

# Camloc Quick-Operating



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## 1/4-Turn Fasteners

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The Camloc brand was established in 1937. Since that time our fastening systems have been successfully integrated into numerous applications within many different industries.

Our customers benefit from our more than 75 years of fastening experience.

We provide local support for innovative, high quality fastening systems supplied globally to the strictest environmental and working conditions.



**ISO/TS 16949: 2009**



**DIN EN ISO 14001: 2004**

Please find additional information about our environmental program under: [www.alcoa.com](http://www.alcoa.com).

Your Alcoa Fastening Systems team

**Disclaimer:**

Parts listed are subject to technical changes. All dimensions in mm. All information is correct to the best of our knowledge at the time of printing. No liability for disadvantages caused by printing errors or false application.

## Advantages of the Camloc 1/4-Turn Fastener

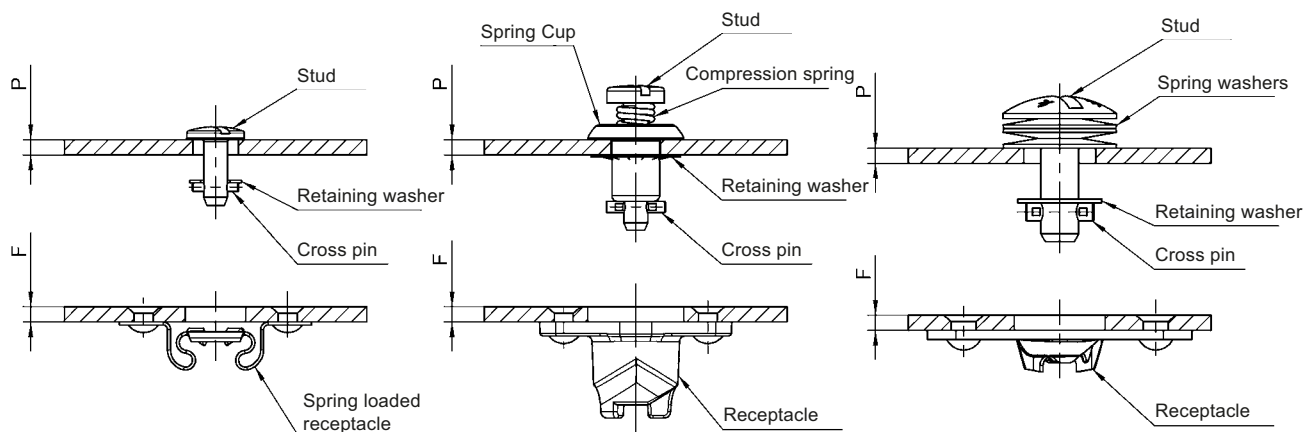
- Secure quick release fastener system
- Locking and unlocking by a quarter turn
- Long life - high number of operating cycles
- Hand or tool-operated
- Easy to use and fast operation reduces assembly costs
- Camloc fasteners are standardised worldwide
- Wide range of sizes
- Stud assemblies are captive in the panel
- Tolerance compensating
- Vibration-resistant

## Components

The 1/4-turn fastener consists of a stud, retaining ring and receptacle.

¼ turn fasteners require a spring element in the joint to enable them to work correctly. Depending upon the fastener type and mounting requirements the spring element can be part of the stud assembly or incorporated in the receptacle.

Stud assemblies with snap-in grommets are available on some series giving a captive assembly without the need for a retaining washer.



## Design Principles

Quarter-turn fasteners connect components under an elastic preload.

The spring element to produce the preload can be part of the stud or receptacle.

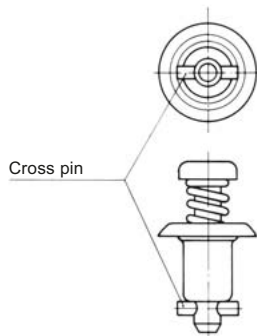
Fastener tensile loads specified in the catalogue are reached after overcoming the spring element generated preload.

Unlike threaded fasteners, Camloc fasteners do not rely on the elasticity of joint and fastener materials to accomplish preload. The stud assembly or receptacle is designed with a spring element which allows repeated application of controlled preload with assured reliability over an high number of cycles.

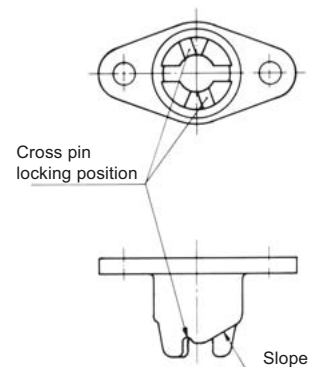
## How it Operates

When the stud assembly is rotated, the stud cross pin rides up the cam causing a controlled joint preload to be applied. This action is accomplished by rotating the stud 90°. At this point a positive mechanical stop is reached and the cross pin falls into the locking detent. Excellent resistance to vibration induced loosening is assured.

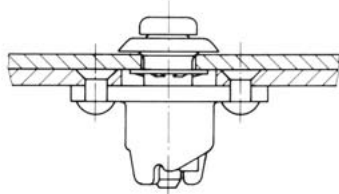
**Stud Assembly**



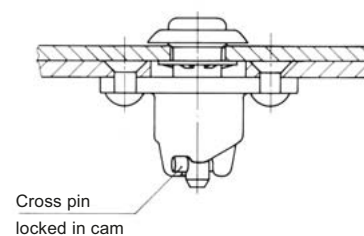
**Receptacle**



**Unlocked**



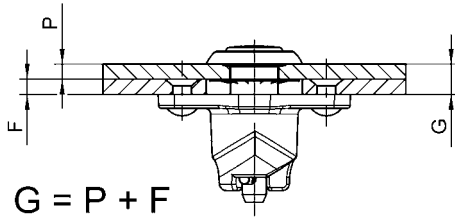
**Locked**



Lock and unlock the stud by a quarter turn.

**For general installation instructions please refer to the next page.**

## Selecting the Fastener

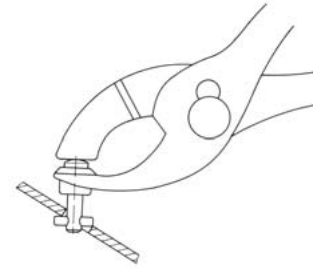
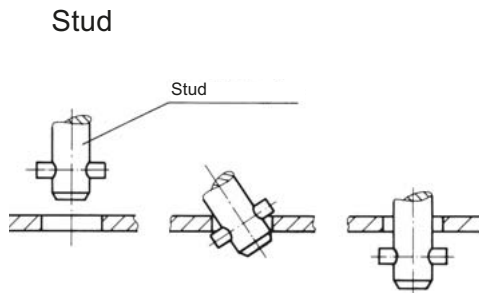


P = panel thickness (stud assembly)

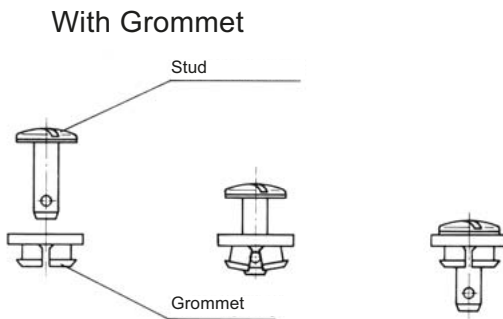
F = frame thickness (receptacle)

G = total thickness, consisting of P + F as well as possible gaskets, paint thickness or gaps.  
This dimension gives the stud length number in the corresponding series tables.

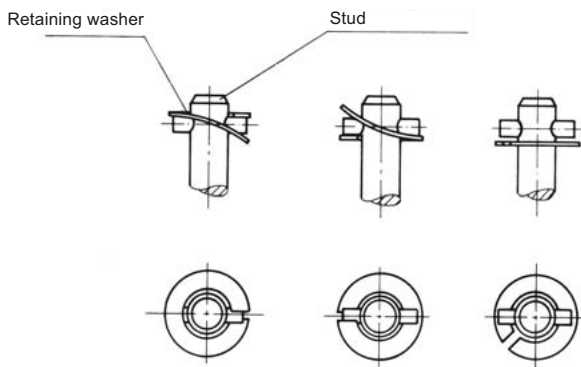
## Installation



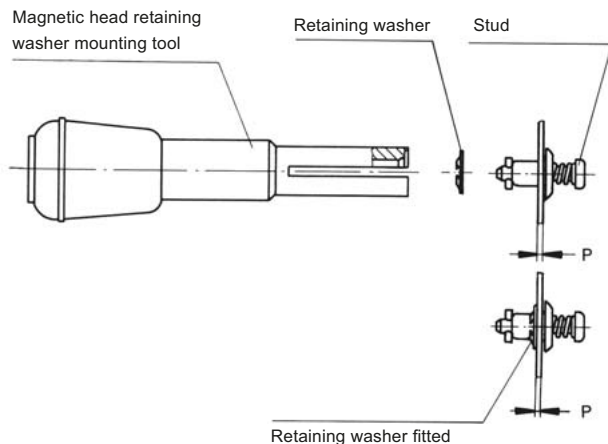
For short, spring-loaded stud assemblies, the use of 4P3-1 pliers is recommended.



With retaining washer (slotted)



With retaining washer



### Overview Quick-Operating Fasteners

Series	Max. Tensile Strength*	Working Load*	Slotted Head	Cross Recess Head	Hex Head	Hex Recess Head	Fixed Wing Head	Offset Fixed Wing Head	Folding Bail Handle	Pages
5F	670 N	450 N	X	X						B1-B4
99F	700 N	480 N	X							C1-C3
50F	900 N	650 N	X	X	X	X	X	X	X	D1-D6
2600	1.330 N	900 N	X	X			X			F1-F12
2700	1.330 N	900 N	X	X						F1-F12
50F	3.700 N	2.600 N	X	X	X	X	X	X	X	E1-E6
D4002	4.700 N	3.100 N	X	X		X	X		X	G1-G12
991F	10.000 N	7.000 N			X	X	X	X	X	H1-H5
V936F	300 N	200 N	X							I1-I2
715F	700 N	600 N	X							L1-L3
716F	1.400 N	1.200 N	X							M1-M3
PT10	1.200 N	800 N	X	X						O1-O4
717F	3.000 N	2.500 N	X							N1-N3

Series	Max. Tensile Strength*	Working Load*	Plastic Star Form Head	Plastic Wing Head	Square Head	Knurled Head	Plastic Triangular Head	Folding Wing Head	Push Button	Pages
50F	900 N	650 N	X	X						D1-D6
2600	1.330 N	900 N	X	X		X	X			F1-F11
50F	3.700 N	2.600 N	X	X	X					E1-E6
991F	10.000 N	7.000 N						X		H1-H5
15F	1.330 N	930 N							X	K1-K3
V936F	300 N	200 N				X				I1-I2
715F	700 N	600 N				X				L1-L3
716F	1.400 N	1.200 N				X				M1-M3
PT10	1.200 N	800 N		X						O1-O4
717F	3.000 N	2.500 N				X				N1-N3

\* Load limitations within series are possible. Please check the footnotes on the relevant catalogue pages.

## Features

Max. tensile strength 670 N, working load 450 N.  
Plastic washer stud assembly to protect decorative surfaces.  
Spring loaded receptacle.

## Selection Instructions

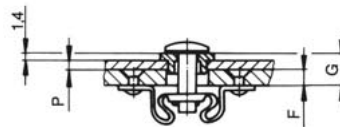
1. Select stud assembly and receptacle, page B-2 und B-4.
2. Select retaining washer or grommet, page B-3.
3. Select stud length number from total thickness G using the formula and table below (e.g. V5S5-\*AGV).

### Determining the stud length number:

With retaining washer  
 $G = P + F$



With Grommet  
 $G = P + F + 1,4$   
 $G_{\min} = 3,9 \text{ mm}$




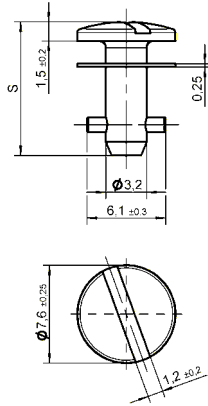

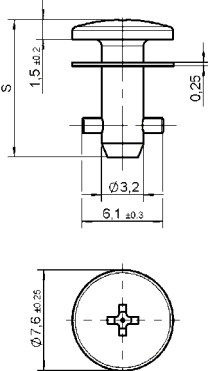
## Stud Length Table

Total Thickness G	Stud Length No. When Using Receptacles
0,50 - 0,90	1
0,90 - 1,30	2
1,30 - 1,65	3
1,65 - 2,05	4
2,05 - 2,40	5
2,40 - 2,80	6
2,80 - 3,20	7
3,20 - 3,55	8
3,55 - 3,95	9
3,95 - 4,30	10
4,30 - 4,70	11
4,70 - 5,10	12
5,10 - 5,45	13
5,45 - 5,85	14
5,85 - 6,20	15
6,20 - 6,60	16
6,60 - 7,00	17
7,00 - 7,35	18
7,35 - 7,75	19
7,75 - 8,15	20
8,15 - 8,50	21

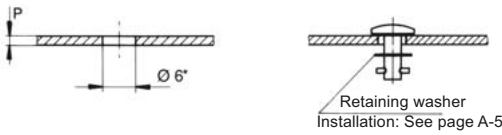
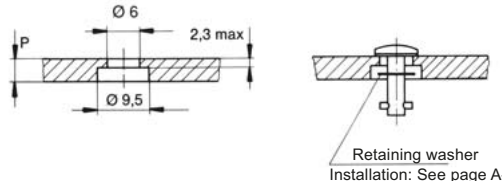
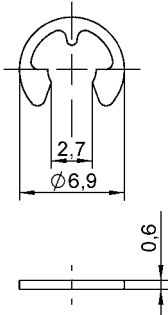
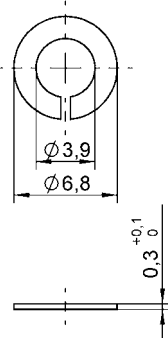

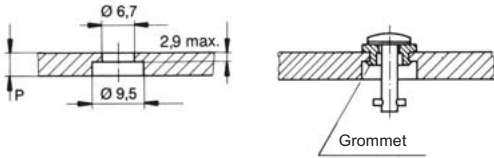
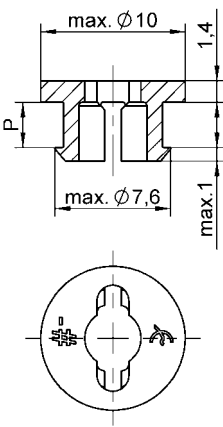
Other lengths on request.


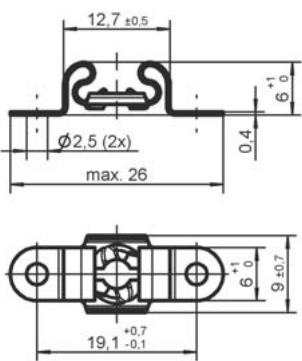
■ Preferred dash-lengths



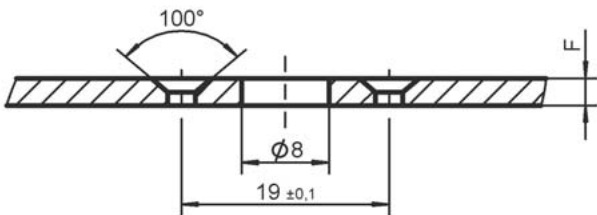
Style	Dimensions	Materials / Finish	°C	Part No.
<b>Slotted Recess Head</b>  	 $S = 6,70 + (0,38 \times \text{length no.})$	Steel / zinc-plated, CrVI-free, clear passivation with plastic washer (PA6)	100	<b>V5S5- *AGV</b>
		Steel / nickel-plated with plastic washer (PA6)	100	<b>5S27-*</b>
<b>Cross Recess Head</b>  	 $S = 6,70 + (0,38 \times \text{length no.})$	Steel / zinc-plated, CrVI-free, clear passivation with plastic washer (PA6)	100	<b>V5S21- *AGV</b>
		Stainless steel with stainless steel washer (tensile strength 470 N max. working load 300 N)	200	<b>5S15-*</b>

\* Length no. from Table, page B-1.  
 For installation dimensions see page B-3.

Installation Dimensions	Accessories	Material / Finish	Panel Thickness P	Part No.						
<p><b>Retaining Washer</b> Panel Thickness P up to 2,3</p>  <p>Retaining washer Installation: See page A-5</p> <p><b>Panel thickness P over 2,3</b></p>  <p>Retaining washer Installation: See page A-5</p> <p>* For P up to 1,4 : Ø 5,6 for installation without retaining washer</p>	<p>Retaining washer</p>  <p>Retaining washer</p> 	<p>Steel/zinc-plated, CrVI-free, clear passivation</p> <p>Stainless steel</p>	<p></p>	<p><b>V5W3-1AG</b></p> <p><b>5S3-2</b></p>						
<p><b>Snap-In Grommet</b> Panel thickness P up to 2,9</p>  <table border="1" data-bbox="215 1668 383 1747"> <thead> <tr> <th>P max</th> <th>G min</th> </tr> </thead> <tbody> <tr> <td>1,4</td> <td>2,0</td> </tr> <tr> <td>2,9</td> <td>3,5</td> </tr> </tbody> </table> <p><b>Panel thickness P over 2,9</b></p>  <p>Grommet</p>	P max	G min	1,4	2,0	2,9	3,5	<p>Grommet</p> 	<p>Plastic (PA6) black</p>	<p>to 1,4</p> <p>1,8 - 2,9</p>	<p><b>5S72-5-1AA</b></p> <p><b>5S72-9-1AA</b></p>
P max	G min									
1,4	2,0									
2,9	3,5									

Style	Dimensions	Materials / Finish	°C	Part-No.
<b>Type 1 Rivet / Screw Mounting</b>  		Steel / zinc flake coated	180	<b>V5R2-1AK7</b>
		Stainless steel	200	<b>5R2-3</b>

## Receptacle Installation Instructions

Dimensions
<p style="text-align: center;"><b>Rivet / Screw Mounting</b></p> 

## Features

Max. tensile strength 700 N, working load 480 N.

Increased grip range.

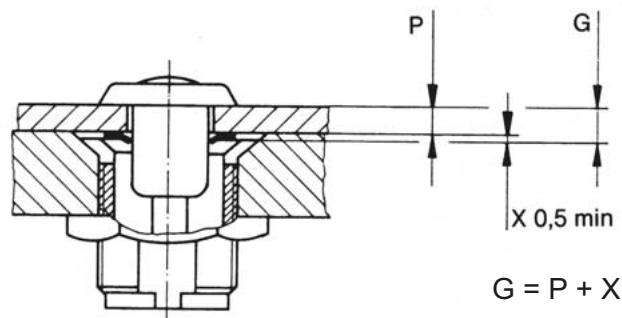
Externally threaded receptacles for use in castings or on panels with a retaining nut (see page C-3).

Encapsulated design, splash-proof.

## Selection Instructions


1. Select stud assembly and receptacle, page C-2 and C-3.
2. Select hex nut for receptacle, if necessary, page C-3.
3. Select stud retaining washer, page C-2.
4. Select stud length number from total thickness G using the formula and table below (e.g. 99S10-01AG).


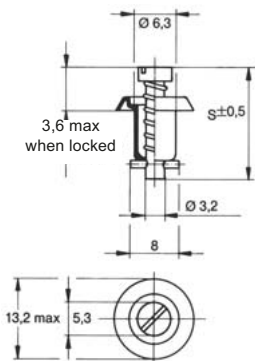
### Determining the stud length number:



Total Thickness G	Stud Length No.
0,5 - 1,5	01
1,5 - 3,0	03
3,0 - 4,5	05
4,5 - 6,0	07
6,0 - 7,5	09
7,5 - 9,0	11
9,0 - 10,5	13
10,5 - 12,0	15
12,0 - 13,5	17
13,5 - 15,0	19

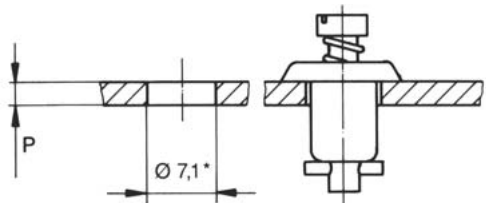
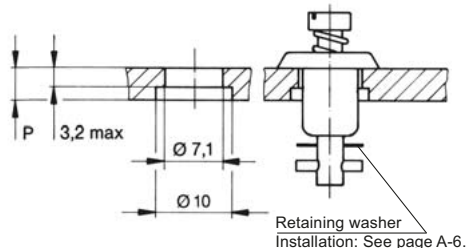
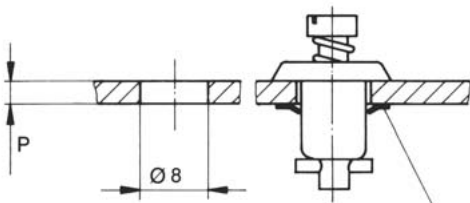
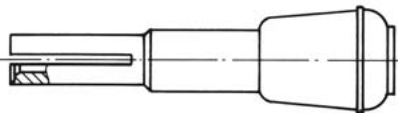
Other lengths on request.


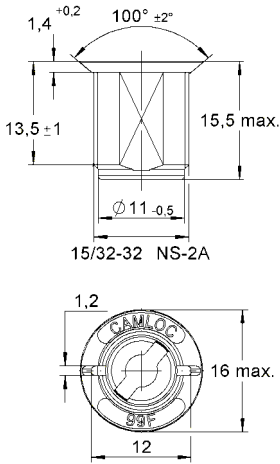

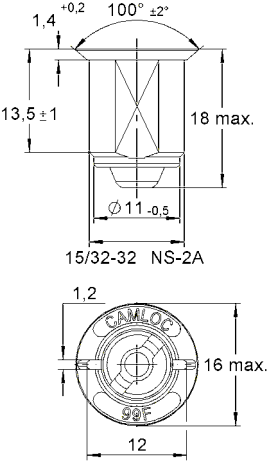
 Preferred dash-lengths

Style	Dimensions	Materials / Finish	°C	Part No.
<p><b>Slotted Recess Head</b></p> 	 <p><math>S = 15,5 + (0,76 \times \text{length no.})</math></p>	Steel / zinc-plated, CrVI-free, clear passivation	100	<b>V99S10-*AG</b>

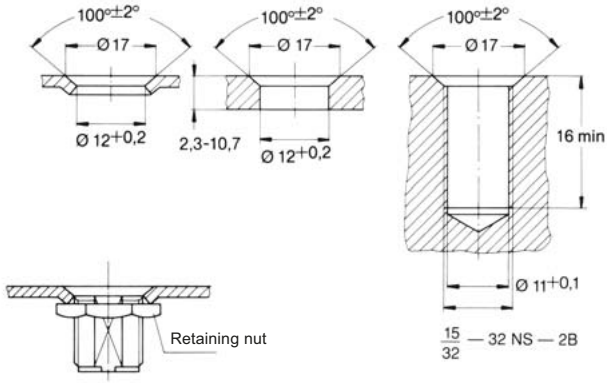
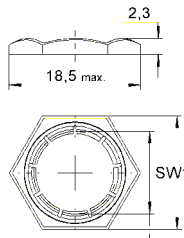
\* Length no. from Table, see page C-1.

### Stud Installation Instructions

Installation Dimensions	Accessories	Materials / Finish	Part No.
<p><b>Panel Thickness P 0,5 - 3,2</b></p>  <p>* For P up to 1,65 m Ø 6,5 for installation without retaining washer</p>	Retaining washer	Stainless steel	<b>2600-SW</b>
<p><b>Panel Thickness P over 3,2</b></p>  <p>Retaining washer Installation: See page A-6.</p>			
<p><b>Panel Thickness P 0,50 - 4,75</b></p>  <p>Retaining washer Installation: See page A-6.</p>	Retaining washer	Steel / zinc-plated, CrVI-free, transparent passivated  Stainless steel	<b>99W10-01A1</b>  <b>V2600-LW-7</b>
	<b>Mounting tool</b> for retaining washer V2600-LW-7 and 99W10-01A1		<b>T98-1</b>

Style	Dimensions	Materials / Finish	°C	Part No.
<p><b>Open</b></p> 		Zinc die casting / zinc-plated, CrVI-free, clear passivation	100	<b>99R10-01A1</b>
<p><b>Encapsulated</b></p> 		Zinc die casting / zinc-plated, CrVI-free, clear passivation  Capsule: Stainless steel	100	<b>99E10-01</b>

## Receptacle Installation Instructions

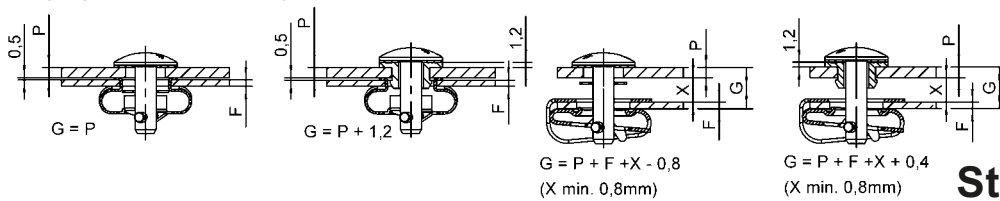
Installation Dimensions	Accessories	Materials / Finish	Part No.
 <p>Installation torque 3 Nm</p>	<p>Retaining nut</p>  <p>Tap</p>	Steel / zinc-plated, CrVI-free, clear passivation	<b>99N10-01A1</b>
			<b>15/32-32 NS-2B</b>

## Features

- Max. tensile strength 900 N, working load 650 N.
- Stud assembly incorporates a plastic washer to protect decorative surfaces.
- Snap-in or clip-on spring loaded receptacle.
- Snap-in grommet for quick stud installation without a retaining washer.

## Selection Instructions

- Select stud assembly and receptacle, page D-2 to D-4 and D-6.
- Select retaining washer or grommet, page D-5.
- Select stud length number from total thickness G using the formula and table below (e.g. 50E21-\*AGV).


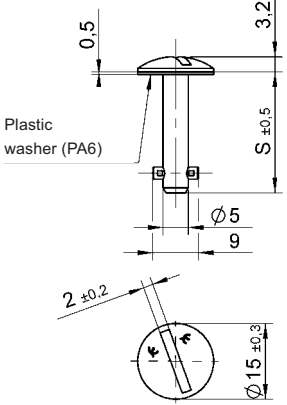

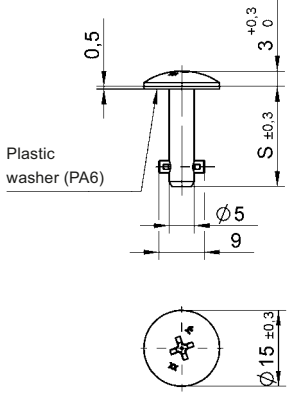

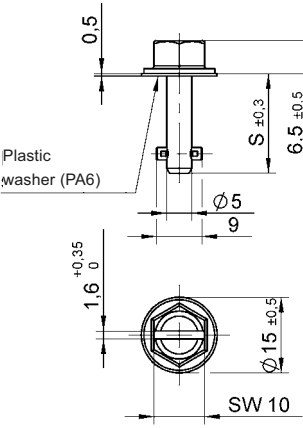


## Stud Length Table

Total Thickness G	Stud Length No. when using Receptacles Type 1 F= 1,0 - 2,1	Total Thickness G	Stud Length No. when using Receptacles Type 2 F= 2,1 - 3,0	Total Thickness G	Stud Length No. when using Receptacles Type 3
0,50 - 1,10	5	0,50 - 1,10	7	2,30 - 2,90	5
1,10 - 1,70	6	1,10 - 1,70	8	2,90 - 3,50	6
1,70 - 2,30	7	1,70 - 2,30	9	3,50 - 4,10	7
2,30 - 2,90	8	2,30 - 2,90	10	4,10 - 4,70	8
2,90 - 3,50	9	2,90 - 3,50	11	4,70 - 5,30	9
3,50 - 4,10	10	3,50 - 4,10	12	5,30 - 5,90	10
4,10 - 4,70	11	4,10 - 4,70	13	5,90 - 6,50	11
4,70 - 5,30	12	4,70 - 5,30	14	6,50 - 7,10	12
5,30 - 5,90	13	5,30 - 5,90	15	7,10 - 7,70	13
5,90 - 6,50	14	5,90 - 6,50	16	7,70 - 8,30	14
6,50 - 7,10	15	6,50 - 7,10	17	8,30 - 8,90	15
7,10 - 7,70	16	7,10 - 7,70	18	8,90 - 9,50	16
7,70 - 8,30	17	7,70 - 8,30	19	9,50 - 10,10	17
8,30 - 8,90	18	8,30 - 8,90	20	10,10 - 10,70	18
8,90 - 9,50	19	8,90 - 9,50	21	10,70 - 11,30	19
9,50 - 10,10	20	9,50 - 10,10	22	11,30 - 11,90	20
10,10 - 10,70	21	10,10 - 10,70	23	11,90 - 12,50	21
10,70 - 11,30	22	10,70 - 11,30	24	12,50 - 13,10	22
11,30 - 11,90	23	11,30 - 11,90	25	13,10 - 13,70	23
11,90 - 12,50	24	11,90 - 12,50	26	13,70 - 14,30	24
12,50 - 13,10	25	12,50 - 13,10	27	14,30 - 14,90	25
13,10 - 13,70	26	13,10 - 13,70	28	14,90 - 15,50	26
13,70 - 14,30	27	13,70 - 14,30	29	15,50 - 16,10	27
14,30 - 14,90	28	14,30 - 14,90	30	16,10 - 16,70	28
14,90 - 15,50	29	14,90 - 15,50	31	16,70 - 17,30	29
15,50 - 16,10	30	15,50 - 16,10	32	17,30 - 17,90	30


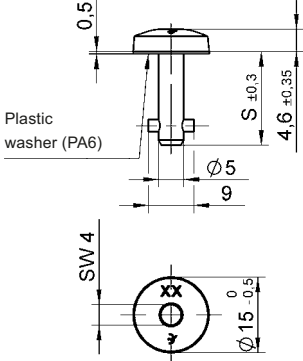

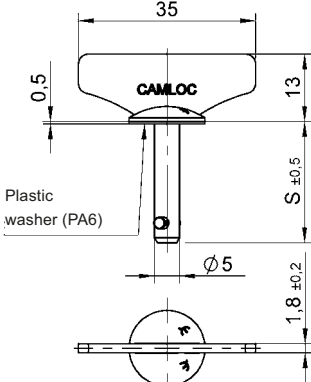

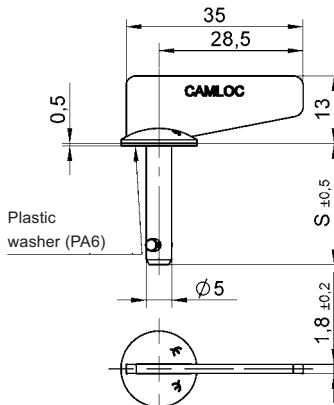
Other lengths on request.

■ Preferred dash-lengths


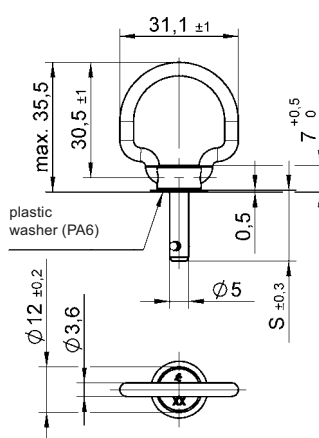

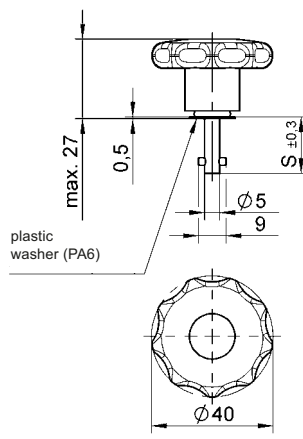

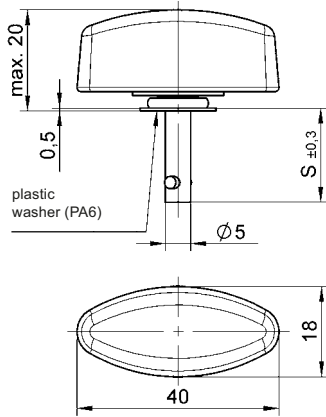
Style	Dimensions	Materials / Finish	°C	Part No.
<p><b>Slotted Recess Head</b></p> 	 <p><math>S = 11,40 + (0,6 \times \text{length no.})</math></p>	<p>Steel / zinc-plated, CrVI-free, clear passivation with plastic washer (PA6)</p> <p>Stainless steel with plastic washer (PA6)</p>	<p>80</p> <p>80</p>	<p><b>50E21-*AGV</b></p> <p><b>50E21-*S</b></p>
<p><b>Cross Recess Head</b></p> 	 <p><math>S = 11,40 + (0,6 \times \text{length no.})</math></p>	<p>Steel / zinc-plated, CrVI-free, clear passivation with plastic washer (PA6)</p>	<p>80</p>	<p><b>50E70-*AGV</b></p>
<p><b>Hex Head Slotted Recess</b></p> 	 <p><math>S = 11,40 + (0,6 \times \text{length no.})</math></p>	<p>Steel / zinc-plated, CrVI-free, clear passivation with plastic washer (PA6)</p>	<p>80</p>	<p><b>50E90-*AGV</b></p>

\* Length no. from Table, see page D-1.

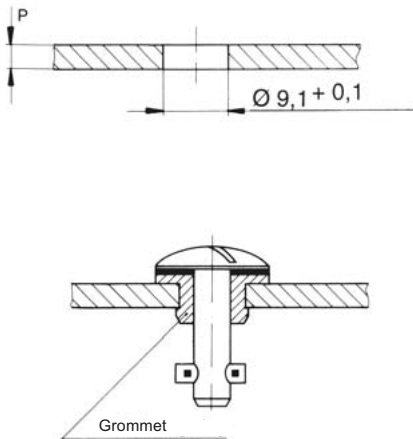
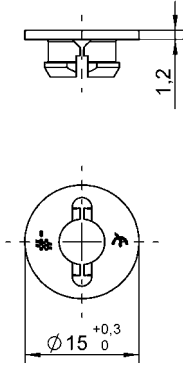
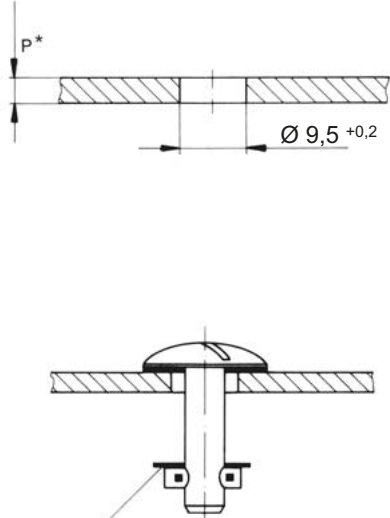
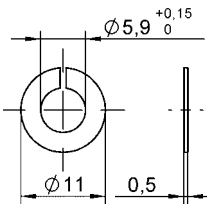
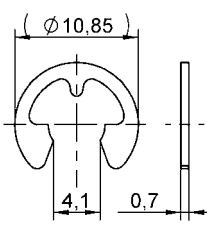
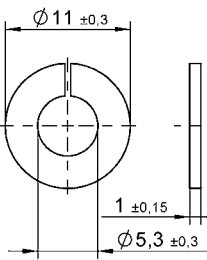



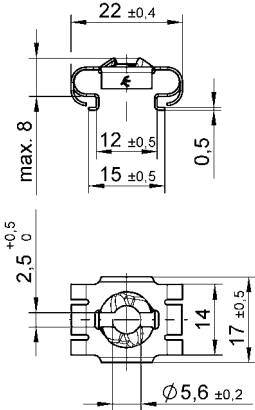

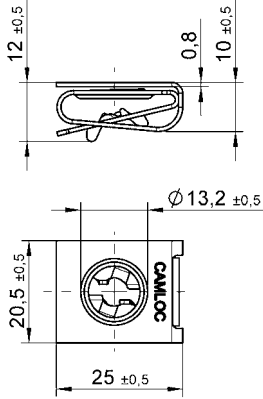
Style	Dimensions	Materials / Finish	°C	Part No.
<p><b>Hex Recess Head</b></p> 	 <p>S = 11,40 + (0,6 x length no.)</p>	<p>Steel / zinc-plated, CrVI-free, clear passivation with plastic washer (PA6)</p>	80	<b>50E60-*AGV</b>
<p><b>Fixed Wing Head</b></p> 	 <p>S = 11,40 + (0,6 x length no.)</p>	<p>Steel / zinc-plated, CrVI-free, clear passivation with plastic washer (PA6)</p> <p>Stainless steel with plastic washer (PA6)</p>	80  80	<b>50E21-*WAGV</b>  <b>50E21-*WS</b>
<p><b>Offset Fixed Wing Head</b></p> 	 <p>S = 11,40 + (0,6 x length no.)</p>	<p>Steel / zinc-plated, CrVI-free, clear passivation with plastic washer (PA6)</p>	80	<b>50E21-*W0AGV</b>

\* Length no. from Table, see page D-1.

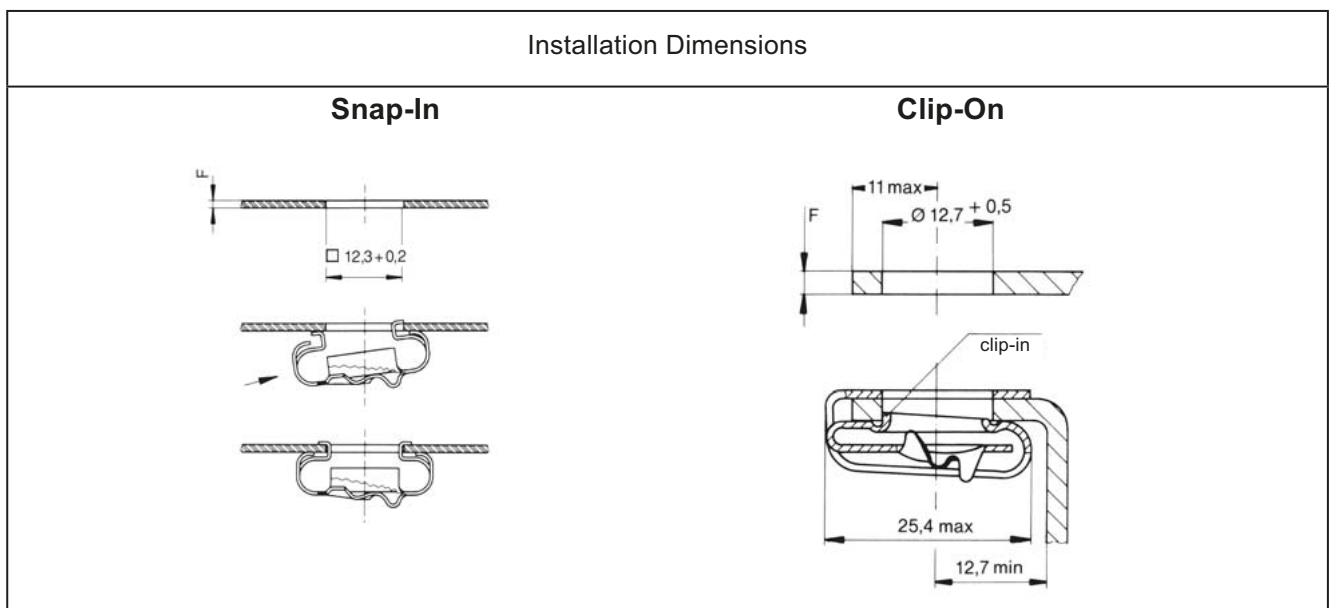
Style	Dimensions	Materials / Finish	°C	Part No.
<p><b>Folding Bail Handle 180°</b></p> 		<p>Steel / zinc-plated, CrVI-free, clear passivation with plastic washer (PA6)</p>	80	<b>50E18-*AGV</b>
<p><b>Plastic Star Form Head</b></p> 		<p>Steel / zinc-plated, CrVI-free, clear passivation with plastic head and plastic washer (PA6)</p> <p>Stainless steel with plastic head and plastic washer (PA6)</p>	<p>- 40 up to + 60</p> <p>- 40 up to + 60</p>	<p><b>50E80-*AGV</b></p> <p><b>50E80-*CP</b></p>
<p><b>Plastic Wing Head</b></p> 		<p>Steel / zinc-plated, CrVI-free, clear passivation with plastic head and plastic washer (PA6)</p> <p>Stainless steel with plastic head and plastic washer (PA6)</p>	<p>- 40 up to + 60</p> <p>- 40 up to + 60</p>	<p><b>50E82-*AGV</b></p> <p><b>50E82-*CP</b></p>

\* Length no. from Table, see page D-1.

Style	Dimensions	Materials / Finish	P	Part No.
<p><b>Snap-In Grommet</b></p> 	<p>Grommet</p> 	<p>Plastic (PA6) / natural colour</p> <p>Working temperature: -40°C + 100°C</p>	Up to 1,60	<b>50S12-0-1AA</b>
			1,70 - 2,80	<b>50S12-1-1AA</b>
			2,90 - 4,00	<b>50S12-2-1AA</b>
			4,10 - 5,30	<b>50S12-3-1AA</b>
			5,40 - 6,65	<b>50S12-4-1AA</b>
<p><b>Retaining Washer</b></p>  <p>Retaining washer Installation: see page A-5.</p>	<p>Retaining washer</p>  <p>Retaining washer</p>  <p>Retaining washer</p> 	<p>Stainless steel</p> <p>Stainless steel</p> <p>Plastic (PA6) / natural colour</p> <p>Working temperature: -40°C + 120°C</p> <p><b>ADVANTAGE:</b> Plastic retaining washer can be assembled without tooling</p>		<b>4002-SW-SS</b>
				<b>50E2-3BP</b>
				<b>50W204-01K</b>
<p>*For P up to 2mm Ø 8 +0,2 for installation without retaining washer</p>				

Style	Dimensions	Materials / Finish	Panel Thickness P	°C	Part No.
<b>Snap-In</b>  		Spring steel / zinc-flake coated	F = 1,0 - 2,0	170	<b>50E20-1AK7 (Type 1)</b>
		Spring steel / zinc-flake coated	F = 2,1 - 3,0	170	<b>50E20-2AK7 (Type 2)</b>
<b>Clip-On</b>  		Spring steel / zinc-flake coated	F = 0,8 - 5,6	170	<b>V50R4-2-1AK7 (Type 3)</b>

## Receptacle Installation Instructions

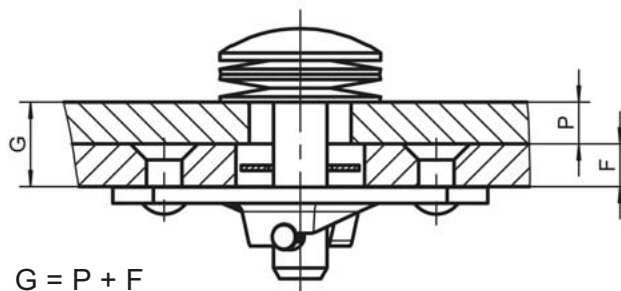


## Features

Max. tensile strength 3.700 N, working load 2.600 N.  
Small fastener giving high tensile load.  
Flat receptacle.  
High preload.

## Selection Instructions

1. Select stud assembly and receptacle, page E-2 to E-4 and E-6.
2. Select retaining washer, page E-5.
3. Select stud length number from total thickness G using the formula and table below (e.g. 50E8-\*AGV).




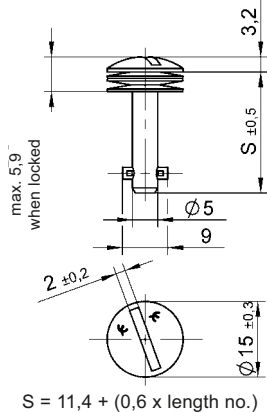

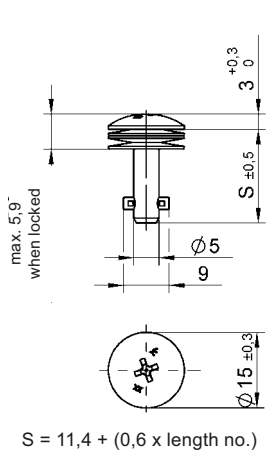

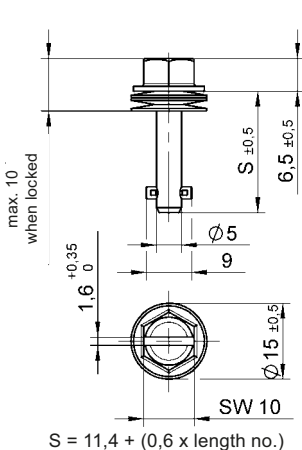
## Stud Length Table

Total Thickness G	Stud Length No.
0,50 - 1,10	2
1,10 - 1,70	3
1,70 - 2,30	4
2,30 - 2,90	5
2,90 - 3,50	6
3,50 - 4,10	7
4,10 - 4,70	8
4,70 - 5,30	9
5,30 - 5,90	10
5,90 - 6,50	11
6,50 - 7,10	12
7,10 - 7,70	13
7,70 - 8,30	14
8,30 - 8,90	15
8,90 - 9,50	16
9,50 - 10,10	17
10,10 - 10,70	18

Total Thickness G	Stud Length No.
10,70 - 11,30	19
11,30 - 11,90	20
11,90 - 12,50	21
12,50 - 13,10	22
13,10 - 13,70	23
13,70 - 14,30	24
14,30 - 14,90	25
14,90 - 15,50	26
15,50 - 16,10	27
16,10 - 16,70	28
16,70 - 17,30	29
17,30 - 17,90	30
17,90 - 18,50	31
18,50 - 19,10	32
19,10 - 19,70	33
19,70 - 20,30	34
20,30 - 20,90	35


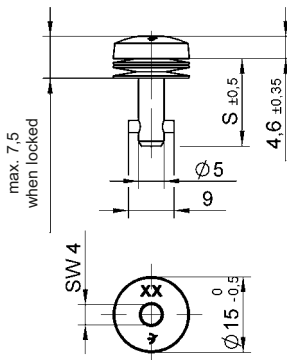

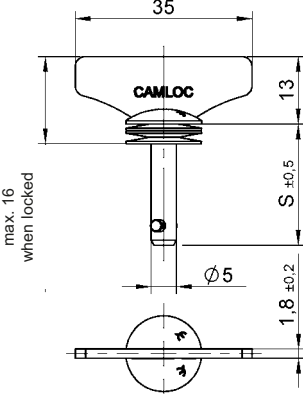

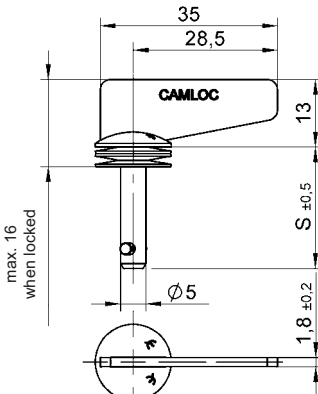
Other lengths on request.

 Preferred dash-lengths

Style	Dimensions	Materials / Finish	°C	Part No.
<p><b>Slotted Recess Head</b></p> 	 <p><math>S = 11,4 + (0,6 \times \text{length no.})</math></p>	<p>Steel / zinc-plated, CrVI-free, clear passivation</p> <p>Stainless steel <sup>1)</sup></p>	<p>120</p> <p>200</p>	<p><b>50E8-*AGV</b></p> <p><b>50E8-*S</b></p>
<p><b>Cross Recess Head</b></p> 	 <p><math>S = 11,4 + (0,6 \times \text{length no.})</math></p>	<p>Steel / zinc-plated, CrVI-free, clear passivation</p>	<p>120</p>	<p><b>50E71-*AGV</b></p>
<p><b>Hex Head Slotted Recess</b></p> 	 <p><math>S = 11,4 + (0,6 \times \text{length no.})</math></p>	<p>Steel / zinc-plated, CrVI-free, clear passivation</p>	<p>120</p>	<p><b>50E91-*AGV</b></p>


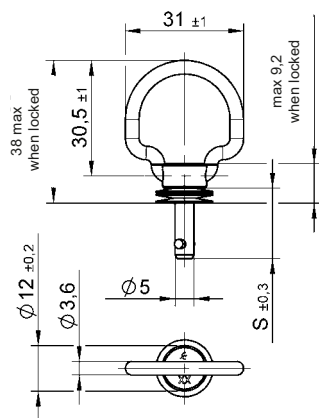

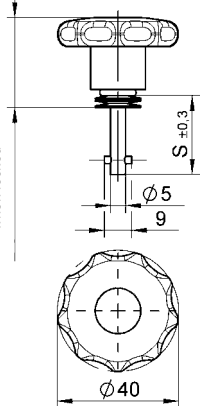

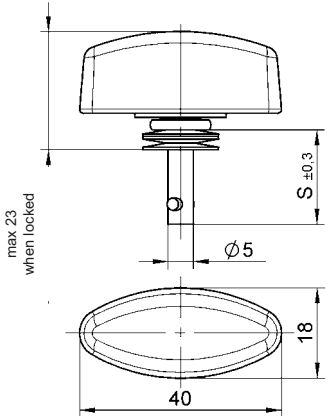

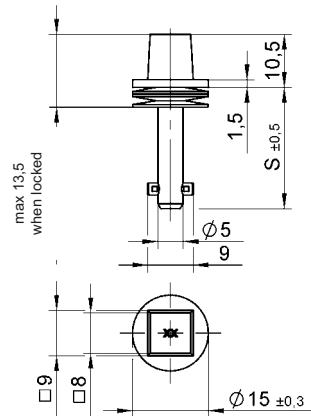
\* Length no. from Table, page E-1.

<sup>1)</sup>Max. tensile strength 2.600 N, working load 1.700 N.

Style	Dimensions	Materials / Finish	°C	Part No.
<p><b>Hex Recess Head</b></p> 	 <p><math>S = 11,4 + (0,6 \times \text{length no.})</math></p>	Steel / zinc-plated, CrVI-free, clear passivation	120	<b>50E61-*AGV</b>
<p><b>Fixed Wing Head</b></p> 	 <p><math>S = 11,4 + (0,6 \times \text{length no.})</math></p>	Steel / zinc-plated, CrVI-free, clear passivation  Stainless steel <sup>1)</sup>	120  200	<b>50E8-*WAGV</b>  <b>50E8-*WS</b>
<p><b>Offset Fixed Wing Head</b></p> 	 <p><math>S = 11,4 + (0,6 \times \text{length no.})</math></p>	Steel / zinc-plated, CrVI-free, clear passivation	120	<b>50E8-*W0AGV</b>

\* Length no. from Table, page E-1.

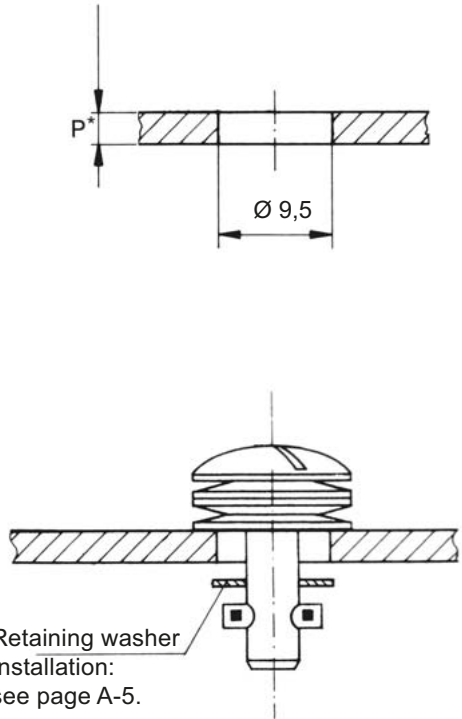
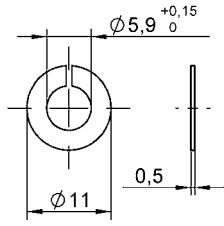
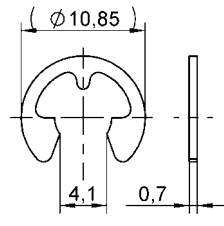
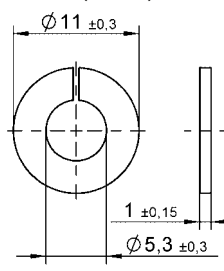
<sup>1)</sup> Max. tensile strength 2.600 N, working load 1.700 N.

Style	Dimensions	Materials / Finish	°C	Part No.
<b>Folding Bail Handle</b> 180° 		Steel / zinc-plated, CrVI-free, clear passivation	120	<b>50E19-*AGV</b>
<b>Star Form Head</b> 		Steel / zinc-plated, CrVI-free, clear passivation with plastic knob (PA 6)  Stainless steel <sup>1)</sup> with plastic knob	-40 up to +60  -40 up to +60	<b>50E81-*AGV</b>  <b>50E81-*CP</b>
<b>Wing Head</b> 		Steel / zinc-plated, CrVI-free, clear passivation with plastic knob (PA 6)  Stainless steel <sup>1)</sup> with plastic knob	-40 up to +60  -40 up to +60	<b>50E83-*AGV</b>  <b>50E83-*CP</b>
<b>Square Head</b> 		Steel / zinc-plated, CrVI-free, clear passivation	120	<b>50E7-*AGV</b>


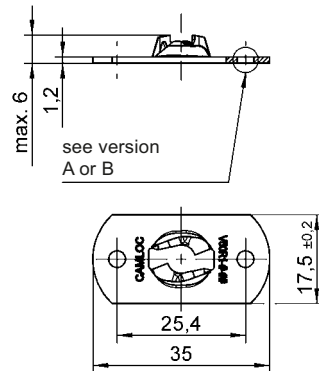
\* Length no. from Table, page E-1.

<sup>1)</sup> Max. tensile strength 2.600 N, working load 1.700 N.

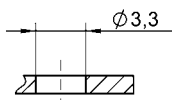


Installation Dimensions	Accessories	Material / Finish	Part No.
 <p>Retaining washer Installation: see page A-5.</p>	<p>Retaining washer (loose)</p> 	<p>Stainless steel</p>	<p><b>4002-SW-SS</b></p>
	<p>Retaining washer (fixed)</p> 	<p>Stainless steel</p>	<p><b>50E2-3BP</b></p>
	<p>Retaining washer (loose)</p> 	<p>Plastic (PA6) / natural colour</p> <p>Working temperature: -40°C + 120°C</p> <p><b>ADVANTAGE:</b> Plastic retaining washer to be assembled without tooling.</p>	<p><b>50W204-01K</b></p>

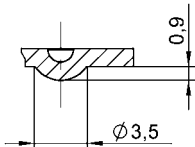
\*For P up to 2 mm  $\varnothing 8^{+0.2}$  for installation without retaining washer

Style	Dimensions	Materials / Finish	°C	Part No.
<b>Rivet- / Screw or Weld Mounting</b>  	 <p>max. 6 1,2 see version A or B</p> <p>25,4 35 17,5 ±0,2</p> <p>CAMLOC</p>	<b>Rivet / Screw Mounting</b>  Steel / zinc-plated, CrVI-free, clear passivation	120	<b>V50R1-1-1AGV</b>
		Stainless steel	200	<b>V50R1-1-1BP</b>
		<b>Welding</b>  Steel / zinc-plated	-	<b>V50R1-1-2AZ</b>
		Steel / oil coated	-	<b>V50R1-1-2AR</b>

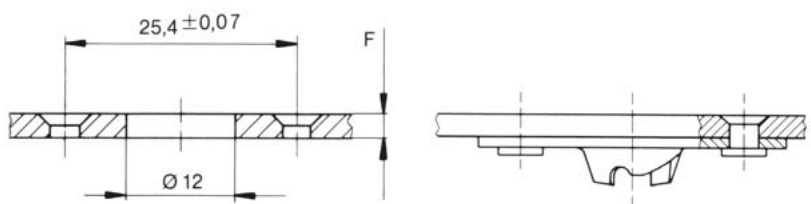
Version A  
Rivet/Screw Mounting



Version B  
Welding



## Receptacle Installation Instructions

Installation Dimensions
<p align="center"><b>Rivet- / Screw or Weld Mounting</b></p>  <p>25,4 ±0,07 Ø 12 F</p>

## Features

Max. tensile strength 1.330 N, working load 900 N.

Small fastener giving a high tensile load.

Wide range of stud head styles and receptacles.

## Selection Instructions

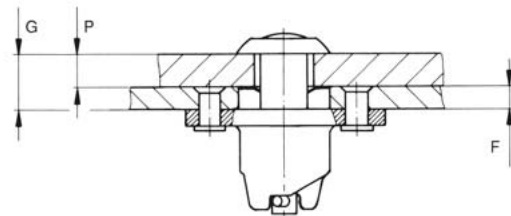
1. Select stud assembly and receptacle, page F-3 up to F-5, F-7 up to F-10.
2. Select stud accessories (retaining washer, gasket), page F-6 and F-7.
3. Select hex nut for receptacle, if necessary, page F-11.
4. Select stud length number from total thickness G using the formula and table on page F-2 (e.g. V26S01-\*AGV).

## Determining the stud length number when using receptacle:

### Type 1 + 3\*

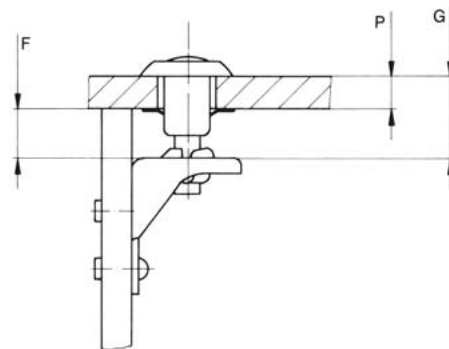
$$G = P + F$$

\* For Type 3: G = 9,9 mm min.



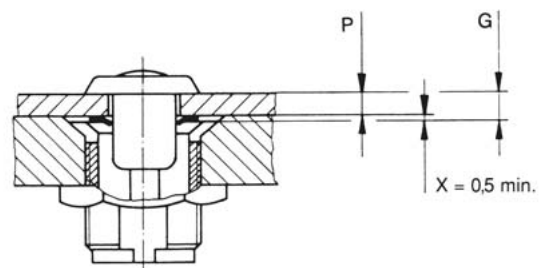
### Type 2

$$G = P + F \text{ (0,75 min.)}$$



### Type 4


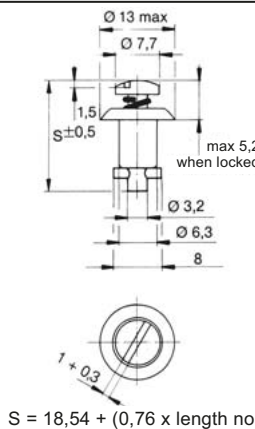

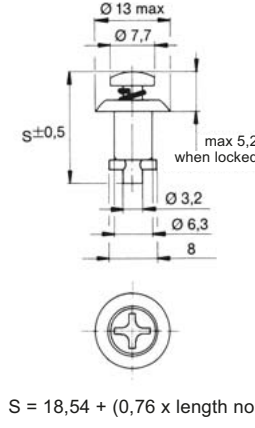

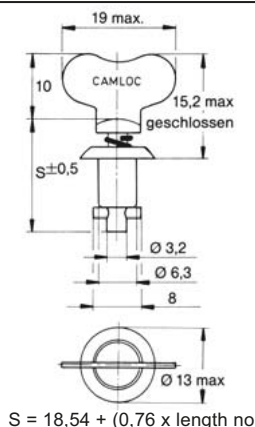
$$G = P + X \text{ (0,5 min.)}$$



Total Thickness G	Stud Length No. When Using <b>Type 1</b> Receptacles	Total Thickness G	Stud Length No. When Using <b>Type 2 + 4</b> Receptacles	Total Thickness G	Stud Length No. When Using <b>Type 3</b> Receptacles
0,75 - 1,50	1	0,75 - 1,50	2	9,90 - 10,65	1
1,50 - 2,30	2	1,50 - 2,30	3	10,65 - 11,40	2
2,30 - 3,05	3	2,30 - 3,05	4	11,40 - 12,20	3
3,05 - 3,80	4	3,05 - 3,80	5	12,20 - 12,95	4
3,80 - 4,60	5	3,80 - 4,60	6	12,95 - 13,70	5
4,60 - 5,35	6	4,60 - 5,35	7	13,70 - 14,50	6
5,35 - 6,10	7	5,35 - 6,10	8	14,50 - 15,25	7
6,10 - 6,85	8	6,10 - 6,85	9	15,25 - 16,00	8
6,85 - 7,60	9	6,85 - 7,60	10	16,00 - 16,75	9
7,60 - 8,40	10	7,60 - 8,40	11	16,75 - 17,50	10
8,40 - 9,15	11	8,40 - 9,15	12	17,50 - 18,30	11
9,15 - 9,90	12	9,15 - 9,90	13	18,30 - 19,05	12
9,90 - 10,65	13	9,90 - 10,65	14	19,05 - 19,80	13
10,65 - 11,40	14	10,65 - 11,40	15	19,80 - 20,60	14
11,40 - 12,20	15	11,40 - 12,20	16	20,60 - 21,35	15
12,20 - 12,95	16	12,20 - 12,95	17	21,35 - 22,10	16
12,95 - 13,70	17	12,95 - 13,70	18	22,10 - 22,85	17
13,70 - 14,50	18	13,70 - 14,50	19	22,85 - 23,60	18
14,50 - 15,25	19	14,50 - 15,25	20	23,60 - 24,40	19
15,25 - 16,00	20	15,25 - 16,00	21	24,40 - 25,15	20
16,00 - 16,75	21	16,00 - 16,75	22	25,15 - 25,90	21
16,75 - 17,50	22	16,75 - 17,50	23	25,90 - 26,65	22
17,50 - 18,30	23	17,50 - 18,30	24	26,65 - 27,40	23
18,30 - 19,05	24	18,30 - 19,05	25	27,40 - 28,20	24
19,05 - 19,80	25	19,05 - 19,80	26	28,20 - 28,95	25
19,80 - 20,60	26	19,80 - 20,60	27	28,95 - 29,70	26
20,60 - 21,35	27	20,60 - 21,35	28	29,70 - 30,50	27
21,35 - 22,10	28	21,35 - 22,10	29	30,50 - 31,25	28
22,10 - 22,85	29	22,10 - 22,85	30	31,25 - 32,00	29
22,85 - 23,60	30	22,85 - 23,60	31	32,00 - 32,75	30
23,60 - 24,40	31	23,60 - 24,40	32	32,75 - 33,50	31
24,40 - 25,15	32	24,40 - 25,15	33	33,50 - 34,30	32
25,15 - 25,90	33	25,15 - 25,90	34	34,30 - 35,05	33
25,90 - 26,65	34	25,90 - 26,65	35	35,05 - 35,80	34
26,65 - 27,40	35	26,65 - 27,40	36	35,80 - 36,60	35
27,40 - 28,20	36	27,40 - 28,20	37	36,60 - 37,35	36
28,20 - 28,95	37	28,20 - 28,95	38	37,35 - 38,10	37
28,95 - 29,70	38	28,95 - 29,70	39	38,10 - 38,85	38
29,70 - 30,50	39	29,70 - 30,50	40	38,85 - 39,60	39
30,50 - 31,25	40	29,70 - 30,50	40	39,60 - 40,40	40


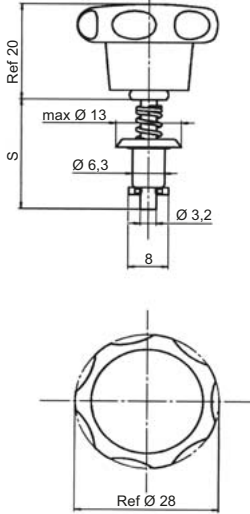

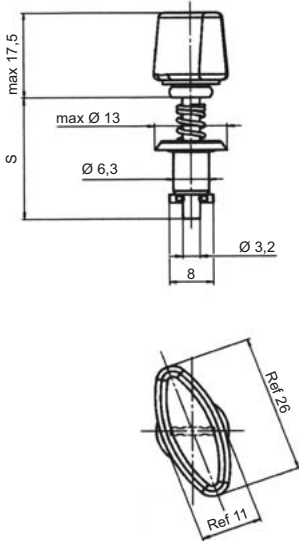

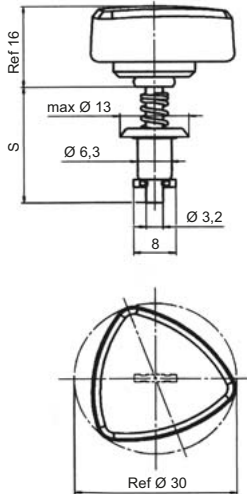
Other lengths on request.

■ Preferred dash-lengths


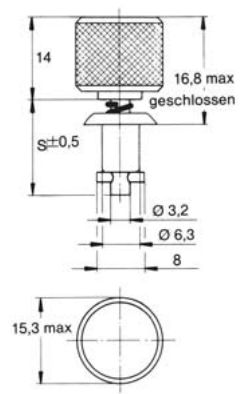
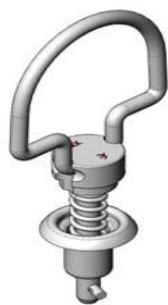
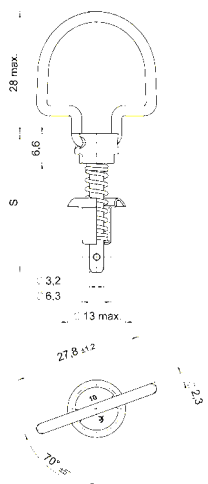
Style	Dimensions	Materials / Finish	°C	Part No.
<b>Slotted Recess Pan Head</b>  	 <p>S = 18,54 + (0,76 x length no.)</p>	Steel / zinc-plated, CrVI-free, clear passivation	120	<b>V26S01-*AGV</b>
		Steel / chrome-plated	120	<b>26S38-*</b>
		Stainless steel <sup>1)</sup>	200	<b>2600-*S</b>
		Steel / nickel-plated	120	<b>26S42-*</b>
<b>Cross Recess Pan Head</b>  	 <p>S = 18,54 + (0,76 x length no.)</p>	Steel / zinc-plated, CrVI-free, clear passivation	120	<b>V26S02-*AGV</b>
		Steel / nickel-plated	120	<b>26S39-*</b>
		Stainless steel <sup>1)</sup>	200	<b>26S51-*</b>
<b>Fixed Wing Head</b>  	 <p>S = 18,54 + (0,76 x length no.)</p>	Steel / zinc-plated, CrVI-free, clear passivation	120	<b>V26S04-*AGV</b>
		Stainless steel <sup>1)</sup>	200	<b>2600-*SW</b>

\* Length no. from Table, page F-2.


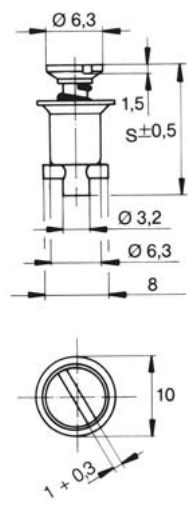

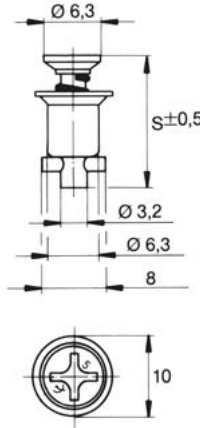
<sup>1)</sup> Max. Tensile strength 1.000 N, working load 700 N.

Style	Dimensions	Materials / Finish	°C	Part No.
<p><b>Star Form Head</b></p> 		<p>Steel / zinc-plated, CrVI-free, clear passivation with plastic knob (PA6)</p> <p>Note: Not to be used with encapsulated receptacles</p>	-40 up to +60	<b>V26S06- *AGV</b>
<p><b>Wing Head</b></p> 		<p>Steel / zinc-plated, CrVI-free, clear passivation with plastic knob (PA6)</p> <p>Note: Not to be used with encapsulated receptacles</p>	-40 up to +60	<b>V26S07- *AGV</b>
<p><b>Triangular Head</b></p> 		<p>Steel / zinc-plated, CrVI-free, clear passivation with plastic knob (PA6)</p> <p>Note: Not to be used with encapsulated receptacles</p>	-40 up to +60	<b>V26S08- *AGV</b>

\* Length no. from Table, page F-2.

Style	Dimensions	Materials / Finish	°C	Part No.
<p><b>Knurled Head</b></p> 	 <p><math>S = 16,76 + (0,76 \times \text{length no.})</math></p>	Steel / chrome-plated	120	<b>26S34-*</b>
<p><b>Folding Bail Handle</b></p> 		Steel / zinc-plated, CrVI-free, clear passivation	120	<b>V26S22 - *AGV</b>

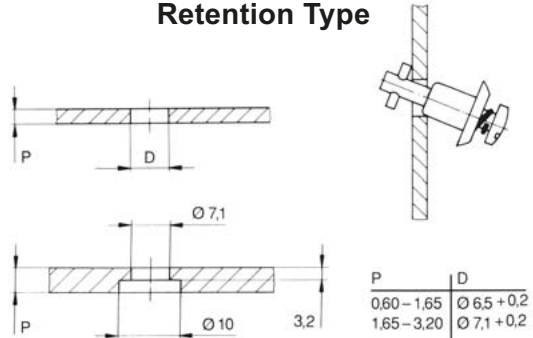
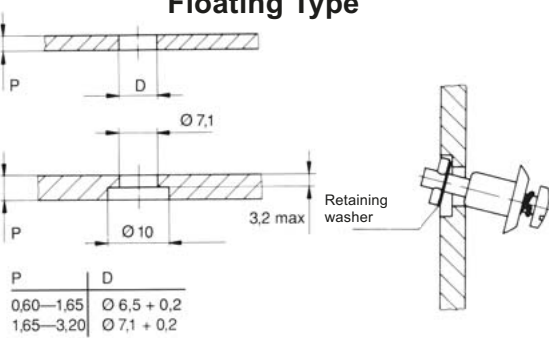
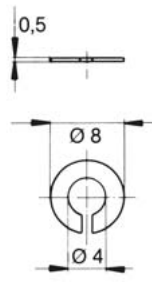
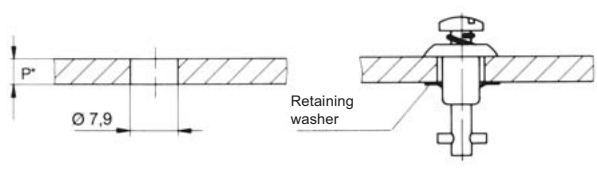
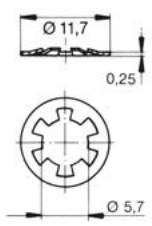
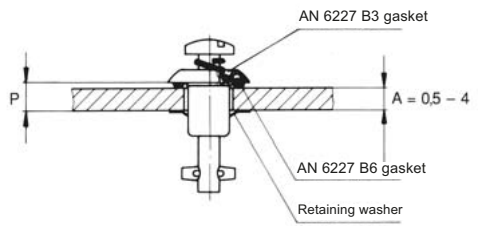
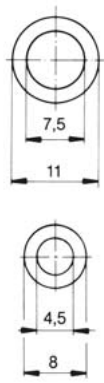
\* Length no. from Table, page F-2.

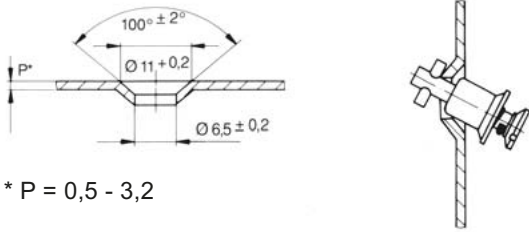
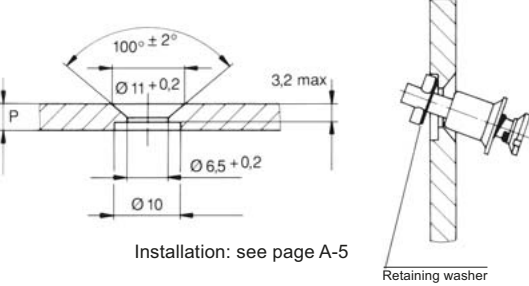
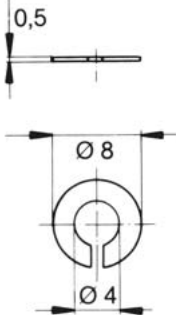

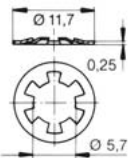
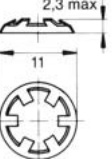

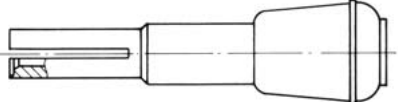
Style	Dimensions	Materials / Finish	°C	Part No.
<p><b>Slotted Recess Flush Head</b></p> 	 <p>S = 14,73 + (0,76 x length no.)</p>	<p>Steel / zinc-plated, CrVI-free, clear passivation</p> <p>Stainless steel <sup>1)</sup></p>	<p>120</p> <p>200</p>	<p><b>V27S01-*AGV</b></p> <p><b>2700-*S</b></p>
<p><b>Cross Recess Flush Head</b></p> 	 <p>S = 14,73 + (0,76 x length no.)</p>	<p>Steel / zinc-plated, CrVI-free, clear passivation</p>	<p>120</p>	<p><b>V27S02-*AGV</b></p>


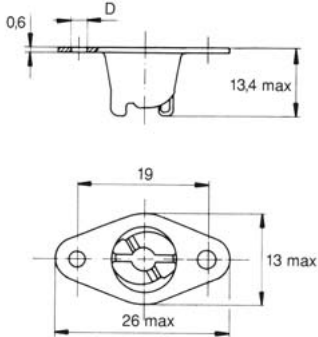

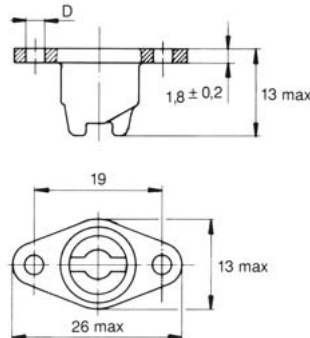

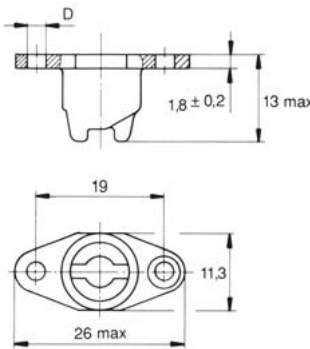

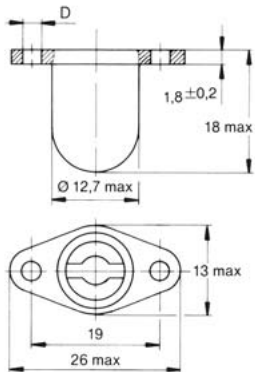
\* Length no. from Table, page F-2.


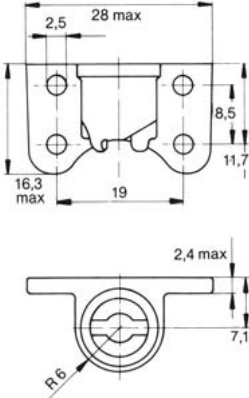

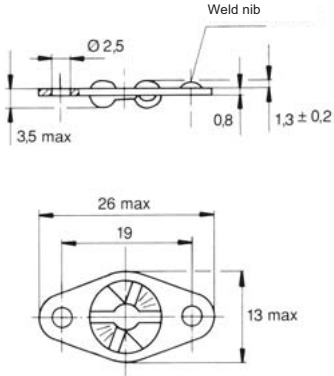
<sup>1)</sup>Max. Tensile strength 1.000 N, working load 700


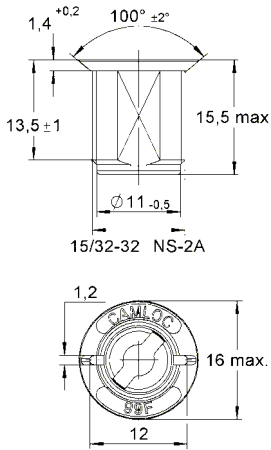

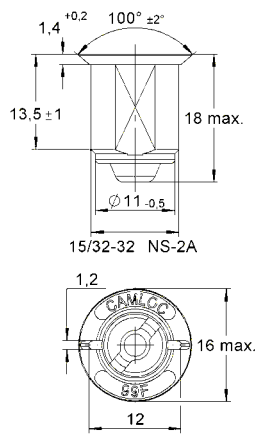


Installation Dimensions	Accessories	Material / Finish	Part No.						
<p><b>Stud Retention without Retaining Washer, Retention Type</b></p>  <table border="1" data-bbox="598 616 766 694"> <tr> <td>P</td> <td>D</td> </tr> <tr> <td>0,60 - 1,65</td> <td>Ø 6,5 + 0,2</td> </tr> <tr> <td>1,65 - 3,20</td> <td>Ø 7,1 + 0,2</td> </tr> </table> <p>4P3-1 installation pliers, see page F-7.</p>	P	D	0,60 - 1,65	Ø 6,5 + 0,2	1,65 - 3,20	Ø 7,1 + 0,2	-	<p>Note: Dash "4" stud and smaller are self-captivating</p>	-
P	D								
0,60 - 1,65	Ø 6,5 + 0,2								
1,65 - 3,20	Ø 7,1 + 0,2								
<p><b>Stud Retention with Retaining Washer, Floating Type</b></p>  <table border="1" data-bbox="231 1064 414 1142"> <tr> <td>P</td> <td>D</td> </tr> <tr> <td>0,60 - 1,65</td> <td>Ø 6,5 + 0,2</td> </tr> <tr> <td>1,65 - 3,20</td> <td>Ø 7,1 + 0,2</td> </tr> </table> <p>4P3-1 installation pliers, see page F-7.</p>	P	D	0,60 - 1,65	Ø 6,5 + 0,2	1,65 - 3,20	Ø 7,1 + 0,2	Retaining washer	<p>Stainless steel</p> <p>Note: Retaining rings are required for stud length dash numbers "5" and up</p> 	<b>2600-SW</b>
P	D								
0,60 - 1,65	Ø 6,5 + 0,2								
1,65 - 3,20	Ø 7,1 + 0,2								
<p><b>Stud Retention with Retaining Washer, Fixed Spring Cup</b></p>  <p>*P = 0,5 - 4,75</p> <p>4P3-1 installation pliers, see page F-7.</p>	Retaining washer	<p>Stainless steel</p> <p>Not for chrome-plated parts</p> 	<b>V2600-LW-7</b>						
<p><b>Sealed (for 2600 series with panhead only)</b></p>  <p>P = A + 0,75</p> <p>T98-1 installation tool, page F-6. Installation see page A-5.</p> <p>4P3-1 installation pliers, see page F-7.</p>	Gaskets	<p>Rubber (100°C)</p> <p>Rubber (100°C)</p> 	<p><b>AN6227-B6</b></p> <p><b>AN6227-B3</b></p>						

Installation Dimensions	Accessories	Material / Finish	Part No.
<p><b>Stud Retention without a Retaining Washer, Retention Type</b></p>  <p>* P = 0,5 - 3,2</p> <p>Installation tool see below</p>	-	<p>-</p> <p>Note: Dash "4" stud and smaller are self-captivating</p>	-
<p><b>Stud Retention without a Retaining Washer, Floating Type</b></p>  <p>Installation: see page A-5</p> <p>Installation tool see below</p>	Retaining washer	<p>Stainless steel</p> <p>Note: Retaining rings are required for stud length dash numbers "5" and up</p> 	<b>2600-SW</b>
<p><b>Stud Retention with a Retaining Washer, Fixed Spring Cup</b></p>  <p>Installation: see page A-5</p> <p>Installation tool see below</p>	Retaining washer	<p>Stainless steel</p>  <p>Steel / nickel-plated</p> 	<b>V2600-LW-7</b> <b>V27W01-1AN</b>
	<b>Stud Installation pliers</b>		<b>4P3-1</b>
	<b>V2600-LW-7 retaining washer installation tool</b>		<b>T98-1</b>

Style	Dimensions	Materials / Finish	D	°C	Part No.
<p><b>Type 1 Lightweight</b></p> 		Steel / zinc-plated, CrVI-free, clear passivation	2,6	120	<b>V26R6-1AGV</b>
<p><b>Type 1 Cast</b></p> 		<p>Hard bronze / zinc-plated, CrVI-free, clear passivation</p> <p>Hard bronze / zinc-plated, CrVI-free, clear passivation</p> <p>Stainless steel</p>	<p>2,5</p> <p>3,3</p> <p>2,5</p>	<p>120</p> <p>120</p> <p>200</p>	<p><b>V212-12-1FGV</b></p> <p><b>V212-12-2FGV</b></p> <p><b>212-12S</b></p>
<p><b>Type 1 Narrow Width</b></p> 		Hard bronze / zinc-plated, CrVI-free, clear passivation	2,5	120	<b>V212-12N-1FGV</b>
<p><b>Type 1 Encapsulated</b></p> 		<p>Hard bronze / zinc-plated, CrVI-free, clear passivation</p> <p>Capsule: Steel / zinc-plated, CrVI-free, clear passivation</p> <p>Stainless steel</p>	<p>2,5</p> <p>2,5</p>	<p>120</p> <p>150</p>	<p><b>26R16-1FGV</b></p> <p><b>26R18-1-1AA</b></p>

Style	Dimensions	Materials / Finish	°C	Part No.
<p><b>Type 2 Side Mounting</b></p> 		Aluminium / anodized	175	<b>26R1-1</b>
<p><b>Type 3 Rivet / Screw or Weld Mounting</b></p> 		<p><b>Rivet / Screw Mounting</b> Steel / zinc-plated, CrVI-free, clear passivation</p> <p>Stainless steel</p> <p><b>Welding</b> Stainless steel</p>	<p>120</p> <p>200</p> <p>-</p>	<p><b>V312-12AGV</b></p> <p><b>312-12S</b></p> <p><b>312-12WS</b></p>

Style	Dimensions	Materials / Finish	°C	Part No.
<p><b>Type 4 Single Hole Mounting</b></p> 		<p>Zinc die cast / zinc-plated, CrVI-free, clear chromate</p>	<p>100</p>	<p><b>99R10-01A1</b></p>
<p><b>Type 4 Single Hole Mounting Encapsulated</b></p> 		<p>Zinc die cast / zinc-plated, CrVI-free, clear chromate</p> <p>Capsule: Stainless steel</p>	<p>100</p>	<p><b>99E10-01</b></p>



## Features

Max. tensile strength 4.700 N, working load 3.100 N.

Small fastener for high tensile load.

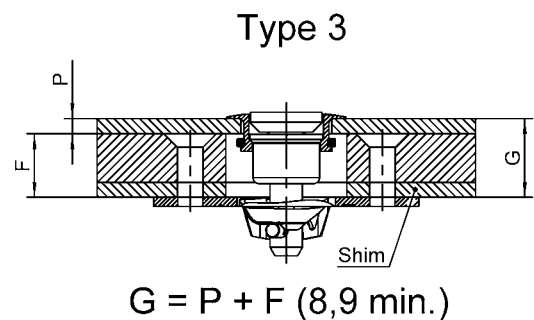
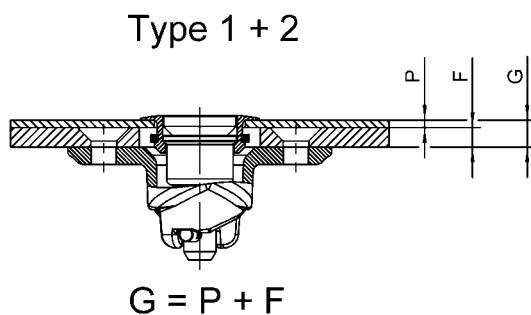
Large range of stud assemblies with fixed and floating receptacles

## Selection Instructions

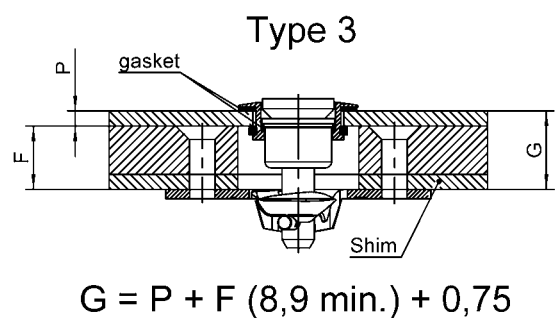
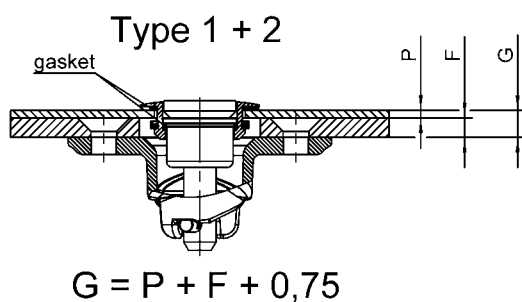
1. Select stud assembly, page G-4 and G-5, grommet and snap-on retaining ring, page G-7 and receptacle, page G-8 and G-9.
2. Select retaining washer, page G-6, for studs from length no. 5.
3. Select stud length number from total thickness G using the formula and the table on page G-2 and G-3 (e.g. D4002-\*AGV).

Determining the stud length number when using receptacle:

### Standard version



### Sealed version



**When Using the Following Grommet and Receptacles:**

**Flush Mounting Grommets**  
**D4002-G-AGV    D4002-H-AGV**  
**4002-GS        4002-HS**

Total Thickness G	Stud Length No. When Using <b>Type 1</b> Receptacles	Total Thickness G	Stud Length No. When Using <b>Type 2</b> Receptacles	Total Thickness G	Stud Length No. When Using <b>Type 3</b> Receptacles
0,50 - 1,30	-	0,50 - 1,30	-	8,90 - 9,65	2
1,30 - 2,05	-	1,30 - 2,05	2	9,65 - 10,40	3
2,05 - 2,80	2	2,05 - 2,80	3	10,40 - 11,20	4
2,80 - 3,55	3	2,80 - 3,55	4	11,20 - 11,95	5
3,55 - 4,30	4	3,55 - 4,30	5	11,95 - 12,70	6
4,30 - 5,10	5	4,30 - 5,10	6	12,70 - 13,50	7
5,10 - 5,85	6	5,10 - 5,85	7	13,50 - 14,20	8
5,85 - 6,60	7	5,85 - 6,60	8	14,20 - 15,00	9
6,60 - 7,30	8	6,60 - 7,30	9	15,00 - 15,75	10
7,30 - 8,15	9	7,30 - 8,15	10	15,75 - 16,50	11
8,15 - 8,90	10	8,15 - 8,90	11	16,50 - 17,30	12
8,90 - 9,65	11	8,90 - 9,65	12	17,30 - 18,00	13
9,65 - 10,40	12	9,65 - 10,40	13	18,00 - 18,80	14
10,40 - 11,20	13	10,40 - 11,20	14	18,80 - 19,55	15
11,20 - 11,95	14	11,20 - 11,95	15	19,55 - 20,30	16
11,95 - 12,70	15	11,95 - 12,70	16	20,30 - 21,10	17
12,70 - 13,50	16	12,70 - 13,50	17	21,10 - 21,85	18
13,50 - 14,20	17	13,50 - 14,20	18	21,85 - 22,60	19
14,20 - 15,00	18	14,20 - 15,00	19	22,60 - 23,40	20
15,00 - 15,75	19	15,00 - 15,75	20	23,40 - 24,15	21
15,75 - 16,50	20	15,75 - 16,50	21	24,15 - 24,90	22
16,50 - 17,30	21	16,50 - 17,30	22	24,90 - 25,65	23
17,30 - 18,00	22	17,30 - 18,00	23	25,65 - 26,40	24
18,00 - 18,80	23	18,00 - 18,80	24	26,40 - 27,20	25
18,80 - 19,55	24	18,80 - 19,55	25	27,20 - 27,95	26
19,55 - 20,30	25	19,55 - 20,30	26	27,95 - 28,70	27
20,30 - 21,10	26	20,30 - 21,10	27	28,70 - 29,50	28
21,10 - 21,85	27	21,10 - 21,85	28	29,50 - 30,20	29
21,85 - 22,60	28	21,85 - 22,60	29	30,20 - 31,00	30
22,60 - 23,40	29	22,60 - 23,40	30	31,00 - 31,75	31
23,40 - 24,15	30	23,40 - 24,15	31	31,75 - 32,50	32
24,15 - 24,90	31	24,15 - 24,90	32	32,50 - 33,30	33
24,90 - 25,65	32	24,90 - 25,65	33	33,30 - 34,05	34
25,65 - 26,40	33	25,65 - 26,40	34	34,05 - 34,80	35
26,40 - 27,20	34	26,40 - 27,20	35		
27,20 - 27,95	35	26,40 - 27,20	35		

Other lengths on request.

■ Preferred dash-lengths




**When Using the Following Grommet and Receptacles:**


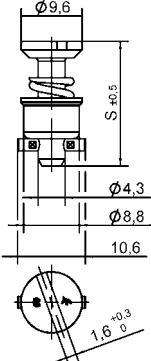

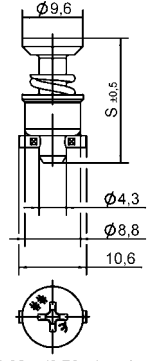

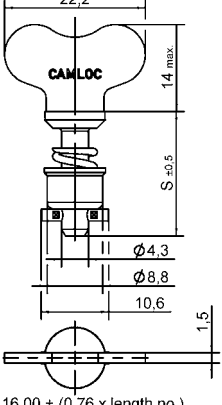
**Plus Flush Mounting Grommets**

**D4002-N-AGV    D4002-O-AGV    D4002-P-AGV**  
**4002-NS        4002-OS            D4002-P-BP**

Total Thickness G	Stud Length No. When Using <b>Type 1</b> Receptacles	Total Thickness G	Stud Length No. When Using <b>Type 2</b> Receptacles	Total Thickness G	Stud Length No. When Using <b>Type 3</b> Receptacles
0,50 - 1,30	-	0,50 - 1,30	2	8,90 - 9,65	3
1,30 - 2,05	2	1,30 - 2,05	3	9,65 - 10,40	4
2,05 - 2,80	3	2,05 - 2,80	4	10,40 - 11,20	5
2,80 - 3,55	4	2,80 - 3,55	5	11,20 - 11,95	6
3,55 - 4,30	5	3,55 - 4,30	6	11,95 - 12,70	7
4,30 - 5,10	6	4,30 - 5,10	7	12,70 - 13,50	8
5,10 - 5,85	7	5,10 - 5,85	8	13,50 - 14,20	9
5,85 - 6,60	8	5,85 - 6,60	9	14,20 - 15,00	10
6,60 - 7,30	9	6,60 - 7,30	10	15,00 - 15,75	11
7,30 - 8,15	10	7,30 - 8,15	11	15,75 - 16,50	12
8,15 - 8,90	11	8,15 - 8,90	12	16,50 - 17,30	13
8,90 - 9,65	12	8,90 - 9,65	13	17,30 - 18,00	14
9,65 - 10,40	13	9,65 - 10,40	14	18,00 - 18,80	15
10,40 - 11,20	14	10,40 - 11,20	15	18,80 - 19,55	16
11,20 - 11,95	15	11,20 - 11,95	16	19,55 - 20,30	17
11,95 - 12,70	16	11,95 - 12,70	17	20,30 - 21,10	18
12,70 - 13,50	17	12,70 - 13,50	18	21,10 - 21,85	19
13,50 - 14,20	18	13,50 - 14,20	19	21,85 - 22,60	20
14,20 - 15,00	19	14,20 - 15,00	20	22,60 - 23,40	21
15,00 - 15,75	20	15,00 - 15,75	21	23,40 - 24,15	22
15,75 - 16,50	21	15,75 - 16,50	22	24,15 - 24,90	23
16,50 - 17,30	22	16,50 - 17,30	23	24,90 - 25,65	24
17,30 - 18,00	23	17,30 - 18,00	24	25,65 - 26,40	25
18,00 - 18,80	24	18,00 - 18,80	25	26,40 - 27,20	26
18,80 - 19,55	25	18,80 - 19,55	26	27,20 - 27,95	27
19,55 - 20,30	26	19,55 - 20,30	27	27,95 - 28,70	28
20,30 - 21,10	27	20,30 - 21,10	28	28,70 - 29,50	29
21,10 - 21,85	28	21,10 - 21,85	29	29,50 - 30,20	30
21,85 - 22,60	29	21,85 - 22,60	30	30,20 - 31,00	31
22,60 - 23,40	30	22,60 - 23,40	31	31,00 - 31,75	32
23,40 - 24,15	31	23,40 - 24,15	32	31,75 - 32,50	33
24,15 - 24,90	32	24,15 - 24,90	33	32,50 - 33,30	34
24,90 - 25,65	33	24,90 - 25,65	34	33,30 - 34,05	35
25,65 - 26,40	34	25,65 - 26,40	35		
26,40 - 27,20	35				


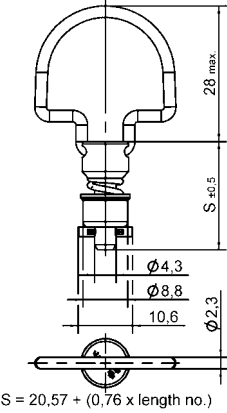

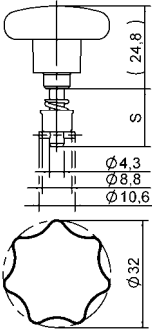

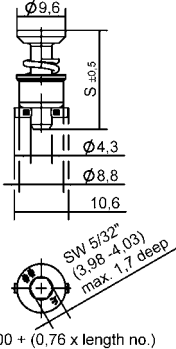
Other lengths on request.

 Preferred dash-lengths

Style	Dimensions	Materials / Finish	°C	Part No.
<p><b>Slotted Recess Head</b></p> 	 <p><math>S = 16,00 + (0,76 \times \text{length no.})</math></p>	<p>Steel / zinc-plated, CrVI-free, clear passivation</p> <p>Stainless steel <sup>1)</sup></p>	<p>120</p> <p>200</p>	<p><b>D4002-*AGV</b></p> <p><b>D4002-*BP</b></p>
<p><b>Cross Recess Head</b></p> 	 <p><math>S = 16,00 + (0,76 \times \text{length no.})</math></p>	<p>Steel / zinc-plated CrVI-free, clear passivation</p> <p>Stainless steel <sup>1)</sup></p>	<p>120</p> <p>200</p>	<p><b>D40S5-*AGV</b></p> <p><b>D40S5-*BP</b></p>
<p><b>Fixed Wing Head</b></p> 	 <p><math>S = 16,00 + (0,76 \times \text{length no.})</math></p>	<p>Steel / zinc-plated, CrVI-free, clear passivation</p> <p>Stainless steel <sup>1)</sup></p>	<p>120</p> <p>200</p>	<p><b>D4002-*WAGV</b></p> <p><b>D4002-*WBP</b></p>


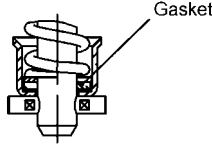

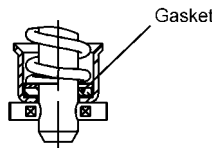
\* Length no. from Table, page G-2 and G-3

<sup>1)</sup> Max. tensile strength 3.300 N, working load 2.200 N

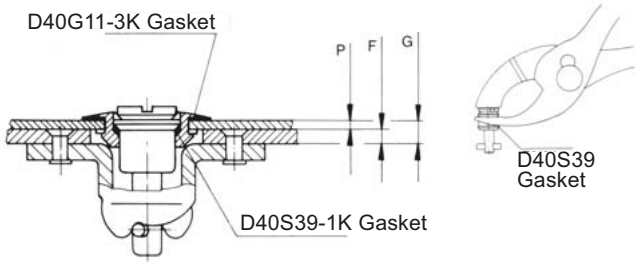
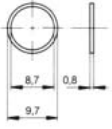
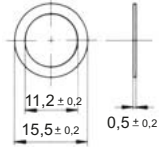
Style	Dimensions	Materials / Finish	°C	Part No.
<p><b>180° Folding Bail Handle</b></p> 	 <p><math>S = 20.57 + (0.76 \times \text{length no.})</math></p>	Steel / zinc-plated, CrVI-free, clear passivation	120	<b>D40S47-*AGV</b>
<p><b>Star Form Head</b></p> 		Steel / zinc-plated, CrVI-free, clear passivation	-40 up to +60	<b>D40E22-*AGV</b>
<p><b>Hex Recess Head</b></p> 	 <p><math>S = 16.00 + (0.76 \times \text{length no.})</math></p>	Steel / zinc-plated, CrVI-free, clear passivation  Stainless steel <sup>1)</sup>	120  200	<b>D40E28- *AGV</b>  <b>D40E28-*BP</b>

\* Length no. from Table, page G-2 and G-3  
N

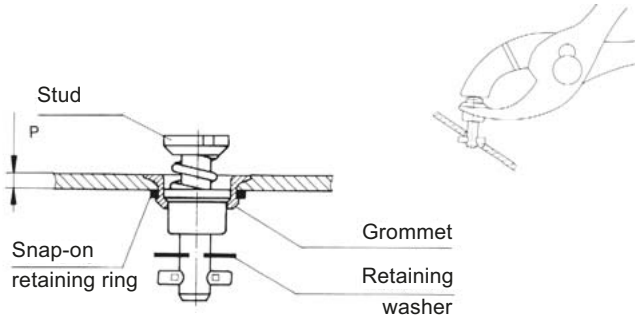
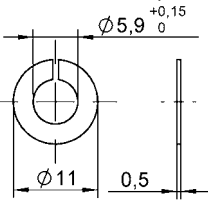
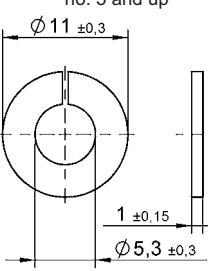
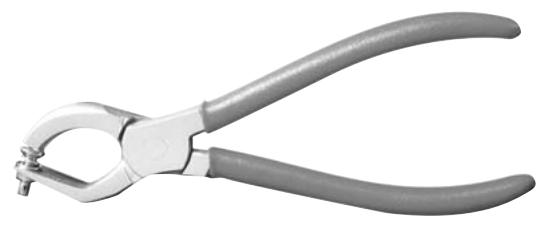
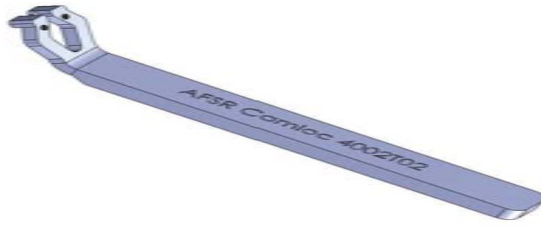
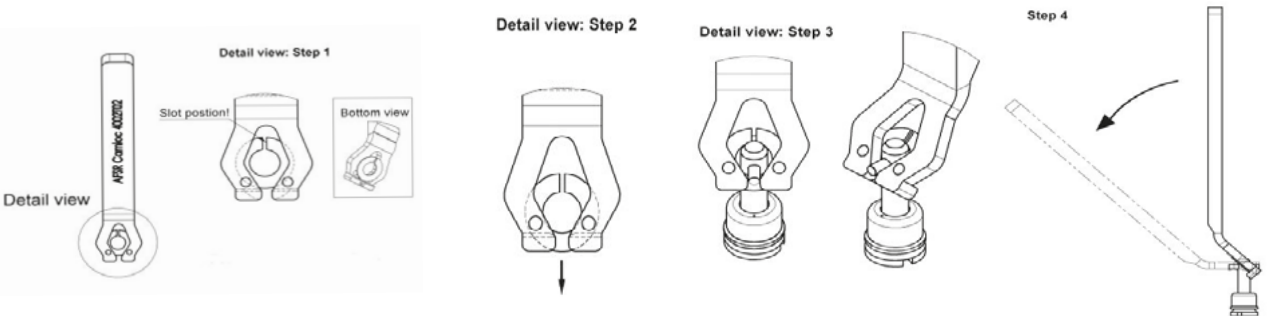
<sup>1)</sup> Max. tensile strenght 3.300 N, working load 2.200

Style	Dimensions	Materials / Finish	°C	Part No.
<p><b>Sealed Slotted Recess Head</b></p> 	 <p>Additional required gasket see page G-4</p>	<p>Steel / zinc-plated, CrVI-free, clear passivation</p> <p>Gasket: Vulkollan<sup>®*</sup></p> <p>Available in Stud Length no. 4 and above</p>	100	<b>D4002I-*AGV</b>
<p><b>Sealed Cross Recess Head</b></p> 	 <p>Additional required gasket see page G-4</p>	<p>Steel / zinc-plated, CrVI-free, clear passivation</p> <p>Gasket: Vulkollan<sup>®*</sup></p> <p>Available in Stud Length no. 4 and above</p>	100	<b>D40S5I-*AGV</b>


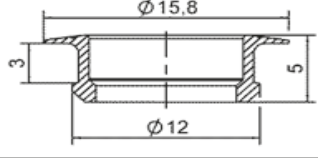

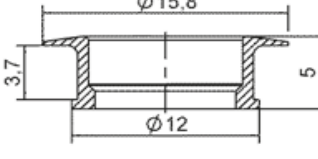

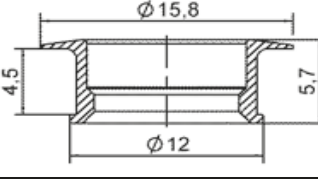

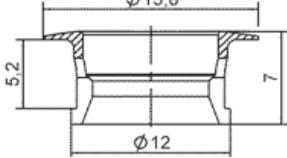

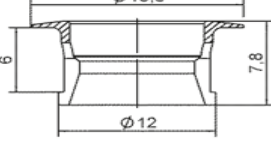

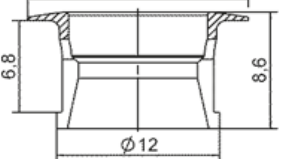

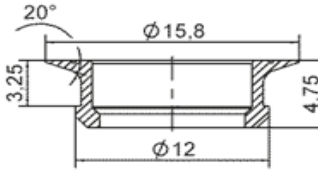

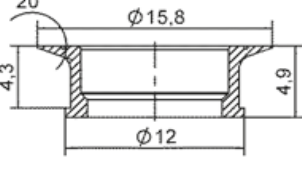
\* Vulkollan<sup>®</sup> is a registered brand of Bayer AG.


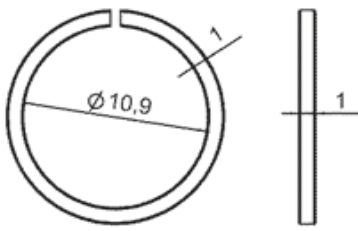
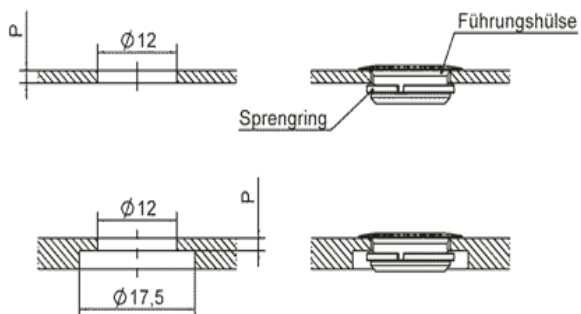
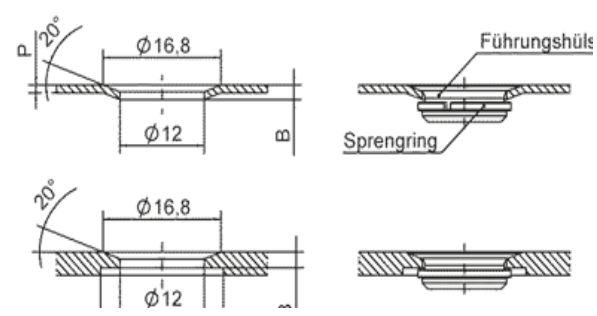

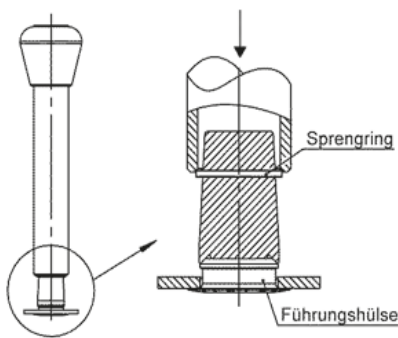
Installation Dimensions	Accessories	Materials / Finish	Part No.
<p><b>Gasket to be ordered in addition to the sealed stud assembly</b></p>  <p>D40G11-3K Gasket</p> <p>D40S39-1K Gasket</p>	<p>Gasket</p>  <p>Gasket</p> 	<p>Plastic / (PA6)</p> <p>EPDM black</p>	<p><b>D40S39-1K</b></p> <p><b>D40G11-3K</b></p>


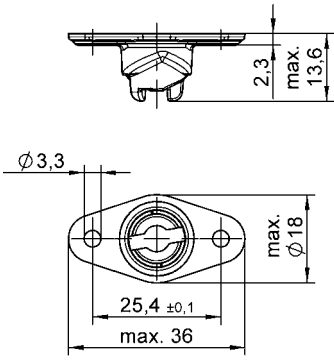

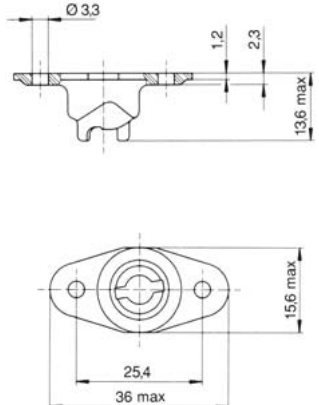

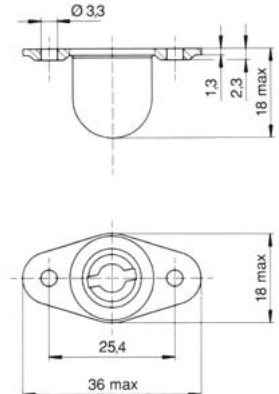
\* Length no. from Table, page G-2 and G-3

Installation Dimensions	Accessories	Materials / Finish	Part No.
 <p>4P3-1 installation pliers, see below</p>	<p>retaining ring loose on stud use for stud length no. 5 and up</p>  <p>retaining ring loose on stud use for stud length no. 5 and up</p> 	<p>Stainless steel</p> <p>Plastic</p>	<p><b>4002-SW-SS</b></p> <p><b>50W204-01K</b></p>
	<p><b>Stud installation pliers</b></p>		<p><b>4P3-1</b></p>
	<p><b>Mounting tool for retaining washers*</b></p>		<p><b>4002T02-1BP</b></p>
<p style="text-align: center;"><b>installation of 4002-SW-SS</b></p> 			


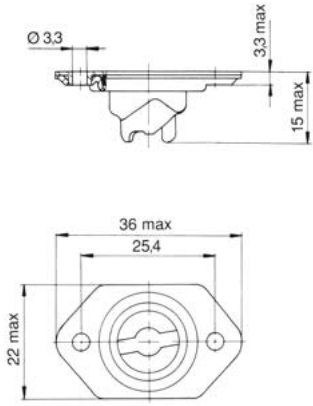

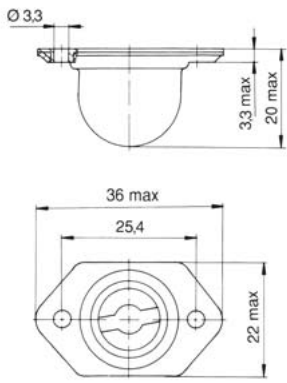

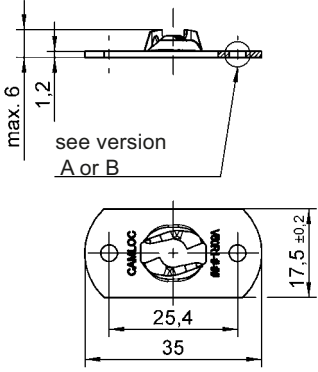
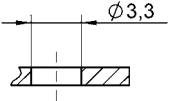
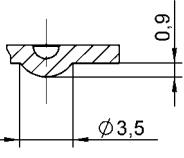
\* Mounting tool 4002T02 is only for retaining washers of (D)4002 Series.

Style	Dimensions	Materials/ Finish	°C	Part no.
<b>Plus Flush Mounting For Panel Thickness up to 1,65</b> 		Steel/ zinc-plated CrVI-free, clear passivation  stainless steel	120  200	<b>D4002-N</b>  <b>4002-NS</b>
<b>Plus Flush Mounting For Panel Thickness from 1,65 to 2,40</b> 		Steel/ zinc-plated CrVI-free, clear passivation  stainless steel	120  200	<b>D4002-O</b>  <b>4002-OS</b>
<b>Plus Flush Mounting For Panel Thickness from 2,40 to 3,20</b> 		Steel/ zinc-plated CrVI-free, clear passivation  stainless steel	120  200	<b>D4002-P</b>  <b>4002-P-BP</b>
<b>Plus Flush Mounting For Panel Thickness from 3,20 to 3,95</b> 		Steel/ zinc-plated CrVI-free, clear passivation	120	<b>D4002-R</b>
<b>Plus Flush Mounting For Panel Thickness from 3,95 to 4,75</b> 		Steel/ zinc-plated CrVI-free, clear passivation	120	<b>D4002-S</b>
<b>Plus Flush Mounting For Panel Thickness from 4,80 to 5,60</b> 		Steel/ zinc-plated CrVI-free, clear passivation	120	<b>D4002-T</b>
<b>Flush Mounting For Panel Thickness up to 1,65</b> 		Steel/ zinc-plated CrVI-free, clear passivation  stainless steel	120  200	<b>D4002-G</b>  <b>4002-GS</b>
<b>Flush Mounting For Panel Thickness from 1,65 to 2,18</b> 		Steel/ zinc-plated CrVI-free, clear passivation  stainless steel	120  200	<b>D4002-H</b>  <b>4002-HS</b>

Style	Dimensions	Materials/ Finish	Part no.
		<p>Steel/ zinc-plated, CrVI-free, clear passivation</p> <p>stainless steel</p> <p>stainless steel/ non-magnetic</p>	<p><b>R4G-3</b></p> <p><b>V40G26-1BP</b></p> <p><b>V40G26-1N</b></p>
		<p>Grommet plus Flush Part no.</p> <p>D4002-N-AGV / 4002-NS D4002-O-AGV / 4002-OS D4002-P-AGV / D4002-P-BP D4002-T-AGV / D4002-T-BP</p>	<p><math>P_{max}</math></p> <p>1,65 2,40 3,20 5,60</p>
		<p>Grommet Flush Part no.</p> <p>D4002-G-AGV / 4002-GS D4002-H-AGV / 4002-HS</p>	<p><math>P_{max}</math>    <math>B_{max}</math></p> <p>1,65    1,88 2,18    2,97</p>
		<p>T26</p>	

Style	Dimensions	Materials / Finish	°C	Part No.
<p><b>Type 1 Cast</b></p> 		<p>Hard bronze / zinc-plated, CrVI-free, clear passivation</p> <p>Stainless steel</p>	<p>120</p> <p>200</p>	<p><b>D214-16FGV</b></p> <p><b>214-16S</b></p>
<p><b>Type 1 Cast Narrow Width</b></p> 		<p>Hard bronze / zinc-plated, CrVI-free, clear passivation</p>	<p>120</p>	<p><b>D214-16NFGV</b></p>
<p><b>Type 1 Cast Encapsulated</b></p> 		<p>Hard bronze / zinc-plated, CrVI-free, clear passivation</p> <p>Capsule: Brass / zinc-plated, CrVI-free, clear passivation</p>	<p>150</p>	<p><b>D40R12-1FGV</b></p>



Style	Dimensions	Materials / Finish	°C	Part No.
<b>Type 2</b> <b>Float up to 0,75 mm</b> <b>(Cast Receptacle)</b>  		Hard bronze / zinc-plated, CrVI-free, clear passivation  Cage: Steel / zinc-plated, CrVI-free, clear passivation	120	<b>D244-16-FGV</b>
		Stainless steel	200	<b>244-16S</b>
<b>Type 2</b> <b>Float up to 0,75 mm</b> <b>Encapsulated</b>  		Hard bronze / zinc-plated, CrVI-free, clear passivation  Capsule: Steel / zinc-plated, CrVI-free, clear passivation	120	<b>D244-16C-FGV</b>
		Stainless steel	200	<b>244-16SC</b>
<b>Type 3</b> <b>Flat</b> <b>Rivet / Screw or</b> <b>Weld Mounting</b>  	 <p>Version A</p>  <p>Version B</p> 	<b>Rivet / Screw Mounting (A)</b> Hard bronze / zinc-plated, CrVI-free, clear passivation	120	<b>V50R1-1-1AGV</b>
		Stainless steel	200	<b>V50R1-1-1BP</b>
		<b>Welding (B)</b> Steel / zinc-plated	-	<b>V50R1-1-2AZ</b>
		Steel/oil-coated	-	<b>V50R1-1-2AR</b>

Installation Dimensions

**Types 1, 2 and 3**  
**Receptacle Hole Pattern**



## Features

Max. tensile strength 10.000 N, working load 7.000 N.

High tensile strength and preload.

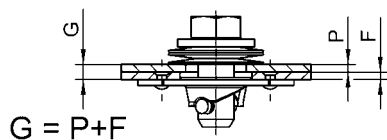
Typical applications:

Commercial vehicles, coaches, agricultural machinery, chemical engineering, heating systems etc.

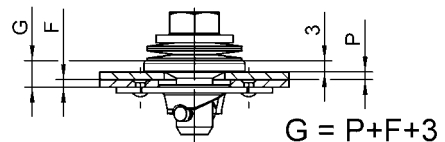
1. Select stud assembly and receptacle, pages H-2, H-3 and H-5.
2. Sealed: Also select rubber gasket and buffer plate, page H-4.
3. Select retaining washer, page H-4.
4. Select stud length number from total thickness G using the formula and table below (e.g. 991S01-\*AGV).

## Determining the stud length number when using:

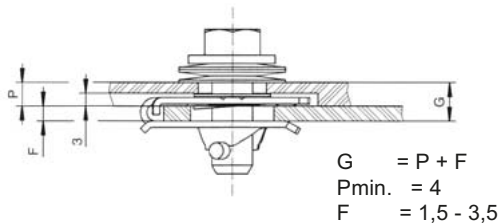
### Rivet, Screw and Weld Mounting Receptacle



### Sealed Stud Assemblies



### Clip-On Receptacle


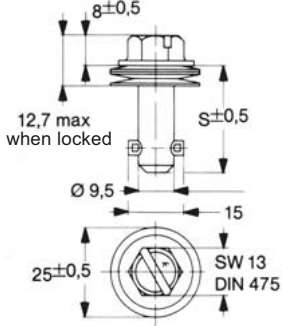

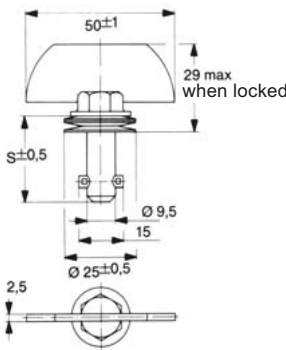

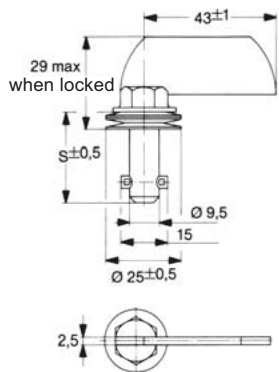

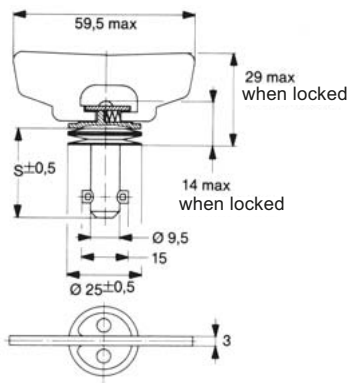


## Stud Length Table

Total Thickness G	Stud Length No.	Total Thickness G	Stud Length No.	Total Thickness G	Stud Length No.
0,90 - 1,65	1	13,85 - 14,60	18	26,80 - 27,55	35
1,65 - 2,40	2	14,60 - 15,35	19	27,55 - 28,30	36
2,40 - 3,15	3	15,35 - 16,15	20	28,30 - 29,10	37
3,15 - 3,95	4	16,15 - 16,90	21	29,10 - 29,85	38
3,95 - 4,70	5	16,90 - 17,65	22	29,85 - 30,60	39
4,70 - 5,45	6	17,65 - 18,40	23	30,60 - 31,35	40
5,45 - 6,20	7	18,40 - 19,20	24	31,35 - 32,15	41
6,20 - 7,00	8	19,20 - 19,95	25	32,15 - 32,90	42
7,00 - 7,75	9	19,95 - 20,70	26	32,90 - 33,65	43
7,75 - 8,50	10	20,70 - 21,45	27	33,65 - 34,40	44
8,50 - 9,25	11	21,45 - 22,25	28	34,40 - 35,20	45
9,25 - 10,05	12	22,25 - 23,00	29	35,20 - 35,95	46
10,05 - 10,80	13	23,00 - 23,75	30	35,95 - 36,70	47
10,80 - 11,55	14	23,75 - 24,50	31	36,70 - 37,45	48
11,55 - 12,30	15	24,50 - 25,25	32	37,45 - 38,25	49
12,30 - 13,10	16	25,25 - 26,05	33	38,25 - 39,00	50
13,10 - 13,85	17	26,05 - 26,80	34		


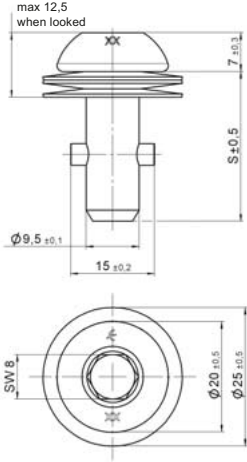

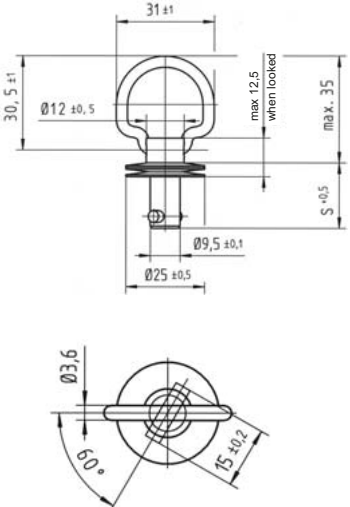
Other lengths on request.

■ Preferred dash-lengths

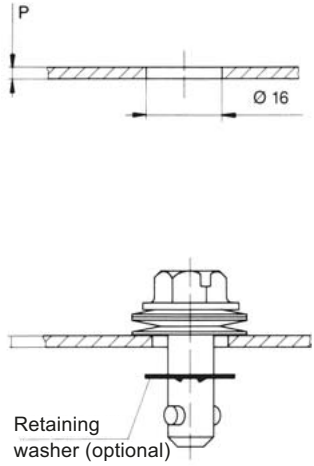
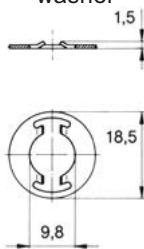
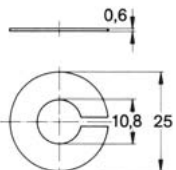
Style	Dimensions	Materials / Finish	°C	Part No.
<p><b>Hex Head Slotted Recess</b></p> 	 <p>S = 16,26 + (0,76 x length no.)</p>	<p>Steel / zinc-plated, CrVI-free, clear passivation</p> <p>Stainless steel <sup>1)</sup></p>	<p>120</p> <p>200</p>	<p><b>991S01- *-1AGV</b></p> <p><b>991S01- *-1BP</b></p>
<p><b>Fixed Wing Head</b></p> 	 <p>S = 16,26 + (0,76 x length no.)</p>	<p>Steel / zinc-plated, CrVI-free, clear passivation</p>	<p>120</p>	<p><b>991S02- *-1AGV</b></p>
<p><b>Offset Fixed Wing Head</b></p> 	 <p>S = 16,26 + (0,76 x length no.)</p>	<p>Steel / zinc-plated, CrVI-free, clear passivation</p>	<p>120</p>	<p><b>991S03- *-1AGV</b></p>
<p><b>180° Folding Wing Head</b></p> 	 <p>S = 16,26 + (0,76 x length no.)</p>	<p>Steel / zinc-plated, CrVI-free, clear passivation</p>	<p>120</p>	<p><b>991S05- *-1AGV</b></p>

\* Length no. from Table, see page H-1.

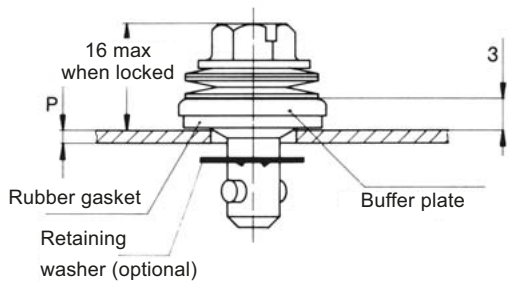
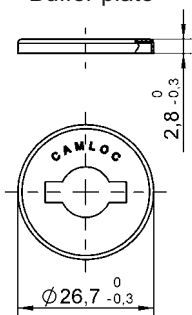
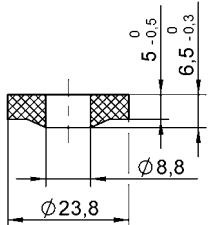
<sup>1)</sup> Max. tensile strength 7.000 N, working load 4.500 N.


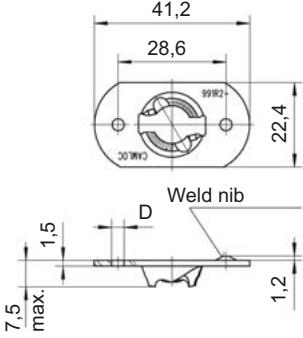

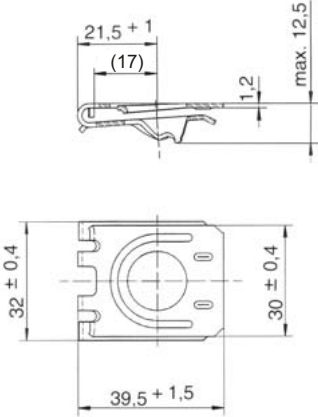
Style	Dimensions	Materials / Finish	°C	Part No.
<p><b>Hex Recess Head</b></p> 		<p>Steel / zinc-plated, CrVI-free, clear passivation</p>	<p>120</p>	<p><b>991S30-*AGV</b></p>
<p><b>Folding Bail Handle 180°</b></p> 	 <p>S = 15,03 + (0,76 X length no.)</p>	<p>Steel / zinc-plated, CrVI-free, clear passivation</p>	<p>120</p>	<p><b>991S2991-*AGV</b></p>

\* Length no. from Table, see page H-1.

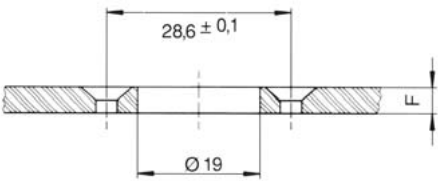
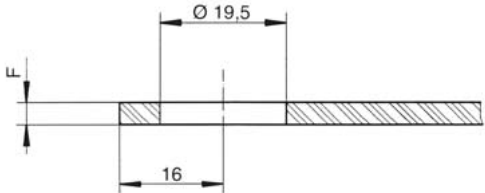
Installation Dimensions	Accessories	Material / Finish	Part No.
	Retaining washer 	Stainless steel	<b>991W04-1BP</b>
	Slotted retaining washer 	Stainless steel	<b>991W02-1BP</b>

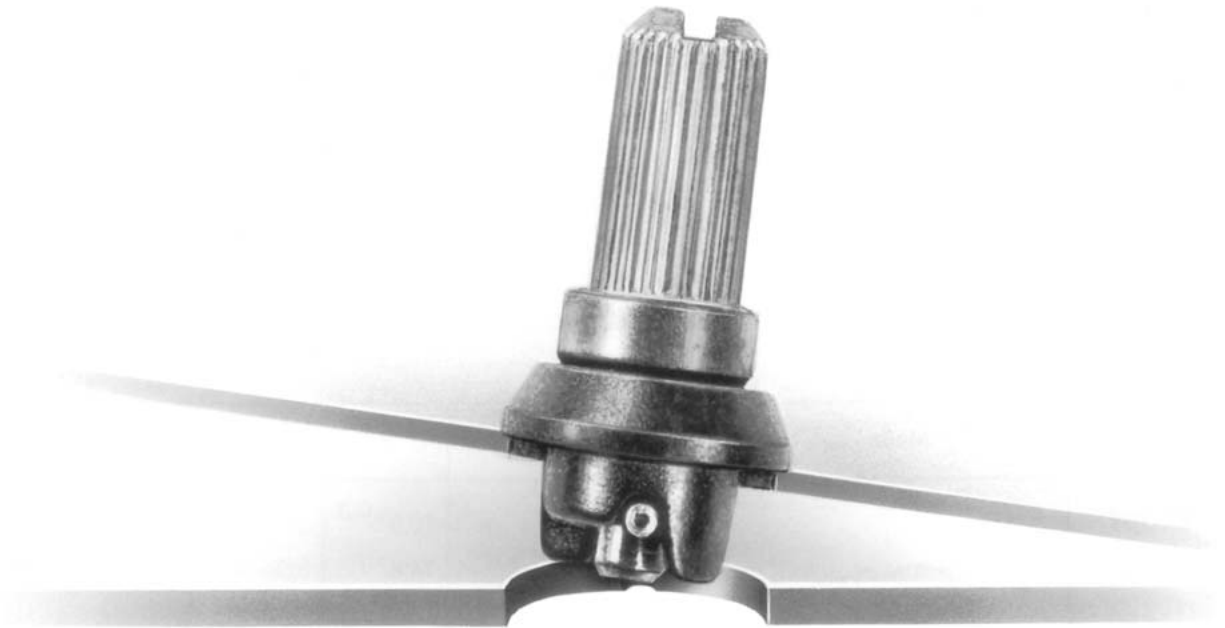
**Sealed Stud Assemblies**

Installation Dimensions	Accessories	Material / Finish	Part No.
	Buffer plate 	Stainless steel	<b>991W03-1BP</b>
	Rubber gasket 	NBR black (100°C max.)	<b>991S17-1K</b>

Style	Dimensions	Materials / Finish	Mounting Ø	°C	Part No.
<b>Rivet / Screw Mounting</b>  		<b>Rivet / Screw Mounting</b> Steel / zinc-plated, CrVI-free, clear passivation	3,3	120	<b>991R2-1AGV</b>
		Steel / zinc-plated, CrVI-free, clear passivation	4,1	120	<b>991R2-3AGV</b>
		Stainless steel	3,3	200	<b>991R2-1BP</b>
		Stainless steel	4,1	200	<b>991R2-3BP</b>
		<b>Welding</b> Steel / zinc-plated	-	-	<b>991R2-2AZ</b>
		Steel / oil coated	-	-	<b>991R2-2AR</b>
<b>Clip-On</b>  		Steel / zinc-plated, zinc flake coated  Frame thickness F= 1,5mm - 3,5mm		150	<b>991R6-1AK7</b>

## Receptacle Installation Instructions

Installation Dimensions	
<b>Rivet / Screw or Welded Mounting</b>  	<b>Clip-On</b>  





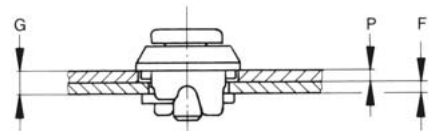
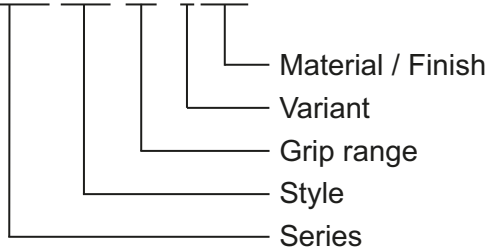
## Features

- Max. tensile strength 300 N, working load 200 N.
- Same hole shape for panel and frame.
- Available in slotted recess or knurled head styles .
- Fastener position indication by stud slot.
- Stud assembly captive in the panel.
- Vibration resistant.
- Grip ranges from 2,0 mm to 4,6 mm.
- Lock and unlock by a quarter turn.
- Typical applications are in electro-mechanical and electronic equipment.
- Quick installation without tools.

## Part no. example


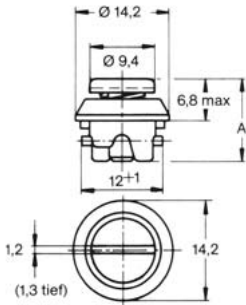

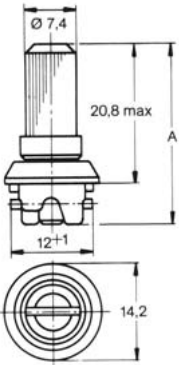
Knurled head for 3,3 mm to 4,6 mm grip range.

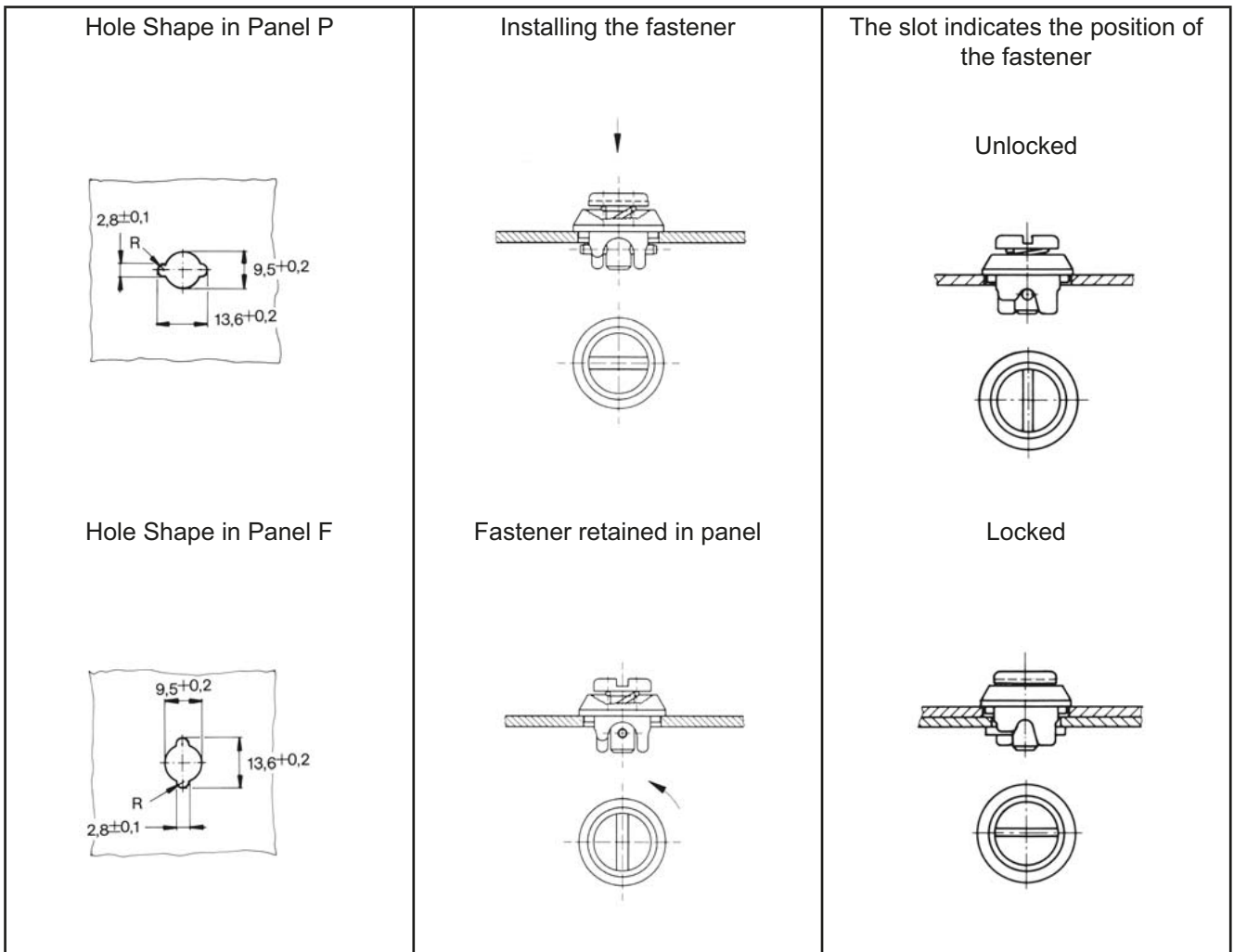
### V936 S11 -4 -1 AA



$$G = P + F$$

$$P_{min} = 1,2 \text{ mm}$$

Style	Dimensions	Materials / Finish	A	Grip Range G	°C	Part No.
<b>Slotted Recess Head</b>  		Stud, spiral pin: Steel / zinc-plated, CrVI-free, clear chromate  Compression spring: Stainless steel  Casing: Zinc die casting / zinc-plated, CrVI-free, clear chromate	12,3 <sup>±0,3</sup>	2,0 - 3,2	100	<b>V936S05-3-1AA</b>
			14,8 <sup>±0,3</sup>	3,3 - 4,6	100	<b>V936S05-4-1AA</b>
<b>Knurled Head</b>  		Stud, Casing: Zinc die casting / zinc-plated, CrVI-free, clear chromate  Compression spring: Stainless steel  Spiral pin: Steel / zinc-plated, CrVI-free, clear chromate	26,4 <sup>±0,3</sup>	2,0 - 3,2	100	<b>V936S11-3-1AA</b>
			28,9 <sup>±0,3</sup>	3,3 - 4,6	100	<b>V936S11-4-1AA</b>



## Features

This fastener fastens panels in electrical switch cabinets (e.g. 19"-equipment) to modular bars.

## Selection Instructions

The dimensions of the front panel and the modular bar as well as the colour determine the final design of the fastener.

To enable us to offer you the custom-tailored fastener, we need your drawings with the dimensions and tolerances of:

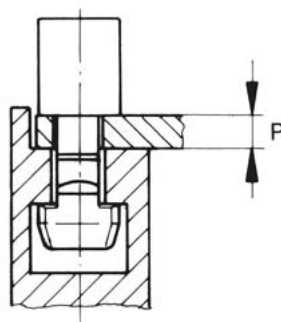
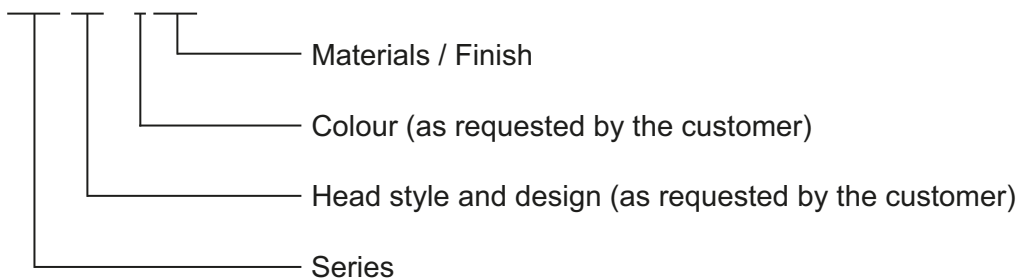
1. the front panel
2. the shape of the modular bar
3. the colour, if necessary


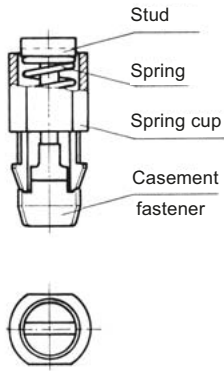

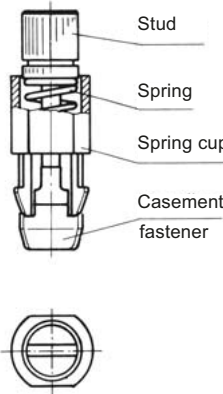
In addition, please send us samples of your modular bar and front panel.

## Part no. example

One-piece fastener

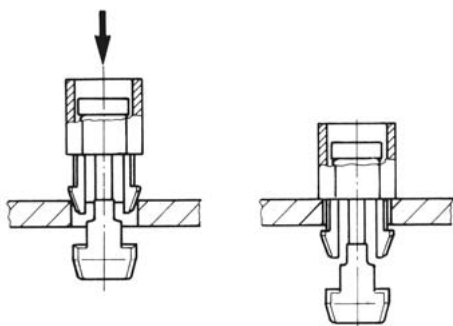
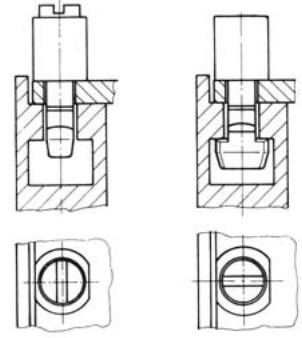
### 713 S\* - \* AE



Style	Dimensions	Materials / Finish	°C	Part No.
<p><b>Slotted Recess Head</b></p> 		<p>Spring cup: Plastic (POM) Stud: Steel / nickel-plated Spring: Steel / zinc-plated, CrVI-free, clear chromate Casement fastener: Zinc die casting / zinc-plated, CrVI-free, clear chromate</p>	-25 up to +90	<b>713S* - *AE</b>
<p><b>Knurled Head</b></p> 		<p>Spring cup: Plastic (POM) Stud: Steel / nickel-plated Spring: Steel / zinc-plated, CrVI-free, clear chromate Casement fastener: Zinc die casting / zinc-plated, CrVI-free, clear chromate</p>	-25 up to +90	<b>713S* - *AE</b>

\* Design and colour as requested by the customer.

Due to the various front panel thickness, hole shapes and modular bar shapes, it is not possible to offer one standard design. We will individually issue the final part number only after determining the front panel and modular bar dimensions and the colour.

Dimensions	Fastener Position
<p>Installing the Fastener</p>  <p>1. Insert fastener with spring cup into hole. 2. Push stud until snap-in hooks lock in.</p>	<p>Unlocked      Locked</p>  <p>To lock push stud and turn 90°C.</p> <p>The slot indicates the position of the fastener.</p>



## Features

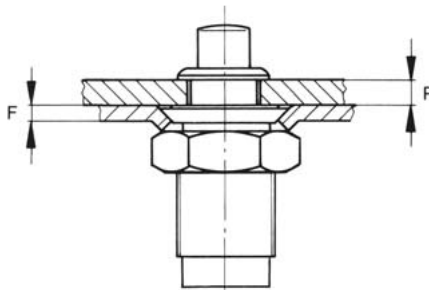
Max. tensile strength 1.330 N, working load 930 N.

Quick opening and closing by a push of the finger.

Easy installation with single hole mounting.

## Selection Instructions


1. Select stud assembly, page K-2 and receptacle, page K-3.
2. Select retaining washer, page K-2 and retaining hexnut, page K-3, if necessary.
3. Select stud length number from Panel thickness P using the table below, insert into stud part number \* (e.g. 15S1-\*-1AD).


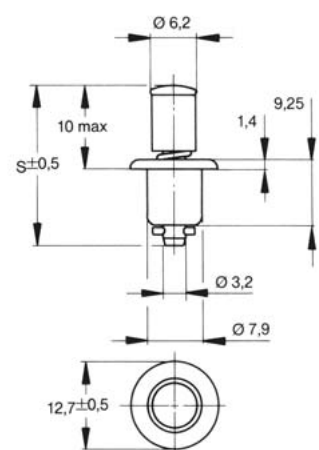


### Stud Length Table

Panel Thickness P	Stud Length No.
0,7 - 2,3	1
2,3 - 3,8	3
3,8 - 5,3	5
5,3 - 6,9	7
6,9 - 8,4	9
8,4 - 9,9	11
9,9 - 11,4	13
11,4 - 13,0	15

Other lengths on request.

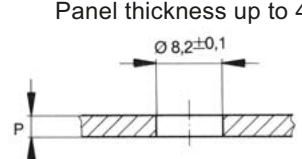
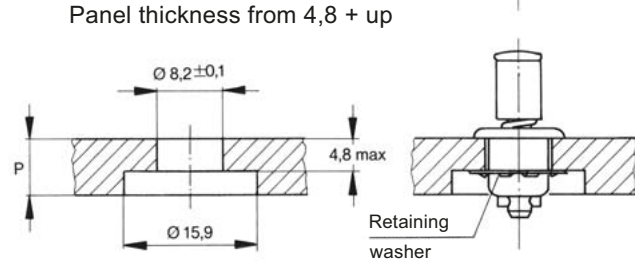

 Preferred dash-lengths


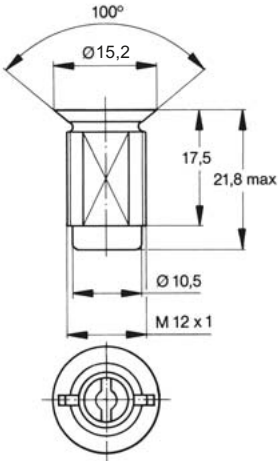
Style	Dimensions	Materials / Finish	°C	Part No.
	 <p>S=22,4 + (0,76 x length no.)</p>	Steel / nickel-plated	120	<b>15S1- *-1AD</b>
		Steel / zinc-plated CrVI-free, clear passivation	120	<b>15S1- *-1AJ</b>

\* Length no. from Table, see page K-1.

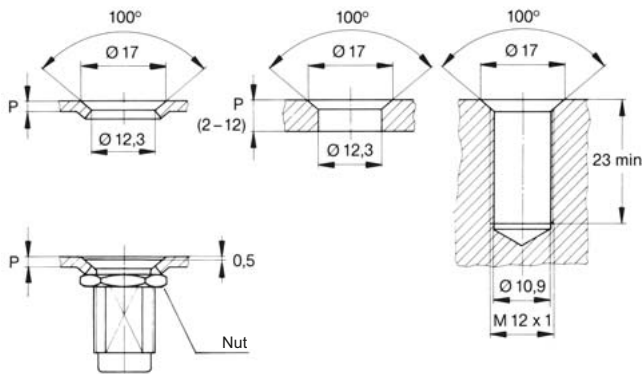
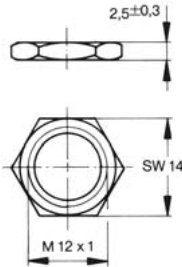
Other lengths and surfaces can be ordered upon request.

## Stud Installation Instructions

Installation Dimensions	Accessories	Materials / Finish	Part No.
<p>Panel thickness up to 4,8</p>  <p>Panel thickness from 4,8 + up</p> 	Retaining washer	Stainless steel	<b>15S11-1CJ</b>
	Installation Tool for 15S11-1CJ retaining washer		<b>T107-1</b>

Style	Dimensions	Materials / Finish	°C	Part No.
		Zinc die casting / zinc-plated CrVI-free, clear passivation	120	<b>V15R13-1-1AB</b>

### Receptacle Installation Instructions

Installation Dimensions	Accessories	Materials / Finish	Part No.
	Hex Nut 	Steel / zinc-plated, CrVI-free, clear passivation	<b>V15R14-1-1AB</b>





## Features

- Max. tensile strength 700 N, working load 600 N.
- Easy and economic clip-in installation for stud and receptacle.
- Also suitable for automatic installation.
- 1/4 turn to open - close by a push of the finger.
- Due to their small size they are particularly suited for use in electrical engineering and electronics.

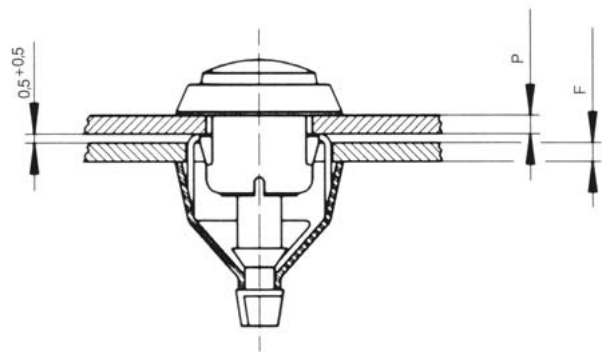
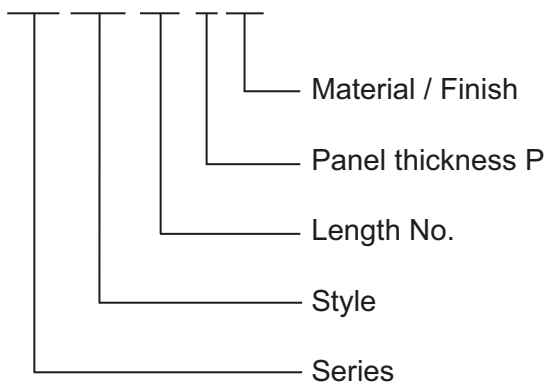
## Selection Instructions

- Select stud assembly according to panel thickness P, page L-2 and spring clip according to frame thickness F, page L-3.
- Select stud length number from panel thickness G using the table below, insert into stud part number \* (e.g. 715S12-\* -1BP).

## Part no. example

Stud, slotted recess head

### 715 S12 -07 -3BP


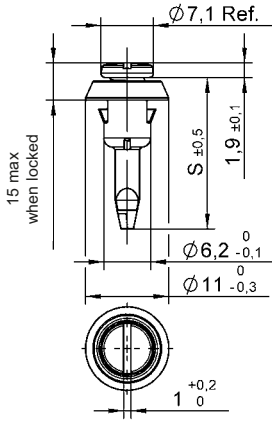

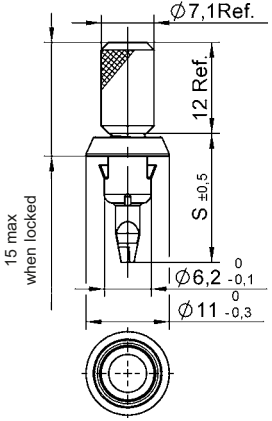


## Stud Length Table

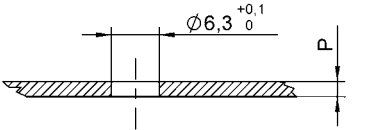
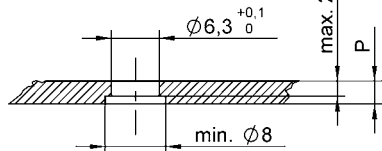
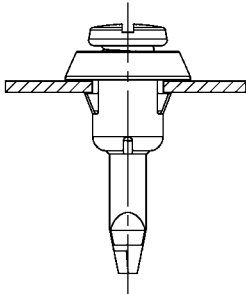
Panel Thickness P	Slotted Recess Head Stud Length No.	Knurled Head Stud Length No.	Panel Thickness P	Slotted Recess Head Stud Length No.	Knurled Head Stud Length No.
0,50 - 1,25	5	5	6,50 - 7,25	13	-
1,25 - 2,00	6	6	7,25 - 8,00	14	-
2,00 - 2,75	7	7	8,00 - 8,75	15	-
2,75 - 3,50	8	8	8,75 - 9,50	16	-
3,50 - 4,25	9	9	9,50 - 10,25	17	-
4,25 - 5,00	10	10	10,25 - 11,00	18	-
5,00 - 5,75	11	-	11,00 - 11,75	19	-
5,75 - 6,50	12	-	11,75 - 12,50	20	-


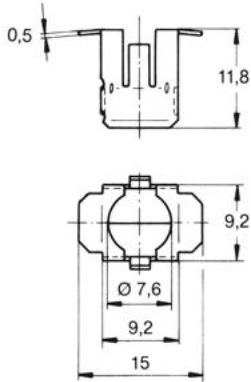
Other lengths on request.

■ Preferred dash-lengths

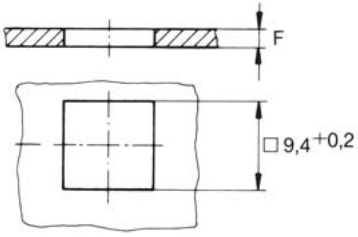
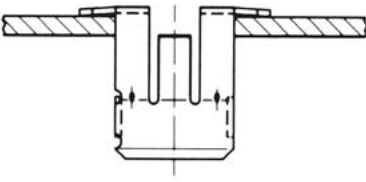
Style	Dimensions	Materials / Finish	Panel Thickness P	°C	Part No.
<p><b>Slotted Recess Head</b></p> 	 <p>S = 13,25 + (0,75 x length no.)</p>	<p>Stainless steel Spring cup: Plastic (POM) / black</p>	<p>0,5 - 1,0 1,0 - 1,5 1,5 - 2,0</p>	<p>-25 up to +90</p>	<p><b>715S12- *-1BP</b> <b>715S12- *-2BP</b> <b>715S12- *-3BP</b></p>
<p><b>Knurled Head</b></p> 	 <p>S = 13,25 + (0,75 x length no.)</p>	<p>Stainless steel Spring cup: Plastic (POM) / black</p>	<p>0,5 - 1,0 1,0 - 1,5 1,5 - 2,0</p>	<p>-25 up to +90</p>	<p><b>715S13- *-1BP</b> <b>715S13- *-2BP</b> <b>715S13- *-3BP</b></p>

## Stud Installation Instructions

Installation Dimensions	
Panel up to 2 mm	
Panel over 2 mm	
	

Style	Dimensions	Materials / Finish	Frame Thickness F	°C	Part No.
<b>Receptacle</b>  		Stainless steel	0,5 - 1,0	-25 up to +90  (See stud assembly)	<b>715R02-1BP</b>
			1,0 - 1,5		<b>715R02-2BP</b>
			1,5 - 2,0		<b>715R02-3BP</b>
			2,0 - 2,5		<b>715R02-4BP</b>

## Installation Instructions

Installation Dimensions	
	

## Features

- Max. tensile strength 1.400 N, working load 1.200 N.
- Easy and economic clip-in installation for stud and receptacle.
- Also suitable for automatic installation.
- 1/4 turn to open – close with a push of the finger.

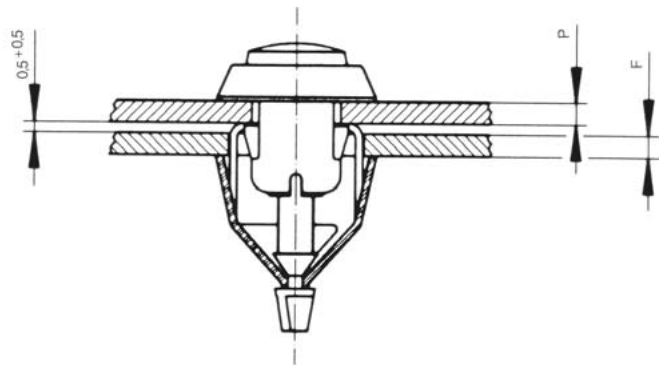
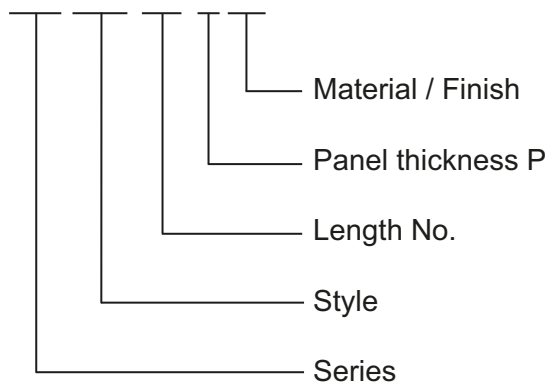
## Selection Instructions

- Select stud assembly according to panel thickness P, page M-2 and spring clip according to frame thickness F, page M-3.
- Select stud length number from panel thickness P using table below, insert into stud part number \* (e.g. 716S12-\* -1BP).

## Part no. example

Stud, slotted recess head

### 716 S12 -03 -2BP


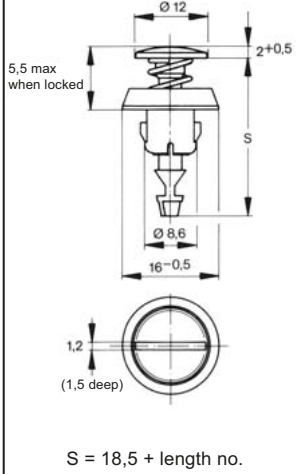

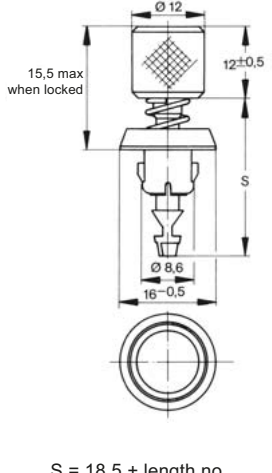


## Stud Length Table

Panel Thickness P	Stud Length No.
1,0 - 2,0	02
2,0 - 3,0	03
3,0 - 4,0	04
4,0 - 5,0	05
5,0 - 6,0	06
6,0 - 7,0	07
7,0 - 8,0	08
8,0 - 9,0	09
9,0 - 10,0	10

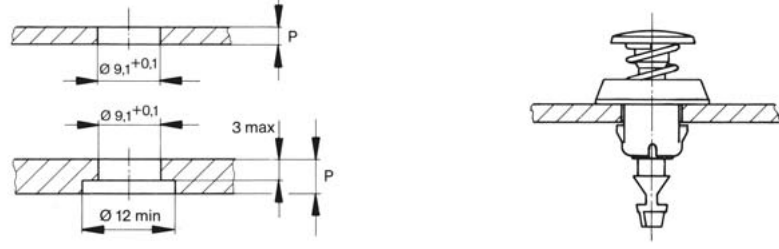
Other lengths on request.


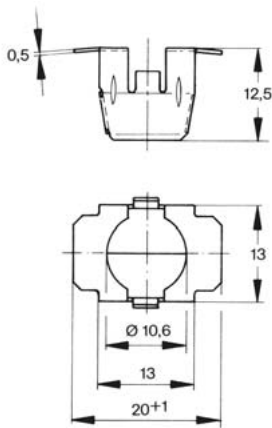
■ Preferred dash-lengths

Style	Dimensions	Materials / Finish	Panel Thickness P	°C	Part No.
<b>Slotted Recess Head</b>  		Stainless steel Spring cup: Plastic (POM)/black	0,5 - 1,0	-25 up to +90	<b>716S12- *-1BP</b>
			1,0 - 1,5		<b>716S12- *-2BP</b>
			1,5 - 2,0		<b>716S12- *-3BP</b>
			2,0 - 2,5		<b>716S12- *-4BP</b>
			2,5 - 3,0		<b>716S12- *-5BP</b>
<b>Knurled Head</b>  		Stainless steel Spring cup: Plastic (POM)/black	0,5 - 1,0	-25 up to +90	<b>716S13- *-1BP</b>
			1,0 - 1,5		<b>716S13- *-2BP</b>
			1,5 - 2,0		<b>716S13- *-3BP</b>
			2,0 - 2,5		<b>716S13- *-4BP</b>
			2,5 - 3,0		<b>716S13- *-5BP</b>

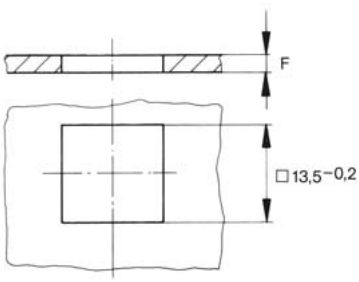
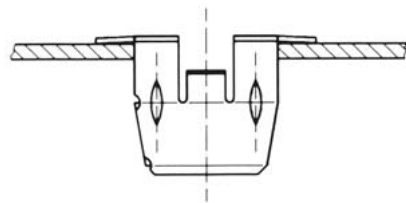
\* Length no. from Table, page M-1.

## Stud Installation Instructions

Installation Dimensions	
Panel up to 3 mm	
Panel over 3 mm	

Style	Dimensions	Materials / Finish	Frame Thickness F	°C	Part No.
<b>Spring Clip</b>  		Stainless steel	1,0 - 1,5	-25 up to +90  (See stud assembly)	<b>720R01-1B</b>
			1,5 - 2,0		<b>720R01-2B</b>
			2,0 - 2,5		<b>720R01-3B</b>
			2,5 - 3,0		<b>720R01-4B</b>

## Installation Instructions

Installation Dimensions	
	

## Features

- Max. tensile strength 3.000 N, working load 2.500 N.
- Robust design - high strength.
- Stud assembly with protective, compensating and retaining washers.
- Rivet or screw mounting spring receptacle.
- 1/4 turn to open - close by a push of the finger.

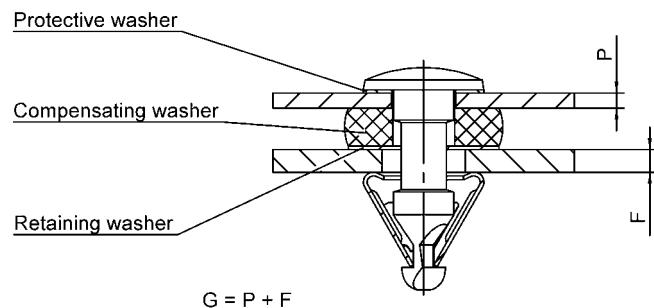
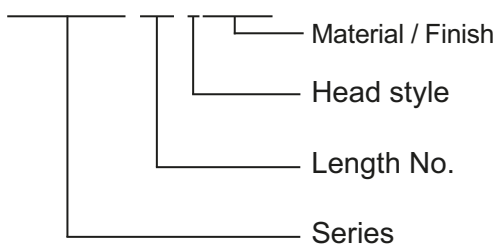
## Selection Instructions

1. Select stud assembly and spring clip, page N-2 and N-3.
2. Select compensating and retaining washers, page N-2.
3. Select stud length number from grip range G using the table below, insert into stud part number \* (e.g. 717S01-\* -1AGV).

## Part no. example

Spring clip, rivet / screw mounting

### 717 S01 -2 -1AGV




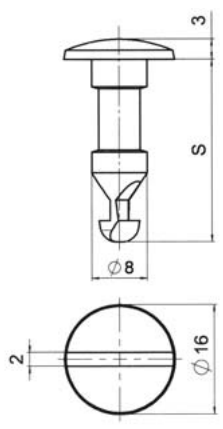

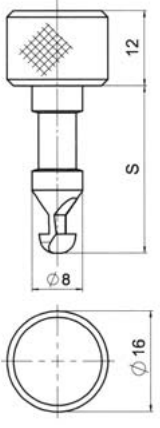
## Stud Length Table

Griprange G	Stud Length No.
1,0 - 3,0	1
3,0 - 5,0	2
5,0 - 7,0	3
7,0 - 9,0	4
9,0 - 11,0	5
11,0 - 13,0	6

Other lengths on request.

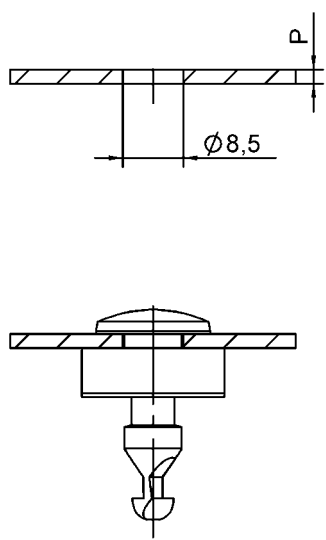
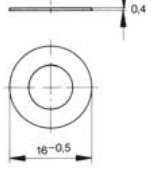
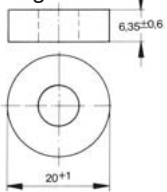

■ Preferred dash-lengths


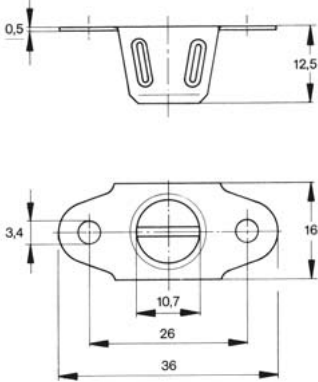


Style	Dimensions	Materials / Finish	°C	Part No.
<p><b>Slotted Recess Head</b></p> 	 <p>S = 20,5 + (2 x length no.)</p>	Steel/ zinc-plated CrVI-free, clear passivation	-40 up to +100	<b>717S01- *-1AGV</b>
<p><b>Knurled Head</b></p> 	 <p>S = 20,5 + (2 x length no.)</p>	Steel/ zinc-plated CrVI-free, clear passivation	-40 up to +100	<b>717S01- *-2AGV</b>

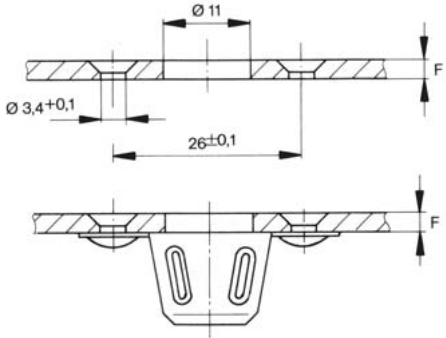
\* Length no. from Table, see page N-1.

## Stud Installation Instructions

Style	Dimensions	Materials / Finish	°C	Part No.
	<p>Protective washer</p> 	Plastic (PA6) / natural colour	-40 up to +100	<b>717W02-1K</b>
	<p>Compensating washer</p> 	Plastic (PU-foam) / anthracite	-40 up to +100	<b>717W03-1K</b>
	<p>Retaining washer</p> 	Plastic (PA6) / natural colour	-40 up to +100	<b>717W01-1K</b>

Style	Dimensions	Materials / Finish	°C	Part No.
<b>Rivet / Screw Mounting</b>  		Steel / zinc flake coated	-40 up to 100	<b>717R01-1AK7</b>

## Installation Instructions

Installation Dimensions


## Features

- Max. tensile strength 1.200 N, working load 800 N.
- 1/4 turn to open, close with a push of the finger
- Wide grip range
- Tool or hand operated
- Fast installation of snap-in spring receptacle.
- No tools required for the installation of the stud and washer.
- Tool operated stud has combination recess.

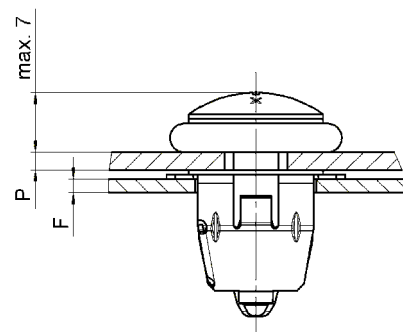
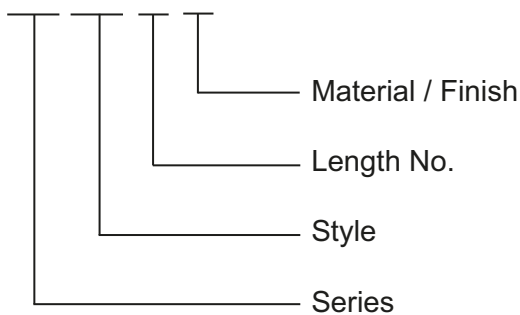
## Selection Instructions

1. Select stud assembly according to panel thickness P, page O-2 and spring clip according to frame thickness F, page O-4.
2. Select Compensating washer and Retaining washer, page O-3.
3. Select stud length number from panel thickness P using the formula and table below (e.g. 720S01-\*B).

## Part no. example


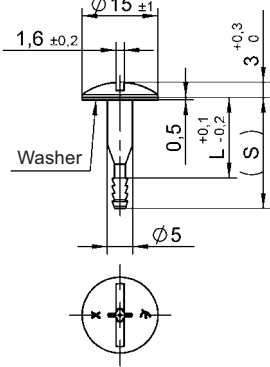

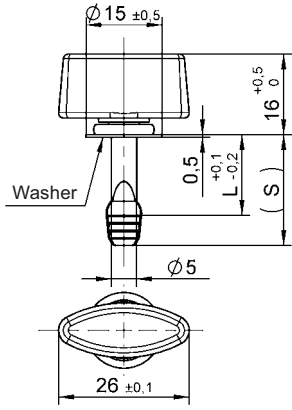
Stud, slot-cross recess

### 720 S01 -1 B



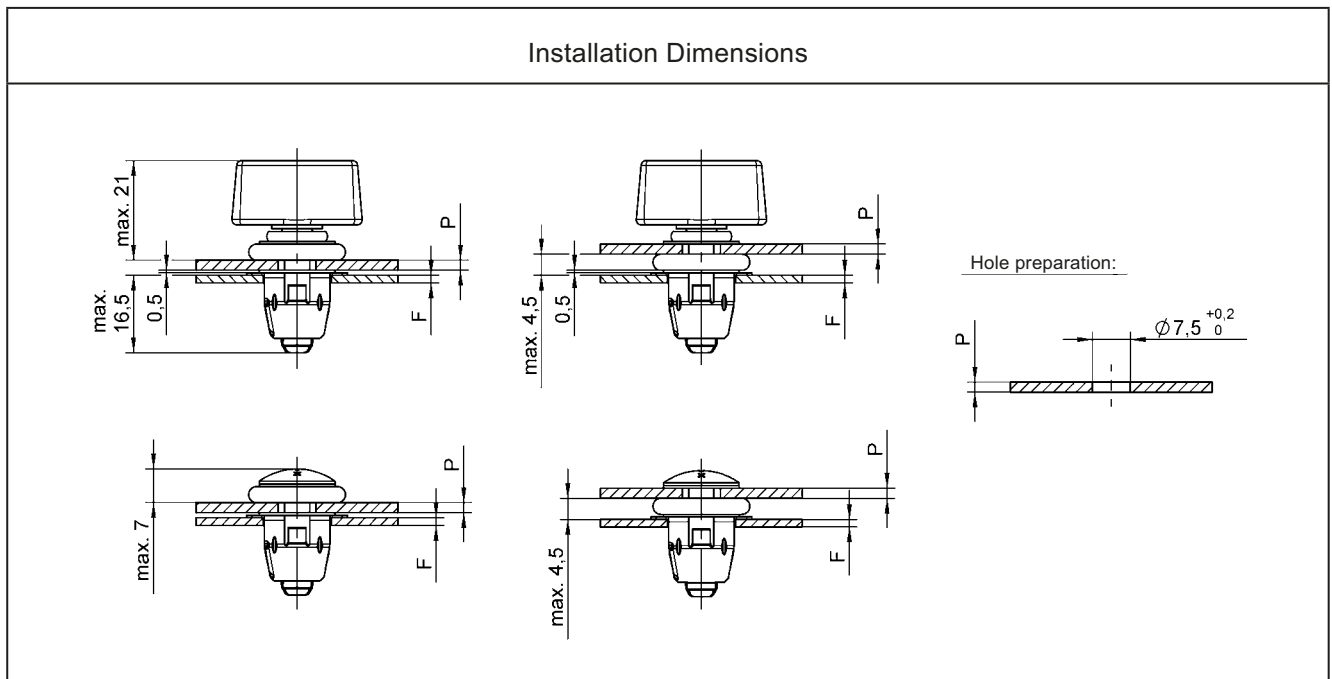
Panel Thickness P	Slot-Cross Recess Length No.	Wing Head Stud Length No.	Dimension L +0,1/-0,2	Dimension (S)
1,00 - 4,00	1	1	16	21
4,00 - 7,00	2	2	19	24
7,00 - 10,00	3	3	22	27


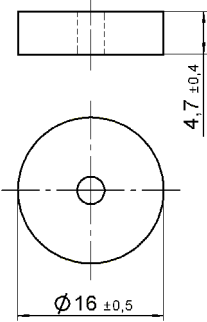

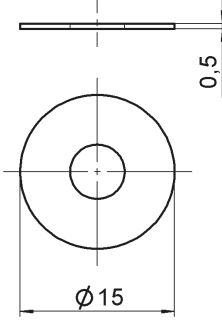
■ Preferred dash-lengths

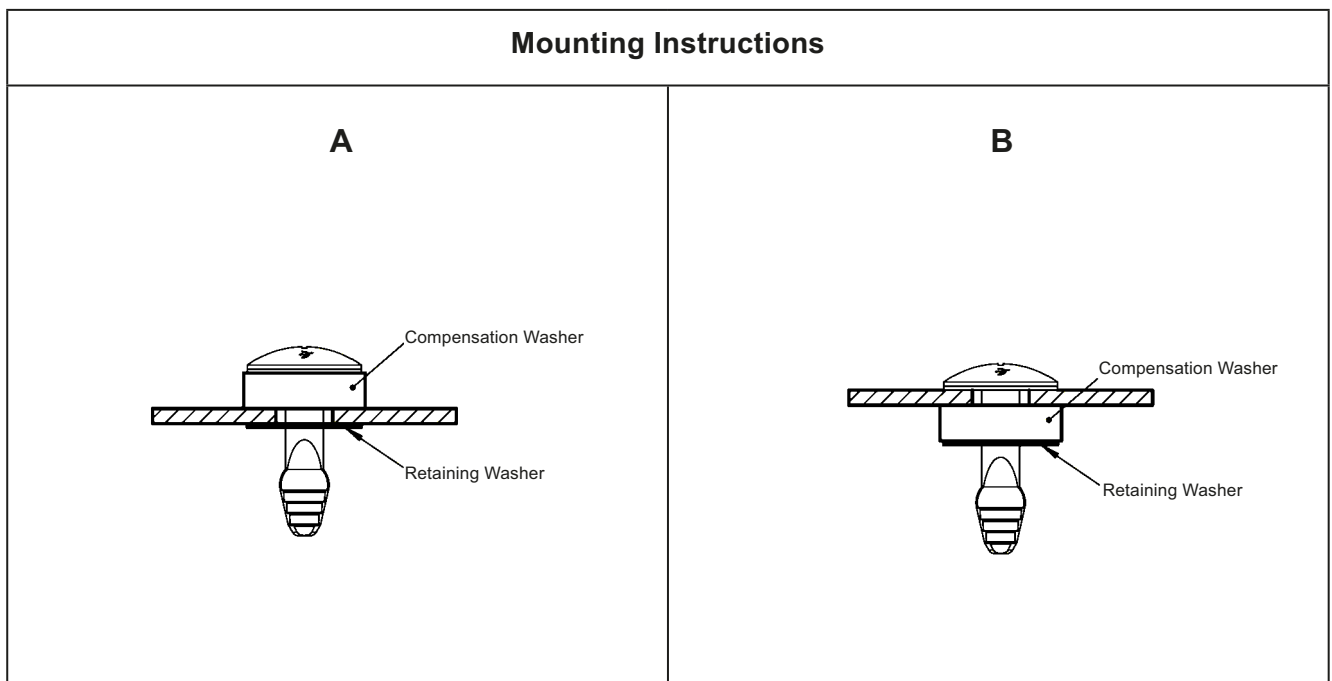
Style	Dimensions	Materials / Finish	°C	Part No.
<b>Slot-Cross Recess Head</b>  	 <p>L + (S) see table page O-1</p>	Stainless steel Washer: PA6 natural	-20 up to +70	<b>720S01-*B</b>
<b>Wing Head</b>  	 <p>L + (S) see table page O-1</p>	Stainless steel Knob: PA6 black Washer: PA6 natural	-20 up to +70	<b>720S02-*B</b>


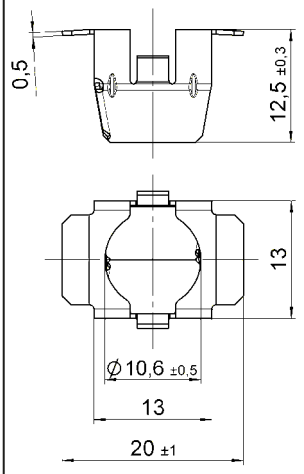
\* Length no. from Table, see page O-1.

## Stud Installation Instructions

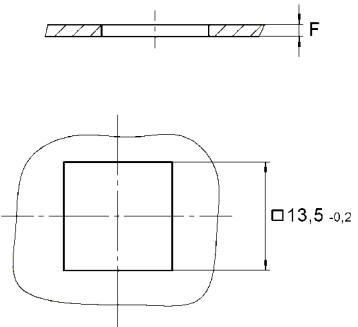
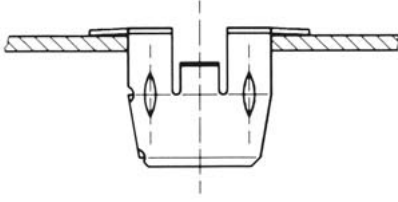


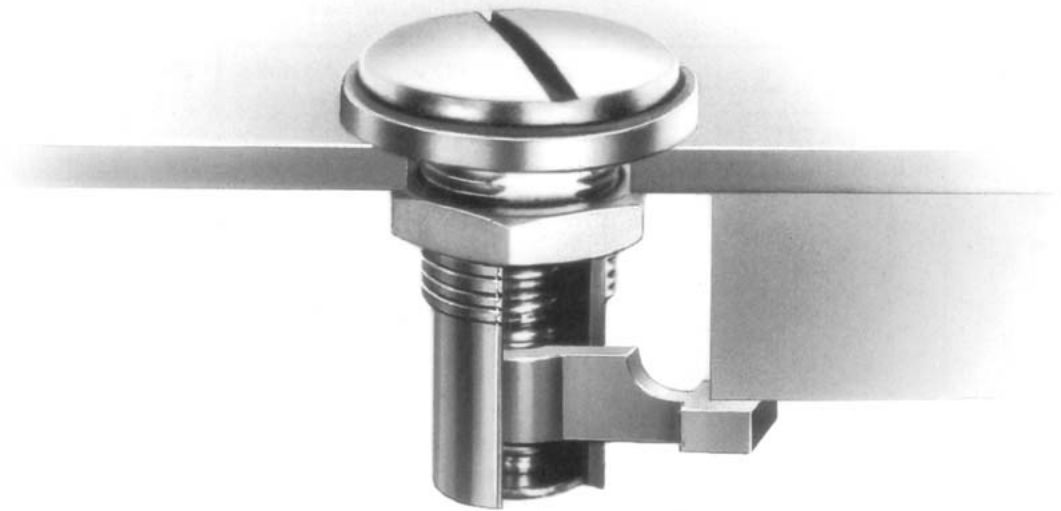
Style	Dimensions	Materials / Finish	°C	Part No.
<p><b>Compensating Washer</b></p> 		PU - Elastomer yellow	-20 up to +70	<b>720W01-2K</b>
<p><b>Retaining Washer</b></p> 		Polyamid natural	-20 up to +70	<b>50E15-1K</b>



Style	Dimensions	Materials / Finish	Frame Thickness F	°C	Part No.
<b>Spring Clip</b>  		Stainless steel	1,0 - 1,5	-20 up to +70	<b>720R01-1B</b>
			1,5 - 2,0		<b>720R01-2B</b>
			2,0 - 2,5		<b>720R01-3B</b>
			2,5 - 3,0		<b>720R01-4B</b>

## Installation Instructions

Installation Dimensions	
	



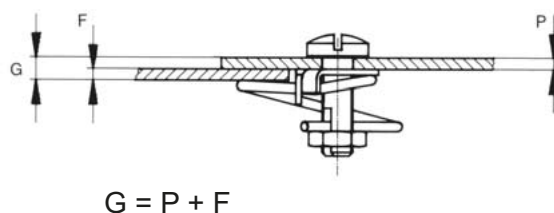
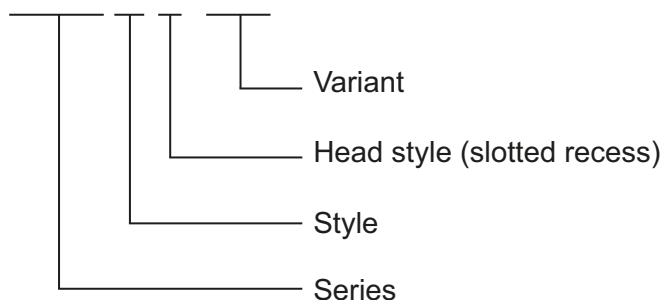
## Features


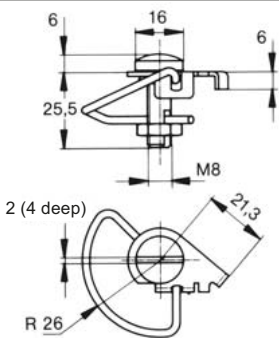

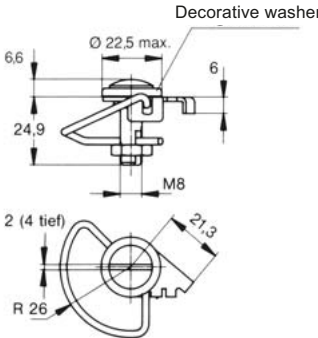

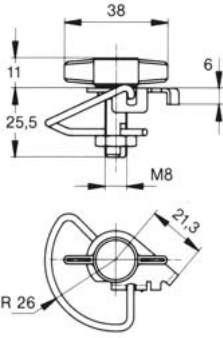
- Wide grip range (total thickness G up to 15 mm).
- Suitable for a large range of applications.
- Easy installation with single-hole mounting.
- Either tool-operated (slotted recess head) or hand-operated (fixed wing head).
- Clockwise locking 3/4 turn maximum.

## Part no. example

Pawl Latches, slotted recess head, with decorative washer.

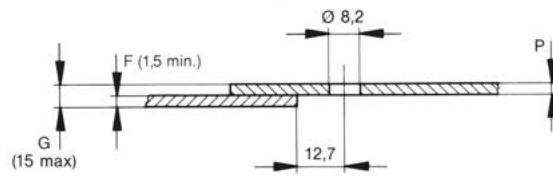
## V964L 01 -1 -2AG



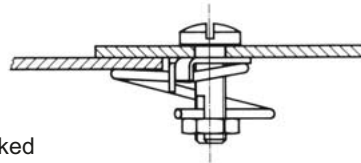
Style	Dimensions	Materials / Finish	°C	Part No.
<b>Slotted Recess Head</b> 		Stud: Steel / zinc-plated CrVI-free, clear passivation  Spring: Stainless steel	120	<b>V964L01-1-1AG</b>
<b>Slotted Recess Head with Decorative Washer</b> 		Stud: Steel / zinc-plated CrVI-free, clear passivation  Spring: Stainless steel	120	<b>V964L01-1-2AG</b>
<b>Fixed Wing Head</b> 		Stud: Steel / zinc-plated CrVI-free, clear passivation  Spring: Stainless steel  Wing: Plastic (POM) black	-40 up to +100	<b>V964L01-2-1AG</b>



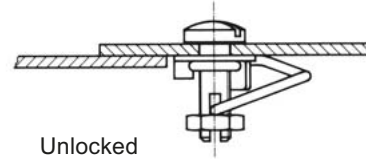
Installation Dimensions



Locked



Unlocked



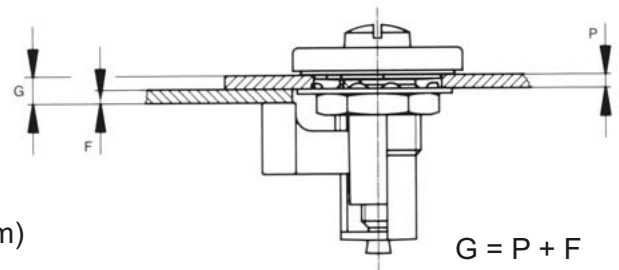
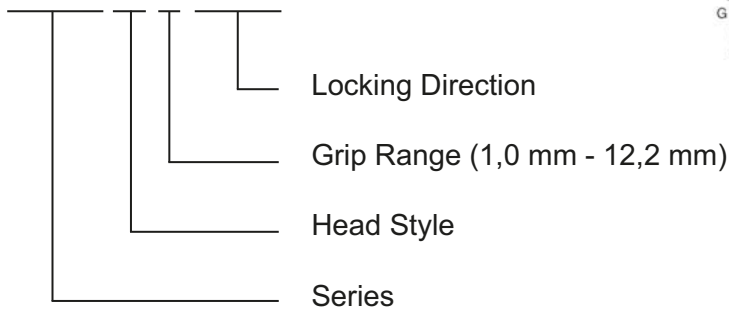
## Features



Variable grip fastener. Available in two grip ranges from 1,0 mm to 18,8 mm.  
Tool or hand operated head styles available.  
Single hole mounting - low installation cost.  
Clockwise locking as standard.  
Counterclockwise locking fasteners upon request.


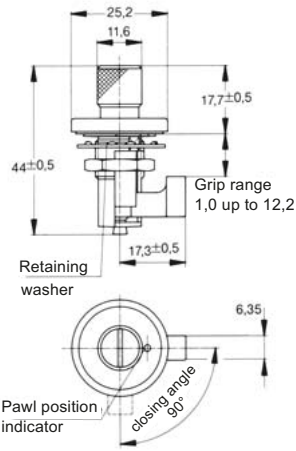

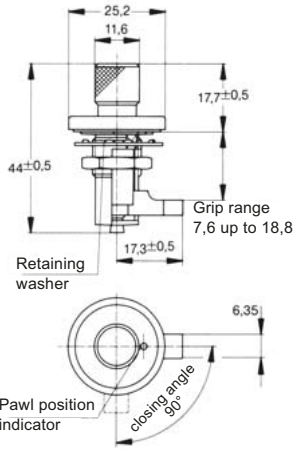
## Part no. example

Pawl Latches, Flat head.  
Grip range 1,0 mm - 12,2 mm.

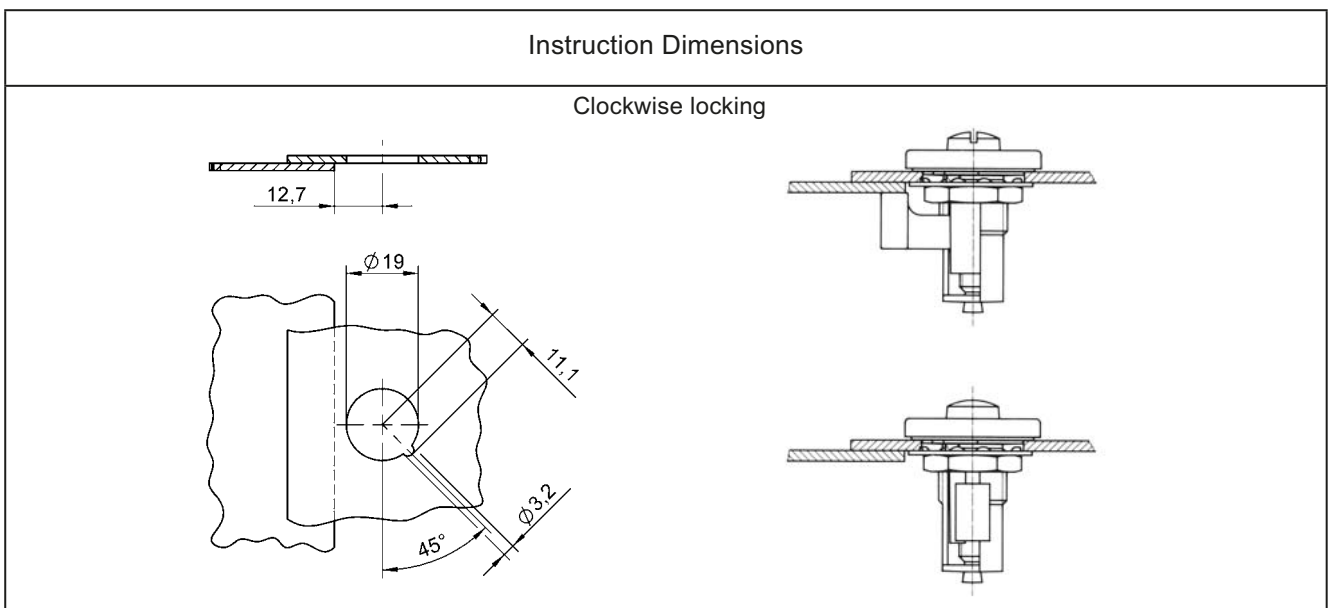
## V965L 23 -1 R1AG



Style	Dimensions	Materials / Finish	°C	Part No.
<b>Flat Head</b> <b>Grip Range</b> <b>1,0 up to 12,2</b> 		Steel / zinc-plated CrVI-free, clear passivation	-40 up to +100	<b>V965L23-1R1AG</b>
<b>Flat Head</b> <b>Grip Range</b> <b>7,6 up to 18,8</b> 		Steel / zinc-plated CrVI-free, clear passivation	-40 up to +100	<b>V965L23-2R1AG</b>

Style	Dimensions	Materials / Finish	°C	Part No.
<b>Knurled Head</b> <b>Grip Range</b> <b>1,0 up to 12,2</b> 		Steel / zinc-plated CrVI-free, clear passivation	-40 up to +100	<b>V965L1-1R1AG</b>
<b>Knurled Head</b> <b>Grip Range</b> <b>7,6 up to 18,8</b> 		Steel / zinc-plated CrVI-free, clear passivation	-40 up to +100	<b>V965L1-2R1AG</b>

## Pawl Latches Installation Instructions



Part No.	Page	Part No.	Page	Part No.	Page
15/32-32NS-2B	C3,F12	50E61-*AGV	E3	715S13- *-3BP	L2
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