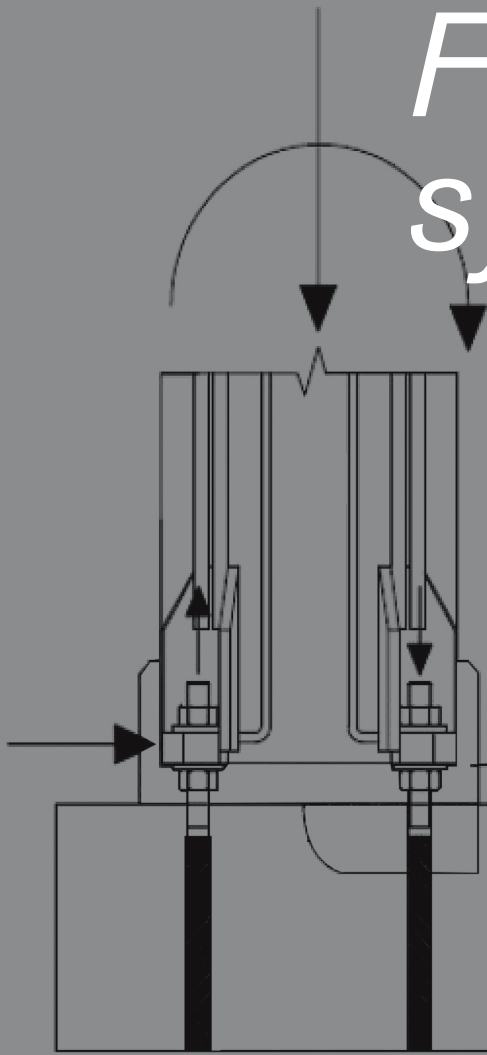


**noxifer**<sup>®</sup>

*global building solutions*

*Foundation  
systems*



**ANCHOR  
BOLTS AND  
COLUMN  
SHOES**



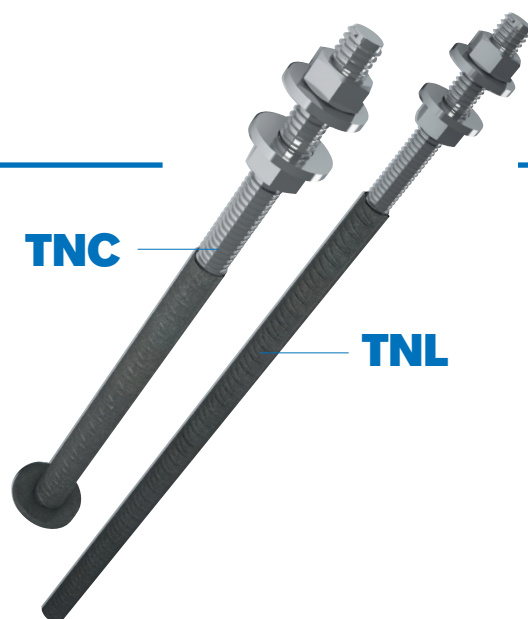
# Foundation system

## TN anchor bolts

Anchor bolts are used for the connection between structural elements and the foundation.

Its basic use is for joining concrete structures and fixing steel structures.

For its correct installation, the steel rebar is partially embedded in the concrete leaving free the threaded part for the later union.



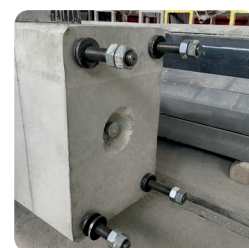
Short bolts in the template.



Concrete hardened.



Long bolts inserted in a column reinforcement.



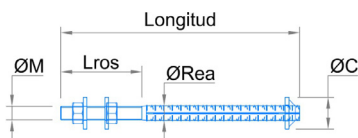
Column base with anchor bolts.

Short anchor bolts **TNC** are ideal for shallow foundations, mat foundations, strip footings and other uses.

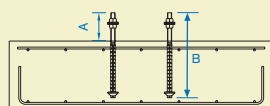
Long anchor bolts **TNL** are ideal for connections such as column to column, wall to column or deep foundations.

### Dimensions

Short anchor bolt **TNC**.

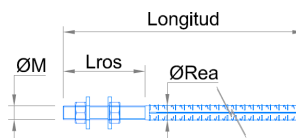


Shallow foundations, mat foundations, strip footings and other uses.

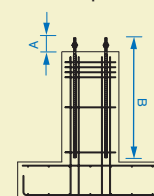


Code	A value	B value
TN20C	115 mm	365 mm
TN24C	130 mm	450 mm
TN30C	150 mm	530 mm
TN39C	180 mm	750 mm

Long anchor bolt **TNL**.



Connections such as column to column, wall to column or deep foundations.



Code	A value	B value
TN20L	115 mm	1000 mm
TN24L	130 mm	1200 mm
TN30L	150 mm	1500 mm
TN39L	180 mm	2000 mm

Code	Description	Lros.	Longitud*	ØM	ØRea	ØC	Weight
TN20C	Short bolt M20	130 mm	365 mm	20 mm	20 mm	46 mm	1,20 kg
TN24C	Short bolt M24	160 mm	450 mm	24 mm	25 mm	56 mm	2,25 kg
TN30C	Short bolt M30	180 mm	530 mm	30 mm	32 mm	70 mm	4,34 kg
TN39C	Short bolt M39	190 mm	750 mm	39 mm	40 mm	90 mm	9,81 kg

Code	Description	Lros.	Longitud*	ØM	ØRea	ØC	Weight
TN20L	Long bolt M20	130 mm	1000 mm	20 mm	20 mm	46 mm	2,78 kg
TN24L	Long bolt M24	160 mm	1200 mm	24 mm	25 mm	56 mm	4,74 kg
TN30L	Long bolt M30	180 mm	1500 mm	30 mm	32 mm	70 mm	10,25 kg
TN39L	Long bolt M39	190 mm	2000 mm	39 mm	40 mm	90 mm	21,67 kg

Possibility to manufacture longer anchor bolts. All the anchor bolts include two washers and two nuts.

# Column shoe AR

**AR** column shoes are elements that are inserted in the precast column and transmit the loads applied on the column to the foundation or to another column through the **TN** anchor bolts.

In its geometry we can distinguish an open box in the base (area where the anchor bolt will be located) and, welded to this box, there are steel rebars responsible for anchoring the AR to the precast element.



The column shoe is inserted in the reinforcement during the construction phase. It is recommended to use recoverable formwork and controlling bolts on the column's base.

In the second phase, the concrete is poured into the mould. Once it is hardened, the formwork is removed leaving a free space to place the anchor bolts during the assembly.

**TORNILLO BAJO.**  
**Resolución:**  
Si el tornillo queda más bajo de 130 mm, tenemos varias posibilidades:  
- Si queda entre 130 i 115 mm, se puede ajustar la junta entre hormigón y pilar por debajo de los 50 mm.  
- Si queda menos de 115 mm, se debe realizar la resolución mediante tuerca DIN6334 definida y varilla roscada.

- Picar zona superior hasta dejar la zona roscada libre de hormigón.  
- Cortar la parte superior hasta dejar una cota de 48 mm respecto nivel hormigón.  
- Limpiar la rosca inferior para poder roscar la tuerca DIN6334 C8 M30.  
- Roscar la tuerca DIN6334 C8 M30 dejando la medida definida.  
- Roscar la varilla roscada M30 8.8 dentro de la tuerca DIN6334.  
- La cota final superior de la varilla debe ser aproximadamente de 150 mm.

Varilla roscada M30 8.8  
Tuerca DIN6334 C8 M30

**Tolerancias en altura:**  
Manteniendo la junta inferior de 50 mm, el anclaje roscado tiene una tolerancia de -20 a +15 mm, por tanto, la variación de la cota que sale el anclaje del nivel de hormigón, puede ser de 150-20 = 130 mm a 150 + 15 = 165 mm.

Pie de pilar AR30

Anclaje TN30C.  
Igual para anclaje largo, TN30L.

Zona a cortar

nivel hormigón

Anclaje TN30C. Igual para anclaje largo, TN30L.

Ø anclaje zona roscada: 30 mm.  
Ø agujero pie pilar AR30: 40 mm.  
Tolerancia: -/+ 5 mm (ejes x e y).

Tuerca TN30, M30 C8.  
Arandela TN30, S275JR.

**TORNILLO ALTO.**  
**Resolución:**  
Si el tornillo queda más alto de 165 mm, tenemos varias posibilidades:  
- Si queda entre 165 i 190 mm, se tiene que cortar la parte superior dejando los 150 mm que se definen.  
- Si queda más alto de 190 mm, consultar con departamento técnico de NOXIFER, puesto que hay que verificar la zona de anclaje en cimentación para anclaje corto. Para anclajes largos, se debe verificar las opciones de solución, si el pilar prefabricado ya está fabricado, etc.  
En definitiva, si el anclaje queda más alto de los 190/200 mm, la resolución puede ser compleja.

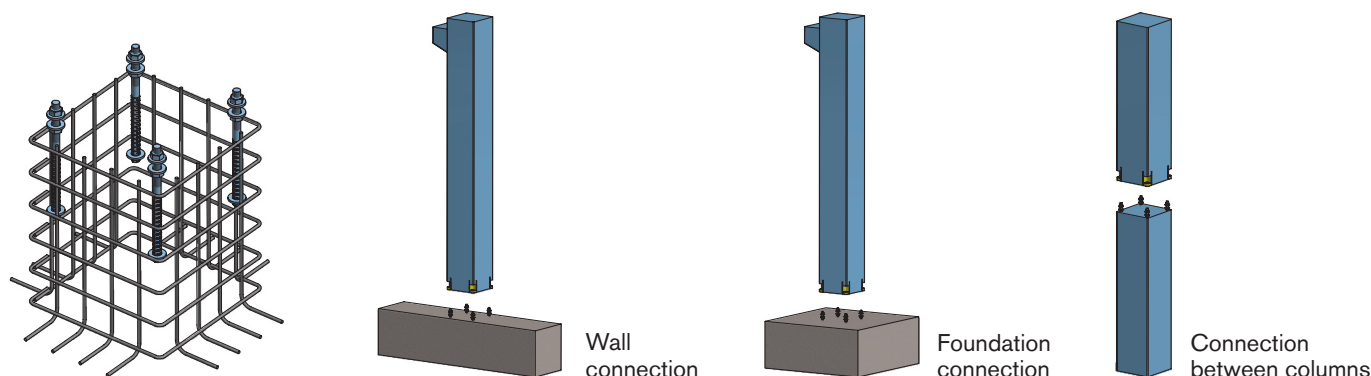
Unidades en mm.

<b>Descripción:</b>	Tolerancias de montaje para pie de pilar AR30 con anclaje corto TN30C y anclaje largo TN30L.	<b>Versión:</b> V0
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The connection between the **TN** anchor bolts and the column shoes **AR** is undertaken in two phases: connection with screws during the assembly phase and concrete pouring during the final phase.

**AR column shoes capacities related to their equivalent TN anchor bolts.**

	AR 20	AR 24	AR 30	AR 39
Associated bolt	TN20 (C/L)	TN24 (C/L)	TN30 (C/L)	TN39 (C/L)
Shoe corrugated bar	2Ø16/401 mm <sup>2</sup>	2Ø16/401 mm <sup>2</sup>	2Ø20/628mm <sup>2</sup>	2Ø25/982 mm <sup>2</sup>
Maximum axial load	96,3 kN	138,7 kN	220,4 kN	383,4 kN
Maximum shear load	31,26 kN	45,04 kN	71,58 kN	124,54 kN
Equivalence	Ø16/201 mm <sup>2</sup>	Ø20/314mm <sup>2</sup>	Ø25/491 mm <sup>2</sup>	Ø32/804mm <sup>2</sup>
Joint thickness (with TN)	50 mm.	50 mm.	50 mm.	60 mm.



The company has extensive experience in manufacturing of steel parts and metallic structures for the precast concrete industry and industrialized construction.

This experience allows us to dialogue with customers and provide specific solutions to any development of product that arises.

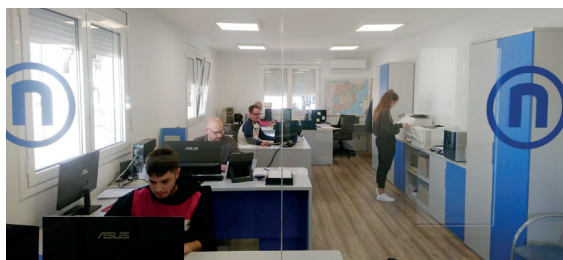
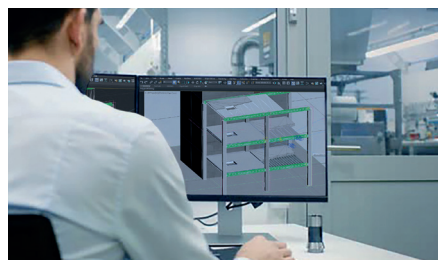
The constant innovation in production systems and the provision of the most modern technological tools place Noxifer at the forefront of new development of products completely adapted to the customer needs.

The high demands on certified quality that Noxifer applies at the time of product development, as well as the internal organization in the productive aspects and logistics, have allowed the company to gain customers' trust, serving them with the most high construction safety requirements, fast and efficient.

**Noxifer's technical team constantly communicates with development centres and innovation in the construction sector.**

**Architects, engineers and construction companies are our referents. Together, we develop the new products they need in each of their projects.**

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