



Providing efficiency and reliability for the technical facilities of an historical palace in the heart of Milan

Having undergone renovation, which took over two and a half years, Palazzo Broggi has been given a new lease of life. This is also thanks to a number of Grundfos devices used when installing the technological systems that today service all the floors in the building.

- Business sector: Services
- Location: Palazzo Broggi – Piazza Cordusio 3, Milan
- Client: Colombo Costruzioni SpA – Via Nino Bixio 4, Lecco
- System design: ESA Engineering Srl – Milan
- System implementation: Panzeri SpA – Registered office Via Vincenzo Gioberti 8, Milan – Operational headquarters Via Milano 1/a, Luisago (Como)

GRUNDFOS 

Possibility in every drop

The situation

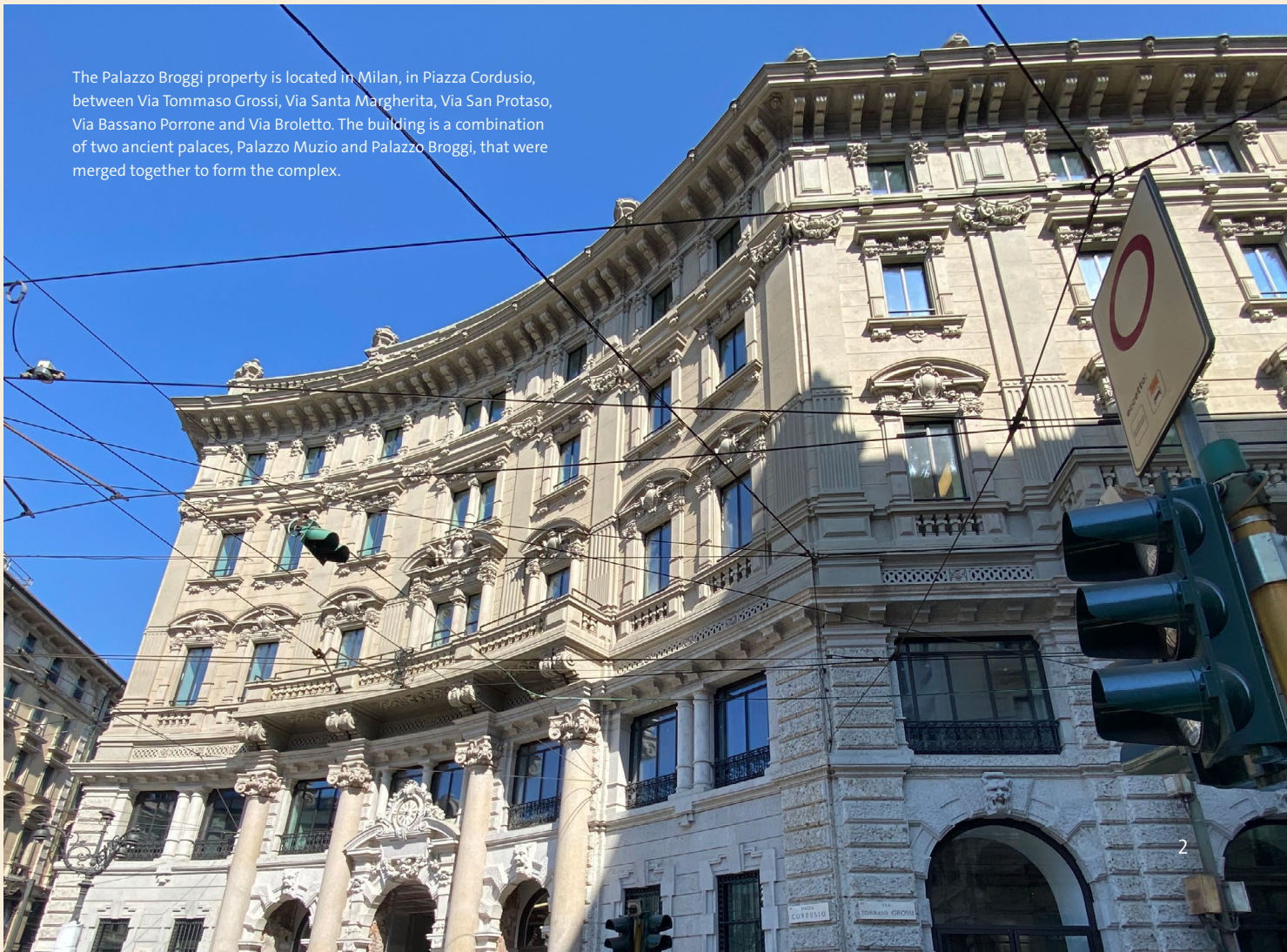
Formed by joining together two existing buildings – Palazzo Muzio and Palazzo Broggi, the former headquarters of the Bank of Italy –, this modern version of Palazzo Broggi is a property complex located in the centre of Milan, between Piazza Cordusio, Via Tommaso Grossi, Via Santa Margherita, Via San Protaso, Via Bassano Porrone and Via Broletto. Owned by IDeA Fimit SGR – Omicron Fund, the building was purchased in 2015 by Fidelidade, a large Portuguese insurance company controlled by the Chinese group Fosun, for EUR 344 million. It was then transferred to the Broggi Fund managed by DeA Capital Real Estate SGR, a De Agostini group company specialising in real estate investment funds. After purchasing the two palaces, the owner decided to undertake specific renovation work on the site, which involved joining it together to create more multi-purpose areas and use them as shops, commercial outlets and offices.

The project was designed in 2018 and it was conceived by the engineering services company Esa Engineering Srl, which was headed by the general contractor Colombo Costruzioni SpA. The company was in charge of all the demolition and reconstruction work that started in February 2020, while the company Panzeri SpA subsequently built and installed all the mechanical and technological systems envisaged in the project. “We started arranging meetings and planning design and coordination activities with the construction and electrical company just before

the spread of the pandemic,” says Paolo Roberto Rossi, Head of the Technical Office at Panzeri SpA. “Once Colombo Costruzioni had prepared the work site for construction, we began to install the plumbing, heating and air conditioning systems, as well as the safety systems, such as the firefighting and smoke extraction systems.” What was the client’s main requirement? To create low-energy consumption systems operating with high-efficiency components, following the provisions of the LEED protocol and WELL certification. “The executive design that we then used to develop the construction project couldn’t take into account all the critical operational aspects that then arose during the construction phase of the facilities. These types of problems are mainly linked to the specific and unique character of historical buildings like this one”, explains Rossi, “such as the change made during construction to the paths and technical areas serving the facilities.

These issues could arise due to identifying structural elements, such as load-bearing beams or pillars, being discovered in unexpected places – or the planned installation of a dense network of systems inside false ceilings, which were inevitably reduced due to the limited inter-storey heights typical of the building’s configuration. The biggest challenge we faced was how to anticipate and quickly resolve any critical issues on the construction site, while keeping track of the project time frames in order to avoid delays in the progress of the construction work.”

The Palazzo Broggi property is located in Milan, in Piazza Cordusio, between Via Tommaso Grossi, Via Santa Margherita, Via San Protaso, Via Bassano Porrone and Via Broletto. The building is a combination of two ancient palaces, Palazzo Muzio and Palazzo Broggi, that were merged together to form the complex.



The solution

The project was implemented on 12 floors, with four of them being underground. Floors -4 and -3 were arranged as technical areas for all systems, such as heating and cooling, as well as electrical system areas. Floor -2 housed the fire pump room, including the firefighting water reserve tank, along with the archives and storage of the facilities that serve the various tenants and owners of the offices and shops. From floor -1 to the first floor, including the ground floor that leads to Piazza Cordusio, eight retail stores were developed across three levels each, with separate systems. Then from the second to the sixth floor, the design was intended to provide more room to allocate offices and, specifically, on the sixth floor there was also an area designated for a restaurant overlooking Piazza Duomo and its Madonnina. Lastly, the seventh floor accommodated some air treatment units, the fans of the smoke extraction systems and the three evaporative towers that work together with the relevant refrigeration units, in addition to a small multi-purpose area.

There are three standalone systems and circuits serving the building's three intended uses: the first one supplies the entire retail and storage area, the second one supplies the six floors that house the offices and the last one independently supplies the restaurant. Based on equal technical and financial conditions, Grundfos was the most competitive supplier in the market for the application of its devices. The Danish company had a large product supply, which included about 60 circulation pumps, booster pumps and water pressurisation units. High-efficiency single-stage in-line pumps were installed for the air conditioning and heating systems – with IE3 motors, as required by the project – equipped with an inverter that allows the flow rate of each pump to be adjusted according to the actual demand for circulating process water, heated or chilled. In-line circulators were installed inside the sanitary water system for recirculating water along with pressurisation units that consist of several rows of pumps, which ensure the flow of cold water from Milan's water mains supply throughout the building using a system of pre-autoclaves and autoclaves.

In the structure's basement, several lamination tanks were provided, intended for collecting rainwater and a series of lifting stations for wastewater. The former are used to provide recycled water for the irrigation system, while the latter are pumped to the sewer connections, located on floor -1. All this water is pushed and transported by multiple Grundfos submersible pumps installed in the building's technical rooms. Two pressurisation units, consisting of a motor pump, an electric pump and a jockey pump, serve the fire-extinguishing hydrant system – located in various areas of the building – and the extinguishing system through sprinkler dispensers, which, if necessary, are supplied by the water reserve from the firefighting tank. In this case the pressurisation units were installed on floor -2, close to the firefighting system, whereas the other Grundfos devices



Palazzo Broggi has various floors, mostly used for shops and offices.

were installed on floors -3 and -4. “All Grundfos pumps in the HVAC system – both for heated and for chilled water – were fixed inside the technical plants. There they are placed on reinforced concrete bases built with acoustic and decoupling materials to prevent the vibrations generated from the pumps while they are working,” explains Rossi. “We used these bases to place the various pumps already assembled in the construction site.

The various pumping units were assembled one by one, with the main priority being given to the HVAC system used for the building's heating and air conditioning systems. Then, once the downpipe lines were completed, we activated the booster pumps for wastewater and rainwater to allow us to continue working on the construction site even if it rained. Lastly, the firefighting pressurisation units and all of the water system's pumps were installed. We did not encounter any difficulties during the installation phase, as we followed meticulously the executive design. Even during commissioning everything went smoothly, since the pumps had been sized up and purchased with the correct fit, and there were no problems during the start-up phase in terms of achieving the project's expected performance and as required by the customer.”

The result

At this moment, the construction site is completely finished and, although the building is still not inhabited, the systems installed – based on technical checks that have been carried out – perfectly meet the criteria and design requirements. Their operation will gradually start at different times, depending on the demands of the owners or tenants in the building. “All the devices were installed as planned,” says Rossi, “and offer great flexibility, one of the essential qualities of modern systems, which means that changes can be implemented when the spaces are purchased or rented. Panzeri SpA has been working with Grundfos for years, and I can personally testify how deeply the company is involved in terms of providing technical support and its practical and prompt assistance during the design phase, when meeting all the needs that arise during the development of the construction project and the end users’ requirements.

Thanks to the Grundfos Technical Department we were able to meet these requirements, ensuring the approval of the materials and the continuation of operational activities on the construction site, something that cannot be taken for granted. Since, nowadays, many manufacturers are aware of the quality of the devices they supply, I believe that the main factor that primarily makes every Grundfos product stand out from its competitors is its operational reliability, as well as the efficiency of its after-sales support centre, with which our testing and commissioning department is still in touch.”



Pumping systems for heating and air conditioning circuits were located on floors -3 and -4 on reinforced concrete bases made of acoustic and uncoupling materials.



In addition to a small multipurpose space, some units of air treatment, smoke extraction system fans and the three evaporative towers that work in conjunction with the related refrigeration units were located on the seventh floor.

Grundfos products installed

- TP 150-340/4 A-F-A-BQQE-RX3
- TPE3 50-240 S-A-F-A-BQQE-IDC
- TPE 100-330/4 S-A-F-A-BQQE-OX3
- TPE 100-360/2 S-A-F-A-BQQE-PX1
- TPE 65-250/2 S-A-F-A-BQQE-KD1
- TPE 125-310/2 S-A-F-A-BQQE-QX1
- TP 150-450/4 A-F-A-BQQE-TX3
- TPE 150-110/4-S-A-F-A-BQQE-MD3
- TPE 150-110/4-S-A-F-A-BQQE-MD3
- TPE3 80-180-S-A-F-A-BQQE-IDB
- TPE3 50-200 S-A-F-A-BQQE-HDC
- TPE3 50-200 S-A-F-A-BQQE-HDC
- TPE 125-230/4 S-A-F-A-BQQE-OX3
- TPE 100-250/4 S-A-F-A-BQQE-NX3
- NK 125-200/196-166 EUPA2F2AE-SBQQE
- Unilift KP 250 A 1
- SEV.65.65.40.2.51D
- SEV.65.65.30.2.50D
- SEV.65.65.40.2.51D
- SLV.65.65.40.2.51D.C
- SLV.65.65.22.2.50D.C
- SLV.80.80.60.2.51D.C
- Hydro EN 65-250/263 YJS ASD-U3-B
- Hydro Multi-E 2 CRE 3-8
- SP46 - 5 Rp3 6"3X380-415/50 7.5 kW
- Hydro MPC-F 2 CRN45-4-2 U2 C-C-N-A
- Hydro EN-Y 50-250/249 JS-ADL-U3-B
- MAGNA3 25-80 N 180 1x230V PN10
- Hydro MPC-F 3 CR20-7 U2 D-C-PA
- Hydro MPC-F 3 CR15-7 U2 D-B-P-A
- DPK.10.80.22.5.0D
- Unilift AP50B.50.08.3.V
- Unilift AP50B.50.11.3.V
- SEG.40.15.2.50B
- TPE3 50-200 S-A-F-A-BQQE-HAC

Advantages of Grundfos systems:

- Long service life
- Reliability
- Energy saving
- Technical support during the choice and offering of devices to the customer
- Speed of material deliveries
- Prompt and efficient support centre



- 1 Evaporative tower water-circuit pumps were located on floor -3.
- 2 Wastewater lifting station was located on floor -4.
- 3 High and low pressure domestic cold water pressurization units were located in the water plant room on floor -3
- 4 In-line water recirculation pumps were located in the water plant room on floor -3.
- 5 Pumps for lifting rainwater from the lamination tanks were located on floor -4.
- 6 Firefighting pressurisation units, motor pump + electric pump + jockey pump were located in the firefighting system on floor -2



“We are very satisfied and, if we could go back in time, we would take the same decisions again.”

Paolo Roberto Rossi, Head of the Technical Office
Panzeri SpA

The project turned out to be very ambitious and complicated, due to the historical nature of the building and the task of merging into a single palace two buildings that were originally built very differently. Ensuring compliance with the work schedule while simultaneously responding to all the changes presented on the operational side was a great challenge.

Carrying out a huge project like this doesn't happen every day. Located in a very central area of Milan, Palazzo Broggi is an important building in Milan, that has a prestigious and privileged location. This structure had already a special heritage, which had to be respected and enhanced. From a technical perspective, the building has been completely revolutionised compared to how it was previously, but by bringing together a number of manufacturers and skills we have managed to create a new sus-

tainable and energy-efficient structure that meets the performance levels and requirements of the LEED and WELL certification processes and complies with all Italian and EU regulations governing the installation and construction of heating, sanitary and air treatment systems.

It was a long journey that lasted two and a half years – a time frame that was extended due to the pandemic – but we used this time and the construction site stoppages wisely to further refine the design and to optimise the performance of Palazzo Broggi. We are very satisfied and, if we could go back in time, we would take the same decisions again.

Grundfos Holding A/S
Poul Due Jensens Vej 7
DK-8850 Bjerringbro
Tel: +45 87 50 14 00
www.grundfos.com

