



Catalogue Camloc  
Standard Products

# Camloc Quick-Operating 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 70 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 : 2009**

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

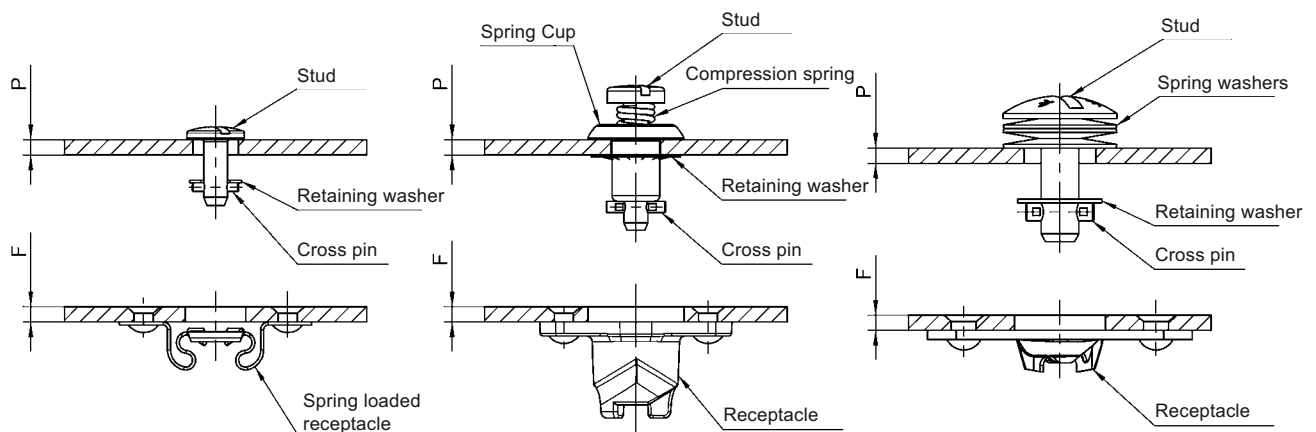
- Secure quick release fastener system
- Locking and unlocking by a quarter turn
- Long life - high number of operating cycles
- Hand or tool-operated
- Easy to use and fast operation reduces assembly costs
- Camloc fasteners are standardised worldwide
- Wide range of sizes
- Stud assemblies are captive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

## Components

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

1/4 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.

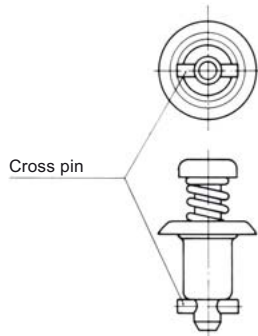
Fastener tensile loads specified in the catalogue are reached after overcoming the spring element generated preload.

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.

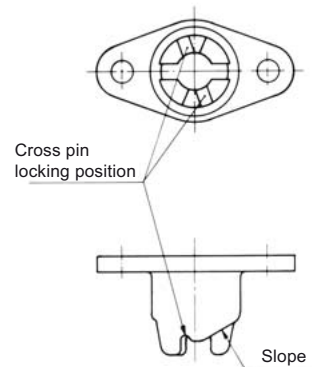
## How it Operates

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.

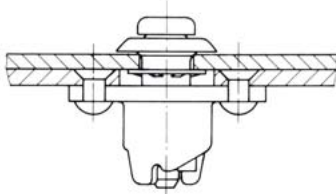
**Stud Assembly**



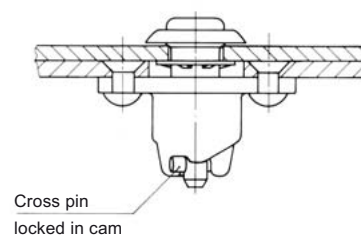
**Receptacle**



**Unlocked**



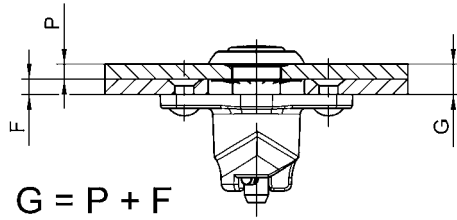
**Locked**



Lock and unlock the stud by a quarter turn.

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

## Selecting the Fastener

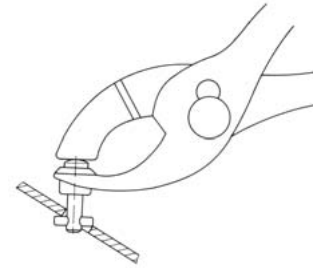
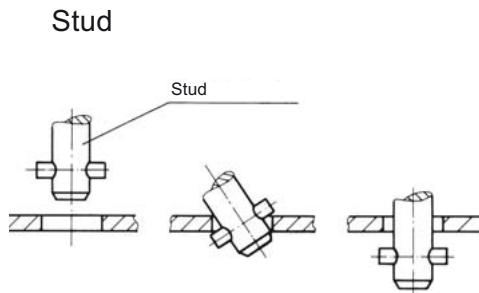


P = panel thickness (stud assembly)

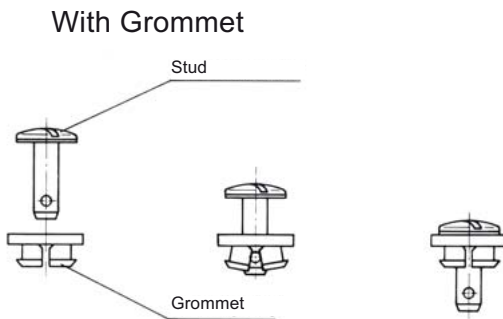
F = frame thickness (receptacle)

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.

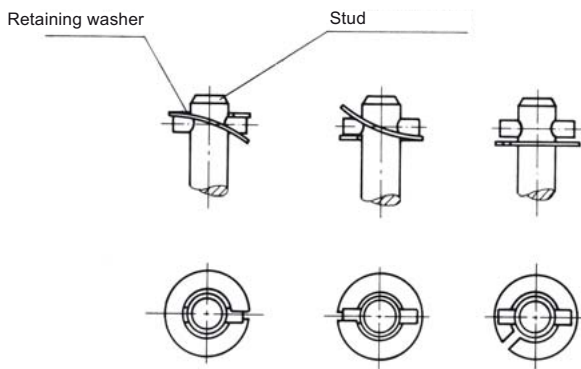
## Installation



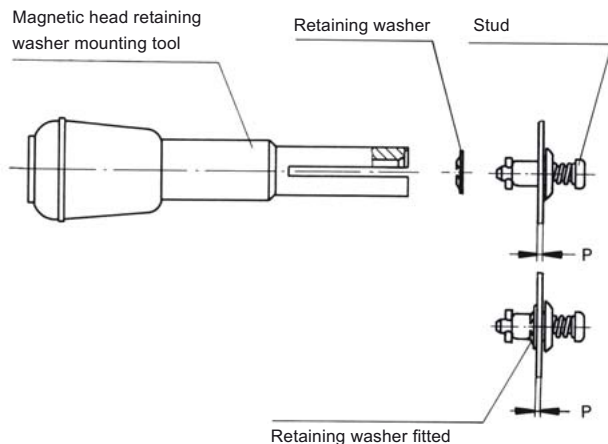
For short, spring-loaded stud assemblies, the use of 4P3-1 pliers is recommended.



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-F11
2700	1.330 N	900 N	X	X						F1-F11
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-G10
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  
 $G = P + F + 1,4$


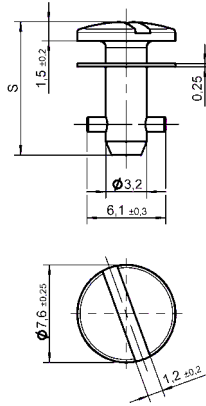

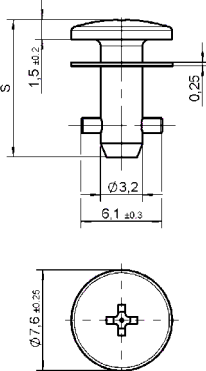


## Stud Length Table

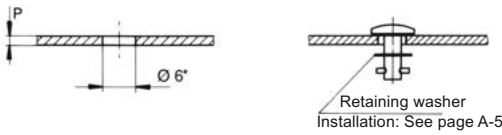
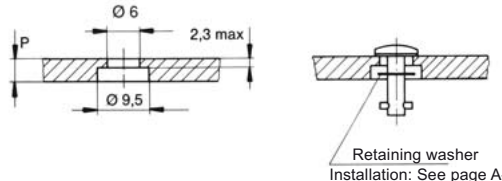
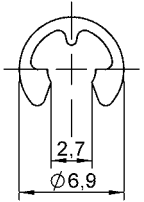
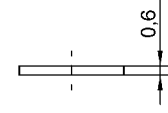
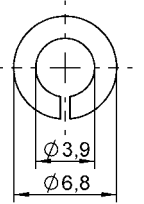
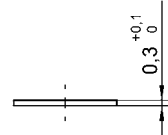

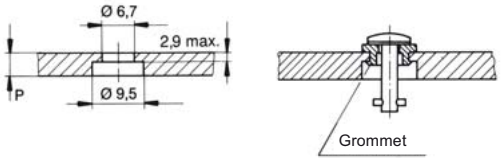
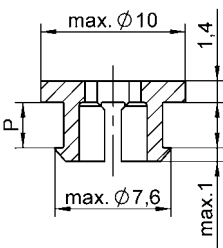
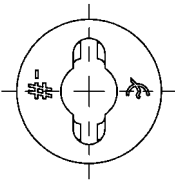
Total Thickness G	Stud Length No. When Using Receptacles
0,50 - 0,90	1
0,90 - 1,30	2
1,30 - 1,65	3
1,65 - 2,05	4
2,05 - 2,40	5
2,40 - 2,80	6
2,80 - 3,20	7
3,20 - 3,55	8
3,55 - 3,95	9
3,95 - 4,30	10
4,30 - 4,70	11
4,70 - 5,10	12
5,10 - 5,45	13
5,45 - 5,85	14
5,85 - 6,20	15
6,20 - 6,60	16
6,60 - 7,00	17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


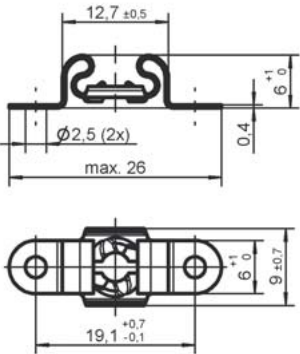
Other lengths on request.

 Preferred dash-lengths

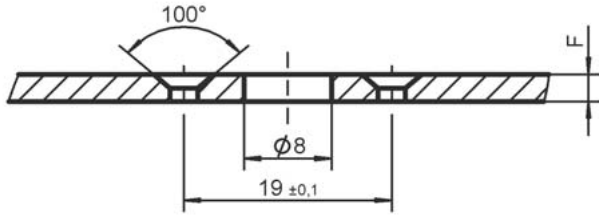
Style	Dimensions	Materials / Finish	°C	Part No.
<p><b>Slotted Recess Head</b></p> 	 <p>S = 6,70 + (0,38 x length no.)</p>	<p>Steel / zinc-plated, CrVI-free, clear passivation with plastic washer (PA6)</p> <p>Steel / nickel-plated with plastic washer (PA6)</p>	<p>100</p> <p>100</p>	<p><b>V5S5- *AGV</b>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

\* 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 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 391 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 align="center"><b>Rivet / Screw Mounting</b></p> 

## Features

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

Increased grip range.

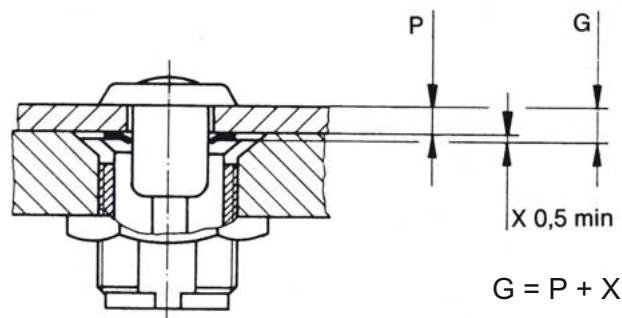
Externally threaded receptacles for use in castings or on panels with a retaining nut (see page C-3).

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).


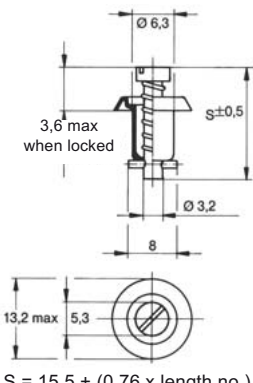
### Determining the stud length number:



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

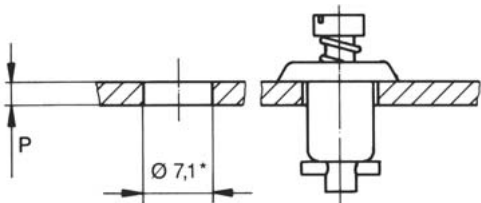
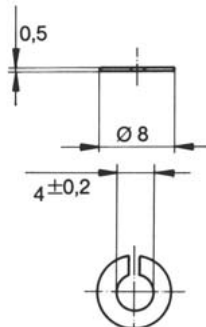
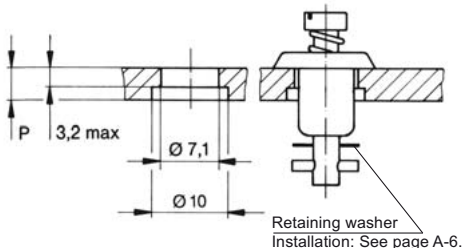
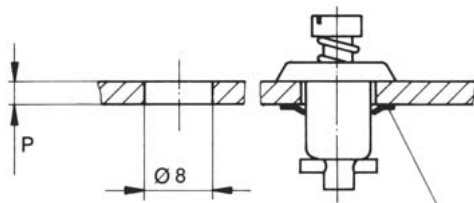
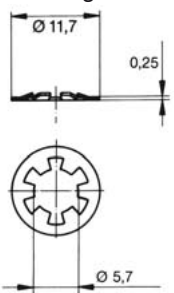
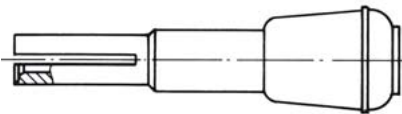
Other lengths on request.


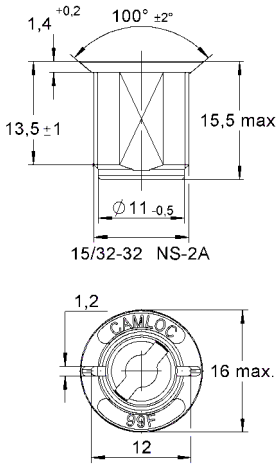

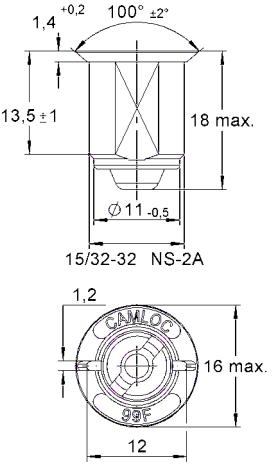
 Preferred dash-lengths

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

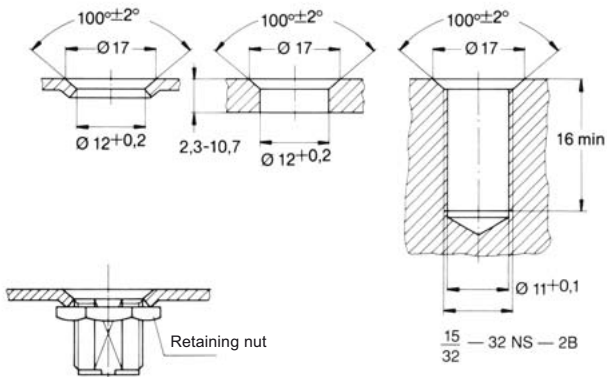
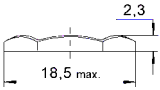
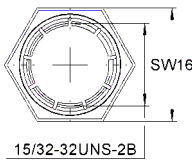
\* Length no. from Table, see page C-1.

### Stud Installation Instructions

Installation Dimensions	Accessories	Materials / Finish	Part No.
<b>Panel Thickness P 0,5 - 3,2</b>   <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>
<b>Panel Thickness P over 3,2</b>   <p>Retaining washer Installation: See page A-6.</p>			
<b>Panel Thickness P 0,50 - 4,75</b>   <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

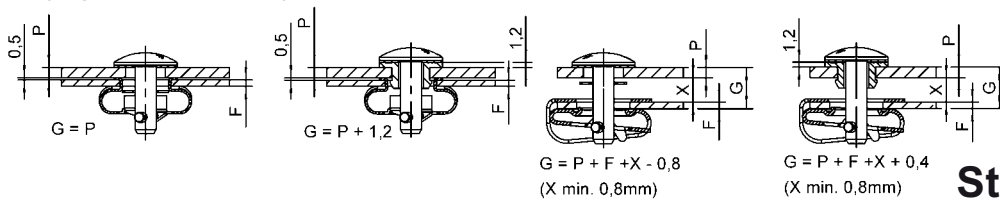
Installation Dimensions	Accessories	Materials / Finish	Part No.
 <p>Retaining nut</p> <p>Installation torque 3 Nm</p>	<p>Retaining nut</p>  <p>Tap</p> 	Steel / zinc-plated, CrVI-free, clear passivation	<b>99N10-01A1</b>
			<b>15/32-32 NS-2B</b>

## 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).




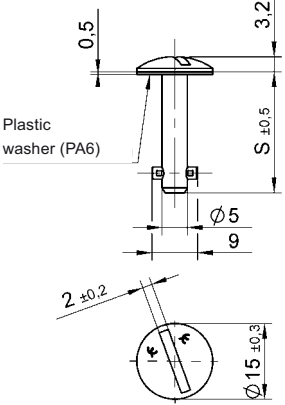

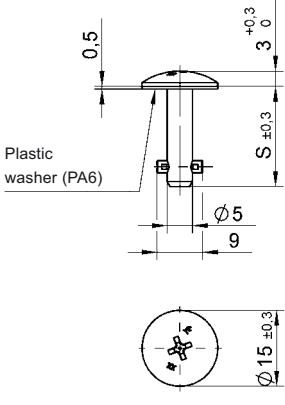

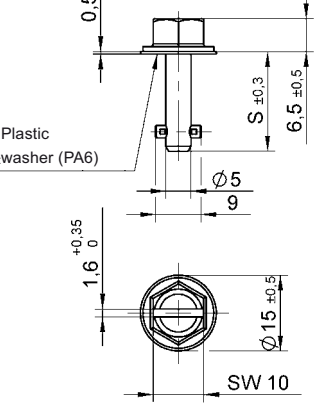
## Stud Length Table

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


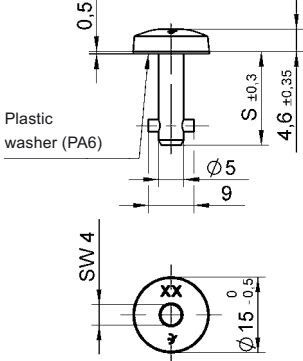

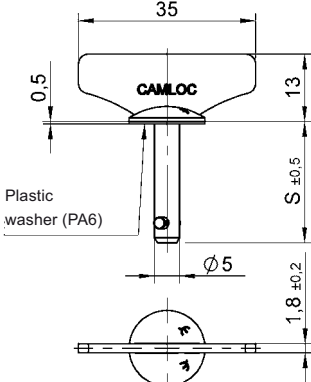

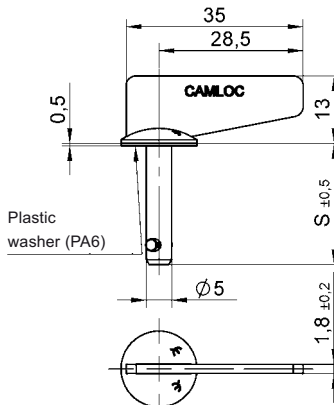
Other lengths on request.

■ Preferred dash-lengths


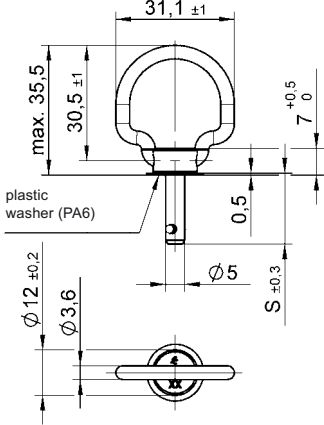

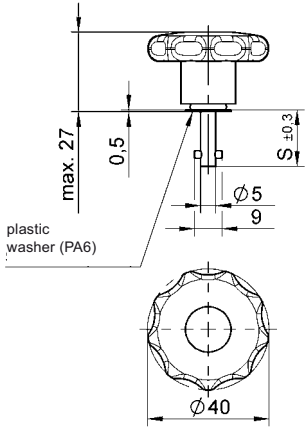

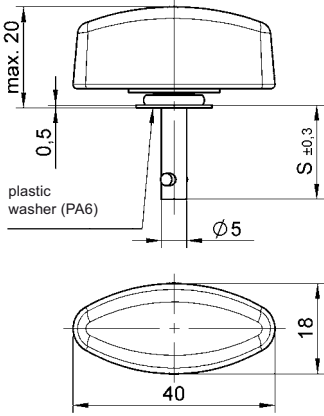


Style	Dimensions	Materials / Finish	°C	Part No.
<p><b>Slotted Recess Head</b></p> 	 <p>S = 11,40 + (0,6 x length no.)</p>	<p>Steel / zinc-plated, CrVI-free, clear passivation with plastic washer (PA6)</p> <p>Stainless steel with plastic washer (PA6)</p>	<p>80</p> <p>80</p>	<p><b>50E21-*AGV</b></p> <p>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

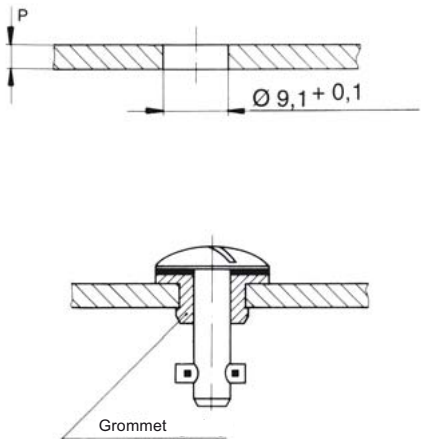
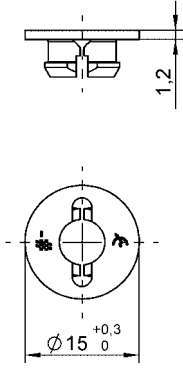
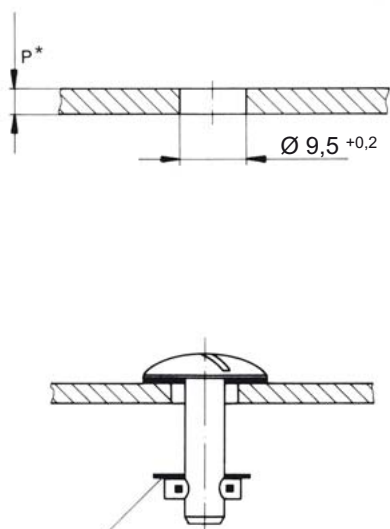
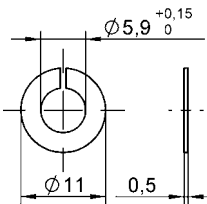
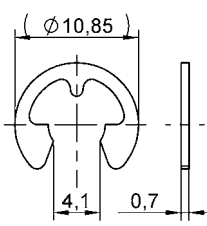
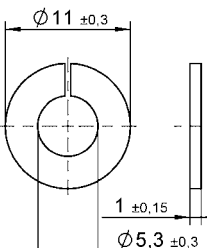
\* Length no. from Table, see page D-1.


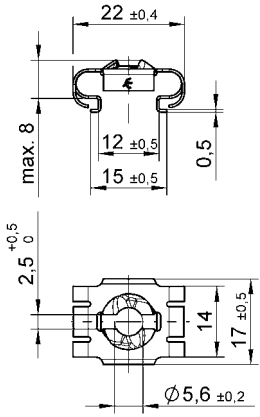

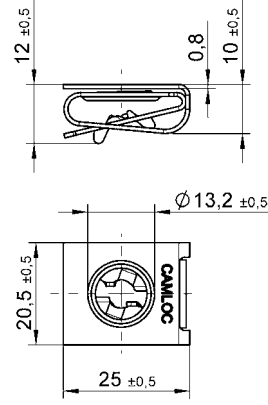
Style	Dimensions	Materials / Finish	°C	Part No.
<p><b>Hex Recess Head</b></p> 	 <p>S = 11,40 + (0,6 x length no.)</p>	Steel / zinc-plated, CrVI-free, clear passivation with plastic washer (PA6)	80	<b>50E60-*AGV</b>
<p><b>Fixed Wing Head</b></p> 	 <p>S = 11,40 + (0,6 x length no.)</p>	Steel / zinc-plated,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

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

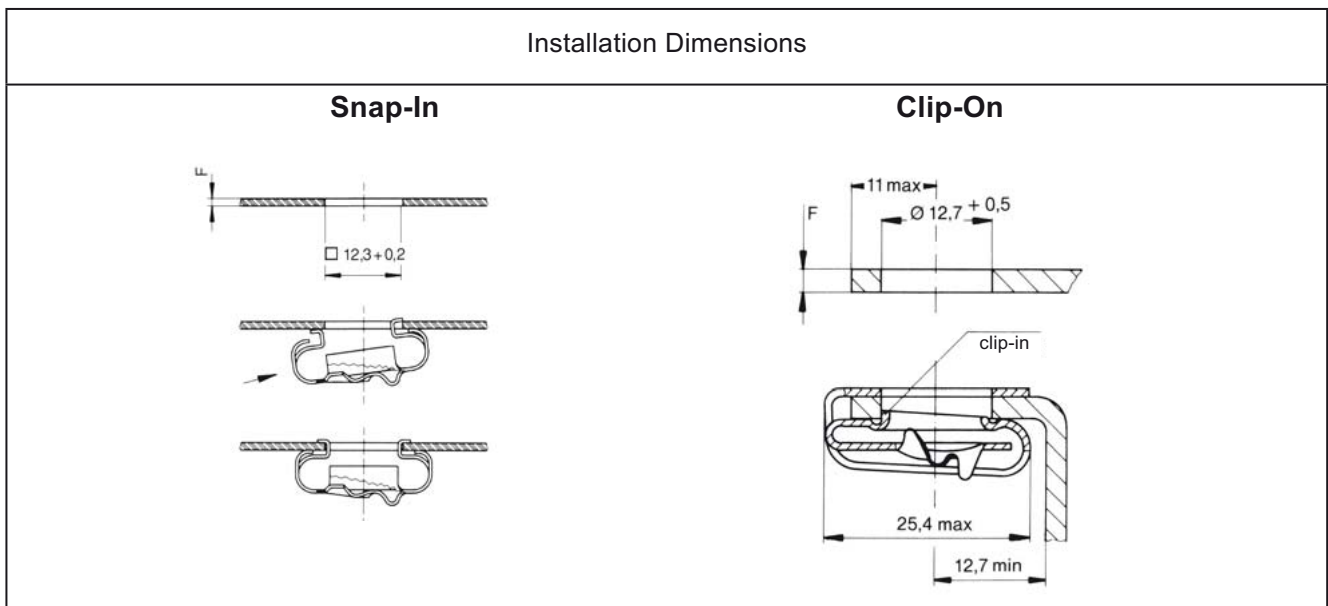
Style	Dimensions	Materials / Finish	°C	Part No.
<b>Folding Bail Handle 180°</b> 		Steel / zinc-plated, CrVI-free, clear passivation with plastic washer (PA6)	80	<b>50E18-*AGV</b>
<b>Plastic Star Form Head</b> 		Steel / zinc-plated, CrVI-free, clear passivation with plastic head and plastic washer (PA6)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

\* 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>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

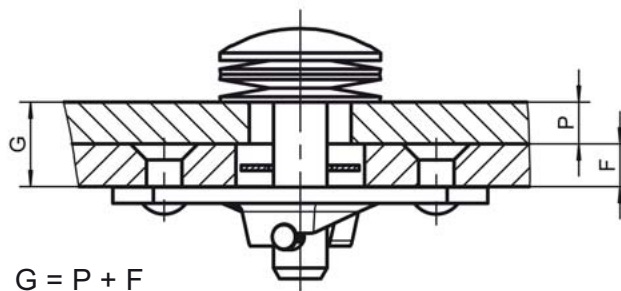


## Features

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).





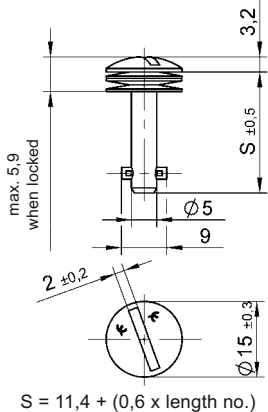

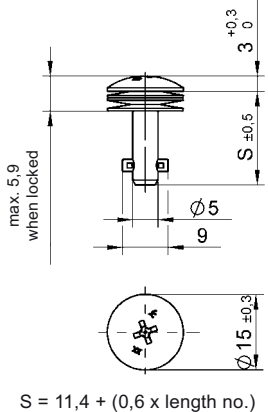

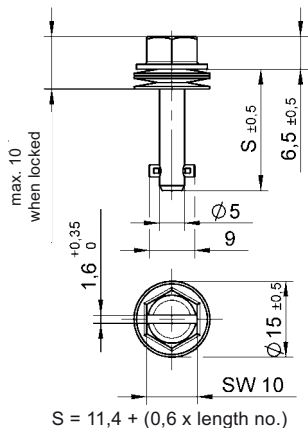
## Stud Length Table

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


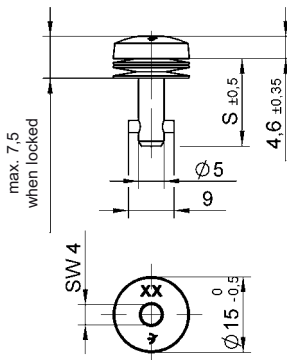

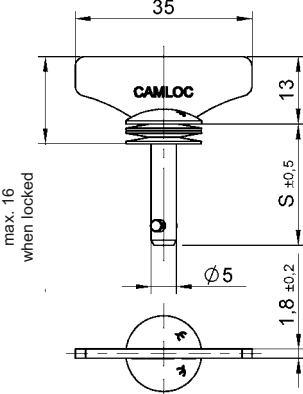

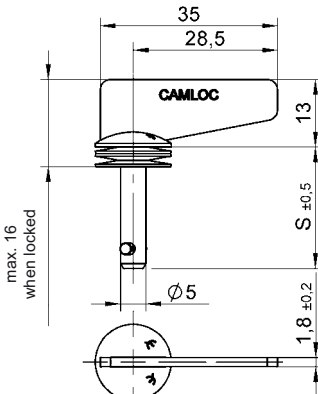
Other lengths on request.

 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.


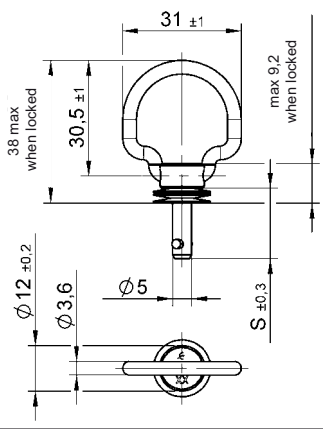

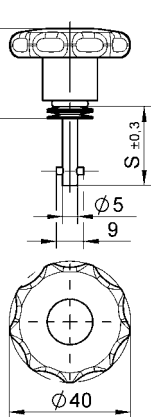

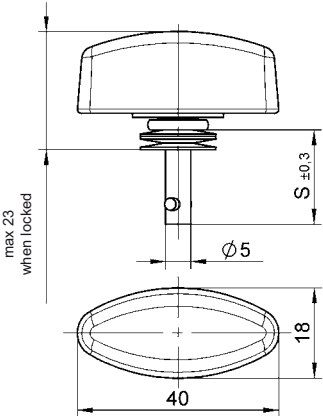

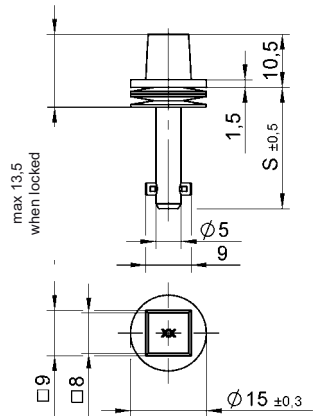
<sup>1)</sup>Max. tensile strength 2.600 N, working load 1.700 N.

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.

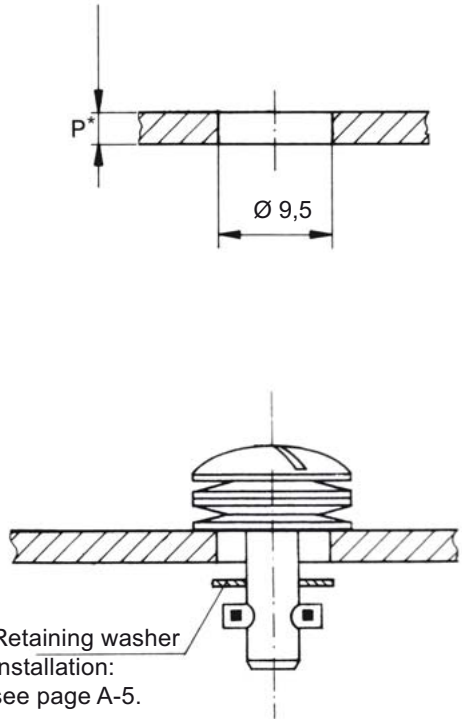
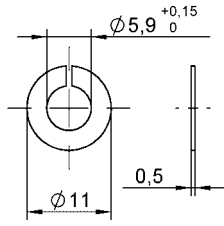
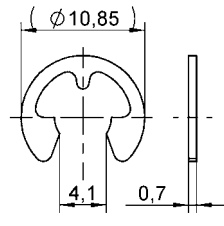
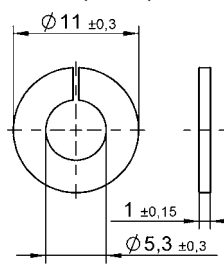
<sup>1)</sup>Max. tensile strength 2.600 N, working load 1.700 N.




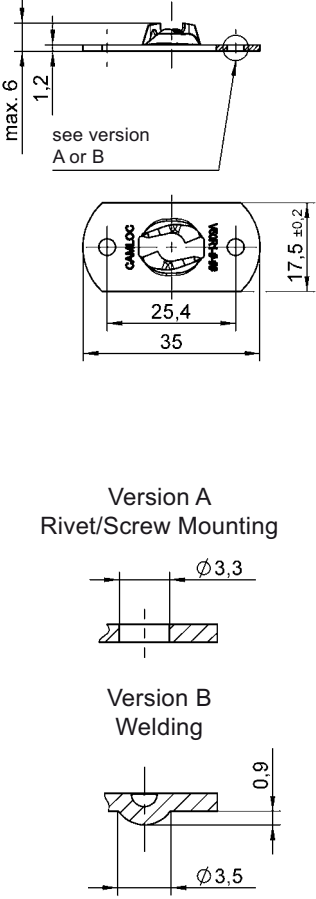
Style	Dimensions	Materials / Finish	°C	Part No.
<p><b>Folding Bail Handle 180°</b></p> 		Steel / zinc-plated, CrVI-free, clear passivation	120	<b>50E19-*AGV</b>
<p><b>Star Form Head</b></p> 		Steel / zinc-plated, CrVI-free, clear passivation with plastic knob (PA 6)  Stainless steel <sup>1)</sup> with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

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

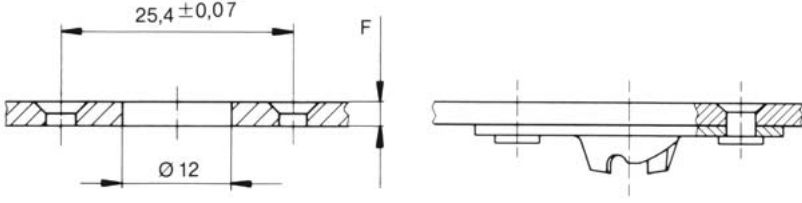
<sup>1)</sup> Max. tensile strength 2.600 N, working load 1.700 N.

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

\*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>  		<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>

## Receptacle Installation Instructions

Installation Dimensions
<p align="center"><b>Rivet- / Screw or Weld Mounting</b></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

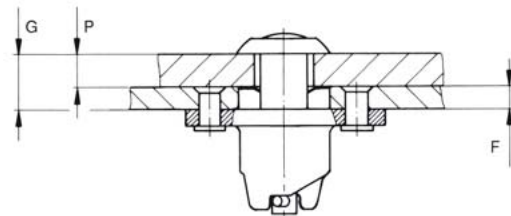
1. Select stud assembly and receptacle, page F-3 up to F-5, F-7 up to F-10.
2. Select stud accessories (retaining washer, gasket), page F-6 and F-7.
3. Select hex nut for receptacle, if necessary, page F-11.
4. Select stud length number from total thickness G using the formula and table on page F-2 (e.g.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

## Determining the stud length number when using receptacle:

### Type 1 + 3\*

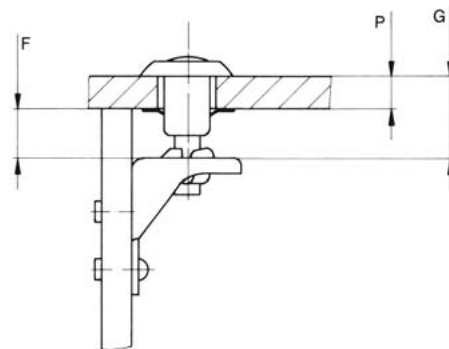
$$G = P + F$$

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



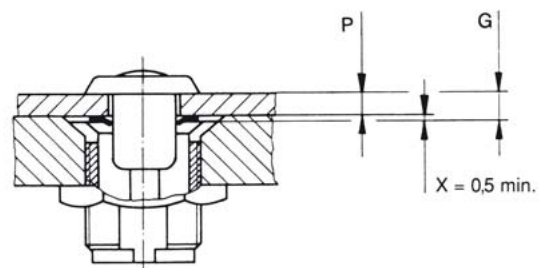
### Type 2

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



### Type 4


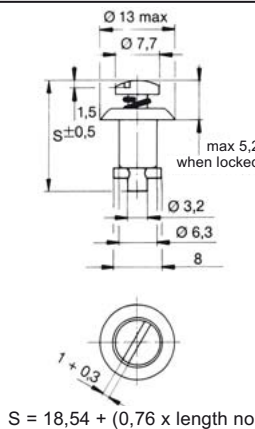

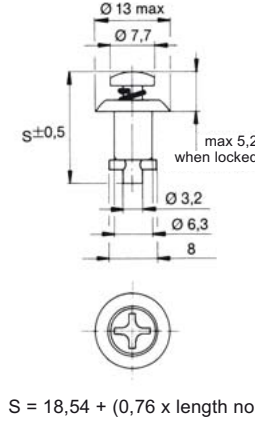

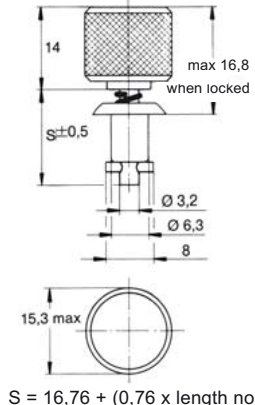

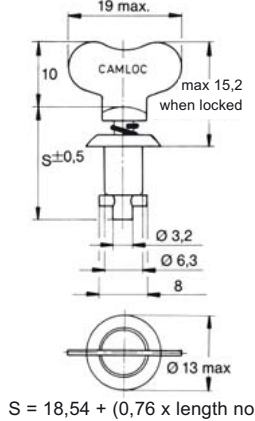
$$G = P + X \text{ (0,5 min.)}$$



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	14,50 - 15,25	20	24,40 - 25,15	20
16,00 - 16,75	21	15,25 - 16,00	21	25,15 - 25,90	21
16,75 - 17,50	22	16,00 - 16,75	22	25,90 - 26,65	22
17,50 - 18,30	23	16,75 - 17,50	23	26,65 - 27,40	23
18,30 - 19,05	24	17,50 - 18,30	24	27,40 - 28,20	24
19,05 - 19,80	25	18,30 - 19,05	25	28,20 - 28,95	25
19,80 - 20,60	26	18,30 - 19,05	25	28,95 - 29,70	26
20,60 - 21,35	27	19,05 - 19,80	26	29,70 - 30,50	27
21,35 - 22,10	28	19,80 - 20,60	27	30,50 - 31,25	28
22,10 - 22,85	29	20,60 - 21,35	28	31,25 - 32,00	29
22,85 - 23,60	30	21,35 - 22,10	29	32,00 - 32,75	30
23,60 - 24,40	31	22,10 - 22,85	30	32,75 - 33,50	31
24,40 - 25,15	32	22,85 - 23,60	31	33,50 - 34,30	32
25,15 - 25,90	33	23,60 - 24,40	32	34,30 - 35,05	33
25,90 - 26,65	34	24,40 - 25,15	33	35,05 - 35,80	34
26,65 - 27,40	35	25,15 - 25,90	34	35,80 - 36,60	35
27,40 - 28,20	36	25,90 - 26,65	35	36,60 - 37,35	36
28,20 - 28,95	37	26,65 - 27,40	36	37,35 - 38,10	37
28,95 - 29,70	38	27,40 - 28,20	37	38,10 - 38,85	38
29,70 - 30,50	39	28,20 - 28,95	38	38,85 - 39,60	39
30,50 - 31,25	40	28,95 - 29,70	39	39,60 - 40,40	40
		29,70 - 30,50	40		


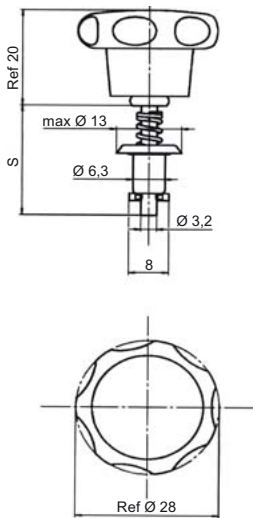

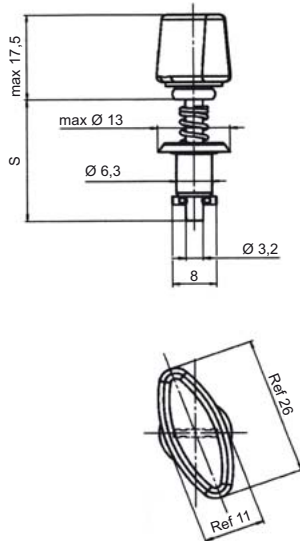

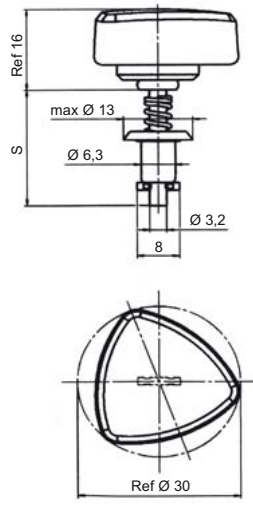
Other lengths on request.

■ Preferred dash-lengths


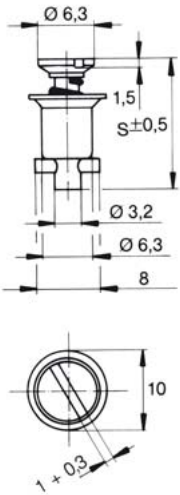

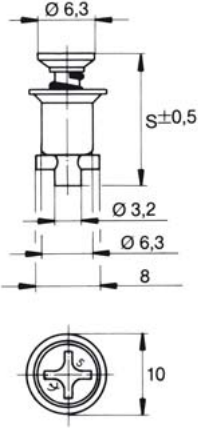
Style	Dimensions	Materials / Finish	°C	Part No.
<b>Slotted Recess Pan Head</b>  	 <p>S = 18,54 + (0,76 x length no.)</p>	Steel / zinc-plated, CrVI-free, clear passivation	120	<b>V26S01-*AGV</b>
		Steel / chrome-plated	120	<b>26S38-*</b>
		Stainless steel <sup>1)</sup>	200	<b>2600-*S</b>
		Steel / nickel-plated	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>Knurled Head</b>  	 <p>S = 16,76 + (0,76 x length no.)</p>	Steel / chrome-plated	120	<b>26S34-*</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>

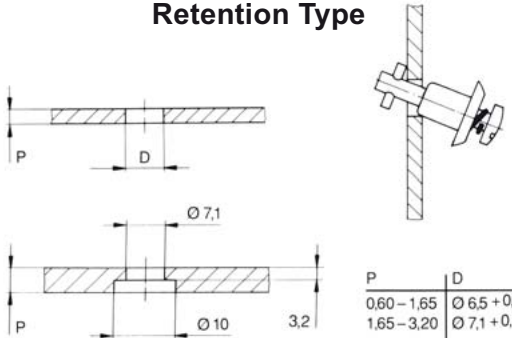
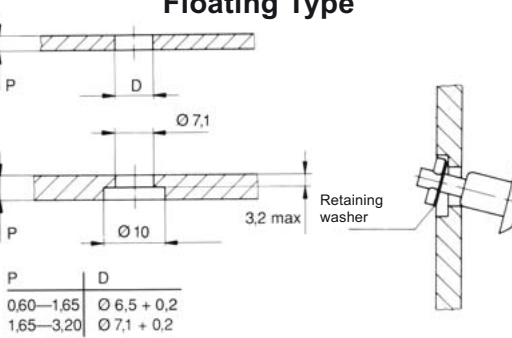
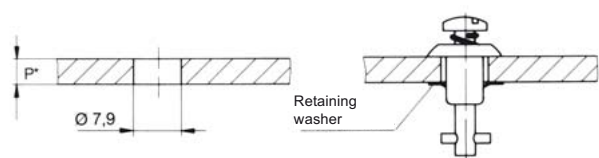
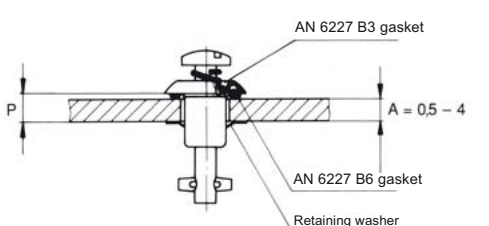
\* Length no. from Table, page F-2.

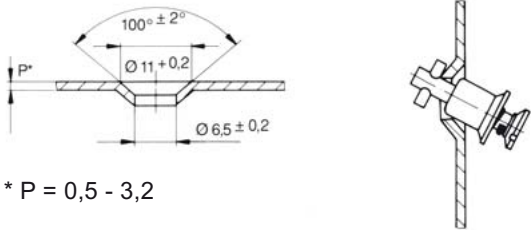
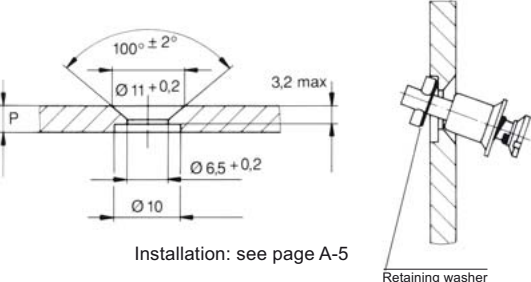
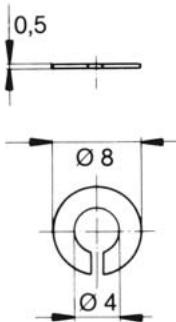

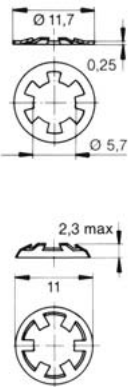

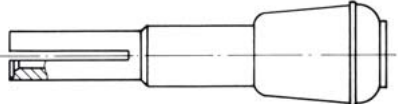
Style	Dimensions	Materials / Finish	°C	Part No.
<p><b>Slotted Recess Flush Head</b></p> 	 <p>S = 14,73 + (0,76 x length no.)</p>	<p>Steel / zinc-plated, CrVI-free, clear passivation</p> <p>Stainless steel <sup>1)</sup></p>	<p>120</p> <p>200</p>	<p><b>V27S01-*AGV</b></p> <p><b>2700-*S</b></p>
<p><b>Cross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


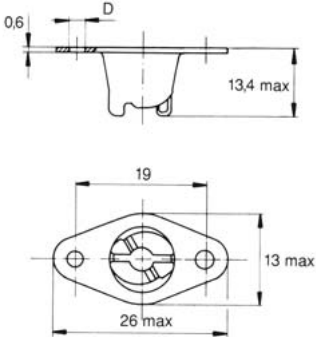

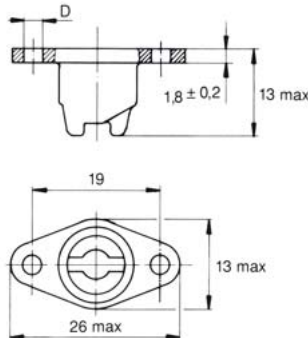

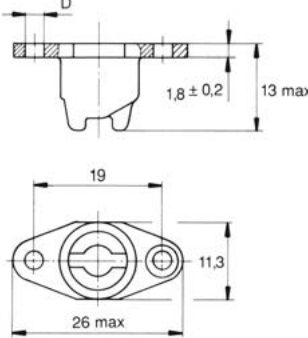

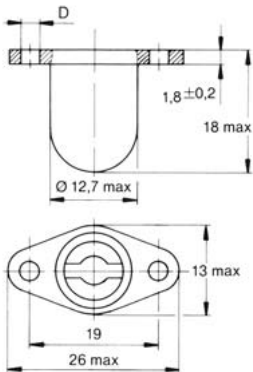
\* Length no. from Table, page F-2.


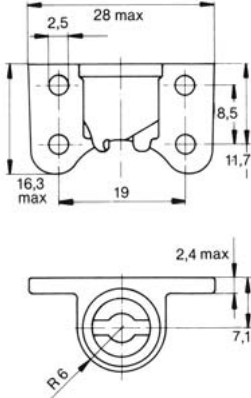

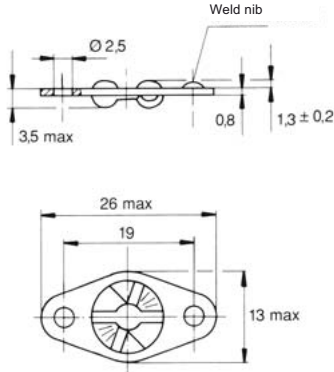
<sup>1)</sup>Max. Tensile strength 1.000 N, working load 700 N.


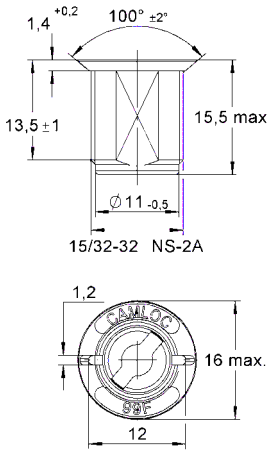

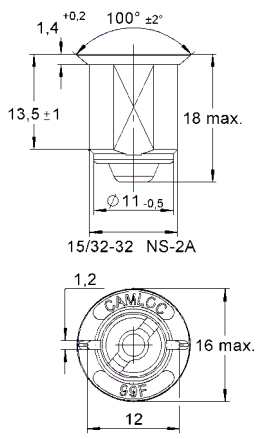


Installation Dimensions	Accessories	Material / Finish	Part No.						
<p><b>Stud Retention without Retaining Washer, Retention Type</b></p>  <table border="1" data-bbox="548 616 705 694"> <tr> <td>P</td> <td>D</td> </tr> <tr> <td>0,60—1,65</td> <td>Ø 6,5 + 0,2</td> </tr> <tr> <td>1,65—3,20</td> <td>Ø 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	D								
0,60—1,65	Ø 6,5 + 0,2								
1,65—3,20	Ø 7,1 + 0,2								
<p><b>Stud Retention without Retaining Washer, Floating Type</b></p>  <table border="1" data-bbox="196 1064 360 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	Stainless steel	<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	Stainless steel	<b>V2600-LW-7</b>						
<p><b>Sealed (for 2600 series with panhead only)</b></p>  <table border="1" data-bbox="219 1948 313 1982"> <tr> <td>P</td> <td>A</td> </tr> <tr> <td>P = A + 0,75</td> <td>A = 0,5 - 4</td> </tr> </table> <p>T98-1 installation tool, page F-6. Installation see page A-5.</p> <p>4P3-1 installation pliers, see page F-7.</p>	P	A	P = A + 0,75	A = 0,5 - 4	Gaskets	Rubber (100°C)	<b>AN6227-B6</b>  <b>AN6227-B3</b>		
P	A								
P = A + 0,75	A = 0,5 - 4								

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>

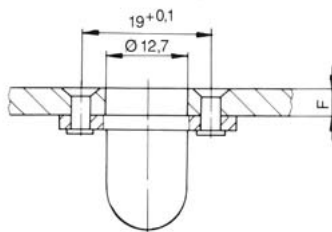
Style	Dimensions	Materials / Finish	D	°C	Part No.
<p><b>Type 1 Lightweight</b></p> 		Steel / zinc-plated, CrVI-free, clear passivation	2,6	120	<b>V26R6-1AGV</b>
<p><b>Type 1 Cast</b></p> 		Hard bronze / zinc-plated, CrVI-free, clear passivation	2,5	120	<b>V212-12-1FGV</b>
		Hard bronze / zinc-plated,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

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>

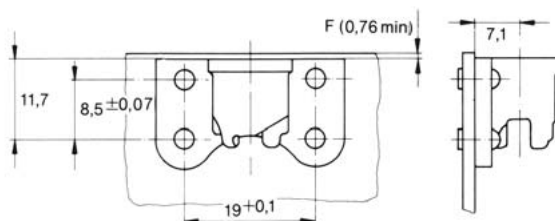
Style	Dimensions	Materials / Finish	°C	Part No.
<p><b>Type 4 Single Hole Mounting</b></p> 		<p>Zinc die cast / zinc-plated, CrVI-free, clear chromate</p>	<p>100</p>	<p><b>99R10-01A1</b></p>
<p><b>Type 4 Single Hole Mounting Encapsulated</b></p> 		<p>Zinc die cast / zinc-plated, CrVI-free, clear chromate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

Installation Dimensions

**Type 1 + 3 Receptacles Hole Pattern**

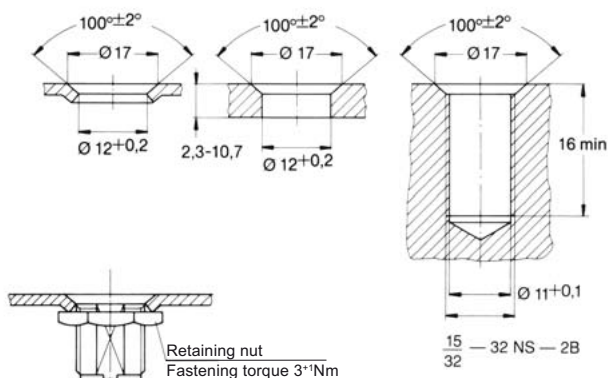


**Type 2 Receptacle Hole Pattern (Side Mounting)**



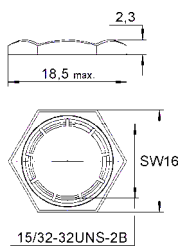
Installation Dimensions

**Installation Options Type 4 Receptacle**



Accessories

Retaining nut



Tap

Materials /  
Finish

Steel / zinc-plated,  
CrVI-free,  
clear chromate

Part No.

**99N10-01A1**

**15/32-32NS-  
2B**

## Features

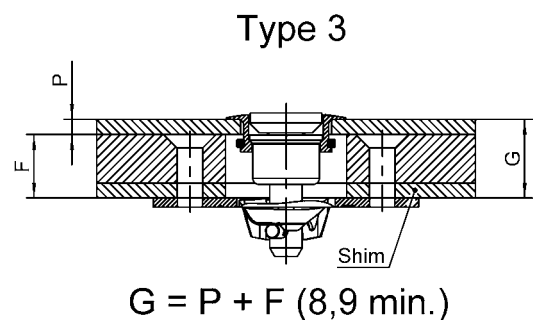
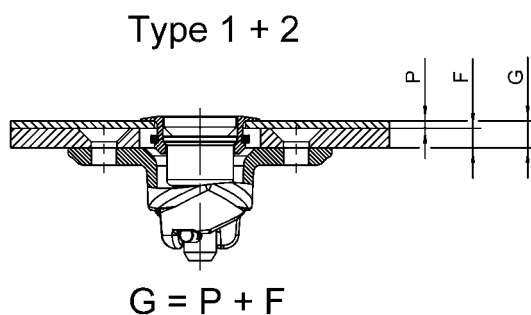
Max. tensile strength 4.700 N, working load 3.100 N.  
Small fastener for high tensile load.  
Large range of stud assemblies with fixed and floating receptacles

## Selection Instructions

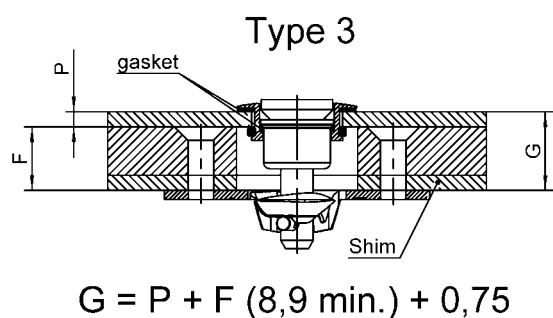
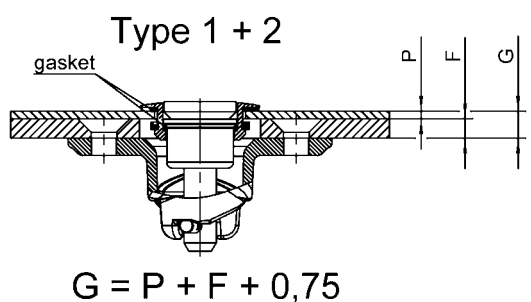
1. Select stud assembly, page G-4 and G-5, grommet and snap-on retaining ring, page G-7 and receptacle, page G-8 and G-9.
2. Select retaining washer, page G-6, for studs from length no. 5.
3. Select stud length number from total thickness G using the formula and the table on page G-2 and G-3 (e.g. D 4002-\*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**

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





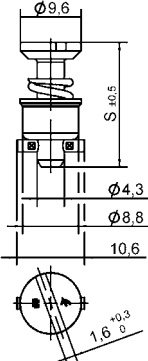

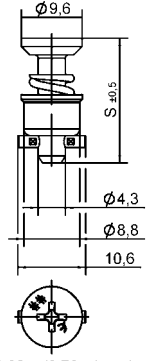

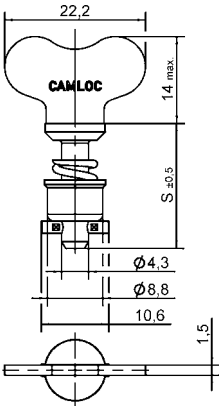

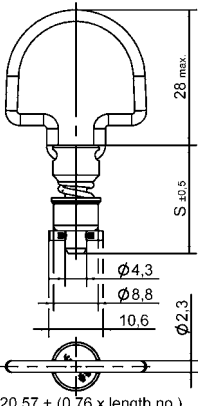
**When Using the Following Grommet and Receptacles:**

**Plus Flush Mounting Grommets  
D4002-N-AGV    D4002-O-AGV  
D4002-P-AGV**


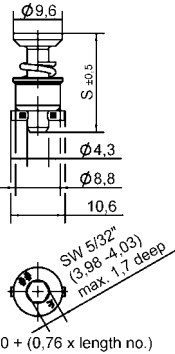

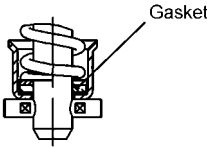

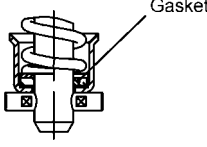
Total Thickness G	Stud Length No. When Using <b>Type 1</b> Receptacles	Total Thickness G	Stud Length No. When Using <b>Type 2</b> Receptacles	Total Thickness G	Stud Length No. When Using <b>Type 3</b> Receptacles
0,50 - 1,30	1	0,50 - 1,30	2	8,90 - 9,65	3
1,30 - 2,05	2	1,30 - 2,05	3	9,65 - 10,40	4
2,05 - 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				

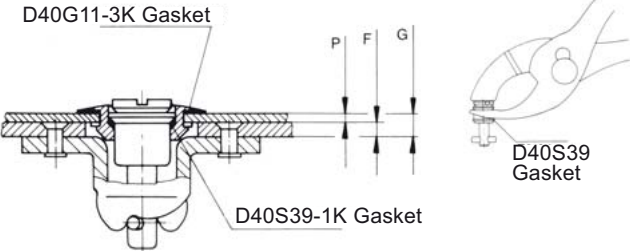
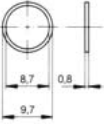
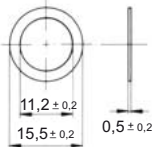
Other lengths on request.

 Preferred dash-lengths

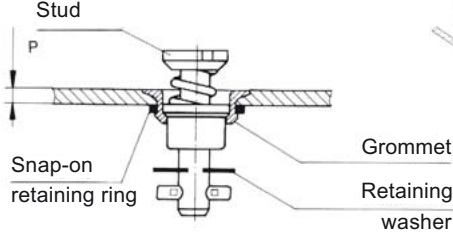
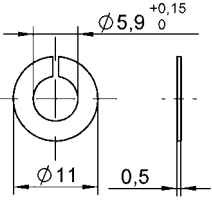
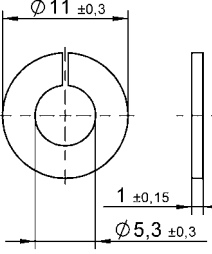

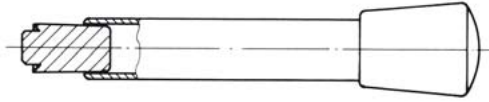
Style	Dimensions	Materials / Finish	°C	Part No.
<p><b>Slotted Recess Head</b></p> 	 <p><math>S = 16,00 + (0,76 \times \text{length no.})</math></p>	Steel / zinc-plated, CrVI-free, clear passivation	120	<b>D4002-*AGV</b>
<p><b>Cross Recess Head</b></p> 	 <p><math>S = 16,00 + (0,76 \times \text{length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


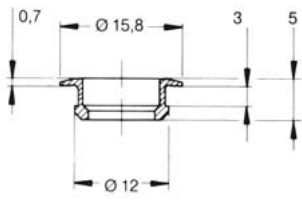

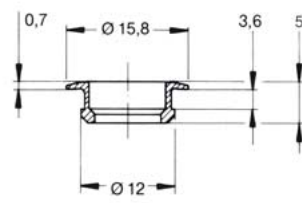

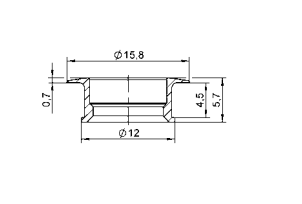

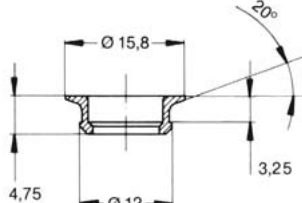

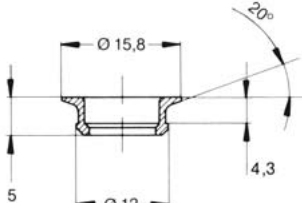
\* Length no. from Table, page G-2 and G-3

Style	Dimensions	Materials / Finish	°C	Part No.
<p><b>Hex Recess Head</b></p> 	 <p>S = 16,00 + (0,76 x length no.)</p>	Steel / zinc-plated, CrVI-free, clear passivation	120	<b>D40E28- *AGV</b>
<p><b>Sealed Slotted Recess Head</b></p> 	 <p>Additional required gasket see page G-4</p>	Steel / zinc-plated, CrVI-free, clear passivation  Gasket: Rubber	100	<b>D4002I-*AGV</b>
<p><b>Sealed Cross Recess Head</b></p> 	 <p>Additional required gasket see page G-4</p>	Steel / zinc-plated, CrVI-free, clear passivation  Gasket: Rubber	100	<b>D40S5I-*AGV</b>

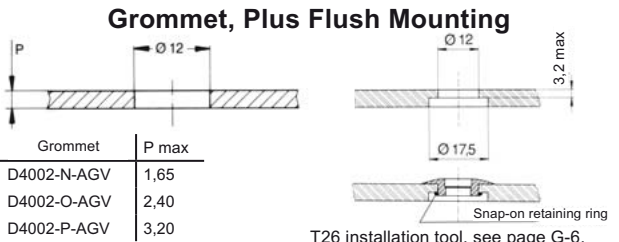
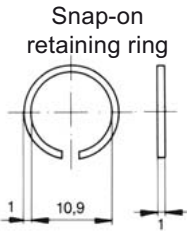
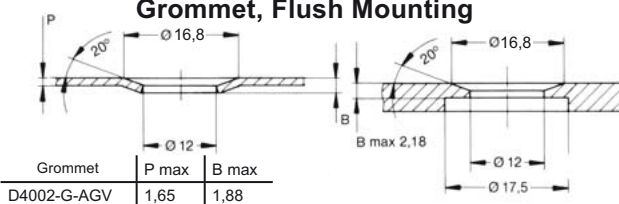
Installation Dimensions	Accessories	Materials / Finish	Part No.
<p><b>Gasket to be ordered in addition to the sealed stud assembly</b></p> 	<p>Gasket</p>  <p>Gasket</p> 	Plastic / (PA6)	<b>D40S39-1K</b>
		EPDM black	<b>D40G11-3K</b>


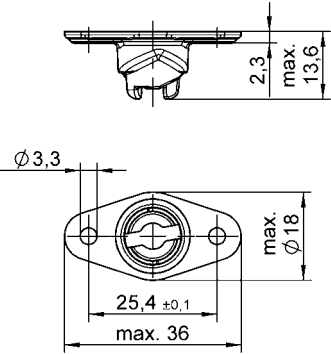

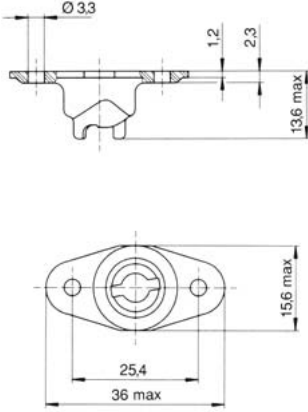

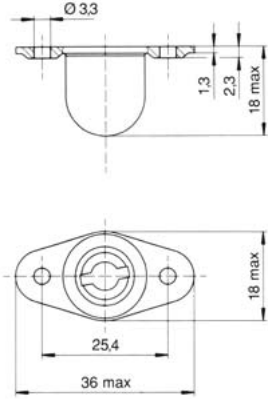
\* Length no. from Table, page G-2 and G-3


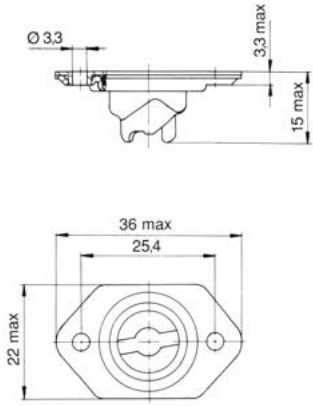

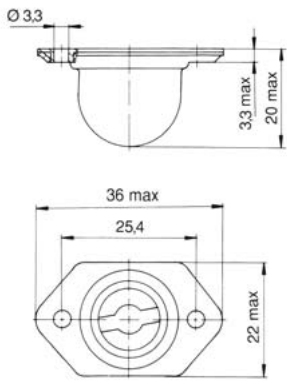

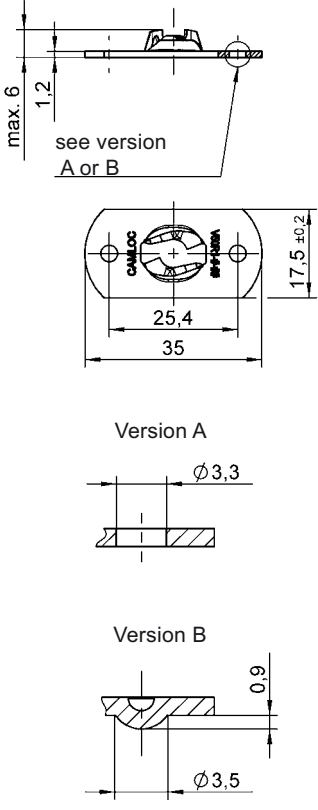
Installation Dimensions	Accessories	Materials / Finish	Part No.
 <p>4P3-1 installation pliers, see below</p>	<p>retaining ring loose on stud use for stud length no. 5 and up</p>  <p>retaining ring loose on stud use for stud length no. 5 and up</p> 	<p>Stainless steel</p> <p>Plastic</p>	<p><b>4002-SW-SS</b></p> <p><b>50W204-01K</b></p>
	<p><b>Stud installation pliers</b></p>		<p><b>4P3-1</b></p>
	<p><b>R4G-* and V40G26-1N snap-on retaining ring installation tool</b></p>		<p><b>T26</b></p>

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	120	<b>D4002-N-AGV</b>
<b>Plus Flush Mounting For Panel Thickness from 1,65 to 2,40</b> 		Steel / zinc-plated, CrVI-free, clear passivation	120	<b>D4002-O-AGV</b>
<b>Plus Flush Mounting For Panel Thickness from 2,40 to 3,20</b> 		Steel / zinc-plated, CrVI-free, clear passivation	120	<b>D4002-P-AGV</b>
<b>Flush Mounting For Panel Thickness up to 1,65</b> 		Steel / zinc-plated, CrVI-free, clear passivation	120	<b>D4002-G-AGV</b>
<b>Flush Mounting For Panel Thickness from 1,65 to 2,18</b> 		Steel / zinc-plated, CrVI-free, clear passivation	120	<b>D4002-H-AGV</b>

Grommets for thicker panels upon request.

Installation Dimensions	Accessories	Materials / Finish	Part No.									
<p><b>Grommet, Plus Flush Mounting</b></p>  <table border="1"> <thead> <tr> <th>Grommet</th> <th>P max</th> </tr> </thead> <tbody> <tr> <td>D4002-N-AGV</td> <td>1,65</td> </tr> <tr> <td>D4002-O-AGV</td> <td>2,40</td> </tr> <tr> <td>D4002-P-AGV</td> <td>3,20</td> </tr> </tbody> </table> <p>T26 installation tool, see page G-6.</p>	Grommet	P max	D4002-N-AGV	1,65	D4002-O-AGV	2,40	D4002-P-AGV	3,20	<p>Snap-on retaining ring</p> 	Steel / zinc plated, CrVI-free, clear passivation	<b>R4G-3</b>	
Grommet	P max											
D4002-N-AGV	1,65											
D4002-O-AGV	2,40											
D4002-P-AGV	3,20											
<p><b>Grommet, Flush Mounting</b></p>  <table border="1"> <thead> <tr> <th>Grommet</th> <th>P max</th> <th>B max</th> </tr> </thead> <tbody> <tr> <td>D4002-G-AGV</td> <td>1,65</td> <td>1,88</td> </tr> <tr> <td>D4002-H-AGV</td> <td>2,18</td> <td>2,97</td> </tr> </tbody> </table> <p>T26 installation tool, see page G-6.</p>	Grommet	P max	B max	D4002-G-AGV	1,65	1,88	D4002-H-AGV	2,18	2,97			
Grommet	P max	B max										
D4002-G-AGV	1,65	1,88										
D4002-H-AGV	2,18	2,97										

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

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

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.

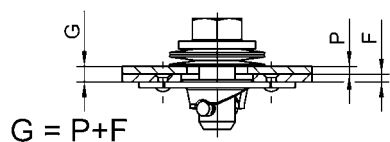
Typical applications:

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

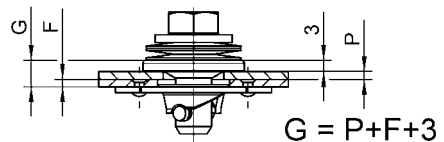
1. Select stud assembly and receptacle, pages H-2, H-3 and H-5.
2. Sealed: Also select rubber gasket and buffer plate, page H-4.
3. Select retaining washer, page H-4.
4. Select stud length number from total thickness G using the formula and table below (e.g. 991S01-\*AGV).

## Determining the stud length number when using:

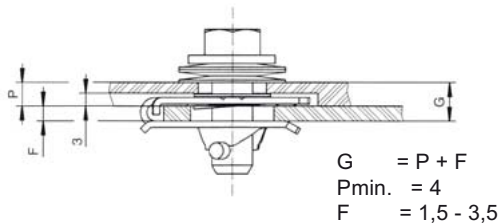
### Rivet, Screw and Weld Mounting Receptacle



### Sealed Stud Assemblies



### Clip-On Receptacle


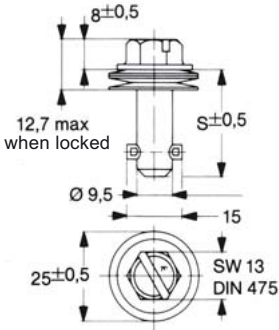

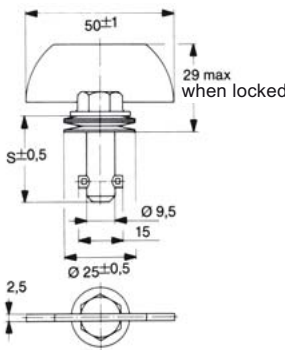

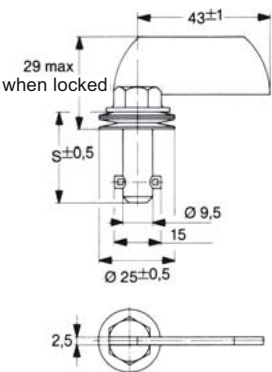

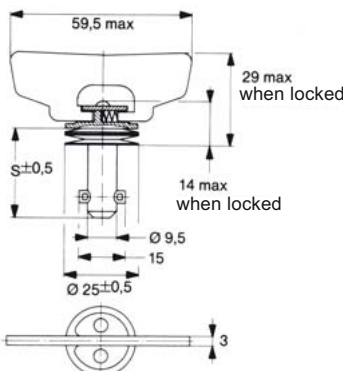


## Stud Length Table

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		


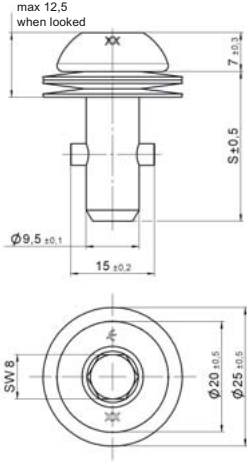

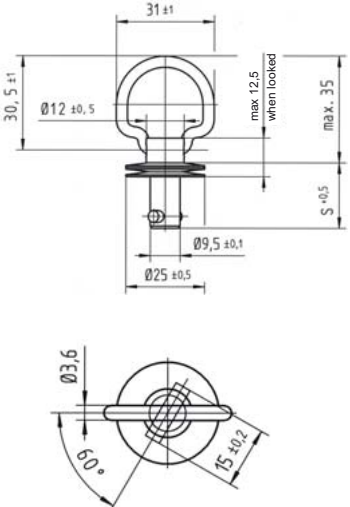
Other lengths on request.

■ Preferred dash-lengths

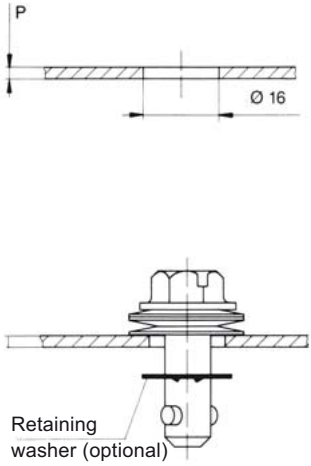
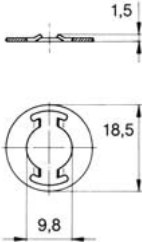
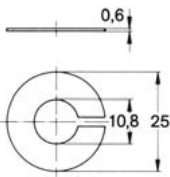
Style	Dimensions	Materials / Finish	°C	Part No.
<p><b>Hex Head Slotted Recess</b></p> 	 <p>S = 16,26 + (0,76 x length no.)</p>	<p>Steel / zinc-plated, CrVI-free, clear passivation</p> <p>Stainless steel <sup>1)</sup></p>	<p>120</p> <p>200</p>	<p><b>991S01- *-1AGV</b></p> <p><b>991S01- *-1BP</b></p>
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

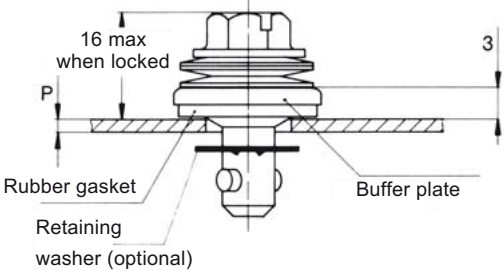
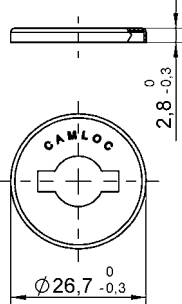
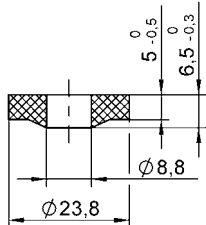
<sup>1)</sup> Max. tensile strength 7.000 N, working load 4.500 N.


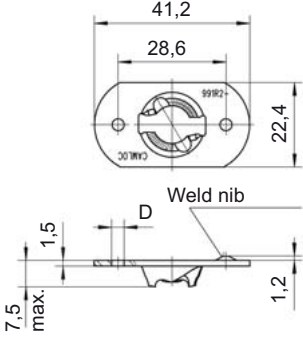

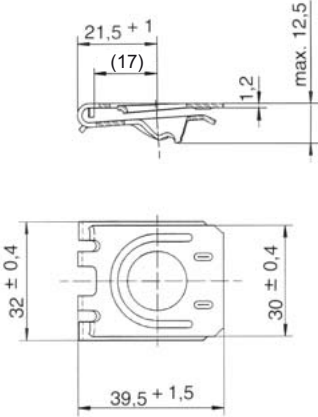
Style	Dimensions	Materials / Finish	°C	Part No.
<p><b>Hex Recess Head</b></p> 		<p>Steel / zinc-plated, CrVI-free, clear passivation</p>	<p>120</p>	<p><b>991S30-*AGV</b></p>
<p><b>Folding Bail Handle 180°</b></p> 	 <p>S = 15,03 + (0,76 X length no.)</p>	<p>Steel / zinc-plated, CrVI-free, clear passivation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

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

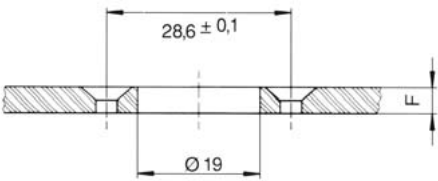
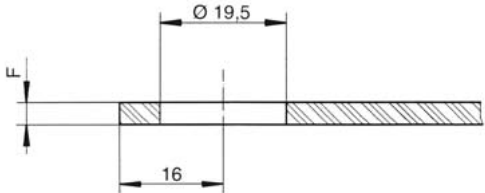
Installation Dimensions	Accessories	Material / Finish	Part No.
 <p>Retaining washer (optional)</p>	<p>Retaining washer</p>  <p>Slotted retaining washer</p> 	<p>Stainless steel</p> <p>Stainless steel</p>	<p><b>991W04-1BP</b></p> <p><b>991W02-1BP</b></p>

**Sealed Stud Assemblies**

Installation Dimensions	Accessories	Material / Finish	Part No.
 <p>16 max when locked</p> <p>Rubber gasket</p> <p>Retaining washer (optional)</p> <p>Buffer plate</p>	<p>Buffer plate</p>  <p>Rubber gasket</p> 	<p>Stainless steel</p> <p>NBR black (100°C max.)</p>	<p><b>991W03-1BP</b></p> <p><b>991S17-1K</b></p>

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>  



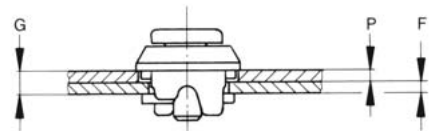
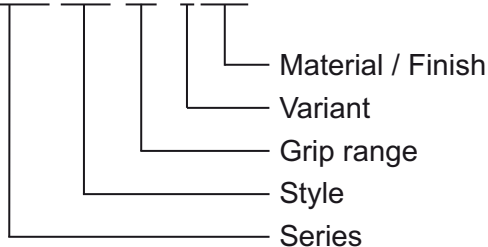
## Features

- 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


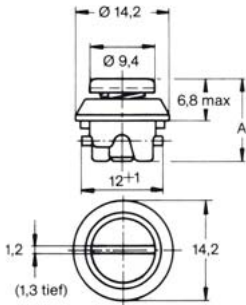

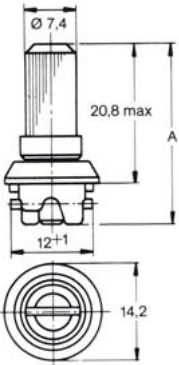
Knurled head for 3,3 mm to 4,6 mm grip range.

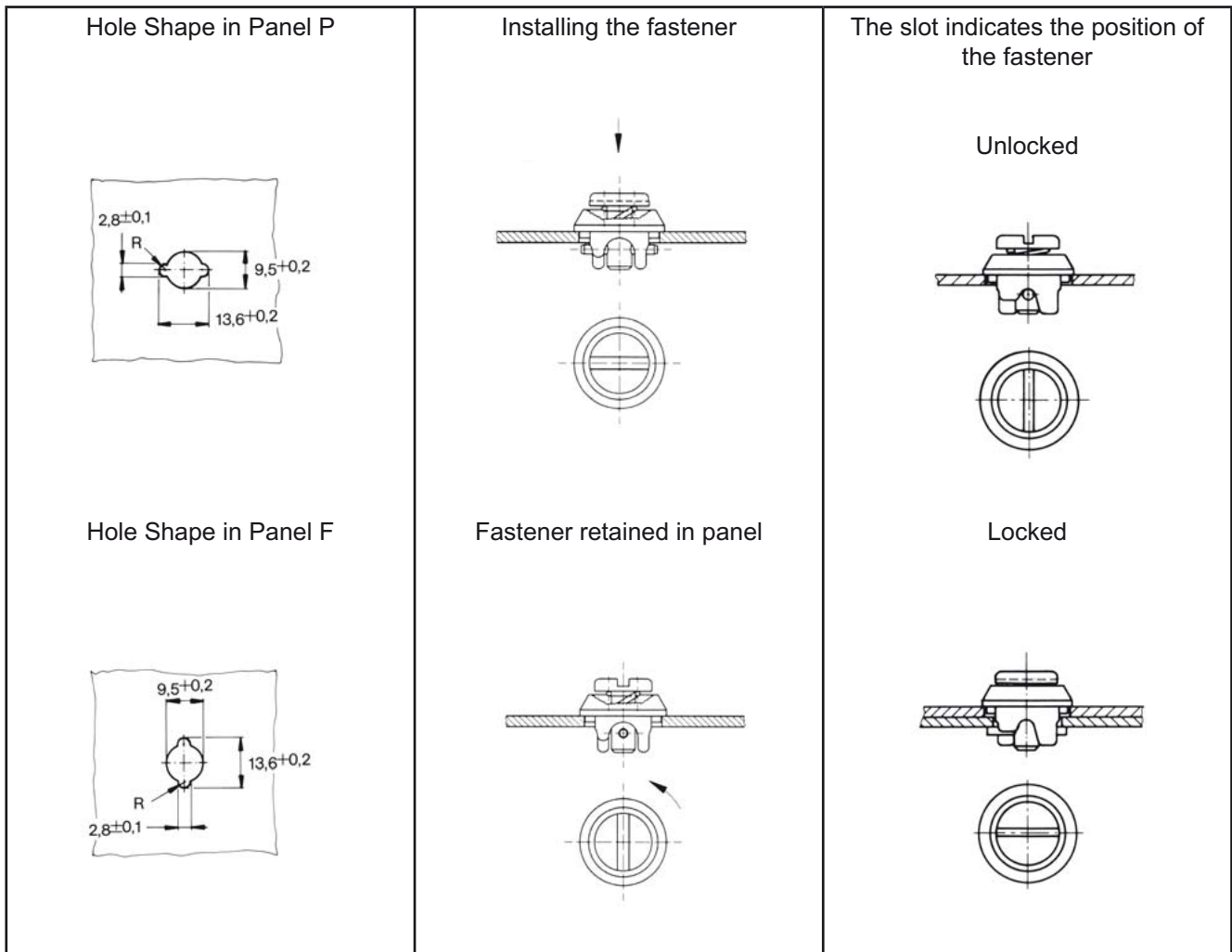
### V936 S11 -4 -1 AA



$$G = P + F$$

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

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:

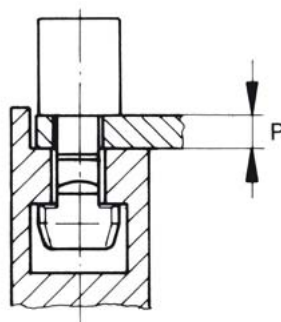
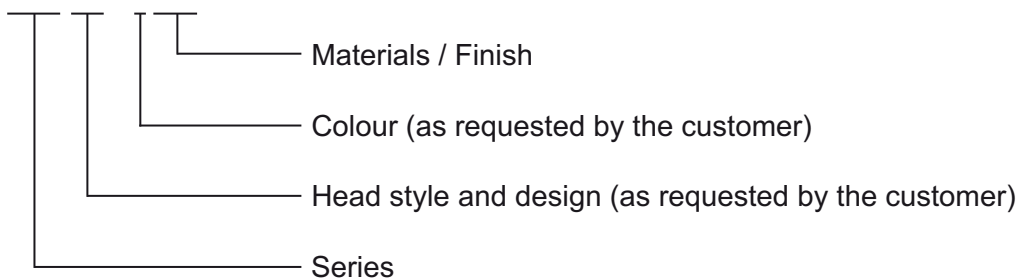
1. the front panel
2. the shape of the modular bar
3. the colour, if necessary


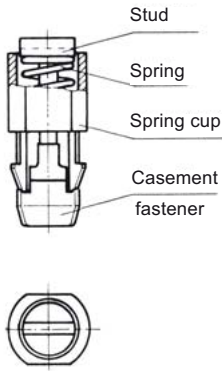

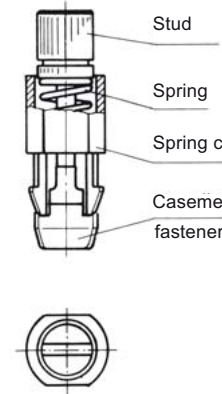
In addition, please send us samples of your modular bar and front panel.

## Part no. example

One-piece fastener

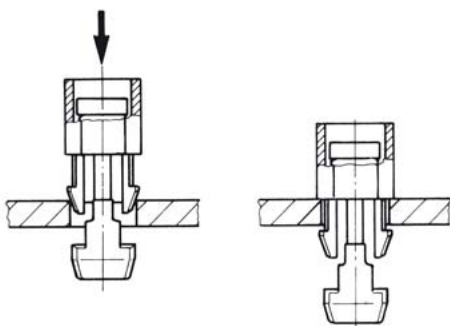
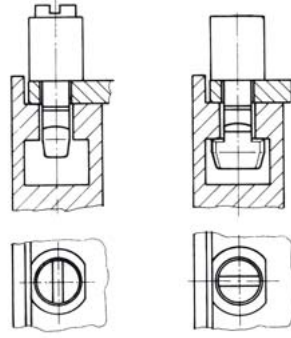
### 713 S\* - \* AE



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



## Features

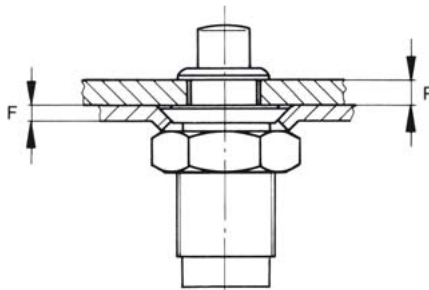
Max. tensile strength 1.330 N, working load 930 N.

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).


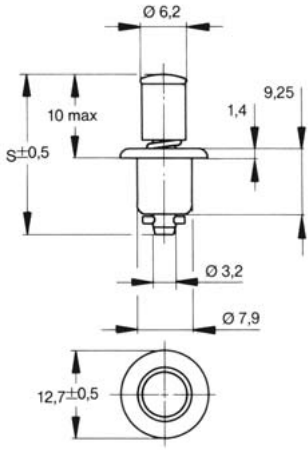


### Stud Length Table

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.

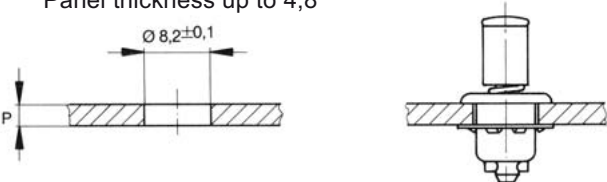
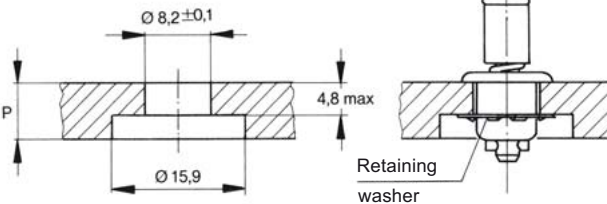

 Preferred dash-lengths


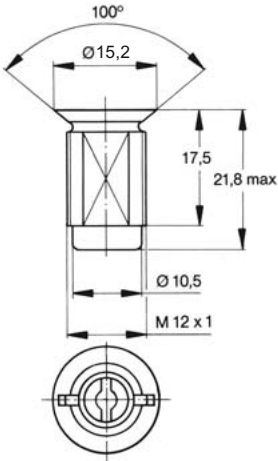
Style	Dimensions	Materials / Finish	°C	Part No.
	 <p>S=22,4 + (0,76 x length no.)</p>	Steel / nickel-plated	120	<b>15S1- *-1AD</b>
		Steel / zinc-plated CrVI-free, clear passivation	120	<b>15S1- *-1AJ</b>

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

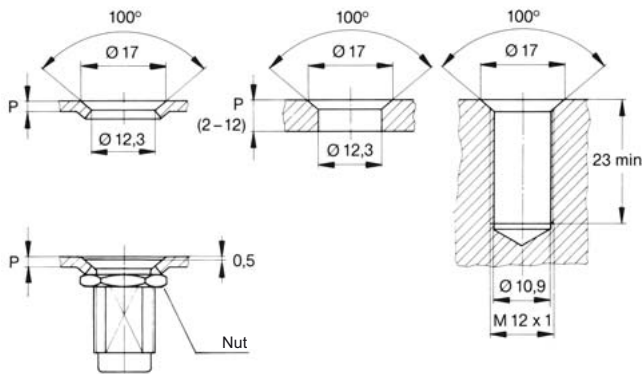
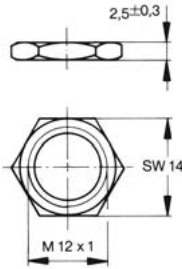
Other lengths and surfaces can be ordered upon request.

### 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.

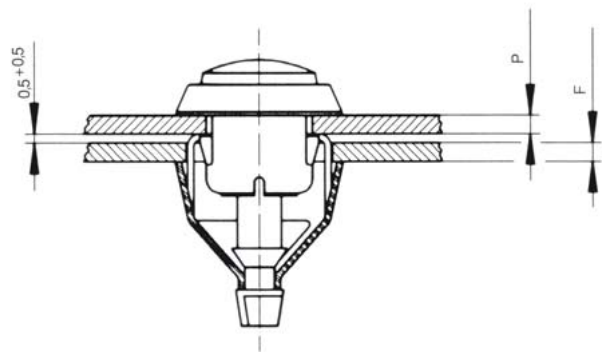
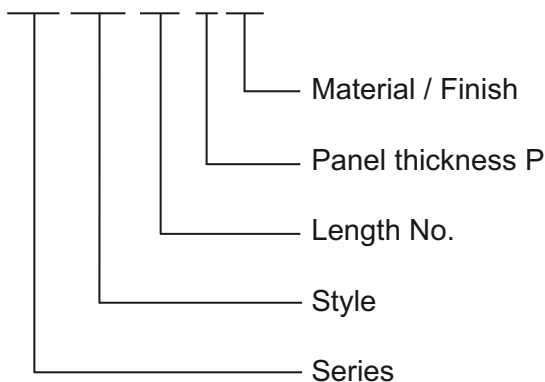
## Selection Instructions

- 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




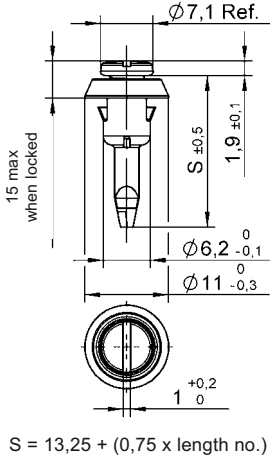

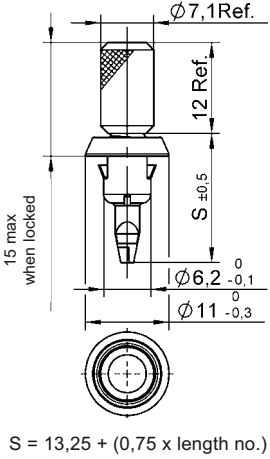
## Stud Length Table

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	-

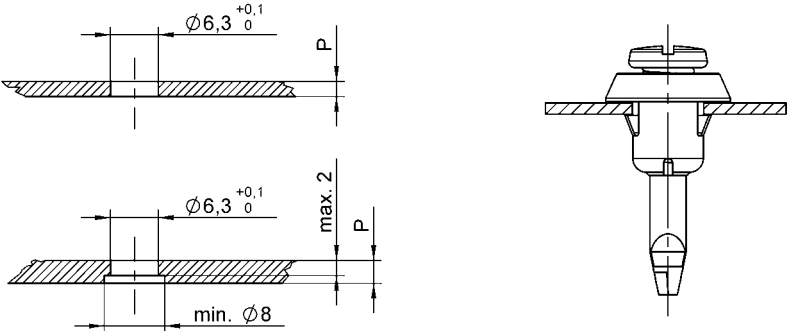
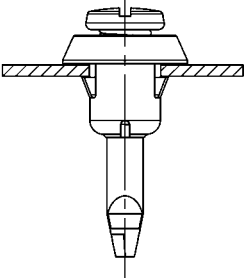
Other lengths on request.


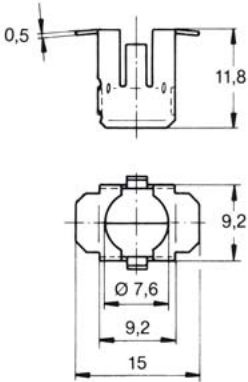
■ Preferred dash-lengths



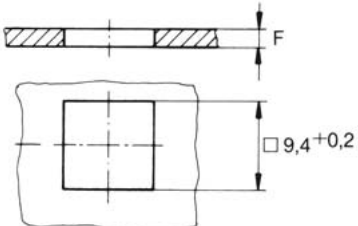
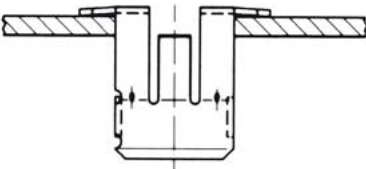
Style	Dimensions	Materials / Finish	Panel Thickness P	°C	Part No.
<b>Slotted Recess Head</b>  		Stainless steel Spring cup: Plastic (POM) / black	0,5 - 1,0	-25 up to +90	<b>715S12- *-1BP</b>
			1,0 - 1,5		<b>715S12- *-2BP</b>
			1,5 - 2,0		<b>715S12- *-3BP</b>
<b>Knurled Head</b>  		Stainless steel Spring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

## 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.

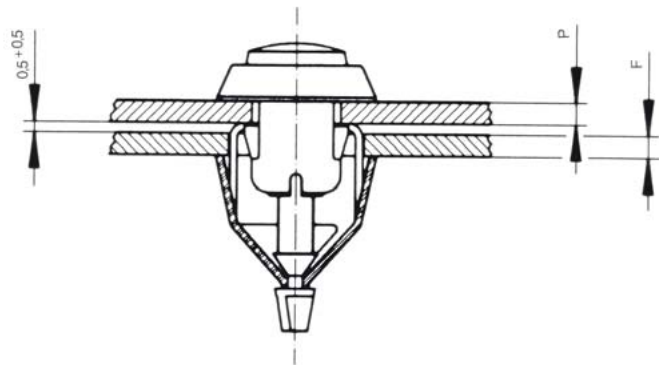
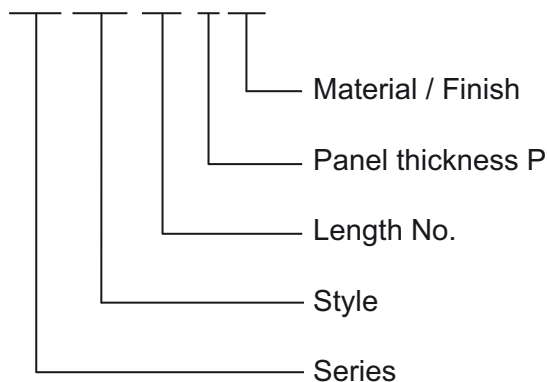
### Selection Instructions

- 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**


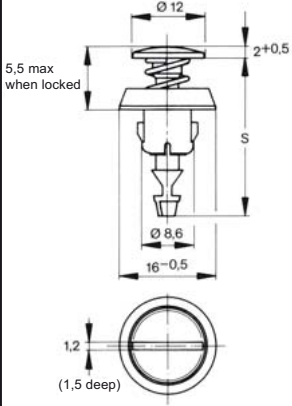

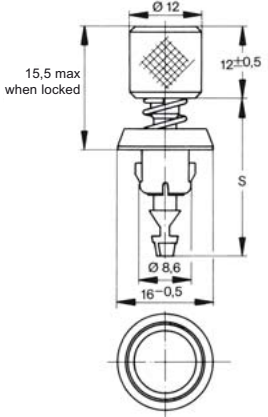


### Stud Length Table

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

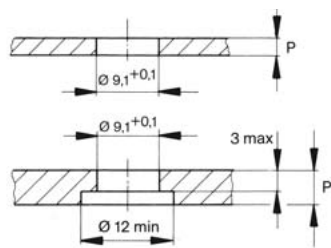
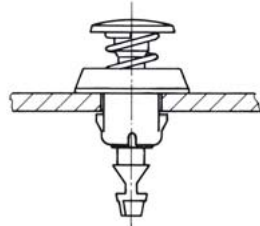
Other lengths on request.


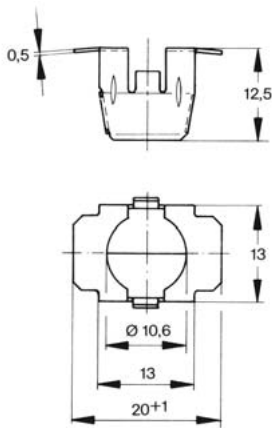
■ Preferred dash-lengths

Style	Dimensions	Materials / Finish	Panel Thickness P	°C	Part No.
<b>Slotted Recess Head</b>  	 <p>S = 18,5 + length no.</p>	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>  	 <p>S = 18,5 + length no.</p>	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>

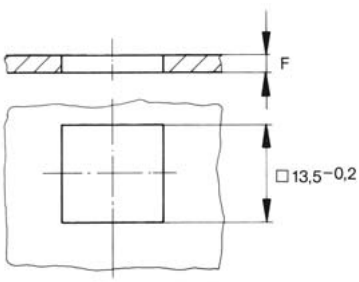
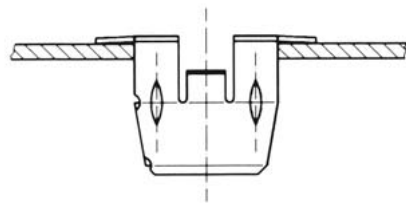
\* Length no. from Table, page M-1.

## 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.

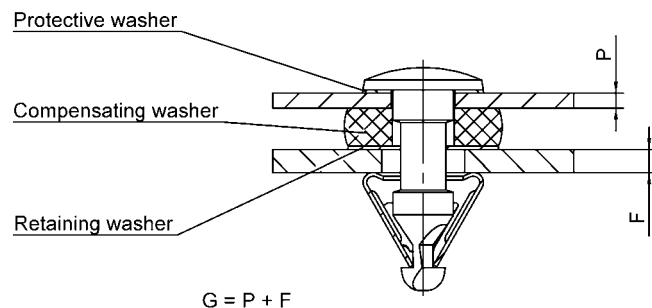
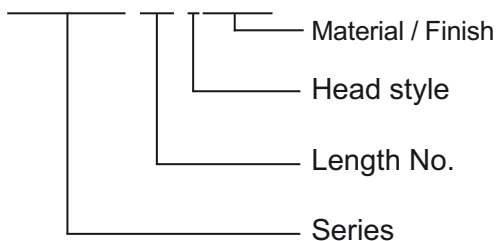
## Selection Instructions

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


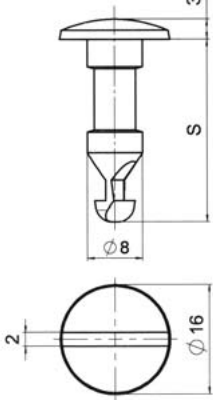

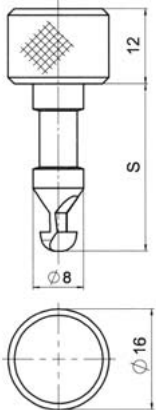


## Stud Length Table

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

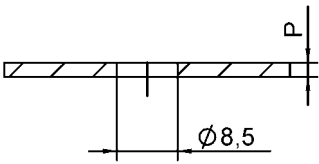
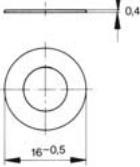
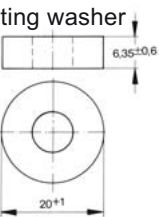

Other lengths on request.


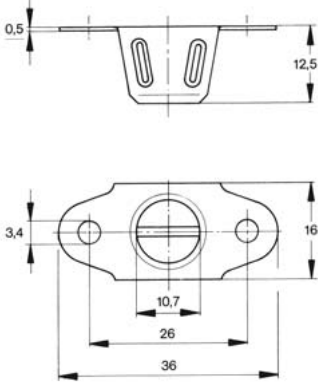
■ Preferred dash-lengths

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>

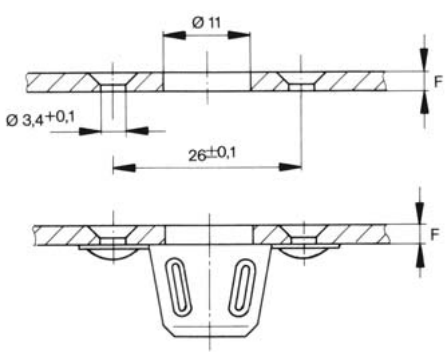
\* Length no. from Table, see page N-1.

## 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.

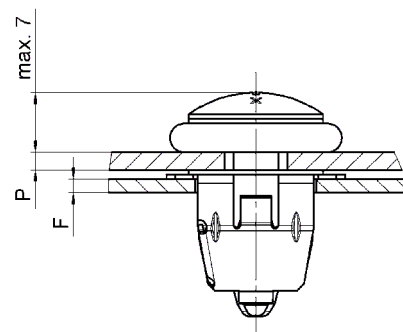
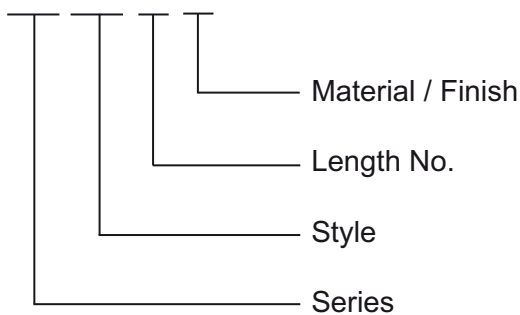
## Selection Instructions

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


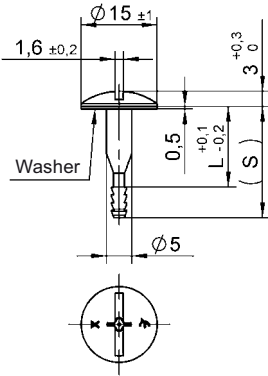

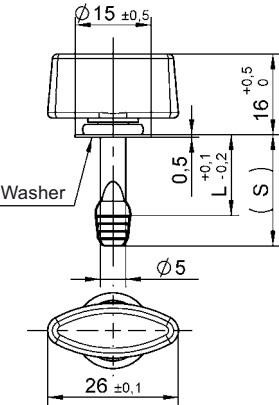
Stud, slot-cross recess

### 720 S01 -1 B



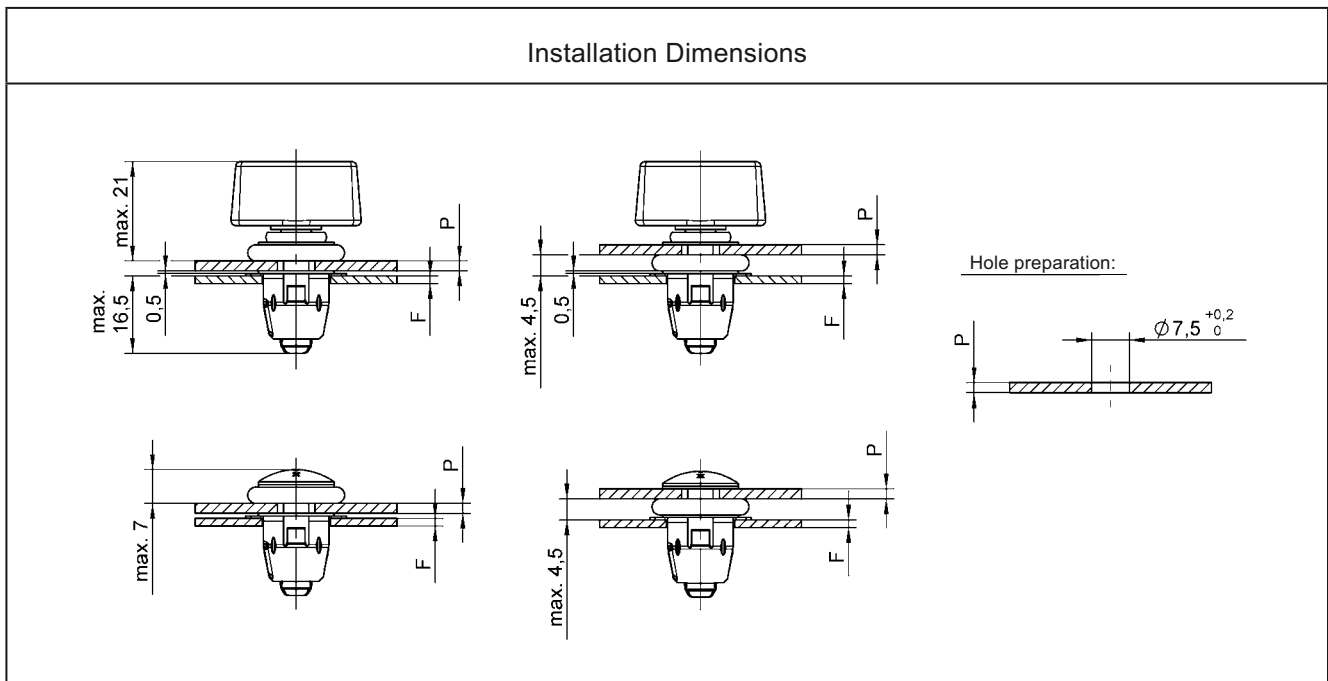
Panel Thickness P	Slot-Cross Recess Length No.	Wing Head Stud Length No.	Dimension L +0,1/-0,2	Dimension (S)
1,00 - 4,00	1	1	16	21
4,00 - 7,00	2	2	19	24
7,00 - 10,00	3	3	22	27


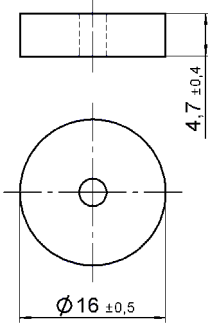

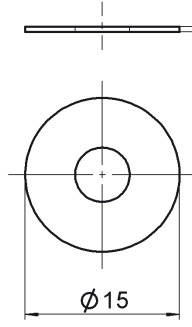
■ Preferred dash-lengths

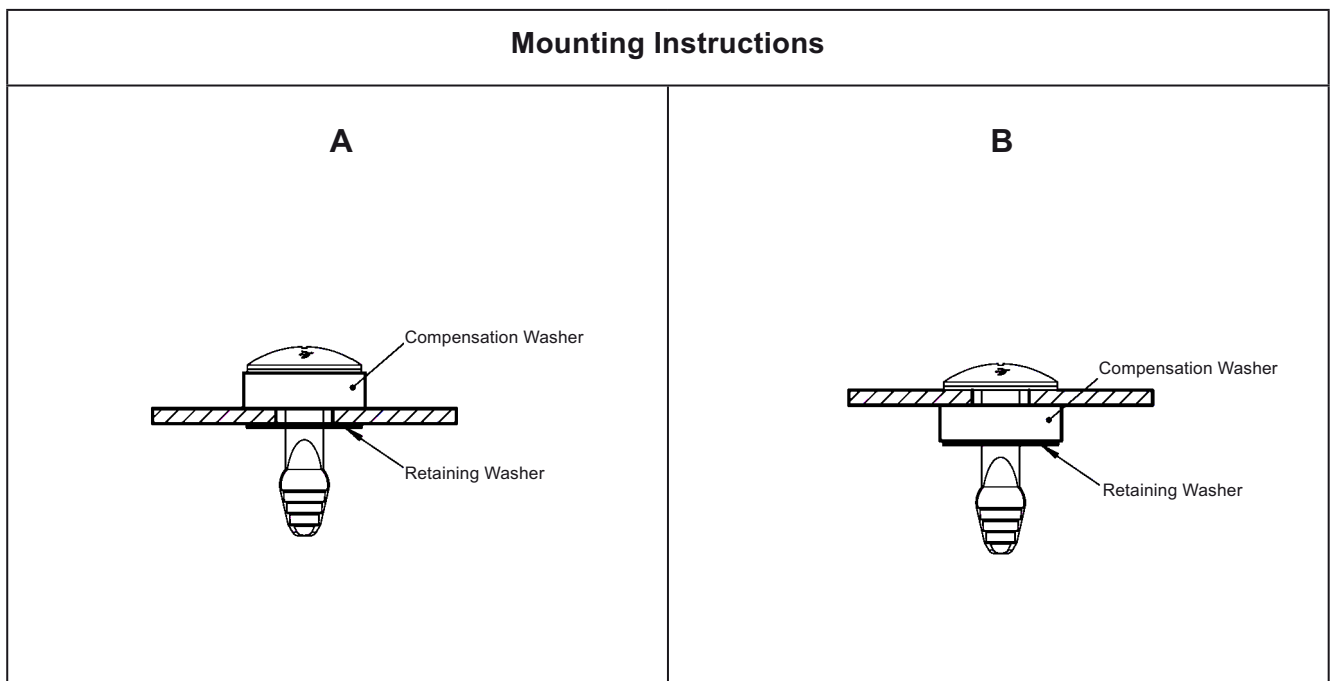
Style	Dimensions	Materials / Finish	°C	Part No.
<b>Slot-Cross Recess Head</b> 	 <p>L + (S) see table page O-1</p>	Stainless steel Washer: PA6 natural	-20 up to +70	<b>720S01-*B</b>
<b>Wing Head</b> 	 <p>L + (S) see table page O-1</p>	Stainless steel Knob: PA6 black Washer: PA6 natural	-20 up to +70	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


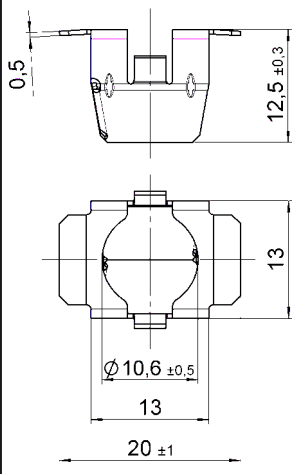
\* Length no. from Table, see page O-1.

## Stud Installation Instructions

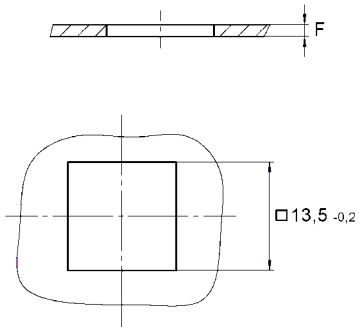
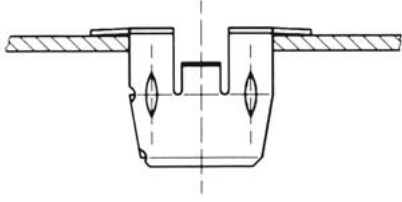


Style	Dimensions	Materials / Finish	°C	Part No.
<p><b>Compensating Washer</b></p> 		PU - Elastomer yellow	-20 up to +70	<b>720W01-2K</b>
<p><b>Retaining Washer</b></p> 		Polyamid natural	-20 up to +70	<b>50E15-1K</b>



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	
	



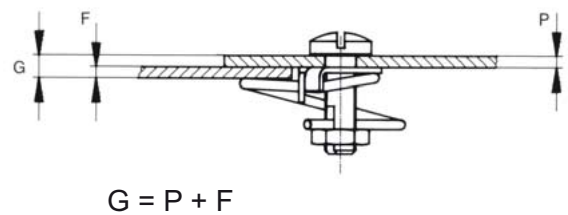
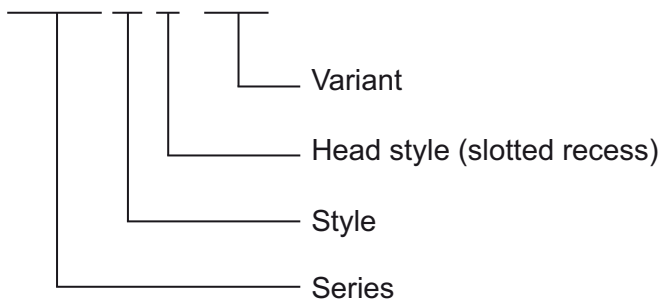
## Features


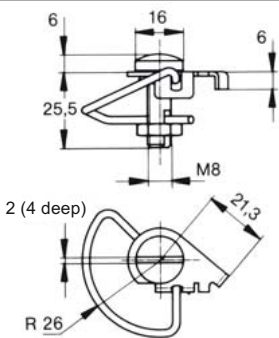

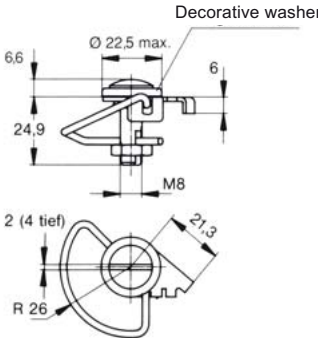

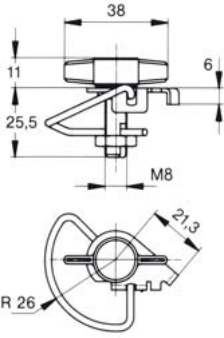
- Wide grip range (total thickness G up to 15 mm).
- Suitable for a large range of applications.
- Easy installation with single-hole mounting.
- Either tool-operated (slotted recess head) or hand-operated (fixed wing head).
- Clockwise locking 3/4 turn maximum.

## Part no. example

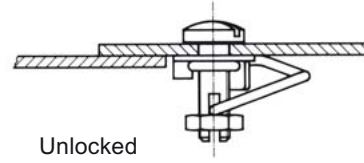
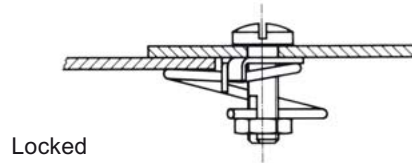
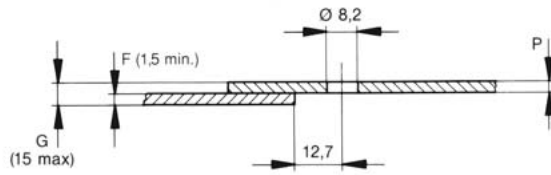
Pawl Latches, slotted recess head, with decorative washer.

## 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



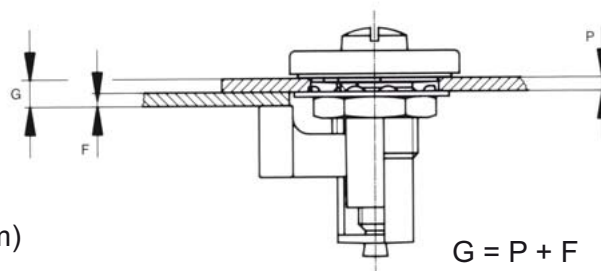
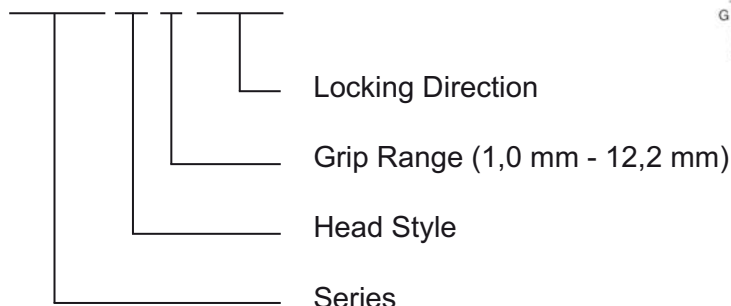
## Features


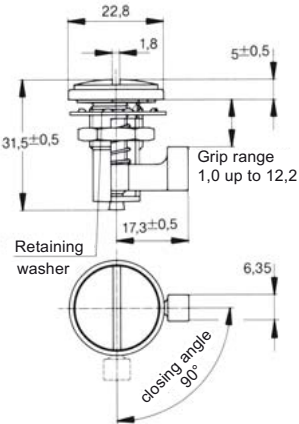

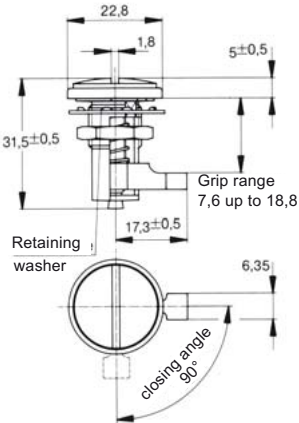
- Variable grip fastener. Available in two grip ranges from 1,0 mm to 18,8 mm.
- Tool or hand operated head styles available.
- Single hole mounting - low installation cost.
- Clockwise locking as standard.
- Counterclockwise locking fasteners upon request.

## Part no. example


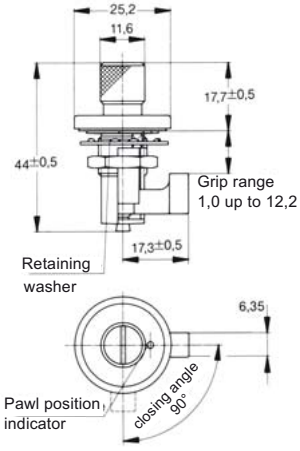

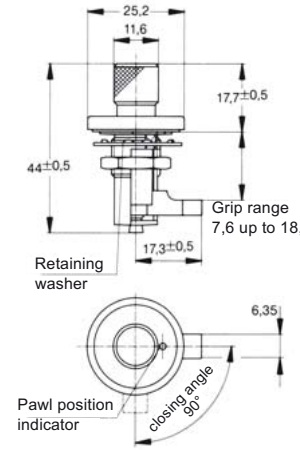
Pawl Latches, Flat head.  
Grip range 1,0 mm - 12,2 mm.

### V965L 23 -1 R1AG

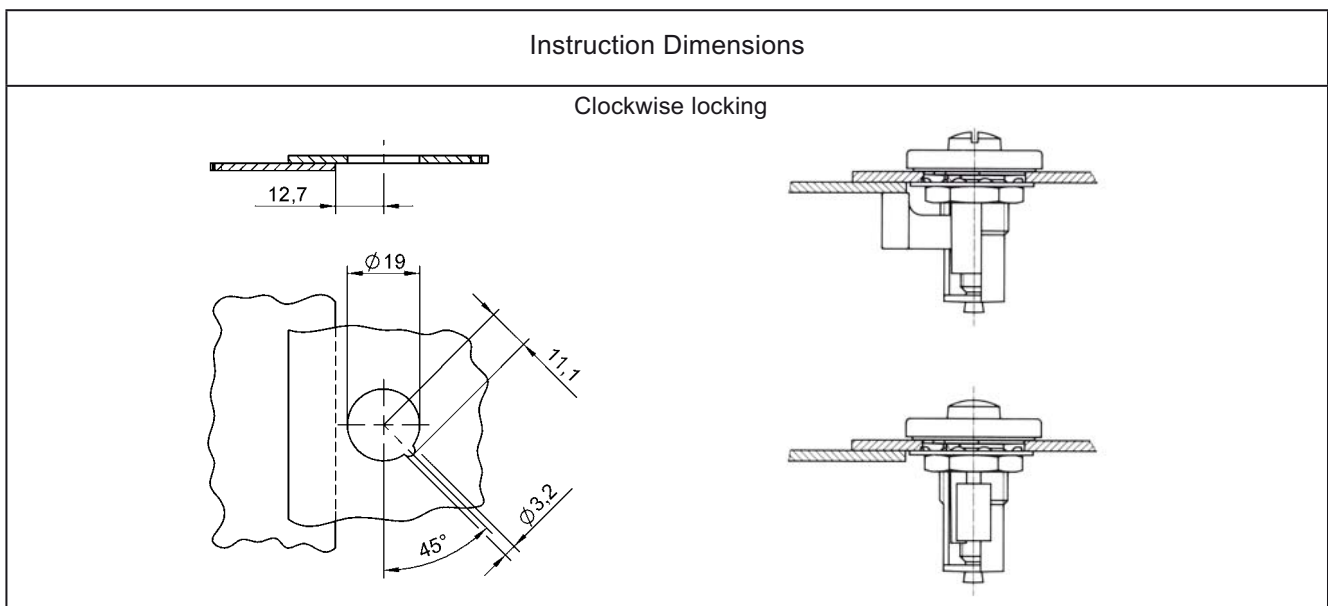


Style	Dimensions	Materials / Finish	°C	Part No.
<b>Flat Head</b> <b>Grip Range</b> <b>1,0 up to 12,2</b> 		Steel / zinc-plated CrVI-free, clear passivation	-40 up to +100	<b>V965L23-1R1AG</b>
<b>Flat Head</b> <b>Grip Range</b> <b>7,6 up to 18,8</b> 		Steel / zinc-plated CrVI-free, clear passivation	-40 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,F11	50E8-*WS	E3	716S13- *-4BP	M2
15S1- *-1AD	K2	50E80-*AGV	D4	716S13- *-5BP	M2
15S1- *-1AJ	K2	50E80-*CP	D4	717R01-1AK7	N3
15S11-1CJ	K2	50E81-*AGV	E4	717S01- *-1AGV	N2
212-12S	F8	50E81-*CP	E4	717S01- *-2AGV	N2
2600-*S	F3	50E82-*AGV	D4	717W01-1K	N2
2600-*SW	F3	50E82-*CP	D4	717W02-1K	N2
2600-SW	C2,F6,F7	50E83-*AGV	E4	717W03-1K	N2
26R1-1	F9	50E83-*CP	E4	720R01-1B	M3,O4
26R16-1FGV	F8	50E90-*AGV	D2	720R01-2B	M3,O4
26R18-1-1AA	F8	50E91-*AGV	E2	720R01-3B	M3,O4
26S34-*	F3	50S12-0-1AA	D5	720R01-4B	M3,O4
26S38-*	F3	50S12-1-1AA	D5	720S01-*B	O2
26S39-*	F3	50S12-2-1AA	D5	720S02-*B	O2
26S42-*	F3	50S12-3-1AA	D5	720W01-2K	O3
26S51-*	F3	50S12-4-1AA	D5	991R2-1AGV	H5
2700-*S	F5	50W204-01K	D5,E5, G6	991R2-1BP	H5
312-12S	F9	5R2-3	B4	991RZ-2AR	H5
312-12WS	F9	5S15-*	B2	991R2-2AZ	H5
4002-SW-SS	D5,E5,G6,	5S3-2	B3	991R2-3AGV	H5
4P3-1	F7,G6	5S72-5-1AA	B3	991R2-3BP	H5
50E15-1K	O3	5S72-9-1AA	B3	991R6-1AK7	H5
50E18-*AGV	D4	713S* -*AE	J2	991S01- *-1AGV	H2
50E19-*AGV	E4	715R02-1BP	L3	991S01- *-1BP	H2
50E20-1AK7	D6	715R02-2BP	L3	991S02- *-1AGV	H2
50E20-2AK7	D6	715R02-3BP	L3	991S03- *-1AGV	H2
50E21-*AGV	D2	715R02-4BP	L3	991S05- *-1AGV	H2
50E21-*S	D2	715S12- *-1BP	L2	991S17-1K	H4
50E21-*W0AGV	D3	715S12- *-2BP	L2	991S2991-*AGV	H3
50E21-*WAGV	D3	715S12- *-3BP	L2	991S30-*AGV	H3
50E21-*WS	D3	715S13- *-1BP	L2	991W02-1BP	H4
50E2-3BP	D5,E5	715S13- *-2BP	L2	991W03-1BP	H4
50E60-*AGV	D3	715S13- *-3BP	L2	991W04-1BP	H4
50E61-*AGV	E3	716S12- *-1BP	M2	99E10-01	C3,F10
50E7-*AGV	E4	716S12- *-2BP	M2	99N10-01A1	C3,F11
50E70-*AGV	D2	716S12- *-3BP	M2	99R10-01A1	C3,F10
50E71-*AGV	E2	716S12- *-4BP	M2	991R2-2AR	H5
50E8-*AGV	E2	716S12- *-5BP	M2	99W10-01A1	C2
50E8-*S	E2	716S13- *-1BP	M2	AN6227-B3	F6
50E8-*W0AGV	E3	716S13- *-2BP	M2	AN6227-B6	F6
50E8-*WAGV	E3	716S13- *-3BP	M2	D214-16FGV	G8

Part No.	Page
D214-16NFGV	G8
D244-16-FGV	G9
D244-16C-FGV	G9
D4002-*AGV	G4
D4002-*WAGV	G4
D4002-N-AGV	G7
D4002-O-AGV	G7
D4002-P-AGV	G7
D4002-G-AGV	G7
D4002-H-AGV	G7
D4002I-*AGV	G5
D40E28-*AGV	G5
D40G11-3K	G5
D40R12-1FGV	G8
D40S39-1K	G5
D40S47-*AGV	G4
D40S5-*AGV	G4
D40S5I-*AGV	G5
R4G-3	G7
T107-1	K2
T26	G6
T98-1	C2,F7
V15R13-1-1AB	K3
V15R14-1-1AB	K3
V212-12-1FGV	F8
V212-12-2FGV	F8
V212-12N-1FGV	F8
V2600-LW-7	C2,F6,F7
V26R6-1AGV	F8
V26S01-*AGV	F3
V26S02-*AGV	F3
V26S04-*AGV	F3
V26S06-* -1AGV	F4
V26S07-* -1AGV	F4
V26S08-* -1AGV	F4
V27S01-*AGV	F5
V27S02-*AGV	F5
V27W01-1AN	F7
V312-12AGV	F9
V50R1-1-1AGV	E6,G9
V50R1-1-1BP	E6

Part No.	Page
V50R1-1-2AR	E6,G9
V50R1-1-2AZ	E6,G9
V50R4-2-1AK7	D6
V5R2-1AK7	B4
V5S21-*AGV	B2
V5W3-1AGV	B3
V5S5-*AGV	B2
5S27-*	B2
V936S05-3-1AA	I1
V936S05-4-1AA	I1
V936S11-3-1AA	I1
V936S11-4-1AA	I1
V964L01-1-1AG	P1
V964L01-1-2AG	P1
V964L01-2-1AG	P1
V965L1-1R1AG	Q2
V965L1-2R1AG	Q2
V965L23-1R1AG	Q1
V965L23-2R1AG	Q1
V99S10-*AG	C2

# Camloc Tension Latches



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Overview on latches ..... A-4

## Tension Latches

V934L Series ..... B-1 - B-2  
95L Series ..... C-1 - C-2  
V96L Series ..... D-1 - D-2  
1429L Series ..... E-1 - E-5  
V951L Series ..... F-1 - F-6  
V917L & 1449L Series ..... G-1 - G-5  
V18L Series ..... H-1 - H-4  
V46L Series ..... I-1

## Slam Latches

2939L Series ..... J-1  
52F Series ..... K-1  
2812L Series ..... L-1 - L-2

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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 70 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 : 2009**

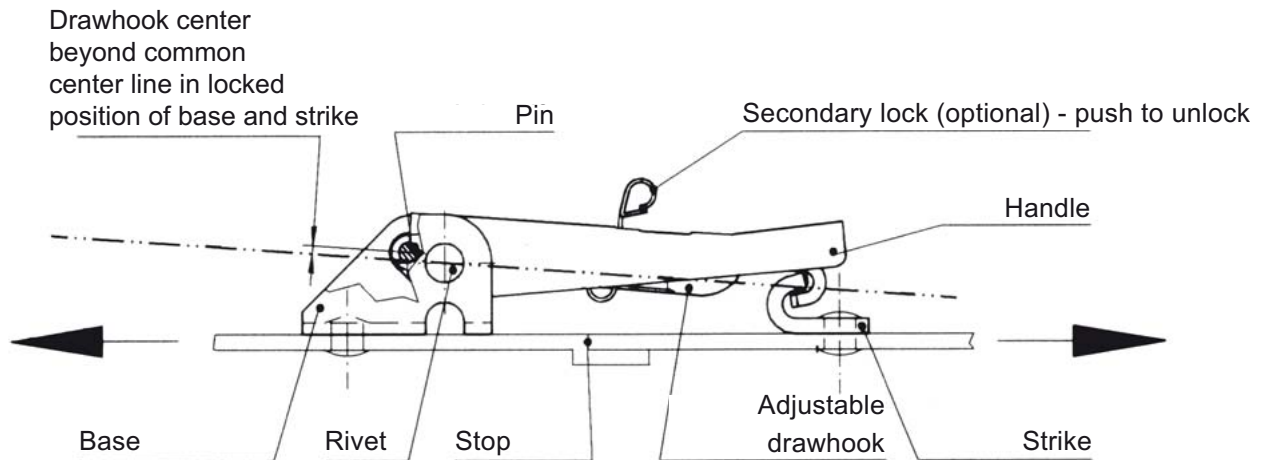
Please find additional information about our environmental program under: [www.alcoa.com](http://www.alcoa.com).

Your Alcoa Fastening Systems team

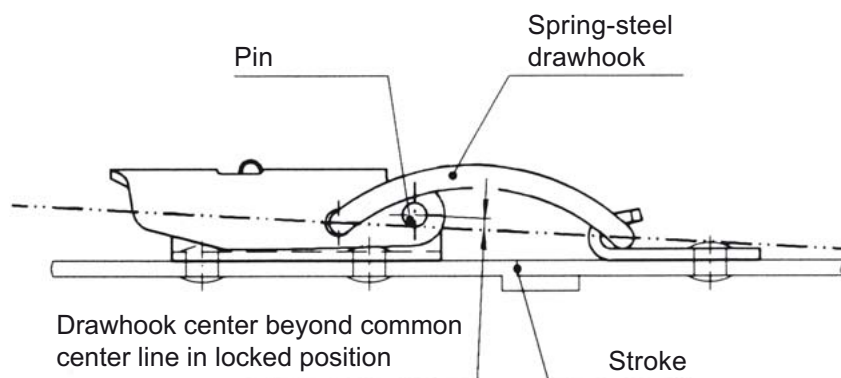
**Disclaimer:**

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.

## How It Operates



- Tension latches provide a quick release yet secure locking mechanism. They can take high tensile loads. Shear forces must be kept off the tension latch by the assembly design.
- Through lever action, the panels connected with the tension latch and the strike are pulled together. If necessary, a stop must be provided.
- Positive lock is achieved when drawhook center is beyond the common center line of the base and strike.



- For unlocking, the secondary lock, if fitted, is operated and the handle lifted. For locking, the secondary lock automatically engages.
- Most of the tension latches can be adjusted by a threaded drawhook. For non-threaded drawhook series the spring steel or wire drawhook gives tolerance compensation and joint tension.


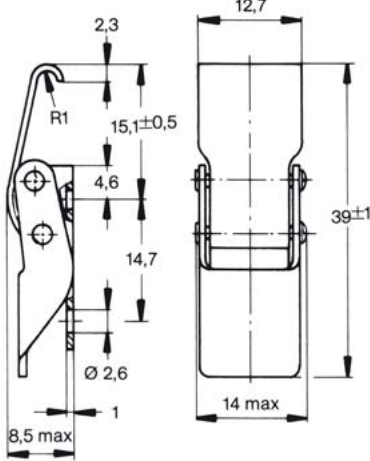

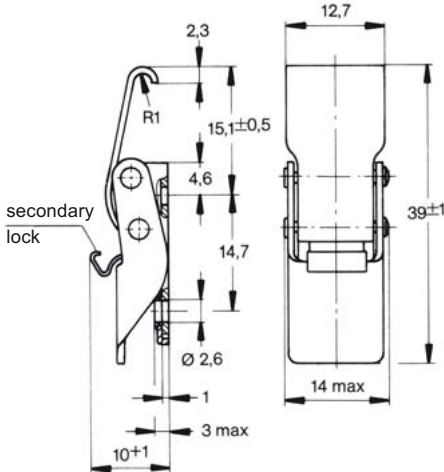
### Overview Latches

Series	Max. tensile strength	Working load	without secondary lock	with secondary lock	with hasp	to rivet on or to screw on	to weld on	adjustable drawhook	carbon steel with surface treatment	Stainless steel	Pages
V934L	550 N	310 N	X	X		X			X	X	B1-B2
95L	445 N	220 N	X			X			X	X	C1-C2
V96L	1.000 N	650 N	X			X			X		D1-D2
1429L	1.500 N	1.000 N	X	X		X			X	X	E1-E5
V951L	2.300 N	1.550 N	X	X	X	X	X	X	X	X	F1-F6
V917L	3.600 N	2.700 N	X	X	X	X	X	X	X	X	G1-G5
V18L	6.000 N	4.200 N	X	X	X	X	X	X	X	X	H1-H4
V46L	4.400 N	3.000 N	X			X	X	X	X		I1


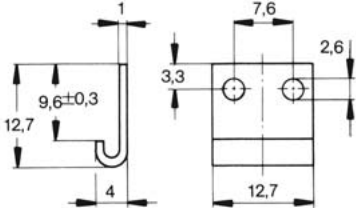
\* Limitations within series possible. Please see (foot) notes at catalogue pages.



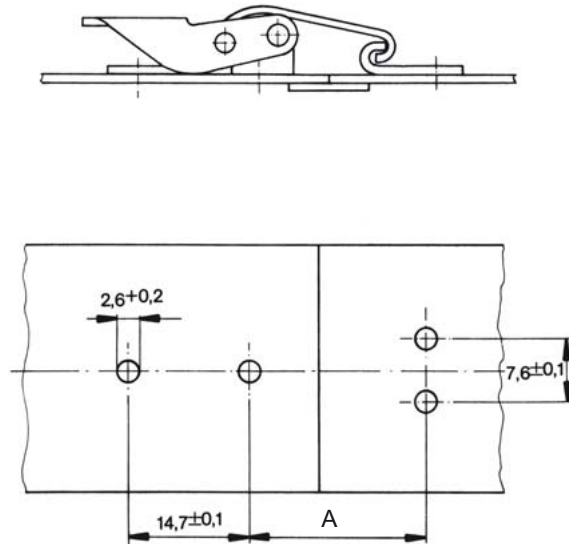
Max. tensile strength 550 N  
Working load 310 N

Style	Dimensions	Materials / Finish	Part No.
		Stainless steel  Steel / zinc-plated, CrVI-free, clear passivation	<b>V934L01-1-1BP</b>  <b>V934L01-1-1AGV</b>
<b>With secondary lock</b> 		Stainless steel  Steel / zinc-plated, CrVI-free, clear passivation	<b>V934L01-1X1BP</b>  <b>V934L01-1X1AGV</b>

## Strikes


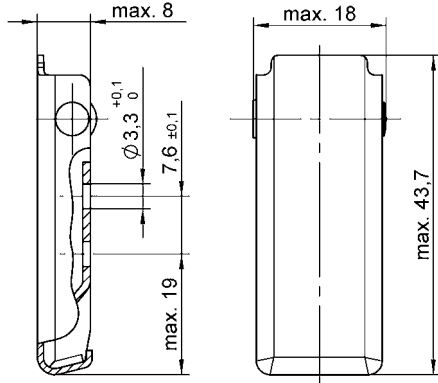

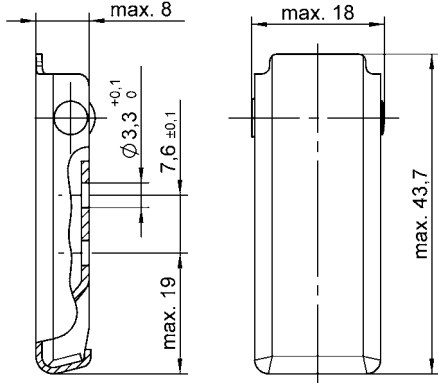
Style	Dimensions	Materials / Finish	D	Part No.
		Stainless steel <sup>1)</sup>  Steel / zinc-plated, CrVI-free, clear passivation	2,6	<b>V934L02-1BP</b>  <b>V934L02-1AGV</b>

## Dimensions


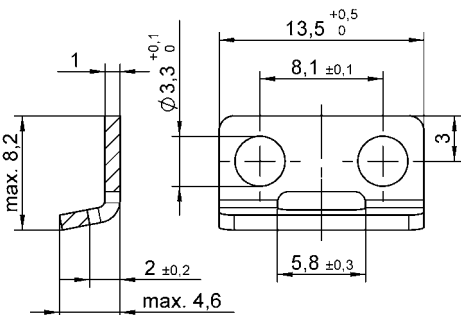


A = min. 23,7 mm, please take into account the application preload and tolerance requirements

Max. tensile strength 445 N, working load 220 N  
 Handle conceals all interior parts and strike  
 Self-compensating spring steel drawhook  
 Low profile

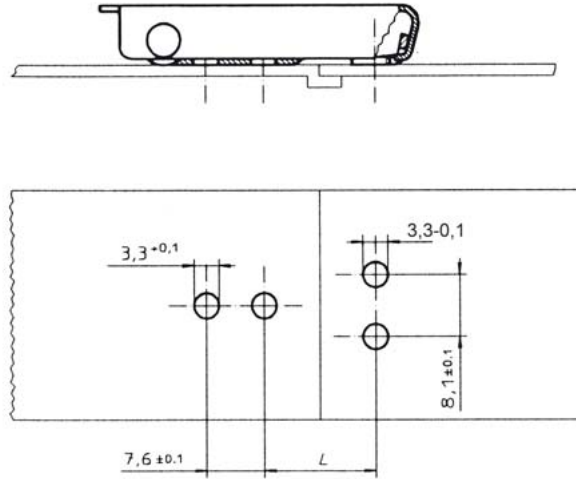
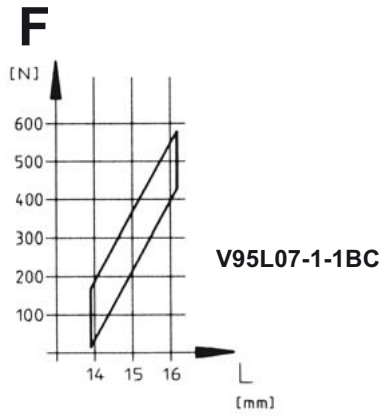
Style	Dimensions	Materials / Finish	Part No.
<b>Self-compensating spring steel drawhook</b> 		Stainless steel	<b>V95L07-1-1BC</b>
<b>Self-compensating spring steel drawhook</b> 		Steel / chrome-plated Interior parts: Steel / zinc-plated, CrVI-free, clear passivation	<b>V95L15-1BD</b>

## Strike


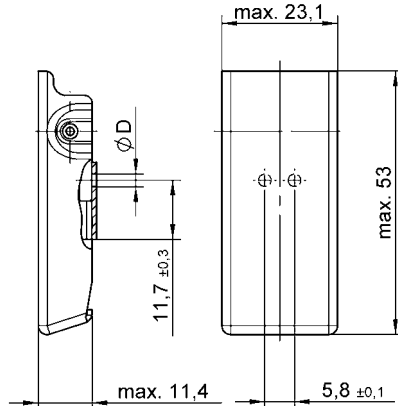
Style	Dimensions	Materials / Finish	Part No.
		Stainless steel	<b>V95H07-1-1BP</b>

Dimensions


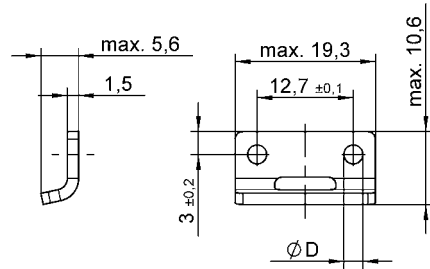
**Spring steel drawhook tension latch / strike**



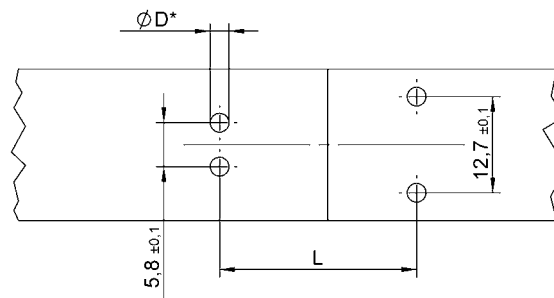
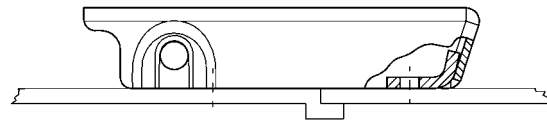
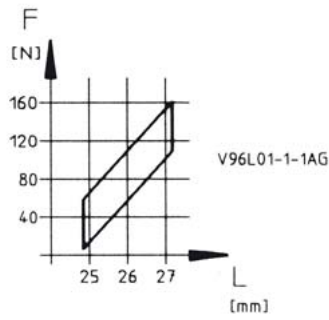
Max. tensile strength 1.000 N, working load 650 N.  
Handle conceals all interior parts and strike  
Self-compensating spring steel drawhook  
Low profile

Style	Dimensions	Materials / Finish	D	Part No.
<b>Self-compensating spring steel drawhook</b>  		Steel / zinc-plated, CrVI-free, clear passivation	2,5	<b>V96L01-1-1AO</b>
			3,2	<b>V96L01-1-2AO</b>
		Steel / chrome-plated Interior parts: Steel / zinc-plated, CrVI-free, clear passivation	2,5	<b>V96L01-1-1AG</b>
			3,2	<b>V96L01-1-2AG</b>

## Strike


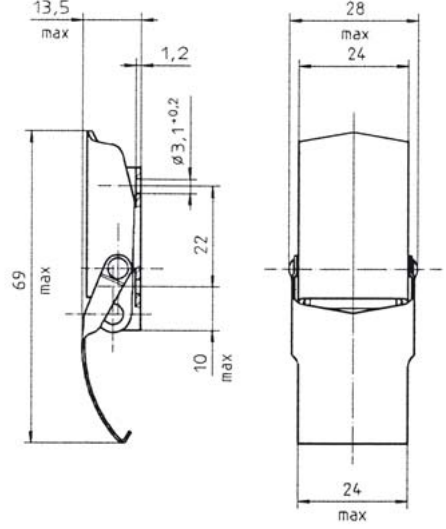

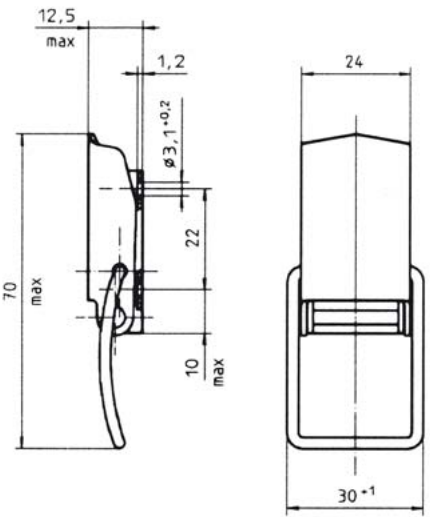
Style	Dimensions	Materials / Finish	D	Part No.
		Steel / zinc-plated, CrVI-free, clear passivation	2,5	<b>V96H01-1-1AO</b>
			3,2	<b>V96H01-1-2AO</b>

Dimensions



\* Ø D see selected version.


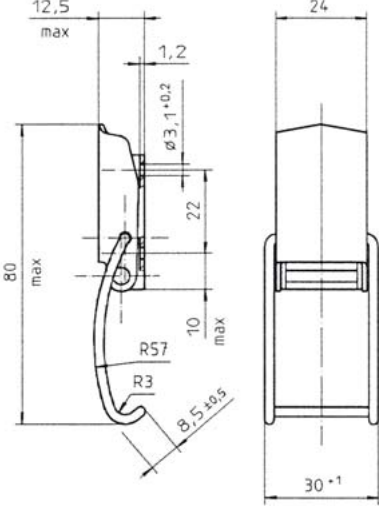

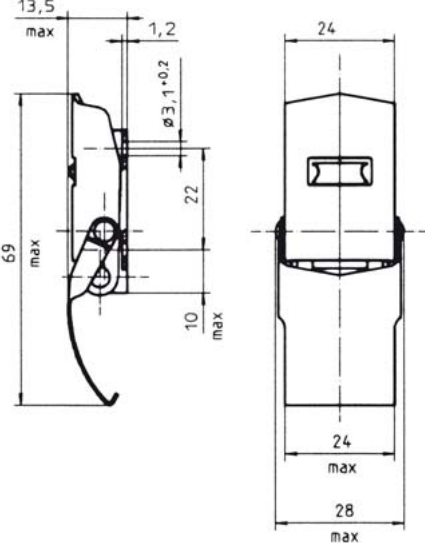
Max. tensile strength 1.500 N, working load up to 1.000 N, see footnotes.  
Available with secondary lock  
Three different drawhook types available

Style	Dimensions	Materials / Finish	D	Part No.
<b>Spring steel drawhook</b>  		Steel / zinc-plated, CrVI-free, clear passivation <sup>1)</sup>	3,1	<b>1429L02-1-1AG</b>
		Stainless steel <sup>2)</sup>	3,1	<b>1429L02-1-1BP</b>
<b>Wire drawhook</b>  		Steel / zinc-plated, CrVI-free, clear passivation <sup>1)</sup>	3,1	<b>1429L02-2-1AG</b>
		Stainless steel <sup>3)</sup>	3,1	<b>1429L02-2-1BP</b>

<sup>1)</sup> Max. tensile strength: 450 N with 1429L8-1AG strike, working load 330 N.

<sup>2)</sup> Max. tensile strength: 300 N with 1429L8-1BP strike, working load 210 N.

<sup>3)</sup> Max. tensile strength: 1.500 N with 1429L9-1AG / -1BP strike, working load 1.000 N.


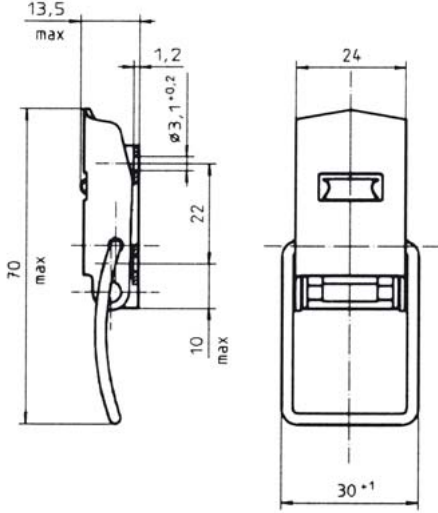

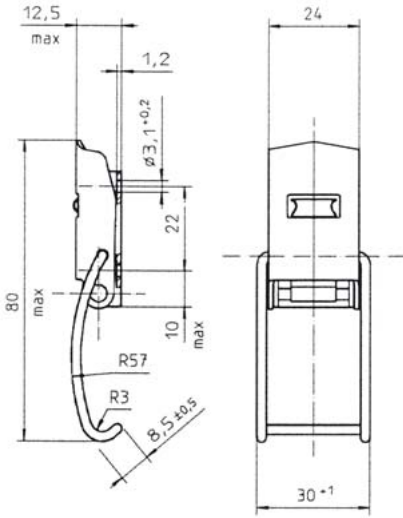
Style	Dimensions	Materials / Finish	D	Part No.
<p><b>Hooked wire drawhook</b></p> 		<p>Steel / zinc-plated, CrVI-free, clear passivation <sup>1)</sup></p> <p>Stainless steel <sup>1)</sup></p>	<p>3,1</p> <p>3,1</p>	<p><b>1429L02-3-1AG</b></p> <p><b>1429L02-3-1BP</b></p>
<p><b>Spring steel drawhook and secondary lock</b></p> 		<p>Steel / zinc-plated, CrVI-free, clear passivation <sup>2)</sup></p> <p>Stainless steel <sup>3)</sup></p>	<p>3,1</p> <p>3,1</p>	<p><b>1429L02-1X1AG</b></p> <p><b>1429L02-1X1BP</b></p>

<sup>1)</sup> Max. tensile strength: 1.100 N with 1429L9-1AG / -1BP strike, working load 800 N.  
or in conjunction with mating component profile.

<sup>2)</sup> Max. tensile strength: 450 N with 1429L8-1AG strike, working load 330 N.


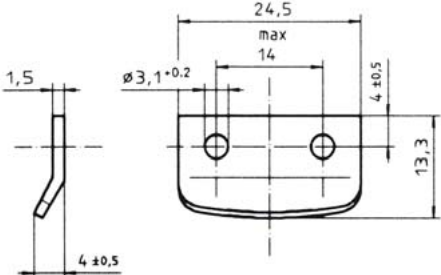

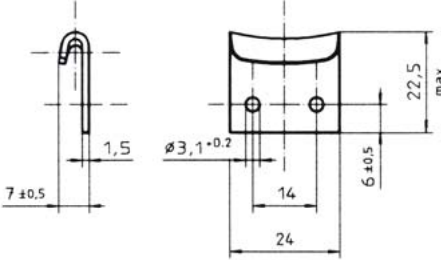
<sup>3)</sup> Max. tensile strength: 300 N with 1429L8-1BP strike, working load 210 N.



Style	Dimensions	Materials / Finish	D	Part No.
<b>Wire drawhook and secondary lock</b>  		Steel / zinc-plated, CrVI-free, clear passivation <sup>1)</sup>	3,1	<b>1429L02-2X1AG</b>
		Stainless steel <sup>1)</sup>	3,1	<b>1429L02-2X1BP</b>
<b>Hooked wire drawhook and secondary lock</b>  		Steel / zinc-plated, CrVI-free, clear passivation <sup>2)</sup>	3,1	<b>1429L02-3X1AG</b>
		Stainless steel <sup>2)</sup>	3,1	<b>1429L02-3X1BP</b>

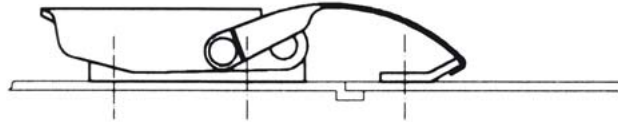
<sup>1)</sup> Max. tensile strength: max. 1.500 N with 1429L9-1AG / -1BP strike, working load 1.000 N.

<sup>2)</sup> Max. tensile strength: max. 1.100 N with 1429L9-1AG / -BP strike, working load 800 N.  
or in conjunction with mating component profile.

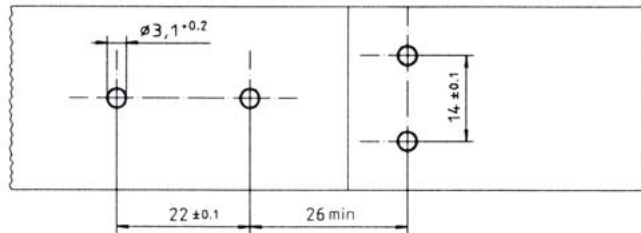
Style	Dimensions	Materials / Finish	D	Part No.
<p><b>For use with spring steel drawhook</b></p> 		<p>Steel / zinc-plated, CrVI-free, clear passivation</p> <p>Stainless steel</p>	<p>3,1</p> <p>3,1</p>	<p><b>1429L8-1AG</b></p> <p><b>1429L8-1BP</b></p>
<p><b>For use with wire drawhook</b></p> 		<p>Steel / zinc-plated, CrVI-free, clear passivation</p> <p>Stainless steel</p>	<p>3,1</p> <p>3,1</p>	<p><b>1429L9-1AG</b></p> <p><b>1429L9-1BP</b></p>

Dimensions

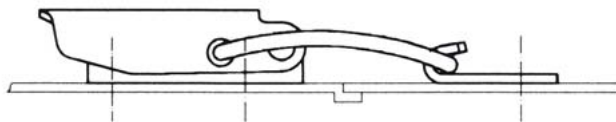
**Spring steel drawhook tension latch / strike**



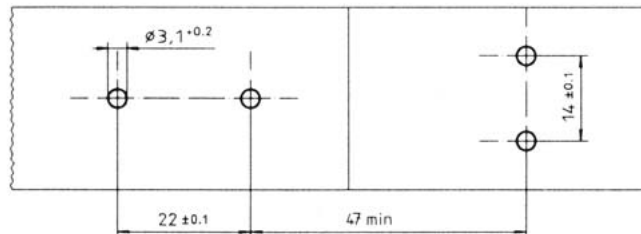
1429L02-1-<sup>\*</sup>  
1429L8-<sup>\*</sup>



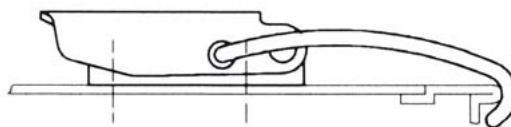
**Wire drawhook tension latch / strike**



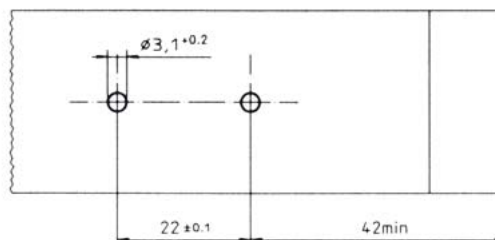
1429L02-2-<sup>\*</sup>  
1429L9-<sup>\*</sup>



**Hokked wire drawhook tension latch / mating component profile**




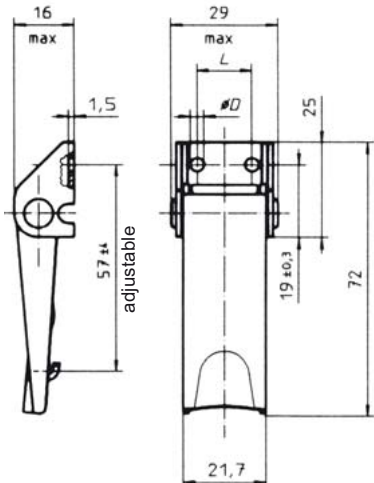

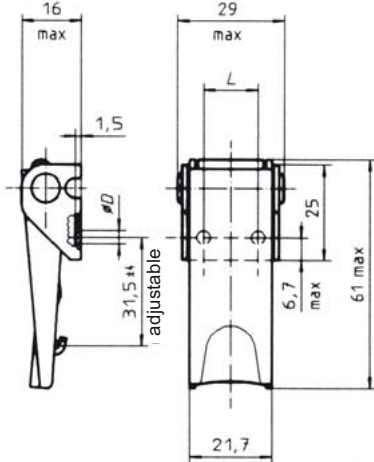
1429L02-3-<sup>\*</sup>  
(1429L9-<sup>\*</sup>)



Max. tensile strength 2.300 N, working load max 1.550 N, see footnotes.

Adjustable drawhook

Available with secondary lock and hasp

Style	Dimensions	Materials / Finish	Mounting Type <sup>1)</sup>	D	L	Part No.
<b>Open base</b>  		Steel / zinc-plated, CrVI-free, clear passivation <sup>2)</sup>	N	3,6	14,3	<b>V951L02-1-1AGV</b>
		Steel / zinc-plated, CrVI-free, clear passivation <sup>2)</sup>	N	4,2	12,7	<b>V951L02-1-5AGV</b>
		Steel / zinc-plated, CrVI-free, clear passivation Base: Steel / zinc-plated <sup>2)</sup>	S	-	-	<b>V951L02-1-2AGV</b>
		Steel / chrome-plated Interior parts: Steel / zinc-plated, CrVI-free, clear passivation <sup>2)</sup>	N	3,6	14,3	<b>V951L02-1-1AD</b>
		Stainless steel <sup>3)</sup>	N	3,6	14,3	<b>V951L02-1-1BP</b>
		Stainless steel <sup>3)</sup>	N	4,2	12,7	<b>V951L02-1-5BP</b>
		Stainless steel <sup>3)</sup>	S	-	-	<b>V951L02-1-2BP</b>
<b>Concealed base <sup>4)</sup></b>  		Steel / zinc-plated, CrVI-free, clear passivation	N	3,6	14,3	<b>V951L03-1-1AGV</b>
		Steel / zinc-plated, CrVI-free, clear passivation	N	4,2	12,7	<b>V951L03-1-5AGV</b>
		Steel / chrome-plated Interior parts: Steel / zinc-plated, CrVI-free, clear passivation	N	3,6	14,3	<b>V951L03-1-1AD</b>
		Stainless steel	N	3,6	14,3	<b>V951L03-1-1BP</b>
		Stainless steel	N	4,2	12,7	<b>V951L03-1-5BP</b>

<sup>1)</sup> Mounting type: N = With holes for riveting or screw fixing


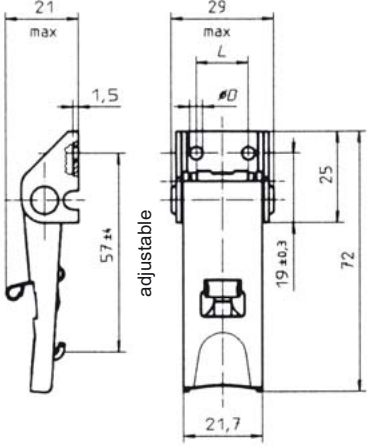

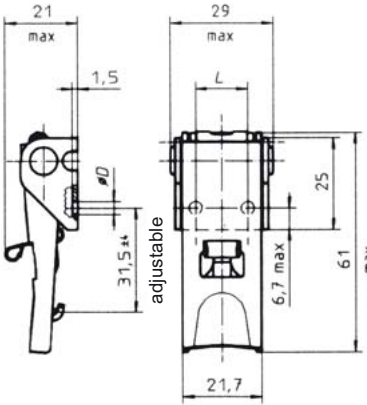
S = Without holes, for welding

<sup>2)</sup> Max. tensile strength: 2.300 N with V951L07-\*A\* and V951L52-1A\* strike, working load 1.550 N.


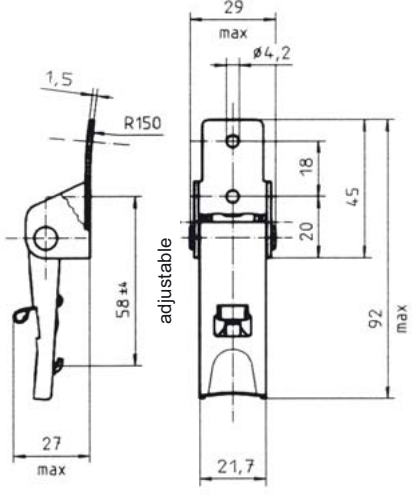

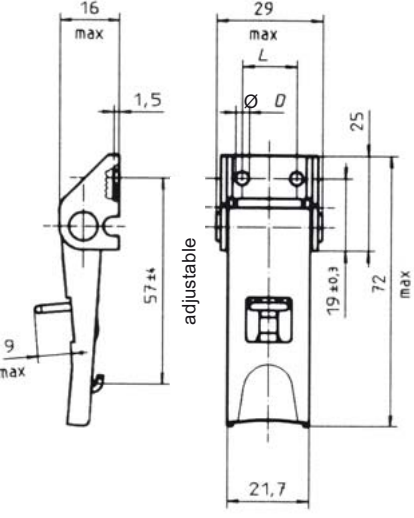
2.000 N with V951L50-1A\* strike, working load 1.300 N.

<sup>3)</sup> Max. tensile strength: 1.500 N with V951L07-\*BP\* and V951L52-1BP strike, working load 1.000 N.


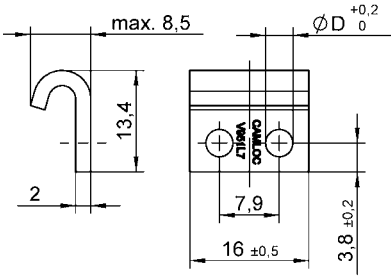

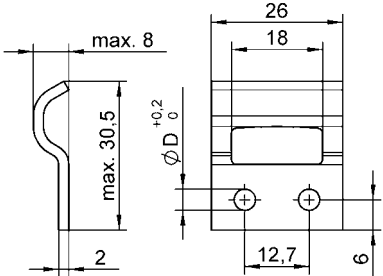

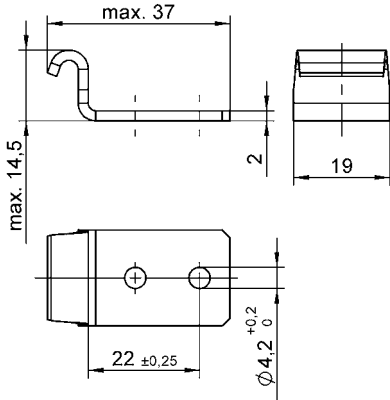
<sup>4)</sup> Due to the mounting geometry, tensile strength reduced to approx. 1200 N, working load 800 N.

Style	Dimensions	Materials / Finish	Mounting Type <sup>1)</sup>	D	L	Part No.
<b>Secondary lock, open base</b>  		Steel / zinc-plated, CrVI-free, clear passivation <sup>2)</sup>	N	3,6	14,3	<b>V951L04-1X1AGV</b>
		Steel / zinc-plated, CrVI-free, clear passivation <sup>2)</sup>	N	4,2	12,7	<b>V951L04-1X5AGV</b>
		Steel / chrome-plated Interior parts: Steel / zinc-plated, CrVI-free, clear passivation Secondary lock: Stainless steel	N	3,6	14,3	<b>V951L04-1X1AD</b>
		Stainless steel <sup>3)</sup>	N	3,6	14,3	<b>V951L04-1X1BP</b>
		Stainless steel <sup>3)</sup>	N	4,2	12,7	<b>V951L04-1X5BP</b>
		Stainless steel <sup>3)</sup>	S	-	-	<b>V951L04-1X2BP</b>
<b>Secondary lock, concealed base <sup>4)</sup></b>  		Steel / zinc-plated, CrVI-free, clear passivation	N	4,2	12,7	<b>V951L03-1X5AGV</b>
		Steel / chrome-plated Interior parts: Steel / zinc-plated, CrVI-free, clear passivation Secondary lock: Stainless steel	N	3,6	14,3	<b>V951L03-1X1AD</b>
		Stainless steel	N	3,6	14,3	<b>V951L03-1X1BP</b>
		Stainless steel	N	4,2	12,7	<b>V951L03-1X5BP</b>

For footnotes refer to page F-1.

Style	Dimensions	Materials / Finish	Mounting Type <sup>1)</sup>	D	Part No.
<b>Secondary lock, high base</b>  		Steel / zinc-plated, CrVI-free, clear passivation Secondary lock: Stainless steel <sup>2)</sup>	N	4,2	<b>V951L05-1X1AGV</b>
		Stainless steel <sup>3)</sup>	N	4,2	<b>V951L05-1X1BP</b>
<b>Hasp</b>  	 <p>Hasp for Padlock Ø 6 max.</p>	Steel / zinc-plated, CrVI-free, clear passivation <sup>2)</sup> Base: Steel / zinc-plated	S	-	<b>V951L01-1Y2AGV</b>
		Steel / zinc-plated, CrVI-free, clear passivation <sup>2)</sup>	N	4,2	<b>V951L01-1Y5AGV</b>

For footnotes refer to page F-1.

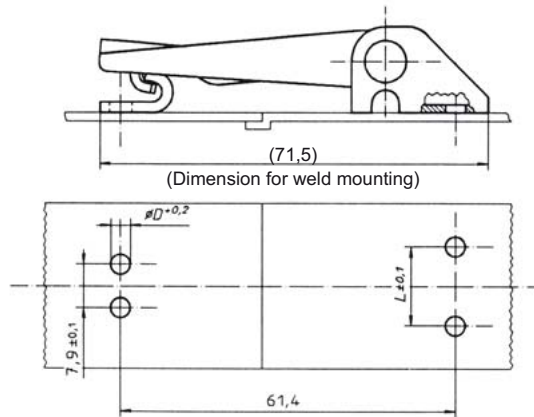
Style	Dimensions	Materials / Finish	Mounting Type <sup>1)</sup>	D	Part No.
<b>Open</b>  		Steel / zinc-plated, CrVI-free, clear passivation	N	3,6	<b>V951L7-1AGV</b>
		Steel / zinc-plated, CrVI-free, clear passivation	N	4,2	<b>V951L7-5AGV</b>
		Steel / zinc-plated	S <sup>2)</sup>	-	<b>V951L7-2AZ</b>
		Steel / chrome-plated	N	3,6	<b>V951L7-1AD</b>
		Stainless steel	N	3,6	<b>V951L7-1BP</b>
		Stainless steel	N	4,2	<b>V951L7-5BP</b>
		Stainless steel	S	-	<b>V951L7-2BP</b>
<b>Closed</b>  		Steel / zinc-plated, CrVI-free, clear passivation	N	4,2	<b>V951L50-1AGV</b>
		Stainless steel	N	4,2	<b>V951L50-1BP</b>
		Stainless steel	N	3,6	<b>V951L50-2BP</b>
		Stainless steel	S	-	<b>V951L50-3BP</b>
<b>Corner mounting</b>  		Steel / zinc-plated, CrVI-free, clear passivation	N	4,2	<b>V951L52-1AGV</b>
		Stainless steel	N	4,2	<b>V951L52-1BP</b>

<sup>1)</sup> Mounting type: N = With holes for riveting or screw fixing  
S = Without holes, for welding

<sup>2)</sup> Material C45, HRC 36-39 steel, please use high-alloy filler welding rods

Dimensions

**Open-base tension latch / open strike**

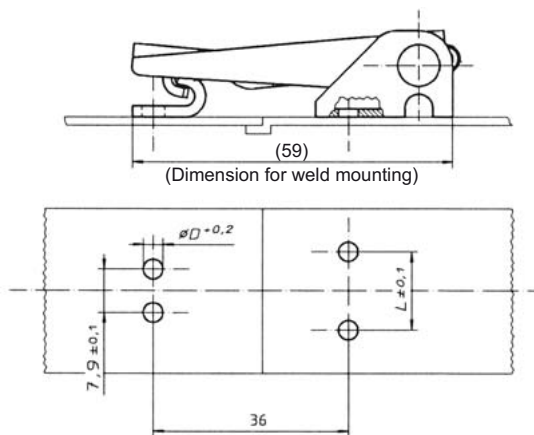


V951L02-  
V951L04-  
V951L01-

V951L7-

Select diameter D and distance L in accordance with the strike and tension latch style.

**Concealed-base tension latch / open strike**

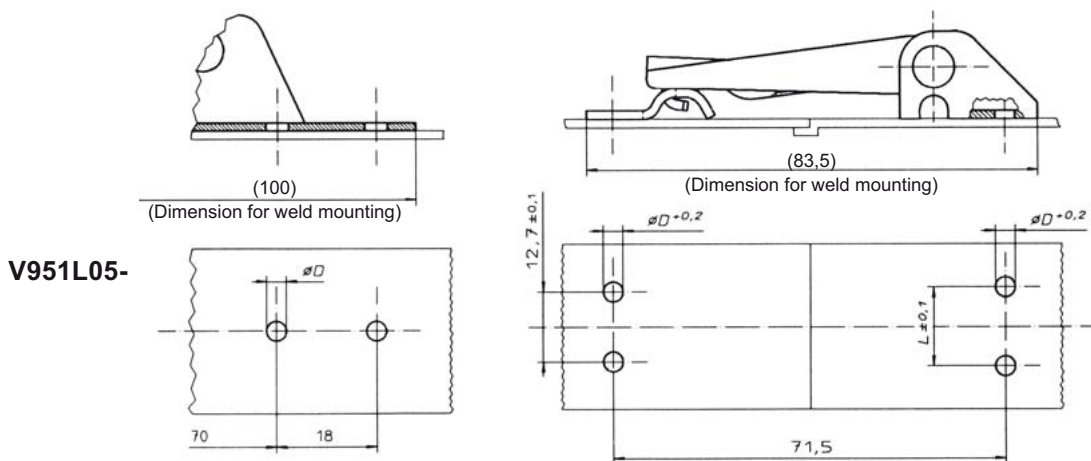


V951L03-

V951L7-

Select diameter D and distance L in accordance with the strike and tension latch style.

**Open-base tension latch / closed strike**



V951L02-  
V951L04-  
V951L01-

V951L50-

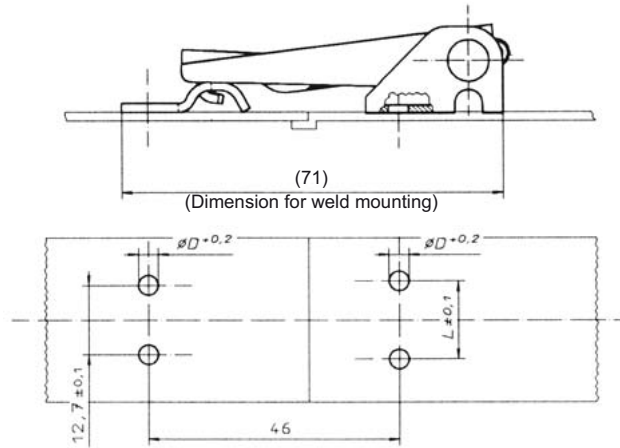
V951L05-

Select diameter D and distance L in accordance with the strike and tension latch style.



Dimensions

**Concealed-base tension latch / closed strike**

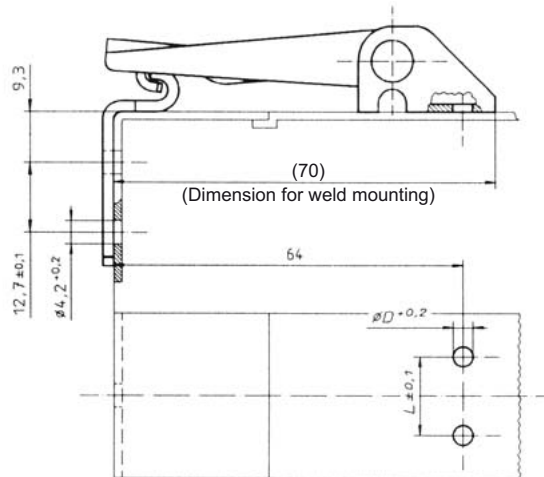


**V951L03-**

**V951L50-**

Select diameter D and distance L in accordance with the strike and tension latch style.

**Open-base tension latch / corner-mounting strike**



**V951L02-**

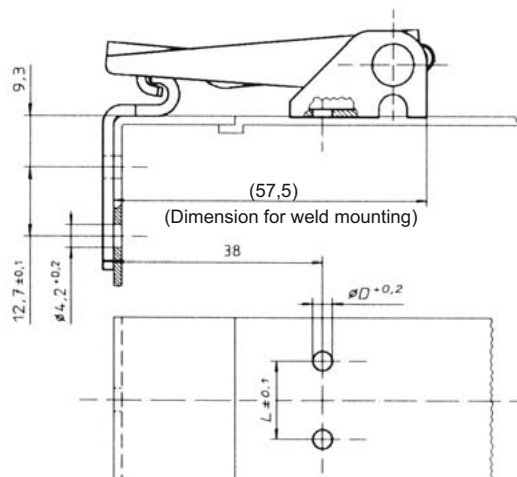
**V951L04-**

**V951L01-**

**V951L52-**

Select diameter D and distance L in accordance with the strike and tension latch style.

**Concealed-base tension latch / corner-mounting strike**


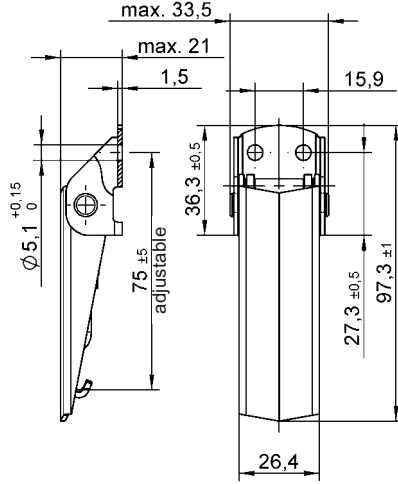

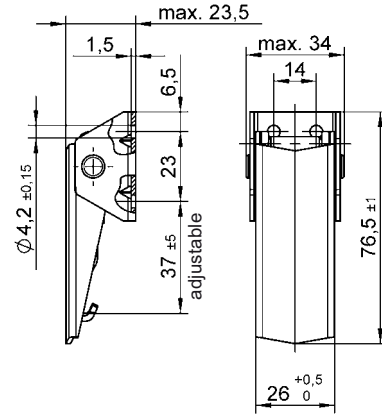


**V951L03-**


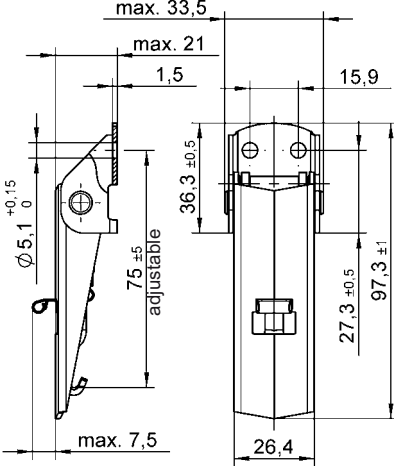

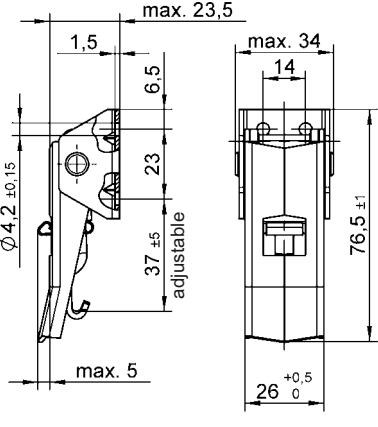

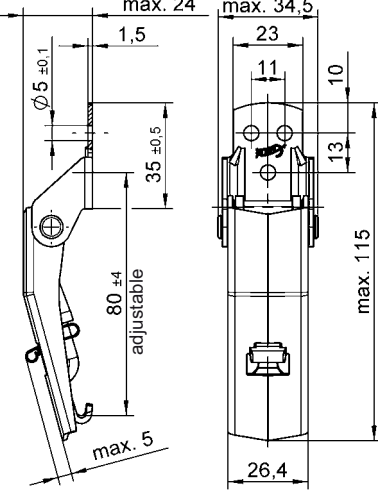
**V951L52-**

Select diameter D and distance L in accordance with the strike and tension latch style.


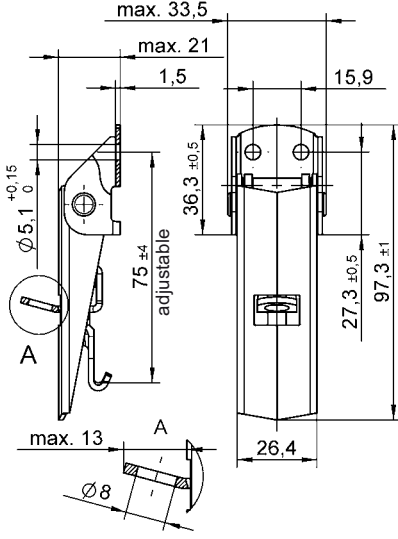
Max. tensile strength 3.600 N, working load max. 2.700 N, see footnotes.  
Adjustable drawhook  
Available with secondary lock and hasp

Style	Dimensions	Materials / Finish	Mounting Type <sup>1)</sup>	D	Part No.
<b>Open base</b>  		Steel / zinc-plated, CrVI-free, clear passivation <sup>2)</sup>	N	5,1	<b>V917L01-1-1AG</b>
		Stainless steel <sup>3)</sup>	N	5,1	<b>V917L01-1-1BP</b>
<b>High base</b>  		Steel / zinc-plated, CrVI-free, clear passivation <sup>2)</sup>	N	4,2	<b>V17L12-1-1AA</b>


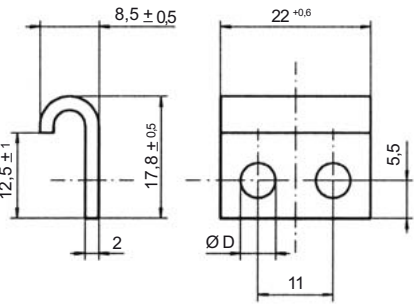

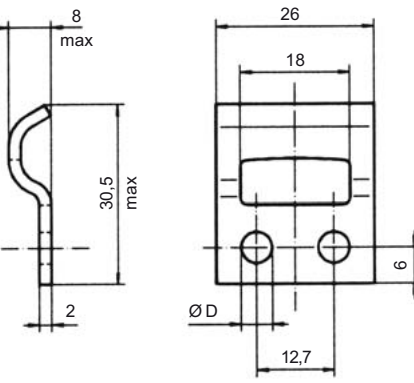
- <sup>1)</sup> Mounting type: N = With hole for riveting or screw fixing  
S = Without holes, for welding
- <sup>2)</sup> Max. tensile strength: 3.200 N with V917L11-1- \*AG strike, working load 2.200 N.  
2.200 N with V951L50-1- \*AGV strike, working load 1.500 N.
- <sup>3)</sup> Max. tensile strength: 3.600 N with V951L50-1- \*BP strike, working load 2.700 N.  
max. 2.300 N with V917L11-1-1BP strike, working load 1.550 N.

Style	Dimensions	Materials / Finish	Mounting Type <sup>1)</sup>	D	Part No.
<b>Secondary lock, open base</b> 		Steel / zinc-plated, CrVI-free, clear passivation <sup>2)</sup>	N	5,1	<b>V917L01-1X1AG</b>
		Stainless steel <sup>3)</sup>	N	5,1	<b>V917L01-1X1BP</b>
		Stainless steel <sup>3)</sup>	S	-	<b>V917L01-1X2BP</b>
		Stainless steel V4A <sup>3)</sup>	N	5,1	<b>V917L01-1X1CP</b>
		Stainless steel V4A <sup>3)</sup>	S	-	<b>V917L01-1X2CP</b>
<b>Secondary lock, high base</b> 		Steel / zinc-plated, CrVI-free, clear passivation <sup>2)</sup>	N	4,2	<b>V17L12-2X1AA</b>
<b>Secondary lock, for curved surfaces (R min = 125 mm)</b> 		Steel / zinc-plated, CrVI-free, clear passivation <sup>2)</sup>	N	5,0	<b>1449L02-1X1AG</b>
		Stainless steel <sup>3)</sup>	N	5,0	<b>1449L02-1X1BP</b>

For footnotes refer to page G-1.

Style	Dimensions	Materials / Finish	Mounting Type <sup>1)</sup>	D	Part No.
<p><b>Open base, with hasp</b></p> 		Steel / zinc-plated, CrVI-free, clear passivation <sup>2</sup>	N	5,1	<b>V917L01-1Y1AG</b>

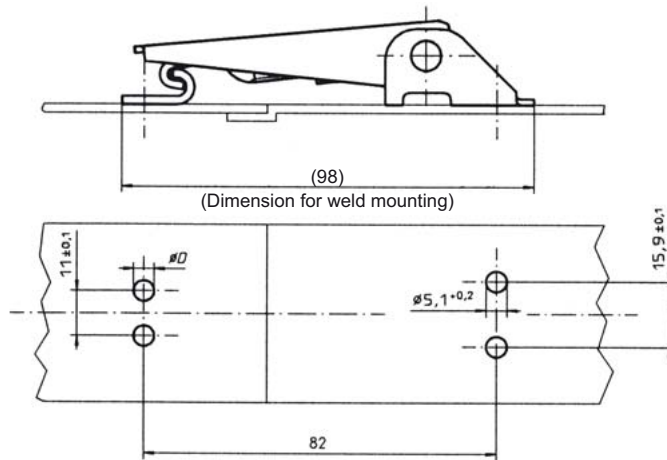
**Strikes**

Style	Dimensions	Materials / Finish	Mounting Type <sup>1)</sup>	D	Part No.
<p><b>Open</b></p> 		Steel / zinc-plated, CrVI-free, clear passivation	N	5,1	<b>V917L11-1-1AG</b>
		Steel / zinc-plated, CrVI-free, clear passivation	N	4,2	<b>V917L11-1-3AG</b>
		Stainless steel	N	5,1	<b>V917L11-1-1BP</b>
<p><b>Closed</b></p> 		Steel / zinc-plated, CrVI-free, clear passivation	N	4,2	<b>V951L50-1AGV</b>
		Steel / zinc-plated, CrVI-free, clear passivation	N	5,1	<b>V951L50-5AGV</b>
		Stainless steel	N	4,2	<b>V951L50-1BP</b>
		Stainless steel	S	-	<b>V951L50-3BP</b>

For footnotes refer to page G-1.

Dimensions

**Open-base tension latch / open strike**

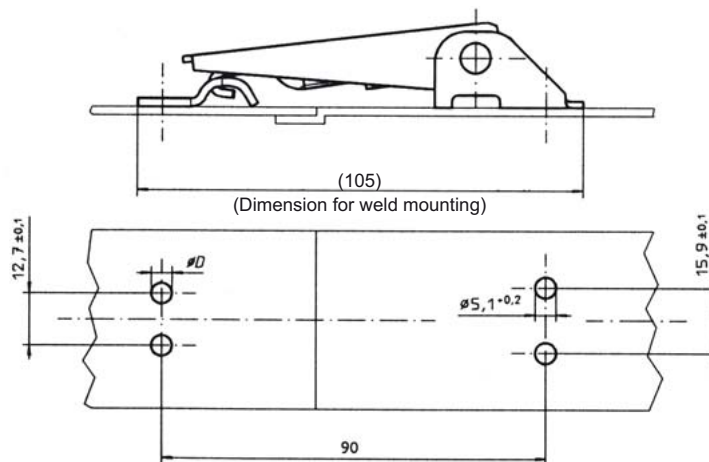


V917L01-

V917L11-

Select diameter D in accordance with the strike style.

**Open-base tension latch / closed strike**

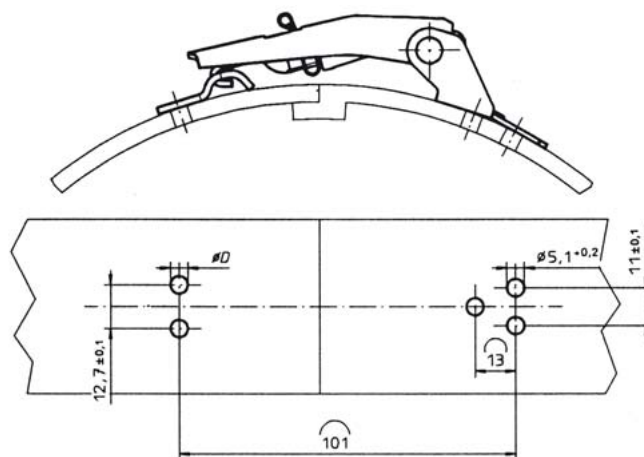


V917L01-

V951L50-

Select diameter D in accordance with the strike style.

**Tension latch for curved surfaces**



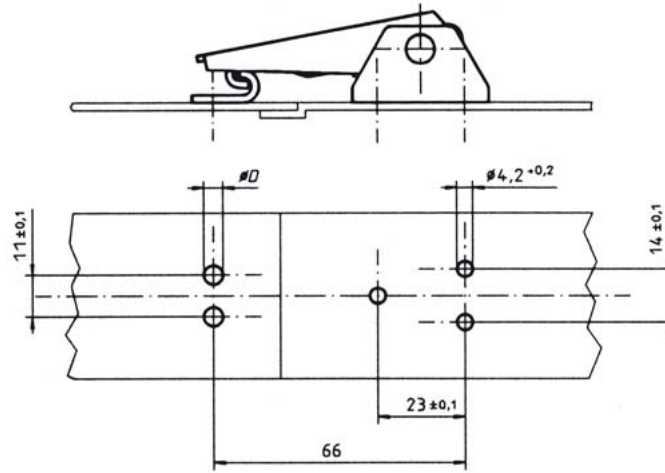
1449L02-

V951L50-

Select diameter D in accordance with the strike style.

Dimensions

**High-base tension latch / open strike**


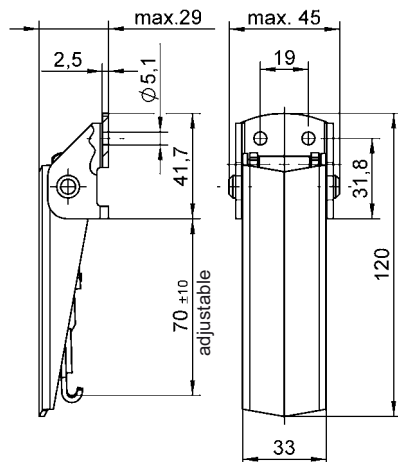

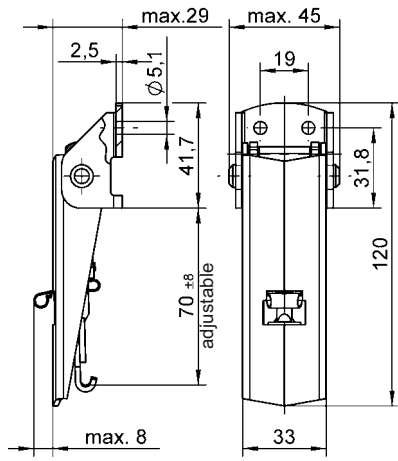


V17L12-

V917L11-

Select diameter D in accordance with the strike style.


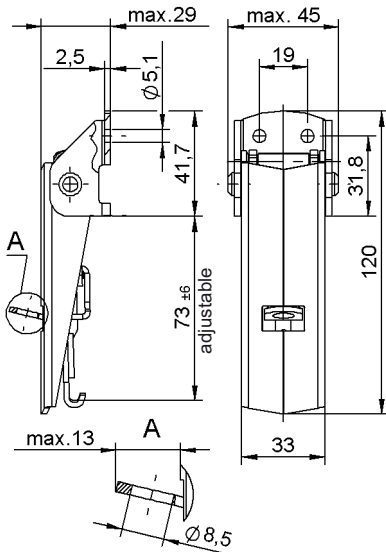
Max. tensile strength 6.000 N, working load max. 4.200 N, see footnotes.  
Adjustable drawhook  
Available with secondary lock, hasp and lift spring

Style	Dimensions	Materials / Finish	Mounting Type <sup>1)</sup>	D	Part No.
		Steel / zinc-plated, CrVI-free, clear passivation <sup>2)</sup>	N	5,1	<b>V18L01-1-1AA</b>
		Stainless steel <sup>3)</sup>	N	5,1	<b>V18L01-1-1BF</b>
		Stainless steel <sup>3)</sup>	S	-	<b>V18L01-1-2BF</b>
<b>With secondary lock</b> 		Steel / zinc-plated, CrVI-free, clear passivation <sup>2)</sup>	N	5,1	<b>V18L01-1X1AA</b>
		Stainless steel <sup>3)</sup>	N	5,1	<b>V18L01-1X1BF</b>
		Stainless steel <sup>3)</sup>	S	-	<b>V18L01-1X2BF</b>

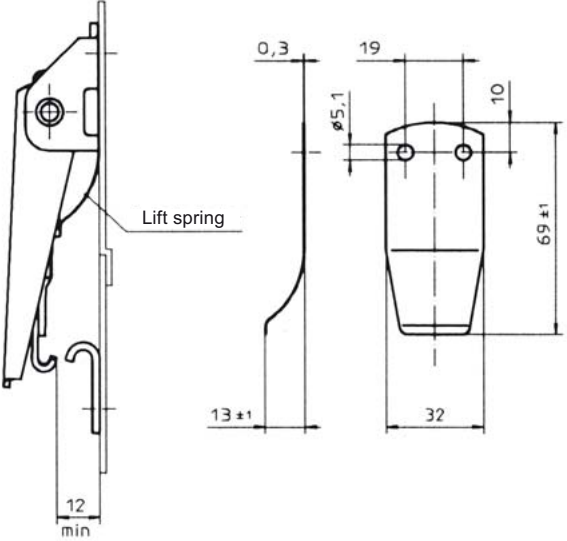
<sup>1)</sup> Mounting type: N = With hole for riveting or screw fixing  
S = Without holes, for welding

<sup>2)</sup> Max. tensile strength: 6.000 N with V18L13-1-1AA strike, working load 4.200 N.

<sup>3)</sup> Max. tensile strength: 4.600 N with V18L13-1-\*BF or 1449L07-1BP strike, working load 3.100 N.


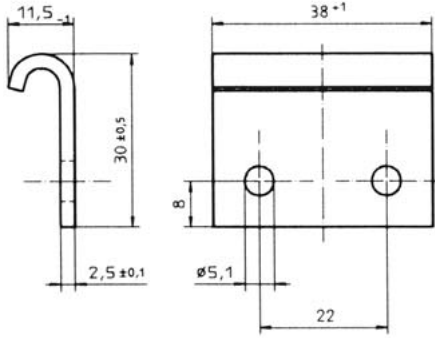

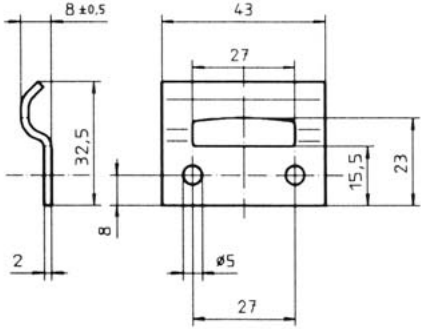
Style	Dimensions	Materials / Finish	Mounting Type <sup>1)</sup>	D	Part No.
<p><b>Hasp</b></p> 		Steel / zinc-plated, CrVI-free, clear passivation <sup>2)</sup>	N	5,1	<b>V18L01-1Y1AA</b>

**Accessories**

Dimensions	Materials / Finish	Mounting Type <sup>1)</sup>	D	Part No.
<p><b>Lift spring</b></p> 	Stainless steel	N	5,1	<b>V18L45-1BP</b>

For footnotes refer to page H-1.

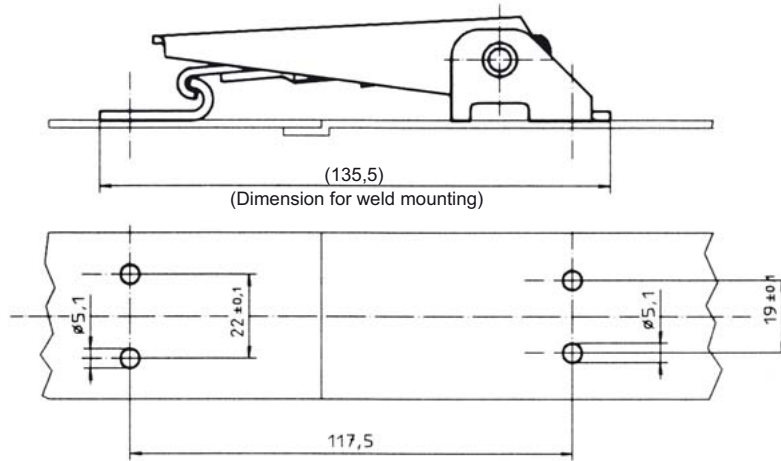


Style	Dimensions	Materials / Finish	Mounting Type <sup>1)</sup>	D	Part No.
<b>Open</b>  		Steel / zinc-plated, CrVI-free, clear passivation <sup>2)</sup>	N	5,1	<b>V18L13-1-1AA</b>
		Stainless steel	N	5,1	<b>V18L13-1-1BF</b>
		Stainless steel	S	-	<b>V18L13-1-2BF</b>
<b>Closed</b>  		Stainless steel	N	5,0	<b>1449L07-1BP</b>

For footnotes refer to page H-1.

Dimensions

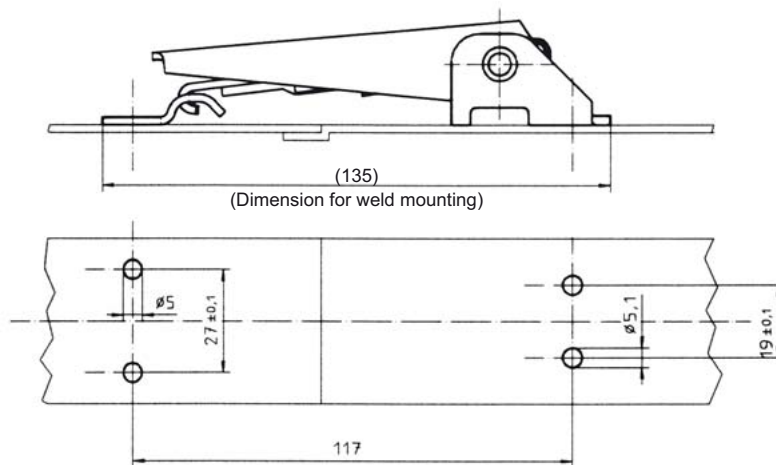
**Tension latch / open strike**



V18L01-

V18L13-


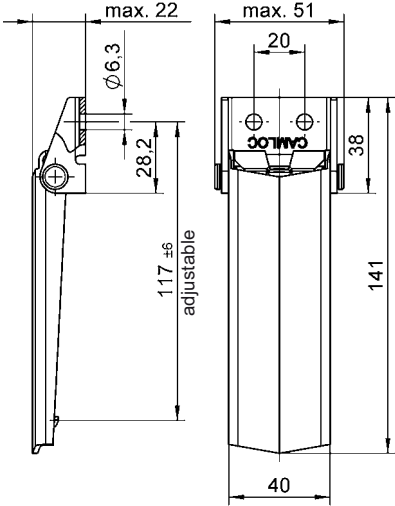
**Tension latch / closed strike**




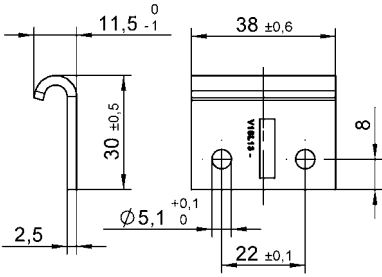
V18L01-

1449L07-

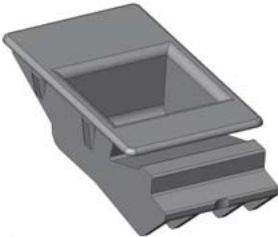
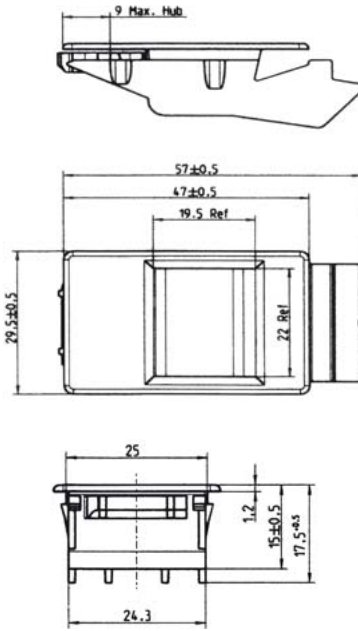
Max. tensile strength 4.500 N, working load 3.000 N.  
Adjustable drawhook

Style	Dimensions	Materials / Finish	Mounting Type <sup>1)</sup>	D	Part No.
		Steel / zinc-plated and yellow chromate	N	6,3	<b>V46L38-1-6AA</b>
		Steel / zinc-plated and yellow chromate	S	-	<b>V46L38-1-1AA</b>

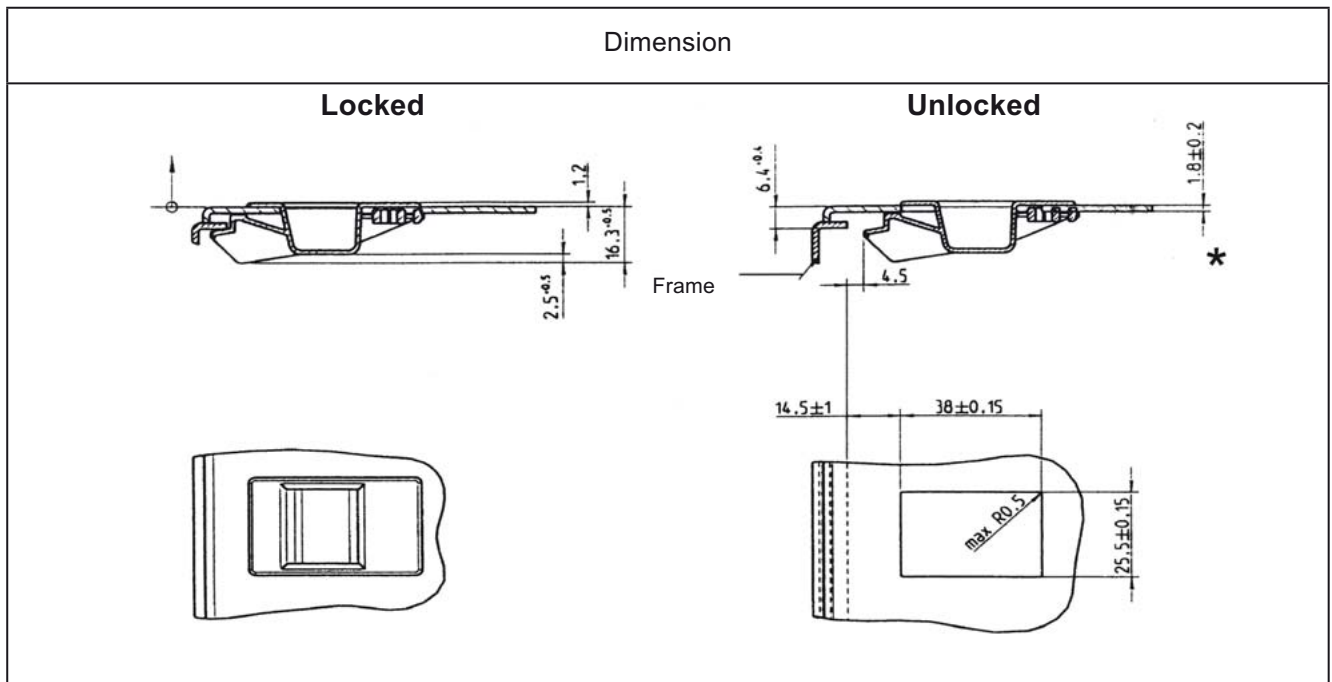
## Strike

Style	Dimensions	Materials / Finish	Mounting Type <sup>1)</sup>	D	Part No.
		Steel / zinc-plated and yellow chromate	N	5,1	<b>V18L13-1-1AC</b>

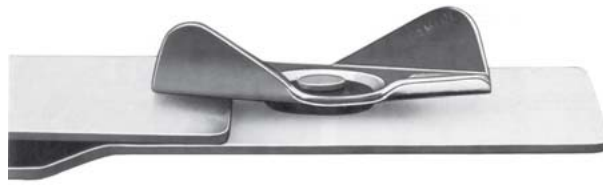
<sup>1)</sup> Mounting type: N = With hole for riveting or screw fixing  
S = Without holes, for welding

Style	Dimensions	Materials / Finish	°C	Part No.
<p><b>Slam latch</b></p> 	 <p>9 Max. Hub</p> <p>57±0.5</p> <p>47±0.5</p> <p>19.5 Ref</p> <p>29.5±0.5</p> <p>22 Ref</p> <p>25</p> <p>1.2</p> <p>15±0.5</p> <p>17.5±0.5</p> <p>24.3</p>	Plastic (POM) black	-10 up to +60	<b>2939L01-01-1K</b>

## Installation Instructions



\* Other panel thicknesses upon request.



**Particular Features**

Simple and economic fastener for lids, etc.

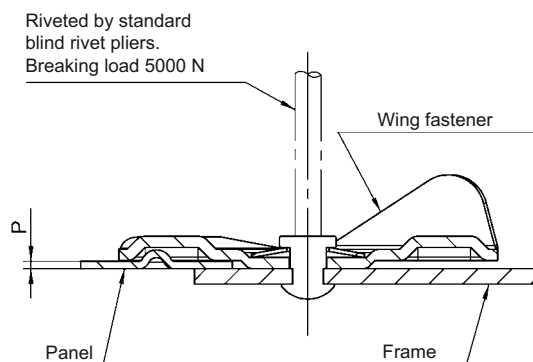
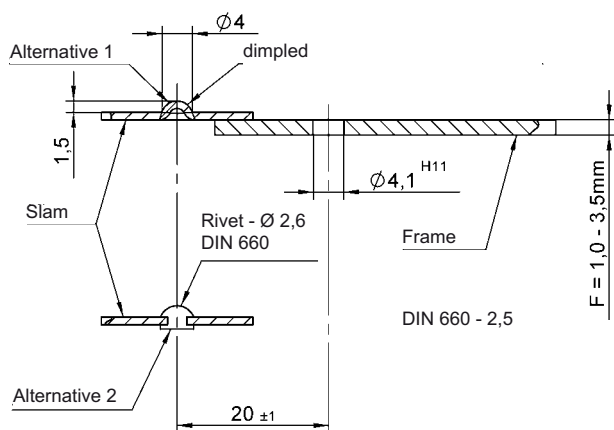
Easy installation by blind riveting.

¼ Turn to lock

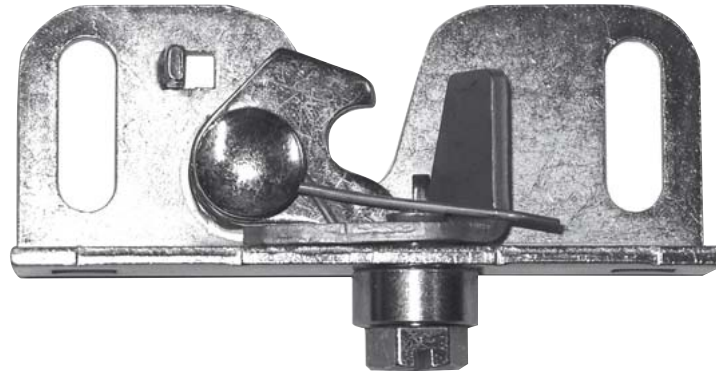
Secure locking on detent.

Dimensions	Materials / Finish	°C	Part No.
	<p>Steel / zinc-plated, CrVI-free, clear passivation</p>	<p>100</p>	<p><b>52E02-*-1AG</b></p>

**Selection and Installation Instructions**

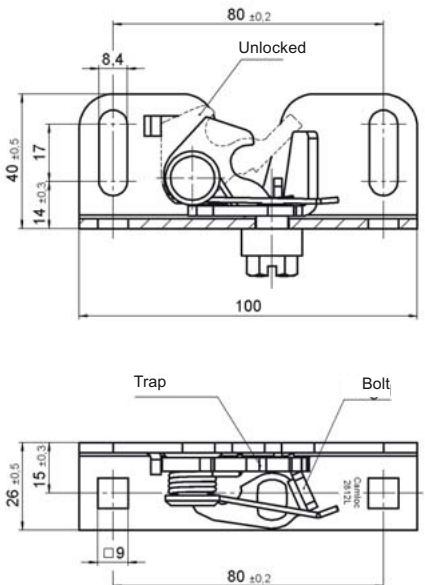


Part No.	Panel Thickness P	Height H
52E02-01-1AG	0 (flush)	0,7
52E02-02-1AG	1	1,1
52E02-03-1AG	2	1,7

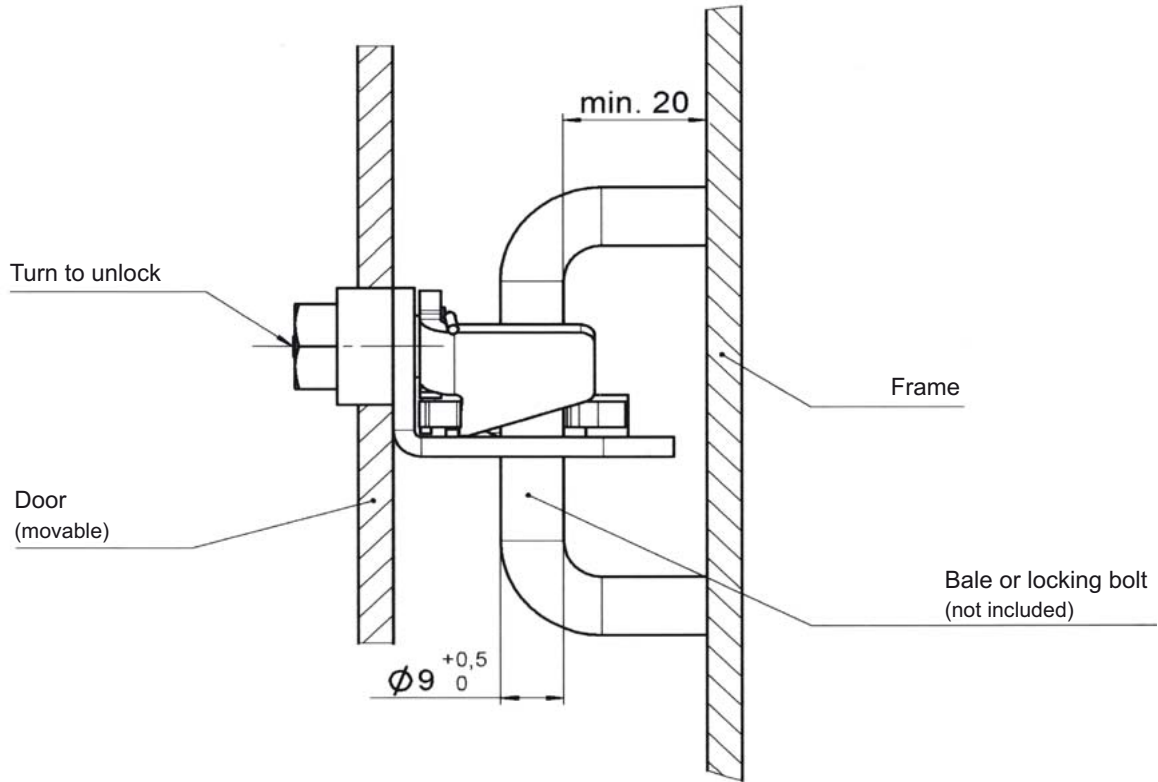


**Particular Features**

- Robust slam latch, self locking
- Max. locking force: 230 N
- Max. tension strength: 2.400 N
- Max. torque: 40 Nm

Dimensions	Materials / Finish	°C	Part No.
	<p>Steel / zinc-plated and yellow chromated Bolt: zinc flake coated</p>	<p>100</p>	<p><b>2812L03-1AF</b></p>

Dimension



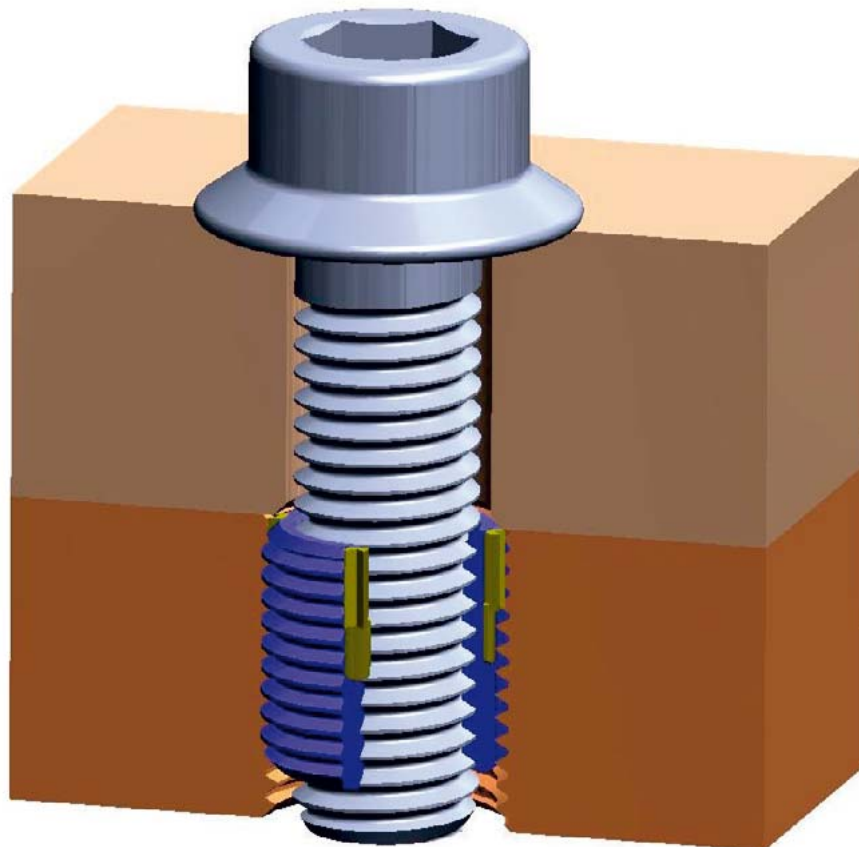
Part No.	Page	Part No.	Page	Part No.	Page
1429L02-1-1AG	E1	V917L01-1X2BP	G2	V951L50-1AGV	F4,G3
1429L02-1-1BP	E1	V917L01-1X1CP	G2	V951L50-1BP	F4,G3
1429L02-1X1AG	E2	V917L01-1X2CP	G2	V951L50-2BP	F4
1429L02-1X1BP	E2	V917L01-1Y1AG	G3	V951L50-3BP	F4,G3
1429L02-2-1AG	E1	V917L11-1-1AG	G3	V951L50-5AGV	G3
1429L02-2-1BP	E1	V917L11-1-3AG	G3	V951L52-1AGV	F4
1429L02-2X1AG	E3	V917L11-1-1BP	G3	V951L52-1BP	F4
1429L02-2X1BP	E3	V934L01-1-1AGV	B1	V951L7-1AD	F4
1429L02-3-1AG	E2	V934L01-1X1AGV	B1	V951L7-1AGV	F4
1429L02-3-1BP	E2	V934L02-1AGV	B1	V951L7-1BP	F4
1429L02-3X1AG	E3	V934L01-1-1BP	B1	V951L7-2AZ	F4
1429L02-3X1BP	E3	V934L01-1X1BP	B1	V951L7-2BP	F4
1429L8-1AG	E4	V934L02-1BP	B1	V951L7-5AGV	F4
1429L8-1BP	E4	V95H07-1-1BP	C1	V951L7-5BP	F4
1429L9-1AG	E4	V95L07-1-1BC	C1	V96H01-1-1AO	D1
1429L9-1BP	E4	V95L15-1BD	C1	V96L01-1-1AG	D1
1449L02-1X1AG	G2	V951L01-1Y2AGV	F3	V96L01-1-1AO	D1
1449L02-1X1BP	G2	V951L01-1Y5AGV	F3	V96H01-1-2AO	D1
1449L07-1BP	H3	V951L02-1-1AD	F1	V96L01-1-2AG	D1
2812L03-1AF	L1	V951L02-1-1AGV	F1	V96L01-1-2AO	D1
2939L01-01-1K	J1	V951L02-1-1BP	F1		
52E02-*-1AG	K1	V951L02-1-2AGV	F1		
V17L12-1-1AA	G1	V951L02-1-2BP	F1		
V17L12-2X1AA	G2	V951L02-1-5AGV	F1		
V18L01-1-1AA	H1	V951L02-1-5BP	F1		
V18L01-1-1BF	H1	V951L03-1-1AD	F1		
V18L01-1-2BF	H1	V951L03-1-1AGV	F1		
V18L01-1X1AA	H1	V951L03-1-1BP	F1		
V18L01-1X1BF	H1	V951L03-1-5AGV	F1		
V18L01-1X2BF	H1	V951L03-1-5BP	F1		
V18L01-1Y1AA	H2	V951L03-1X1AD	F2		
V18L13-1-1AA	H3	V951L03-1X1BP	F2		
V18L13-1-1BF	H3	V951L03-1X5AGV	F2		
V18L13-1-2BF	H3	V951L03-1X5BP	F2		
V18L13-1-1AC	I1	V951L04-1X1AD	F2		
V18L45-1BP	H2	V951L04-1X1AGV	F2		
V46L38-1-6AA	I1	V951L04-1X1BP	F2		
V46L38-1-1AA	I1	V951L04-1X2BP	F2		
V917L01-1-1AG	G1	V951L04-1X5AGV	F2		
V917L01-1-1BP	G1	V951L04-1X5BP	F2		
V917L01-1X1AG	G2	V951L05-1X1AGV	F3		
V917L01-1X1BP	G2	V951L05-1X1BP	F3		



# KEENSERTS®



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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 70 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 : 2009**

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.

## Threaded Inserts

**KEENSERTS**<sup>®</sup> are high strength threaded inserts made from stainless steel 1.4305. They are passivated according to EN 2516. Our **KEENSERTS**<sup>®</sup> standard product range contains metric thread dimensions. Imperial dimensions and specials are available upon request.

**KEENSERTS**<sup>®</sup> can be used in alloys, light materials, steel and cast iron to give increased thread strength in these low strength materials. They are also be used for thread repair enabling the damaged thread to be replaced with the same size thread.

**KEENSERTS**<sup>®</sup> Solid configuration gives a high cycle life with multiple tightening and loosening of the bolt. Locking inserts have a dry film lubrication on the surface to protect the screw from galling.

**KEENSERTS**<sup>®</sup> have a positive mechanical lock against rotation and vibration.

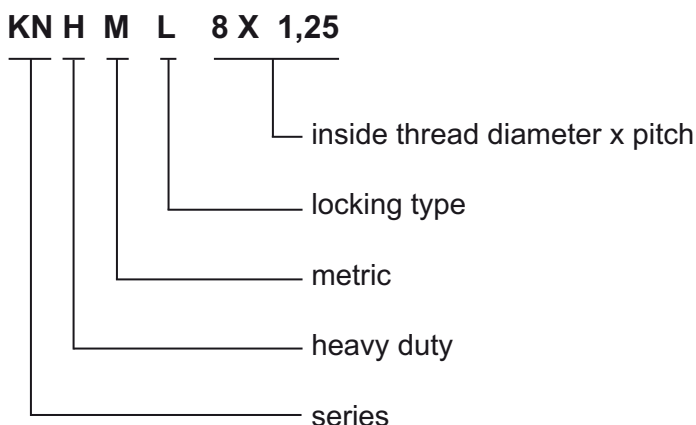
**KEENSERTS**<sup>®</sup> have 2 or 4 pre-assembled kees depending on the size of the external thread. After installation of the kees into the parent material the assembly is positively locked in place.

Pull-out-strength for **KEENSERTS**<sup>®</sup>. Calculation is as follows:

Pull-out-strength(N) = shear engagement (mm<sup>2</sup>) x ultimate shear strength of parent material (N/mm<sup>2</sup>)  
Shear engagement areas are shown on the **KEENSERTS**<sup>®</sup> data sheets.

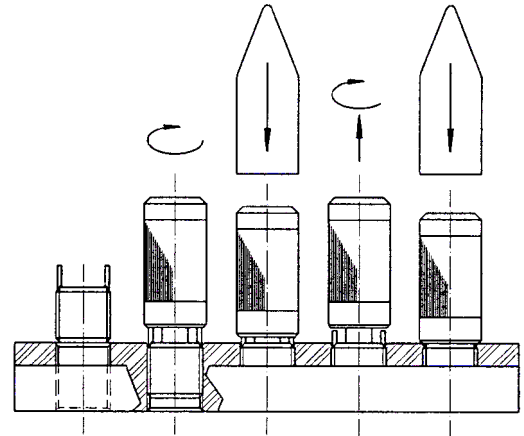
### Part-no. example:

The part-no. for metric **KEENSERTS**<sup>®</sup> are coded as follows:



## Installation:

- Drill - with standard drill
- Countersink - with cone countersink (80° - 100°)
- Thread - with standard tap
- Screw in - by hand or with installation tool  
(see installation data pages B-1 to B-4)
- Lock in Place - drive the kees into place by hand  
or in a press with the appropriate  
installation tool



Installation depth of the **KEENSERTS**<sup>®</sup> is determined by the pre-assembled kees.  
The installed depth of the **KEENSERTS**<sup>®</sup> is based on the depth of the countersink.

### Installation in hard materials

For very hard materials with a hardness greater than 30 HRC or 300 Vickers it is necessary to pre-broach the slots for the kees. The first step is to mark the position of the kees on the parent material. To do this wind the **KEENSERTS**<sup>®</sup> in until the kees touch the surface of the parent material.

Mark the positions of the kees and unwind the **KEENSERTS**<sup>®</sup>.

Then line up the blades of the broaching tool with the marked positions and push it in with a hammer or under a press, remove the tool and install the **KEENSERTS**<sup>®</sup>.

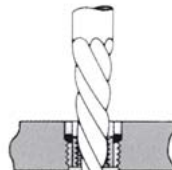
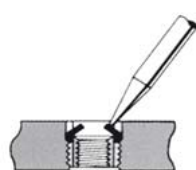
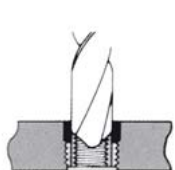
In some cases it may be necessary to run the tap back down the hole to clear out any burrs.

Available for external thread M5 and up.

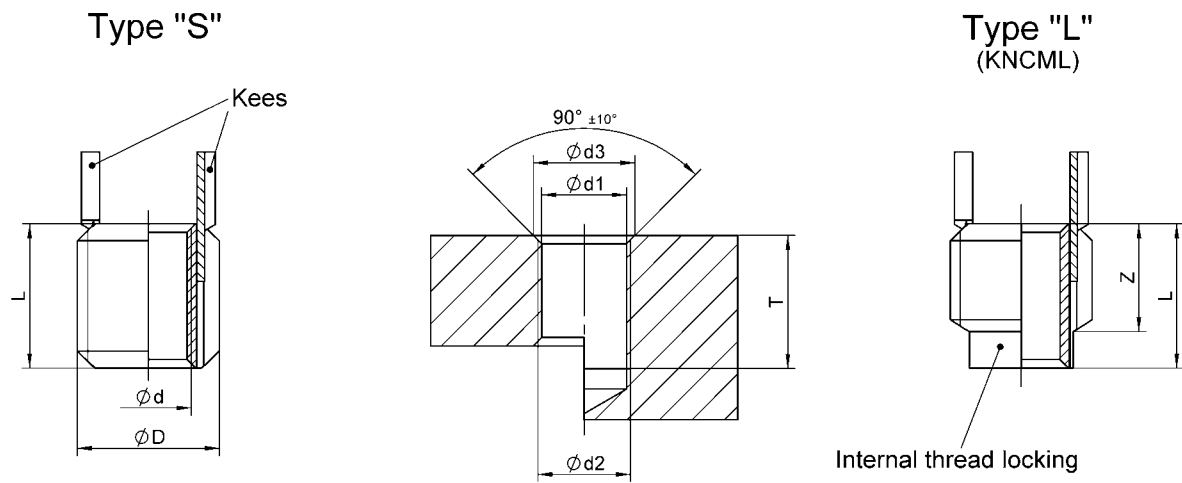


## Removal:

1. Drilling  
Dimensions see pages B1 to B4
2. Deflect kees inward and break off
3. Remove insert with E-Z out type tool
4. Insert new **KEENSERTS**<sup>®</sup> as before



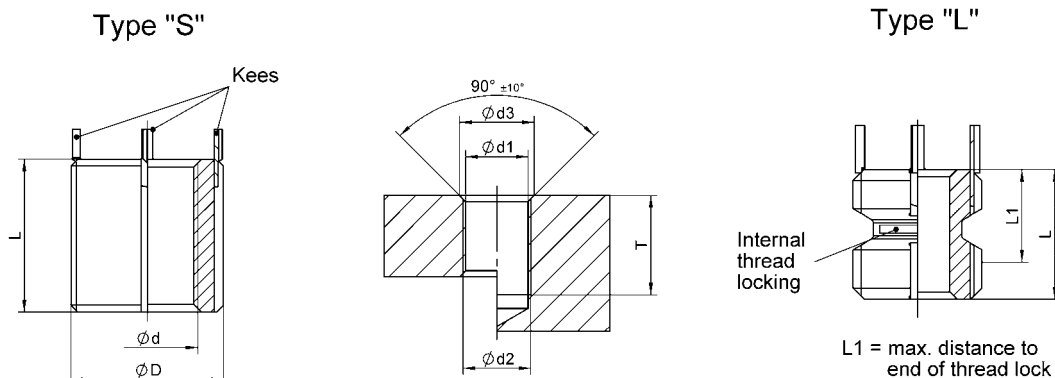
**KNCM Series**



Part-no.		Dimensions				
Standard type "S"	Locking type "L"	Ø d 5H	Ø D 4h	Shear engagement mm <sup>2</sup>	L ± 0,25	Z
KNCM2X0,4		M2X0,4	M4X0,7	16,5	3	2,2
	KNCML2X0,4			10,3		
KNCM2,5X0,45		M2,5X0,45	M4,5X0,75	26,5	3,8	2,7
	KNCML2,5X0,45			15,9		
KNCM3X0,5		M3X0,5	M5X0,8	33,1	4,25	3,1
	KNCML3X0,5			21,4		
KNCM4X0,7		M4X0,7	M6X0,75	58,4	5,25	4,1
	KNCML4X0,7			42,9		

Part-no.	Installation dimensions				Hand installation tool part-no.	Removal dimensions	
	d1 Tap drill Ø	d3 Counter-sink Ø	Thread			Drill	
			Ø d2 6H	T min.		Ø	Depth
KNCM2X0,4	3,4 +0,080 -0,025	4,1	M4X0,7	4,0	KRTM2-01	2,8	2,00
KNCML2X0,4							
KNCM2,5X0,45	3,9 +0,080 -0,025	4,6	M4,5X0,75	5,0	KRTM2,5-01	3,0	2,00
KNCML2,5X0,45							
KNCM3X0,5	4,4 +0,080 -0,025	5,1	M5X0,8	5,5	KRTM3-01	3,5	2,25
KNCML3X0,5							
KNCM4X0,7	5,5 +0,080 -0,025	6,1	M6X0,75	6,5	KRTM4-01	4,6	2,50
KNCML4X0,7							

## KNM Series

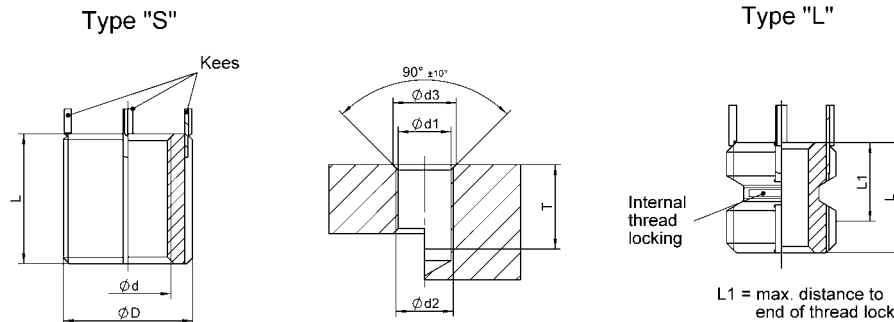


**Kees:**  
Inserts with internal thread size of M6 and under are furnished with 2 locking kees.  
Inserts with internal thread of M8 and above are furnished with 4 locking kees.

Part-no.		Dimensions				
Standard type "S"	Locking type "L"	Ø d 5H	Ø D 4h	Shear engagement mm <sup>2</sup>	L ± 0,30	L1
KNM5X0,8		M5X0,8	M8X1,25	104,9	8	7,6
	KNML5X0,8			83,1		
KNM6X1,0		M6X1,0	M10X1,25	177,7	10	8,2
	KNML6X1,0			152,7		
KNM8X1,25		M8X1,25	M12X1,25	266,7	12	9,5
	KNML8X1,25			242,7		
KNM10X1,5		M10X1,5	M14X1,5	341,6	14	10,0
	KNML10X1,5			316,4		
KNM12X1,75		M12X1,75	M16X1,5	470,2	16	11,2
	KNML12X1,75			441,4		

Part-no.	Installation dimensions					Removal dimensions	
	d1 Tap drill Ø	d3 Counter-sink Ø	Thread		Hand installation tool part-no.	Drill	
			Ø d2 6H	T min.		Ø	Depth
KNM5X0,8	6,90 <sup>+0,100</sup> <sub>-0,025</sub>	8,25	M8X1,25	9,5	KRTM5-01	5,5	4,00
KNML5X0,8							
KNM6X1,0	8,80 <sup>+0,100</sup> <sub>-0,025</sub>	10,25	M10X1,25	11,5	KRTM6-01	7,5	4,75
KNML6X1,0							
KNM8X1,25	10,80 <sup>+0,100</sup> <sub>-0,025</sub>	12,25	M12X1,25	13,5	KRTM8-01	9,5	4,75
KNML8X1,25							
KNM10X1,5	12,80 <sup>+0,130</sup> <sub>-0,025</sub>	14,25	M14X1,5	15,5	KRTM10-01	11,5	4,75
KNML10X1,5							
KNM12X1,75	14,75 <sup>+0,130</sup> <sub>-0,025</sub>	16,25	M16X1,5	17,5	KRTM12-01	13,5	4,75
KNML12X1,75							

**KNHM Series**



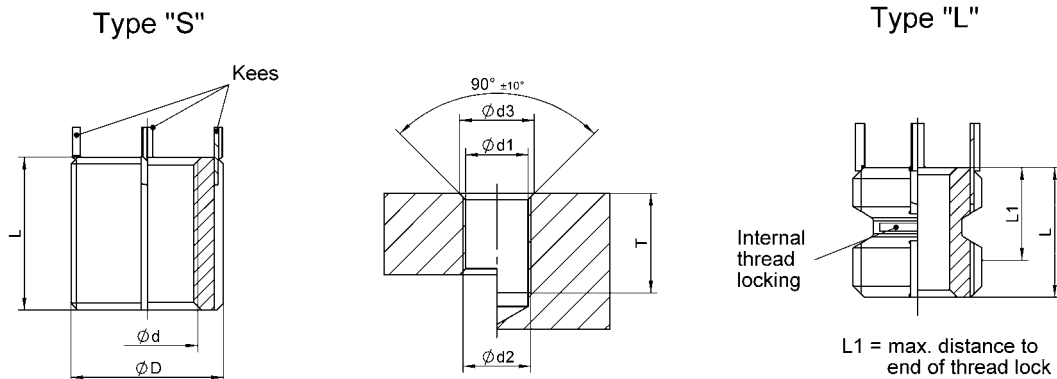
**Kees:**  
Inserts with internal thread size of M6 and under are furnished with 2 locking kees.  
Inserts with internal thread of M8 and above are furnished with 4 locking kees.

Part-no.		Dimensions				
Standard type "S"	Locking type "L"	Ø d 5H	Ø D 4h	Shear engagement mm <sup>2</sup>	L ± 0,30	L1
KNHM4X0,7		M4X0,7	M8X1,25	104,9	8	8,0
	KNHML4X0,7			83,1		
KNHM5X0,8		M5X0,8	M10X1,25	177,1	10	8,7
	KNHML5X0,8			152,7		
KNHM6X1,0		M6X1,0	M12X1,25	266,7	12	9,5
	KNHML6X1,0			242,5		
KNHM8X1,25		M8X1,25	M14X1,5	341,6	14	10,0
	KNHML8X1,25			316,4		
KNHM10X1,5		M10X1,5	M16X1,5	470,2	16	10,0
	KNHML10X1,5			441,4		
KNHM12X1,75		M12X1,75	M18X1,5	608,5	18	10,7
	KNHML12X1,75			561,8		

Part-no.	Installation dimensions				Removal dimensions		
	d1 Tap drill Ø	d3 Counter- sink Ø	Thread		Hand installation tool part-no.	Drill	
			Ø d2 6H	T min.		Ø	Depth
KNHM4X0,7	6,90 <sup>+0,100</sup> -0,025	8,25	M8X1,25	9,5	KRTM4-02	5,5	4,00
KNHML4X0,7							
KNHM5X0,8	8,80 <sup>+0,100</sup> -0,025	10,25	M10X1,25	11,5	KRTM5-02	7,5	4,75
KNHML5X0,8							
KNHM6X1,0	10,80 <sup>+0,100</sup> -0,025	12,25	M12X1,25	13,5	KRTM6-02	9,5	4,75
KNHML6X1,0							
KNHM8X1,25	12,80 <sup>+0,130</sup> -0,025	14,25	M14X1,5	15,5	KRTM8-02	11,5	4,75
KNHML8X1,25							
KNHM10X1,5	14,80 <sup>+0,130</sup> -0,025	16,25	M16X1,5	17,5	KRTM10-02	13,5	4,75
KNHML10X1,5							
KNHM12X1,75	16,80 <sup>+0,130</sup> -0,025	18,25	M18X1,5	19,5	KRTM12-02	15,5	4,75
KNHML12X1,75							



## KNHM Series



**Kees:**  
Inserts with internal thread size of M6 and under are furnished with 2 locking kees.  
Inserts with internal thread of M8 and above are furnished with 4 locking kees.

Part-no.		Dimensions				
Standard type "S"	Locking type "L"	Ø d 5H	Ø D 4h	Shear engagement mm <sup>2</sup>	L ± 0,30	L1
KNHM14X2,0		M14X2,0	M20X1,5	770,5	20	12,4
	KNHML14X2,0			724,4		
KNHM16X2,0		M16X2,0	M22X1,5	896,8	22	12,4
	KNHML16X2,0			855,2		
KNHM18X1,5		M18X1,5	M24X1,5	1084,4	24	16,8
	KNHML18X1,5			1051,5		
KNHM20X2,5		M20X2,5	M30X2,0	1774,3	30	17,5
	KNHML20X2,5			1736,4		
KNHM24X3,0		M24X3,0	M33X2,0	2189,4	33	19,0
	KNHML24X3,0			2161,9		

Part-no.	Installation dimensions				Hand installation tool part-no.	Removal dimensions	
	d1 Tap drill Ø	d3 Counter-sink Ø	Thread			Drill	
			Ø d2 6H	T min.		Ø	Depth
KNHM14X2,0	18,75 <sup>+0,130</sup> <sub>-0,025</sub>	20,25	M20X1,5	22,5	KRTM14-02	17,50	4,75
KNHML14X2,0							
KNHM16X2,0	20,50 <sup>+0,130</sup> <sub>-0,025</sub>	22,25	M22X1,5	24,5	KRTM16-02	17,75	4,75
KNHML16X2,0							
KNHM18X1,5	22,50 <sup>+0,130</sup> <sub>-0,025</sub>	24,25	M24X1,5	26,5	KRTM18-02	19,75	4,75
KNHML18X1,5							
KNHM20X2,5	28,00 <sup>+0,130</sup> <sub>-0,025</sub>	30,25	M30X2,0	34,5	KRTM20-02	25,75	6,35
KNHML20X2,5							
KNHM24X3,0	31,00 <sup>+0,130</sup> <sub>-0,025</sub>	33,25	M33X2,0	37,5	THM24	28,75	6,35
KNHML24X3,0							