



# PSI CASING SPACERS

## INSULATORS FOR PIPE-IN-PIPE SYSTEMS



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### GENERAL INFORMATION

Polypropylen casing spacers are universally applicable in the installation of pipelines when a media pipe runs through a casing pipe.

Plastic insulators provide many advantages for these applications:

- Easy penetration of carrier pipe. The insulator's friction coefficient is reduced to a minimum because they are made of plastic.
- The minimized friction prevents the media pipe from taking damage inside the casing pipe.
- A wide range of skid heights ensures concentricity of the media pipe inside the casing pipe.
- Excellent insulation characteristics. All requirements of cathodic pipe protection are met.



Plastic insulators are suitable for all pipe diameters from 25 mm upwards and many skid heights are available to suit specific requirements.



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## TECHNICAL DATA

### Materials

Polypropylene has a good friction coefficient due to its waxy surface with good sliding properties. The sliding friction coefficient is approx. 0.2 for PP on steel. In comparison to this, steel on steel is approx. 0.5. Therefore the abrasion is reduced to a minimum. The material is strong and yet flexible and is therefore resistant to stress cracking. Flexibility of the body, stability of the skid form and excellent dielectric insulation are some more of the good characteristics of this material.

### Installation notes

Plastic insulator rings are normally installed with the following spacing in between the rings:

- Pipe diameter up to 300 mm in 2.5 m support distance
- Pipe diameter 301 - 600 mm in 2.0 m support distance
- Pipe diameter of more than 600 mm in 1.5 m support distance

In particular cases, the ring distance may be modified after having examined the installation situation.

### Load capacity

Type	max. static load per ring
PA/PE 0.75 - PA/PE 1.5	85 kg
PA/PE 2.0 - PA/PE 3.0	100 kg
PA/PE 4.0	200 kg
PA/PE 6.0 - PA/PE 12.0	250 kg
AZ/AC 1 / AZ/AC 2	200 kg
GKO-mK	250 kg
MA	650 kg
RGV	1.000 kg
GKO-gl	4.000 kg
GKO-gs	14.200 kg

**The load capacity data is applicable for a skid height of up to 75 mm. For skid heights above 75 mm, these values need to be multiplied with a factor of 0.75.**

All values are calculated for standard pipes. To determine the correct distance for your individual application many other factors have to be taken into consideration, such as carrier pipe wall thickness, pipe length and type of media. For further assistance please get in contact with us.

If you cannot determine the type according to our tables please specify:

- Outer diameter of carrier pipe (inclusive coating) in mm
- Inner diameter of casing pipe

## GENERAL INFORMATION

### Outer diameter of Pipe from 25 mm to 336 mm

Type PA/PE insulators are available for outer diameter of Pipes from 25 mm to 336 mm. PA/PE consist of two half shells. The nuts and bolts required for assembly are included in every delivery.

The type code indicates the outer diameter of carrier pipe in inch and the skid height in mm (e.g. PA/PE 4-38 = carrier pipe 4", skid height 38 mm).

The skid height is calculated from the difference in diameter of carrier pipe and casing pipe. It is important to consider the actual dimensions, including coatings and sockets, rather than the nominal sizes.

Example:

- PE-coated carrier pipe with PE coating DN 100
- Outer diameter (117.9 x 5.2 mm)
- Steel casing DN 200 (219.1 x 6.3)
- Inner diameter 206.5 mm minus outer diameter of carrier pipe 117.9 mm = 88.6
- $88,6 : 2 = 44.3$  mm skid height
- Suitable type: PA/PE 4-38

This means the suitable type of insulator is PA/PE 4-38.

After determining the skid height, the next lower height is selected from the table (e.g. 44.3 mm, ideal skid height = 38 mm). The segments can be assembled with the corrosion protected steel bolts DIN 912 and nuts DIN 562 included.

Up to type PA/PE 4 the insulator rings have 4 skids; from type PA/PE 6 up to 6 skids are provided. The following table gives the technical details on available sizes, skid heights of the various types and carrier pipe diameters.



More content can be found at  
[www.psi-products.com](http://www.psi-products.com)

## SELECTION TABLE

Nominal width		Outer diameter of Pipe in mm		Type PA/PE	Skid height in mm including basic element	Width mm	Number of segments	Number of skids	Bolts DIN 912 Qty/Size	Art. No.
mm	inch	min.	max.							
20	0.75	25.0	32.0	PA/PE 0.75-12.5	12.5	80	2	4	4 M 4 x 30	3-001-02400
				PA/PE 0.75-21	21.0					3-001-01001
				PA/PE 0.75-25	25.0					3-001-01002
				PA/PE 0.75-36	36.0					3-001-01003
25	1.0	32.0	40.0	PA/PE 1-13	13.0	80	2	4	4 M 4 x 30	3-001-01004
				PA/PE 1-19	19.0					3-001-01005
				PA/PE 1-25	25.0					3-001-01006
				PA/PE 1-34	34.0					3-001-01007
32	1.25	42.0	48.3	PA/PE 1.25-11	11.0	80	2	4	4 M 4 x 30	3-001-01008
				PA/PE 1.25-17.6	17.5					3-001-01009
				PA/PE 1.25-29	29.0					3-001-01010
				PA/PE 1.25-40	40.0					3-001-01011
40	1.5	48.0	54.0	PA/PE 1.5-11	11.0	80	2	4	4 M 4 x 30	3-001-01069
				PA/PE 1.5-14.5	14.5					3-001-01012
				PA/PE 1.5-26	26.0					3-001-01013
				PA/PE 1.5-36	36.0					3-001-01014
				PA/PE 1.5-48	48.0					3-001-01015
				PA/PE 1.5-70	70.0					3-001-01039
50	2.0	60.0	67.0 <sup>1)</sup>	PA/PE 2-16	16.0	100	2	4	4 M 6 x 40	3-001-01016
				PA/PE 2-25	25.0					3-001-01017
				PA/PE 2-36	36.0					3-001-01018
				PA/PE 2-48	48.0					3-001-01019
				PA/PE 2-55	55.0					3-001-01085
				PA/PE 2-70	70.0					3-001-01086
				PA/PE 2-90	90.0					3-001-01087
				PA/PE 2-110	110.0					3-001-01088
65	2.5	76.1	82.5 <sup>2)</sup>	PA/PE 2.5-16	16.0	100	2	4	4 M 6 x 40	3-001-01020
				PA/PE 2.5-25	25.0					3-001-01021
				PA/PE 2.5-36	36.0					3-001-01022
				PA/PE 2.5-48	48.0					3-001-01023
				PA/PE 2.5-55	55.0					3-001-01095
				PA/PE 2.5-70	70.0					3-001-01096
				PA/PE 2.5-90	90.0					3-001-01097
				PA/PE 2.5-105	105.0					3-001-01098
80	3.0	88.9	96.0 <sup>3)</sup>	PA/PE 3-16	16.0	100	2	4	4 M 6 x 40	3-001-01024
				PA/PE 3-25	25.0					3-001-01025
				PA/PE 3-36	36.0					3-001-01026
				PA/PE 3-48	48.0					3-001-01027
				PA/PE 3-55	55.0					3-001-01100
				PA/PE 3-70	70.0					3-001-01101
				PA/PE 3-90	90.0					3-001-01102
100	4.0	106.6	120.0 <sup>4)</sup>	PA/PE 4-16	16.0	130	2	4	4 M 6 x 55	3-001-01028
				PA/PE 4-25	25.0					3-001-01029
				PA/PE 4-38	38.0					3-001-01030
				PA/PE 4-55	55.0					3-001-01031
				PA/PE 4-75	75.0					3-001-01032
				PA/PE 4-90	90.0					3-001-01033
125	See list for AZ/AC Ø 125 mm Type AZ/AC 1									

<sup>1)</sup> up to max. outer diameter of Pipe 75.0 mm with 4x M 6 x 55 bolts

<sup>2)</sup> up to max. outer diameter of Pipe 88.9 mm with 4x M 6 x 55 bolts

<sup>3)</sup> up to max. outer diameter of Pipe 101.6 mm with 4x M 6 x 55 bolts

<sup>4)</sup> up to max. outer diameter of Pipe 127.0 mm with 4x M 6 x 70 bolts

## SELECTION TABLE

Nominal width		Outer diameter of Pipe in mm		Type PA/PE	Skid height in mm including basic element	Width mm	Number of segments	Number of skids	Bolts DIN 912 Qty/Size	Art. No.
mm	inch	min.	max.							
150	6	160.0	178.0	PA/PE 6-16	16	130	2	6	4 M 6 x 70	3-001-01036
				PA/PE 6-25	25					3-001-01037
				PA/PE 6-36	36					3-001-01038
				PA/PE 6-55	55					3-001-01040
				PA/PE 6-75*	75					3-001-01041
				PA/PE 6-90*	90					3-001-01042
200		193.7	210.0	PA/PE 7-16	16	175	2	6	4 M 6 x 70	3-001-01110
				PA/PE 7-25	25					3-001-01111
				PA/PE 7-36	36					3-001-01112
				PA/PE 7-55	55					3-001-01113
				PA/PE 7-75	75					3-001-01114
				PA/PE 7-90	90					3-001-01115
				PA/PE 7-110	110					3-001-01116
				200	8					221.0
PA/PE 8-25	25	3-001-01044								
PA/PE 8-36	36	3-001-01045								
PA/PE 8-55*	55	3-001-01046								
PA/PE 8-75*	75	3-001-01047								
PA/PE 8-90*	90	3-001-01048								
250		244.5	260.0	PA/PE 9-16	16	175	2	6	4 M 6 x 70	3-001-01120
				PA/PE 9-25	25					3-001-01121
				PA/PE 9-36	36					3-001-01122
				PA/PE 9-55	55					3-001-01123
				PA/PE 9-75	75					3-001-01124
				PA/PE 9-90	90					3-001-01125
				PA/PE 9-110	110					3-001-01126
				250	10					276.0
PA/PE 10-25	25	3-001-01050								
PA/PE 10-36	36	3-001-01051								
PA/PE 10-55*	55	3-001-01052								
PA/PE 10-75*	75	3-001-01053								
PA/PE 10-90*	90	3-001-01054								
315		298.5	315.0	PA/PE 11-16	16	175	2	6	4 M 6 x 70	3-001-01130
				PA/PE 11-25	25					3-001-01131
				PA/PE 11-36	36					3-001-01132
				PA/PE 11-55	55					3-001-01133
				PA/PE 11-75	75					3-001-01134
				PA/PE 11-90	90					3-001-01135
				PA/PE 11-110	110					3-001-01136
				300	12					326.0
PA/PE 12-25	25	3-001-01056								
PA/PE 12-36	36	3-001-01057								
PA/PE 12-55*	55	3-001-01058								
PA/PE 12-75*	75	3-001-01059								
PA/PE 12-90*	90	3-001-01060								

Shear-secure-tape against slipping of spacers, see next page

\* Plug-in skid




Sectional drawing of segment.  
PA/PE 0.75 to PA/PE 4  
Ring with a total of 4 skids



Sectional drawing of segment.  
PA/PE 6 to PA/PE 12  
Ring with a total of 6 skids

## ACCESSORIES

Accessory Shear-Secure-Tape	
	Art. No. 4-002-S20088 = width 50 mm, length 15 m
	Art. No. 4-002-S20089 = width 100 mm, length 15 m

Material: PE-tape with butyl rubber mixture

### Application:

On a smooth pipe surface (e.g. PE, PVC, steel/cast or PE-coated or stoneware) we recommend wrapping shear-secure-tape where there is contact between the pipe and insulator to guarantee optimum security against slipping.



## GENERAL INFORMATION

### Outer diameter of pipe from 98 mm to 385 mm

AZ/AC insulator rings are used for pipe ODs from 98 to 385 mm and consist of several segments. This type of Insulator is made out of several segments. The number of segments depends on the carrier pipe's outer diameter. The nuts and bolts required for assembly are included.

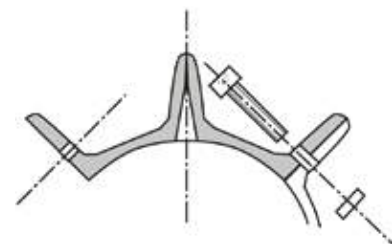
The universal applicability of type AZ/AC provides two special advantages:

- variable ring diameter, which is especially important for thick-walled pipes whose outer diameter substantially deviates from the nominal size (e.g. AZ/AC pressure pipe DN 16, vitrified clay pipes);
- only two segment sizes are required to assemble DN 100 to DN 350 insulator rings - a decisive edge in stock-keeping.

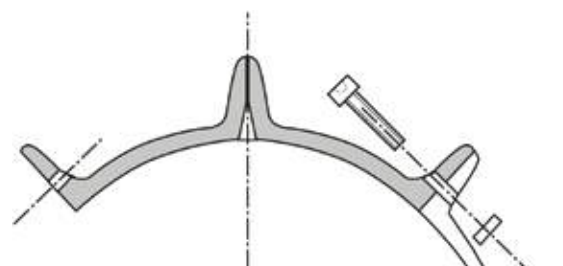
The skid height is calculated from the difference in diameter of the carrier pipe and the casing pipe. It is important to consider the actual dimensions, including coatings and sockets, rather than the nominal sizes. For an example calculation refer to type PA/PE.

The segments can be assembled with the corrosion protected steel bolts according to DIN 912 and nuts according to DIN 562.

The following table gives the technical details on available sizes and skid heights of the various types and carrier pipe diameters.



Sectional drawing of AZ/AC 1



Sectional drawing of segment AZ/AC 2



More content can be found at  
[www.psi-products.com](http://www.psi-products.com)




## SELECTION TABLE

Type	Skid height	Width	Number of bolts per segment	Art. No.
AZ/AC-1	16	130	2 M6 x70	3-002-00085
AZ/AC-1	25	130	2 M6 x70	3-002-00086
AZ/AC-1	36	130	2 M6 x70	3-002-00087
AZ/AC-1	55	130	2 M6 x70	3-002-00088
AZ/AC-1	75	130	2 M6 x70	3-002-00089
AZ/AC-1	90	130	2 M6 x70	3-002-00083
AZ/AC-1	110	130	2 M6 x70	3-002-00097
AZ/AC-2	16	130	2 M6 x70	3-002-00090
AZ/AC-2	25	130	2 M6 x70	3-002-00091
AZ/AC-2	36	130	2 M6 x70	3-002-00092
AZ/AC-2	55	130	2 M6 x70	3-002-00093
AZ/AC-2	75	130	2 M6 x70	3-002-00094
AZ/AC-2	90	130	2 M6 x70	3-002-00095
AZ/AC-2	110	130	2 M6 x70	3-002-00096

Shear-secure-tape see below

Outer diameter of carrier pipe in mm		Number of segments per ring		Bolts Qty/Size
min.	max.	AZ/AC 1	AZ/AC 2	
98	130	3		6 M 6x70
130	172	4		8 M 6x70
173	202	5		10 M 6x70
203	230		3	6 M 6x70
234	268	1	3	8 M 6x70
269	310		4	8 M 6x70
302	350	1	4	10 M 6x70
350	385		5	10 M 6x70

Accessory Shear-Secure-Tape	
	Art. No. 4-002-S20088 = width 50 mm, length 15 m
	Art. No. 4-002-S20089 = width 100 mm, length 15 m

Material: PE-tape with butyl rubber mixture

### Application:

On smooth pipe surface which are in contact with the spacers (e.g. PE, PVC, steel/cast on PE-coated or stoneware) wrap a shear-secure-tape to guarantee an optimum security against slipping.



## GENERAL INFORMATION

GKO-mk is the latest PSI casing spacer generation. Due to the bolt less wedge system the installation can be achieved quickly and easily. The flexible design ensures suitability for all pipe diameters > 150 mm. If required, an additional support for cable ducts can be installed on the segments.

- Flexible construction
- Non-metallic connection for simple and fast installation
- New wedge connection technology

PSI shear-secure-tape or similar products can be used to improve adhesion on smooth surfaces, or to balance pipe tolerances.



Subject to technical changes.



More content can be found at  
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## SELECTION TABLE


Type	Skid height	Width	Art. No.
GKO mk	25	130	3-002-04101
GKO mk	36	130	3-002-04102
GKO mk	50	130	3-002-04103
GKO mk	65	130	3-002-04104
GKO mk	75	130	3-002-04105
GKO mk	90	130	3-002-04106
GKO mk	110	130	3-002-04107
GKO mk	125	130	3-002-04108

Shear-secure-tape see below

Outer diameter of carrier pipe in mm		Number of segments per ring
min.	max.	
150	180	4
181	230	5
231	280	6
281*	330*	7
331*	380*	8
381*	430*	9

\* from outer diameter of carrier pipe 281 mm only still suitable for plastic pipes



Accessory Shear-Secure-Tape	
	Art. No. 4-002-S20088 = width 50 mm, length 15 m
	Art. No. 4-002-S20089 = width 100 mm, length 15 m

Material: PE-tape with butyl rubber mixture

### Application:

On smooth pipe surfaces which get in contact with the spacers (e.g. PE, PVC, steel/cast on PE-coated or stoneware) wrap a shear-secure tape to guarantee optimum security against slipping.



## GENERAL INFORMATION

### Outer diameter of Pipe from 400 mm

Starting with a pipe OD of 402 mm, MA insulator rings, consisting of two segment sizes (MA and MA 2) and various skid heights, are used to suit large pipe ODs.

The special advantage of these insulators is their universal applicability. The following rule is used to determine the composition of suitable insulator rings:

For every 100 mm of Outer diameter of Pipe 1 MA segment  
For every 50 mm of Outer diameter of Pipe 1 MA 2 segment

Example:

Outer diameter of carrier pipe 559 = 5 MA segments  
+ 1 MA 2 segment.

The skid height of the segments is calculated from the difference in diameter of the carrier pipe and the casing pipe. For an example calculation refer to type PA/PE.

The segments can be assembled with the included corrosion protected steel bolts according to DIN 912 and nuts according to DIN 562.

The following table gives the technical details on available sizes, skid heights of the various types and carrier pipe diameters.



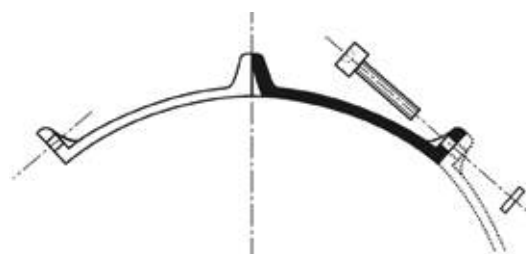
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## SELECTION TABLE

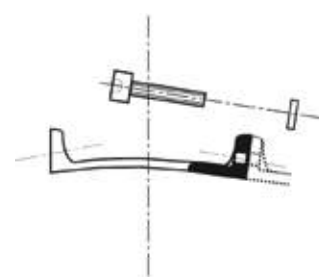
Type	Skid height in mm	Width in mm	Number of skids	Number of bolts per segment	Art. No.
MA 25	25	160	3	2 M 8 x 70	3-002-00050
MA 36	36	160	3	2 M 8 x 70	3-002-00051
MA 50	50	160	3	2 M 8 x 70	3-002-00053
MA 65	65	160	3	2 M 8 x 70	3-002-00064
MA 75	75	160	3	2 M 8 x 70	3-002-00054
MA 2/25	25	160	2	2 M 8 x 70	3-002-00055
MA 2/36	36	160	2	2 M 8 x 70	3-002-00056
MA 2/50	50	160	2	2 M 8 x 70	3-002-00057
MA 2/65	65	160	2	2 M 8 x 70	3-002-00063
MA 2/75	75	160	2	2 M 8 x 70	3-002-00058
<b>MA 2 as half a segment</b>					

Shear-secure-tape against slipping see below

Nominal width		Outer diameter of carrier pipe in mm		Number of segments per ring		Bolts Qty/size - length
DN	inch	min.	max.	MA	MA 2	
400	16	402	420	4		8 M 8 x 70
		420*	426*	4		6 M 8x70 + 2 M 8x90
		426*	432*	4		4 M 8x70 + 4 M 8x90
450	18	450	485	4	1	10 M 8x70
		485*	494*	4	1	8 M 8 + 2 M 8x90
500	20	500	530	5		10 M 8 x 70
		530*	544*	5		8 M 8 + 2 M 8x90
550	22	548	599	5	1	12 M 8 x 70
600	24	600	653	6		12 M 8 x 70
650	26	654	699	6	1	14 M 8 x 70
700	28	700	749	7		14 M 8 x 70
750	30	750	799	7	1	16 M 8 x 70
800	32	800	849	8		16 M 8 x 70
850	34	850	899	8	1	18 M 8 x 70
900	36	900	949	9		18 M 8 x 70
950	38	950	994	9	1	20 M 8 x 70
1000	40	995	1044	10		20 M 8 x 70
1050	42	1045	1097	10	1	22 M 8 x 70
1100	44	1098	1149	11		22 M 8 x 70
1150	46	1150	1199	11	1	24 M 8 x 70
1200	48	1200	1249	12		24 M 8 x 70



Sectional drawing of MA segment



Sectional drawing of MA 2 segment

Caution: Install bolt length as specified for the corresponding segments.  
For larger nominal diameter upon request.

\* Please contact our inside sales department

Accessory Shear-Secure-Tape	
	Art. No. 4-002-S20088 = width 50 mm, length 15 m
	Art. No. 4-002-S20089 = width 100 mm, length 15 m

Material: PE-tape with butyl rubber mixture

### Application:

On smooth pipe surfaces which are in contact with the spacers (e.g. PE, PVC, steel/cast on PE-coated or stoneware), wrap a shear-secure-tape to guarantee optimal security against slipping.



## GENERAL INFORMATION

### For high load capacity and pipe ODs starting from 500 mm.

RGV insulator rings are used for pipes with outer diameter > 500mm. They differ from MA types in having two reinforced load-carrying solid skids per segment. The fastening skids (36 mm high) are for connection only. To match the required outer diameter, RGV segments are combined with RGV 2 segments.

High static-load bearing capacity and versatility are the particular advantages of the RGV casing spacers. The following simple method is used to determine the composition of suitable insulator rings:

For every 100 mm outer diameter of pipe = 1 RGV segment  
For every 50 mm outer diameter of pipe = 1 RGV half segment

Example:

outer diameter of carrier pipe 559 = 5 RGV segments  
+ 1 RGV half segment.

The skid height of the segments is calculated from the difference in diameter of the carrier pipe and the casing pipe. For an example calculation refer to type PA/PE.

The segments can be assembled with the included corrosion protected steel bolts according to DIN 912 and nuts according to DIN 562.

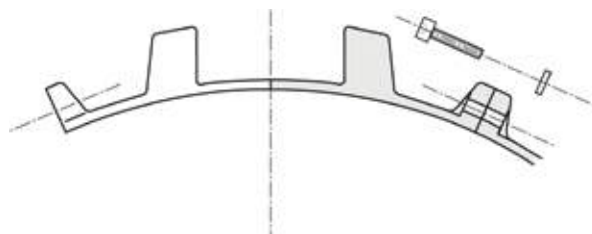
The following table gives the technical details on available sizes, skid heights of the various types and carrier pipe diameters.



More content can be found at  
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## SELECTION TABLE

Type	Skid height	Width	Number of bolts	Art. No.
RGV	50	210	2 M 8 x 70	3-002-00074
	75	210	2 M 8 x 70	3-002-00075
	90	210	2 M 8 x 70	3-002-00076
	125	210	2 M 8 x 70	3-002-00073
RGV half	50	210	2 M 8 x 70	3-002-00274
	75	210	2 M 8 x 70	3-002-00275
	90	210	2 M 8 x 70	3-002-00276
	125	210	2 M 8 x 70	3-002-00273




Sectional drawing of a RGV segment

Shear-secure-tape see below

Nominal width		Outer diameter of pipe in mm		Number of segments		Bolts Quantity/ Size
DN	inch	min.	max.	RGV	RGV half	
500	20	500	535	5		10 M 8 x 70
550	22	547	595	5	1	12 M 8 x 70
600	24	596	645	6		12 M 8 x 70
650	26	646	699	6	1	14 M 8 x 70
700	28	700	750	7		14 M 8 x 70
750	30	751	799	7	1	16 M 8 x 70
800	32	800	850	8		16 M 8 x 70
850	34	851	899	8	1	18 M 8 x 70
900	36	900	950	9		18 M 8 x 70
950	38	951	999	9	1	20 M 8 x 70
1000	40	1000	1075	10		20 M 8 x 70
1100	44	1090	1180	11		22 M 8 x 70
1200	48	1190	1290	12		24 M 8 x 70
1300	52	1291	1390	13		26 M 8 x 70
1400	56	1391	1490	14		28 M 8 x 70
1500	60	1491	1590	15		30 M 8 x 70
1600	64	1591	1690	16		32 M 8 x 70
1700	68	1691	1790	17		34 M 8 x 70
1800	72	1791	1890	18		36 M 8 x 70
1900	76	1891	1990	19		38 M 8 x 70
2000	80	1991	2100	20		40 M 8 x 70

Larger nominal diameters upon request.

### Shear-Secure-Tape

	Art. No. 4-002-S20088 = width 50 mm, length 15 m
	Art. No. 4-002-S20089 = width 100 mm, length 15 m

Material: PE-tape with butyl rubber mixture

### Application:

On smooth pipe surfaces which are in contact with the spacers (e.g. PE, PVC, steel/cast on PE-coated or stoneware), wrap a shear-secure-tape to guarantee optimal security against slipping.



## GENERAL INFORMATION

Due to the bolt less wedge system and half segments GKO gh, the installation can be achieved easily and quickly. Owing to various diameter ranges and type GKO gh half segments, continuous use for an outer diameter exceeding 400 mm is possible. If required additional cable ducts can be attached with cable binders to the segment.

- Flexible construction
- Non-metallic connection for simple and fast installation
- New wedge connection technology

PSI shear-secure-tape or similar products can be used to improve adhesion on smooth surfaces or to balance pipe tolerances.

Subject to technical changes.



More content can be found at  
[www.psi-products.com](http://www.psi-products.com)




### SELECTION TABLE

Type	Skid height	Width	Art. No.
GKO-gl	36	225	3-002-02200
	50	225	3-002-02201
	65	225	3-002-02202
	75	225	3-002-02203
	90	225	3-002-02204
	110	225	3-002-02205
GKO-gs	125	225	3-002-02206
	36	225	3-003-03207
	50	225	3-003-03208
	65	225	3-003-03209
	75	225	3-003-03210
	90	225	3-003-03211
GKO-gh	110	225	3-003-03212
	125	225	3-003-03213
	36	225	3-003-03200
	50	225	3-003-03201
	65	225	3-003-03202
	75	225	3-003-03203
	90	225	3-003-03204
	110	225	3-003-03205
	125	225	3-003-03206

Shear-secure-tape see below

Outer diameter of carrier pipe in mm		Number of segments	
min.	max.	GKO gl/gs	GKO gh
400	440	3	1
441	490	4	
491	540	4	1
541	625	5	
626	659	5	1
660	749	6	
750	854	7	
855	959	8	
960	1067	9	
1068	1199	10	
1200	1330	11	
1331	1440	12	
1441	1540	13	
1541	1660	14	
1661	1800	15	
1801	1910	16	
1911	2042	17	
2043	2150	18	
2151	2270	19	
2271	2400	20	
2401	2500	21	

Accessory Shear-Secure-Tape	
	Art. No. 4-002-S20088 = width 50 mm, length 15 m
	Art. No. 4-002-S20089 = width 100 mm, length 15 m

Material: PE-tape with butyl rubber mixture

GKO-gl



GKO-gs



GKO-gh



**Application:**

On smooth pipe surfaces which are in contact with the spacers (e.g. PE, PVC, steel/cast on PE-coated or stoneware), wrap a shear-secure-tape to guarantee optimum security against slipping.

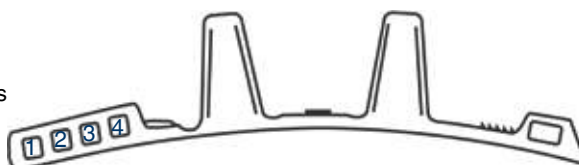
## SELECTION TABLE

Pipe DN			Outer diameter of pipe in mm		No. of elements		Position of wedges per Insulator element			
PE/PVC	Steel	GGG	from	to	Whole GKO	Half GKO	1	2	3	4
DN 400	DN 400		397	402	3	1			3	1
			406	411	3	1		1	3	
		DN 400	429	439	3	1	1	3		
DN 450			448	452	4				3	1
			456	462	4			1	3	
DN 500	DN 500		498	504	4	1			2	3
			508	513	4	1			4	1
			532	542	4	1		3	2	
DN 600	DN 600		538	542	5					5
			559	564	5				4	1
			610	615	5		2	3		
			630	635	5	1			6	
			635	645	5	1		1	5	
DN 600	DN 600		660	665	6				3	3
			711	716	6			5	1	
			738	748	6		4	2		
DN 800	DN 800		762	767	7				2	5
			796	802	7				7	
			813	819	7			3	4	
			842	852	7		1	6		
			864	870	8					1
DN 900	DN 900		914	920	8			1	7	
			945	955	8			6	2	
DN 1000	DN 1000		1016	1022	9				7	2
			1048	1058	9			4	5	
			1057	1063	9			6	3	
DN 1200	DN 1200		1118	1125	10				6	4
			1219	1226	11				6	5
			1321	1328	11		1	10		
DN 1400	DN 1400		1422	1430	12			9	3	
			1524	1532	13			7	6	
DN 1600	DN 1600		1626	1634	14			5	9	
			1727	1736	15			3	12	
DN 1800	DN 1800		1829	1838	16			1	15	
			1930	1939	17				16	1
DN 2000	DN 2000		2032	2041	17			16	1	
			2134	2144	18			14	4	
DN 2200	DN 2200		2235	2245	19			12	7	
			2337	2347	20			10	10	
DN 2400	DN 2400		2438	2448	21			8	13	

The position specified for the wedges per insulator element are guideline values and can deviate by one or two slots, depending on the outside temperature.

### GKO Insulators example application:

For a pipe outer diameter of 429 mm, select 3 whole segments and 1 half segment. Insert a wedge in position 1 and 3 wedges in position 2.





# PSI CASING SPACERS FOR PIPE BUNDLING



[WWW.PSI-PRODUCTS.COM](http://WWW.PSI-PRODUCTS.COM)

## TECHNICAL DATA

Non-metallic insulators (System PSI Ranger) are highly suitable for pipelines requiring cathodic protection. With just six different segment sizes - micro, mini, midi, medi, maxi and maxi 0.5 - all pipe diameters from DN 15 upwards are covered.

### Segment sizes and skid heights

#### micro

For pipe diameters from 21 mm to approx. 80 mm

#### mini

For pipe diameters from 40 mm to approx. 140 mm

#### midi

For pipe diameters from 110 mm to approx. 460 mm

#### medi

For pipe diameters from 400 to mm DN 650

#### maxi

For pipe diameters from approx. 400 mm to ∞

#### maxi 0.5 (half segment of maxi)

For intermediate sizes 390-550 mm

### Diameter table

No. of segments	Diameter in mm						
	micro	mini	midi	medi	maxi	maxi + maxi 0.5	maxi 0.5
3	<b>21-29</b>	46-62	104-141		325-395		195-235
3 + 1 x 0.5						390-460	
4	<b>29-40</b>	62-83	<b>138-188</b>	<b>390-494</b>	426-546		235-300
4 + 1 x 0.5						450-550	
5	<b>38-49</b>	<b>77-104</b>	<b>172-235</b>	<b>495-625</b>	532-682		275-365
6	<b>46-60</b>	<b>92-125</b>	<b>207-282</b>	<b>600-750</b>	<b>638-819</b>		
7	<b>55-69</b>	<b>107-145</b>	<b>241-329</b>	700-890	<b>745-955</b>		
8	<b>61-80</b>	123-166	<b>276-376</b>	800-1000	<b>851-1092</b>		
9		138-187	310-423	900-1140	957-1228		
10		153-205	344-470	1000-1290	<b>1064-1365</b>		
11		169-228	379-517		1170-1502		
12		184-249	413-564		<b>1276-1838</b>		
13					1383-1775		
14					<b>1489-1911</b>		
15					1595-2048		
16					<b>1702-2184</b>		
17					1808-2321		
18					<b>1914-2457</b>		
19					2020-2594		
20					<b>2127-2731</b>		
21					2233-2867		

Standard dimensions are printed in **bold**

## PLUG-IN CONNECTION WITHOUT BOLTS

PSI Insulators with boltless plug-in connection are suitable for pipe bundles and individual solutions. The flexibility of the insulator allows for extreme bends, and the high number of skids provides the bearing and load distribution inside the casing pipe.

### Advantages:

- Significant cost savings compared to constructions with steel insulators
- Quick and easy assembly
- Individual solutions

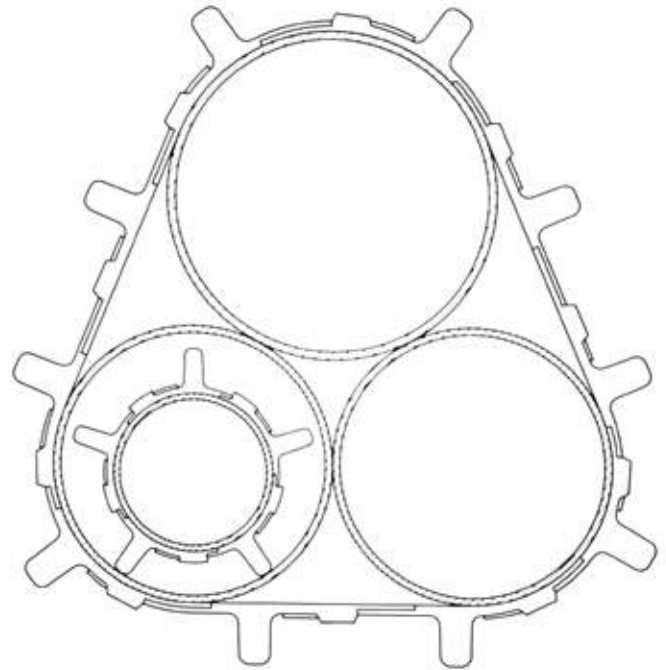
PSI will calculate individual solutions for your projects. Use our experience.

Give us a call. We will tell you ...

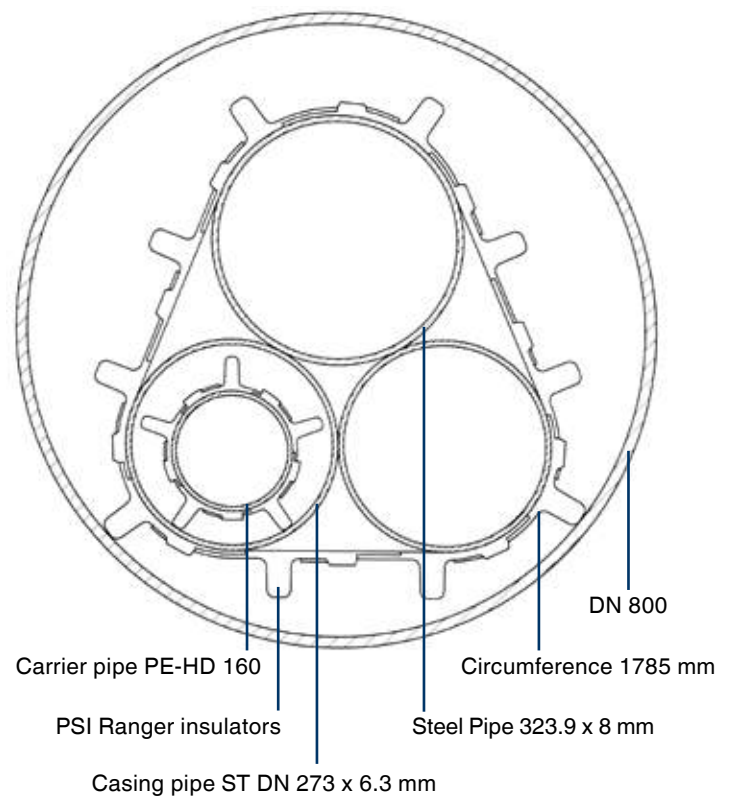
- ... which type of insulator,
- ... how many elements and
- ... which skid heights

... you will need for your application.

Example



Example



PSI guarantee is restricted to the replacement of faulty material. The suitability of the product for a special purpose must be tested by the user on his own responsibility.

