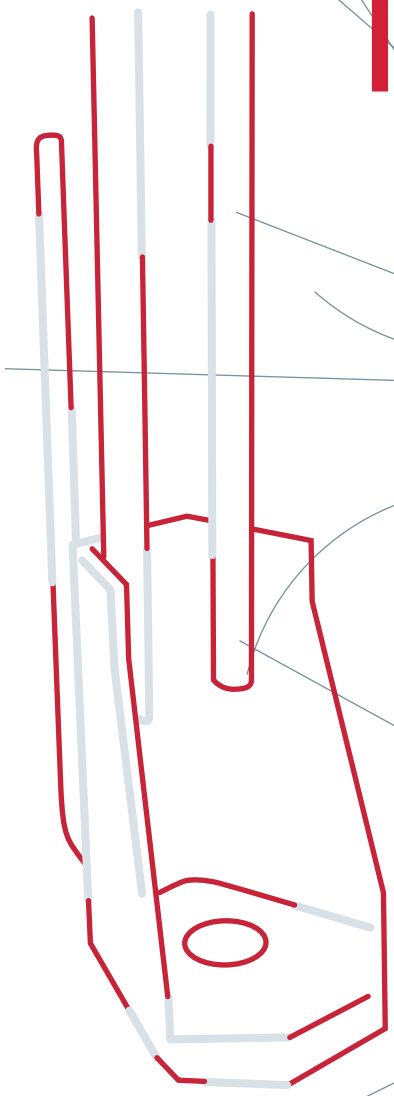
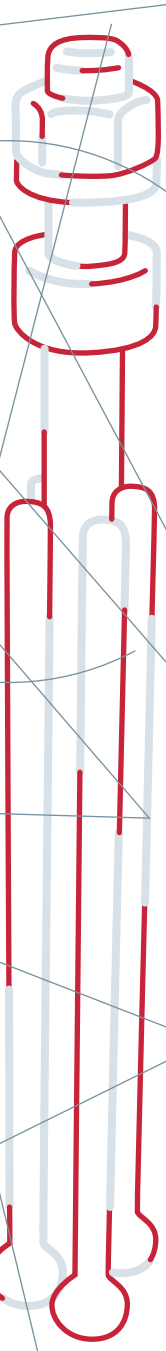
EDITION 03 - January 2026

CONNECTIONS

PILLAR FOUNDATION EPF

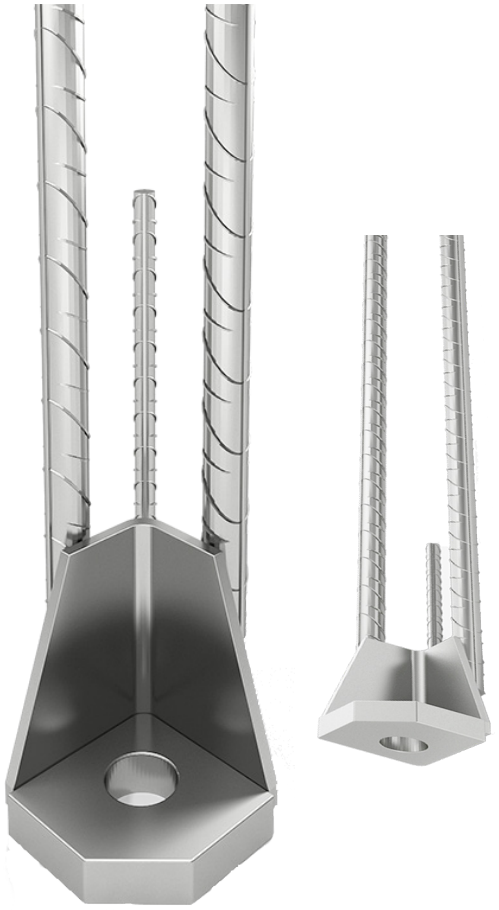




EDILMATIC

PILLAR-FOUNDATION SYSTEM EPF

INTRODUCTION



Edilmatic ESC
Column Shoe

The **EDILMATIC EPF** system is proposed as a solution for the
installation of pillars.

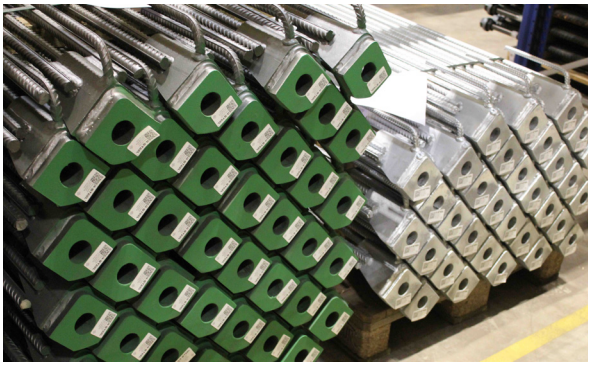
This can also be carried out with the help of Shaft Plinths in which the Pillars are placed and subsequently fixed.

The **EDILMATIC EPF** system provides for the provision of a series of inserts (shoes and anchor bolts) both in the pillars and in the 'foundation slab' prior to casting.

When the abutment is assembled on site, the inserts are
fastened together with appropriately designed accessories, and only after the verticality has been adjusted, is a finishing pour with self-compacting, self-levelling high-performance mortar carried out.

The **EDILMATIC EPF** system, thanks to its fixing accessories,
allows the Pillar to be secured without the need for shoring with poles and/or lifting cranes, and also allows for extensive horizontal and vertical adjustments, which are necessary for the correct 'plumbing' of the Pillars.

Design-wise, nodes made with the **EDILMATIC EPF** connection allow for continuity in reinforcement strength between the abutment and the foundation.



Foundation Anchor
Edilmatic ETF-G1K

Foundation Anchor
Edilmatic ETF-G4K

PILLAR-FOUNDATION SYSTEM EPF

ESC - SHOES FOR PILLARS

ESC

Edilmatic ESC column shoes are the elements to be inserted in precast concrete pillars. They are placed in the corners of the pillars and are part of the reinforcement system of the pillar itself.

They are available in different types according to the required strength class.

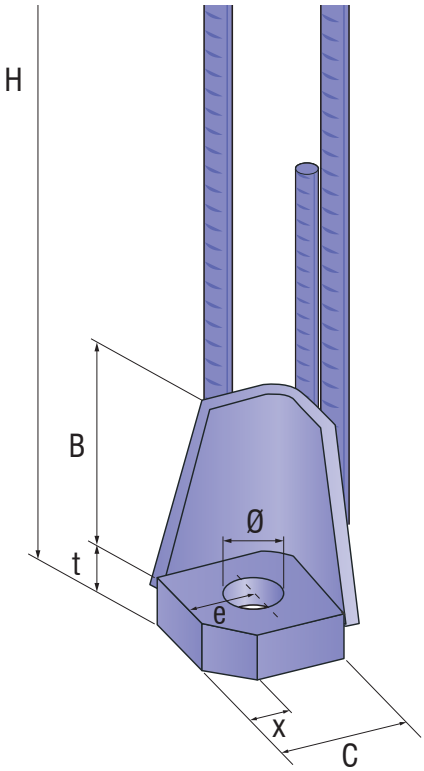
MATERIALS

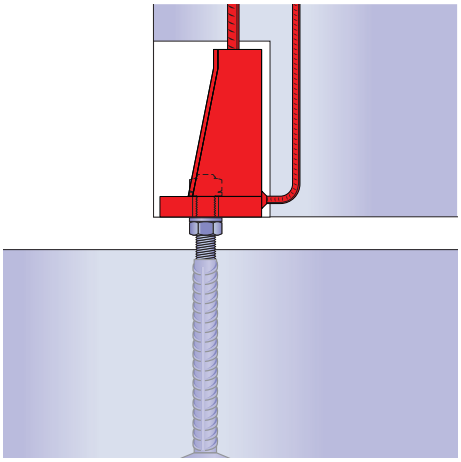
Steel reinforcement bars:

B500 EN 10080

Carpentry part:

S355J2 UNI EN10025-2





Type	Product code	ULS Design resistance N_{Rd} [kN]	B [mm]	C [mm]	e [mm]	H [mm]	t [mm]	Ø [mm]	x [mm]	Weight [kg]	Identification colour
M 16	**ESC 16**	**62.2**	102	85	50	597	15	28	30	2.4	
M 20	**ESC 20**	**97.0**	100	89	50	820	20	31	30	4.3	
M 24	**ESC 24**	**139.4**	120	98	50	1185	30	35	30	6.5	
M 30	**ESC 30-1**	**222.2**	130	105	50	1390	45	40	30	11.5	
M 30	**ESC 30-2**	**299.2**	205	112	50	1264	30	45	30	16.0	
M 36	**ESC 36**	**435.7**	190	132	60	1415	40	55	37	24.4	
M 39	**ESC 39-1**	**386.5**	210	135	60	1910	50	55	37	25.5	
M 39	**ESC 39-2**	**520.5**	255	139	60	1664	50	55	37	30.2	
M 45	**ESC 45**	**696.5**	290	153	60	2141	50	65	37	48.1	
M 52	**ESC 52**	**937.6**	395	160	60	2177	60	70	37	76.3	

PILLAR-FOUNDATION SYSTEM EPF

ETF - FOUNDATION ANCHOR

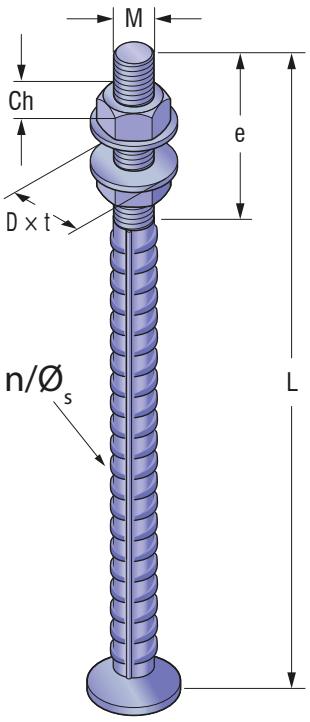
ETF-G1-K

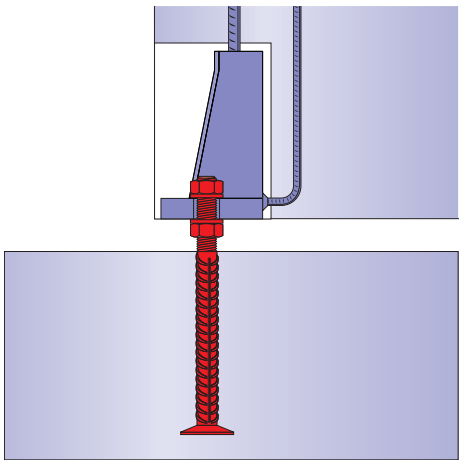
Edilmatic ETF foundation anchors are the elements to be inserted into the concrete foundation. They must be prepared by means of a template, at the Shoes in the Pillar and are part of the reinforcement system of the Foundation. They are available in different types according to the required strength class. They are available in different types according to the required strength class.

MATERIALS:
Steel reinforcement bars:
B500 EN 10080

Nuts:
class 8 EN 20898

Washer:
S355J2 UNI EN10025-2





Type	Product code	ULS Design resistance N_{Rd} [kN]	M [mm]	e [mm]	Ch [mm]	D x t [mm]	L [mm]	n/Ø$_s$ [mm]	Weight [kg]
M 16	**ETF 16-G1K**	62.2	16	140	24	38x6	280	1 - 16	0.9
M 20	**ETF 20-G1K**	97.0	20	140	30	46x6	350	1 - 20	1.4
M 24	**ETF 24-G1K**	139.4	24	170	36	55x6	430	1 - 25	2.2
M 30	**ETF 30-G1K**	222.2	30	190	46	65x8	500	1 - 32	4.1
M 39	**ETF 39-G1K**	386.5	39	200	60	90x10	700	1 - 40	9.2

PILLAR-FOUNDATION SYSTEM EPF

ETF - FOUNDATION ANCHOR

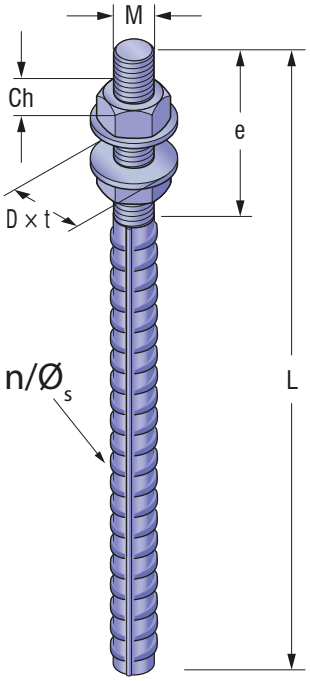
ETF-G1

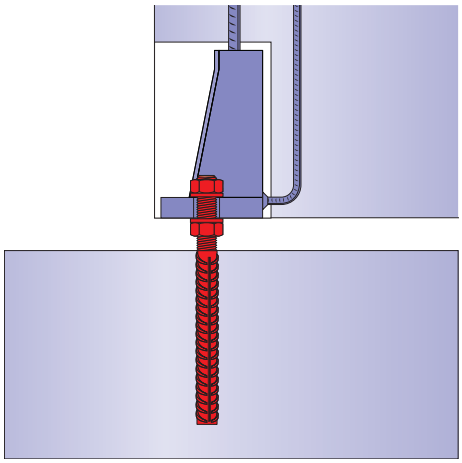
Edilmatic ETF foundation anchors are the elements to be inserted into the concrete foundation. They must be prepared by means of a template, at the Shoes in the Pillar and are part of the reinforcement system of the Foundation. They are available in different types according to the required strength class. They are available in different types according to the required strength class.

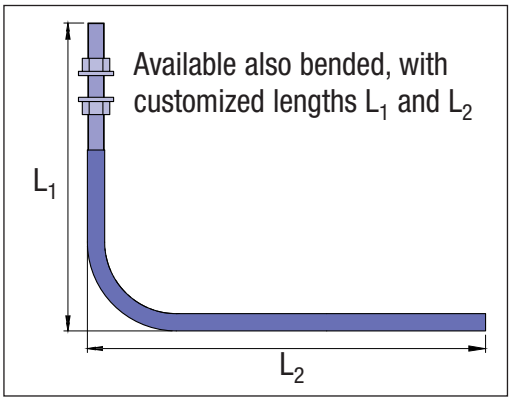
MATERIALS:
Steel reinforcement bars:
B500 EN 10080

Nuts:
class 8 EN 20898

Washer:
S355J2 UNI EN10025-2







Type	Product code	ULS Design resistance N_{Rd} [kN]	M [mm]	e [mm]	Ch [mm]	D x t [mm]	L [mm]	n/Ø$_s$ [mm]	Weight [kg]
M 16	**ETF 16-G1**	62.2	16	140	24	38x6	810	1 - 16	1.7
M 20	**ETF 20-G1**	97.0	20	140	30	46x6	960	1 - 20	2.9
M 24	**ETF 24-G1**	139.4	24	170	36	55x6	1160	1 - 25	4.9
M 30	**ETF 30-G1**	222.2	30	190	46	65x8	1460	1 - 32	9.8
M 39	**ETF 39-G1**	386.5	39	200	60	90x10	2000	1 - 40	21.8

PILLAR-FOUNDATION SYSTEM EPF

ETF - TIRAFONDI PER FONDAZIONE

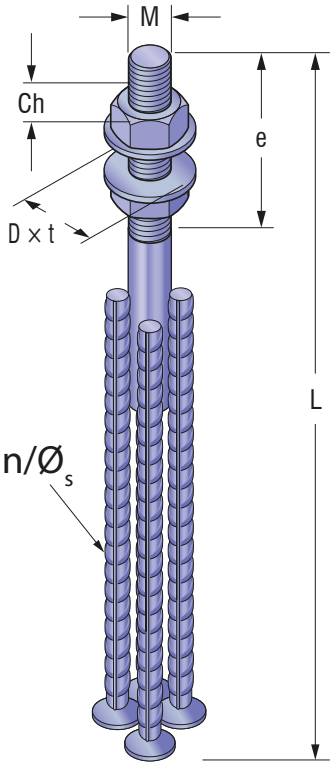
ETF-G4-K

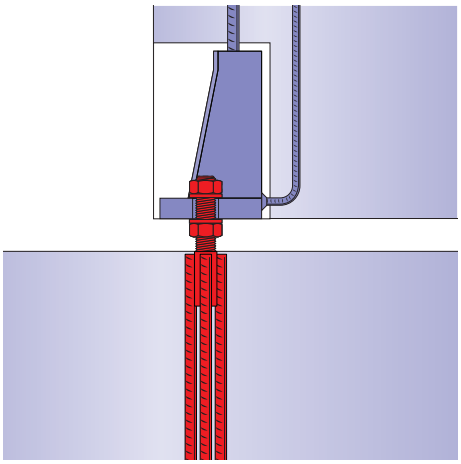
Edilmatic ETF anchors are the elements to be inserted into the concrete foundation.
They must be prepared by means of a template, at the Shoes in the Pillar and are part of the Foundation reinforcement system. They are available in different types according to the required strength class.

MATERIALS:
Steel reinforcement bars:
B500 EN 10080

Nuts:
class 8 EN 20898

Washer:
S355J2 UNI EN10025-2





Type	Product code	ULS Design resistance N_{Rd} [kN]	M [mm]	e [mm]	Ch [mm]	D x t [mm]	L [mm]	n/Ø$_s$ [mm]	Weight [kg]
M 30	**ETF 30-G4K**	299.2	30	190	46	65x8	670	2 - 25	7.0
M 36	**ETF 36-G4K**	435.7	36	190	55	80x8	740	4 - 20	8.6
M 39	**ETF 39-G4K**	520.5	39	200	60	90x10	880	3 - 25	11.0
M 45	**ETF 45-G4K**	696.5	45	220	70	100x10	980	4 - 25	15.9
M 52	**ETF 52-G4K**	937.6	52	250	80	100x12	1140	4 - 32	30.0
M 60	**ETF 52-G4K**	1260.0	60	310	90	115x12	1330	4 - 32	36.4

PILLAR-FOUNDATION SYSTEM EPF

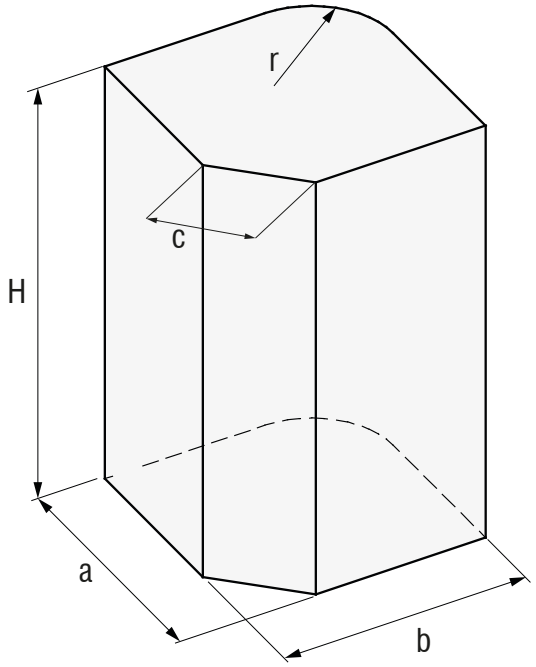
EDP - POLYSTYRENE RECESS FORMER

EDP

For creating the compartment in the shoe, disposable polystyrene pads are available.

MATERIAL

Polystyrene, density 30 kg/m^3

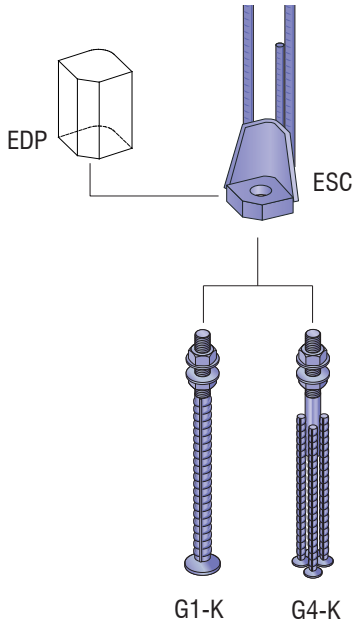


Shoe type	Product code	H [mm]	a [mm]	b [mm]	c [mm]	r [mm]
ESC 16	**EDP 16**	102	80	80	42	6
ESC 20	**EDP 20**	100	83	83	42	6
ESC 24	**EDP 24**	120	90	90	42	8
ESC 30-1	**EDP 30-1**	130	95	95	42	17
ESC 30-2	**EDP 30-2**	205	97	97	42	17
ESC 36	**EDP 36**	190	114	114	52	23
ESC 39-1	**EDP 39-1**	210	120	120	52	15
ESC 39-2	**EDP 39-2**	255	120	120	52	15
ESC 45	**EDP 45**	290	123	123	52	42
ESC 52	**EDP 52**	395	125	125	52	42
ESC 60	**EDP 60**	395	125	125	52	43

PILLAR-FOUNDATION SYSTEM EPF

INSTALLATION AND OPERATING INSTRUCTIONS

The EDILMATIC system is intended for structural connections between pillars and foundations. The bolted connection guarantees quick installation without the need for shoring.
The choice of system type depends on the calculation stresses and constraint conditions.



Colour code for ESC Column Shoes

Type	Colour
ESC 16	Yellow
ESC 20	Blue
ESC 24	Grey
ESC 30-1	Green
ESC 30-2	Black
ESC 36	Red
ESC 39-1	Orange
ESC 39-2	Brown
ESC 45	Purple
ESC 52	White

Column shoes are placed in the corners (figure 1) or along the sides of the precast column (figure 2) and radially in circular columns (figure 3), while the anchor bolts are embedded in the foundation.
The anchor bolts are also suitable for connections of steel or wooden columns (figure 4).

Fig. 1

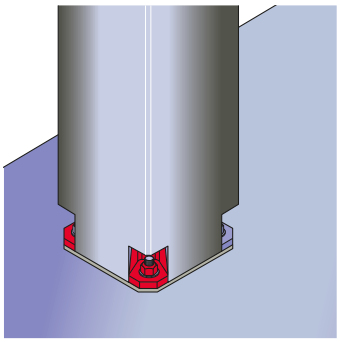


Fig. 2

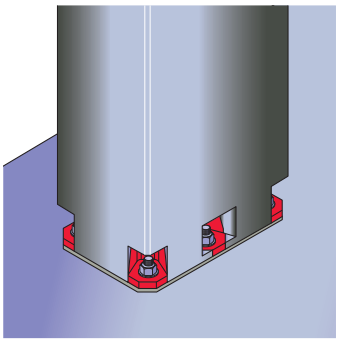


Fig. 3

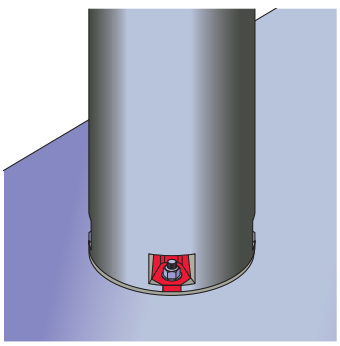
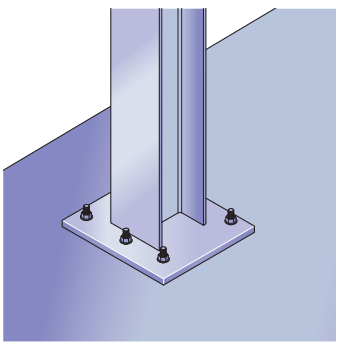


Fig. 4



PILLAR-FOUNDATION SYSTEM EPF

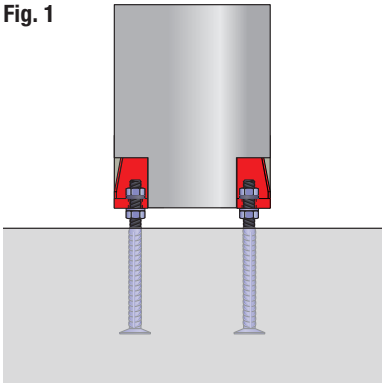
DESIGN INSTRUCTIONS

During the mounting phase (Figure 1), the column shoes are attached to the anchor bolts using the appropriate nuts and washers. At this stage, the tensile, compressive and shear forces shown in Table 1 can be applied to the shoes.
In the final phase (Figure 2), the joint is filled with a high-performance mortar, which must have a strength equal to or greater than that of the concrete. Only after the mortar has hardened can the section be considered according to the usual rules of reinforced concrete construction.

TABLE 1 - DESIGN RESISTANCE OF EPF SYSTEM

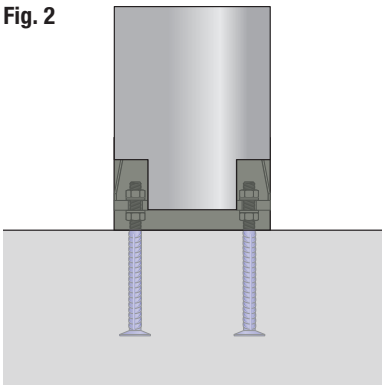
Type	ULS tensile resistance N_{Rd} [kN]	ULS shear resistance V_{Rd} [kN]	Thread	Horizontal tolerance [mm]
ESC 16	± 62.2	4.3	M 16	± 6,0
ESC 20	± 97.0	8.2	M 20	± 5,5
ESC 24	± 139.4	12.7	M 24	± 5,5
ESC 30-1	± 222.2	22.4	M 30	± 5,0
ESC 30-2	± 299.2	34.5	M 30	± 7,5
ESC 36	± 435.7	52.6	M 36	± 9,5
ESC 39-1	± 386.5	43.3	M 39	± 8,0
ESC 39-2	± 520.5	61.4	M 39	± 8,0
ESC 45	± 696.5	88.6	M 45	± 10,0
ESC 52	± 937.6	124.1	M 52	± 9,0

Fig. 1



Mounting phase

Fig. 2



Final phase

REQUIREMENTS

Pillar:
- Concrete class ≥ C30/37
- Additional reinforcement as indicated in the 'Reinforcement' section

Foundation:
- Concrete class ≥ C20/25
- Compliance with minimum edge distances

SHEAR FORCES

The shear resistance of the connection can be entrusted to the foundation bolts or it can be increased by shear-bearing link, as depicted in the figures 3-4-5 below.

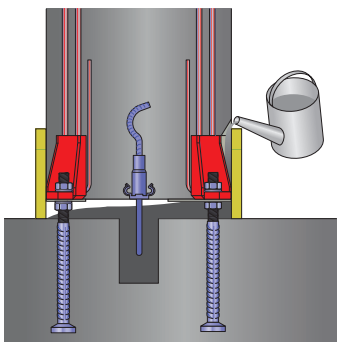


Fig. 3

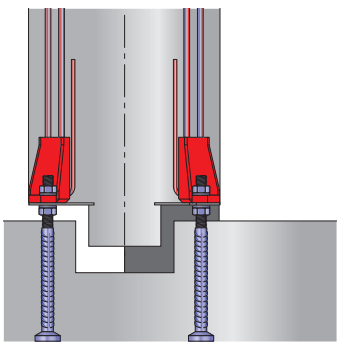


Fig. 4

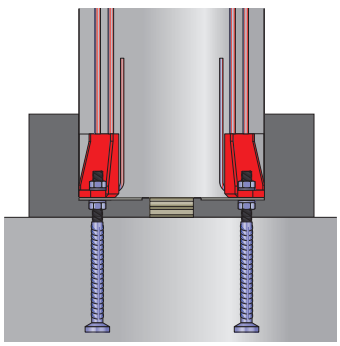


Fig. 5

PILLAR-FOUNDATION SYSTEM EPF

REINFORCEMENT DESIGN

Column shoes should be integrated in the reinforcement system of the pillar. The two reinforcement bars of the shoe form an overlap joint with the longitudinal reinforcement of the pillar.

The stirrups in the lower area of the pillar must comply with the minimum requirements shown in Table 1.

The verification of the reinforcement must in any case be carried out for the individual case according to the regulations in force.

The overlap length of the longitunal reinforcement is evaluated according to EN 1992-1-1.

TABELLA 1 - ADDITIONAL REINFORCEMENT

Type	Pos. 1	Pos. 2	Overlapping length [mm]
ESC 16	2 Ø 8	2 Ø 8	480
ESC 20	2 Ø 8	2 Ø 8	750
ESC 24	3 Ø 8	3 Ø 8	1100
ESC 30-1	3 Ø 8	3 Ø 8	1300
ESC 30-2	4 Ø 8	4 Ø 8	1400
ESC 36	3 Ø 10	3 Ø 10	1400
ESC 39-1	3 Ø 10	3 Ø 10	1800
ESC 39-2	4 Ø 10	4 Ø 10	1650
ESC 45	5 Ø 12	5 Ø 12	1800
ESC 52	5 Ø 12	5 Ø 12	2600

Fig. 1

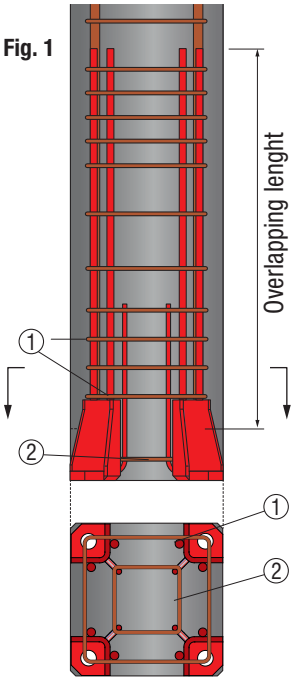


Fig. 2

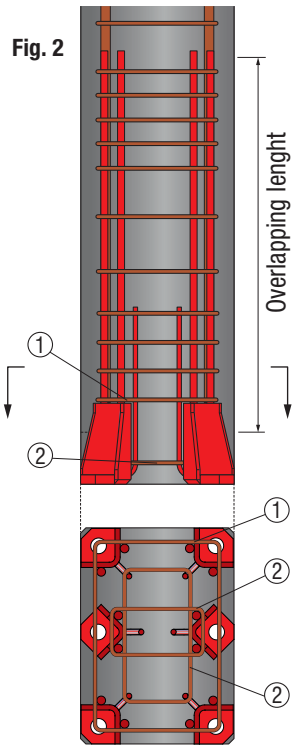
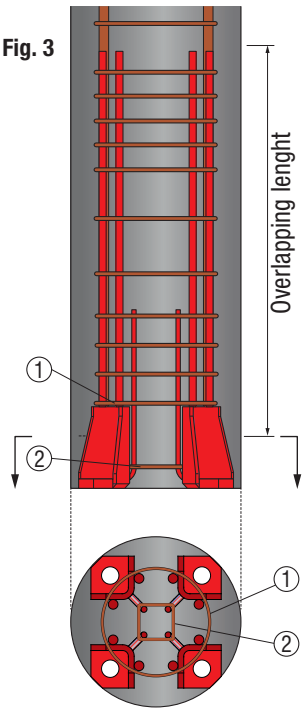
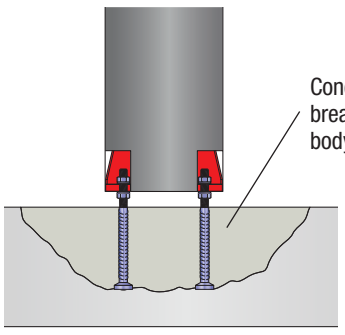


Fig. 3





The verification of anchor bolts must be carried out in accordance with Eurocode 2 Part 4 (UNI EN 1992-4), by considering the concrete-side failure (cone of failure) or additional reinforcement.

PILLAR-FOUNDATION SYSTEM EPF

MINIMUM DISTANCES

MINIMUM DISTANCE BETWEEN SHOES

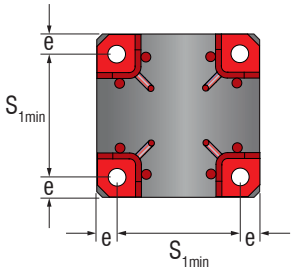


Fig. 1

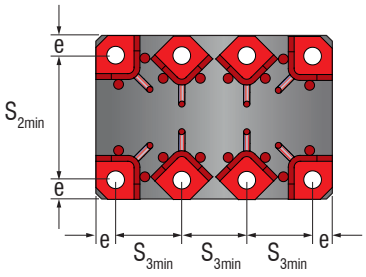


Fig. 2

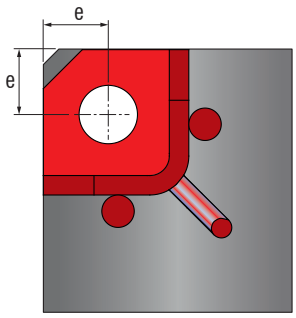


Fig. 3

Tab. 1 – Minimum spacing

Tipo	e [mm]	$S_{1,min}$ [mm]	$S_{2,min}$ [mm]	$S_{3,min}$ [mm]
ESC 16	45	140	140	130
ESC 20	45	150	150	130
ESC 24	45	160	160	150
ESC 30-1	45	190	190	160
ESC 30-2	50	210	210	180
ESC 36	50	260	260	200
ESC 39-1	45	270	270	200
ESC 39-2	50	270	270	210
ESC 45	45	410	410	260
ESC 52	45	420	420	260

The minimum distances given in Table 1 are also valid in the case of elements with a circular cross-section.

MINIMUM DISTANCES BETWEEN FOUNDATION BOLTS

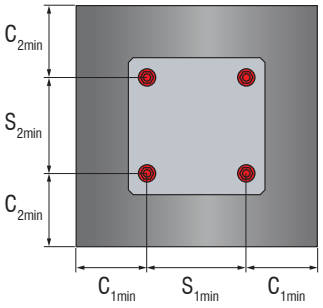


Fig. 4

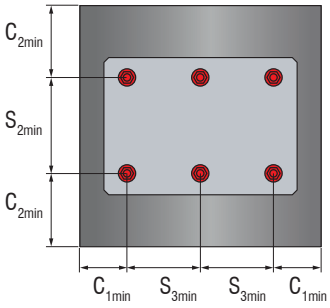


Fig. 5

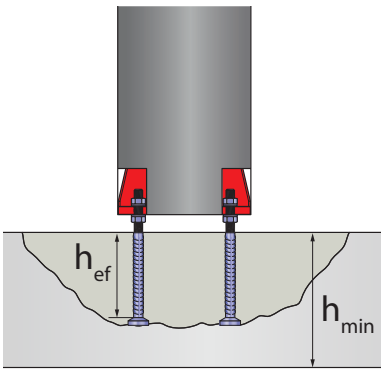


Fig. 6

Tab. 2 – Minimum spacing

Type	$C_{1,min}$ $C_{2,min}$ [mm]	$S_{1,min}$ $S_{2,min}$ [mm]	h_{ef} [mm]	h_{min} [mm]
ETF16-G1K	60	80	169	270
ETF20-G1K	80	110	229	330
ETF24-G1K	90	120	294	395
ETF30-G1K	130	180	342	445
ETF39-G1K	160	280	510	610
ETF30-G4K	120	130	507	600
ETF36-G4K	140	160	562	665
ETF39-G4K	150	180	680	780
ETF45-G4K	160	200	765	865
ETF52-G4K	180	280	893	995

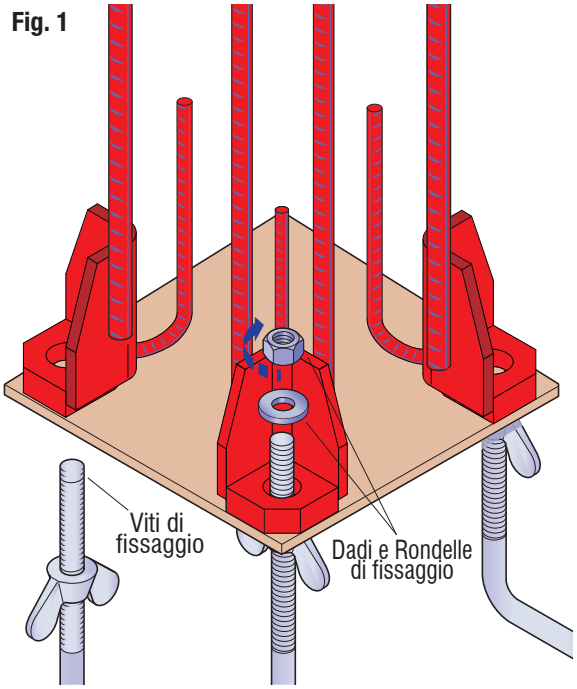
The minimum distances given in Table 2 are also valid in the case of elements with a circular cross-section.

PILLAR-FOUNDATION SYSTEM EPF

INSTALLATION

SHOES

Fig. 1



TEMPLATE

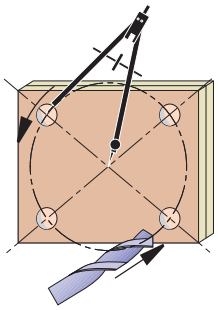


Fig. 2

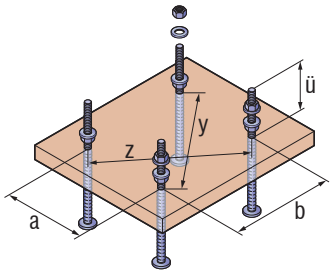


Fig. 3

Nota: To facilitate the positioning of the shoes, it is recommanded to use suitably dimensioned template whose holes follow the position of the anchor bolts (Figure 1-2-3).

Nota: we recommend to tie the shoe reinforcement to the pillar reinforcement to secure the position of the components.

Nota: The shoes must be installed on the edge of the pillar. If necessary, the concrete cover can be increased to meet fire protection requirements.

FOUNDATION BOLTS

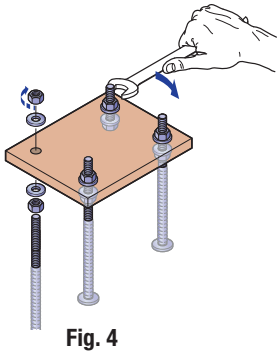


Fig. 4

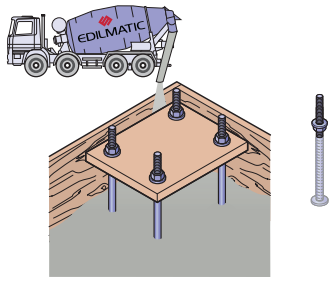


Fig. 5

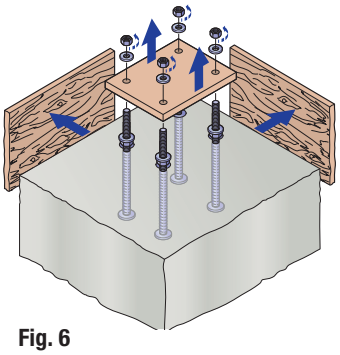


Fig. 6

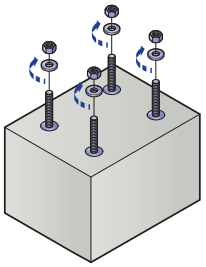


Fig. 7

Nota: In order to facilitate the positioning of the anchor bolts, we recommend to use suitably dimensioned template whose holes follow the position of the column shoes (Figure 4-5-6-7).

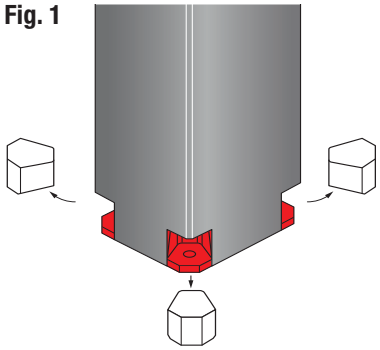
Nota: We recommend to protect the foundation bolts against any accidental bending.

PILLAR-FOUNDATION SYSTEM EPF

MOUNTING PHASE

PREPARATION FOR PILLAR ASSEMBLY

Fig. 1



Before mounting the pillars on the anchor bolts:

1) Completely remove the recess formers from the shoes (Fig. 1) and anything that could interfere; clean the bolts area.
2) Check the position of the bolts and shoes.
3) Check the threads of nuts and bolts. If necessary, the bolts and threads must be cleaned, e.g. of concrete residues on the threads.

MOUNTING

Place a steel shim underneath the pillar, capable of bearing the full weight of the abutment (Fig. 2). After lowering the pillar, keeping it hanging from the crane (Fig. 3-4), its position can be regulated by screwing or unscrewing the lower nuts (Fig. 5). Once in position, the upper nuts must finally be tightened to secure the connection in accordance with the tightening torque indicated in Table 1 using a torque spanner (Fig. 6). After tightening, it is possible to proceed with the casting to complete the joint (Fig. 7).

Table 1 - Max. joint thickness, thread lenght and torque.

Type	Max. joint thickness [mm]	Thread lenght [mm]	Torque [Nm]
ETF16-G1K	50	105	120
ETF20-G1K	50	115	150
ETF24-G1K	50	130	200
ETF30-G1K	50	150	250
ETF30-G4K	50	150	300
ETF36-G4K	55	170	350
ETF39-G1K	60	180	300
ETF39-G4K	60	190	400
ETF45-G4K	65	205	450
ETF52-G4K	70	235	500

Fig. 2

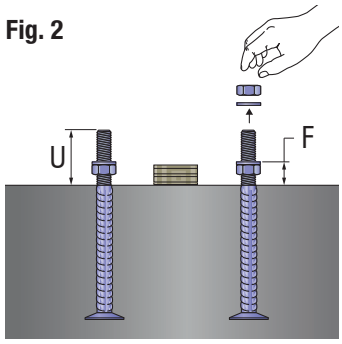


Fig. 3

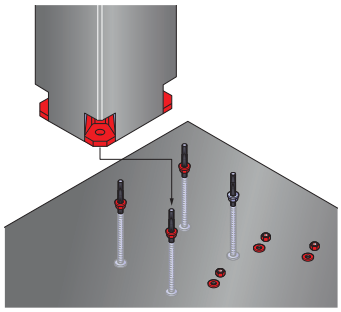


Fig. 4

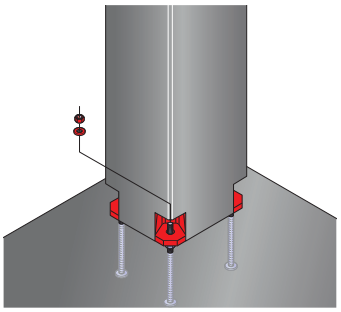


Fig. 5

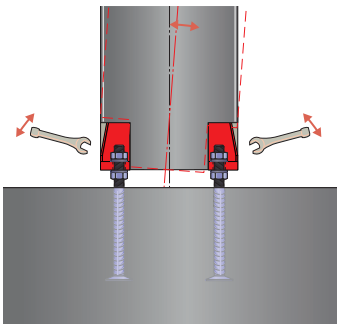


Fig. 6

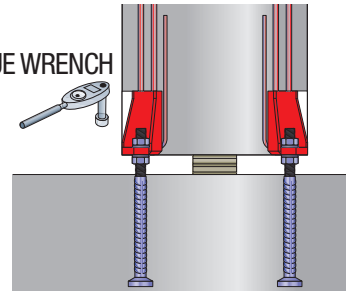
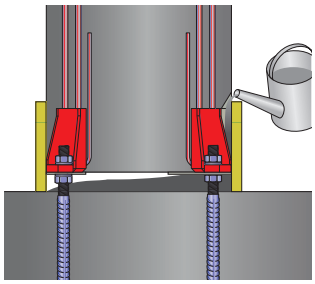


Fig. 7



Note

EDILMATIC

Sistemi di ancoraggio, di appoggio e di sollevamento per elementi prefabbricati. Accessori, fissaggi e minuterie metalliche.

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