



FORBUILD



BALCONY CONNECTORS

Dear Customers,

In this catalog we present you reinforcement connectors KP / KPE, hereinafter referred to as the balcony connectors KP / KPE.

KP balcony connectors offered by Forbuild are an innovative and reliable solution, which will to a great extent eliminate the emergence of thermal bridges. Precise manufacture ensures structure reliability, at the same time allowing quick and simple assembly.

The large selection of balcony connectors allows us to pick, together with the Customer, the optimum solution adapted to most cases. Our technical advisers are available to You at every stage of the investment.

We are confident that providing You with this catalogue, we shall simplify Your decision process with regard to the best technical solution. We will be grateful for any and all remarks concerning both the content as well as the graphics and presentation style of the included information.

Choosing Forbuild, You choose a solid partner and satisfaction from a good investme

*We supply the technology, experience and high quality.
Build with us ensures success.*

FORBUILD

■ CONTENTS LIST



1. General information

4



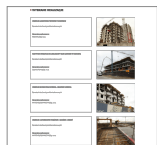
2. Products

9



3. Assembly suggestions

54



4. Realizations

55



5. Gallery

56

■ **GENERAL INFORMATION**

Thermal bridges emerge where the thermal insulation of an external partition has a leak, is discontinuous or where it changes thickness, thus describing an uninsulated space, i. e. a cold space. Temperature drops on the outside surface of the partition (it is required for it to be higher than the allowable value set forth in the relevant provisions of the law and Polish Standards). Otherwise, there arises a high risk of emergence of mildew and fungal growth. If the surface temperature drops below the dew point in its vicinity, water vapour condenses. To the dew point corresponds a temperature value, with respect to which air containing a particular volume of water vapour reaches a state of full saturation (relative humidity - 100%). It is worth noting that in case with a capillary and porous structure (i. e. gypsum, bricks), there exists the possibility of condensation of water vapour already at a relative air humidity equal to 80%. The dew point in a room with an air temperature of 20 °C and relative humidity of 50% amounts to approximately 9,5 °C. In the considered case, the minimum allowable temperature of the partition surface, allowing the ability of development of fungus, shall be approximately 12,5°C.

A very sensitive point causing much problems to investors is the connection between the ceiling and the balcony. This single component must do justice to structural and aesthetic requirements as well as high demands concerning thermal insulation.

In the recent years, the discussion concerning energy-saving buildings is becoming more and more intense. In the construction industry, due to the need of attaining a so-called low-energy level, thermal insulation processes were intensified. Today, houses are built as energy-efficient, meaning, utilising such solutions and materials, which minimise energy losses during use. Sadly, a house is like a chain - its energy requirements, reflected in the heating bills, depends on its weakest link. These spots are the nodes in the building structure (thermal bridges). Apart of increased energy exchange, they are often characterised by increased air penetrability as compared to full partitions. Uncontrolled infiltration of a stream of cold air to the inside of the building may decidedly influence the building's thermal requirement balance.

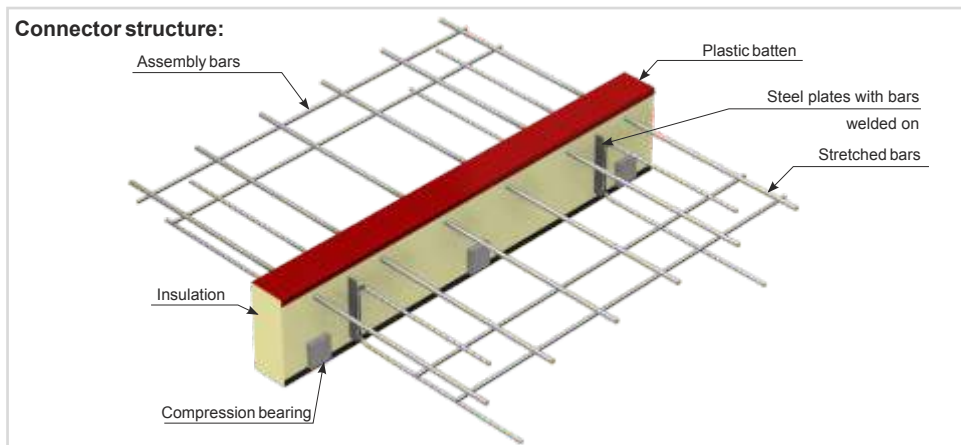
■ **STRUCTURE OF THE KP REINFORCEMENT CONNECTORS**

The structure of the KP/KPE reinforcement connectors allows freedom in the creation of a balcony's geometry, ensuring at the same time the required load bearing capacity and structure rigidity (deflection reduction). The load bearing base structure of the joints is made up of components transferring compressive forces (steel or reinforced concrete bearings) and shear forces, as well as of extended bars. The spaces between them are filled with insulating material - styrofoam or mineral wool with a low λ coefficient.

In addition, the joint bars work towards great reduction of thermal and contraction stress in the balcony slab. Such a solution allows the reduction of thermal bridges to a minimum, the heat from the inside of the space remains inside, and does not move to the interior of the balcony slab

As standard, they are manufactured with a length of one metre and in 20 cm and 30 cm modules, allowing almost unlimited design freedom.

KP/KPE reinforcement connectors	Technical approval of the Polish Building Research Institute no. AT-15-9007/2013
Component	Material:
- main reinforcement bars (extended)	Stainless steel (ferritic-austenitic duplex steel) or ordinary fire-galvanised carbon steel
- insulation material	Styrofoam with a thermal conduction coefficient of $\lambda \leq 0,036$ or mineral wool with a coefficient of $\lambda \leq 0,040$. Standard insulation width - 80 mm, options: 60 mm, 100 mm or 120 mm.
- compression bearings	Ferritic-austenitic duplex stainless steel (for ceiling thickness values of 14 cm or 16 cm), concrete (for ceiling thickness values above 18 cm).
- components transferring shear forces	Stainless steel (ferritic-austenitic duplex steel)



■ CONSTRUCTION DETAILS - ERRORS IN DESIGN AND EXECUTION

Thermal bridges emerge as a result of design and construction errors. Heat loss through thermal bridges causes the building's energy requirements to increase, and this is related to a great increase of heating expenses.

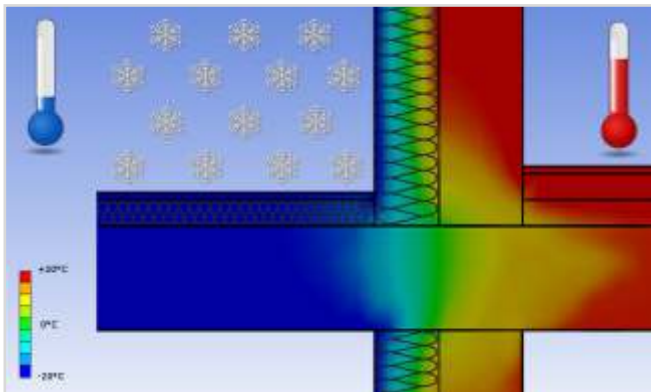
Already during the design phase, it is worth considering proper protection of spots sensitive to the emergence of thermal bridges, i. e. balconies, ledges, parapet walls, terraces, etc.

Reinforcement joints eliminate their risk, they reduce the threat of humidity as well as mildew and fungus, both of which are a health hazard. The solution offered by us means savings on time, money and energy.

The reinforcement joint is easy to install at the construction site, it is easily joined with reinforcement of the ceiling/balcony. Labour-intensive and costly thermal insulation of components from all sides become redundant. The construction work progresses much more quickly and much more efficiently.

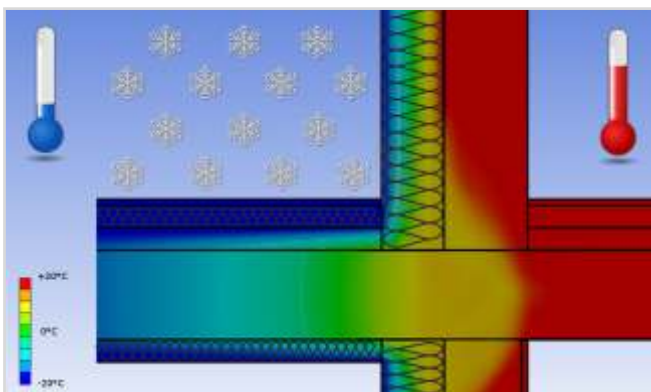
■ AN OVERVIEW OF THE MOST POPULAR SOLUTIONS

Thermal vision analyses of buildings have indicated that if the balcony is wide, thermal heat losses as a result of heat being diverted away by a badly insulated component are comparable to thermal heat losses caused by several square metres of uninsulated building external walls. The heat requirement for room heating can increase even by 20%. The above described solution, at today's heating costs, is unacceptable. Various methods are used in order to thermally separate the balcony plate from the inter-storey ceiling plate.



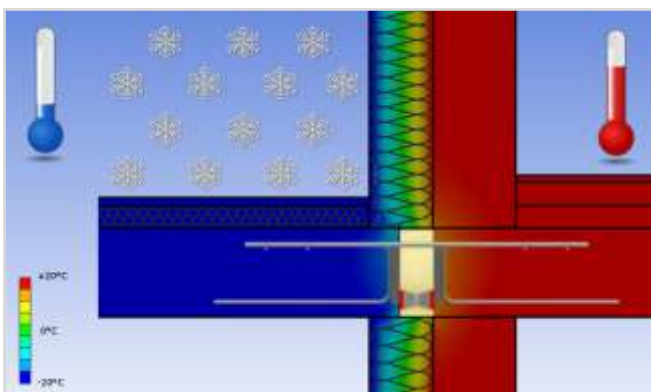
1. Balcony reinforced concrete slab - uninsulated balcony.

The most popular solution used in Poland is a supported reinforced concrete slab constituting an extension of the ceiling. Thermal vision research shows that as a result of discontinuity of the insulation, the component shall be a big thermal bridge, through which heat will very quickly escape from the building. There emerges the phenomenon of a geometric thermal bridge (the balcony slab forms a so-called cooling rib) and one of a material thermal bridge (high thermal conductivity of the reinforced concrete). Such a solution may lead to water vapour condensing over and under the ceiling, which in extreme cases may lead to the emergence of mildew and the grown of health-hazardous fungi.



2. The balcony slab, covered by insulation material from both sides.

In Poland, the reduction of the influence of a thermal bridge by covering the balcony with insulation material from all sides is very popular. An appropriate choice of thickness of the structural component and the thermal insulation layer may reduce the influence of the thermal bridge. However, such a solution does not guarantee protection in case of long-lasting low outside temperature levels.



3. Maintenance of insulation continuity - use of KP/KPE reinforcement connectors

One of the most effective methods of elimination of thermal bridges at the joint between the balcony and the ceiling are special KP/KPE reinforcement joints. They serve to interrupt the path of the thermal heat stream in the construction component (in most cases the balcony) through maintenance of continuity of thermal insulation, with simultaneous maintenance of continuity of structure and the transmission of the required cross-section forces. A broad product selection allows the use of joints in most constructional solutions and for various static concepts, both for balconies as well as for other components (i. e. parapet walls, terraces, ledges).

Balcony connectors

GENERAL INFORMATION

■ OTHER ADVANTAGES. DURABILITY.

Depending on the joint type, the reinforcement bars are made of ferritic-austenitic duplex stainless steel, or ordinary heat-galvanised carbon steel. The utilised stainless steel unites in itself the best qualities of chrome ferritic steel and chrome-nickel austenitic steel. It is characterised by very good mechanical properties: the yield strength, tensile strength and ductility as well as resistance to general, pitting and stress corrosion.

The zinc cladding, however, is applied pursuant to requirements of Polish Standard PN-EN ISO 14713 'Guidelines and recommendations for the protection against corrosion of iron and steel in structures. Zinc and aluminium coatings. Requirements'. The durability of the utilised cladding is up to 120 years. Thus, all requirements concerning the usability period for structures, contained in PN-EN 1990 (Eurocode: Basis of structural design), are adhered to.

The solution proposed by us allows effective and durable protection of reinforcement bars against corrosion for decades.

It must be stressed, however, that the joint is protected on both sides by reinforced concrete slabs, finishing layers and insulation.

In such an arrangement, basically, there are no spots where humidity could pass through to the reinforcement bars.

Utilisation of coherent properties of stainless steel bars as well as fire-galvanised bars allows the avoidance of welding and joining two types of materials (i.e. when rebar steel bars are joined with stainless steel bars). Thus, there is no increased risk of emergence of corrosion in this area. A unified rebar steel type along the entire length of the bars ensures the same resistance properties in both joined components. Thus, one avoids additional stress, which could lead to vertical deformations of the supports.

■ SUPPLEMENTARY REINFORCEMENT (ADDED AT THE CONSTRUCTION SITE)

Bars of the KP/KPE reinforcement joint must be connected to the reinforcement of the ceiling and the balcony using tie wire. It is recommended for the plates to be additionally reinforced by the addition of:

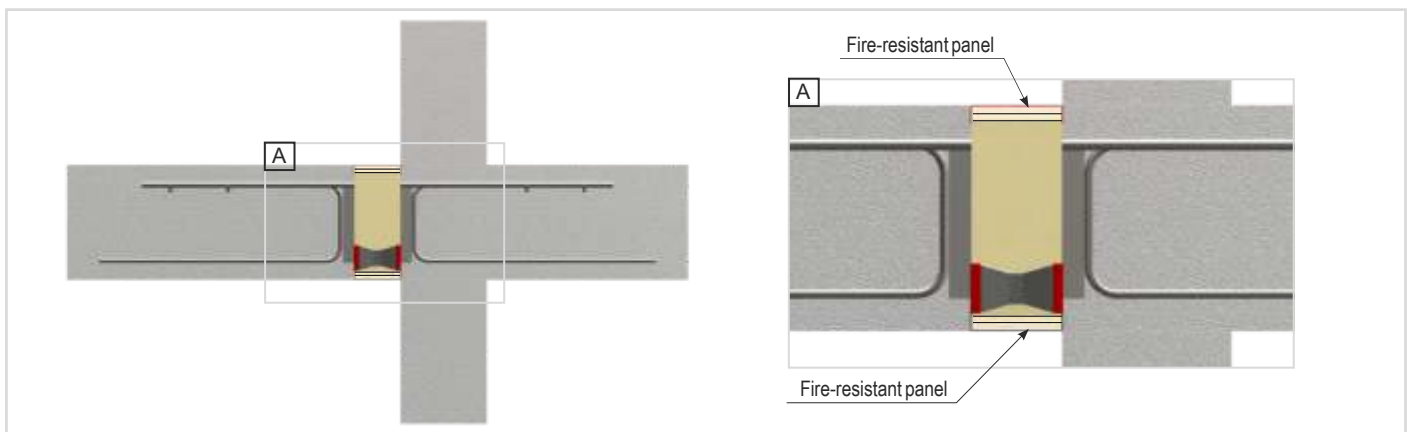
- closing reinforcement (U-shaped shackles at the edges of the balcony - 8)
- horizontal crosswise edge reinforcement (straight bars - 10)

Detailed guidelines concerning the amount and type of reinforcement added at the construction site are found in the latter part of the catalogue (page nos. 11, 16, 18, 23, 25, 28, 37).

■ FIRE RESISTANCE

In particular circumstances, provisions of the law enforce an elevation of requirements concerning the fire resistance class of structural components. This is the case when the designed balcony is i. e. an evacuation route. Standing in front of necessity of permanent development and to provide optimal solutions adjusted to the most of design cases, company Forbuild conducted a tests confirming class of fire resistance R120 for part of its products.

In cases mentioned above, a component is designed with integrated fire-safe inlays. Their use guarantees fulfilment of fire resistance class requirements without the necessity of using additional safety devices.



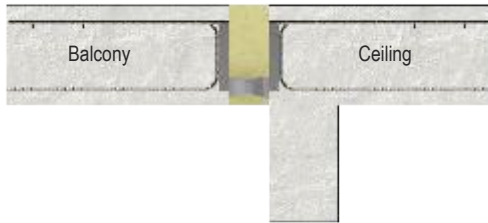
■ TECHNICAL APPROVALS AND CERTIFICATES



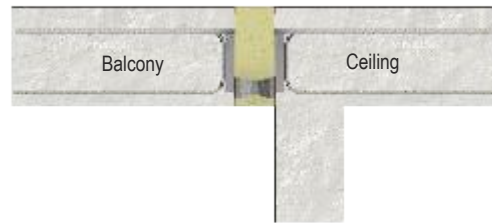
Technical agreement AT-15-9007/2012 issued by Building Research Institute in Warsaw

■ PRODUCT OVERVIEW

KP-100 connector used at the support joints of the balcony slab with the ceiling slab - transfer of M_{Rd} bending moments (-) and V_{Rd} shear forces (\pm). Reinforcement bars of stainless steel.



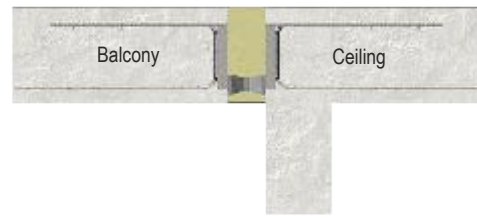
KPE-100 connector, used at corners, at the support joints of the balcony slab with the ceiling slab - transfer of M_{Rd} bending moments (-) and V_{Rd} shear forces (\pm). Reinforcement bars of stainless steel.



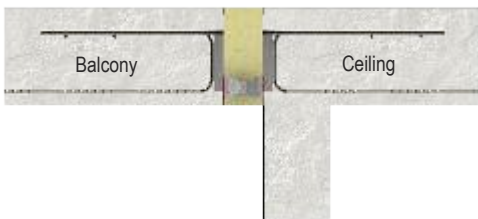
KP-200 connector, used at continuous joints of the balcony slab with the ceiling slab - transfer of M_{Rd} bending moments (\pm) and V_{Rd} shear forces (\pm). Reinforcement bars of stainless steel.



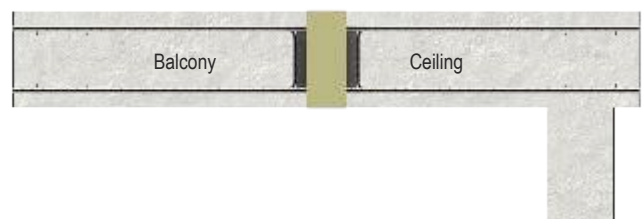
KP-300 connector, used at support joints of the balcony slab with the ceiling slab - transfer of M_{Rd} bending moments (-) and V_{Rd} shear forces (\pm). Reinforcement bars of normal fire-galvanised carbon steel.



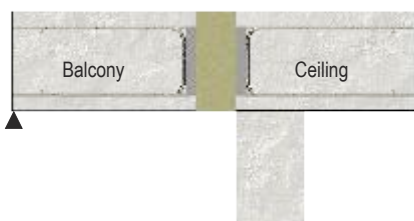
KPE-300 connector, used at corners, at support joints of the balcony slab with the ceiling slab - transfer of M_{Rd} bending moments (-) and V_{Rd} shear forces (\pm). Reinforcement bars of normal fire-galvanised carbon steel.



KP-400 connector, used at continuous joints of the balcony slab with the ceiling slab - transfer of M_{Rd} bending moments (\pm) and V_{Rd} shear forces (\pm). Reinforcement bars of normal fire-galvanised carbon steel.



KP-500 connector, used at articulated joints of the balcony slab with the ceiling slab - transfer of V_{Rd} shear forces (\pm). Reinforcement bars of stainless steel.



KP-600 connector, used at articulated joints of the balcony slab with the ceiling slab - transfer of V_{Rd} shear forces (+). Reinforcement bars of stainless steel.

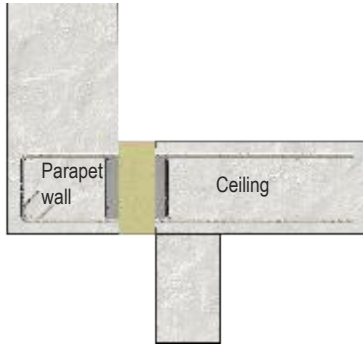


Balcony connectors

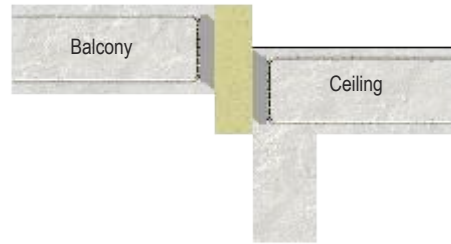
GENERAL INFORMATION

■ PRODUCT OVERVIEW

KP-700 connector, used at support joints of parapet walls, ledges and short supports with the ceiling (roof) slab - transfer of M_{Rd} bending moments (\pm) and V_{Rd} shear forces (\pm). Reinforcement bars of stainless steel.



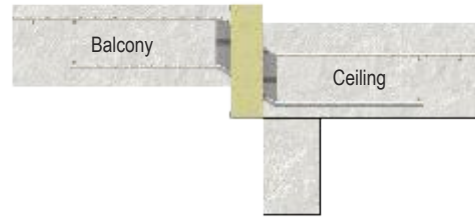
KP-800 connector, used at articulated joints of the balcony slab with the ceiling slab - transfer of V_{Rd} shear forces (\pm). Reinforcement bars of stainless steel.



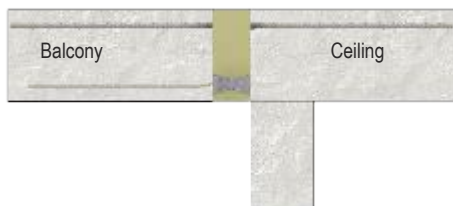
KP-900 connector, used at support joints of the balcony slab with the ceiling slab - transfer of V_{Rd} shear forces (\pm). Reinforcement bars of stainless steel.



KP-1000 connector, used at support joints of the balcony slab with the ceiling slab - transfer of M_{Rd} bending moments (\pm) and V_{Rd} shear forces (\pm). Reinforcement bars of stainless steel.



KP-1100 connector, used at support joints of the balcony slab with the ceiling slab - transfer of M_{Rd} bending moments (-) and V_{Rd} shear forces (+). Reinforcement bars of stainless steel.



KP-1200 connector, used at continuous joints of the balcony slab with the ceiling slab - transfer of M_{Rd} bending moments (\pm) and V_{Rd} shear forces (\pm). Reinforcement bars of stainless steel.



KP-1300 connector, used at support joints of the balcony slab with the ceiling slab - transfer of M_{Rd} bending moments (-) and V_{Rd} shear forces (+). Reinforcement bars of normal fire-galvanised carbon steel.



KP-1400 connector, used at continuous joints of the balcony slab with the ceiling slab - transfer of M_{Rd} bending moments (\pm) and V_{Rd} shear forces (\pm). Reinforcement bars of normal fire-galvanised carbon steel.

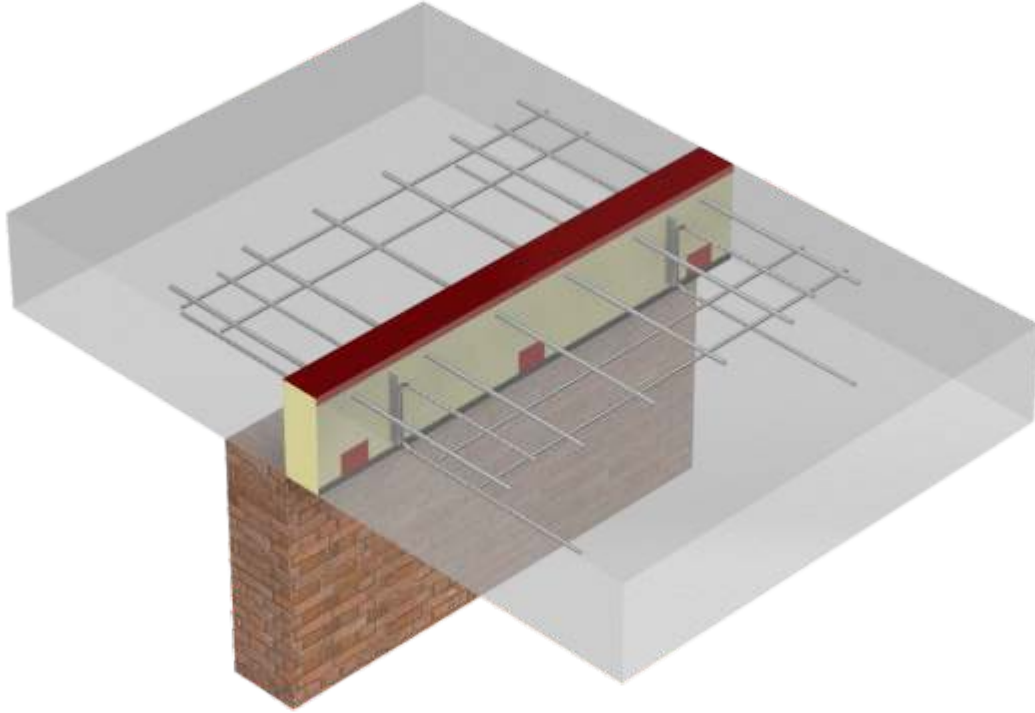




PRODUCTS



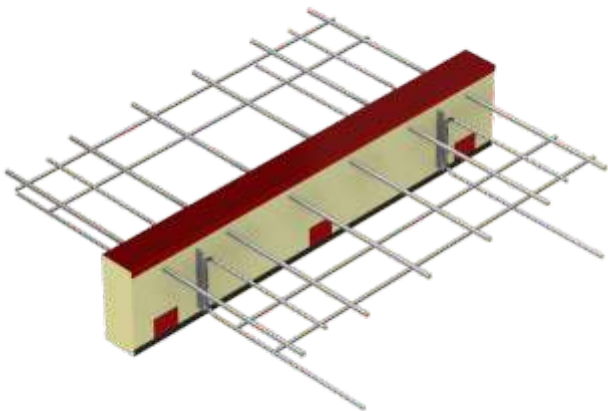
■ **KP-100 BALCONY CONNECTOR FOR SUPPORT BALCONY SLABS**



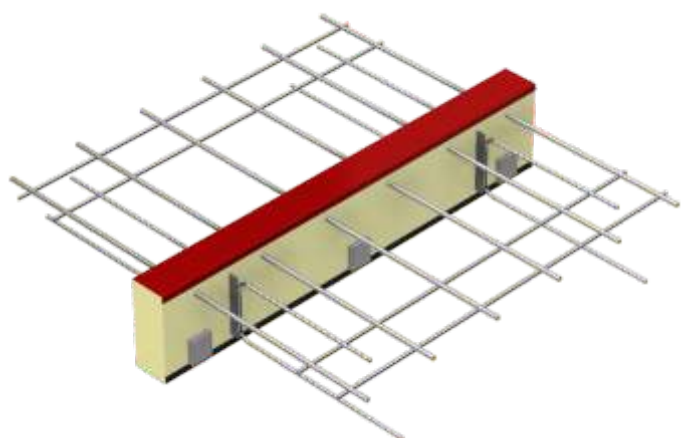
- standard elements for ceilings of thickness between 140 mm and 300 mm
- standard insulation thickness 80 mm; options: 60 mm, 100 mm, 120 mm
- insulation type: mineral wool (WM) or styrofoam (XPS)
- reinforcement bars of stainless steel
- steel plates of stainless steel
- stainless steel compression bearing (for 14 cm or 16 cm thick ceilings) or concrete compression bearing (for ceiling thickness values 18 cm and upwards)

Marking example:

$\text{KP-104}_{\text{connector type}}$
 $\text{, } \underline{6}_{\text{quantity of bars}}$
 $\text{ x } \text{, } \underline{10}_{\text{bar diameter}}$
 $\text{ - } \underline{2}_{\text{quantity of steel plate}}$
 $\text{ h=200 mm, XPS80, L=1000 mm}$



KP-104 balcony connector (6x10-2) with concrete compression bearings

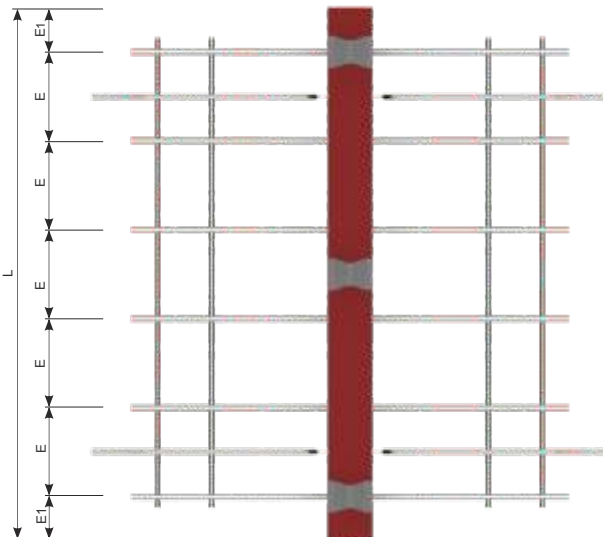
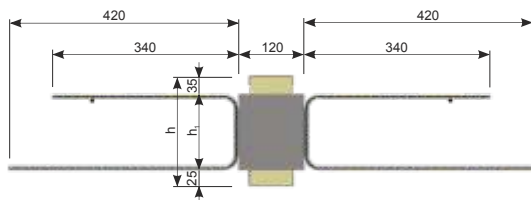
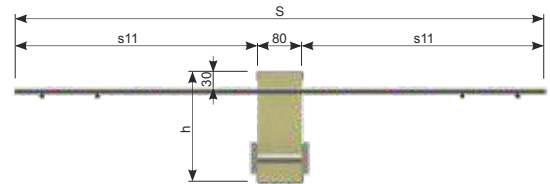
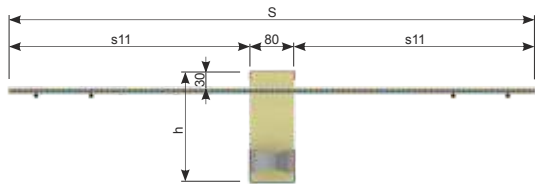


KP-104 balcony connector (6x10-2) with steel compression bearings

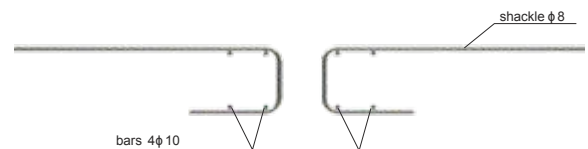
KP-100 BALCONY CONNECTOR - 20 cm module

Concrete class: C25/30

Symbol	h [mm]	h ₁ [mm]	Bar diameter ϕ [mm]	Quantity			M _{Rd} (-) [kNm]	Insulation	Insulation	Rigidity k [kNm/rad]	ψ [W/mK]	Dimension [mm]		
				80 mm	120 mm	Bars		Plate	Compression bearing			V _{Rd} (\pm) [kN]	V _{Rd} (\pm) [kN]	S
KP-101 2x10-1 L=200 mm	140	80	10	2	1	1	6	22	16	318	0,060	960	100	50
	160	100	10	2	1	1	8	27	22	517	0,067	960	100	50
	180	120	10	2	1	1	10	33	27	765	0,073	960	100	50
	200	140	10	2	1	1	11	38	31	1 061	0,079	960	100	50
	220	160	10	2	1	1	13	44	35	1 405	0,085	960	100	50
	240	180	10	2	1	1	15	49	40	1 798	0,091	960	100	50
	260	200	10	2	1	1	17	55	45	2 239	0,096	960	100	50
	280	220	10	2	1	1	18	60	48	2 728	0,102	960	100	50
	300	240	10	2	1	1	20	65	53	3 266	0,108	960	100	50
KP-102 2x14-1 L=200 mm	140	80	14	2	1	2	12	22	16	450	0,083	1280	100	50
	160	100	14	2	1	2	15	27	22	742	0,089	1280	100	50
	180	120	14	2	1	2	19	33	27	1 106	0,095	1280	100	50
	200	140	14	2	1	2	22	38	31	1 542	0,100	1280	100	50
	220	160	14	2	1	2	26	44	35	2 051	0,105	1280	100	50
	240	180	14	2	1	2	29	49	40	2 632	0,111	1280	100	50
	260	200	14	2	1	2	32	55	45	3 286	0,116	1280	100	50
	280	220	14	2	1	2	36	60	48	4 012	0,122	1280	100	50
	300	240	14	2	1	2	39	65	53	4 811	0,127	1280	100	50



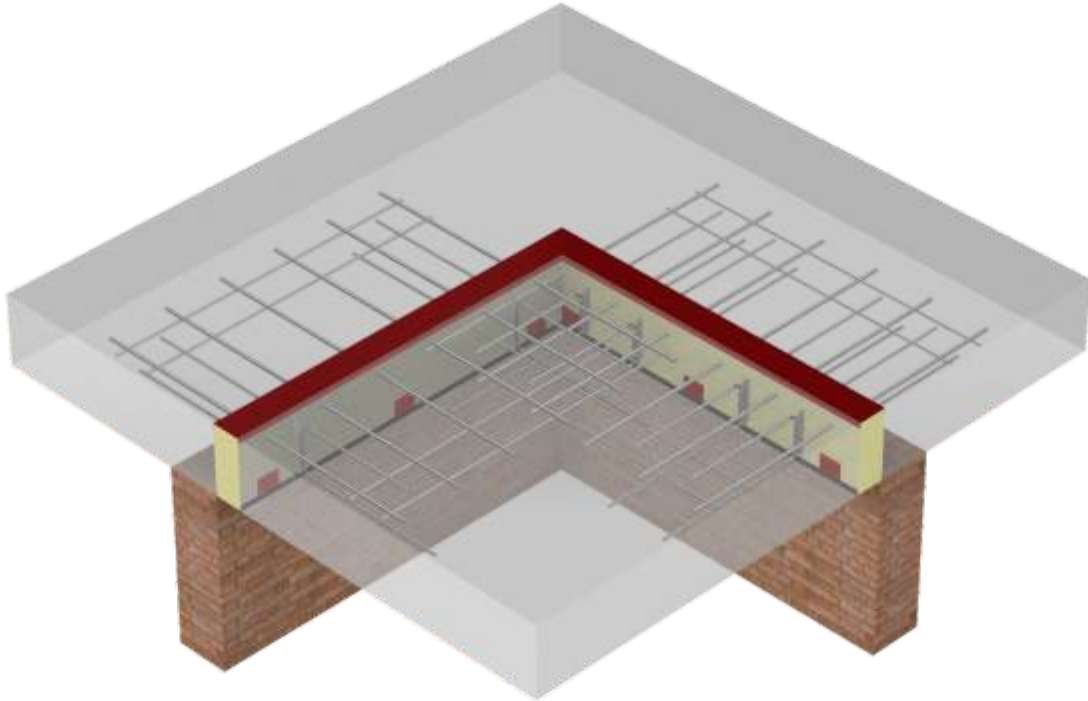
Additional bars installed at the construction site



Balcony connectors PRODUCTS

KP-100 BALCONY CONNECTOR - element 100 cm												Concrete class: C25/30		
Symbol	h [mm]	h _i [mm]	Bar diameter ϕ [mm]	Quantity			M _{Rd} (-) [kNm]	Insulation 80 mm	Insulation 120 mm	Rigidity k [kNm/rad]	ψ [W/mK]	Dimension [mm]		
				Bars	Plate	Compression bearing		V _{Rd} (\pm) [kN]	V _{Rd} (\pm) [kN]			S	E	E1
KP-103 4x10-1 L=1000 mm	140	80	10	4	1	2	13	22	16	635	0,127	960	250	125
	160	100	10	4	1	2	16	27	22	1 034	0,133	960	250	125
	180	120	10	4	1	2	20	33	27	1 529	0,140	960	250	125
	200	140	10	4	1	2	23	38	31	2 121	0,147	960	250	125
	220	160	10	4	1	2	26	44	35	2 810	0,154	960	250	125
	240	180	10	4	1	2	30	49	40	3 595	0,161	960	250	125
	260	200	10	4	1	2	33	55	45	4 478	0,168	960	250	125
	280	220	10	4	1	2	37	60	48	5 456	0,175	960	250	125
300	240	10	4	1	2	40	65	53	6 532	0,182	960	250	125	
KP-104 6x10-2 L=1000 mm	140	80	10	6	2	3	19	43	32	953	0,182	960	167	83
	160	100	10	6	2	3	24	54	44	1 551	0,193	960	167	83
	180	120	10	6	2	3	29	65	54	2 294	0,204	960	167	83
	200	140	10	6	2	3	34	76	62	3 182	0,215	960	167	83
	220	160	10	6	2	3	40	87	70	4 215	0,227	960	167	83
	240	180	10	6	2	3	45	98	80	5 393	0,238	960	167	83
	260	200	10	6	2	3	50	109	90	6 716	0,250	960	167	83
	280	220	10	6	2	3	55	120	96	8 184	0,261	960	167	83
300	240	10	6	2	3	60	130	106	9 797	0,273	960	167	83	
KP-105 4x14-2 L=1000 mm	140	80	14	4	2	4	24	43	32	900	0,205	1280	250	125
	160	100	14	4	2	4	31	54	44	1 483	0,217	1280	250	125
	180	120	14	4	2	4	38	65	54	2 211	0,229	1280	250	125
	200	140	14	4	2	4	44	76	62	3 084	0,241	1280	250	125
	220	160	14	4	2	4	51	87	70	4 102	0,253	1280	250	125
	240	180	14	4	2	4	58	98	80	5 265	0,264	1280	250	125
	260	200	14	4	2	4	65	109	90	6 572	0,276	1280	250	125
	280	220	14	4	2	4	72	120	96	8 025	0,287	1280	250	125
300	240	14	4	2	4	78	130	106	9 622	0,299	1280	250	125	
KP-106 6x14-3 L=1000 mm	140	80	14	6	3	6	36	65	48	1 350	0,283	1280	167	83
	160	100	14	6	3	6	46	81	66	2 225	0,299	1280	167	83
	180	120	14	6	3	6	56	98	81	3 317	0,314	1280	167	83
	200	140	14	6	3	6	67	114	93	4 626	0,319	1280	167	83
	220	160	14	6	3	6	77	131	105	6 153	0,335	1280	167	83
	240	180	14	6	3	6	87	147	120	7 897	0,350	1280	167	83
	260	200	14	6	3	6	97	164	135	9 858	0,366	1280	167	83
	280	220	14	6	3	6	107	180	144	12 037	0,381	1280	167	83
300	240	14	6	3	6	118	195	159	14 433	0,397	1280	167	83	
KP-107 8x14-4 L=1000 mm	140	80	14	8	4	8	48	86	64	1 800	0,326	1280	125	63
	160	100	14	8	4	8	62	108	88	2 967	0,345	1280	125	63
	180	120	14	8	4	8	75	130	108	4 423	0,364	1280	125	63
	200	140	14	8	4	8	89	152	124	6 168	0,383	1280	125	63
	220	160	14	8	4	8	102	174	140	8 204	0,402	1280	125	63
	240	180	14	8	4	8	116	196	160	10 529	0,420	1280	125	63
	260	200	14	8	4	8	130	218	180	13 145	0,439	1280	125	63
	280	220	14	8	4	8	143	240	192	16 049	0,457	1280	125	63
300	240	14	8	4	8	157	260	212	19 244	0,476	1280	125	63	
KP-108 10x14-5 L=1000 mm	140	80	14	10	5	10	60	97	72	2 250	0,375	1280	100	50
	160	100	14	10	5	10	77	122	99	3 708	0,396	1280	100	50
	180	120	14	10	5	10	94	146	122	5 528	0,417	1280	100	50
	200	140	14	10	5	10	111	171	140	7 711	0,438	1280	100	50
	220	160	14	10	5	10	128	196	158	10 255	0,459	1280	100	50
	240	180	14	10	5	10	145	221	180	13 162	0,480	1280	100	50
	260	200	14	10	5	10	162	245	203	16 431	0,500	1280	100	50
	280	220	14	10	5	10	179	270	216	20 062	0,521	1280	100	50
300	240	14	10	5	10	196	293	239	24 055	0,542	1280	100	50	

■ KPE-100 BALCONY CONNECTOR FOR SUPPORT BALCONY SLABS - CORNERS



- standard elements for ceilings of thickness between 160 mm and 300 mm
- standard insulation thickness 80 mm; options: 60 mm, 100 mm, 120 mm
- insulation type: mineral wool (WM) or styrofoam (XPS)
- reinforcement bars of stainless steel
- steel plates of stainless steel
- stainless steel compression bearing (for 16 cm thick ceilings) or concrete compression bearing (for ceiling thickness values 18 cm and upwards)

Marking example:

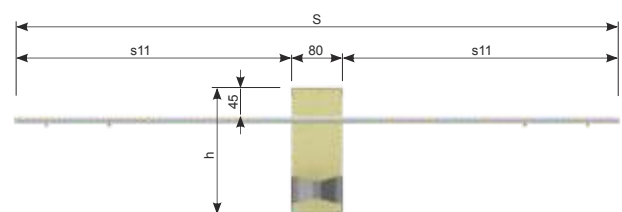
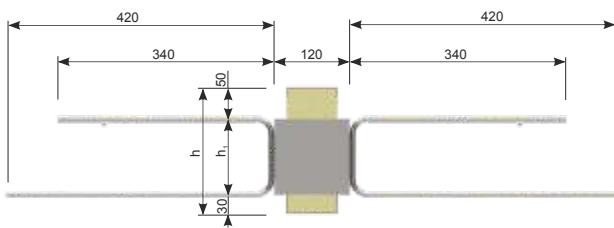
KPE - 109 , 6 , x 10 , - 4 h=200 mm, XPS80, L=1000 mm

connector
type

quantity
of bars

bar
diameter

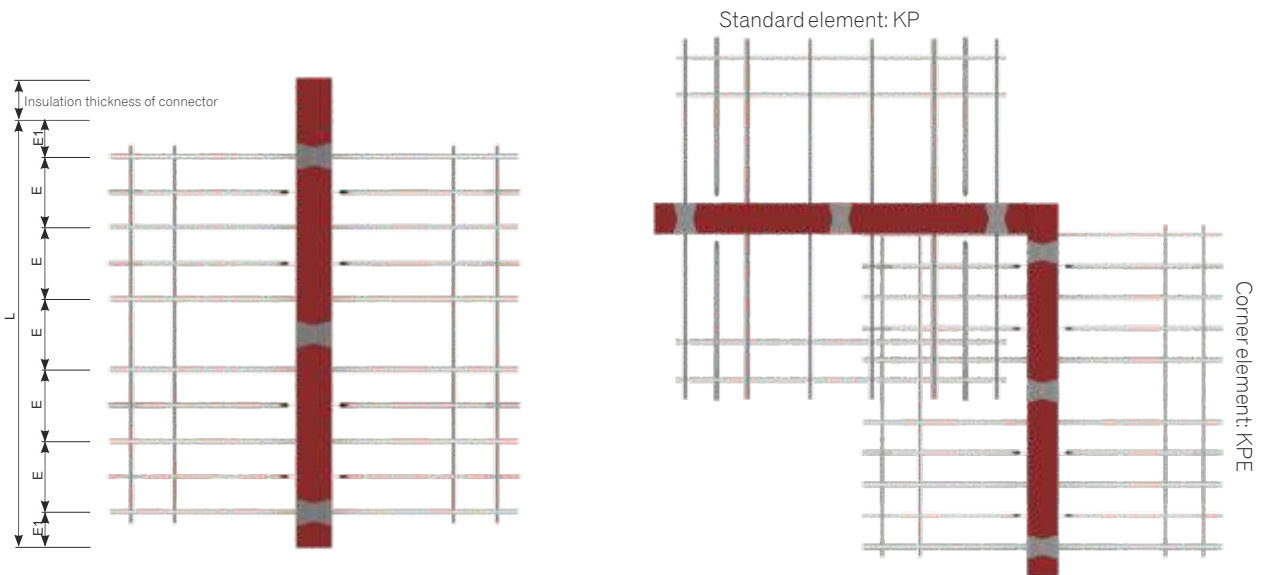
quantity
of steel
plate



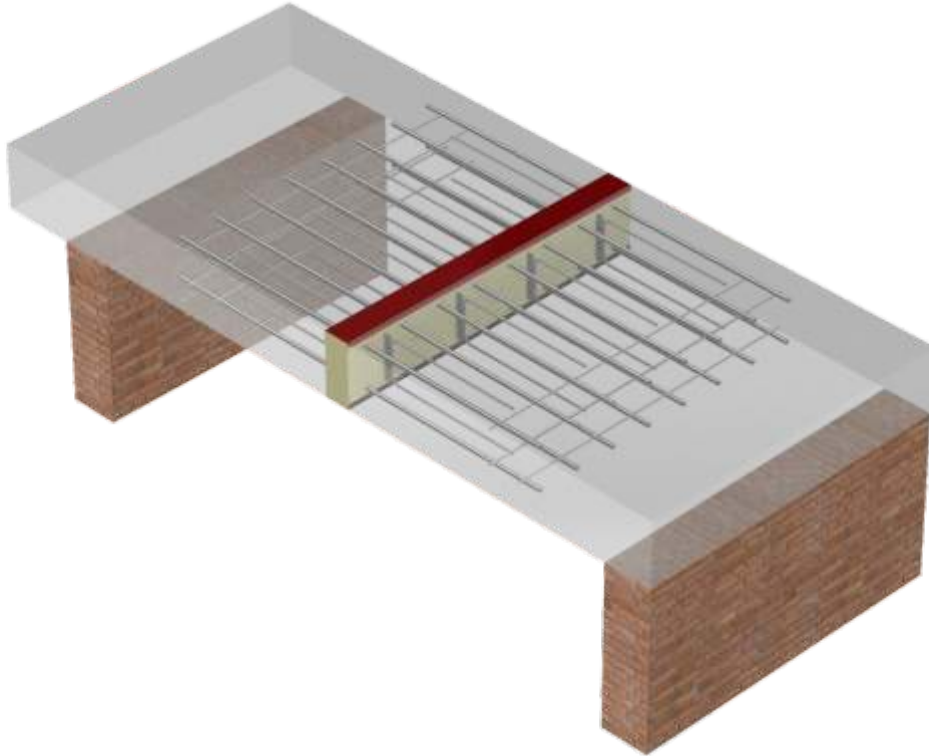
KPE-100 BALCONY CONNECTOR - element 100 cm

Concrete class: C25/30

Symbol	h [mm]	h ₁ [mm]	Bar diameter φ [mm]	Quantity			M _{Rd} (-) [kNm]	Insulation	Insulation	Rlgidity k [kNm/rad]	ψ [W/mK]	Dimension [mm]			
				80 mm V _{Rd} (±) [kN]	120 mm V _{Rd} (±) [kN]	S		E	E1						
				Bars	Plate	Compression bearing									
KPE-109 6x10-4 L=1000 mm	160	80	10	6	4	3	20	86	64	1 089	0,230	960	167	83	
	180	100	10	6	4	3	25	108	88	1 723	0,250	960	167	83	
	200	120	10	6	4	3	31	130	108	2 502	0,270	960	167	83	
	220	140	10	6	4	3	36	152	124	3 427	0,290	960	167	83	
	240	160	10	6	4	3	41	174	140	4 496	0,310	960	167	83	
	260	180	10	6	4	3	46	196	160	5 710	0,330	960	167	83	
	280	200	10	6	4	3	51	218	180	7 070	0,350	960	167	83	
	300	220	10	6	4	3	57	240	192	8 574	0,370	960	167	83	
KPE-110 6x14-5 L=1000 mm	160	80	14	6	5	6	38	97	72	1 549	0,316	1280	167	83	
	180	100	14	6	5	6	49	122	99	2 428	0,337	1280	167	83	
	200	120	14	6	5	6	59	146	122	3 624	0,358	1280	167	83	
	220	140	14	6	5	6	69	171	140	4 988	0,379	1280	167	83	
	240	160	14	6	5	6	79	196	158	6 569	0,401	1280	167	83	
	260	180	14	6	5	6	89	221	180	8 367	0,422	1280	167	83	
	280	200	14	6	5	6	100	245	203	10 383	0,444	1280	167	83	
	300	220	14	6	5	6	110	270	216	16 616	0,465	1280	167	83	
KPE-111 8x14-5 L=1000 mm	160	80	14	8	5	8	51	97	72	2 065	0,351	1280	125	63	
	180	100	14	8	5	8	65	122	99	3 303	0,372	1280	125	63	
	200	120	14	8	5	8	79	146	122	4 832	0,393	1280	125	63	
	220	140	14	8	5	8	92	171	140	6 650	0,414	1280	125	63	
	240	160	14	8	5	8	106	196	158	8 758	0,435	1280	125	63	
	260	180	14	8	5	8	119	221	180	11 156	0,456	1280	125	63	
	280	200	14	8	5	8	133	245	203	13 844	0,477	1280	125	63	
	300	220	14	8	5	8	146	270	216	16 821	0,498	1280	125	63	
KPE-112 10x14-6 L=1000 mm	160	80	14	10	6	10	64	110	80	2 581	0,398	1280	100	50	
	180	100	14	10	6	10	81	138	110	4 129	0,419	1280	100	50	
	200	120	14	10	6	10	98	166	135	6 040	0,442	1280	100	50	
	220	140	14	10	6	10	115	194	155	8 313	0,465	1280	100	50	
	240	160	14	10	6	10	132	222	175	10 948	0,488	1280	100	50	
	260	180	14	10	6	10	149	250	200	13 945	0,512	1280	100	50	
	280	200	14	10	6	10	166	278	225	17 305	0,535	1280	100	50	
	300	220	14	10	6	10	183	306	240	21 026	0,558	1280	100	50	



■ **KP-200 BALCONY CONNECTOR FOR SEAMLESS CONNECTION OF THE BALCONY SLAB WITH THE CEILING SLAB**

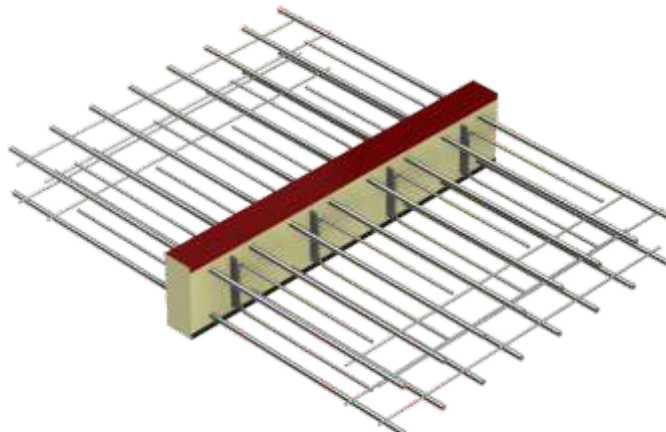


- standard elements for ceilings of thickness between 140 mm and 300 mm
- standard insulation thickness 80 mm; options: 60 mm, 100 mm, 120 mm
- insulation type: mineral wool (WM) or styrofoam (XPS)
- reinforcement bars of stainless steel
- steel plates of stainless steel

Marking example:

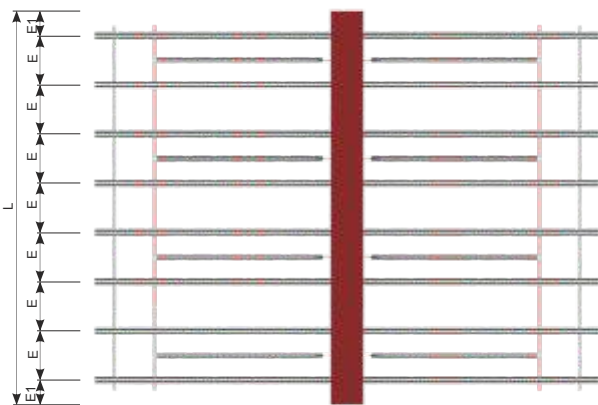
KP-204, 8, x 14, - 4, h=200 mm, XPS80, L=1000 mm

connector quantity bar quantity
type of bars diameter of steel
plate

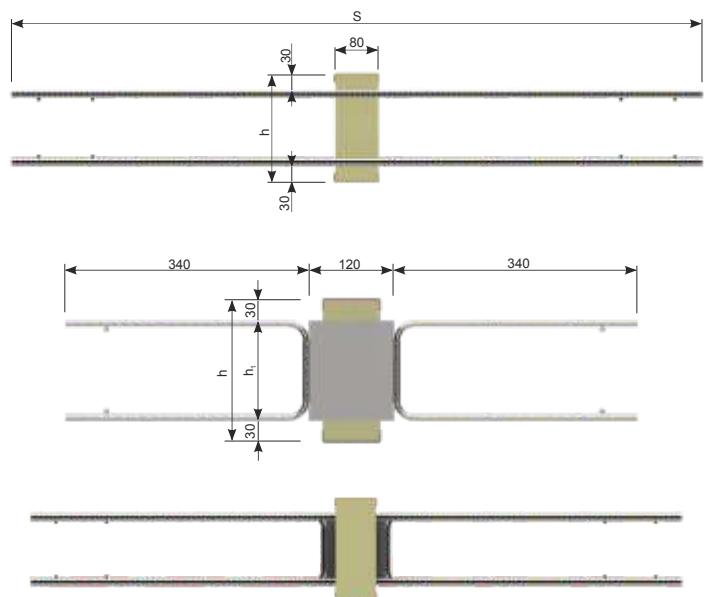


KP-204 balcony connector (8x14-4)

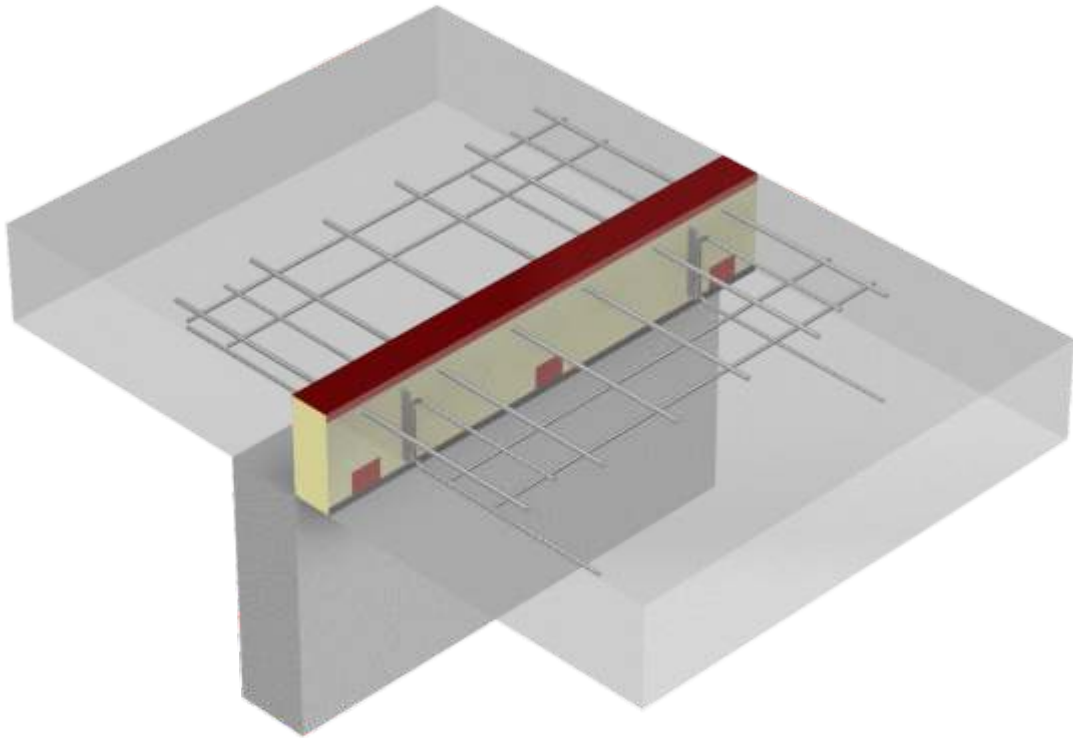
KP-200 BALCONY CONNECTOR - element 100 cm											Concrete class: \geq C25/30		
Symbol	h [mm]	h _i [mm]	Bar diameter ϕ [mm]	Quantity		M _{Rd} (-) [kNm]	Insulation		Rigidity k [kNm/rad]	ψ [W/mK]	Dimension [mm]		
				Bars	Plate		80 mm V _{Rd} (\pm) [kN]	120 mm V _{Rd} (\pm) [kN]			S	E	E1
KP-201 6x10-2 L=1000 mm	140	80	10	6	2	15	43	32	888	0,174	960	167	83
	160	100	10	6	2	20	54	44	1 468	0,186	960	167	83
	180	120	10	6	2	24	65	54	2 193	0,198	960	167	83
	200	140	10	6	2	29	76	62	3 063	0,210	960	167	83
	220	160	10	6	2	33	87	70	4 078	0,222	960	167	83
	240	180	10	6	2	37	98	80	5 238	0,234	960	167	83
	260	200	10	6	2	42	109	90	6 543	0,245	960	167	83
	280	220	10	6	2	46	120	96	7 993	0,257	960	167	83
	300	240	10	6	2	51	130	106	9 588	0,269	960	167	83
KP-202 4x14-2 L=1000 mm	140	80	14	4	2	21	43	32	789	0,191	1280	250	125
	160	100	14	4	2	27	54	44	1 339	0,203	1280	250	125
	180	120	14	4	2	34	65	54	2 035	0,215	1280	250	125
	200	140	14	4	2	40	76	62	2 875	0,227	1280	250	125
	220	160	14	4	2	47	87	70	3 860	0,239	1280	250	125
	240	180	14	4	2	53	98	80	4 990	0,251	1280	250	125
	260	200	14	4	2	59	109	90	6 265	0,262	1280	250	125
	280	220	14	4	2	66	120	96	7 685	0,274	1280	250	125
	300	240	14	4	2	72	130	106	9 250	0,286	1280	250	125
KP-203 6x14-3 L=1000 mm	140	80	14	6	3	32	65	48	1 183	0,260	1280	167	83
	160	100	14	6	3	41	81	66	2 009	0,276	1280	167	83
	180	120	14	6	3	51	98	81	3 052	0,290	1280	167	83
	200	140	14	6	3	60	114	93	4 313	0,305	1280	167	83
	220	160	14	6	3	70	131	105	5 791	0,319	1280	167	83
	240	180	14	6	3	80	147	120	7 486	0,334	1280	167	83
	260	200	14	6	3	89	164	135	9 398	0,348	1280	167	83
	280	220	14	6	3	99	180	144	11 528	0,363	1280	167	83
	300	240	14	6	3	108	195	159	13 875	0,377	1280	167	83
KP-204 8x14-4 L=1000 mm	140	80	14	8	4	42	86	64	1 578	0,312	1280	125	63
	160	100	14	8	4	55	108	88	2 678	0,331	1280	125	63
	180	120	14	8	4	68	130	108	4 070	0,350	1280	125	63
	200	140	14	8	4	81	152	124	5 750	0,369	1280	125	63
	220	160	14	8	4	93	174	140	7 721	0,387	1280	125	63
	240	180	14	8	4	106	196	160	9 981	0,405	1280	125	63
	260	200	14	8	4	119	218	180	12 531	0,422	1280	125	63
	280	220	14	8	4	132	240	192	15 374	0,440	1280	125	63
	300	240	14	8	4	144	260	212	18 500	0,458	1280	125	63



Additional bars installed at the construction site



■ KP-300 BALCONY CONNECTOR FOR SUPPORT BALCONY SLABS

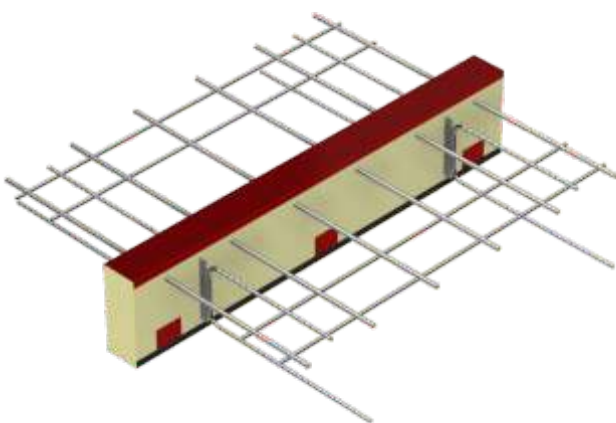


- standard elements for ceilings of thickness between 140 mm and 300 mm
- standard insulation thickness 80 mm; options: 60 mm, 100 mm, 120 mm
- insulation type: mineral wool (WM) or styrofoam (XPS)
- expanded tension rod of ordinary heat galvanised carbon steel
- steel plates of stainless steel
- stainless steel compression bearing (for 14 cm or 16 cm thick ceilings) or concrete compression bearing (for ceiling thickness values 18 cm and upwards)

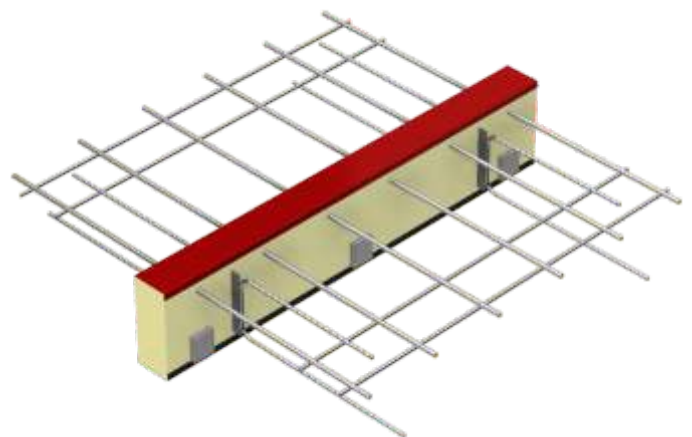
Marking example:

KP-304, 6, x 10, - 2, h=200 mm, XPS80, L=1000 mm

connector quantity bar quantity
type of bars diameter of steel plate



KP-304 balcony connector (6x10-2) with concrete compression bearings

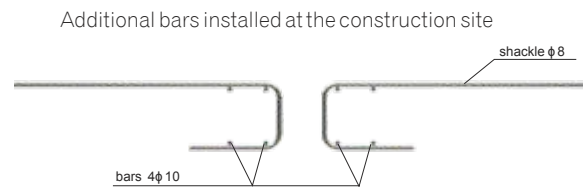
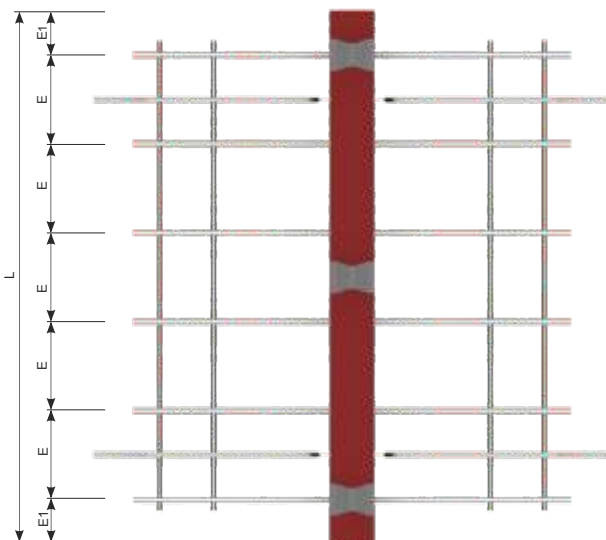
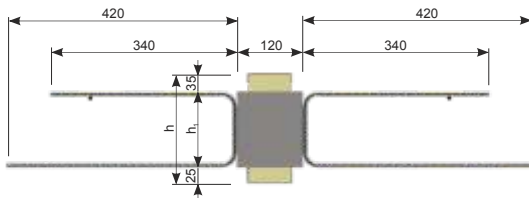
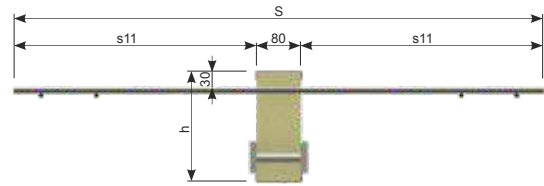
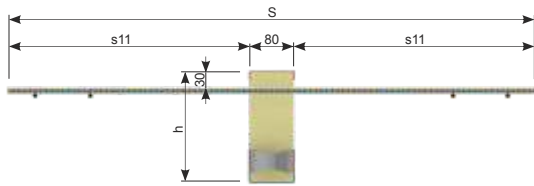


KP-304 balcony connector (6x10-2) with steel compression bearings

KP-300 BALCONY CONNECTOR- 20 cm module

Concrete class: \geq C25/30

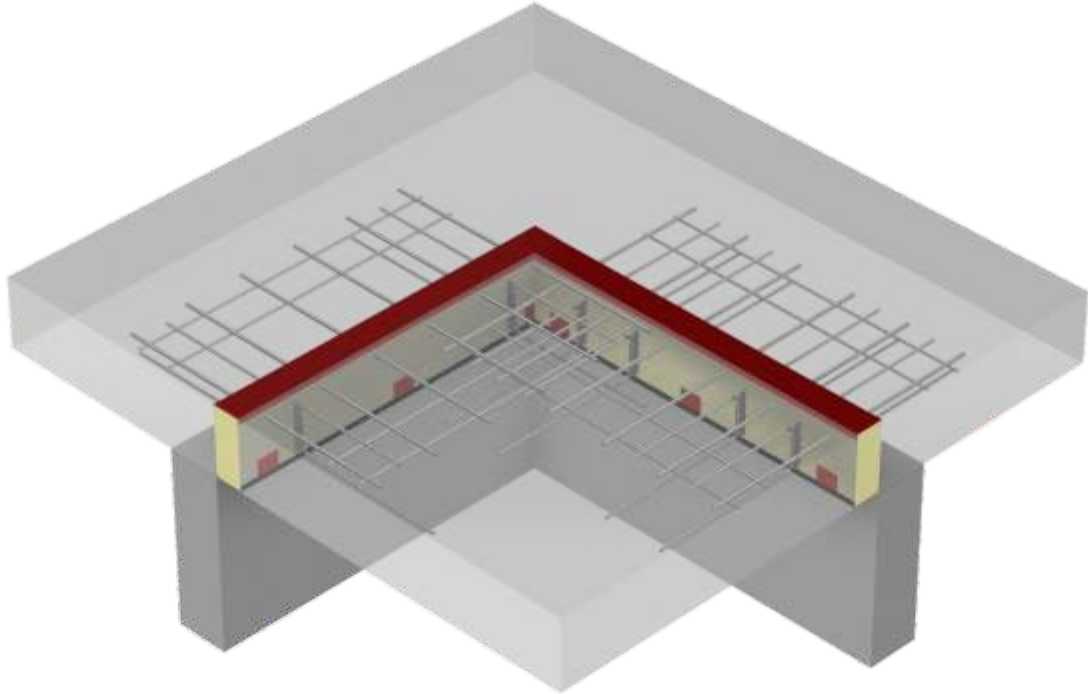
Symbol	h [mm]	h ₁ [mm]	Bar diameter ϕ [mm]	Quantity			M _{Rd} (-) [kNm]	Insulation		Rigidity k [kNm/rad]	ψ [W/mK]	Dimension [mm]		
				Bars	Plate	Compression bearing		80 mm	120 mm			S	E	E1
								V _{Rd} (\pm) [kN]	V _{Rd} (\pm) [kN]					
KP-301 2x10-1 L=200 mm	140	80	10	2	1	1	5	22	16	376	0,073	820	100	50
	160	100	10	2	1	1	6	27	22	612	0,081	820	100	50
	180	120	10	2	1	1	8	33	27	906	0,088	820	100	50
	200	140	10	2	1	1	9	38	31	1 256	0,095	820	100	50
	220	160	10	2	1	1	10	44	35	1 664	0,102	820	100	50
	240	180	10	2	1	1	12	49	40	2 129	0,109	820	100	50
	260	200	10	2	1	1	13	55	45	2 652	0,115	820	100	50
	280	220	10	2	1	1	15	60	48	3 231	0,122	820	100	50
	300	240	10	2	1	1	16	65	53	3 868	0,129	820	100	50
KP-302 2x14-1 L=200 mm	140	80	14	2	1	2	9	22	16	555	0,105	1050	100	50
	160	100	14	2	1	2	12	27	22	915	0,111	1050	100	50
	180	120	14	2	1	2	15	33	27	1 364	0,118	1050	100	50
	200	140	14	2	1	2	17	38	31	1 902	0,125	1050	100	50
	220	160	14	2	1	2	20	44	35	2 530	0,132	1050	100	50
	240	180	14	2	1	2	23	49	40	3 247	0,138	1050	100	50
	260	200	14	2	1	2	26	55	45	4 054	0,145	1050	100	50
	280	220	14	2	1	2	28	60	48	4 950	0,151	1050	100	50
	300	240	14	2	1	2	31	65	53	5 935	0,158	1050	100	50



KP-300 BALCONY CONNECTOR - element 100 cm
Concrete class: ≥ C25/30

Symbol	h [mm]	h ₁ [mm]	Bar diameter φ [mm]	Quantity			M _{Rd} (-) [kNm]	Insulation		Rigidity k [kNm/rad]	ψ [W/mK]	Dimension [mm]		
				Bars	Plate	Compression bearing		80 mm	120 mm			S	E	E1
								V _{Rd} (±) [kN]	V _{Rd} (±) [kN]					
KP-303 4x10-1 L=1000 mm	140	80	10	4	1	2	10	22	16	752	0,162	820	250	125
	160	100	10	4	1	2	13	27	22	1 225	0,171	820	250	125
	180	120	10	4	1	2	15	33	27	1 811	0,180	820	250	125
	200	140	10	4	1	2	18	38	31	2 513	0,189	820	250	125
	220	160	10	4	1	2	21	44	35	3 328	0,198	820	250	125
	240	180	10	4	1	2	24	49	40	4 259	0,206	820	250	125
	260	200	10	4	1	2	26	55	45	5 303	0,215	820	250	125
	280	220	10	4	1	2	29	60	48	6 463	0,223	820	250	125
300	240	10	4	1	2	32	65	53	7 736	0,232	820	250	125	
KP-304 6x10-2 L=1000 mm	140	80	10	6	2	3	15	43	32	1 128	0,228	820	167	83
	160	100	10	6	2	3	19	54	44	1 837	0,242	820	167	83
	180	120	10	6	2	3	23	65	54	2 717	0,256	820	167	83
	200	140	10	6	2	3	27	76	62	3 769	0,270	820	167	83
	220	160	10	6	2	3	31	87	70	4 993	0,284	820	167	83
	240	180	10	6	2	3	35	98	80	6 388	0,299	820	167	83
	260	200	10	6	2	3	39	109	90	7 955	0,313	820	167	83
	280	220	10	6	2	3	44	120	96	9 694	0,328	820	167	83
300	240	10	6	2	3	48	130	106	11 605	0,342	820	167	83	
KP-305 4x14-2 L=1000 mm	140	80	14	4	2	4	19	43	32	1 110	0,259	1050	250	125
	160	100	14	4	2	4	24	54	44	1 830	0,271	1050	250	125
	180	120	14	4	2	4	30	65	54	2 728	0,285	1050	250	125
	200	140	14	4	2	4	35	76	62	3 805	0,299	1050	250	125
	220	160	14	4	2	4	40	87	70	5 060	0,314	1050	250	125
	240	180	14	4	2	4	46	98	80	6 495	0,329	1050	250	125
	260	200	14	4	2	4	51	109	90	8 108	0,343	1050	250	125
	280	220	14	4	2	4	56	120	96	9 900	0,358	1050	250	125
300	240	14	4	2	4	62	130	106	11 870	0,373	1050	250	125	
KP-306 5x14-2 L=1000 mm	140	80	14	5	2	5	24	43	32	1 388	0,265	1050	200	100
	160	100	14	5	2	5	30	54	44	2 287	0,290	1050	200	100
	180	120	14	5	2	5	37	65	54	3 410	0,306	1050	200	100
	200	140	14	5	2	5	44	76	62	4 756	0,323	1050	200	100
	220	160	14	5	2	5	50	87	70	6 325	0,340	1050	200	100
	240	180	14	5	2	5	57	98	80	8 118	0,357	1050	200	100
	260	200	14	5	2	5	64	109	90	10 135	0,373	1050	200	100
	280	220	14	5	2	5	70	120	96	12 374	0,390	1050	200	100
300	240	14	5	2	5	77	130	106	14 838	0,407	1050	200	100	
KP-307 6x14-3 L=1000 mm	140	80	14	6	3	6	28	65	48	1 666	0,316	1050	167	83
	160	100	14	6	3	6	36	81	66	2 745	0,338	1050	167	83
	180	120	14	6	3	6	44	98	81	4 092	0,360	1050	167	83
	200	140	14	6	3	6	52	114	93	5 707	0,382	1050	167	83
	220	160	14	6	3	6	60	131	105	7 591	0,404	1050	167	83
	240	180	14	6	3	6	69	147	120	9 742	0,426	1050	167	83
	260	200	14	6	3	6	77	164	135	12 162	0,449	1050	167	83
	280	220	14	6	3	6	85	180	144	14 849	0,471	1050	167	83
300	240	14	6	3	6	93	195	159	17 805	0,493	1050	167	83	
KP-308 8x14-4 L=1000 mm	140	80	14	8	4	8	38	86	64	2 221	0,386	1050	125	63
	160	100	14	8	4	8	48	108	88	3 660	0,408	1050	125	63
	180	120	14	8	4	8	59	130	108	5 456	0,433	1050	125	63
	200	140	14	8	4	8	70	152	124	7 610	0,458	1050	125	63
	220	160	14	8	4	8	81	174	140	10 121	0,484	1050	125	63
	240	180	14	8	4	8	91	196	160	12 989	0,509	1050	125	63
	260	200	14	8	4	8	102	218	180	16 216	0,535	1050	125	63
	280	220	14	8	4	8	113	240	192	19 799	0,560	1050	125	63
300	240	14	8	4	8	123	260	212	23 740	0,586	1050	125	63	
KP-309 10x14-5 L=1000 mm	140	80	14	10	5	10	47	97	72	2 776	0,446	1050	100	50
	160	100	14	10	5	10	61	122	99	4 575	0,470	1050	100	50
	180	120	14	10	5	10	74	146	122	6 820	0,496	1050	100	50
	200	140	14	10	5	10	87	171	140	9 512	0,521	1050	100	50
	220	160	14	10	5	10	101	196	158	12 651	0,548	1050	100	50
	240	180	14	10	5	10	114	221	180	16 237	0,575	1050	100	50
	260	200	14	10	5	10	128	245	203	20 269	0,603	1050	100	50
	280	220	14	10	5	10	141	270	216	24 749	0,630	1050	100	50
300	240	14	10	5	10	154	293	239	29 675	0,657	1050	100	50	

■ **KPE-300 BALCONY CONNECTOR FOR SUPPORT BALCONY SLABS - CORNERS**

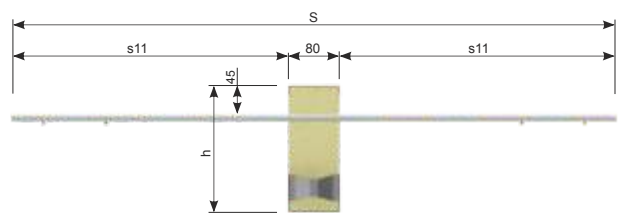
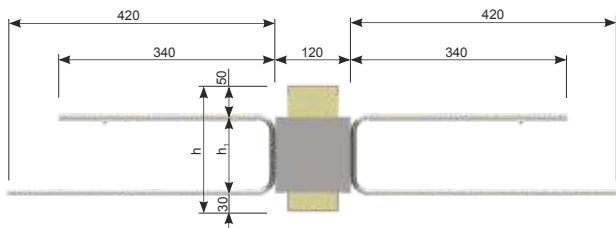


- standard elements for ceilings of thickness between 160 mm and 300 mm
- standard insulation thickness 80 mm; options: 60 mm, 100 mm, 120 mm
- insulation type: mineral wool (WM) or styrofoam (XPS)
- expanded tension rod of ordinary heat galvanised carbon steel
- steel plates of stainless steel
- stainless steel compression bearing (for 16 cm thick ceilings) or concrete compression bearing (for ceiling thickness values 18 cm and upwards)

Marking example:

KPE-310, 6, x 10, 4 h=200 mm, XPS80, L=1000 mm

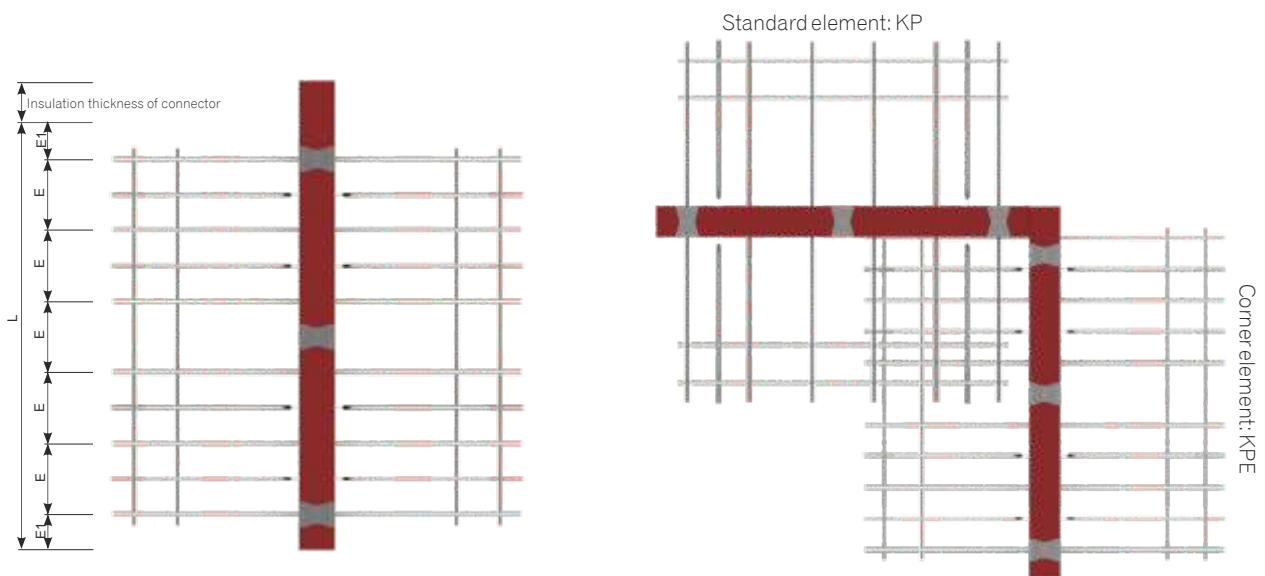
connector type quantity of bars bar diameter quantity of steel plate



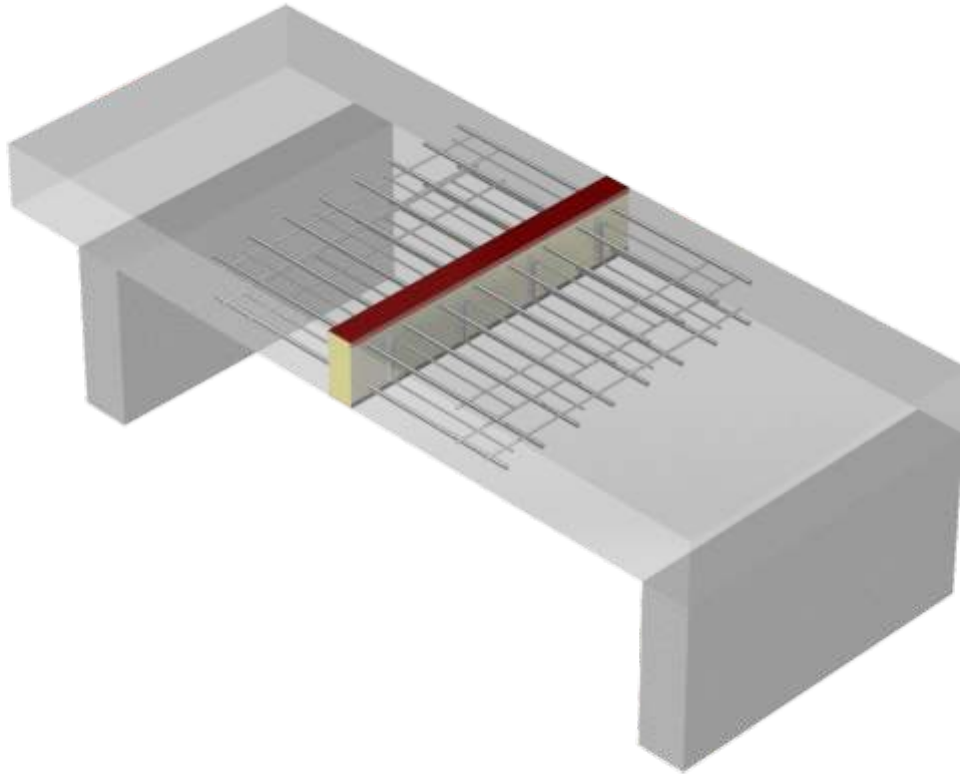
KPE-300 BALCONY CONNECTOR - element 100 cm

 Concrete class: \geq C25/30

Symbol	h [mm]	h ₁ [mm]	Bar diameter ϕ [mm]	Quantity			$M_{rd} (-)$ [kNm]	Insulation 80 mm $V_{rd} (\pm)$ [kN]	Insulation 120 mm $V_{rd} (\pm)$ [kN]	Rigidity k [kNm/rad]	ψ [W/mK]	Dimension [mm]		
				Bars	Plate	Compression bearing						S	E	E1
KPE-310 6x10-4 L=1000 mm	160	80	10	6	4	3	16	86	64	1 289	0,261	820	167	83
	180	100	10	6	4	3	20	108	88	2 041	0,287	820	167	83
	200	120	10	6	4	3	24	130	108	2 964	0,313	820	167	83
	220	140	10	6	4	3	28	152	124	4 059	0,339	820	167	83
	240	160	10	6	4	3	32	174	140	5 325	0,364	820	167	83
	260	180	10	6	4	3	36	196	160	6 764	0,390	820	167	83
	280	200	10	6	4	3	40	218	180	8 374	0,415	820	167	83
	300	220	10	6	4	3	45	240	192	10 155	0,441	820	167	83
KPE-311 6x14-5 L=1000 mm	160	80	14	6	5	6	30	97	72	1 910	0,362	1050	167	83
	180	100	14	6	5	6	38	122	99	3 056	0,390	1050	167	83
	200	120	14	6	5	6	46	146	122	4 474	0,418	1050	167	83
	220	140	14	6	5	6	54	171	140	6 153	0,446	1050	167	83
	240	160	14	6	5	6	62	196	158	8 103	0,474	1050	167	83
	260	180	14	6	5	6	71	221	180	10 322	0,502	1050	167	83
	280	200	14	6	5	6	79	245	203	12 808	0,530	1050	167	83
	300	220	14	6	5	6	87	270	216	15 563	0,558	1050	167	83
KPE-312 8x14-5 L=1000 mm	160	80	14	8	5	8	40	97	72	2 547	0,414	1050	125	63
	180	100	14	8	5	8	51	122	99	4 075	0,441	1050	125	63
	200	120	14	8	5	8	62	146	122	5 961	0,468	1050	125	63
	220	140	14	8	5	8	73	171	140	8 204	0,495	1050	125	63
	240	160	14	8	5	8	83	196	158	10 804	0,522	1050	125	63
	260	180	14	8	5	8	94	221	180	13 762	0,550	1050	125	63
	280	200	14	8	5	8	105	245	203	17 078	0,577	1050	125	63
	300	220	14	8	5	8	115	270	216	20 751	0,604	1050	125	63
KPE-313 10x14-6 L=1000 mm	160	80	14	10	6	10	51	110	80	3 184	0,472	1050	100	50
	180	100	14	10	6	10	64	138	110	5 094	0,501	1050	100	50
	200	120	14	10	6	10	77	166	135	7 451	0,530	1050	100	50
	220	140	14	10	6	10	91	194	155	10 255	0,559	1050	100	50
	240	160	14	10	6	10	104	222	175	13 506	0,588	1050	100	50
	260	180	14	10	6	10	118	250	200	17 203	0,618	1050	100	50
	280	200	14	10	6	10	131	278	225	21 347	0,647	1050	100	50
	300	220	14	10	6	10	144	306	240	25 939	0,676	1050	100	50



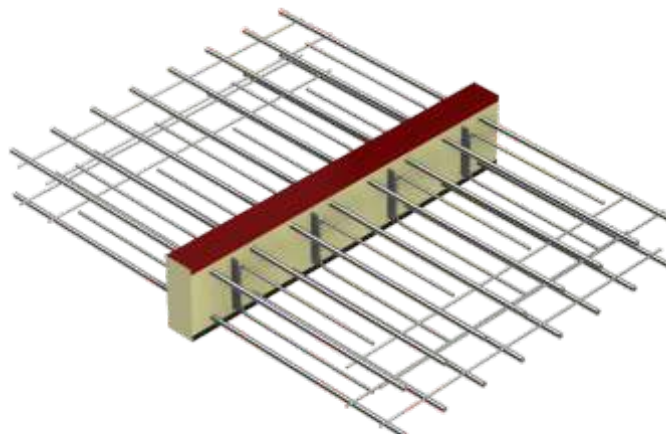
■ **KP-400 BALCONY CONNECTOR FOR BALCONY SLABS ENTERING THE CEILING**



- standard elements for ceilings of thickness between 140 mm and 300 mm
- standard insulation thickness 80 mm; options: 60 mm, 100 mm, 120 mm
- insulation type: mineral wool (WM) or styrofoam (XPS)
- expanded tension rod of ordinary heat galvanised carbon steel
- steel plates of stainless steel

Marking example:

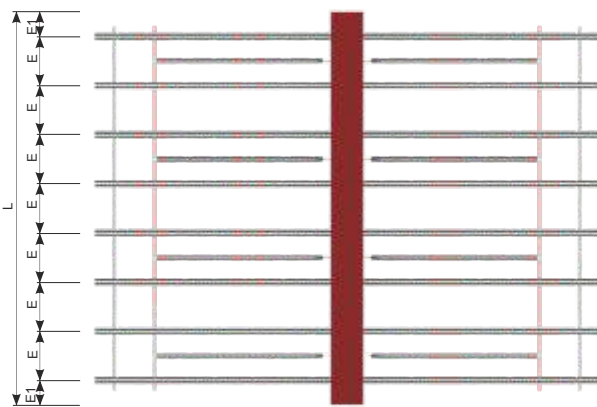
$\underbrace{\text{KP-404}}_{\text{connector type}}$
 $\underbrace{8}_{\text{quantity of bars}}$
 \times
 $\underbrace{14}_{\text{bar diameter}}$
 $\underbrace{4}_{\text{quantity of steel plate}}$
 $h=200 \text{ mm, XPS80, L=1000 mm}$



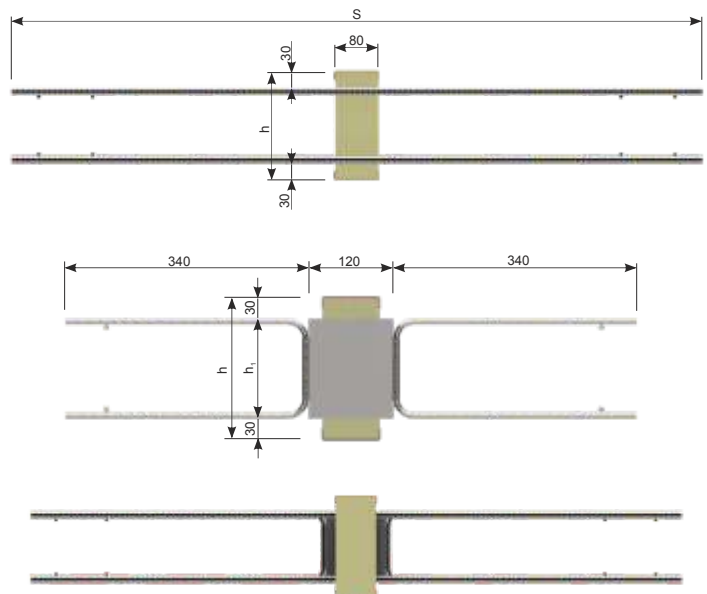
KP-404 balcony connector (8x14-4)

KP-400 BALCONY CONNECTOR - element 100 cm
Concrete class: \geq C25/30

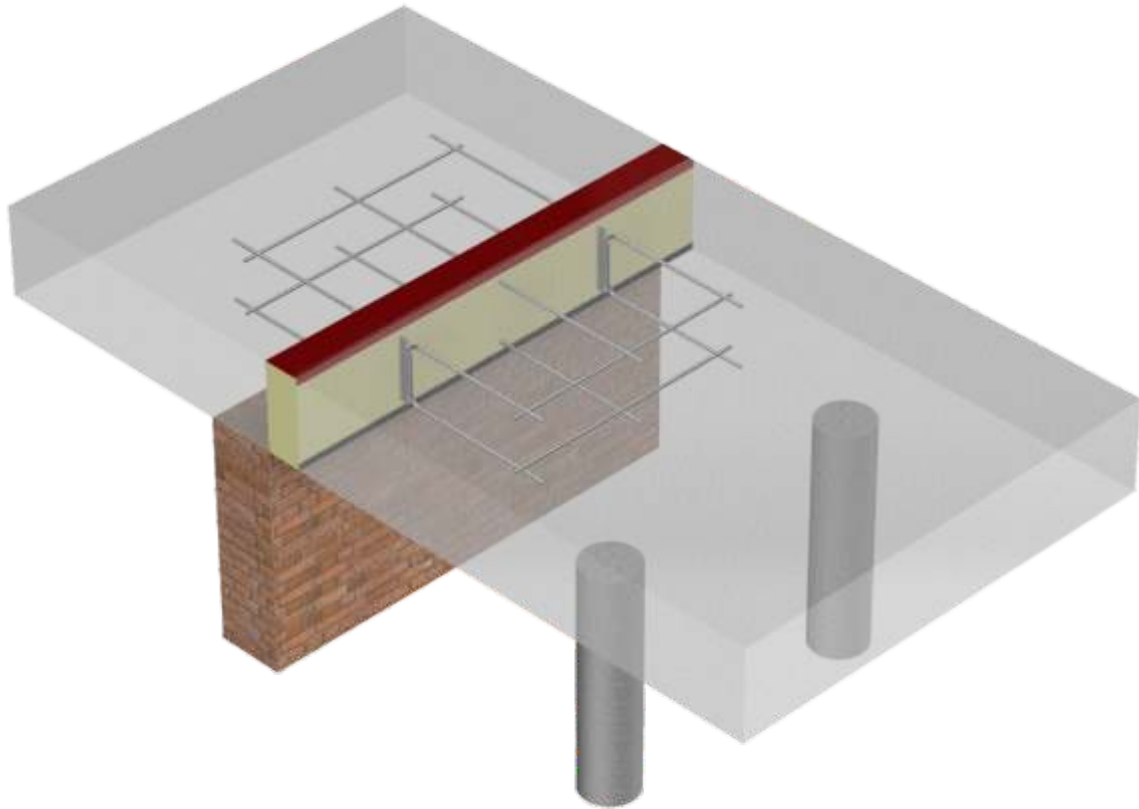
Symbol	h [mm]	h ₁ [mm]	Bar diameter ϕ [mm]	Quantity		M _{Rd} (-) [kNm]	Insulation		Rigidity k [kNm/rad]	ψ [W/mK]	Dimension [mm]		
				Bars	Plate		80 mm V _{Rd} (\pm) [kN]	120 mm V _{Rd} (\pm) [kN]			S	E	E1
KP-401 6x10-2 L=1000 mm	140	80	10	6	2	13	43	32	1 052	0,280	820	167	83
	160	100	10	6	2	16	54	44	1 739	0,293	820	167	83
	180	120	10	6	2	20	65	54	2 598	0,306	820	167	83
	200	140	10	6	2	23	76	62	3 628	0,319	820	167	83
	220	160	10	6	2	27	87	70	4 830	0,332	820	167	83
	240	180	10	6	2	31	98	80	6 204	0,345	820	167	83
	260	200	10	6	2	34	109	90	7 750	0,359	820	167	83
	280	220	10	6	2	38	120	96	9 467	0,372	820	167	83
KP-402 4x14-2 L=1000 mm	140	80	14	4	2	17	43	32	973	0,303	1050	250	125
	160	100	14	4	2	22	54	44	1 652	0,317	1050	250	125
	180	120	14	4	2	27	65	54	2 510	0,331	1050	250	125
	200	140	14	4	2	32	76	62	3 547	0,345	1050	250	125
	220	160	14	4	2	38	87	70	4 762	0,359	1050	250	125
	240	180	14	4	2	43	98	80	6 211	0,373	1050	250	125
	260	200	14	4	2	48	109	90	7 729	0,387	1050	250	125
	280	220	14	4	2	53	120	96	9 481	0,401	1050	250	125
KP-403 6x14-3 L=1000 mm	140	80	14	6	3	25	65	48	1 460	0,420	1050	167	83
	160	100	14	6	3	33	81	66	2 479	0,434	1050	167	83
	180	120	14	6	3	41	98	81	3 765	0,448	1050	167	83
	200	140	14	6	3	49	114	93	5 320	0,462	1050	167	83
	220	160	14	6	3	56	131	105	7 143	0,476	1050	167	83
	240	180	14	6	3	64	147	120	9 235	0,489	1050	167	83
	260	200	14	6	3	72	164	135	11 594	0,503	1050	167	83
	280	220	14	6	3	80	180	144	14 221	0,516	1050	167	83
KP-404 8x14-4 L=1000 mm	140	80	14	8	4	34	86	64	1 946	0,494	1050	125	63
	160	100	14	8	4	44	108	88	3 305	0,514	1050	125	63
	180	120	14	8	4	55	130	108	5 021	0,534	1050	125	63
	200	140	14	8	4	65	152	124	7 094	0,554	1050	125	63
	220	160	14	8	4	75	174	140	9 525	0,574	1050	125	63
	240	180	14	8	4	85	196	160	12 313	0,594	1050	125	63
	260	200	14	8	4	96	218	180	15 458	0,613	1050	125	63
	280	220	14	8	4	106	240	192	18 962	0,633	1050	125	63
300	240	14	8	4	116	260	212	22 822	0,653	1050	125	63	



Additional bars installed at the construction site



■ **KP-500 BALCONY CONNECTOR FOR ARTICULATE-SUPPORTED BALCONY SLABS**

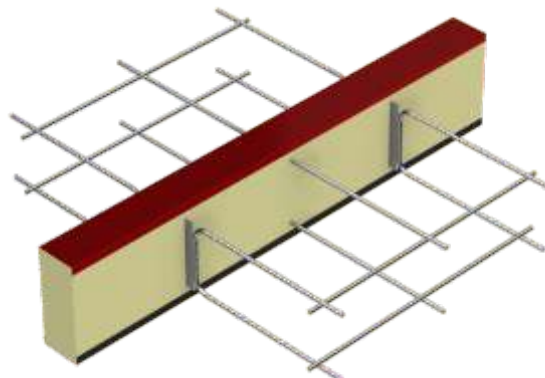


- standard elements for ceilings of thickness between 140 mm and 300 mm
- standard insulation thickness 80 mm; options: 60 mm, 100 mm, 120 mm
- insulation type: mineral wool (WM) or styrofoam (XPS)
- reinforcement bars of stainless steel
- steel plates of stainless steel

Marking example:

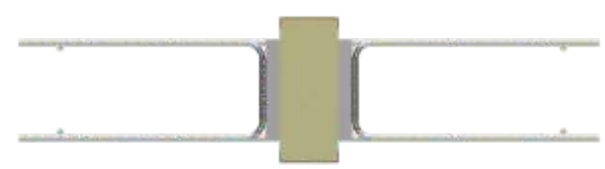
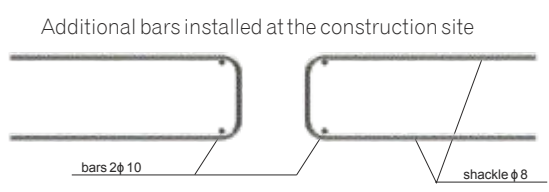
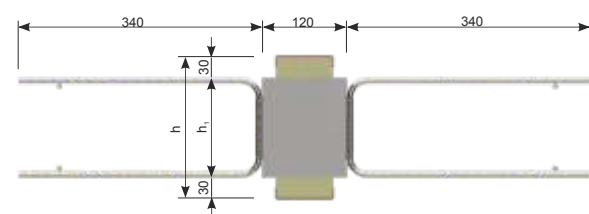
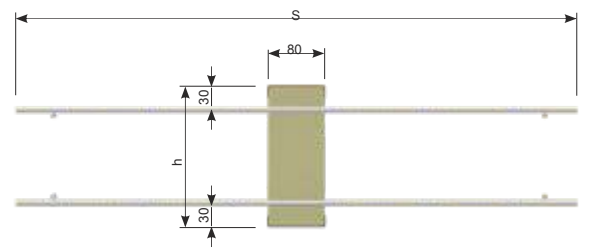
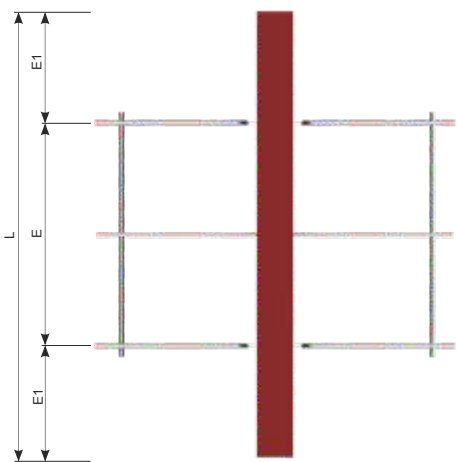
KP-504, 2, h=200 mm, XPS80, L=1000 mm

connector type quantity of steel plate



KP-500 BALCONY CONNECTOR - 20 and 30 cm module
Concrete class: \geq C25/30

Symbol	h [mm]	h _i [mm]	Quantity	Insulation 80 mm	Insulation 120 mm	Dimension [mm]		
			Plate	V _{Rd} (±) [kN]	V _{Rd} (±) [kN]	S	E	E1
KP-501 (1pl) L=200 mm	140	80	1	22	16	800	100	50
	160	100	1	27	22	800	100	50
	180	120	1	33	27	800	100	50
	200	140	1	38	31	800	100	50
	220	160	1	44	35	800	100	50
	240	180	1	49	40	800	100	50
	260	200	1	55	45	800	100	50
	280	220	1	60	48	800	100	50
	300	240	1	65	53	800	100	50
KP-502 (2pl) L=300 mm	140	80	2	43	32	800	100	50
	160	100	2	54	44	800	100	50
	180	120	2	65	54	800	100	50
	200	140	2	76	62	800	100	50
	220	160	2	87	70	800	100	50
	240	180	2	98	80	800	100	50
	260	200	2	109	90	800	100	50
	280	220	2	120	96	800	100	50
	300	240	2	130	106	800	100	50

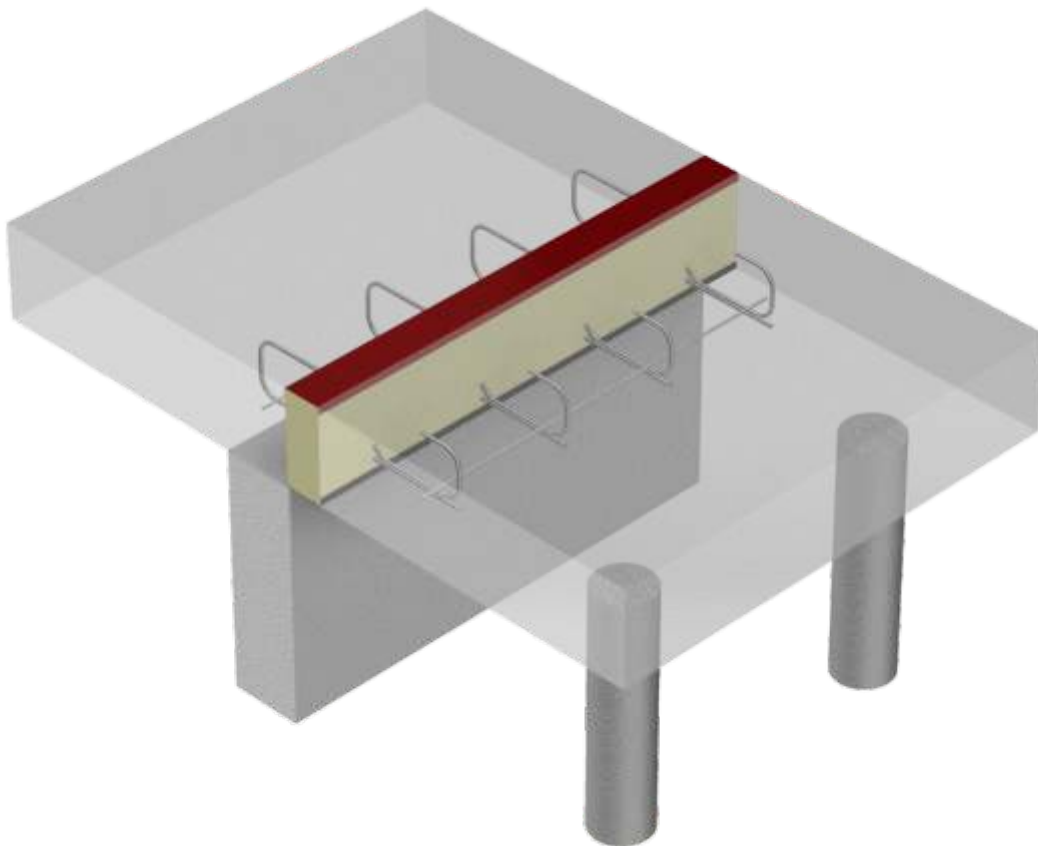


KP-500 BALCONY CONNECTOR - element 100 cm

Concrete class: \geq C25/30

Symbol	h [mm]	h ₁ [mm]	Quantity	Insulation 80 mm	Insulation 120 mm	Dimension [mm]		
			Plate	V _{Rd} (±) [kN]	V _{Rd} (±) [kN]	S	E	E1
KP-503 (1pl) L=1000 mm	140	80	1	22	16	800	-	500
	160	100	1	27	22	800	-	500
	180	120	1	33	27	800	-	500
	200	140	1	38	31	800	-	500
	220	160	1	44	35	800	-	500
	240	180	1	49	40	800	-	500
	260	200	1	55	45	800	-	500
	280	220	1	60	48	800	-	500
	300	240	1	65	53	800	-	500
KP-504 (2pl) L=1000 mm	140	80	2	43	32	800	500	250
	160	100	2	54	44	800	500	250
	180	120	2	65	54	800	500	250
	200	140	2	76	62	800	500	250
	220	160	2	87	70	800	500	250
	240	180	2	98	80	800	500	250
	260	200	2	109	90	800	500	250
	280	220	2	120	96	800	500	250
	300	240	2	130	106	800	500	250
KP-505 (3pl) L=1000 mm	140	80	3	65	48	800	333	167
	160	100	3	81	66	800	333	167
	180	120	3	98	81	800	333	167
	200	140	3	114	93	800	333	167
	220	160	3	131	105	800	333	167
	240	180	3	147	120	800	333	167
	260	200	3	164	135	800	333	167
	280	220	3	180	144	800	333	167
	300	240	3	195	159	800	333	167
KP-506 (4pl) L=1000 mm	140	80	4	86	64	800	250	125
	160	100	4	108	88	800	250	125
	180	120	4	130	108	800	250	125
	200	140	4	152	124	800	250	125
	220	160	4	174	140	800	250	125
	240	180	4	196	160	800	250	125
	260	200	4	218	180	800	250	125
	280	220	4	240	192	800	250	125
	300	240	4	260	212	800	250	125
KP-507 (5pl) L=1000 mm	140	80	5	97	72	800	200	100
	160	100	5	122	99	800	200	100
	180	120	5	146	122	800	200	100
	200	140	5	171	140	800	200	100
	220	160	5	196	158	800	200	100
	240	180	5	221	180	800	200	100
	260	200	5	245	203	800	200	100
	280	220	5	270	216	800	200	100
	300	240	5	293	239	800	200	100

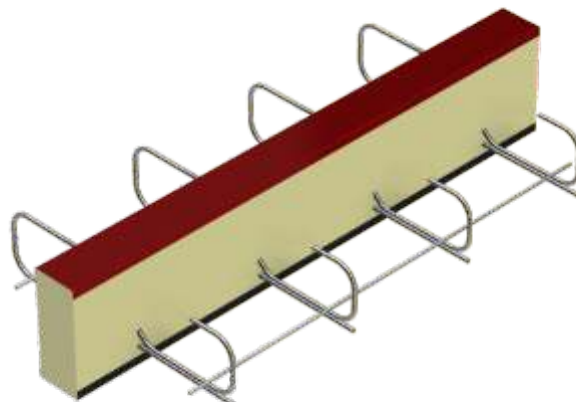
■ **KP-600 BALCONY CONNECTOR FOR ARTICULATE-SUPPORTED BALCONY SLABS**



- standard elements for ceilings of thickness between 160 mm and 300 mm
- standard insulation thickness 80 mm; options: 60 mm
- insulation type: mineral wool (WM) or styrofoam (XPS)
- reinforcement bars (rod) of stainless steel

Marking example:

KP - 604
h=200 mm, XPS80, L=1000 mm
connector type



KP-604 balcony connector

KP-600 BALCONY CONNECTOR - 20 cm module

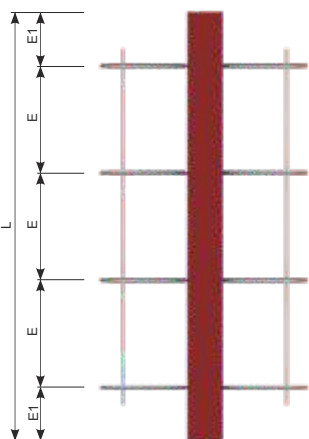
Concrete class: \geq C25/30

Symbol	h [mm]	Bar diameter Φ [mm]	Quantity	$V_{rod}(+)$ [kN]	Dimension [mm]				
			Rod		S	s11	h_1	E	E1
KP-601 L=200 mm	160	8	2	38	480	200	120	100	50
	180	8	2	38	480	200	120	100	50
	200	8	2	38	480	200	120	100	50
	220	10	2	61	720	320	160	100	50
	240	10	2	61	720	320	160	100	50
	260	10	2	61	720	320	160	100	50
	280	10	2	61	720	320	160	100	50
300	10	2	61	720	320	160	100	50	

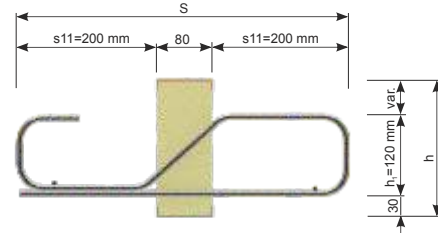
KP-600 BALCONY CONNECTOR - element 100 cm

Concrete class: \geq C25/30

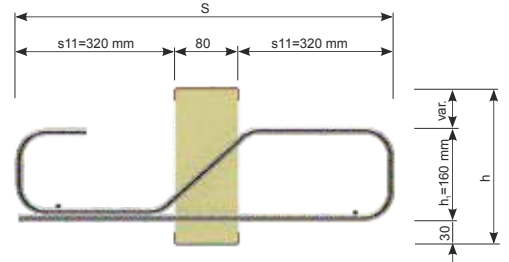
KP-602 L=1000 mm	160	8	2	38	480	200	120	400	300
	180	8	2	38	480	200	120	400	300
	200	8	2	38	480	200	120	400	300
	220	10	2	61	720	320	160	400	300
	240	10	2	61	720	320	160	400	300
	260	10	2	61	720	320	160	400	300
	280	10	2	61	720	320	160	400	300
KP-603 L=1000 mm	160	8	3	57	480	200	120	333	167
	180	8	3	57	480	200	120	333	167
	200	8	3	57	480	200	120	333	167
	220	10	3	92	720	320	160	333	167
	240	10	3	92	720	320	160	333	167
	260	10	3	92	720	320	160	333	167
	280	10	3	92	720	320	160	333	167
KP-604 L=1000 mm	160	8	4	76	480	200	120	250	125
	180	8	4	76	480	200	120	250	125
	200	8	4	76	480	200	120	250	125
	220	10	4	122	720	320	160	250	125
	240	10	4	122	720	320	160	250	125
	260	10	4	122	720	320	160	250	125
	280	10	4	122	720	320	160	250	125
KP-605 L=1000 mm	160	8	5	95	480	200	120	200	100
	180	8	5	95	480	200	120	200	100
	200	8	5	95	480	200	120	200	100
	220	10	5	153	720	320	160	200	100
	240	10	5	153	720	320	160	200	100
	260	10	5	153	720	320	160	200	100
	280	10	5	153	720	320	160	200	100
KP-606 L=1000 mm	160	8	6	113	480	200	120	167	83
	180	8	6	113	480	200	120	167	83
	200	8	6	113	480	200	120	167	83
	220	10	6	184	720	320	160	167	83
	240	10	6	184	720	320	160	167	83
	260	10	6	184	720	320	160	167	83
	280	10	6	184	720	320	160	167	83
300	10	6	184	720	320	160	167	83	



To h=200 mm



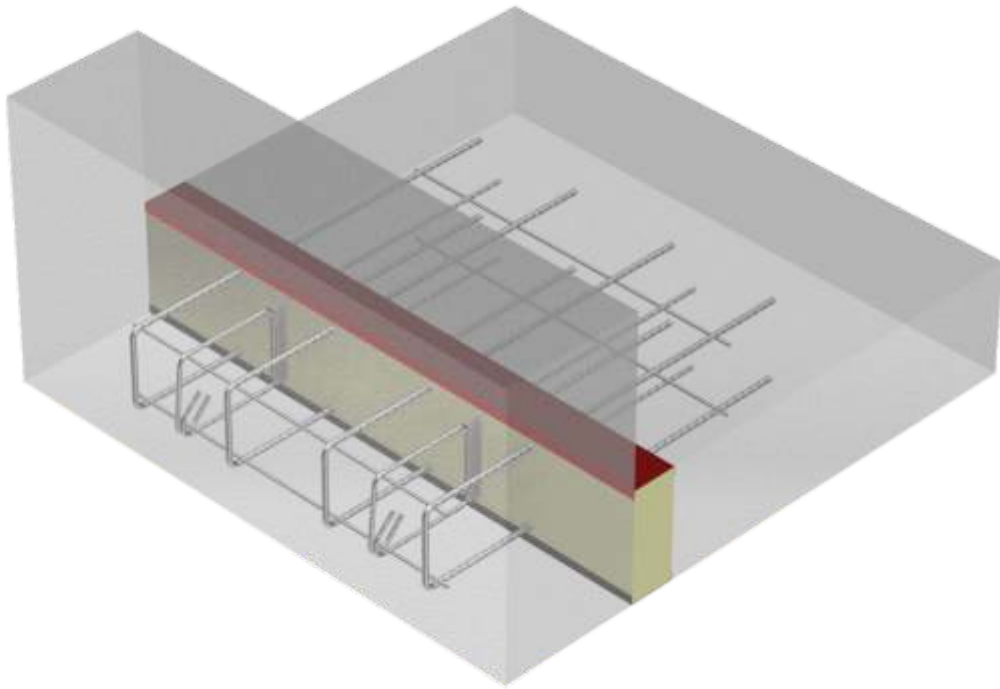
From h=220 mm



Additional bars installed at the construction site



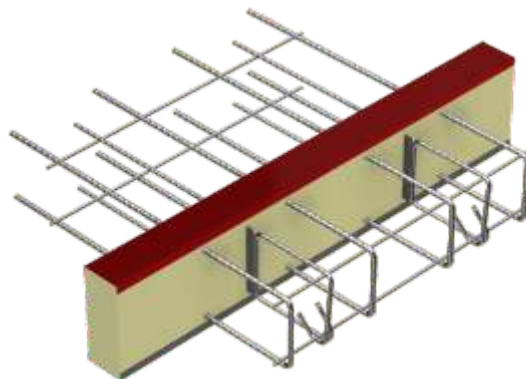
■ KP-700 BALCONY CONNECTOR FOR THE INSTALLATION OF PARAPET WALLS, LEDGES AND SHORT SUPPORTS



- standard elements for ceilings of thickness between 140 mm and 300 mm
- standard insulation thickness 80 mm; options: 60 mm, 100 mm, 120 mm
- insulation type: mineral wool (WM) or styrofoam (XPS)
- reinforcement bars (plate) of stainless steel

Marking example:

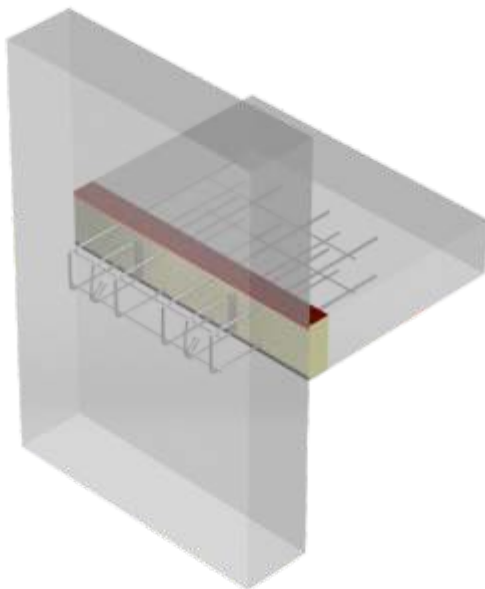
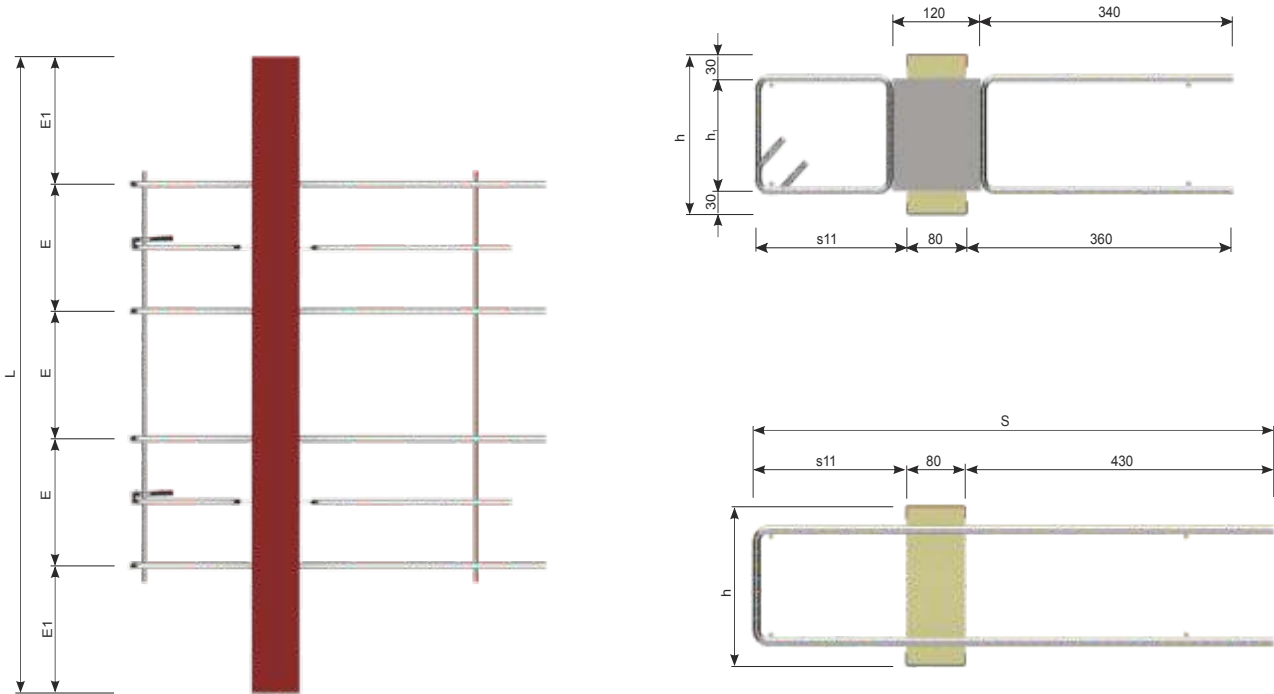
KP-704 4 x 10 - 2 h=200 mm, XPS80, L=1000 mm
connector type quantity of bars bar diameter quantity of steel plate



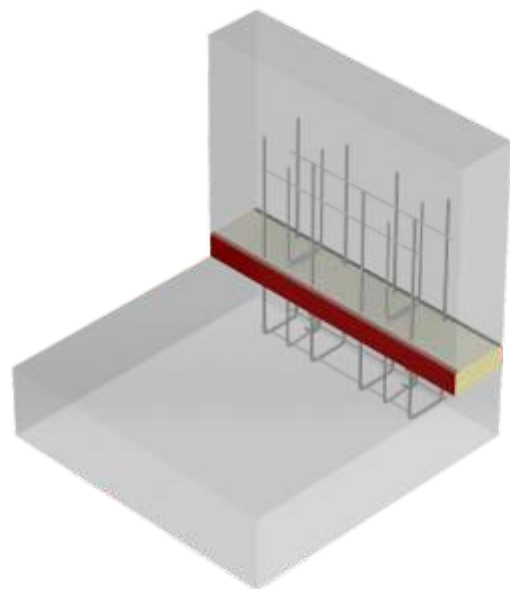
KP - 704 balcony connector (4 x 10 - 2)

KP-700 BALCONY CONNECTOR - 20 cm module										Concrete class: \geq C25/30							
Symbol	h [mm]	Bar diameter ϕ [mm]	Quantity		s11=120 mm	s11=200 mm	Insulation 80 mm	Insulation 120 mm	$M_{Rd}=0$ N_{Rd} [kN]	Dimension [mm]							
			Rod	Plate	$M_{Rd}(\pm)$ [kNm]	$M_{Rd}(\pm)$ [kNm]	$V_{Rd}(\pm)$ [kN]	$V_{Rd}(\pm)$ [kN]		s11		S		E	E1		
KP-701 2x10-1 L=200 mm	140	10	2	1	4	5	22	16	124	120	160	200	630	670	710	100	50
	160	10	2	1	5	7	27	22	124	120	160	200	630	670	710	100	50
	180	10	2	1	6	8	33	27	124	120	160	200	630	670	710	100	50
	200	10	2	1	8	10	38	31	124	120	160	200	630	670	710	100	50
	220	10	2	1	9	11	44	35	124	120	160	200	630	670	710	100	50
	240	10	2	1	11	12	49	40	124	120	160	200	630	670	710	100	50
	260	10	2	1	12	14	55	45	124	120	160	200	630	670	710	100	50
	280	10	2	1	14	15	60	48	124	120	160	200	630	670	710	100	50
300	10	2	1	15	17	65	53	124	120	160	200	630	670	710	100	50	
KP-700 BALCONY CONNECTOR - element 100 cm										Concrete class: \geq C25/30							
KP-702 2x10-1 L=1000 mm	140	10	2	1	4	5	22	16	124	120	160	200	630	670	710	400	300
	160	10	2	1	5	7	27	22	124	120	160	200	630	670	710	400	300
	180	10	2	1	6	8	33	27	124	120	160	200	630	670	710	400	300
	200	10	2	1	8	10	38	31	124	120	160	200	630	670	710	400	300
	220	10	2	1	9	11	44	35	124	120	160	200	630	670	710	400	300
	240	10	2	1	11	12	49	40	124	120	160	200	630	670	710	400	300
	260	10	2	1	12	14	55	45	124	120	160	200	630	670	710	400	300
	280	10	2	1	14	15	60	48	124	120	160	200	630	670	710	400	300
300	10	2	1	15	17	65	53	124	120	160	200	630	670	710	400	300	
KP-703 3x10-1 L=1000 mm	140	10	3	1	6	8	22	16	186	120	160	200	630	670	710	300	200
	160	10	3	1	8	10	27	22	186	120	160	200	630	670	710	300	200
	180	10	3	1	10	12	33	27	186	120	160	200	630	670	710	300	200
	200	10	3	1	12	15	38	31	186	120	160	200	630	670	710	300	200
	220	10	3	1	14	17	44	35	186	120	160	200	630	670	710	300	200
	240	10	3	1	16	19	49	40	186	120	160	200	630	670	710	300	200
	260	10	3	1	18	21	55	45	186	120	160	200	630	670	710	300	200
	280	10	3	1	21	23	60	48	186	120	160	200	630	670	710	300	200
300	10	3	1	23	26	65	53	186	120	160	200	630	670	710	300	200	
KP-704 4x10-2 L=1000 mm	140	10	4	2	8	10	43	32	248	120	160	200	630	670	710	200	200
	160	10	4	2	10	13	54	44	248	120	160	200	630	670	710	200	200
	180	10	4	2	13	16	65	54	248	120	160	200	630	670	710	200	200
	200	10	4	2	15	19	76	62	248	120	160	200	630	670	710	200	200
	220	10	4	2	18	22	87	70	248	120	160	200	630	670	710	200	200
	240	10	4	2	21	25	98	80	248	120	160	200	630	670	710	200	200
	260	10	4	2	24	28	109	90	248	120	160	200	630	670	710	200	200
	280	10	4	2	27	31	120	96	248	120	160	200	630	670	710	200	200
300	10	4	2	31	34	130	106	248	120	160	200	630	670	710	200	200	
KP-705 6x10-3 L=1000 mm	140	10	6	3	11	15	65	48	372	120	160	200	630	670	710	150	150
	160	10	6	3	15	20	81	66	372	120	160	200	630	670	710	150	150
	180	10	6	3	19	24	98	81	372	120	160	200	630	670	710	150	150
	200	10	6	3	23	29	114	93	372	120	160	200	630	670	710	150	150
	220	10	6	3	27	33	131	105	372	120	160	200	630	670	710	150	150
	240	10	6	3	32	37	147	120	372	120	160	200	630	670	710	150	150
	260	10	6	3	36	42	164	135	372	120	160	200	630	670	710	150	150
	280	10	6	3	41	46	180	144	372	120	160	200	630	670	710	150	150
300	10	6	3	46	51	195	159	372	120	160	200	630	670	710	150	150	

■ **KP-700 BALCONY CONNECTOR FOR THE INSTALLATION OF PARAPET WALLS, LEDGES AND SHORT SUPPORTS**

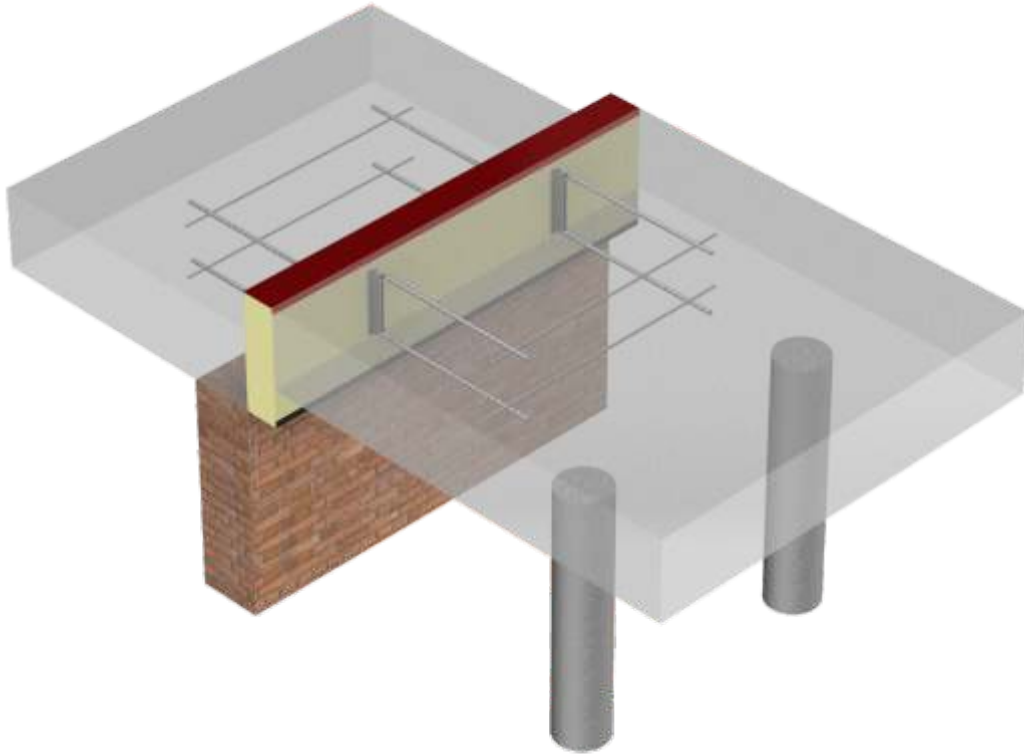


Connection of wall-support



Connection of Parapet wall-roof ceiling

■ **KP-800 BALCONY CONNECTOR FOR ARTICULATE-SUPPORTED BALCONY SLABS WITH SHIFTED BALCONY SLAB WITH RESPECT TO THE CEILING**

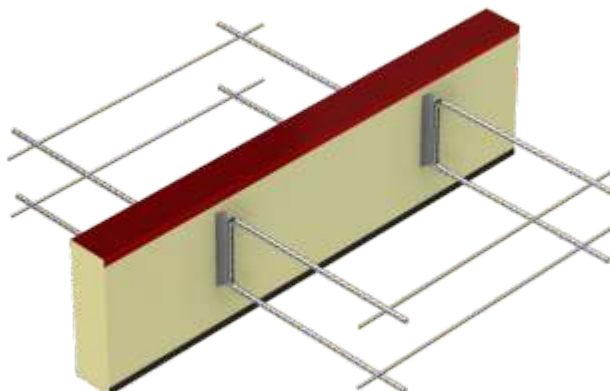


- standard elements for ceilings of thickness between 160 mm and 500 mm
- standard insulation thickness 80 mm; options: 60 mm
- insulation type: mineral wool (WM) or styrofoam (XPS)
- steel plates of stainless steel
- reinforcement bars (plate) of stainless steel

Marking example:

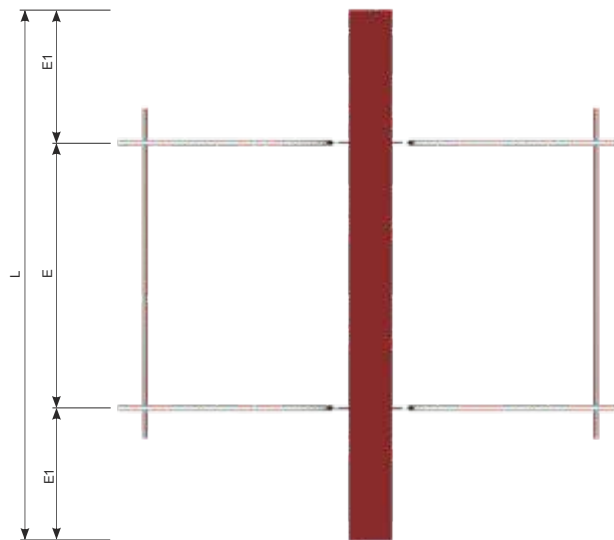
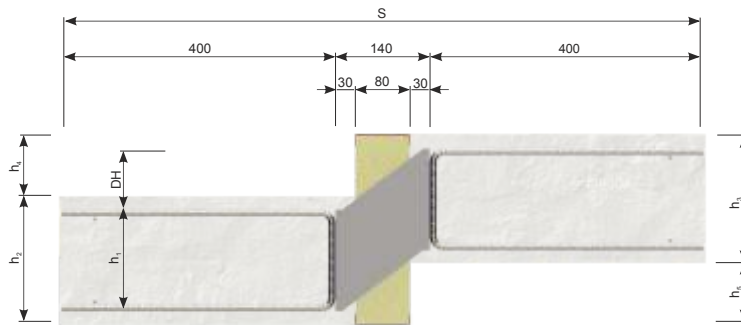
KP - 802/150, 2 DH60, XPS80, L=1000 mm

connector type quantity of steel plate

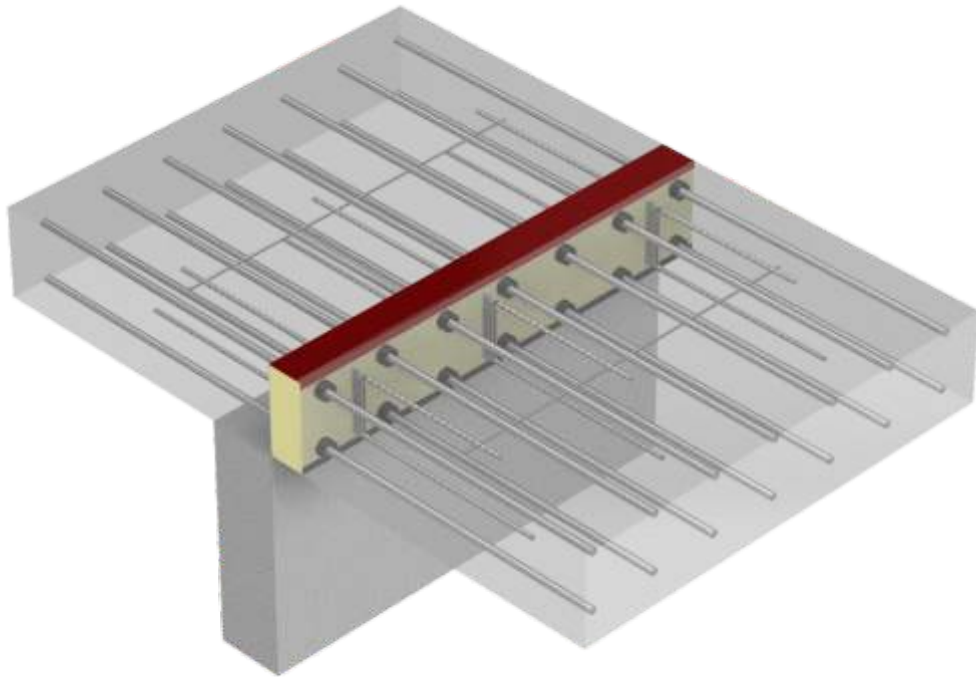


KP-800 BALCONY CONNECTOR - element 100 cm					Concrete class: \geq C25/30		
Symbol	Quantity	h_i [mm]	Shift DH [mm]	$V_{rd}(\pm)$ [kN]	Dimension [mm]		
	Plate				S	E	E1
KP-801/110 L=1000 mm	1	110	60	26	940	-	500
	1	110	90	24	940	-	500
	1	110	120	22	940	-	500
KP-801/130 L=1000 mm	1	130	60	32	940	-	500
	1	130	90	30	940	-	500
	1	130	120	27	940	-	500
KP-801/150 L=1000 mm	1	150	60	38	940	-	500
	1	150	90	36	940	-	500
	1	150	120	32	940	-	500
KP-802/110 L=1000 mm	2	110	60	52	940	500	250
	2	110	90	48	940	500	250
	2	110	120	44	940	500	250
KP-802/2-130 L=1000 mm	2	130	60	64	940	500	250
	2	130	90	59	940	500	250
	2	130	120	54	940	500	250
KP-802/150 L=1000 mm	2	150	60	76	940	500	250
	2	150	90	72	940	500	250
	2	150	120	64	940	500	250
KP-803/110 L=1000 mm	3	110	60	78	940	333	167
	3	110	90	72	940	333	167
	3	110	120	66	940	333	167
KP-803/130 L=1000 mm	3	130	60	96	940	333	167
	3	130	90	88	940	333	167
	3	130	120	81	940	333	167
KP-803/150 L=1000 mm	3	150	60	114	940	333	167
	3	150	90	108	940	333	167
	3	150	120	96	940	333	167
KP-804/110 L=1000 mm	4	110	60	104	940	250	125
	4	110	90	96	940	250	125
	4	110	120	88	940	250	125
KP-804/130 L=1000 mm	4	130	60	128	940	250	125
	4	130	90	118	940	250	125
	4	130	120	108	940	250	125
KP-804/150 L=1000 mm	4	150	60	152	940	250	125
	4	150	90	144	940	250	125
	4	150	120	128	940	250	125
KP-805/110 L=1000 mm	5	110	60	130	940	200	100
	5	110	90	120	940	200	100
	5	110	120	110	940	200	100
KP-805/130 L=1000 mm	5	130	60	160	940	200	100
	5	130	90	148	940	200	100
	5	130	120	135	940	200	100
KP-805/150 L=1000 mm	5	150	60	190	940	200	100
	5	150	90	180	940	200	100
	5	150	120	160	940	200	100
KP-806/110 L=1000 mm	6	110	60	156	940	167	82
	6	110	90	144	940	167	82
	6	110	120	132	940	167	82
KP-806/130 L=1000 mm	6	130	60	192	940	167	82
	6	130	90	180	940	167	82
	6	130	120	162	940	167	82
KP-806/150 L=1000 mm	6	150	60	228	940	167	82
	6	150	90	216	940	167	82
	6	150	120	192	940	167	82

■ **KP-800 BALCONY CONNECTOR FOR ARTICULATE-SUPPORTED BALCONY SLABS WITH SHIFTED BALCONY SLAB WITH RESPECT TO THE CEILING**



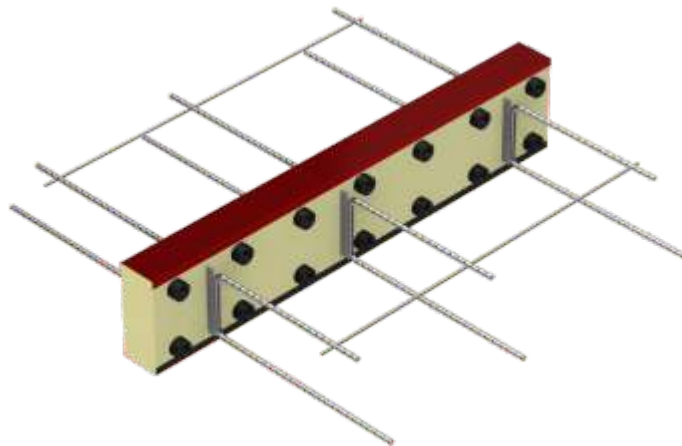
■ KP-900 BALCONY CONNECTOR FOR SUPPORT BALCONY SLABS



- standard elements for ceilings of thickness between 160 mm and 300 mm
- standard insulation thickness 80 mm; options: 60 mm
- insulation type: mineral wool (WM) or styrofoam (XPS)
- steel plates of stainless steel
- PVC pipe (inner diameter 24 mm, outer diameter 36 mm)

Marking example:

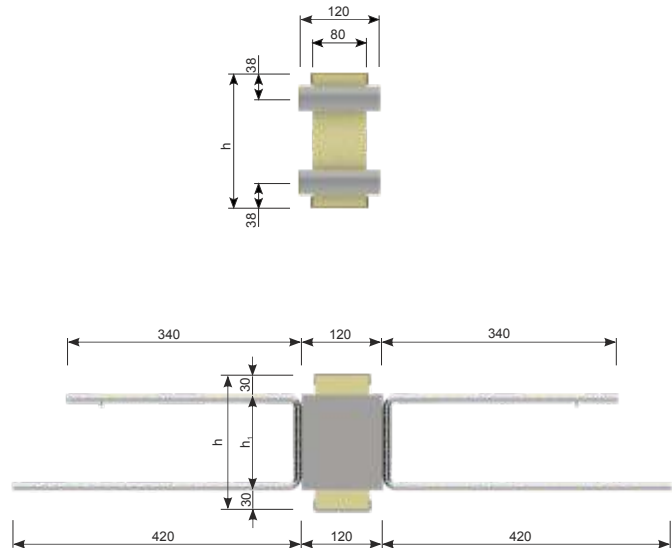
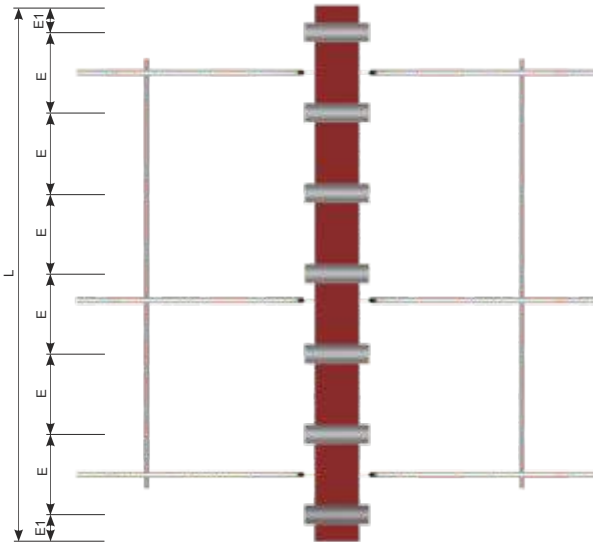
KP-903, 3, h=200 mm, XPS80, L=1000 mm
connector type quantity of steel plate



KP-900 BALCONY CONNECTOR - element 100 cm										Concrete class: \geq C25/30	
Symbol	Ilość	h [mm]	h ₁ [mm]	V _{Rd} (±) [kN]	Pręty dostarczane we własnym zakresie M _{Rd} (2x7 prętów) [kNm]				Wymiar [mm]		
	Płytki				10	12	14	16	S	E	E1
KP-901 L=1000 mm	1	160	100	27	20	28	37	47	960	150	50
	1	180	120	32	24	34	46	59	960	150	50
	1	200	140	38	29	41	55	71	960	150	50
	1	220	160	44	34	48	65	83	960	150	50
	1	240	180	49	39	55	74	96	960	150	50
	1	260	200	55	44	62	83	106	960	150	50
	1	280	220	60	48	69	93	120	960	150	50
KP-902 L=1000 mm	1	300	240	65	53	76	102	132	960	150	50
	2	160	100	54	20	28	37	47	960	150	50
	2	180	120	65	24	34	46	59	960	150	50
	2	200	140	76	29	41	55	71	960	150	50
	2	220	160	87	34	48	65	83	960	150	50
	2	240	180	98	39	55	74	96	960	150	50
	2	260	200	109	44	62	83	106	960	150	50
KP-903 L=1000 mm	2	280	220	120	48	69	93	120	960	150	50
	2	300	240	130	53	76	102	132	960	150	50
	3	160	100	81	20	28	37	47	960	150	50
	3	180	120	98	24	34	46	59	960	150	50
	3	200	140	114	29	41	55	71	960	150	50
	3	220	160	131	34	48	65	83	960	150	50
	3	240	180	147	39	55	74	96	960	150	50
KP-904 L=1000 mm	3	260	200	164	44	62	83	106	960	150	50
	3	280	220	180	48	69	93	120	960	150	50
	3	300	240	195	53	76	102	132	960	150	50
	4	160	100	108	20	28	37	47	960	150	50
	4	180	120	130	24	34	46	59	960	150	50
	4	200	140	152	29	41	55	71	960	150	50
	4	220	160	174	34	48	65	83	960	150	50
KP-905 L=1000 mm	4	240	180	196	39	55	74	96	960	150	50
	4	260	200	218	44	62	83	106	960	150	50
	4	280	220	240	48	69	93	120	960	150	50
	4	300	240	260	53	76	102	132	960	150	50
	5	160	100	122	20	28	37	47	960	150	50
	5	180	120	146	24	34	46	59	960	150	50
	5	200	140	171	29	41	55	71	960	150	50
KPE-906 L=1000 mm	5	220	160	196	34	48	65	83	960	150	50
	5	240	180	221	39	55	74	96	960	150	50
	5	260	200	245	44	62	83	106	960	150	50
	5	280	220	270	48	69	93	120	960	150	50
	5	300	240	293	53	76	102	132	960	150	50
	2	160	80	43	12	17	22	27	960	150	50
	2	180	100	54	17	23	31	39	960	150	50
KPE-907 L=1000 mm	2	200	120	65	22	30	40	51	960	150	50
	2	220	140	76	26	37	50	64	960	150	50
	2	240	160	87	31	44	59	76	960	150	50
	2	260	180	98	36	51	68	88	960	150	50
	2	280	200	109	41	58	78	100	960	150	50
	2	300	220	120	45	65	87	113	960	150	50
	2	160	80	86	12	17	22	27	960	150	50
KPE-907 L=1000 mm	2	180	100	108	17	23	31	39	960	150	50
	2	200	120	130	22	30	40	51	960	150	50
	2	220	140	152	26	37	50	64	960	150	50
	2	240	160	174	31	44	59	76	960	150	50
	2	260	180	196	36	51	68	88	960	150	50
	2	280	200	218	41	58	78	100	960	150	50
	2	300	220	240	45	65	87	113	960	150	50

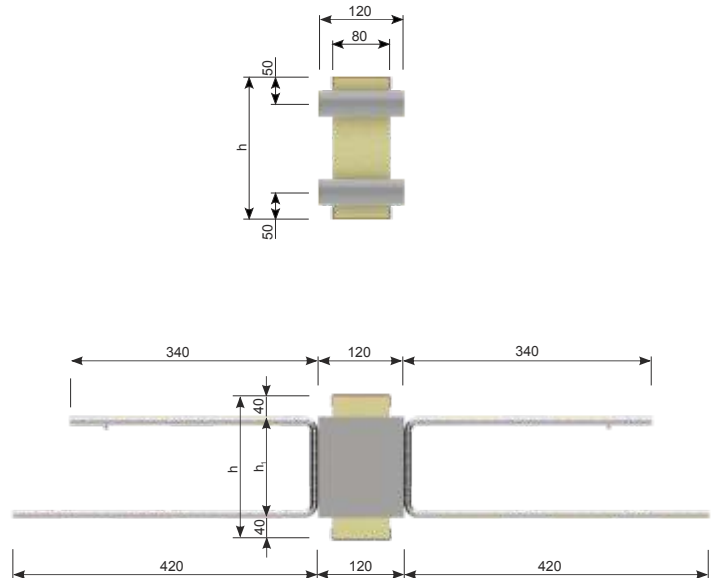
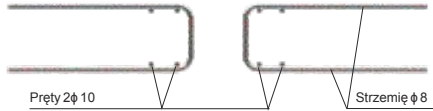
■ KP-900 BALCONY CONNECTOR FOR SUPPORT BALCONY SLABS

Elements KP-901 - KP-905

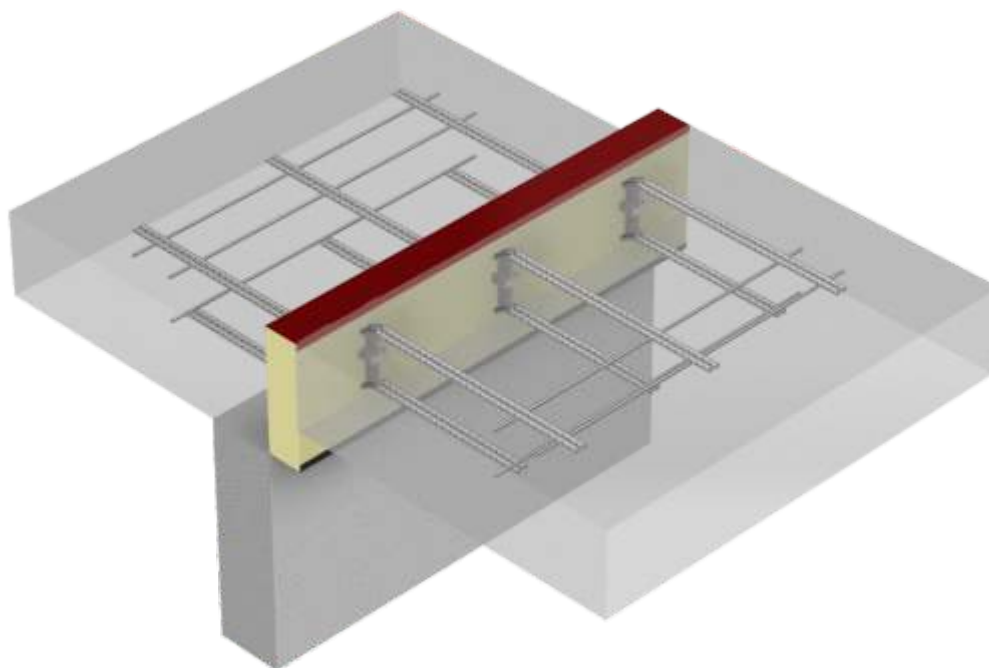


Corner elements KPE-906 - KPE-907

Additional bars installed at the construction site



■ **KP-1000 BALCONY CONNECTOR FOR SUPPORT BALCONY SLABS WITH SHIFTED BALCONY SLAB WITH RESPECT TO THE CEILING**

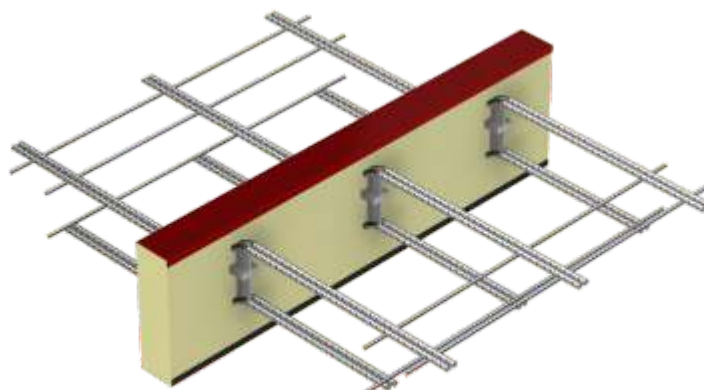


- standard elements for ceilings of thickness between 160 mm and 500 mm
- standard insulation thickness 80 mm; options: 60 mm
- insulation type: mineral wool (WM) or styrofoam (XPS)
- steel plates of stainless steel
- bars $\phi 12$ mm of stainless steel

Marking example:

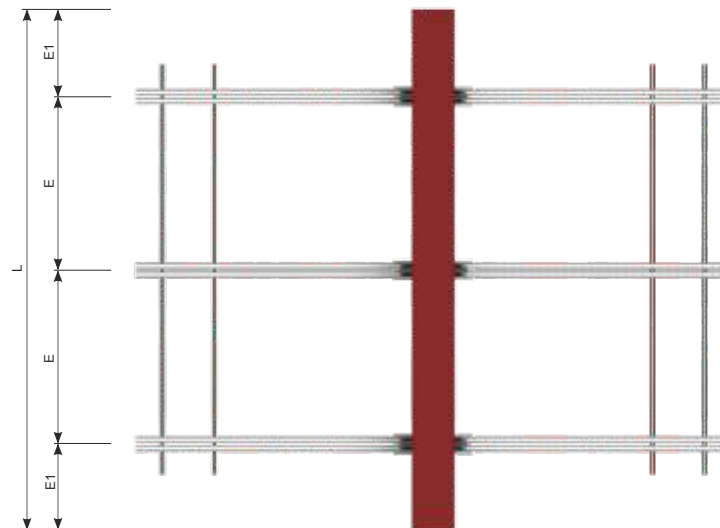
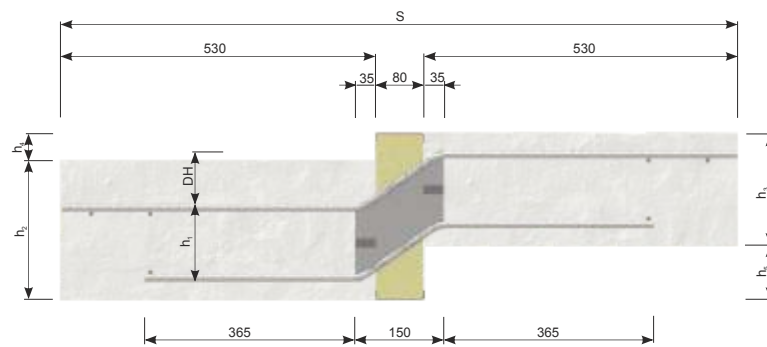
KP - 1003/110, 3 DH60, XPS80, L=1000 mm

connector type quantity of steel plate



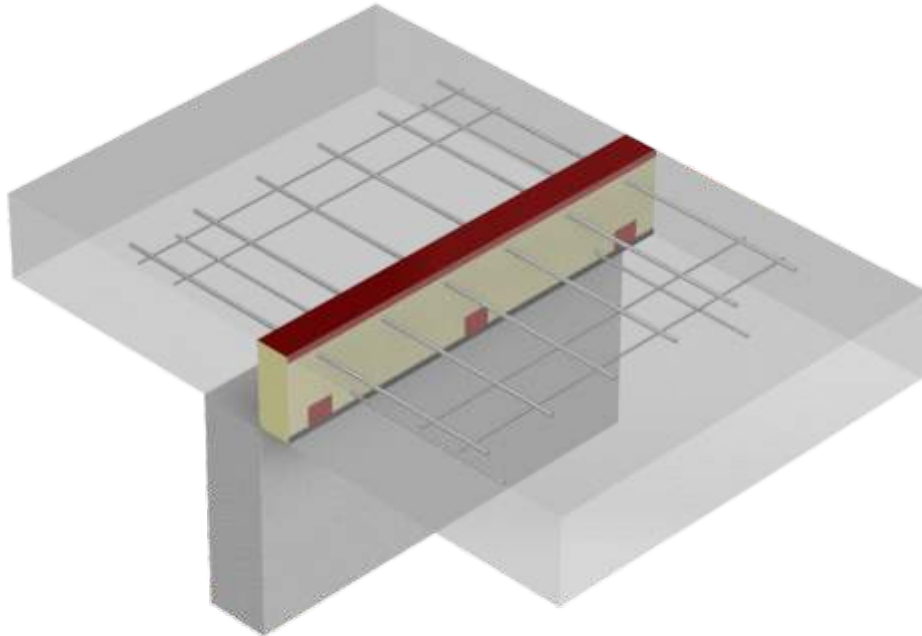
KP - 1003/110 balcony connector (3pl) DH60

KP-1000 BALCONY CONNECTOR - 20 cm module						Concrete class: \geq C25/30		
Symbol	Quantity	h_1 [mm]	Shift DH [mm]	$M_{rd}(\pm)$ [kNm]	$V_{rd}(\pm)$ [kN]	Dimension [mm]		
	Plate					S	E	E1
KP-1001/110 L=200 mm	1	110	60	14	26	1140	-	-
	1	110	90	12,5	24	1140	-	-
	1	110	120	11	22	1140	-	-
KP-1001/130 L=200 mm	1	130	60	16	32	1140	-	-
	1	130	90	14	30	1140	-	-
	1	130	120	12	27	1140	-	-
KP-1001/150 L=200 mm	1	150	60	19	38	1140	-	-
	1	150	90	17	36	1140	-	-
	1	150	120	15	32	1140	-	-



KP-1000 BALCONY CONNECTOR - element 100 cm						Concrete class: \geq C25/30		
Symbol	Quantity	h, [mm]	Shift DH [mm]	M _{rd} (±) [kNm]	V _{rd} (±) [kN]	Dimension [mm]		
	Plate					S	E	E1
KP-1002/110 L=1000 mm	2	110	60	28	52	1140	500	250
	2	110	90	25	48	1140	500	250
	2	110	120	22	44	1140	500	250
KP-1002/130 L=1000 mm	2	130	60	32	64	1140	500	250
	2	130	90	28	60	1140	500	250
	2	130	120	24	54	1140	500	250
KP-1002/150 L=1000 mm	2	150	60	38	76	1140	500	250
	2	150	90	34	72	1140	500	250
	2	150	120	30	64	1140	500	250
KP-1003/110 L=1000 mm	3	110	60	42	78	1140	333	167
	3	110	90	37,5	72	1140	333	167
	3	110	120	33	66	1140	333	167
KP-1003/130 L=1000 mm	3	130	60	48	96	1140	333	167
	3	130	90	42	90	1140	333	167
	3	130	120	36	81	1140	333	167
KP-1003/150 L=1000 mm	3	150	60	57	114	1140	333	167
	3	150	90	51	108	1140	333	167
	3	150	120	45	96	1140	333	167
KP-1004/110 L=1000 mm	4	110	60	56	104	1140	250	125
	4	110	90	50	96	1140	250	125
	4	110	120	44	88	1140	250	125
KP-1004/130 L=1000 mm	4	130	60	64	128	1140	250	125
	4	130	90	56	120	1140	250	125
	4	130	120	48	108	1140	250	125
KP-1004/150 L=1000 mm	4	150	60	76	152	1140	250	125
	4	150	90	68	144	1140	250	125
	4	150	120	60	128	1140	250	125
KP-1005/110 L=1000 mm	5	110	60	70	130	1140	200	100
	5	110	90	62,5	120	1140	200	100
	5	110	120	55	110	1140	200	100
KP-1005/130 L=1000 mm	5	130	60	80	160	1140	200	100
	5	130	90	70	150	1140	200	100
	5	130	120	60	135	1140	200	100
KP-1005/150 L=1000 mm	5	150	60	95	190	1140	200	100
	5	150	90	85	180	1140	200	100
	5	150	120	75	160	1140	200	100
KP-1006/110 L=1000 mm	6	110	60	84	156	1140	167	82
	6	110	90	75	144	1140	167	82
	6	110	120	66	132	1140	167	82
KP-1006/130 L=1000 mm	6	130	60	96	192	1140	167	82
	6	130	90	84	180	1140	167	82
	6	130	120	72	162	1140	167	82
KP-1006/150 L=1000 mm	6	150	60	114	228	1140	167	82
	6	150	90	102	216	1140	167	82
	6	150	120	90	192	1140	167	82

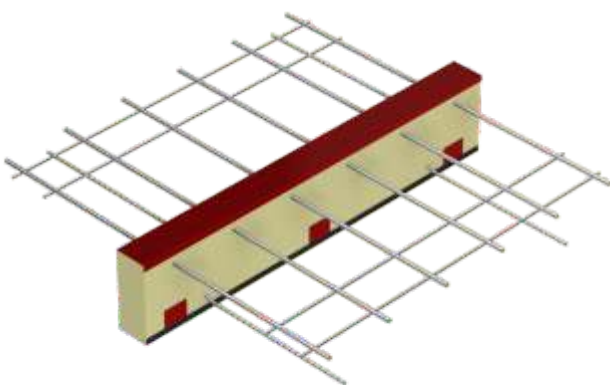
■ KP-1100 BALCONY CONNECTOR FOR SUPPORT BALCONY SLABS



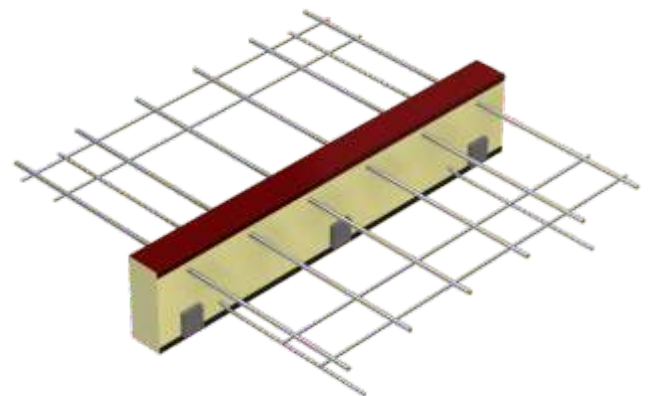
- standard elements for ceilings of thickness between 160 mm and 300 mm
- standard insulation thickness 80 mm; options: 60 mm, 100 mm, 120 mm
- insulation type: mineral wool (WM) or styrofoam (XPS)
- reinforcement bars and rod of stainless steel
- stainless steel compression bearing (for 16 cm thick ceilings) or concrete compression bearing (for ceiling thickness values 18 cm and upwards)

Marking example:

KP-1104 , 6 , \times , 10 , $-$, 2 , $h=200$ mm, XPS80, L=1000 mm
connector type quantity of bars bar diameter quantity of rod



KP-1104 balcony connector (6 x 10 - 2) with concrete compression bearings

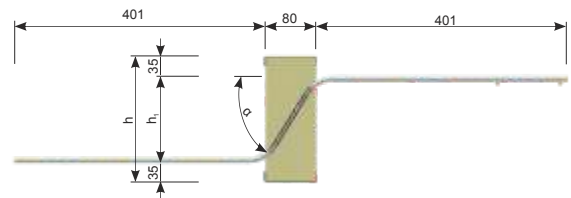
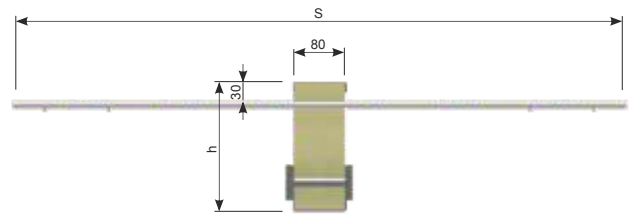
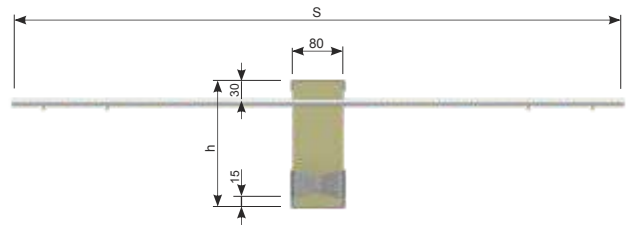
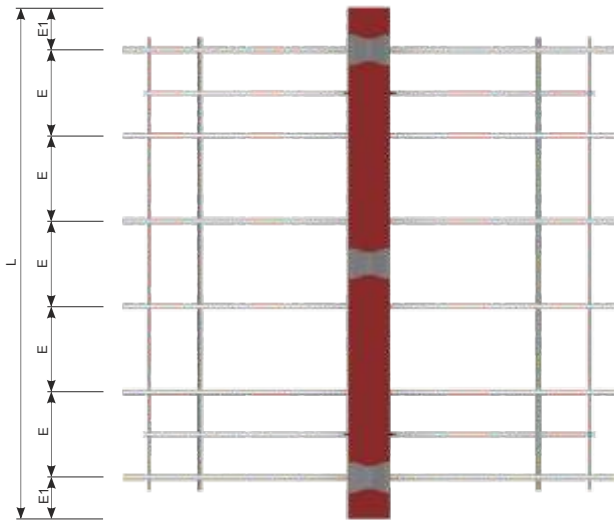


KP-1104 balcony connector (6 x 10 - 2) with steel compression bearings

KP-1100 BALCONY CONNECTOR - 20 and 30 cm module

Concrete class: \geq C25/30

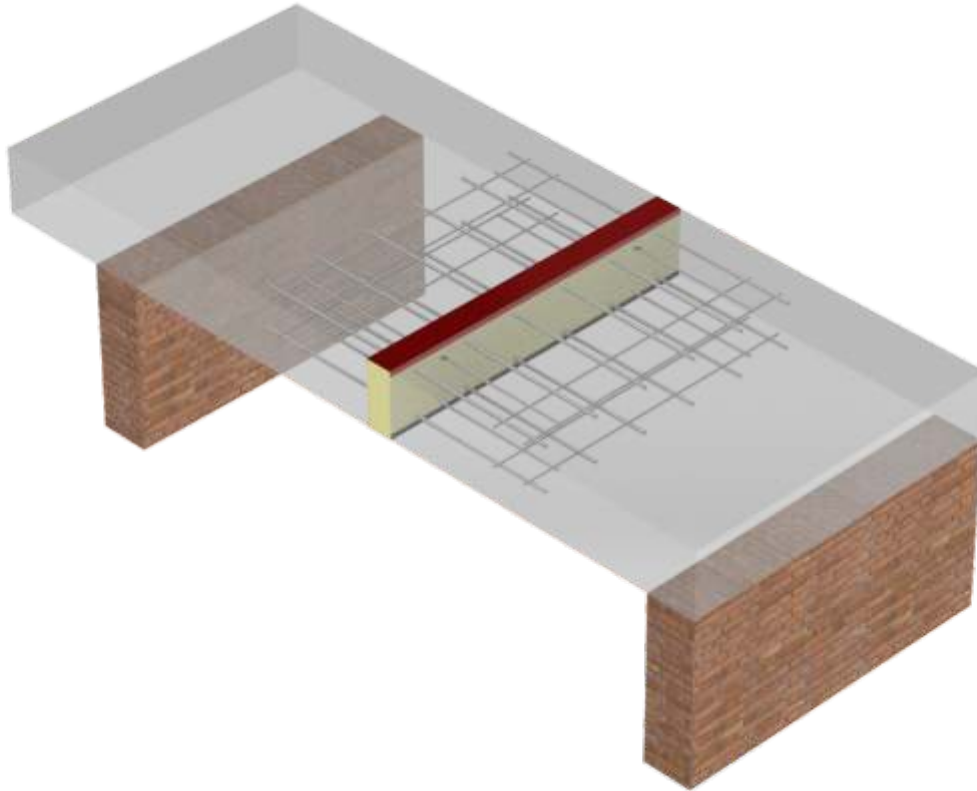
Symbol	h [mm]	h ₁ [mm]	Bar diameter ϕ [mm]	Quantity		M _{rd} (-) [kNm]	Insulation 80 mm			Insulation 120 mm			Dimension [mm]		
				Bars	Rod		V _{rd} (+) [kN]	Rigidity k [kNm/rad]	Ψ [W/mK]	V _{rd} (+) [kN]	Rigidity k [kNm/rad]	Ψ [W/mK]	S	E	E1
KP-1101 2x10-1 L=200 mm	160	90	10	2	1	8	17	420	0,060	13	373	0,031	960	100	50
	180	110	10	2	1	10	19	636	0,063	16	565	0,039	960	100	50
	200	130	10	2	1	11	21	895	0,066	18	796	0,047	960	100	50
	220	150	10	2	1	13	22	1 200	0,072	19	1066	0,056	960	100	50
	240	170	10	2	1	15	23	1 548	0,080	21	1376	0,064	960	100	50
	260	190	10	2	1	17	24	1 941	0,088	22	1725	0,073	960	100	50
	280	210	10	2	1	18	25	2 379	0,096	23	2114	0,081	960	100	50
300	230	10	2	1	20	25	2 860	0,110	23	2543	0,09	960	100	50	
KP-1102 2x14-2 L=300 mm	160	90	14	2	2	15	34	823	0,109	27	732	0,059	1280	200	50
	180	110	14	2	2	19	38	1 245	0,116	32	1107	0,067	1280	200	50
	200	130	14	2	2	22	42	1 754	0,123	36	1559	0,076	1280	200	50
	220	150	14	2	2	26	45	2 350	0,130	39	2089	0,085	1280	200	50
	240	170	14	2	2	29	47	3 033	0,137	41	2696	0,095	1280	200	50
	260	190	14	2	2	33	48	3 803	0,144	44	3381	0,104	1280	200	50
	280	210	14	2	2	36	50	4 660	0,151	45	4143	0,114	1280	200	50
300	230	14	2	2	40	51	5 604	0,158	47	4982	0,123	1280	200	50	



KP-1100 BALCONY CONNECTOR - element 100 cm
Concrete class: ≥ C25/30

Symbol	h [mm]	h _i [mm]	Bar diameter ϕ [mm]	Quantity		M _{rd} (-) [kNm]	Insulation 80 mm			Insulation 120 mm			Dimension [mm]		
				Bars	Rod		V _{rd} (+) [kN]	Rigidity k [kNm/rad]	Ψ [W/mK]	V _{rd} (+) [kN]	Rigidity k [kNm/rad]	Ψ [W/mK]	S	E	E1
KP-1103 4x10-1 L=1000 mm	160	90	10	4	1	15	17	839	0,115	13	746	0,079	960	250	125
	180	110	10	4	1	19	19	1 269	0,122	16	1128	0,089	960	250	125
	200	130	10	4	1	23	21	1 788	0,129	18	1590	0,099	960	250	125
	220	150	10	4	1	26	22	2 396	0,136	19	2130	0,108	960	250	125
	240	170	10	4	1	30	23	3 092	0,143	21	2749	0,117	960	250	125
	260	190	10	4	1	33	24	3 877	0,151	22	3447	0,125	960	250	125
	280	210	10	4	1	37	25	4 751	0,155	23	4223	0,134	960	250	125
KP-1104 6x10-2 L=1000 mm	160	90	10	6	2	23	34	1 259	0,155	27	1119	0,088	960	167	83
	180	110	10	6	2	28	38	1 904	0,164	32	1693	0,098	960	167	83
	200	130	10	6	2	34	42	2 683	0,173	36	2385	0,128	960	167	83
	220	150	10	6	2	39	45	3 594	0,182	39	3195	0,135	960	167	83
	240	170	10	6	2	44	47	4 639	0,191	41	4123	0,142	960	167	83
	260	190	10	6	2	50	48	5 816	0,198	44	5170	0,149	960	167	83
	280	210	10	6	2	55	50	7 127	0,206	45	6335	0,156	960	167	83
KP-1105 4x14-3 L=1000 mm	160	90	14	4	3	30	50	1646	0,174	40	746	0,135	1280	250	125
	180	110	14	4	3	37	57	2490	0,179	47	1464	0,141	1280	250	125
	200	130	14	4	3	44	63	3508	0,183	53	2214	0,147	1280	250	125
	220	150	14	4	3	51	67	4700	0,188	58	3119	0,153	1280	250	125
	240	170	14	4	3	58	70	6067	0,192	62	4178	0,159	1280	250	125
	260	190	14	4	3	65	73	7607	0,197	65	5392	0,166	1280	250	125
	280	210	14	4	3	72	75	9321	0,201	68	6761	0,172	1280	250	125
KP-1106 6x14-4 L=1000 mm	160	90	14	6	4	45	67	2470	0,225	54	2195	0,150	1280	167	83
	180	110	14	6	4	56	76	3736	0,234	63	3321	0,165	1280	167	83
	200	130	14	6	4	66	84	5263	0,243	71	4678	0,179	1280	167	83
	220	150	14	6	4	77	89	7051	0,252	78	6267	0,193	1280	167	83
	240	170	14	6	4	87	93	9100	0,263	83	8089	0,207	1280	167	83
	260	190	14	6	4	98	97	11410	0,270	87	10142	0,221	1280	167	83
	280	210	14	6	4	108	99	13981	0,277	91	12428	0,235	1280	167	83
KP-1107 8x14-4 L=1000 mm	160	90	14	8	4	61	67	3293	0,271	54	2927	0,194	1280	125	63
	180	110	14	8	4	74	76	4981	0,280	63	4427	0,207	1280	125	63
	200	130	14	8	4	88	84	7017	0,289	71	6237	0,220	1280	125	63
	220	150	14	8	4	102	89	9401	0,298	78	8356	0,233	1280	125	63
	240	170	14	8	4	116	93	12133	0,310	83	10785	0,246	1280	125	63
	260	190	14	8	4	130	97	15213	0,321	87	13523	0,259	1280	125	63
	280	210	14	8	4	144	99	18641	0,333	91	16570	0,272	1280	125	63
KP-1108 10x14-5 L=1000 mm	160	90	14	10	5	76	84	4116	0,301	67	3659	0,221	1280	100	50
	180	110	14	10	5	93	96	6226	0,312	79	5534	0,237	1280	100	50
	200	130	14	10	5	111	105	8771	0,324	89	7797	0,253	1280	100	50
	220	150	14	10	5	128	111	11751	0,336	97	10446	0,269	1280	100	50
	240	170	14	10	5	145	117	15166	0,348	104	13481	0,285	1280	100	50
	260	190	14	10	5	163	121	19017	0,360	109	16904	0,301	1280	100	50
	280	210	14	10	5	180	124	23302	0,372	113	20713	0,317	1280	100	50
	300	230	14	10	5	198	127	28022	0,383	117	24909	0,333	1280	100	50

■ **KP-1200 BALCONY CONNECTOR FOR BALCONY SLABS ENTERING THE CEILING**

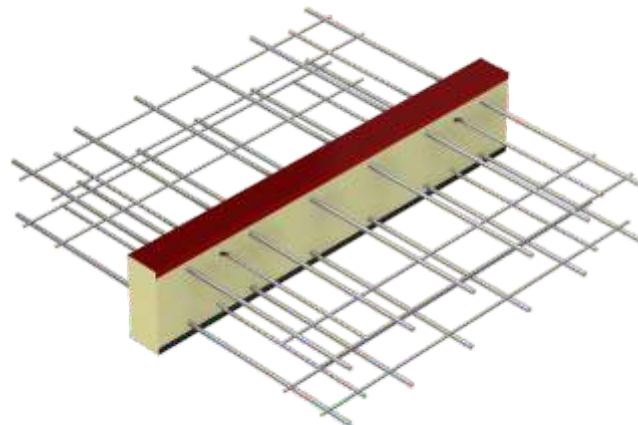


- standard elements for ceilings of thickness between 160 mm and 300 mm
- standard insulation thickness 80 mm; options: 60 mm, 100 mm, 120 mm
- insulation type: mineral wool (WM) or styrofoam (XPS)
- reinforcement bars of stainless steel

Marking example:

KP-1204, 6 x 10 - 2, h=200 mm, XPS80, L=1000 mm

connector quantity bar quantity
type of bars diameter of rod

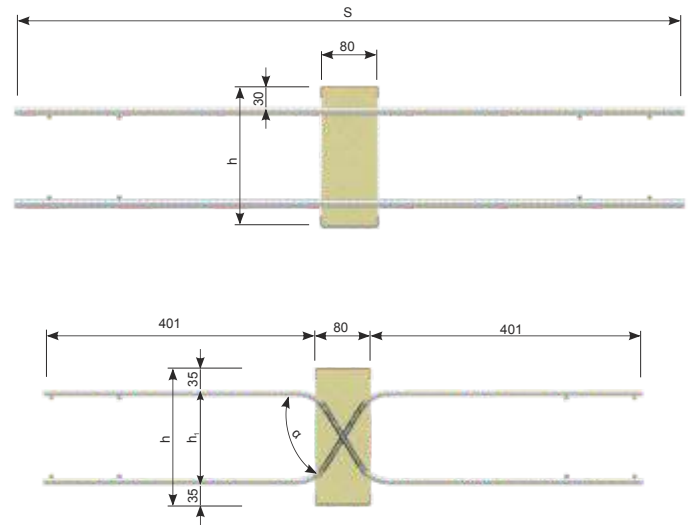
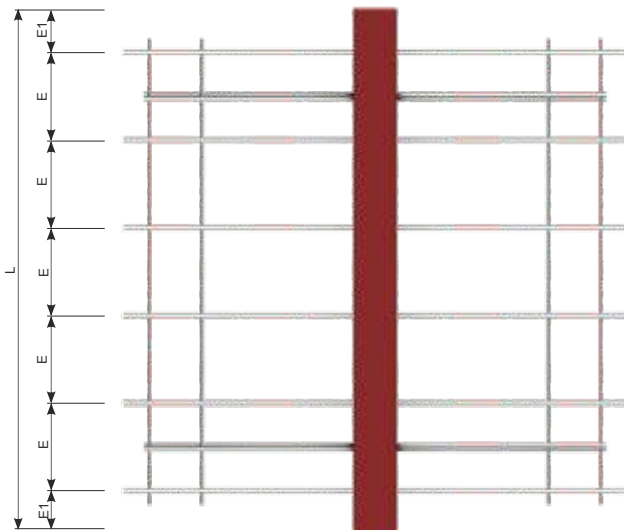


KP-1204 balcony connector (6 x 10 - 2)

KP-1200 BALCONY CONNECTOR - 20 and 30 cm module

 Concrete class: \geq C25/30

Symbol	h [mm]	h ₁ [mm]	Bar diameter ϕ [mm]	Quantity		M _{rd} (-) [kNm]	Insulation 80 mm			Insulation 120 mm			Dimension [mm]		
				Bars	Rod		V _{rd} (+) [kN]	Rigidity k [kNm/rad]	Ψ [W/mK]	V _{rd} (+) [kN]	Rigidity k [kNm/rad]	Ψ [W/mK]	S	E	E1
KP-1201 2x10-1 L=200 mm	160	90	10	2	1+1	7	15	258	0,062	12	219	0,036	960	100	50
	180	110	10	2	1+1	9	17	404	0,064	14	342	0,040	960	100	50
	200	130	10	2	1+1	11	19	581	0,066	16	492	0,044	960	100	50
	220	150	10	2	1+1	12	21	791	0,068	18	670	0,048	960	100	50
	240	170	10	2	1+1	14	22	1 034	0,071	19	875	0,053	960	100	50
	260	190	10	2	1+1	16	23	1 308	0,073	21	1 107	0,057	960	100	50
	280	210	10	2	1+1	18	24	1 615	0,076	22	1 366	0,062	960	100	50
	300	230	10	2	1+1	20	24	1 954	0,078	23	1 653	0,066	960	100	50
KP-1202 2x14-2 L=300 mm	160	90	14	2	2+2	13	30	457	0,085	24	387	0,038	1280	200	50
	180	110	14	2	2+2	17	35	729	0,087	29	617	0,045	1280	200	50
	200	130	14	2	2+2	20	39	1 064	0,089	33	901	0,052	1280	200	50
	220	150	14	2	2+2	24	42	1 463	0,091	36	1 238	0,059	1280	200	50
	240	170	14	2	2+2	27	44	1 925	0,093	39	1 629	0,067	1280	200	50
	260	190	14	2	2+2	31	46	2 450	0,094	41	2 073	0,074	1280	200	50
	280	210	14	2	2+2	34	48	3 039	0,096	43	2 571	0,082	1280	200	50
	300	230	14	2	2+2	38	49	3 690	0,098	45	3 123	0,089	1280	200	50

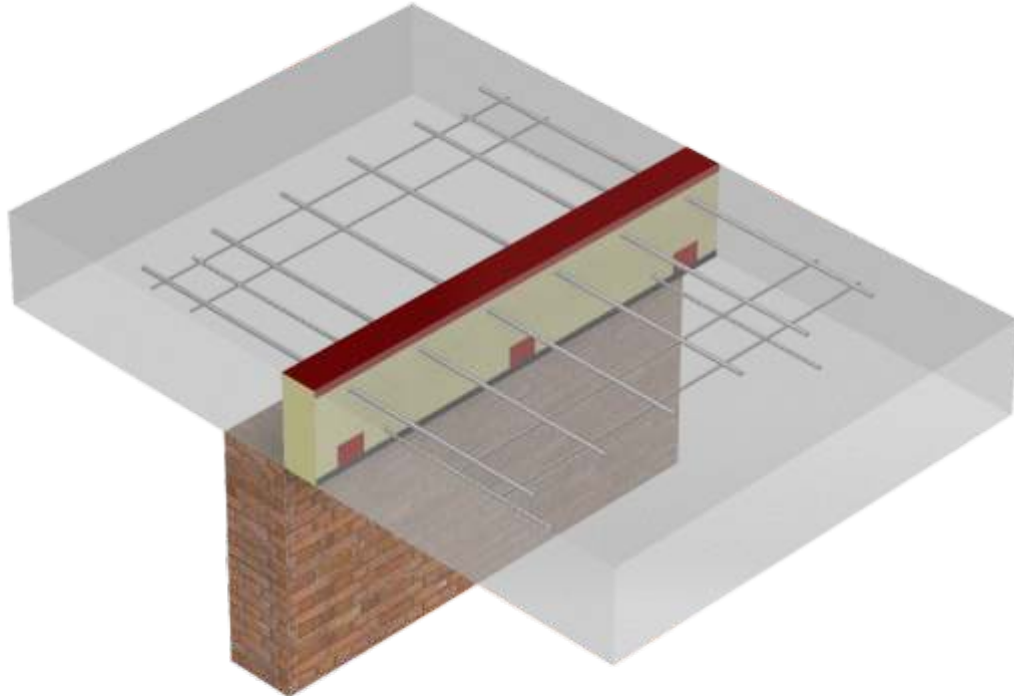


KP-1200 BALCONY CONNECTOR - element 100 cm

Concrete class: \geq C25/30

Symbol	h [mm]	h _i [mm]	Bar diameter ϕ [mm]	Quantity		M _{rd} (-) [kNm]	Insulation 80 mm			Insulation 120 mm			Dimension [mm]		
				Bars	Rod		V _{rd} (+) [kN]	Rigidity k [kNm/rad]	Ψ [W/mK]	V _{rd} (+) [kN]	Rigidity k [kNm/rad]	Ψ [W/mK]	S	E	E1
KP-1203 4x10-1 L=1000 mm	160	90	10	4	1+1	14	15	516	0,097	12	437	0,045	960	250	125
	180	110	10	4	1+1	18	17	806	0,099	14	682	0,053	960	250	125
	200	130	10	4	1+1	21	19	1 161	0,101	16	983	0,061	960	250	125
	220	150	10	4	1+1	25	21	1 581	0,103	18	1 337	0,069	960	250	125
	240	170	10	4	1+1	28	22	2 064	0,106	19	1 747	0,077	960	250	125
	260	190	10	4	1+1	32	23	2 613	0,108	21	2 211	0,085	960	250	125
	280	210	10	4	1+1	35	24	3 226	0,111	22	2 729	0,093	960	250	125
300	230	10	4	1+1	39	24	3 903	0,113	22	3 303	0,101	960	250	125	
KP-1204 6x10-2 L=1000 mm	160	90	10	6	2+2	21	30	774	0,136	24	655	0,060	960	167	83
	180	110	10	6	2+2	27	35	1 210	0,137	29	1 024	0,078	960	167	83
	200	130	10	6	2+2	32	39	1 742	0,138	33	1 474	0,096	960	167	83
	220	150	10	6	2+2	37	42	2 371	0,139	36	2 006	0,104	960	167	83
	240	170	10	6	2+2	43	44	3 097	0,140	39	2 620	0,113	960	167	83
	260	190	10	6	2+2	48	46	3 919	0,141	41	3 316	0,121	960	167	83
	280	210	10	6	2+2	53	48	4 838	0,142	43	4 094	0,130	960	167	83
300	230	10	6	2+2	59	49	5 855	0,143	45	4 954	0,138	960	167	83	
KP-1205 4x14-3 L=1000 mm	160	90	14	4	3+3	26	45	914	0,161	37	773	0,102	1280	250	125
	180	110	14	4	3+3	33	52	1 458	0,163	43	1 234	0,110	1280	250	125
	200	130	14	4	3+3	40	58	2 129	0,165	49	1 801	0,118	1280	250	125
	220	150	14	4	3+3	47	62	2 926	0,167	54	2 476	0,126	1280	250	125
	240	170	14	4	3+3	54	66	3 850	0,169	58	3 258	0,137	1280	250	125
	260	190	14	4	3+3	61	69	4 900	0,170	62	4 146	0,146	1280	250	125
	280	210	14	4	3+3	68	71	6 077	0,172	65	5 142	0,156	1280	250	125
300	230	14	4	3+3	75	73	7 381	0,174	67	6 245	0,165	1280	250	125	
KP-1206 6x14-4 L=1000 mm	160	90	14	6	4+4	40	60	1371	0,215	49	1 160	0,149	1280	167	83
	180	110	14	6	4+4	50	69	2187	0,217	58	1 851	0,159	1280	167	83
	200	130	14	6	4+4	61	77	3193	0,219	66	2 702	0,169	1280	167	83
	220	150	14	6	4+4	71	83	4389	0,221	72	3 714	0,179	1280	167	83
	240	170	14	6	4+4	81	88	5775	0,224	78	4 886	0,189	1280	167	83
	260	190	14	6	4+4	92	92	7351	0,226	83	6 220	0,199	1280	167	83
	280	210	14	6	4+4	102	95	9116	0,229	86	7 714	0,209	1280	167	83
300	230	14	6	4+4	113	98	11071	0,231	90	9 368	0,219	1280	167	83	
KP-1207 8x14-4 L=1000 mm	160	90	14	8	4+4	53	60	1 828	0,259	49	2927	0,194	1280	125	63
	180	110	14	8	4+4	67	69	2 916	0,261	58	4427	0,207	1280	125	63
	200	130	14	8	4+4	81	77	4 257	0,263	66	6237	0,220	1280	125	63
	220	150	14	8	4+4	95	83	5 852	0,265	72	8356	0,233	1280	125	63
	240	170	14	8	4+4	109	88	7 700	0,266	78	10785	0,246	1280	125	63
	260	190	14	8	4+4	123	92	9 801	0,268	83	13523	0,259	1280	125	63
	280	210	14	8	4+4	136	95	12 155	0,269	86	16570	0,272	1280	125	63
300	230	14	8	4+4	150	98	14 762	0,271	90	19927	0,285	1280	125	63	
KP-1208 10x14-5 L=1000 mm	160	90	14	10	5+5	66	75	2 284	0,303	61	1 933	0,231	1280	100	50
	180	110	14	10	5+5	84	87	3 645	0,306	72	3 084	0,242	1280	100	50
	200	130	14	10	5+5	101	96	5 322	0,309	82	4 503	0,253	1280	100	50
	220	150	14	10	5+5	118	104	7 315	0,312	90	6 190	0,264	1280	100	50
	240	170	14	10	5+5	136	110	9 625	0,315	97	8 144	0,275	1280	100	50
	260	190	14	10	5+5	153	115	12 251	0,317	103	10 366	0,287	1280	100	50
	280	210	14	10	5+5	171	119	15 194	0,320	108	12 856	0,298	1280	100	50
300	230	14	10	5+5	188	122	18 452	0,323	112	15 614	0,309	1280	100	50	

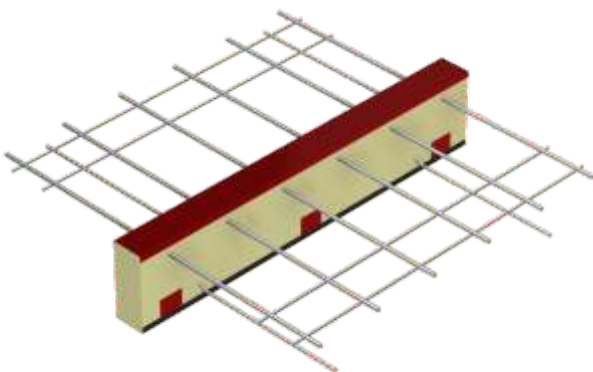
■ KP-1300 BALCONY CONNECTOR FOR SUPPORT BALCONY SLABS



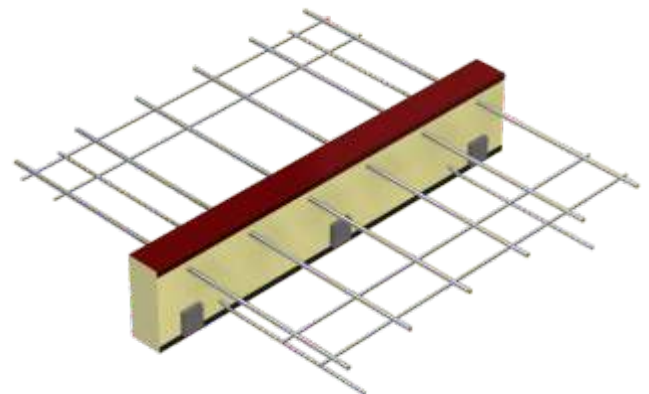
- standard elements for ceilings of thickness between 160 mm and 300 mm
- standard insulation thickness 80 mm; options: 60 mm, 100 mm, 120 mm
- insulation type: mineral wool (WM) or styrofoam (XPS)
- expanded tension rod of ordinary heat galvanised carbon steel
- stainless steel rod
- stainless steel compression bearing (for 16 cm thick ceilings) or concrete compression bearing (for ceiling thickness values 18 cm and upwards)

Marking example:

KP-1304 6 \times 10 - 2 $h=200 \text{ mm, XPS80, L=1000 mm}$
connector type quantity of bars bar diameter quantity of rod



KP-1304 balcony connector (6 x 10 - 2) with concrete compression bearings

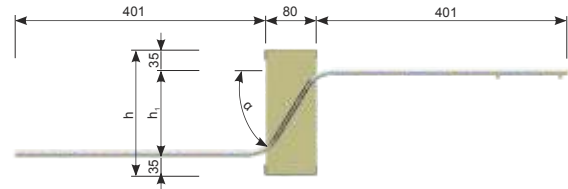
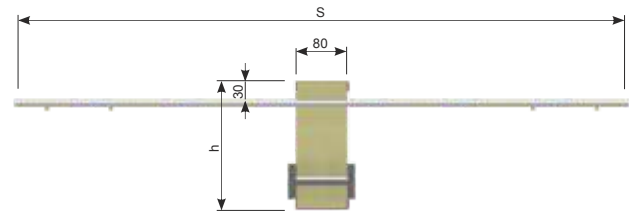
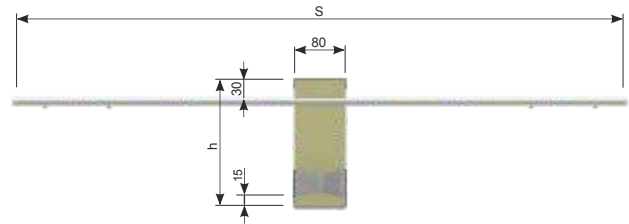
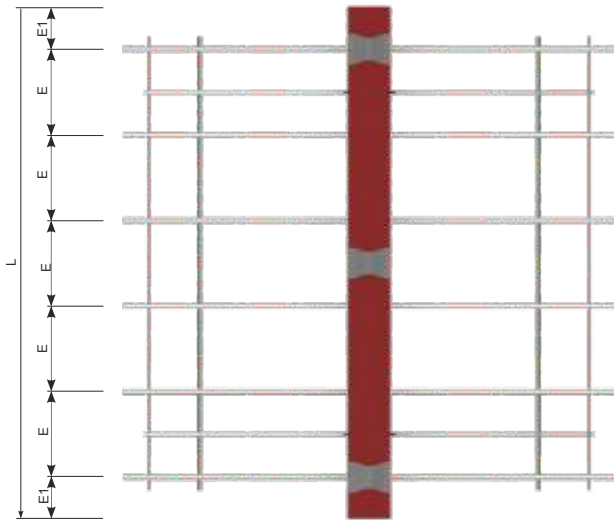


KP-1304 balcony connector (6 x 10 - 2) with steel compression bearings

KP-1300 BALCONY CONNECTOR - 20 and 30 cm module

Concrete class: \geq C25/30

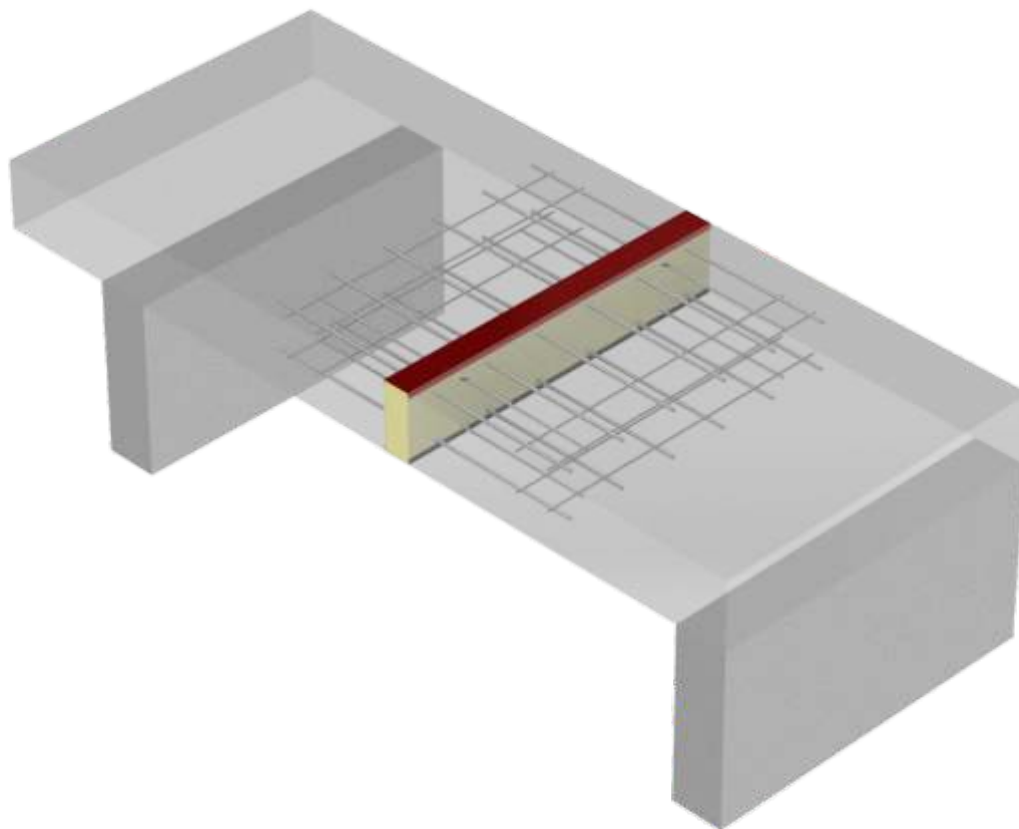
Symbol	h [mm]	h ₁ [mm]	Bar diameter ϕ [mm]	Quantity		M _{red} (-) [kNm]	Insulation 80 mm			Insulation 120 mm			Dimension [mm]		
				Bars	Rod		V _{red} (+) [kN]	Rigidity k [kNm/rad]	Ψ [W/mK]	V _{red} (+) [kN]	Rigidity k [kNm/rad]	Ψ [W/mK]	S	E	E1
KP-1301 2x10-1 L=200 mm	160	90	10	2	1	6	17	345	0,063	13	304	0,047	820	100	50
	180	110	10	2	1	7	19	522	0,065	16	461	0,048	820	100	50
	200	130	10	2	1	9	21	735	0,066	18	649	0,049	820	100	50
	220	150	10	2	1	10	22	985	0,067	19	869	0,050	820	100	50
	240	170	10	2	1	11	23	1 271	0,068	21	1 122	0,051	820	100	50
	260	190	10	2	1	13	24	1 594	0,068	22	1 407	0,051	820	100	50
	280	210	10	2	1	14	25	1 953	0,069	23	1 724	0,052	820	100	50
KP-1302 2x14-2 L=300 mm	160	90	14	2	2	12	34	676	0,101	27	597	0,085	1050	200	50
	180	110	14	2	2	14	38	1 023	0,103	32	902	0,087	1050	200	50
	200	130	14	2	2	17	42	1 441	0,105	36	1 271	0,088	1050	200	50
	220	150	14	2	2	20	45	1 930	0,106	39	1 703	0,089	1050	200	50
	240	170	14	2	2	22	47	2 491	0,108	41	2 198	0,091	1050	200	50
	260	190	14	2	2	25	48	3 123	0,109	44	2 756	0,092	1050	200	50
	280	210	14	2	2	28	50	3 827	0,111	45	3 377	0,094	1050	200	50
300	230	14	2	2	30	51	4 603	0,112	47	4 061	0,095	1050	200	50	



KP-1300 BALCONY CONNECTOR - element 100 cm
Concrete class: \geq C25/30

Symbol	h [mm]	h _i [mm]	Bar diameter ϕ [mm]	Quantity		M _{rd} (-) [kNm]	Insulation 80 mm			Insulation 120 mm			Dimension [mm]		
				Bars	Rod		V _{rd} (+) [kN]	Rigidity k [kNm/rad]	Ψ [W/mK]	V _{rd} (+) [kN]	Rigidity k [kNm/rad]	Ψ [W/mK]	S	E	E1
KP-1303 4x10-1 L=1000 mm	160	90	10	4	1	12	17	689	0,143	13	608	0,087	820	250	125
	180	110	10	4	1	15	19	1 043	0,146	16	920	0,089	820	250	125
	200	130	10	4	1	17	21	1 469	0,148	18	1 296	0,091	820	250	125
	220	150	10	4	1	20	22	1 968	0,151	19	1 736	0,093	820	250	125
	240	170	10	4	1	23	23	2 540	0,154	21	2 241	0,096	820	250	125
	260	190	10	4	1	26	24	3 184	0,156	22	2 810	0,098	820	250	125
	280	210	10	4	1	28	25	3 902	0,159	23	3 443	0,101	820	250	125
KP-1304 6x10-2 L=1000 mm	160	90	10	6	2	18	34	1 034	0,197	27	912	0,139	820	167	83
	180	110	10	6	2	22	38	1 564	0,205	32	1 380	0,141	820	167	83
	200	130	10	6	2	26	42	2 203	0,212	36	1 944	0,143	820	167	83
	220	150	10	6	2	30	45	2 952	0,214	39	2 604	0,145	820	167	83
	240	170	10	6	2	34	47	3 809	0,216	41	3 361	0,147	820	167	83
	260	190	10	6	2	38	48	4 776	0,218	44	4 214	0,149	820	167	83
	280	210	10	6	2	42	50	5 853	0,220	45	5 164	0,151	820	167	83
KP-1305 4x14-3 L=1000 mm	160	90	14	4	3	23	50	1 352	0,223	40	1 193	0,165	1050	250	125
	180	110	14	4	3	29	57	2 045	0,228	47	1 805	0,168	1050	250	125
	200	130	14	4	3	34	63	2 881	0,233	53	2 542	0,171	1050	250	125
	220	150	14	4	3	39	67	3 860	0,236	58	3 406	0,174	1050	250	125
	240	170	14	4	3	45	70	4 982	0,240	62	4 396	0,178	1050	250	125
	260	190	14	4	3	50	73	6 247	0,243	65	5 512	0,181	1050	250	125
	280	210	14	4	3	55	75	7 655	0,247	68	6 754	0,185	1050	250	125
KP-1306 5x14-3 L=1000 mm	160	90	14	5	3	29	50	1 690	0,260	40	1 491	0,214	1050	200	100
	180	110	14	5	3	36	57	2 557	0,267	47	2 256	0,216	1050	200	100
	200	130	14	5	3	43	63	3 602	0,273	53	3 178	0,218	1050	200	100
	220	150	14	5	3	49	67	4 825	0,277	58	4 258	0,220	1050	200	100
	240	170	14	5	3	56	70	6 228	0,281	62	5 495	0,222	1050	200	100
	260	190	14	5	3	63	73	7 809	0,284	65	6 890	0,223	1050	200	100
	280	210	14	5	3	69	75	9 568	0,288	68	8 443	0,225	1050	200	100
KP-1307 6x14-4 L=1000 mm	160	90	14	6	4	35	67	2 028	0,299	54	1 790	0,238	1050	167	83
	180	110	14	6	4	43	76	3 068	0,307	63	2 707	0,242	1050	167	83
	200	130	14	6	4	51	84	4 322	0,314	71	3 813	0,246	1050	167	83
	220	150	14	6	4	59	89	5 790	0,318	78	5 109	0,250	1050	167	83
	240	170	14	6	4	67	93	7 473	0,322	83	6 594	0,254	1050	167	83
	260	190	14	6	4	75	97	9 370	0,327	87	8 268	0,258	1050	167	83
	280	210	14	6	4	83	99	11 482	0,331	91	10 131	0,262	1050	167	83
KP-1308 8x14-4 L=1000 mm	160	90	14	8	4	47	67	2 704	0,358	54	2 386	0,294	1050	125	63
	180	110	14	8	4	57	76	4 090	0,366	63	3 609	0,299	1050	125	63
	200	130	14	8	4	68	84	5 763	0,373	71	5 085	0,304	1050	125	63
	220	150	14	8	4	79	89	7 720	0,378	78	6 812	0,309	1050	125	63
	240	170	14	8	4	89	93	9 964	0,383	83	8 792	0,314	1050	125	63
	260	190	14	8	4	100	97	12 494	0,388	87	11 024	0,319	1050	125	63
	280	210	14	8	4	111	99	15 309	0,393	91	13 508	0,324	1050	125	63
KP-1309 10x14-5 L=1000 mm	160	90	14	10	5	58	84	3 380	0,422	67	2 983	0,356	1050	100	50
	180	110	14	10	5	72	96	5 113	0,427	79	4 512	0,360	1050	100	50
	200	130	14	10	5	85	105	7 203	0,432	89	6 356	0,364	1050	100	50
	220	150	14	10	5	98	111	9 651	0,436	97	8 515	0,368	1050	100	50
	240	170	14	10	5	112	117	12 455	0,441	104	10 990	0,372	1050	100	50
	260	190	14	10	5	125	121	15 617	0,445	109	13 780	0,375	1050	100	50
	280	210	14	10	5	139	124	19 136	0,450	113	16 885	0,379	1050	100	50
	300	230	14	10	5	152	127	23 013	0,454	117	20 305	0,383	1050	100	50

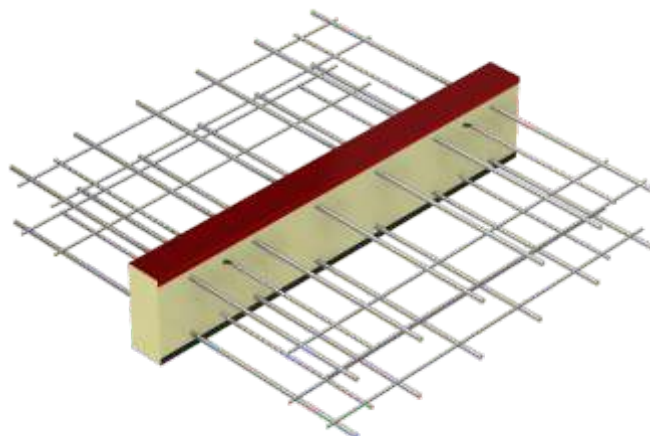
■ **KP-1400 BALCONY CONNECTOR FOR CONTINUOUS CONNECTION OF THE BALCONY SLAB WITH THE CEILING SLAB**



- standard elements for ceilings of thickness between 160 mm and 300 mm
- standard insulation thickness 80 mm; options: 60 mm, 100 mm, 120 mm
- insulation type: mineral wool (WM) or styrofoam (XPS)
- expanded tension rod of ordinary heat galvanised carbon steel
- stainless steel rod

Marking example:

KP-1404 , 6 x , 10 - 2 $h=200 \text{ mm}$, XPS80, L=1000 mm
connector quantity bar quantity
type of bars diameter of rod

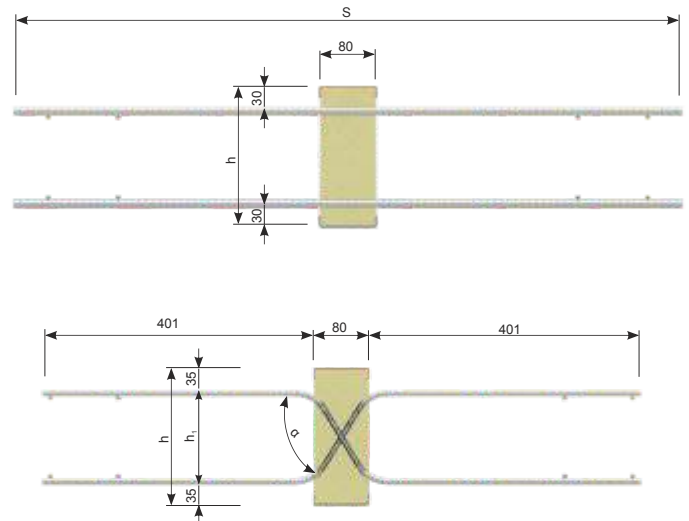
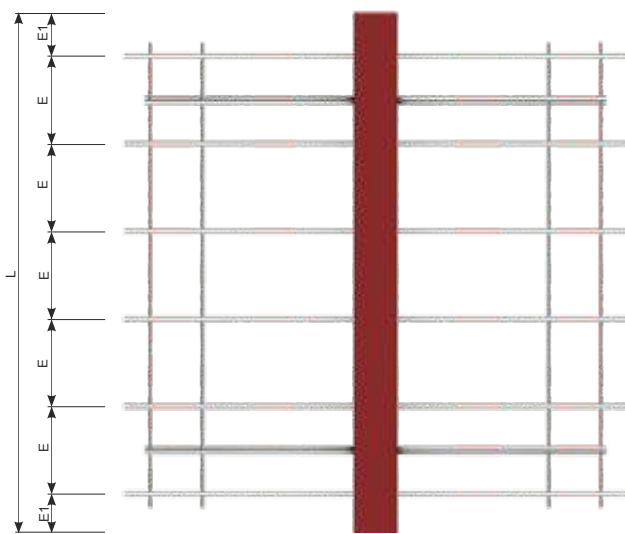


KP-1404 balcony connector (6x10-2)

KP-1400 BALCONY CONNECTOR - 20 and 30 cm module

 Concrete class: \geq C25/30

Symbol	h [mm]	h ₁ [mm]	Bar diameter ϕ [mm]	Quantity		M _{rd} (\pm) [kNm]	Insulation 80 mm			Insulation 120 mm			Dimension [mm]		
				Bars	Rod		V _{rd} (+) [kN]	Rigidity k [kNm/rad]	Ψ [W/mK]	V _{rd} (+) [kN]	Rigidity k [kNm/rad]	Ψ [W/mK]	S	E	E1
KP-1401 2x10-1 L=200 mm	160	90	10	2	1+1	5	15	219	0,084	12	182	0,066	820	100	50
	180	110	10	2	1+1	7	17	342	0,085	14	285	0,067	820	100	50
	200	130	10	2	1+1	8	19	492	0,086	16	410	0,068	820	100	50
	220	150	10	2	1+1	10	21	670	0,087	18	558	0,069	820	100	50
	240	170	10	2	1+1	11	22	875	0,088	19	729	0,070	820	100	50
	260	190	10	2	1+1	12	23	1 108	0,088	21	923	0,070	820	100	50
	280	210	10	2	1+1	14	24	1 368	0,089	22	1 140	0,071	820	100	50
KP-1402 2x14-2 L=300 mm	160	90	14	2	2+2	10	30	387	0,119	24	322	0,088	1050	200	50
	180	110	14	2	2+2	13	35	617	0,122	29	514	0,093	1050	200	50
	200	130	14	2	2+2	16	39	901	0,125	33	751	0,098	1050	200	50
	220	150	14	2	2+2	18	42	1 239	0,128	36	1 033	0,103	1050	200	50
	240	170	14	2	2+2	21	44	1 630	0,130	39	1 359	0,108	1050	200	50
	260	190	14	2	2+2	24	46	2 075	0,133	41	1 729	0,113	1050	200	50
	280	210	14	2	2+2	26	48	2 573	0,135	43	2 145	0,118	1050	200	50
300	230	14	2	2+2	29	49	3 125	0,138	45	2 605	0,123	1050	200	50	

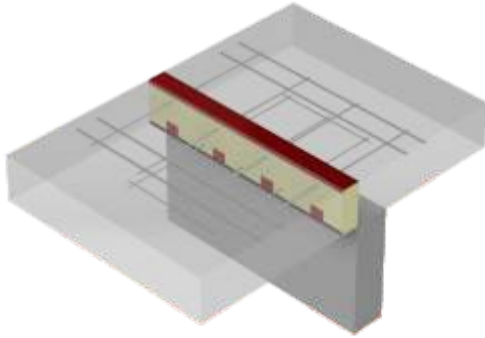


KP-1400 BALCONY CONNECTOR - element 100 cm													Concrete class: \geq C25/30		
Symbol	h [mm]	h ₁ [mm]	Bar diameter ϕ [mm]	Quantity		M _{rd} (\pm) [kNm]	Insulation 80 mm			Insulation 120 mm			Dimension [mm]		
				Bars	Rod		V _{rd} (+) [kN]	Rigidity k [kNm/rad]	Ψ [W/mK]	V _{rd} (+) [kN]	Rigidity k [kNm/rad]	Ψ [W/mK]	S	E	E1
KP-1403 4x10-1 L=1000 mm	160	90	10	4	1+1	11	15	437	0,185	12	364	0,127	820	250	125
	180	110	10	4	1+1	14	17	683	0,188	14	569	0,130	820	250	125
	200	130	10	4	1+1	16	19	983	0,191	16	820	0,133	820	250	125
	220	150	10	4	1+1	19	21	1 339	0,193	18	1 115	0,135	820	250	125
	240	170	10	4	1+1	22	22	1 748	0,195	19	1 457	0,137	820	250	125
	260	190	10	4	1+1	25	23	2 213	0,197	21	1 844	0,140	820	250	125
	280	210	10	4	1+1	27	24	2 732	0,199	22	2 277	0,142	820	250	125
300	230	10	4	1+1	30	24	3 305	0,201	22	2 755	0,144	820	250	125	
KP-1404 6x10-2 L=1000 mm	160	90	10	6	2+2	16	30	656	0,257	24	546	0,197	820	167	83
	180	110	10	6	2+2	20	35	1 024	0,261	29	854	0,199	820	167	83
	200	130	10	6	2+2	25	39	1 475	0,265	33	1 229	0,201	820	167	83
	220	150	10	6	2+2	29	42	2 008	0,267	36	1 673	0,203	820	167	83
	240	170	10	6	2+2	33	44	2 623	0,269	39	2 185	0,205	820	167	83
	260	190	10	6	2+2	37	46	3 319	0,272	41	2 766	0,208	820	167	83
	280	210	10	6	2+2	41	48	4 098	0,274	43	3 415	0,210	820	167	83
300	230	10	6	2+2	45	49	4 958	0,276	45	4 132	0,212	820	167	83	
KP-1405 4x14-3 L=1000 mm	160	90	14	4	3+3	20	45	774	0,285	37	645	0,238	1050	250	125
	180	110	14	4	3+3	26	52	1 235	0,290	43	1 029	0,239	1050	250	125
	200	130	14	4	3+3	31	58	1 803	0,294	49	1 502	0,240	1050	250	125
	220	150	14	4	3+3	36	62	2 478	0,296	54	2 065	0,240	1050	250	125
	240	170	14	4	3+3	42	66	3 261	0,299	58	2 717	0,241	1050	250	125
	260	190	14	4	3+3	47	69	4 150	0,301	62	3 458	0,241	1050	250	125
	280	210	14	4	3+3	53	71	5 147	0,304	65	4 289	0,242	1050	250	125
300	230	14	4	3+3	58	73	6 251	0,306	67	5 209	0,242	1050	250	125	
KP-1406 5x14-3 L=1000 mm	160	90	14	5	3+3	25	45	967	0,278	37	806	0,278	1050	200	100
	180	110	14	5	3+3	32	52	1 543	0,280	43	1 286	0,280	1050	200	100
	200	130	14	5	3+3	39	58	2 254	0,282	49	1 878	0,282	1050	200	100
	220	150	14	5	3+3	46	62	3 098	0,284	54	2 581	0,284	1050	200	100
	240	170	14	5	3+3	52	66	4 076	0,286	58	3 396	0,286	1050	200	100
	260	190	14	5	3+3	59	69	5 188	0,287	62	4 323	0,287	1050	200	100
	280	210	14	5	3+3	66	71	6 434	0,289	65	5 361	0,289	1050	200	100
300	230	14	5	3+3	72	73	7 814	0,291	67	6 511	0,291	1050	200	100	
KP-1407 6x14-4 L=1000 mm	160	90	14	6	4+4	31	60	1 161	0,334	49	967	0,334	1050	167	83
	180	110	14	6	4+4	39	69	1 852	0,335	58	1 543	0,335	1050	167	83
	200	130	14	6	4+4	47	77	2 704	0,336	66	2 254	0,336	1050	167	83
	220	150	14	6	4+4	55	83	3 717	0,337	72	3 098	0,337	1050	167	83
	240	170	14	6	4+4	63	88	4 891	0,338	78	4 076	0,338	1050	167	83
	260	190	14	6	4+4	71	92	6 225	0,339	83	5 188	0,339	1050	167	83
	280	210	14	6	4+4	79	95	7 720	0,340	86	6 434	0,340	1050	167	83
300	230	14	6	4+4	87	98	9 376	0,341	90	7 814	0,341	1050	167	83	
KP-1408 8x14-4 L=1000 mm	160	90	14	8	4+4	41	60	1 548	0,417	49	1 290	0,417	1050	125	63
	180	110	14	8	4+4	51	69	2 470	0,418	58	2 058	0,418	1050	125	63
	200	130	14	8	4+4	62	77	3 606	0,419	66	3 005	0,419	1050	125	63
	220	150	14	8	4+4	73	83	4 956	0,420	72	4 130	0,420	1050	125	63
	240	170	14	8	4+4	84	88	6 521	0,422	78	5 434	0,422	1050	125	63
	260	190	14	8	4+4	94	92	8 300	0,423	83	6 917	0,423	1050	125	63
	280	210	14	8	4+4	105	95	10 294	0,425	86	8 578	0,425	1050	125	63
300	230	14	8	4+4	116	98	12 502	0,426	90	10 418	0,426	1050	125	63	
KP-1409 10x14-5 L=1000 mm	160	90	14	10	5+5	51	75	1 935	0,490	61	1 612	0,490	1050	100	50
	180	110	14	10	5+5	64	87	3 087	0,492	72	2 572	0,492	1050	100	50
	200	130	14	10	5+5	78	96	4 507	0,494	82	3 756	0,494	1050	100	50
	220	150	14	10	5+5	91	104	6 195	0,496	90	5 163	0,496	1050	100	50
	240	170	14	10	5+5	105	110	8 151	0,499	97	6 793	0,499	1050	100	50
	260	190	14	10	5+5	118	115	10 375	0,501	103	8 646	0,501	1050	100	50
	280	210	14	10	5+5	131	119	12 867	0,504	108	10 723	0,504	1050	100	50
300	230	14	10	5+5	145	122	15 627	0,506	112	13 023	0,506	1050	100	50	

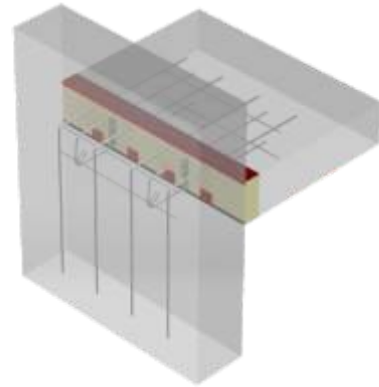
■ ATYPICAL ELEMENTS

Non-standard solutions:

The balcony connector consist of standard elements, which usually may be adapted to individual needs of a particular structure.

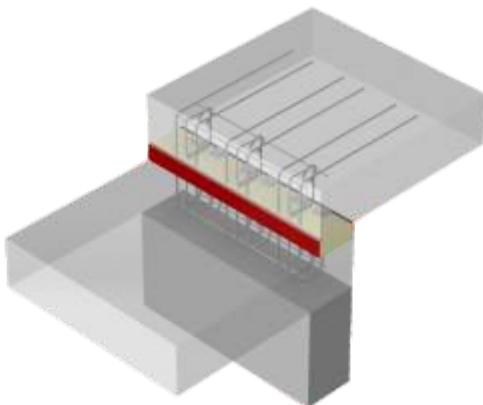


Type A noise dampening

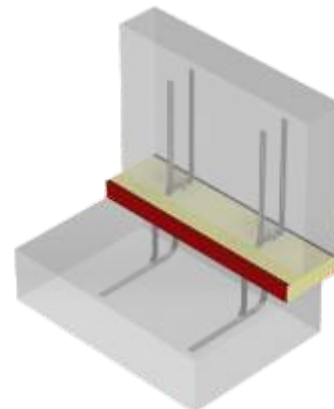


Type B connection wall-roof

Unusual loads:

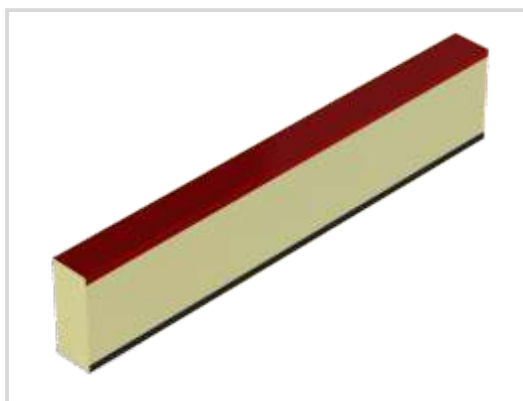


Type C - elements for add-on balconies



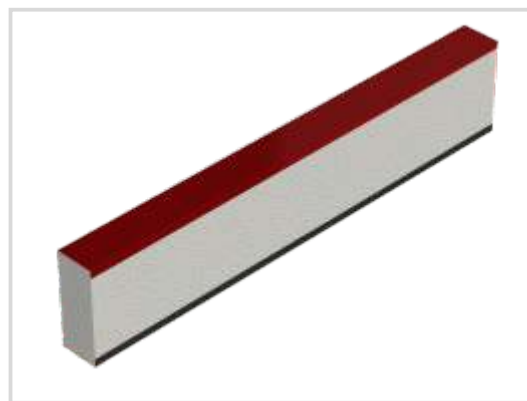
Type D - elements for shifted sub-window walls (bannisters)

■ INSULATION TYPES



Mineral wool:

- standard thickness 80 mm
- optional 60, 100, 120 mm
- thermal conductivity coefficient $\lambda=0,040$ W/mK

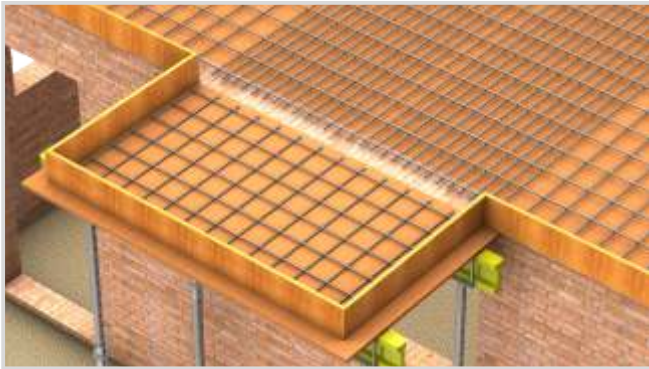


Styrofoam:

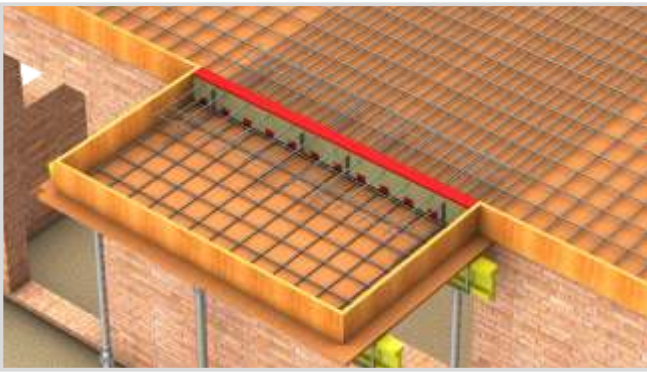
- standard thickness 80 mm
- optional 60, 100, 120 mm
- thermal conductivity coefficient $\lambda=0,036$ W/mK

■ ASSEMBLY SUGGESTIONS

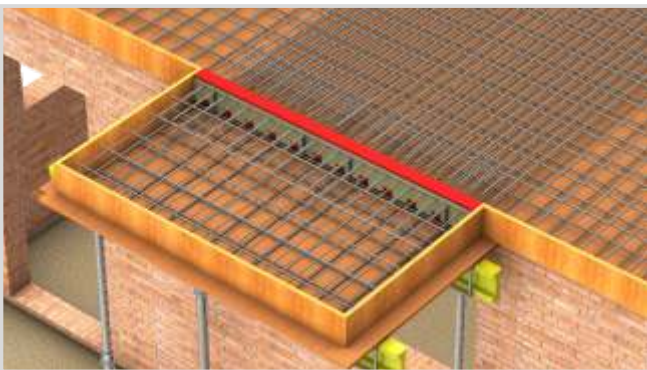
1. Lay down the lower reinforcement and the reinforcement of balcony slab.



2. Lay out and affix KP connector.



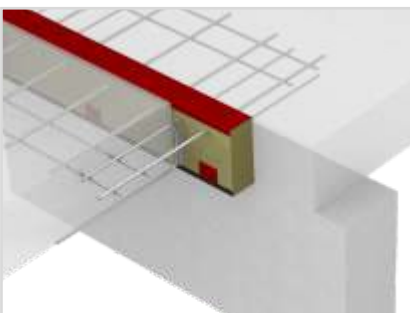
3. Lay out upper reinforcement of ceiling and balcony slab, tie with tie rod to the of KP connector bars.



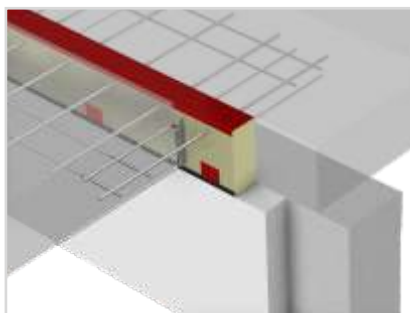
Note:

In order to ensure that the placement of the KP connector remains unchanged during concreting, fill equally and compress the concrete mix.

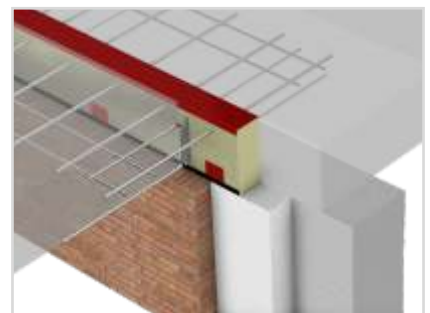
■ INSTALLATION CONDITIONS FOR JOINTS.



Single leaf masonry



Single leaf masonry with insulation



Double leaf masonry

■ **CHOSEN REALIZATIONS**

HOUSING ALBATROSS TOWERS IN GDANSK

Sale and supply of balcony connectors

General contractor:

BAUHAUS sp. z o.o.



RESIDENTIAL AND COMMERCIAL BUILDING SUN GARDEN IN RADOM

Sale and supply of balcony connectors

General contractor:

Country Homes Sp. z o.o.



HOUSING SUNNY MORENA - GDANSK MORENA

Sale and supply of balcony connectors

General contractor:

MAREX BUDOWNICTWO Sp. z o.o.



HOUSING LAVENDER HILL – GDANSK JASIEN

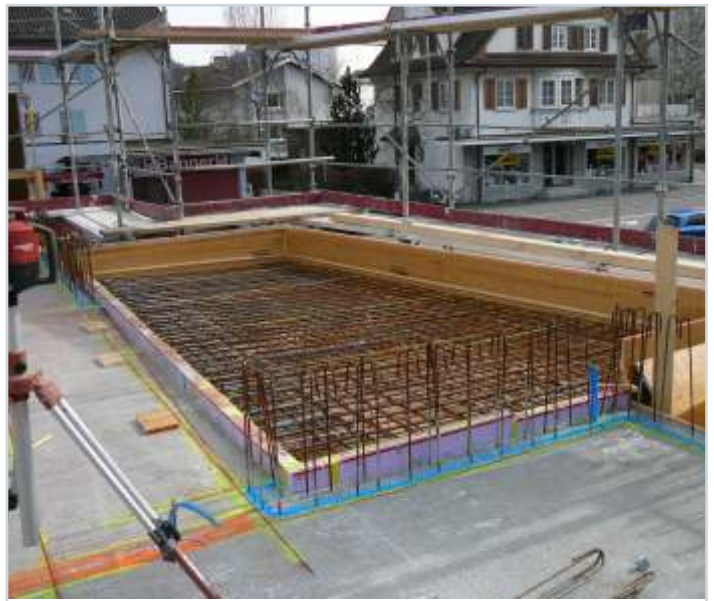
Sale and supply of balcony connectors

General contractor:

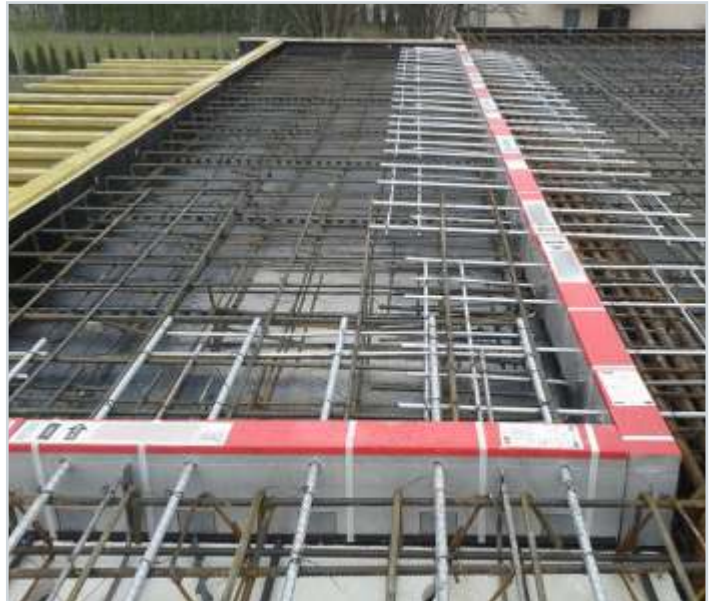
MAREX BUDOWNICTWO Sp. z o.o.



GALLERY

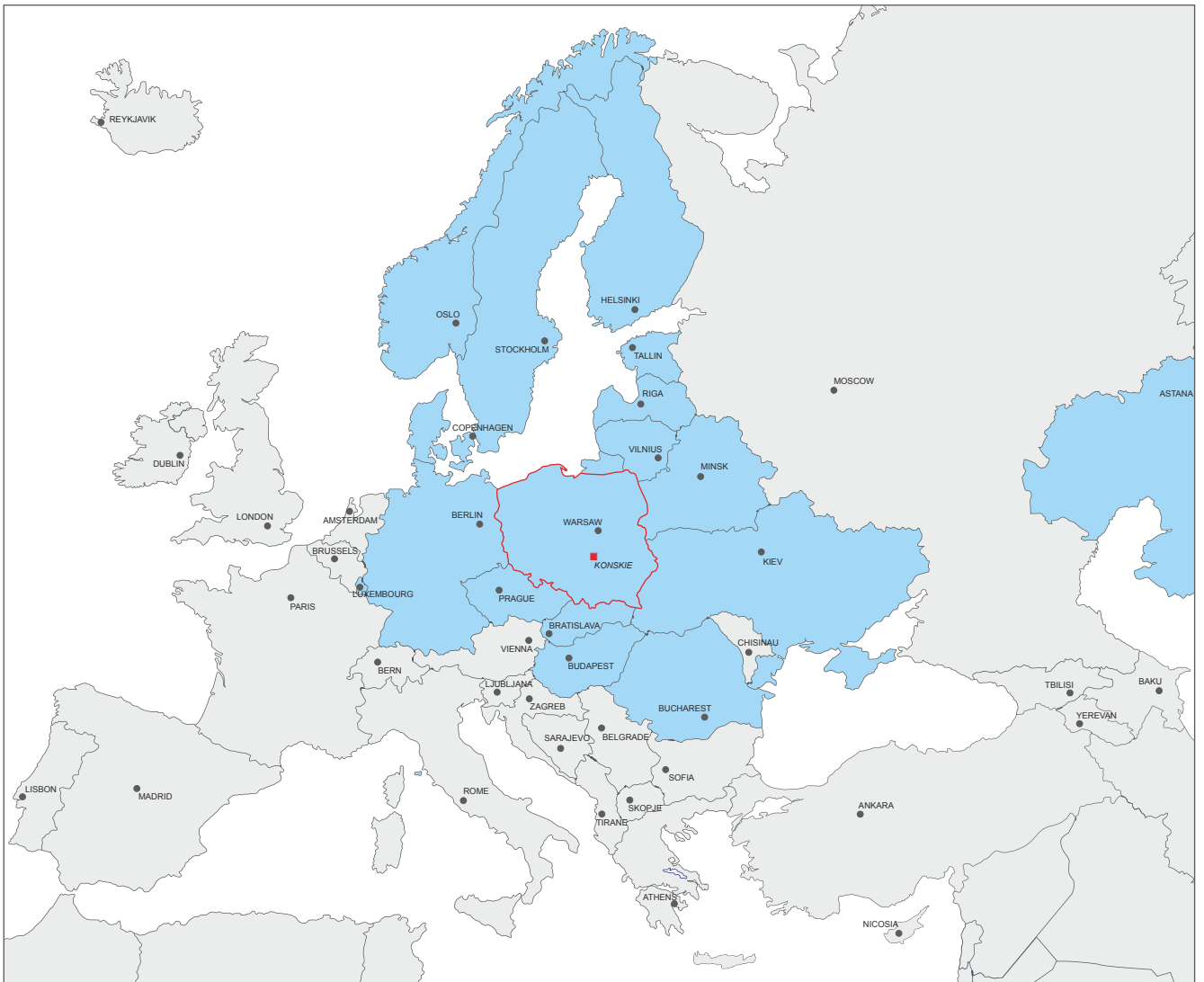


GALLERY



NOTES

A large grid of graph paper for taking notes, consisting of 20 columns and 30 rows of small squares.





FORBUILD SA
ul. Górna 2a
26-200 Końskie, Poland
tel.: +48 41 375 1347
fax: +48 41 375 1348
forbuild@forbuild.eu
www.forbuild.eu