy supply and fire protection systems for such projects in Vienna, Madrid and Rotterdam. For shopping centres of the conventional kind, contracts were placed by our long-standing customers Metro (Moscow), Vösendorf (Austria), Craiova (Romania) and Szombathely (Hungary), as well as by Metrovacesa (Barcelona, Bilbao and Sevilla) and other store chains in Budapest and Avilés, Spain ("El Corte Inglés").

Modernization of historical buildings under preservation order

The market for rehabilitating preserved buildings offers high potential today, but demands good references and flexible project management. During the period under review we upgraded a number of historical buildings to meet modern office technology demands, without interrupting operations thereby. For example, by installing facilities such as cooled ceilings and displacement ventilation at the UBS Bärenhof and CS Uetlihof bank buildings in Zurich, the Hotel International in Vienna, and the Caja Madrid, among other historical buildings. A special challenge was the conversion of three former gasometers in Vienna into modern apartment and business locations with shopping and events facilities. The success of this project was



the effects of economic recession, particularly in the construction industry.

Engineering & Contracting Building Services

In Great Britain we participated to an above-average extent in market upswing, despite our change of name. Major contracts and clients included the spectacular new headquarters built by Sir Norman Foster for the Lord Mayor of London, the Canary Wharf DS4 high-rise office

Pharmaceutical engineering

Over the last two years Axima's market position in this sector has been significantly strengthened by the acquisition of sterile technology and process automation companies. As a result, we generate greater value-added in the pharmaceutical technology field both for our customers and for Axima. Our comprehensive single-source offering now ranges from feasibility studies and basic design at one end of the time-scale to qualification and validation services at the other. This has enabled our Engineering Contracting business unit to compensate for declining order intake from the stagnating micro-electronics sector, particularly chip producers, by providing strong support with new facilities for our long-standing customers in the chemical and pharmaceutical industries. These recently included Roche and Novartis in Switzerland, Boehringer Ingelheim and Aventis in Germany (Biberach and Höchst respectively). According to our principle "Axima follows its customers", we have exploited our multilingual team capabilities to intensify existing customer relations. Thanks to comprehensive market presence, Axima is now in the practically unequalled position to provide customers with on-the-spot support wherever they may be. Apart from the availability of specialists in the disciplines required, this also means the presence of experienced engineers who speak the local language and are familiar with the local regulations and procurement market conditions. It is on this kind of teamwork that Axima's outstanding competence in project management is based. A good example is the Epcos plant expansion contract recently

completed in Portugal (see enclosed report) With our local presence in European markets and the forthcoming EU extension, we are in an excellent position to support these countries with their ongoing expansion projects, as we did for Polfa in Warsaw among other companies.

Automobile industry

Production in the automobile industry has flattened off lately, although at a high level. Axima is currently involved in rationalisation projects, such as for saving energy or reducing cooling water consumption, also among suppliers to the automobile industry. In this connection we again completed contracts for reputed customers including Fasa Renault Valladolid, Brose Barcelona and Daimler Chrysler Bremen.

Refrigeration

Merger of the former Sulzer Infra Refrigeration division with the Tractebel refrigeration companies has created a potent European group. With companies in ten European countries and a branch office in Brazil, Axima Refrigeration is now extremely well positioned in the market. Activities are focused as before on industrial and commercial needs, and cover the design planning, installation, maintenance and modernization of refrigeration systems with piston, screw and rotary compressors. The use of non ozone depletant compound (non-ODC) refrigerants is constantly investigated, and tests in this connection have already included CO₂ applications.



Another strength of Axima Refrigeration is the familiar blue water-saving cooling towers manufactured at our Lindau plant on the Lake of Constance, for which Axima has closed production and sales licence agreements with numerous other companies. Axima is a refrigeration market leader in Germany, and apart from standard chiller aggregates, also specializes for example in grain coolers and crane tempering systems. One of the latest examples of our team capability in this field was the successful execution of a wind tunnel contract for high-speed train testing in Vienna. Completed in consortium with two Austrian VA-Tech Group companies, this wind tunnel will be handed over to the owner in late summer 2002. It will be used for full-scale tests on trains up to 95 m long at temperatures from -50 to +60 °C. Among other activities, this business unit is Europe's largest supplier of ice-rinks. The reference list includes numerous Olympic rinks, and since 2001 the world's largest ice-rink in Nischnij Nowgorod, Russia. Currently under construction in Switzerland are new rinks in Winterthur and Montchoisi, Lausanne.

Project management for large refrigeration projects

A typical case benefiting from Axima's decades of experience in the food indu-

stry is the contract recently awarded for refrigeration installations at Sassnitz harbour fish processing centre in Germany, the execution of which is commencing in mid-2002. Another rotary compressor refrigeration application in which Axima has been successful for decades is heat pumps. These are mainly used in Scandinavia for supplying district heating systems with low-cost thermal energy from exhaust emissions, seawater, thus reducing primary energy consumption significantly. By including chilled water supplies for air-conditioning needs in thermal energy systems, the simultaneous generation of heat and refrigeration by the same aggregate results in high overall system efficiency. As described in this report, another of these compact heat pump aggregates was recently delivered to our customer near Stockholm.



Maintenance and Service

The Axima maintenance and service business units focused intensively last year on offering their customers innovative services and meeting their needs on a comprehensive "one-stop" basis. As a result, overall long-term oriented service business volume in Switzerland, Austria, Germany and the Netherlands increased markedly. Likewise the Axima companies with strong

service divisions in Spain and Great Britain offered additional facility management services enabling customers to concentrate on their core activities and save costs thereby. These include our resident and mobile service support – 365 days per year around the clock – for heating, ventilation and air-conditioning, as well as building automation with remote monitoring of power supplies, fire protection systems, elevators and escalators. We also offer performance contracting for additional energy savings. Our specialists undergo regular training in these services, which primarily interest store chains, hotels, administrations and telecommunications providers as well as industrial companies. In this way we meet a clear need among our customers for cost reductions through outsourcing and facility management. In the field of performance contracting, our market position in Germany has been further expanded. Long-standing Axima customers such as Ulm University Clinic and Südwestrundfunk (SWR) Stuttgart have extended our mandates in this connection in order to create greater liquidity for their core activities. A breakthrough in Technical Facility Management was achieved by Axima Romandie (French-speaking Switzerland) with the signing of a long-term facility management agreement for the Nestlé plant in Entre-Deux-Villes, as detailed later on in this report. In autumn 2002 a further FM contract will be closed for the Orbe plant in Switzerland, where three production units are already in the implementation phase.

Axima Lab

The Axima laboratory has now been relocated to Winterthur Technology Park, a new undertaking with state-of-the-art infrastructures, for closer teamwork with other companies and greater exploitation of synergy effects. Activities are focused on providing services for Axima companies and third parties, including for example numerical airflow simulation, dynamic building simulation, field measurements, laboratory tests, and customer personnel training.

In combination with the energy-oriented Elyo services, Axima will in future be able to meet customer needs even more comprehensively – with competent partnership ranging from engineering contracting to the long-term facility management of energy centres, for example. On behalf of the Axima management I sincerely thank all our customers and business partners for their ongoing loyalty and confidence. It is this which motivates the entire Axima team to tackle the continuous improvement process required for ongoing success in constantly changing markets.

A handwritten signature in blue ink, appearing to read 'K. Bochsler'.

Karl Bochsler
Member of the Executive Board,
Tractebel Energy Services

Axima Management

Karl Bochsler	Member of the Executive Committee Tractebel Energy Services (till 30.09.2002) Etienne Oleffe (from 01.10.2002)
Karl-Walter Schuster	German speaking region and Central Europe
Nicolas Celier	Refrigeration
David Bright	Human Resources and Organizational Development
Richard Fallegger	Information Technology
Gerhard Rutz	Controlling and Finance (till 30.09.2002) Audit Tractebel Energy Services (from 01.10.2002)
Peter Schweizer	Customer Support
Eva Tschudi	Communication
Christoph Wolleb	Supply Management

Tractebel

Energy		Services		
Electricity & Gas Europe	Electricity & Gas International	Installations & Maintenance	Energy Services	Engineering
			<ul style="list-style-type: none"> ■ Elyo ■ Axima 	

Building Services

Applications:

Heating, co-generation, ventilation and air-conditioning, refrigeration, building automation, sanitation systems, fire protection, piping systems

Customer Segments:

Office and administration buildings, industrial buildings, hotels, shopping and recreation centers, art galleries, museums and theatres, transport terminals

Expansion of radiotherapy and radio-oncology facilities at Leipzig University

With building extension investments totalling EUR 1.65 million, the cancer research and therapy facilities at Leipzig University's nuclear medicine clinics and polyclinics have been further modernized. Completion is scheduled for autumn 2002. Axima Central Germany is installing the comprehensive air-conditioning and exhaust air handling systems in the radiotherapy and radio-oncology departments based on extensive experience with similar projects. Particularly important thereby is work safety in the vicinity of radioactive nuclides and therapy radiation sources. All systems are therefore being installed on a redundant basis, and the room air pressure in various zones is maintained below atmospheric.

room utilization for offices and/or data processing, widely varying heat loads have to be taken into account to comply with all safety and comfort requirements. The new business centre, located in the preferred quarter of Madrid, has a total floor area of 21,000 m². All office rooms are equipped with fire sprinklers, and the computer rooms with FM-200 gas extinguishers. The 11,500 m² basement parking garage is also included in the fire sprinkler and ventilation systems. Typical of the high construction standards in this business centre are the ceiling plenums and double floors.

**New Allianz business centre opened in Madrid**

On behalf of the Allianz, Europe's largest insurance group, their real estate company Inverfenix assigned Axima Sistemas e Instalaciones with air-conditioning, fire protection and alarm system installations at the new business centre in Madrid. Since this building will subsequently be let out to several tenant companies, with

Large Axima contract for the Altadis tobacco processing plant

In 1987 Axima Madrid equipped Spain's largest tobacco processing plant in Cádiz with building services systems, and since then has been responsible for facilities maintenance. Based on this successful partnership, Axima has now been entrusted with another contract worth EUR 5.4 million. Altadis, Spanish-French tobacco

corporation headquartered in Madrid, is transferring production from its Valencia and Alicante plants to a new facility in Alicante. Here Axima is installing the air conditioning and handling systems for the offices and

plant buildings, as well as steam generation, media supplies including compressed air and vacuum, and all control and regulation systems.



Vienna's new Tech Gate

In the immediate vicinity of the Andromeda Tower and UNO-City, two existing Axima landmarks in Vienna, another imposing building was completed in 2001. Tech Gate Vienna is now Austria's leading address for research and development in telecommunications and information technology, as well as software development and medical technology. Axima installed all the heating, ventilation, air-conditioning and sanitation systems in this new building. Tech Gate Vienna is owned by Wissenschafts- und Technologiepark GmbH, a joint venture between Wiener Städtischen Allgemeinen Versicherung AG and Technologie Impulse

Gesellschaft m.b.H. (a subsidiary founded by the Federal ministry of transport, innovation and technology) and Wiener Hafen GmbH.

Living and working in Vienna's old gasometers

As consortium leader, Axima played a key role in one of Vienna's most spectacular projects – the reutilization of two out of four gasometer structures with a capacity around 24,000m³ each. The first of these, gasometer A, now incorporates three sales floors and a shopping mall, together with offices on three floors and 128 apartments. Gasometer B contains an auditorium for 4000 people, acoustically isolated from the main structure, a foyer and 12 floors of apartments partially for students. A shield shaped extension with 18 apartment floors and two basement parking levels was also added. In both these notable buildings Axima installed the ventilation and air-conditioning, refrigeration and recooling systems. The scope of contract also included smoke extraction systems for the fire protection installations. A historical brick-built building nearby, under preservation order, houses the district heating converter station, the refrigeration plant with ice storage, fire sprinkler centre, emergency power generators and control system installations.

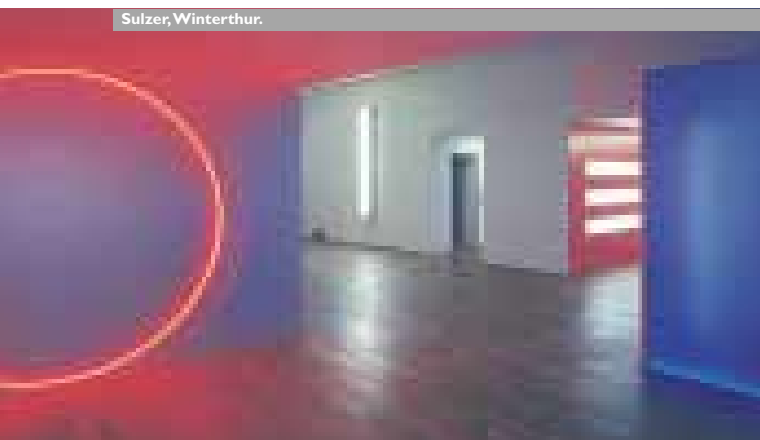
Mannheim's first high-rise building with concrete core cooling

The new 27-storey administration block at the Mannheim headquarters of Victoria Assurance, a member of the ERGO Insurance Group, is largely built of environment-friendly materials. In this connection the building also has a double facade. Three of the floors, where conference rooms and the staff restaurant are located, are conventionally air-conditioned due to the high internal heat loading. For the other 24 office floors, however, concrete core cooling is used. Instead of air-conditioning in the normal sense, the possibility of natural ventilation is exploited here by utilizing the thermal capacity of the structural masses for cold storage. To this purpose, cooled water flows during the night through piping coils concreted into the floors and ceilings. Led by Axima Rhein/Main in consortium with Siemens, this demanding contract – worth EUR 6.5 million to Axima – covered ventilation and air-conditioning, heating, sanitation, fire protection, refrigeration, measuring, control and regulation systems. The completion time of only nine months can be regarded as a record for a high-rise building of this size.

Flush-mounted cooled ceiling development opens up new architectural possibilities

In 2000/2001 the Sulzer headquarters building in Winterthur, dating back to 1928/29, was comprehensively

renovated. Not only were the infrastructures modernized by the Zurich architects Burkhalter and Sumi, but the entire building concept was also updated to modular office utilization and the latest energy-saving technolo-



Sulzer, Winterthur.

gies. The new concept also includes a rooftop conference pavilion for the Board of Directors. Axima Ostschweiz and the Winterthur competence centre played an important role here in developing new ways of saving refrigeration, heating and lighting energy and for reducing air change rates to 2 per hour. This enabled the architects to meet the owner's goals as well as complying with cantonal energy-saving regulations. A key role in this connection is played by an innovative flush-mounted cooled ceiling, without which it would not have been possible to meet the interior architecture requirement for invisible technology. This cooled ceiling absorbs 41 Watt/m² internal heat load, so that only

9 Watt/m² has to be removed by the ventilation system to comply with requirements. Comprehensive safety measures have been taken against water damage due to leaks or room air condensation. The offices are provided with radiators for heating during the winter months. Subsequently Axima also took over responsibility for the technical facilities management including security.

Allianz Suisse headquarters renovation in Zurich

Allianz Germany, Europe's largest insurance group, is a long-standing Axima customer in several countries including Switzerland. Via the Group's construction company DEGGO AG, Allianz placed a general contractor order with Axima Zurich for comprehensive renovation of air-conditioning installations in the Allianz Suisse headquarters building. The existing air-conditioning systems no longer met today's more demanding requirements, and were replaced with a modern energy-saving displacement ventilation concept. In coordination with civil works progress, the existing installations were dismantled in

stages and removed for environment-friendly disposal. Since all renovation work had to be carried out together with other contractors without interrupting office procedures, the project lasted from the end of 1999 until spring 2001. The total costs of air-conditioning renovations amounted to EUR 1.5 million.



Sulzer, Winterthur.

Facilities management contract for Nestlé now in force

After intensive negotiations regarding facilities management outsourcing for the Nestlé Suisse SA Entre-Deux-Ville plant, with 600 employees, this contract was signed by Axima Romandie Lausanne in July 2001. The organization to provide the agreed facilities management performance was set up between October and December 2001, and on January 1, 2002 our service team took over under the designated FM manager. The contractual fee of EUR 4 million p.a. covers the following comprehensive services: facilities management and coordination including interior

fittings, removals and auxiliary work, as well as new project development and coordination of partner company performance. One partner group provides janitor, postal and messenger services as well as garden upkeep, while another group provides reception, security and fire protection services. Vehicle fleet rentals, mailing and dispatch services have been contracted out. The next service package to be taken over by Axima will be "Hygiene, Safety and Environment". Facility management services provided here by Axima Romandie cover comprehensive building services maintenance in all five buildings of this 22,000m² complex, which also includes a 4000m² warehouse.

Spectacular new building for the Lord Mayor of London

In her Golden Jubilee year, HM Queen Elizabeth II has inaugurated one of the most spectacular new buildings in the City of London. Designed by Foster & Partners, this ten storey Thames-side seat for the Lord Mayor of London and his staff of

400 is also notable from the energy-saving point of view. The overhanging floors provide welcome shade in summer – thus reducing cooling energy requirements – but do not impede the rays of the winter sun.

92,000 m² of office floor for GlaxoSmithKline London

Axima Building Services Ltd has completed an EUR 11 million contract for a new building tailored to user require-



Greater London Authority, London.

For this outstanding project Mace, the general contractor, awarded Axima a contract worth EUR 3 million for installation of the entire building services systems. An interesting point in this connection is that cold water supplies are taken directly from the building's own groundwater borehole. Three of the floors are open to the public, with cafeteria, exhibition zone and library, while floors three to nine comprise open-plan and individual offices, conference and meeting rooms. The top floor – dubbed "London's living room" – can be flexibly utilized for all kinds of public events and functions.

ments – rather unusual in Great Britain. About 3000 people will work in this £ 300 million global headquarters of GlaxoSmithKline on the outskirts of London, which has 93,000m² of floor space. To meet the short build time set for such a large project, with parallel infrastructure installation and fit-out programmes, all 200 or more contractors and consultants involved were continuously linked by an on-site computer networked document management system and intranet. Here again, Axima's project management and team skills proved invaluable, also the off-site pre-assembly and quality control of the various aggregates.



Apart from the typical mix of open-plan and cellular offices, there are also 130 conference and meeting rooms in this building together with numerous facilities such as shops, restaurants, hairdressers, cafeterias,

conditioning system is of the variable airflow type. Axima was furthermore responsible for subcontractor co-ordination in connection for example with chiller deliveries, exhaust ducting, underfloor heating and insulation, water treatment, air handling and control systems.



etc. Axima installed the basement plantroom equipment – pumps, storage tanks and heat exchangers – together with main and distribution piping, as well as the room heating radiators. The scope of contract also covered complete steam generation and cold water systems for air humidification and cooling, and the entire sanitation system pipework. The air-con-



A photograph of a modern, multi-story building with a glass and steel facade. The building is reflected in a large, shallow pool of water in the foreground. The sky is blue with some clouds. The text "Engineering Contracting" is overlaid on the left side of the image.

Engineering Contracting

Applications:

Plant and building services, measuring, control and regulation technology, building automation, civil engineering, electrical and mechanical systems, process media supplies, cleanroom technology

Customer Segments:

Pharmaceutical, biotechnology and chemical industries, microelectronics, automobile industry, food and beverage industry

New microelectronics research centre completed for the ETH Zurich

In March 2001 Axima won against international competition a general contracting order worth EUR 4.5 million for fitting out the new microelectronics research centre at the Federal Institute of Technology (ETH) on the Hönggerberg in Zurich. Thanks to meticulous project management and strict quality control, the entire contract was punctually completed in only nine months. The scope of performance covered energy supply systems and air-conditioning installations for the cleanrooms to ISO 14644, classes 4-7, or classes 10-100000 in US Fed. Standard 209E. Installation included all interior fittings including lighting and fire protection. Particularly demanding were the contractual requirements for media supplies, including ultra-pure water and twenty different ultra high purity gases including the respective gas detectors.

Vinification cooling systems for 36 million bottles of red wine p.a. at the new Osborne plant

Founded in the eighteenth century, the internationally reputed sherry and brandy producer Osborne Selección S.A., El Puerto de Santa María near Cádiz, is a long-standing Axima customer in Spain. In order to facilitate business expansion into wine

trading, Osborne has erected a new vinification and bottling plant in Malpica de Tajo near Toledo. Axima Sistemas e Instalaciones was awarded a contract worth about EUR 1 million for installing the extensive cooling systems here. Via various circuits, these serve all production stages from fermentation to maturing in the barrel, as well as air-conditioning for the bottling plant and cold water supplies for the shipping department and offices. The output of this plant is up to 36 million bottles per annum.

Microbiology laboratory for a Polish pharmaceuticals producer

For Polfa Pharmaceuticals, Warsaw, Axima Engineering Contracting installed an 800 m² microbiology laboratory on the fourth floor of an existing production building. Axima won this contract thanks to meticulous project planning for precise compliance with the customer's requirements. The new laboratory is scheduled for completion and hand-over in November 2002. Mainly local subcontractors have been engaged for this contract, and to minimize



Swiss Federal Institute of Technology, Zurich.



Osborne, Cádiz.

interface problems, they are subject to strict quality control and project management – in which Axima has vast experience. The scope of contract also covers room installations and supply systems for ultra high purity gases, fluids, steam, hot water and compressed air, as well as the measuring, control and regulation systems. Design qualification (DQ) has already been completed, and Axima will now be supporting the customer with pharmaceutical certification requirements such as IQ, OQ and PQ according to GMP regulations, including all necessary documentation.

EPCOS entrusts Axima with additional processing plants

Further to our report last year on the long-standing teamwork by Axima Germany and Portugal with our customer Epcos AG, Évora/Portugal, this



project has now entered a further phase. Thanks to the successful outcome of our international project coordination, Epcos has awarded

Axima another contract for their tantalum chip production facility, which now covers a floor area of 20,000 m². This new order for media supply and disposal systems increases the total contract value to around EUR 7 million.

Caliqua steam piping installation over the intercity express line near Nuremberg

Caliqua Powertec GmbH, Weil am Rhein (D) won a large contract from Nuremberg waste incineration plant thanks not only to outstanding expertise in this field, but also to efficient cooperation with Axima Engineering Contracting Munich and Axima Refrigeration Nuremberg. Steam generated at the incineration plant is piped to the Sandreuth cogeneration station of the local power and water utility EWAG (Energie- und Wasserversorgungs AG) to serve Nuremberg's district heating and electricity needs. Since this overhead pipeline crosses the Nuremberg - Munich intercity express line, protective sheath piping was required in order to comply with the strict safety regulations of the German Federal Railways. The 350mm diameter steam line is therefore installed over a length of 110 metres inside 500mm dia. sheath piping.

The scope of contract covered installation and commissioning of the entire thermal pipeline system including natural gas, ammonia and compressed air lines.

Axima Brazil awarded a demanding contract by Dentsply

Dentsply USA, the leading global supplier of dental products, has awarded a contract to Axima São Paulo in 2001 for an ambitious project. At a cost of 2.4 million USD, of which the Axima contract is worth 0.8 million USD, the company is expanding its dental anaesthesia syringe plant in Brazil. Axima has been entrusted with basic design and logistics for all four expansion phases at this plant, including overall procurement of components and materials. The scope of contract covers construction work, cleanroom installations and air-conditioning systems, steam generation, humidification water supplies, ultra high purity water and water for injection, as well as all electrical installations. The plant output will be increased thereby from 60 to 120 million disposable syringes p.a., at the same time complying with the GMP regulations also valid in the Mercosur trade area.

Project planning and contract management for Aventis

The feasibility study submitted by Axima Engineering Contracting, Heidelberg, brought a general planning award in 2001 by the leading international pharmaceuticals producer Aventis. This mandate covers several new production lines, such as

for insulin. The high degree of automation required by the customer will be ensured by a sophisticated process control system. The detailed planning mandate additionally awarded for the 3-module precipitation zone covers room installations, air-conditioning systems, sanitation and electrical installations, and media supplies. Each module comprises a 4000-litre storage and precipitation vessel with agitation for the various solutions. Since these are high-sterility processes, GMP-compliant design and "Cleaning and Sterilization in Place" regulations are mandatory. The respective implementation requirements were defined accordingly by Axima in cooperation with the subcontractors. Process line installation will commence in August 2002, and qualification should be completed by the end of September 2003.

Creating added value for Boehringer as technical general contractor

In order to concentrate research activities at the Biberach-an-der-Riß location, Boehringer Ingelheim Pharma KG is investing in a new R&D laboratory building. In May 2000 Axima was awarded a general contractorship by this new customer for all technical facility installations in building G101. In May 2002 this building was already handed over for biopharmaceuticals quality assurance. Based on our outstanding performance and teamwork with the

Boehringer, Biberach.



customer, Boehringer awarded Axima in December 2000 a planning and implementation contract for laboratory building H104, likewise allocated to quality assurance.

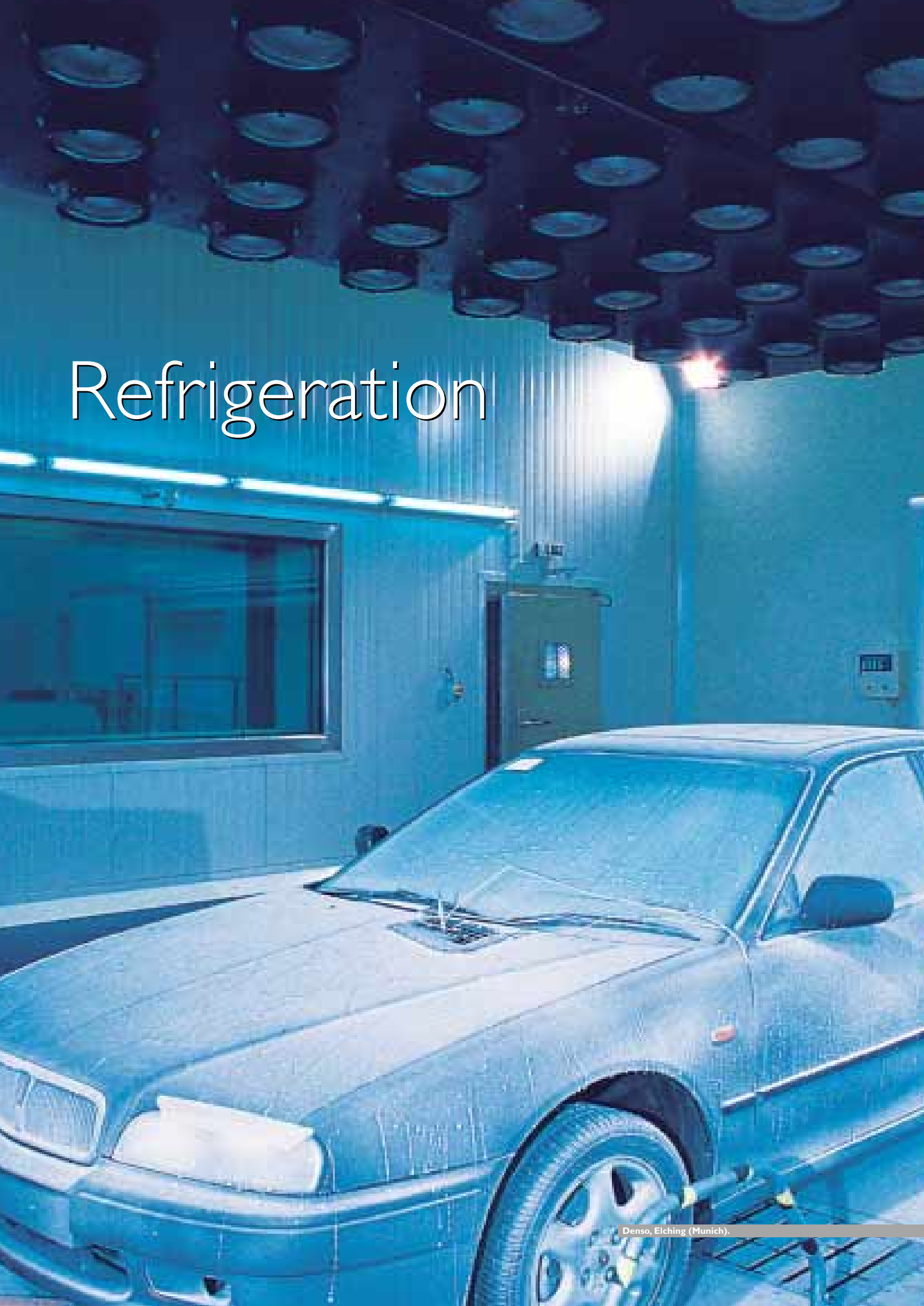
This was followed by a third mandate as technical general contractor, for laboratory building J89, confirming once again the customer's satisfaction with Axima's outstanding performance. Axima created substantial added value for the customer with these projects by taking overall responsibility for all activities, including project management and construction supervision, materials procurement coordination, scheduling and guarantee fulfilment. All quality requirements and cost budgets were fully complied with, as well as the tight deadlines. Our scope of performance for all three contracts, worth EUR 11.1 million in total, covered air-conditioning and ventilation installations, hot water and steam, refrigeration, sanitation and fire sprinkler systems, electrical installations, media supplies, building automation, personnel and freight elevators, and all laboratory installations.

Comprehensive general planning for an AKZO NOBEL pharmaceuticals plant rebuild

Axima is also a leader now in general planning to meet specific requirements for pharmaceuticals production. Our

customer-friendly competence was recently proved once again by taking over at short notice a mandate for Intervet International GmbH Werk Munich, Unterschleißheim, an AKZO NOBEL subsidiary specializing in veterinary medications production. The scope of contract covered re-design and computer validation for a process control system covering all production cycle phases, as well as qualification of a precipitation facility and a filling line for sterile injection medications. It also covered design planning, commissioning and qualification of a product transfer line and precipitation system for sterile suspensions with antibiotics filling facility. Other tasks included the planning and qualification of a multi-purpose line for sterile suspensions and ointments, a feasibility study for insulin production, and re-design for integrating an additional filling line in the existing cleanroom concept. The overall fee for this planning mandate totalled around EUR 1 million.

Refrigeration



Applications:

Process refrigeration, production, storage and transport refrigeration, marine refrigeration, wind tunnels, heat pumps, water chillers, energy recovery and CO₂ technology

Customer Segments:

Food and beverage industry, automobile industry, printing industry, ice sport and snow sport centers, chemical, petrochemical and pharmaceutical industries

Ongoing demand in Scandinavia for large heat pumps by Axima

The extensive district heating networks in many Scandinavian cities were originally designed for fossil fuelling. For environmental protection reasons and with the availability of relatively low-cost electrical power, large heat pumps are often used instead these days. Some of the UNITOP® rotary heat pumps supplied by Axima in Scandinavia have now been in trouble-free operation for twenty years or more. In 2001 the Birka Energi AB power utility started using large heat pumps for covering Stockholm's district refrigeration needs in future. This concept also enables heat-recovery of refrigeration to be fed to the district heating network. To this purpose Axima Refrigeration supplied three UNITOP® units type 33CY, three of which are connected in parallel and deliver a refrigeration output of 36 MW during the summer months. Thanks to good part-load efficiency down to 20% of rated output, cost-effective operation is also possible during the spring and autumn. Waste heat of refrigeration is used for water heating in summer at low tariff during the night. In winter all three units operate as heat pumps, utilizing thermal energy from the ocean or waste heat at 35°C from the flue gas scrubbing system of a coal-fired power plant. The resultant heat output of 26.7 MW

enables water to be fed at 78 °C into the district heating network. Mean performance factors in refrigeration and heating modes are 4.9 and 3.0 respectively. Back in the mid-eighties, Axima installed six heat pumps for this customer with a total output of 180 MW.

The dependability and cost-effectiveness of Axima heat pumps was demonstrated yet again last year. For Scandinavia's "Silicon Valley of the North", in Akalla-Kista between Arlanda airport and Stockholm, Axima supplied two more UNITOP® 33CX units with a total capacity of 12 MW. Four of these units were already installed here two years ago by Axima.

Cogeneration plant for a new commercial zone in Oslo

Oslo's former national airport in Fornebu, no longer used, will now be re-utilized as an industrial and trading zone. The consortium responsible for this re-utilization project is led by Telenor, the Norwegian telecommunications provider, whose new headquarters for around 7500 employees will be completed here by the end of 2002. Covering a site area of 140,000m² and costing about EUR 150 million, this will be the largest office complex in the whole of Scandinavia. In keeping with Scandinavia's high degree of environmental awareness, 85% of thermal energy requirements are supplied



here by heat pumps using seawater in Lysaker Fjord as heat source. During the summer months the same units are used for cooling the building.

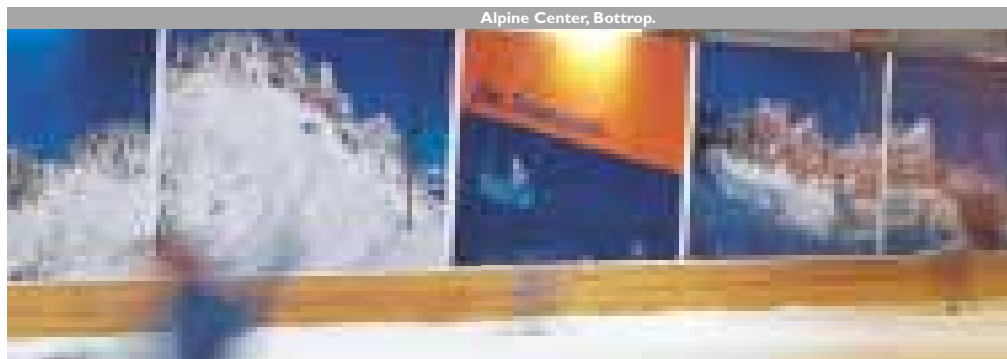
Axima Refrigeration was awarded the contract to supply and install UNITOP® heat pumps here both for heating purposes and for air-conditioning water chilling.

**Bottrop Alpine Centre:
year-round skiing at 113 m.a.s.l.**

Every day, summer or winter, about 3000 winter sports enthusiasts in Germany's Ruhr region and the nearby Netherlands can now enjoy year-round skiing on the world's longest indoor slopes. Ever since it opened in 2001, the Bottrop ski centre built by Alpincenter.com AG has been in high demand. The remarkably trouble-free operation of this facility, designed and installed by Axima Refrigeration Antwerp, demonstrates once again Axima's

prowess in winter sports installations. Built on one of the rubble tip sites typical of this former coal-mining area, the indoor slopes here are

of powder snow produced by flake ice generators. Optimal conditions are ensured by ski run maintenance machines, as well as by continuous



Alpine Center, Bottrop.

steep enough at 24 % for quite fast skiing. The main run is 640 metres long, and even includes a ski jump. Skiers and arriving visitors are conveyed separately to the top of the run through two cooled tunnels 600 metres long.

Set in this "alpine panorama" is a large and attractive restaurant offering après-ski specialties. The comprehensive infrastructures include computerized pay facilities, changing rooms, airlocks and the necessary plantrooms. On top of the underlying ice layer, 10cm thick, the 15,240m² of ski runs are covered with a 30cm layer



Alpine Center, Bottrop.



supply air handling and temperature regulation to a constant $-5\text{ }^{\circ}\text{C}$. Waste heat from the two screw-compressor chillers, using environment-friendly

ammonia refrigerant, is utilized for heating the non-ski zones and for the frost damage protection system.



Axima companies as part of Tractebel Energy Services.

Local for our clients.

Austria

Axima Gebäudetechnik Ges.m.b.H.

A-1111 Vienna
Tel. +43 1 740 360

Axima Kältetechnik Ges.m.b.H.

A-6923 Lauterach
Tel. +43 557 46 705

Belgium

Axima Contracting S.A./N.V.

B-1190 Brussels
Tel. +32 2 533 23 11

Axima Refrigeration N.V.

B-2060 Antwerpen 6
Tel. +32 3 235 11 44

Brazil

Axima Ltda.

BR-04717-004 Sao Paolo
Tel. +55 11 5184 1899

France

Axima SA

F-4420 Nantes
+33 2 40 41 00 05

Axima Refrigeration SA

F-67800 Bischheim
+33 3 88 19 19 00

Germany

Axima Baden GmbH

D-79108 Freiburg
Tel. +49 761 510 030

Axima Bayern GmbH

D-81338 Munich
Tel. +49 89 746 410

Axima Mitteldeutschland GmbH

D-01277 Dresden
Tel. +49 3 51 253 360

Axima Rhein/Main GmbH

D-67073 Ludwigshafen
Tel. +49 621 56 050

Axima Württemberg GmbH

D-70510 Stuttgart
Tel. +49 711 78 810

Axima Engineering Contracting GmbH

D-70565 Stuttgart
Tel. +49 711 64 840

Axima Steritec GmbH

D-35260 Stadtallendorf
Tel. +49 6428 44 980

Axima Refrigeration GmbH

D-88131 Lindau
Tel. +49 83 82 70 61

Caliqua Powertech GmbH

D-79567 Weil am Rhein
Tel. +49 7621 974 270

Hungary

Axima Épületgépészeti Kft

H-1144 Budapest
Tel. +36 1 363 50 47

Italy

Axima Refrigeration S.r.l.

I-20153 Milano
Tel. +39 02 456 781

Netherlands

Axima Contracting B.V.

NL-500 AE Tilburg
Tel. +31 13 583 8100

GTI Koudetechniek BV

NL-2712 LA Zoetermeer
Tel. +31 79 3 46 2700

Poland

Frigo-Polsk

PL-93578 Lodz
+42 2 50 69 05

Portugal

Axima Sistemas e Instalações S.A.

P-2720028 Amadora
Tel. +351 21 472 16 80

Spain

Axima Sistemas e Instalaciones S.A.

E-28046 Madrid
Tel. +34 91 749 82 00

Switzerland

Axima Management Services AG

CH-8401 Winterthur
Tel. +41 52 262 11 44

Axima Lab AG

CH-8401 Winterthur
Tel. +41 52 262 47 47

Axima Nordwestschweiz AG

CH-4054 Basel
Tel. +41 61 306 66 00

Axima Ostschweiz AG

CH-8411 Winterthur
Tel. +41 52 262 41 07

Axima Romandie SA

CH-1000 Lausanne 8
Tel. +41 21 644 34 34

Axima Zentral AG

CH-8034 Zurich
Tel. +41 1 386 91 11

F. Heusser AG

CH-8031 Zurich
Tel. +41 1 444 56 56

Axima Pharma Engineers Automation AG

CH-4051 Basel
Tel. +41 1 61 280 53 00

Axima Pharma Engineers AG

CH-4051 Basel
Tel. +41 61 205 66 00

Axima Steritec AG

CH-4104 Oberwil
Tel. +41 61 403 00 01

Axima Engineering Contracting AG

CH-8401 Winterthur
Tel. +41 52 262 81 11

Axima Refrigeration AG

CH-8401 Winterthur
Tel. +41 52 262 80 80

Caliqua AG

CH-4002 Basel
Tel. +41 61 366 35 00

Axima FM AG

CH-8404 Winterthur
Tel. +41 52 262 41 41

United Kingdom

Axima Building Services Ltd.

GB-Farnborough, Hants. (GU14 7LP)
Tel. +44 1252 544 400

Axima Management Services Ltd

P. O. Box 414

CH-8401 Winterthur, Switzerland

Telephone ++41 (0)52 262 11 44

Telefax ++41 (0)52 262 00 00

E-mail info@axima.eu.com

Website www.axima.eu.com



AXIMA