

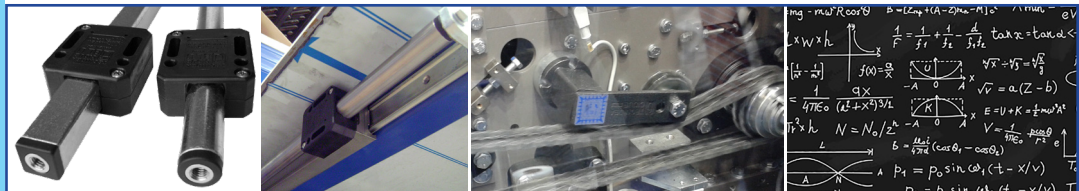
TC2 - S.Q.

# TC2 **TECNIDEA CIDUE** **S.r.l.**

...ideas in motion...

Inside you will find: Mechanics - Updates

n° 30  
February 2025



**NEWSPAPER**  
Technical News

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TECNIDEA CIDUE



# ...ideas in motion...

COVERED TOPICS: Axial sliding guides - History of numbers and the zero

## PRODUCT: Components

Axial sliding  
guides:  
GSQ and GST

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## UPDATES:

History of numbers  
and the zero

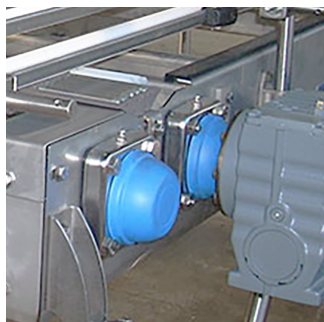
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## CURIOSITIES:

Evolution  
of symbols

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Editorial Dott. Giorgio Canova

Franco Canova: Ideas Creations Inventions

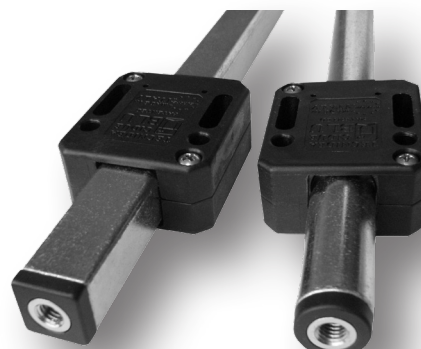
## PRODUCT

### Components: Axial sliding guides GSQ e GST

The mechanical and construction industry, in the various sectors of application, is composed by an unlimited number of products, articles, details, components etc., all elements with specific functions and purposes: each of these products has a specific task to perform, which is always aimed at achieving a certain functional objective. Listing and knowing all the products that the market offers is impossible, also because they are continuously implemented but certainly the market provides users with new means that allow users, technicians and designers, to find the products which are most suitable for the realization of their projects and for the construction of the machines or equipment they need. In most cases, the articles that are proposed have an unknown number of possible uses and therefore the same products are used in different applications and in different product sectors. In some cases, when the shapes and sizes are the same, it is sufficient to change the material used to make them so that new uses can be found for different applications.

All this premise is aimed to better describe the new product that here **Tecnidea Cidue** proposes you as this article can have numerous uses in different application sectors.

Fig.1



2025 COLLECTION  
**NEW**  
 PRODUCT



What we present here is an **axial guide**, so in a very simple way we can say that it is a box body that runs on a track, going from point **A** to point **B** and then returning to point **A** see Fig.2:

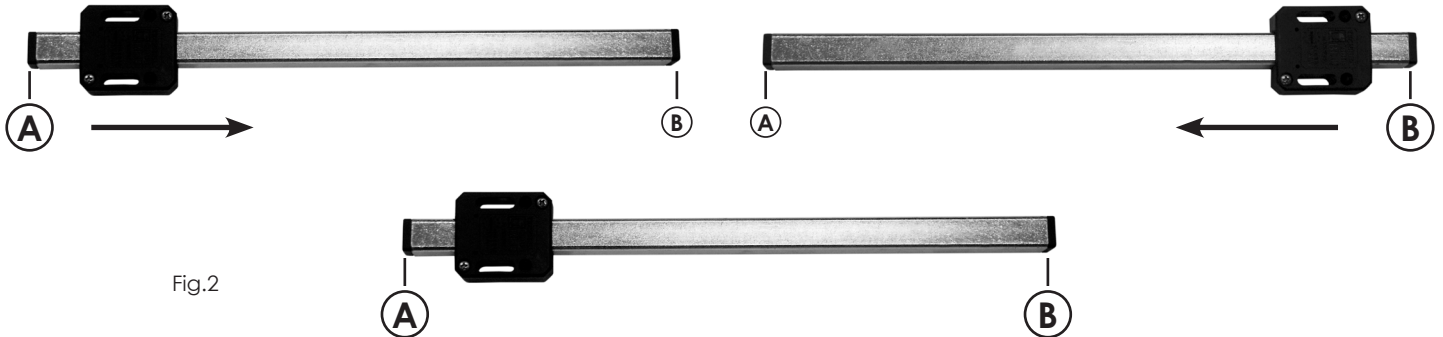


Fig.2

As you can see the function is very simple, but what makes it very interesting is the possibility of using it in many different ways, since it fits perfectly to the application needs.

The new **GS** axial sliding blocks are simple to operate and cost-effective components. The constructive solution consists of a sliding box in polyamide, in which is housed a brass insert into which the support and slide guide is inserted, which can be circular or square (Fig.3):

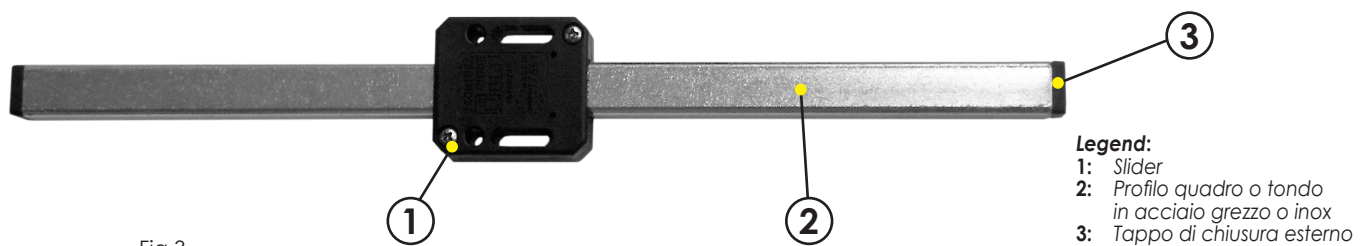


Fig.3

This design allows the block to slide over the tubular metal profiles; at their ends; the profiles are fitted with plug caps with threaded holes (Fig.4), this means that the product can be easily installed on any operating structure. The brass insert enclosed inside the plastic box body allows low friction sliding with good coupling precision with the metal tubular profile.



Fig.4

The materials used are: body in **polyamide box with brass guide** (slider) support profiles in **untreated steel** (S235) or **stainless steel** (AISI 304), these last ones guarantee operability even in aggressive environments preserving them from the degenerative oxidant actions.



The **GSQ** square section guides allow only axial movements (Fig.5), while the **GST** circular sections (Fig.6) allow in addition to axial movements (Fig.7) also rotational actions (Fig.8) on 360° of a turn angle (Fig.6), of course with dedicated guides also right or left screws on bars with metric threads and other grooves.

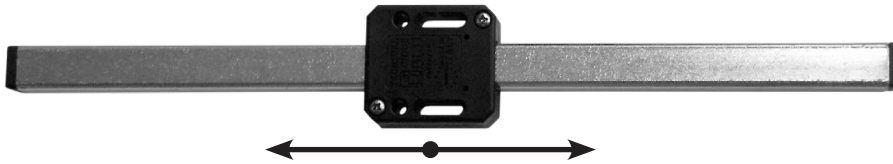


Fig.5

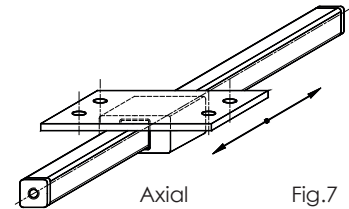


Fig.7

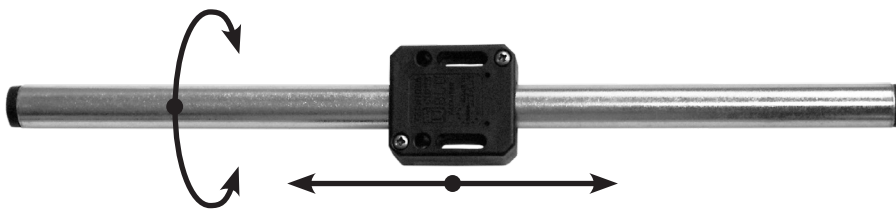


Fig.6

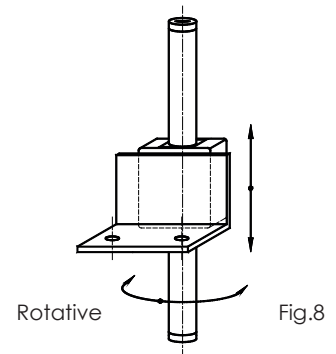


Fig.8

We emphasize that specific guides can be created which, through axial displacement, produce a stroke with helical winding along the sliding bar. This movement is the result of the combination of axial displacement with the rotational action around the axis. Upon request, profiles with different lengths from those proposed can be provided, as well as solid square or round drawn profiles to increase the strength modulus. The product can be equipped with accessories upon request, such as screw stops, grease fittings, limit switches, position sensors, and, of course, shaped profiles. The movements of the slider can be axial, vertical, or even rotational; in most cases, these movements must be controlled, but in many situations, they can be autonomous, utilizing the gravity of the materials being moved.

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*Franco Canova*

## HERE IS A SUMMARY OF OUR GENERAL CATALOGUE VOL. 3:



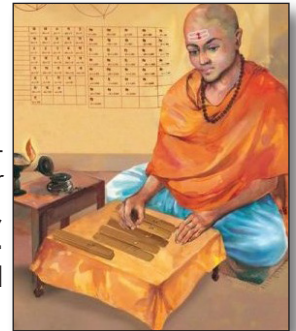
**GSQ - GST  
SLIDING GUIDE  
GUIDE ASSIALI**



## UPDATES: History of numbers and the zero

Numbers: **9-8-7-6-5-4-3-2-1** and the number **0**.

The first to have discovered or invented them was a great Indian mathematician, **Brahmagupta**, lived between 598 and 668 AD and author of the first book of modern mathematics, the *Brahmasphuta Siddhānta*, where he gives the first example of **systematic arithmetic involving negative numbers and zero** but also other, for example, a very advanced algebra with general solutions for second degree equations.



It is widely held among historians that Hindu mathematics comes before any other to the discovery of the number zero and its representation by a symbol.

And it is the first to adopt a system of so-called positional numbering by using only ten digits. For a long time, no one could consider zero to be a true number. Even the Hellenistic mathematicians considered it an absence of number. On the other hand, **Brahmagupta** also proposes a numerical system consisting of only nine digits (9-8-7-6-5-4-3-2-1) and the symbol 0 (zero), by which it is possible to write in a simple way any number. Only later did Indian mathematics equate that symbol with the other nine and began to consider zero as a **true number**. In 662, a Nestorian bishop, Severo Sabokt, who lives in Damascus, is the first to report that beyond the Indus there are more refined languages that use a **positional numbering system** superior to any other for practicality and effectiveness that is based on nine digits plus the zero symbol. Already in the **7th century**, therefore, Islam took over and used the Indian positional numbering system, taking it to the Asian and African shores of the Mediterranean.



And it is to this numbering based on nine digits plus the zero symbol that will also refer to the greatest Arab mathematician, **al-Khwārizmī** (lived between 780 and 850), author of a very well-known work, *Al-jabr*, latinized as Algebra. Unfortunately he had no news that his colleagues beyond the Indus had gone further and, with a further logical pass, had raised the zero and true number. So that while al-Khwārizmī spoke of a system based on nine digits and the symbol of zero, in India there was already reference to a positional numbering system based on ten digits.

The zero and the positional numbering system arrive in Europe only half a millennium later, even if in the European lands ruled by the Muslims (Spain and also Sicily) the landing had already taken place. To bring in our continent the zero and the system of positional numbering and, therefore, to make possible the development of mathematics as we know it today is **Leonardo Pisano**, called **Fibonacci**, in the year 1202, when he writes and makes public his *Liber Abaci*.



In short, Fibonacci becomes a great mathematician: a mathematician capable of producing new knowledge (for example on the golden section). And when he returns to Pisa and publishes the *Liber Abaci* in 1228 realizes a real record. He is the first creative mathematician, probably the first scientist in Latin Europe. Before him no part of our continent had known a man capable of creating new knowledge in mathematics. The only mathematicians originally from European lands were **Archimedes** of Syracuse, in Hellenistic times, and the Arab mathematicians of **al-Andalus**; men born in European lands but belonging to cultures different from that of Rome. Fibonacci recognizes that the new system comes from India. But he too is not up to speed on the latest developments in Indian mathematics. As the incipit of the *Liber abaci* shows.



The nine Indian digits are: **9 8 7 6 5 4 3 2 1**. With these nine digits and the sign **0**, which the Arabs call **zefiro**, you can write any number as it is proved and universally known. Fibonacci has made his knowledge public, and only in this way did Arabic and Indian numerals become part of European culture. Fibonacci, being infected by the Islamic culture in turn infected by the Indian and Chinese culture, as well as Hellenistic, has at least two great merits that go beyond mathematics:

- **It has shown that there is no science without communication of science.**
- **And it has shown that there is no culture without contagion.**

## CURIOSITIES related to the number zero

- The graphic form of zero (0) is equal to a slightly compressed circumference, as the ellipse.
- It is an even number.
- For a long time it was not considered a number, but a position.
- Zero (0) indicates the cardinality of the empty set.
- The spelling of zero (0) is the only one that represents a delimited surface but also an empty space; moreover it is the only symbol, among numbers, which do not have a starting point and an ending point for spelling, but an infinite continuity.
- The zero (0) is the beginning of infinity; in fact, the list of natural numbers begins with zero and has no end; in every direction it is considered.
- The use of zero (its acceptance among natural numbers) made calculations faster and more precise, allowing even the introduction of more complex calculations such as algebra and algorithms. The West was the last continent to introduce it and the first European to use it was the great Italian mathematician **Leonardo Fibonacci** in 1202 A.D.
- Zero is the first of the natural numbers, the next one is 1, then 2, then 3, then 4, then 5, etc.

## EVOLUTION OF SYMBOLS

The European numerical system, derived from the Arabic numerical system is a decimal positional notation. Various groups of symbols are used to represent the numbers in the Arabic numeral system and all evolved from the brahmi (Indian) numbers. The symbols used to represent the system have been divided into various typographical variants since the Middle Ages:

- The widely used **European numbers** in the Latin alphabet are descended from the western **Arabic numerals** that developed in al-Andalus and the Maghreb.
- The **Indo-Arabic numerals**, used in the Arabic alphabet, originally developed in present-day Iraq.
- **Devanagari numbers**, used in India, also called as Indu numbers.

| European<br>(descended from the West Arabic) | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|----------------------------------------------|---|---|---|---|---|---|---|---|---|---|
| Arabic-Indic                                 | • | ١ | ٢ | ٣ | ٤ | ٥ | ٦ | ٧ | ٨ | ٩ |
| Eastern Arabic-Indic<br>(Persian and Urdu)   | • | ١ | ٢ | ٣ | ٤ | ٥ | ٦ | ٧ | ٨ | ٩ |
| Devanagari<br>(Hindi)                        | ० | १ | २ | ३ | ४ | ५ | ६ | ७ | ८ | ९ |



Wood engraving showing the 16th century **astronomical clock** of Uppsala Cathedral in Sweden with two dials. One in Arabic numerals and the other in Roman numerals..

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TC2 ARCO



TC2 CRESA



TC2 ECO



TC2 CIAO



TC2 45T



TC2 MIX



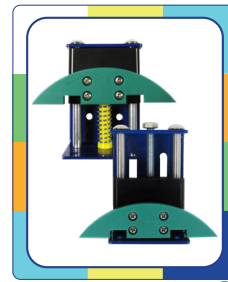
TC2 TEN BLOC



TC2 GdR



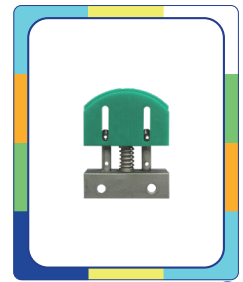
TC2 BLU



TC2 BLU DN-DB



TC2 BLU DQ



TC2 BLU DM



TC2 ARIA



TC2 OLIO



TC2 ASSO



TC2 ASSO AH



TC2 ASSO SB



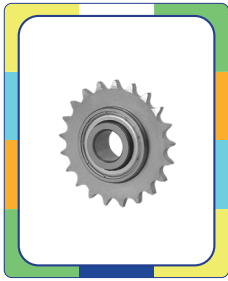
TC2 ASSO MB



TC2 GRIGIO



TC2 TEN JOY



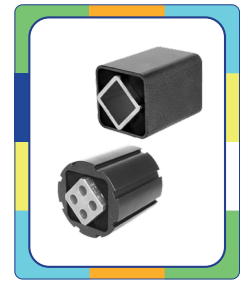
TC2 PTC



TC2 PTF



TC2 CAFRA



TC2 VIB Rubber Suspension



TC2 VIB Oscillating Mountings



TC2 VIB Antivibration Mountings



TC2 VIB Oscillating Mountings



TC2 VIB Oscillating Mountings



TC2 VIB Oscillating Mountings



TC2 AV



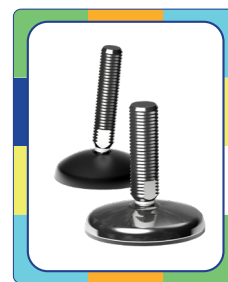
TC2 3KD



TC2 PLOC



TC2 CONVEYOR COMPONENTS



TC2 LEVELLING FEET



TC2 BEARING SUPPORTS



TC2 SLIDING GUIDES GSQ - GST