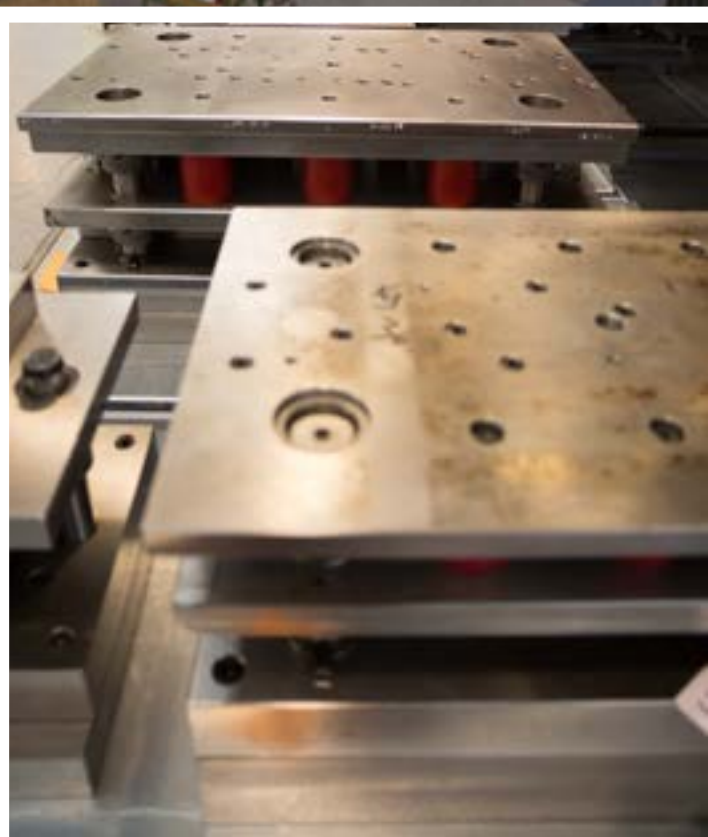




**TOGGLE  
CLAMPS**

**Catalogue 1/2016**

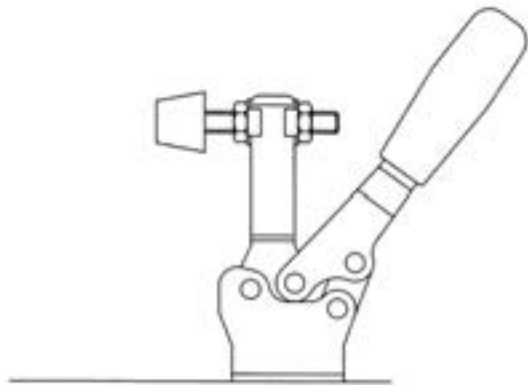




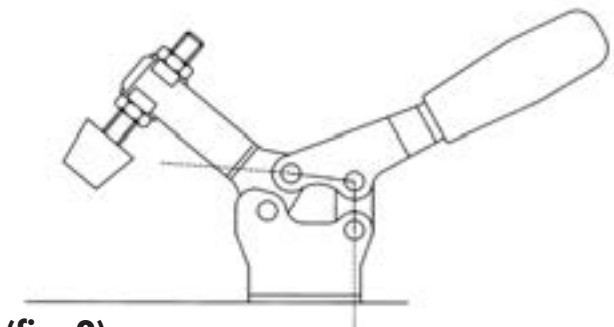




# FEATURES



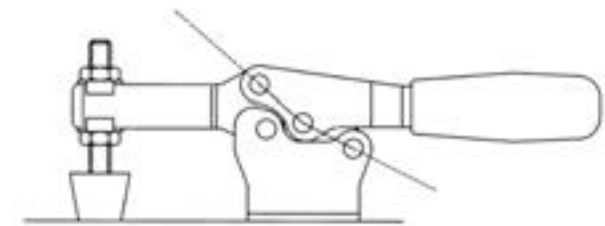
(fig. 1)



(fig. 2)



(fig. 3)



(fig. 4)

Using the toggle principle, the quick clamping tools have decisive advantages:

- The clamping lever is opened so as to completely clear the work surface, so that the work piece can be extracted from and/or placed in the equipment without difficulty (**fig. 1**).
- A small shift of the control lever is sufficient to bring the control lever to the work piece. The placement of three pivots (**fig. 2**) clearly shows that the force exerted by the clamping lever is transmitted to the control lever.
- In the **fig. 3** position, when the three pivots are aligned the maximum  $F_s$  clamping force is obtained (dead centre of the lever). The intensity of the  $F_s$  force exerted on the clamp depends on the:
  - 1) Force exerted on the control lever.
  - 2) Position of the pressure screw on the clamping lever.
 Since it is not possible to determine the strength of the

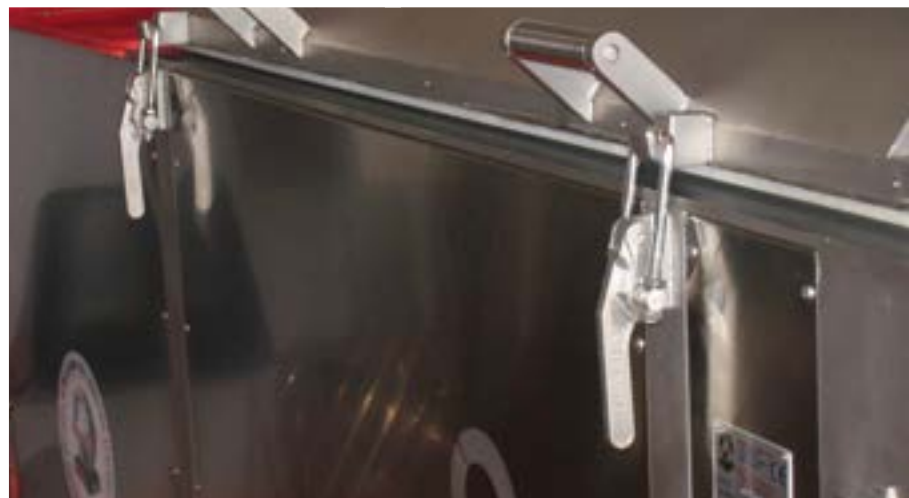
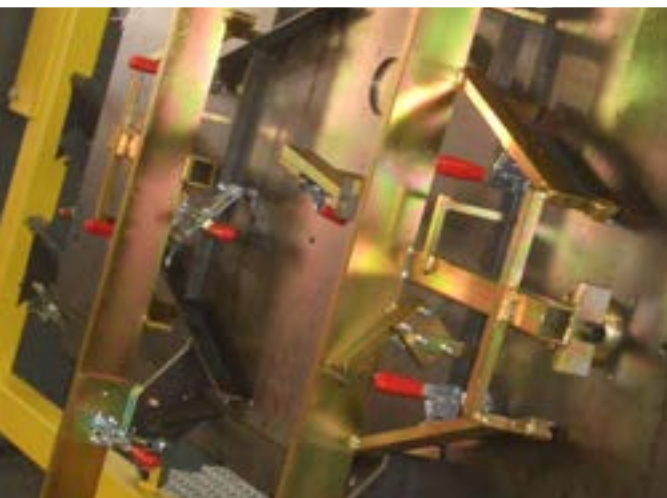
operator in manual, the tables indicate the  $F_s$  clamping force for pneumatic clamps only. In the maximum strength position (**fig. 3**), the clamping balance is unstable since opposing forces acting on the clamping lever can disengage the clamp.

- If, in the clamping position, the dead centre of the lever exceeds a certain limit (**fig. 4**), the clamping lever stops with a fixed stop and, thus obtains secure and irreversible clamping.

The strength that the clamp can receive in the closed position without permanent deformation is called  $F_h$  holding force. This is a variable feature for each clamp and depends on the size (sizes and geometry) of each clamp. The tables show the respective maximum  $F_h$  retaining force of the clamp including the safety factor. All forces are shown in daN. (decaNewton)=10 N (Newton)=1Kg. weight.



## POSSIBLE APPLICATIONS

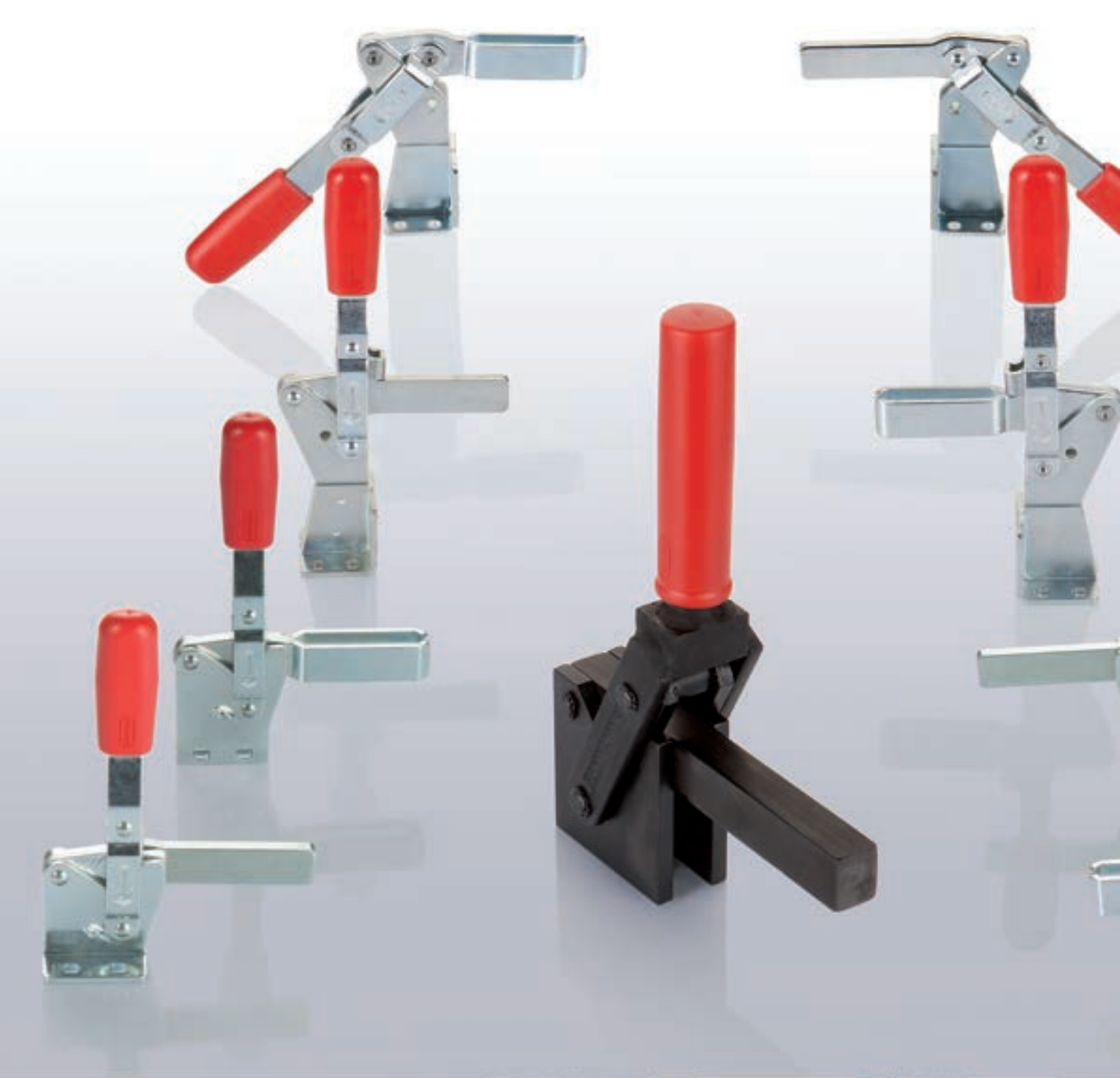


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# VERTICAL SERIES

The clamping and control levers move in the same direction. When clamping is obtained, the control lever is in the vertical position. The light version of the series presented in this catalogue has a retaining force between 75 and 875 daN, while the heavy version has a retaining force between 1000 and 3000 daN. The heavy version is used when highly intense resistant forces are used, for example when closing jigs for foams, polyurethanes, etc. The clamps of this series are built to be easily disassembled for reworking of the individual elements depending on the requirements of use.

## PERFORMANCE

**FOR THE LIGHT SERIES:** Components in case-hardening sheet steel. Hardened and tempered supporting pivots. Supporting bushes (for sizes from 130 daN and over) undergo case-hardening and grinding. The clamping lever is shorn and reinforced in the points of maximum stress. In the closing movement, it is guided laterally to ensure greater stability against possible transverse stresses. Finishing of the series: galvanized

**FOR THE HEAVY SERIES:** The pivots and supporting bushes are made of tempered and ground steel. The other parts are made of weldable steel. Finishing of the series: burnished.

The red handles are made of polyurethane and are resistant to oils, solvents and other chemical agents.

## VERTICAL SERIES



### VERTICAL SERIES WITH FOLDED BASE.

Some sizes of this series are also produced in stainless steel and are shown below in red.

**Material:** Galvanized steel or **AISI 304 stainless steel**

**Riveted pivots:** Galvanized steel or **AISI 304 stainless steel**

**Supporting bushes:** Hardened and ground steel  
(for sizes  $\geq 130$ )

**Handles:** Red polyurethane resistant to oils, grease and other chemical agents.

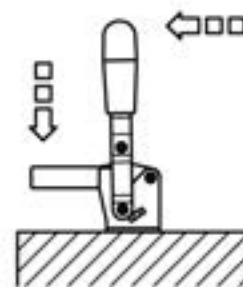
**Performance:** Form A and **form AX** with open clamping lever and two flanged washers.

Form E and **form EX** with full clamping lever and bolt retainers to be welded in the desired position and angle.

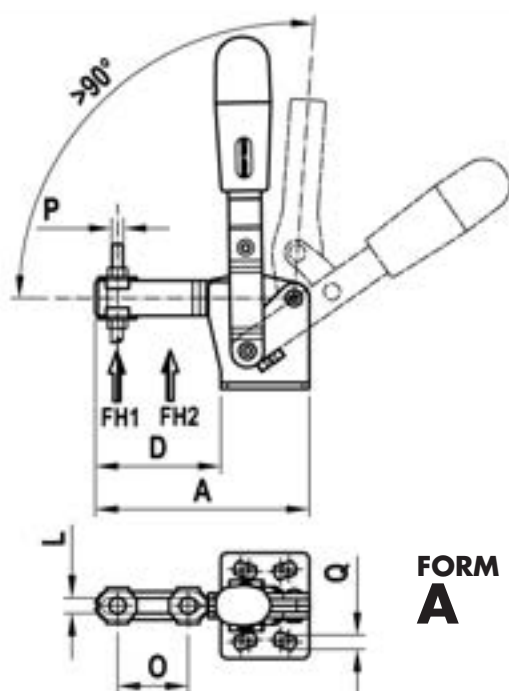
**Spindles:** To be ordered separately (see Accessories on page 76)

**Features and applications:** During the closing, the clamping lever is guided laterally to ensure greater stability against possible transverse stresses.

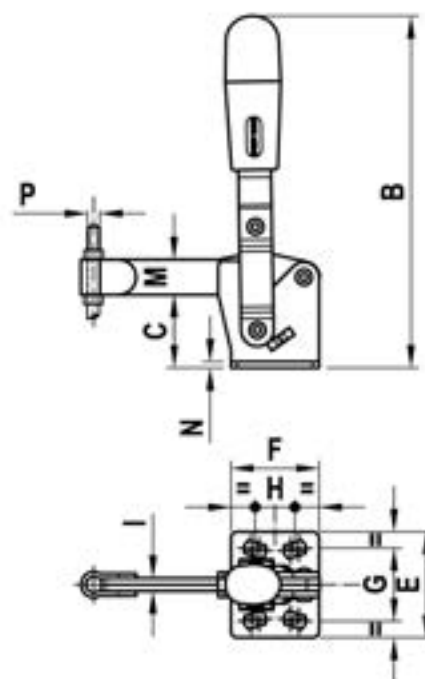
A special grease is placed between two contacting surfaces during assembly.



This pneumatic actuated series is found on page 69.



**FORM A**



**FORM E**

Code	Description	Stainless steel Code	Stainless steel	A	B	C	D	E	F	G	H	I	L	M	N	O	P	Q	Fh1 (daN)	Fh2 (daN)	gr.
AA520	75/A	AS095	75/AX	66,5	98	20,5	37,5	34	29	24	15÷16		5,2	11	2	20	M5	4,5	75	160	98
AA524	75/E	AS105	75/EX	67	98	20,5	38	34	29	24	15÷16	4		11	2		M5	4,5	75		100
AA530	130/A	AS150	130/AX	85	142	28	50	42	35	27÷29	12,5÷19		6,2	16	2,5	28	M6	5,6	105	175	230
AA534	130/E	AS160	130/EX	86	142	28	51	42	35	27÷29	12,5÷19	5		16	2,5		M6	5,6	105		235
AA540	230/A	AS180	230/AX	110,5	168	33,5	67,5	45	43	32	19÷20		8,5	18	3	40	M8	6,7	200	320	380
AA544	230/E	AS190	230/EX	112	168	33,5	69	45	43	32	19÷20	6		18	3		M8	6,7	200		390
AA550	330/A			129	195	43	79	65	50	45÷46	29÷32		10,5	22	3,5	43	M10	8,5	240	400	604
AA554	330/E			130,5	195	43	80,5	65	50	45÷46	29÷32	7		22	3,5		M10	8,5	240		604
AA560	430/A			164	247	55,5	106	65	58	45	32		12,5	26	4	64	M12	8,5	280	500	1100
AA564	430/E			166	247	55,5	108	65	58	45	32	10		26	4		M12	8,5	280		1100
AA570	530/A			223	303	84,5	143	95	80	70	50÷51		12,5	32	7	90	M12	12,5	450	875	2110
AA574	530/E			225	303	84,5	145	95	80	70	50÷51	10		32	7		M12	12,5	450		2110





## VERTICAL SERIES WITH STRAIGHT BASE.

Some sizes of this series are also produced in stainless steel and are shown below in red.

**Material:** Galvanized steel or **AISI 304 stainless steel**

**Riveted pivots:** Galvanized steel or **AISI 304 stainless steel**

**Supporting bushes:** Hardened and ground steel  
(for sizes  $\geq 130$ )

**Handles:** Red polyurethane resistant to oils, grease and other chemical agents.

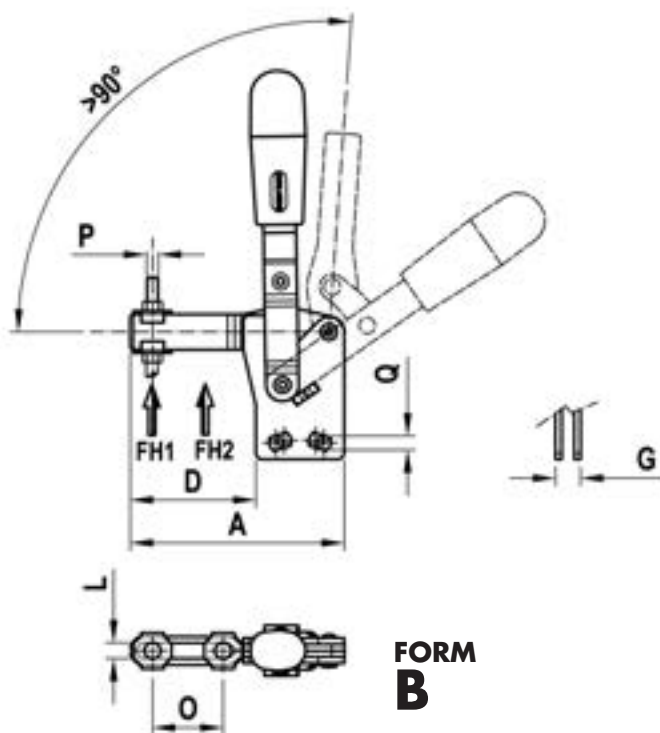
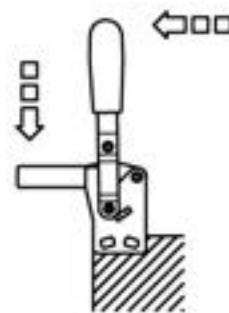
**Performance:** Form B and **form BX** with open clamping lever and two flanged washers.

Form F and **form FX** with full clamping lever and bolt retainers to be welded in the desired position and angle.

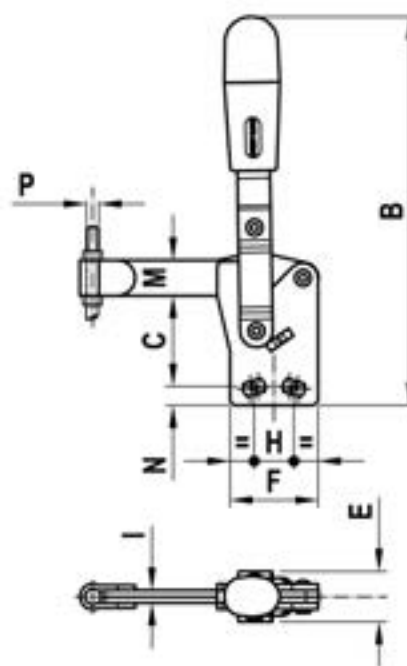
**Spindles:** To be ordered separately (see Accessories on page 76)

**Features and applications:** During the closing, the clamping lever is guided laterally to ensure greater stability against possible transverse stresses.

A special grease is placed between two contacting surfaces during assembly.



**FORM B**



**FORM F**

Code	Description	Stainless steel Code	Stainless steel	A	B	C	D	E	F	G	H	I	L	M	N	O	P	Q	Fh1 (daN)	Fh2 (daN)	gr.
AA522	75/B	AS100	75/BX	66,5	109,5	27	37,5	16	29	8	15÷16		5,2	11	5	20	M5	4,5	75	160	98
AA526	75/F	AS110	75/FX	67	109,5	27	38	16	29	8	15÷16	4		11	5		M5	4,5	75		100
AA532	130/B	AS155	130/BX	85	156	35	50	20	35	10	12,5÷19		6,2	16	6,5	28	M6	5,6	105	175	230
AA536	130/F	AS165	130/FX	86	156	35	51	20	35	10	12,5÷19	5		16	6,5		M6	5,6	105		235
AA542	230/B	AS185	230/BX	110,5	183	41,5	67,5	23	43	12	19÷20		8,5	18	6,5	40	M8	6,7	200	320	380
AA546	230/F	AS195	230/FX	112	183	41,5	69	23	43	12	19÷20	6		18	6,5		M8	6,7	200		390
AA552	330/B			129	218	56,5	79	25	50	14	29÷32		10,5	22	9,5	43	M10	8,5	240	400	620
AA556	330/F			130,5	218	56,5	80,5	25	50	14	29÷32	7		22	9,5		M10	8,5	240		620
AA562	430/B			164	267,5	67,5	106	34	58	18	32		12,5	26	10	64	M12	8,5	280	500	1110
AA566	430/F			166	267,5	67,5	108	34	58	18	32	10		26	10		M12	8,5	280		1110
AA572	530/B			223	337	105	146	34	77	18	50÷51		12,5	32	12,5	90	M12	12,5	450	875	1920
AA576	530/F			225	337	105	148	34	77	18	50÷51	10		32	12,5		M12	12,5	450		1920

## VERTICAL SERIES



### VERTICAL SERIES WITH FOLDED AND FRONT BASE.

**Material:** Galvanized steel

**Riveted pivots:** Galvanized steel

**Supporting bushes:** Hardened and ground steel

**Handles:** Red polyurethane resistant to oils, grease and other chemical agents.

**Performance:** Form AV with open clamping lever and two flanged washers.

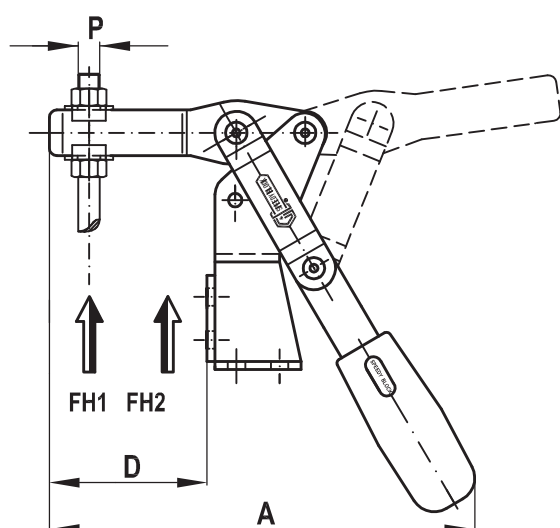
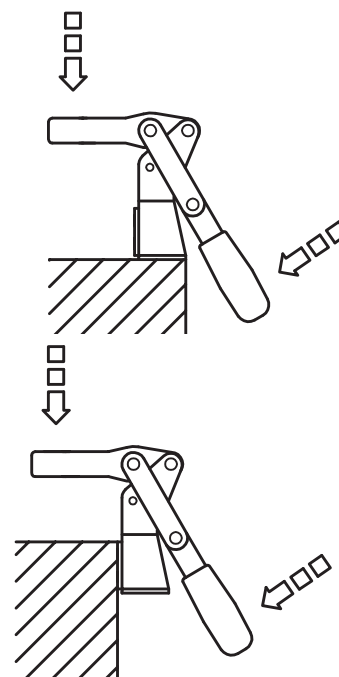
Form EV with full clamping lever and bolt retainers to be welded in the desired position and angle.

**Spindles:** To be ordered separately  
(see Accessories on page 76)

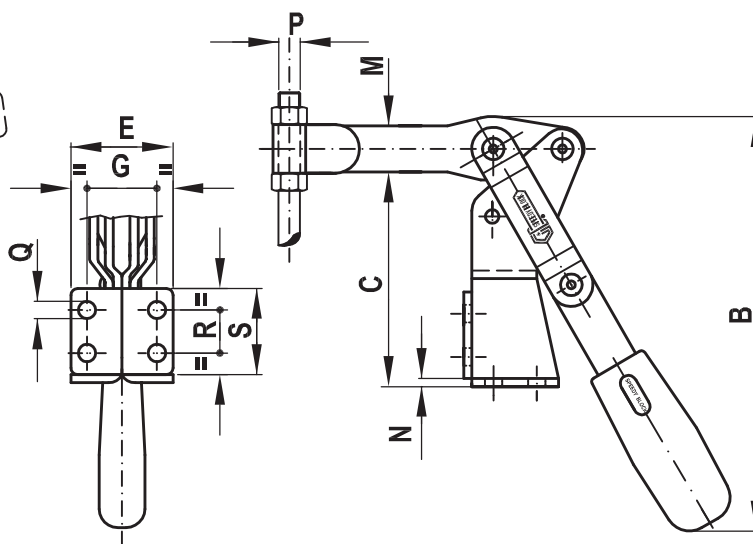
**Features and applications:** During the closing, the clamping lever is guided laterally to ensure greater stability against possible transverse stresses.

A special grease is placed between two contacting surfaces during assembly.

This pneumatically actuated series



**FORM  
AV**



**FORM  
EV**

Code	Description	A	B	C	D	E	F	G	H	I	L	M	N	O	P	Q	R	S	Fh1 (daN)	Fh2 (daN)	gr.
AA220	200/AV	157	154	75	58,5	38	32	26	16		8,5	17	3	34	M8	6,5	16	32	120	240	430
AA225	200/EV	159	154	75	60,5	38	32	26	16	6		17	3		M8	6,5	16	32	120	240	430
AA320	300/AV	193	198	108	76	48	45	30	28		10,4	20	3	42	M10	8,5	30	48	190	280	800
AA325	300/EV	195	198	108	78	48	45	30	28	8		20	3		M10	8,5	30	48	190	280	800





## VERTICAL SERIES WITH STRAIGHT AND FRONT BASE.

**Material:** Galvanized steel

**Riveted pivots:** Galvanized steel

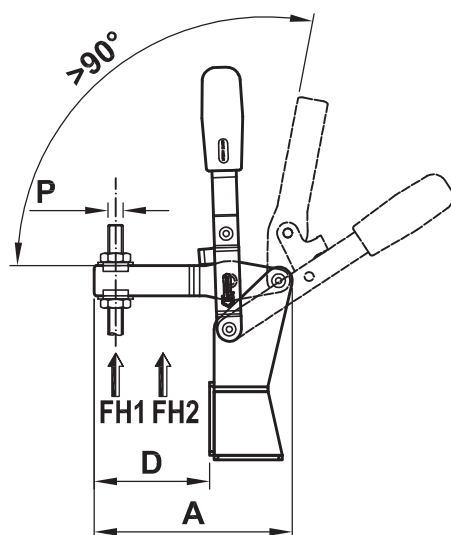
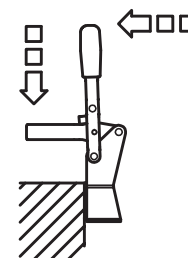
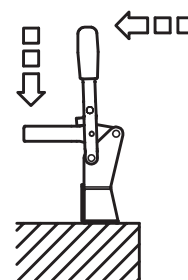
**Supporting bushes:** Hardened and ground steel

**Handles:** Red polyurethane resistant to oils, grease and other chemical agents.

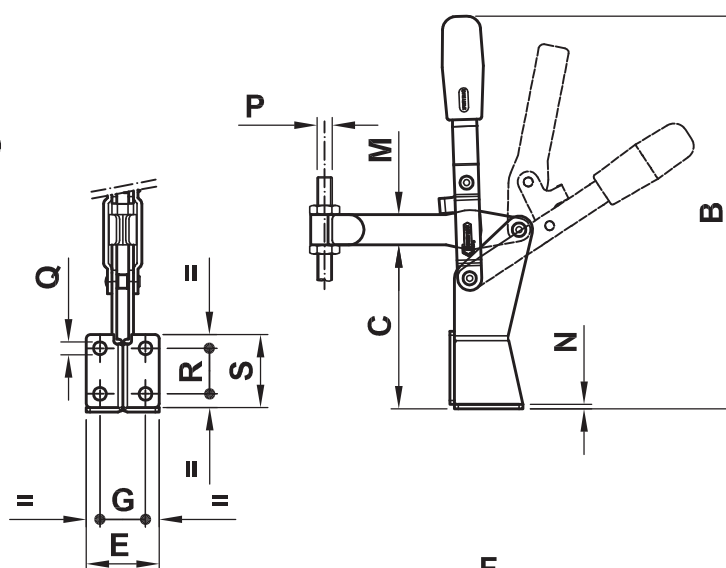
**Performance:** Form AVF with open clamping lever and two flanged washers. Form EVF with full clamping lever and bolt retainers to be welded in the desired position and angle.

**Spindles:** To be ordered separately (see Accessories on page 76)

**Features and applications:** During the closing, the clamping lever is guided laterally to ensure greater stability against possible transverse stresses. A special grease is placed between two contacting surfaces during assembly. This pneumatic actuated series is found on page 69.



**FORM  
AVF**



**FORM  
EVF**

Code	Description	A	B	C	D	E	F	G	H	I	L	M	N	O	P	Q	R	S	Fh1 (daN)	Fh2 (daN)	Gr.
AA221	200/AVF	103	203	77	59	38	32	26	16		8,5	17	3	36	M8	6,5	16	32	160	250	390
AA226	200/EVF	105	203	77	61	38	32	26	16	6		17	3		M8	6,5	16	32	160	250	400
AA321	300/AVF	130	258	108	76	48	45	30	28		10,3	20	3	50	M10	8,5	30	48	240	370	680
AA326	300/EVF	132	258	108	77,5	48	45	30	28	8		20	3		M10	8,5	30	48	240	370	690

## VERTICAL SERIES



### HEAVY VERTICAL SERIES

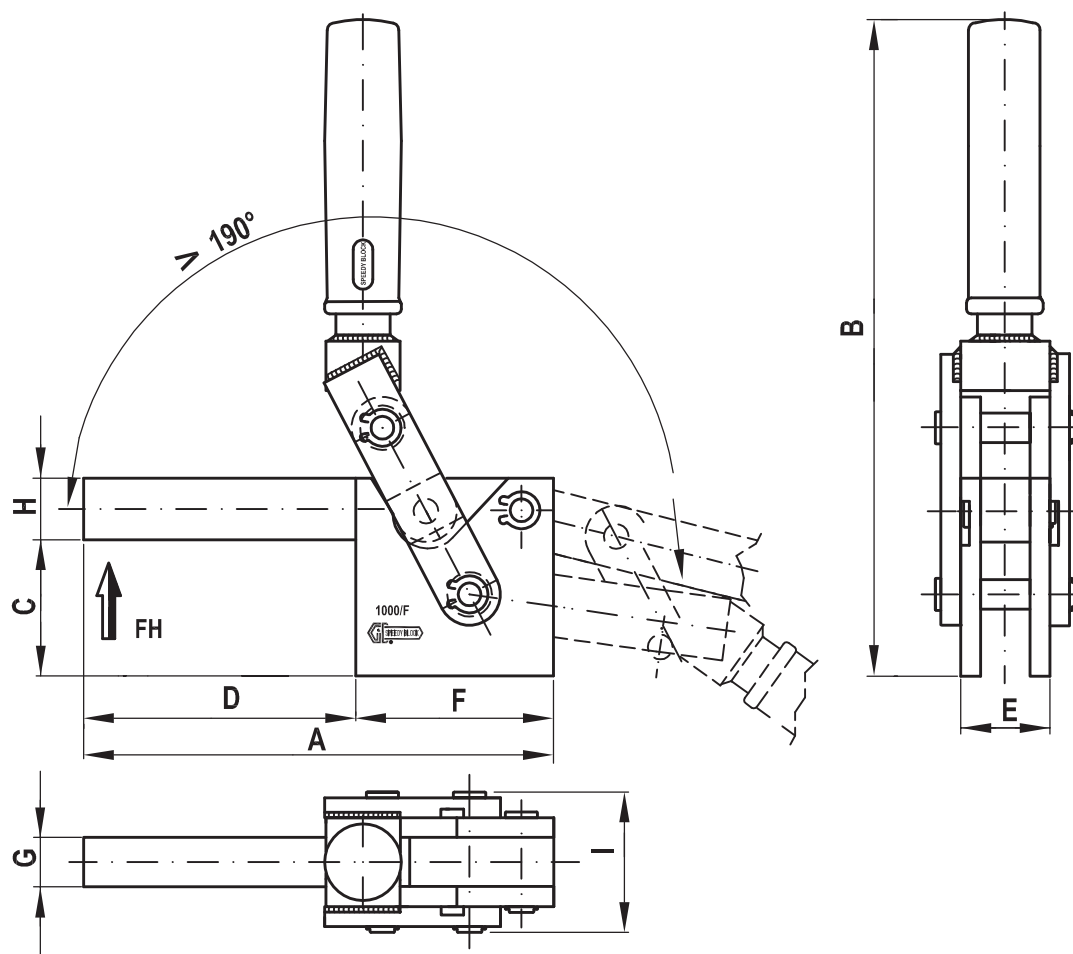
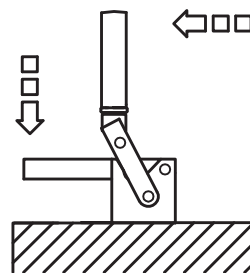
**Material:** Weldable burnished steel.

**Pivots:** Hardened and ground steel.

**Supporting bushes:** Hardened and ground steel

**Handles:** Red polyurethane resistant to oils, grease and other chemical agents.

**Features and applications:** Series generally used for heavy applications requiring which require major resistant forces. The clamps of this series are built to be easily disassembled for reworking of the individual elements depending on the requirements of use.



Code	Description	A	B	C	D	E	F	G	H	I	Fh (daN)	gr.
AA900	1000/F	190	265	55	110	36	80	20	25	57,5	1000	2400
AA905	2000/F	220	295	65	120	36	100	20	35	57,5	2000	3600
AA910	3000/F	250	320	80	140	45	110	25	40	71	3000	5700



## MANUFACTURING PROCESS









# LONG LIFE SERIES

The tools of the Long life series have been successfully tested for more than 1,000,000 cycles.


**REINFORCED LONG LIFE SERIES:** the hot forged parts, as well as hardened and ground pivots and bushings make this series suitable for heavy duty loads and a long operating life.

**TOGGLE MECHANISM:** the accessories such as clamping arm and control lever, can be welded according to applications for use.

**PECULIARITIES AND ADVANTAGES:** • The clamping and control levers are forged. • All pivots are hardened and ground and flow into similar bushings. • Red, ergonomic and oil resistant handles. • The clamping arm guide is adjustable.

**APPLICATIONS:** For uses in medium and heavy duty clamping works, on welding jigs, carpentry works, moulds and generally when high clamping forces are needed and when there is strong repetitiveness of movements.

**TOGGLE MECHANISM:** Same peculiarities and applications as the previous vertical reinforced series. The design of these mechanisms is more versatile, being possible to weld the different parts and accessories and make up your clamp to better meet the requirements for all types of clamping needs.



## REINFORCED VERTICAL SERIES



### REINFORCED VERTICAL SERIES WITH FOLDED BASE

**Material:** Burnished steel

**Pivots:** Hardened and ground steel.

**Supporting bushes:** Hardened and ground steel

**Handles:** Red polyurethane resistant to oils, grease and other chemical agents.

**Performance:** Form A with open clamping lever and two flanged washers.

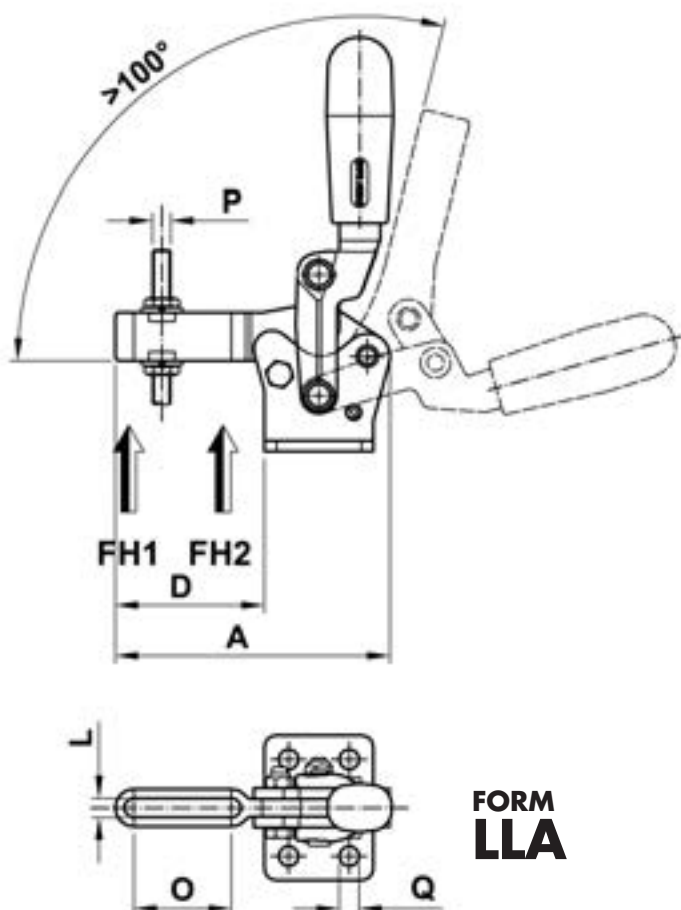
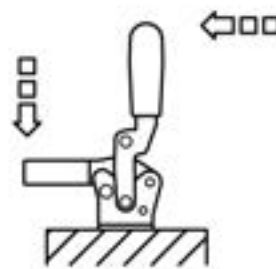
Form E with eyelet clamping lever to insert the spindle.

**Spindles:** To be ordered separately (see Accessories on page 76)

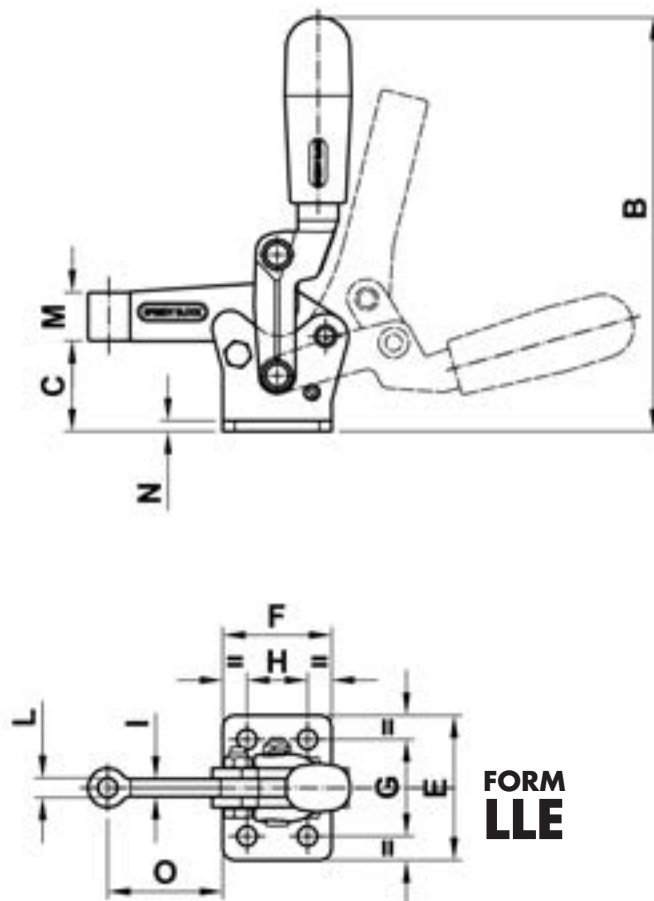
**Features and applications:** The clamping levers and control levers are forged; the guide of the clamping lever is adjustable.

This series is usually used for medium and heavy duty clamping works, on welding jigs, carpentry works, moulds and generally when high clamping forces are needed and when there is strong repetitiveness of movements.

Tested for more than 1,000,000 cycles.



**FORM  
LLA**



**FORM  
LLE**

Code	Description	A	B	C	D	E	F	G	H	I	L	M	N	O	P	Q	Fh1 (daN)	Fh2 (daN)	gr.
AA600	LLA01	91	136,5	30	49	48	36	32	20		6,3	16	3,5	32	M6	6,5	220	280	330
AA610	LLE01	86	136,5	30	44	48	36	32	20	6	6,5	16	3,5	38	M6	6,5	220		325
AA630	LLA02	129,5	215	50	64	65	54	45	30		10,3	24	5	34	M10	8,5	440	820	1200
AA640	LLE02	129,5	215	50	64	65	54	45	30	10	10,5	24	5	54,5	M10	8,5	440		1200
AA660	LLE03	161	280	67	74	75	75	55	55	12	12,5	30	6	62	M12	10,5	850		1200
AA680	LLE04	203	330	76,5	96	100	90	65	65	16	16,5	35	8	80	M16	12,5	1540		4510

## REINFORCED VERTICAL SERIES



### REINFORCED VERTICAL SERIES WITH STRAIGHT BASE

**Material:** Burnished steel

**Pivots:** Hardened and ground steel.

**Supporting bushes:** Hardened and ground steel

**Handles:** Red polyurethane resistant to oils, grease and other chemical agents.

**Performance:** Form B with open clamping lever and two flanged washers.

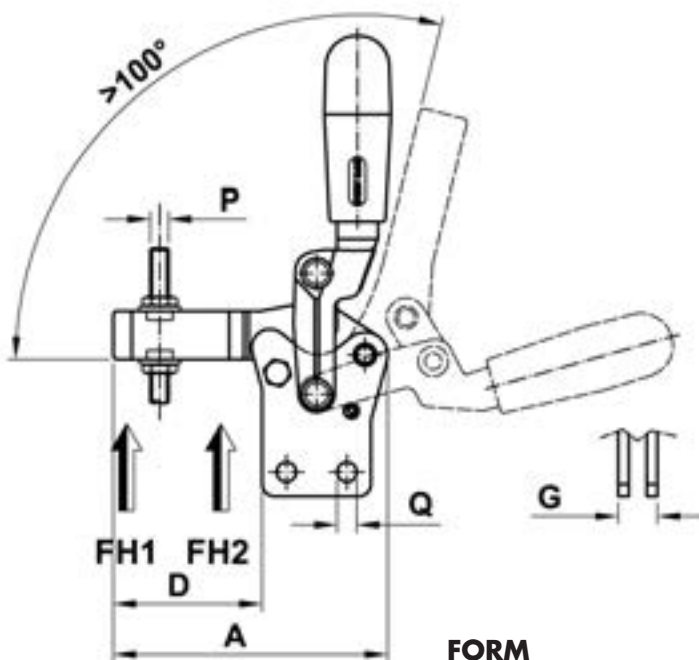
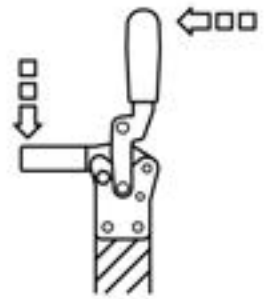
Form F with eyelet clamping lever to insert the spindle.

**Spindles:** To be ordered separately (see Accessories on page 76)

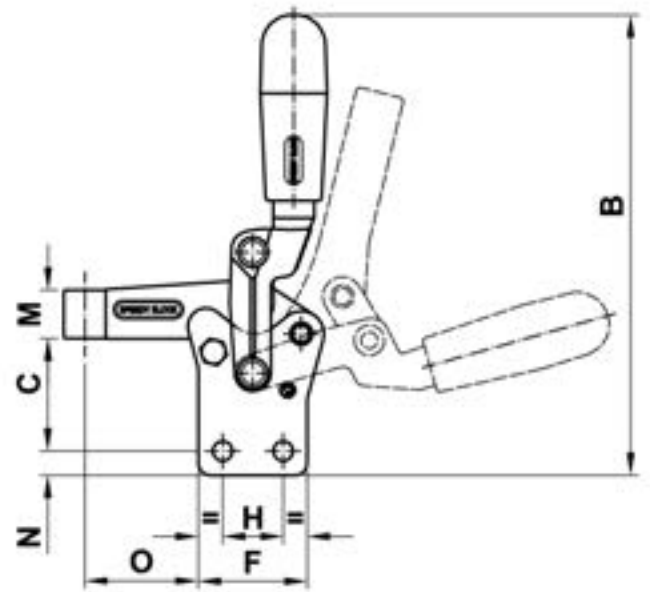
**Features and applications:** The clamping levers and control levers are forged; the guide of the clamping lever is adjustable.

This series is usually used for medium and heavy duty clamping works, on welding jigs, carpentry works, moulds and generally when high clamping forces are needed and when there is strong repetitiveness of movements.

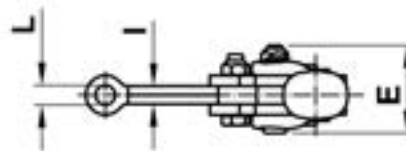
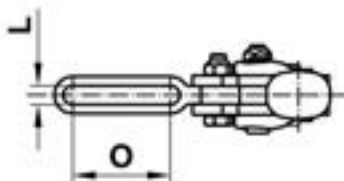
Tested for more than 1,000,000 cycles.



**FORM  
LLB**



**FORM  
LLF**



Code	Description	A	B	C	D	E	F	G	H	I	L	M	N	O	P	Q	Fh1 (daN)	Fh2 (daN)	gr.
AA605	LLB01	91	152	37,5	49	29	36	13	20		6,3	16	8	32	M6	6,5	220	280	330
AA615	LLF01	86	152	37,5	44	29	36	13	20	6	6,5	16	8	38	M6	6,5	220		325
AA635	LLB02	129,5	235	59,5	64	42	54	20	30		10,3	24	10	34	M10	8,5	440	820	1200
AA645	LLF02	129,5	235	59,5	64	42	54	20	30	10	10,5	24	10	54,5	M10	8,5	440		1200
AA665	LLF03	161	301	78	74	52	75	24	55	12	12,5	30	10	62	M12	10,5	850		1200
AA685	LLF04	203	330	88,5	96	68	90	32	65	16	16,5	35	17,5	80	M16	12,5	1540		4510



## TOGGLE MECHANISMS



### TOGGLE MECHANISM WITH FOLDED BASE

**Material:** Burnished steel

**Pivots:** Hardened and ground steel.

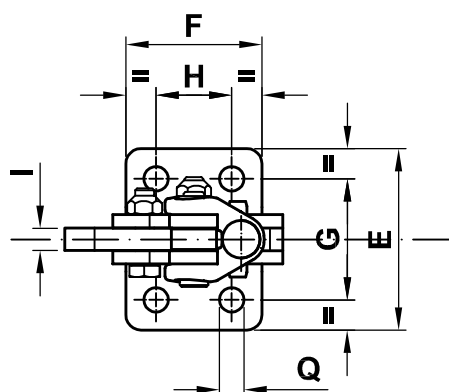
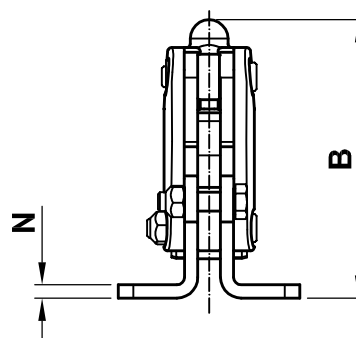
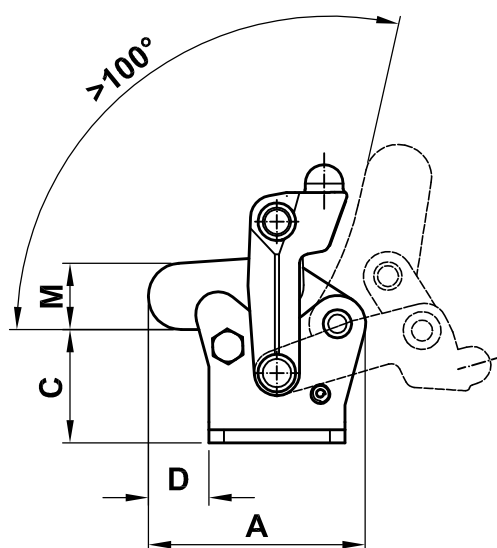
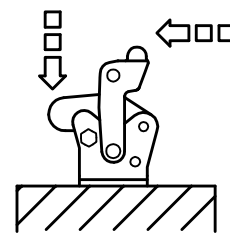
**Supporting bushes:** Hardened and ground steel

**Accessories:** To be ordered separately (see Accessories on page 24)

**Features and applications:** The clamping and control levers are forged; for uses in medium and heavy duty clamping works, on welding jigs, carpentry works, moulds and generally when high clamping forces are needed and when there is strong repetitiveness of movements.

The design of these mechanisms is more versatile, being possible to weld the different parts and accessories and make up your clamp to better meet your requirements.

Tested for more than 1,000,000 cycles.



Code	Description	A	B	C	D	E	F	G	H	I	M	N	Q	Fh (daN)	gr.
AA700	LSC01	57,5	71	30	16	48	36	32	20	6	17,5	3,5	6,5	220	256
AA725	LSC02	85,5	121	50	20	65	54	45	30	10	28	5	8,5	440	967
AA750	LSC03	115	158	67	28	75	75	55	55	12	35	6	10,5	850	1900
AA775	LSC04	147,5	193	76,5	40,5	100	90	65	65	16	40,5	8	12,5	1540	3980



## TOGGLE MECHANISM WITH STRAIGHT BASE

**Material:** Burnished steel

**Pivots:** Hardened and ground steel.

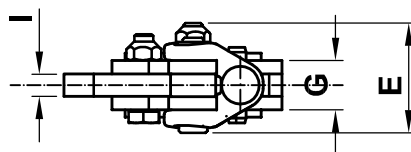
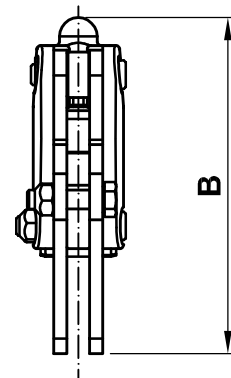
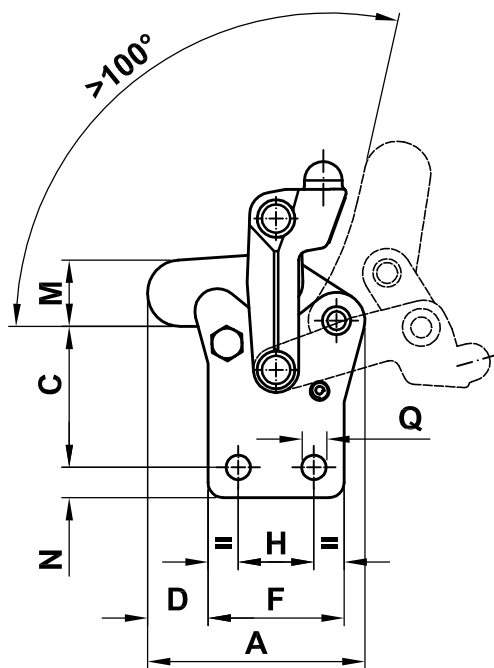
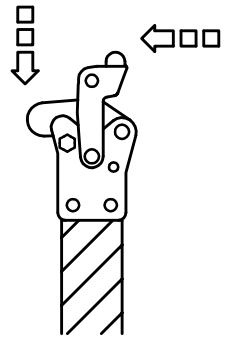
**Supporting bushes:** Hardened and ground steel

**Accessories:** To be ordered separately (see Accessories on page 24)

**Features and applications:** The clamping and control levers are forged; for uses in medium and heavy duty clamping works, on welding jigs, carpentry works, moulds and generally when high clamping forces are needed and when there is strong repetitiveness of movements.

The design of these mechanisms is more versatile, being possible to weld the different parts and accessories and make up your clamp to better meet your requirements.

Tested for more than 1,000,000 cycles.



Code	Description	A	B	C	D	E	F	G	H	I	M	N	Q	Fh (daN)	gr.
AA705	LSG01	57,5	86	37,5	16	29	36	13	20	6	17,5	8	6,5	220	256
AA730	LSG02	85,5	140,5	59,5	20	42,5	54	20	30	10	28	10	8,5	440	967
AA755	LSG03	115	180	78	28	52	75	24	55	12	35	10	10,5	850	1900
AA780	LSG04	147,5	222	88,5	40,5	68	90	32	65	16	40,5	17,5	12,5	1540	3980

## TOGGLE MECHANISMS



### TOGGLE MECHANISM WITH SWINGING BASE

**Material:** Burnished steel

**Pivots:** Hardened and ground steel.

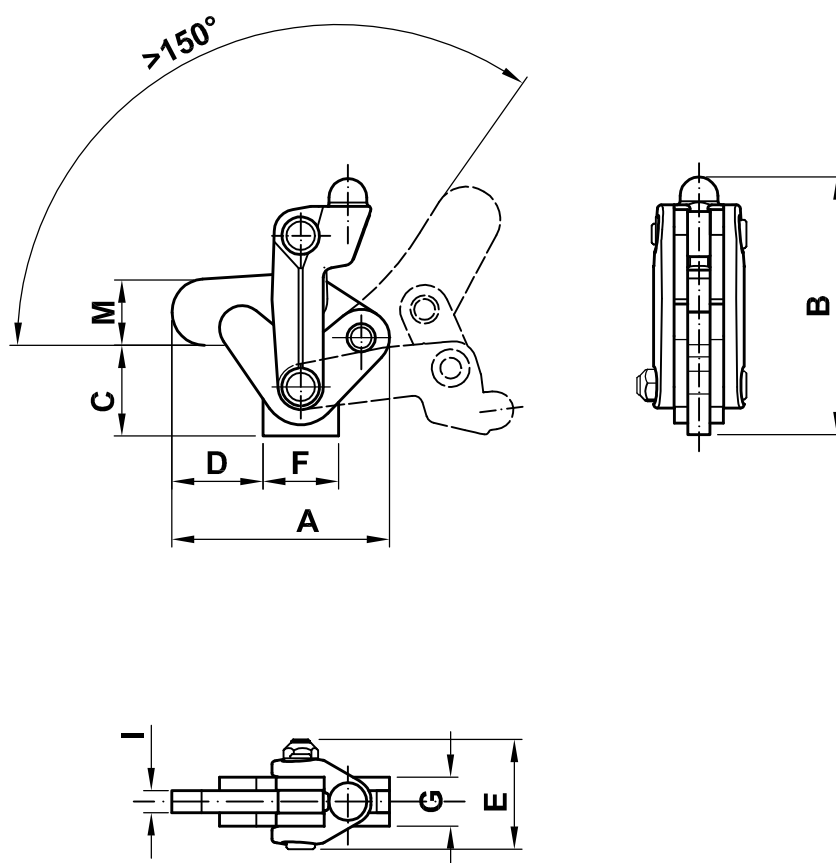
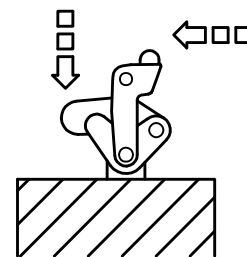
**Supporting bushes:** Hardened and ground steel

**Accessories:** To be ordered separately (see Accessories on page 24)

**Features and applications:** The clamping and control levers are forged; for uses in medium and heavy duty clamping works, on welding jigs, carpentry works, moulds and generally when high clamping forces are needed and when there is strong repetitiveness of movements.

The design of these mechanisms is more versatile, being possible to weld the different parts and accessories and make up your clamp to better meet your requirements.

Tested for more than 1,000,000 cycles.



Code	Description	A	B	C	D	E	F	G	I	M	Fh (daN)	gr.
AA710	LSH01	57,5	68	24	24	29	20	13	6	17,5	220	268
AA735	LSH02	85,5	113	42	32	42	30	20	10	28	440	820
AA760	LSH03	115	148	57	40,5	52	50	24	12	35	850	1600
AA785	LSH04	147,5	183	66,5	55,5	68	60	32	16	40,5	1540	3450

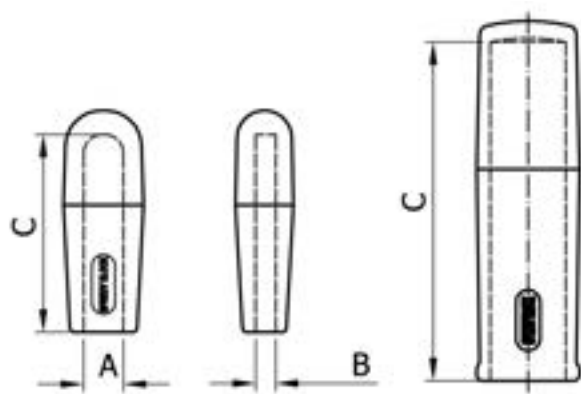


## APPLICATIONS



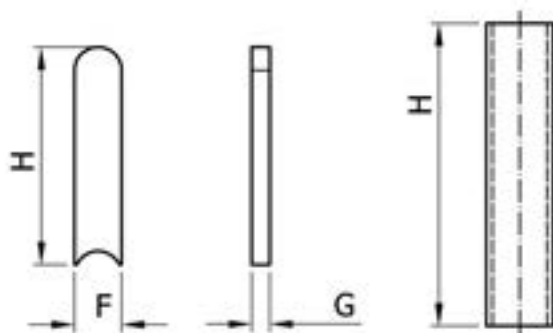


## LONG LIFE SERIES ACCESSORIES



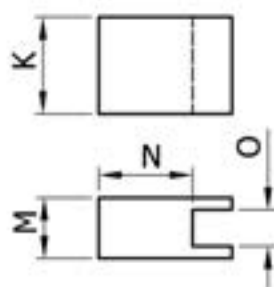
### HANDLE

Code	Description	A	B	C	F	gr
AU151	10151	13	5	55		12
AU154	10154	20	8	77		34
AU156	10156			112	22	50
AU157	10157			112	25	50



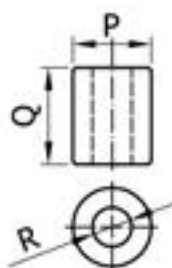
### CONTROL LEVER

Code	Description	F	G	H	gr
AU250	LC01	13	5	63	31
AU255	LC02	20	8	90	108
AU260	LC03	22		122	122
AU265	LC04	25		138	175



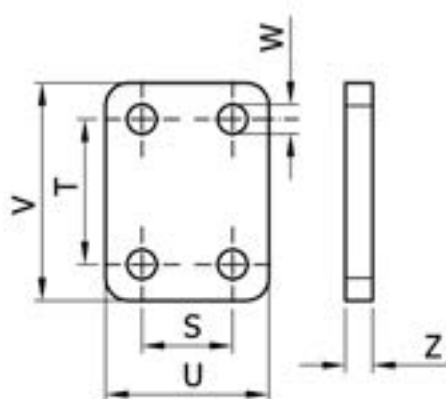
### CLAMPING LEVER

Code	Description	K	M	N	O	gr
AU230	LS01	16	10	15.5	6	23
AU235	LS02	24	15	24	10	75.5
AU240	LS03	30	20	22.1	12	130
AU245	LS04	35	25	23.5	16.2	160



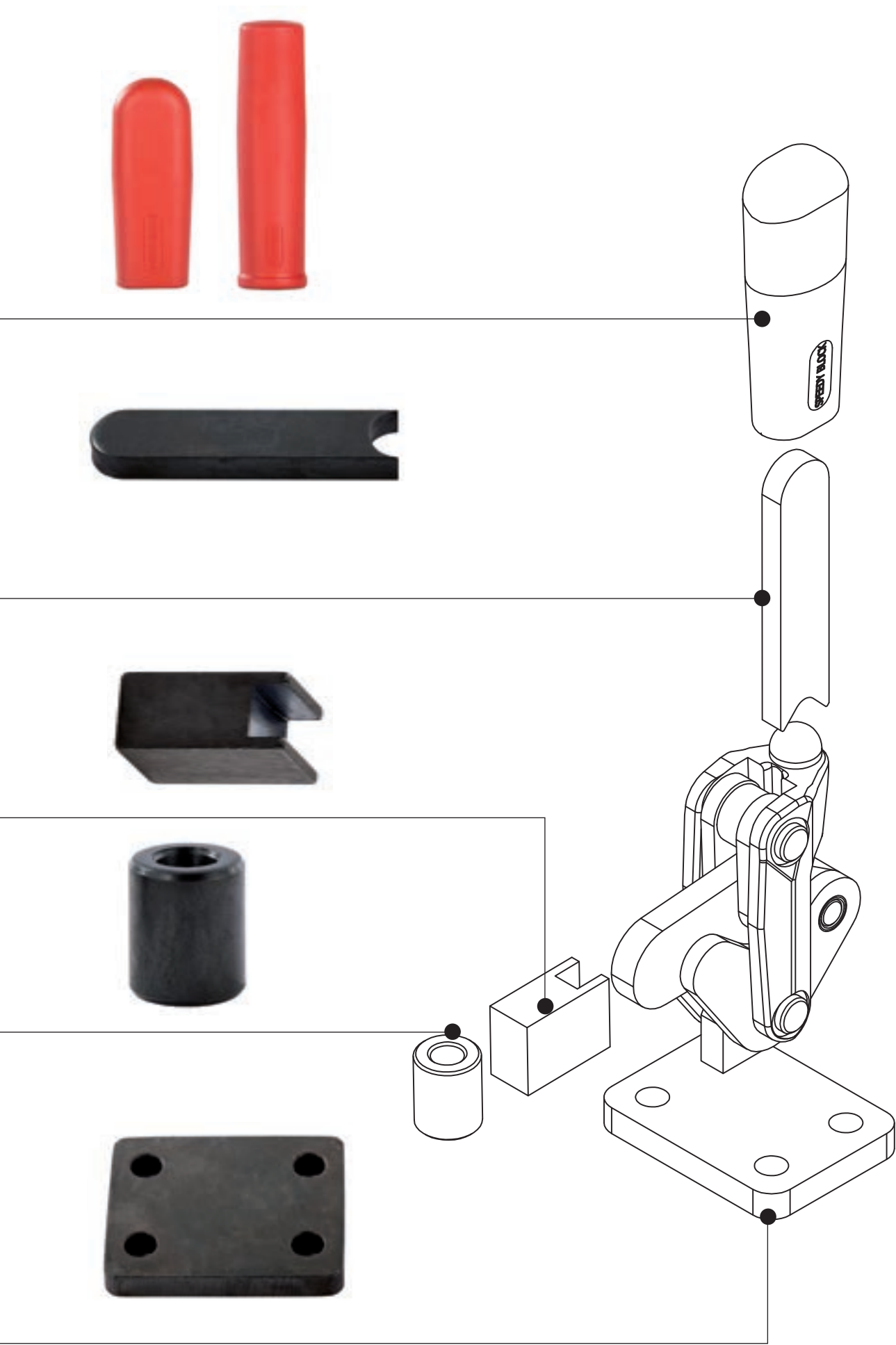
### SLEEVE

Code	Description	P	Q	R	gr
AU280	LM01	13	16	6.5	13
AU285	LM02	20	24	10.5	42
AU290	LM03	24	30	12.5	76
AU295	LM04	32	35	16.5	120

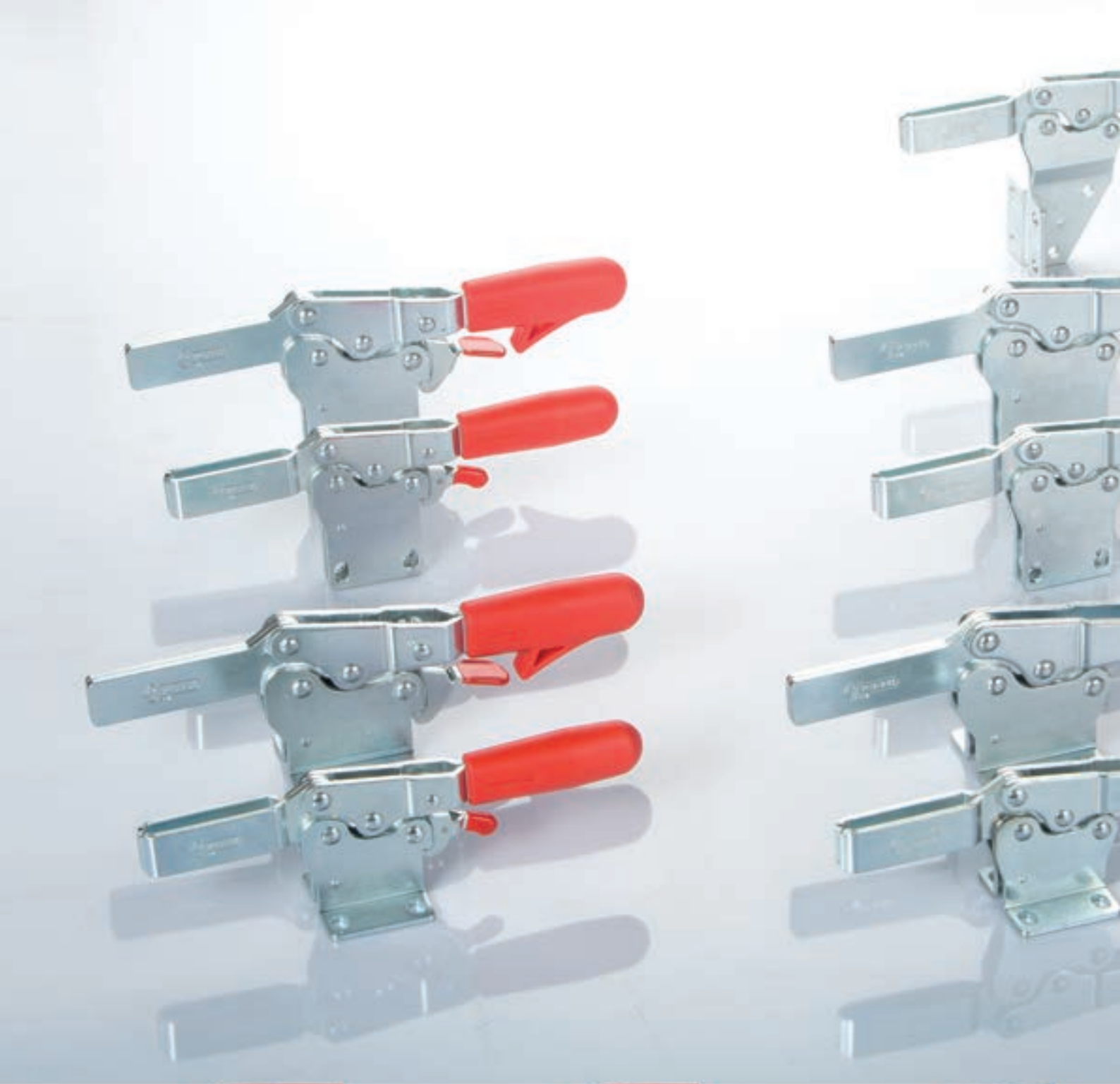


### BASE PLATE

Code	Description	S	T	U	V	W	Z	gr
AU300	PB01	20	32	36	48	6.5	6	74
AU305	PB02	30	45	54	65	8.5	8	205
AU310	PB03	55	55	75	75	10.5	10	400
AU315	PB04	65	65	90	100	12.5	10	570









# HORIZONTAL SERIES

The control and clamping levers move in opposite directions. When clamping is obtained, the control lever is in the horizontal position. Available with clamping forces between 40 and 620 daN.

## PERFORMANCE

Components in case-hardening sheet steel. Hardened and tempered supporting pivots. Supporting bushes (for sizes from 350 daN and over) undergo case-hardening and grinding. Finish: Galvanized. The shape of the tool ensures a safe distance between the clamping and control lever that prevents the operator's fingers from getting stuck during the opening of the tool.

The clamping lever is guided during closing to ensure greater stability against transverse stresses.

In order to prevent accidental openings, caused by vibrations, some tools of this series are provided with a device called, "safety device", suitable for maintaining the clamp in a closed position.

# HORIZONTAL SERIES



## HORIZONTAL SERIES WITH FOLDED BASE.

Some sizes of this series are also made of stainless steel and are shown in red.

**Material:** Galvanized steel or **AISI 304 stainless steel**

**Riveted pivots:** Galvanized steel or **AISI 304 stainless steel**

**Supporting bushes:** Hardened and ground steel (for sizes  $\geq 355$ )

**Handles:** Red polyurethane, resistant to oils, grease and other chemical agents.

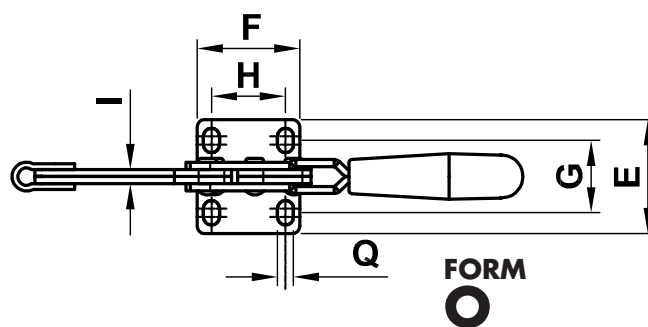
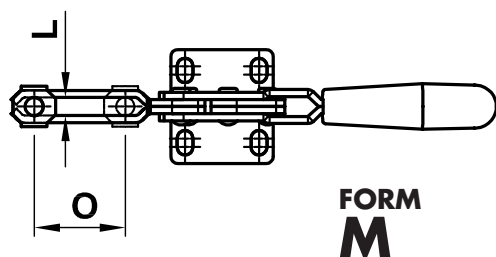
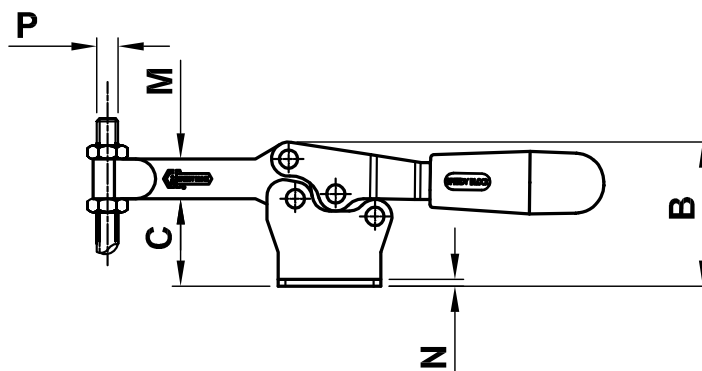
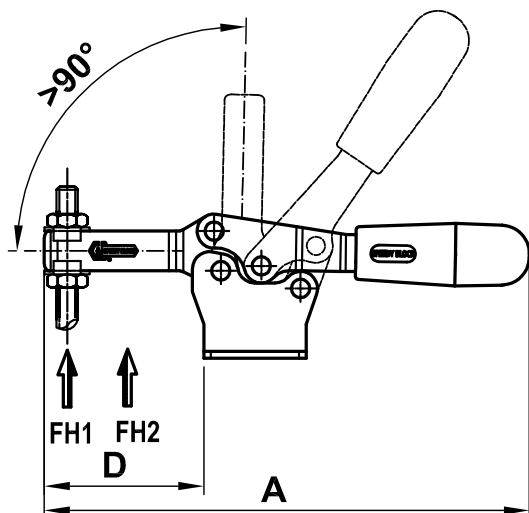
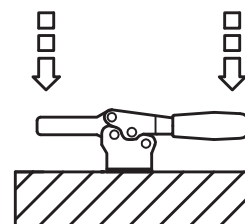
**Performance:** Form M and **form MX** with open clamping lever and two flanged washers. Form O and **form OX** with full clamping lever and bolt retainers to be welded in the desired position and angle.

**Spindles:** To be ordered separately (see Accessories on page 76)

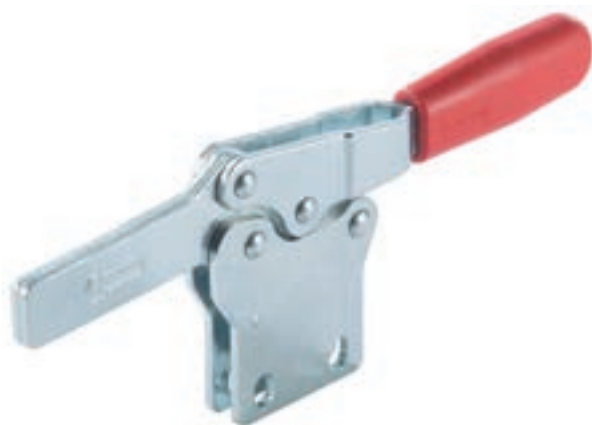
### Features and applications:

The main feature of this series is the low profile of the tool; these tools are designed to prevent the operator's fingers from being crushed by the levers when opening. During the closing, the clamping lever is guided laterally to ensure greater stability against possible transverse stresses.

A special grease is placed between two contacting surfaces during assembly.



Code	Description	Stainless steel Code	Stainless steel	A	B	C	D	E	F	G	H	I	L	M	N	O	P	Q	Fh1 (daN)	Fh2 (daN)	gr.
AD025	25/M	DS025	25/MX	68	23	12	19	24,5	24	16	15		4,2	7	1,2	10	M4	4,3	40		25
AD075	75/M	DS075	75/MX	118	37	20	40	26	28	16÷19	13,5		5,5	11	2	20	M5	4,5	90	135	88
AD085	75/O	DS085	75/OX	118,5	37	20	40,5	26	28	16÷19	13,5	4		11	2		M5	4,5	90	135	88
AD135	130/M	DS135	130/MX	170	51	30,5	56	40	36	22,4÷28,4	26		6,5	16	2,5	32	M6	5,5	100	200	200
AD145	130/O	DS145	130/OX	171	51	30,5	57	40	36	22,4÷28,4	26	5		16	2,5		M6	5,5	100	200	200
AD270	230/M	DS270	230/MX	195	61,5	36,5	65	42	44	26÷31,5	26		8,5	18	3	37	M8	6,5	170	330	330
AD280	230/O	DS280	230/OX	197	61,5	36,5	67	42	44	26÷31,5	26	6		18	3		M8	6,5	170	330	340
AD370	355/M			269	83	50	100	56	60	38,8÷43	41		10	22	3,5	58	M10	8,5	180	400	700
AD380	355/O			271	83	50	102	56	60	38,8÷43	41	7		22	3,5		M10	8,5	180	400	720
AD470	455/M			308	98,5	60	115	65	70	40÷43	41,5		12,4	26	4	65	M12	8,5	320	620	1200
AD480	455/O			310	98,5	60	117	65	70	40÷43	41,5	10		26	4		M12	8,5	320	620	1230



## HORIZONTAL SERIES WITH STRAIGHT BASE.

Some sizes of this series are also made of stainless steel and are shown in red.

**Material:** Galvanized steel or **AISI 304 stainless steel**

**Riveted pivots:** Galvanized steel or **AISI 304 stainless steel**

**Supporting bushes:** Hardened and ground steel  
(for sizes  $\geq 355$ )

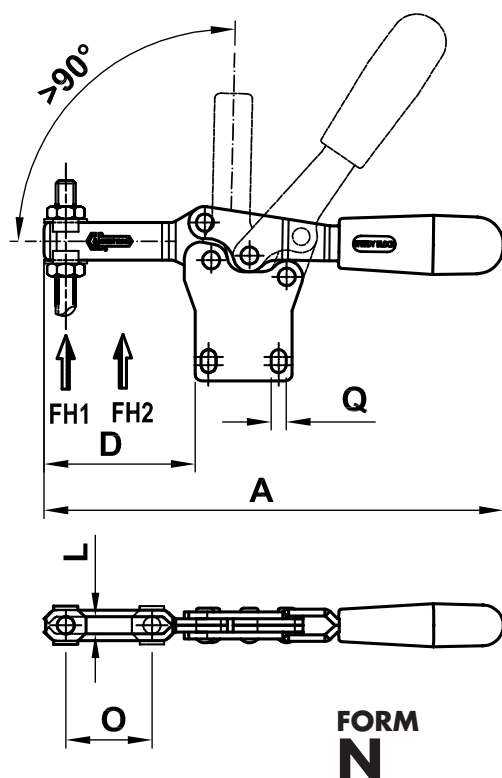
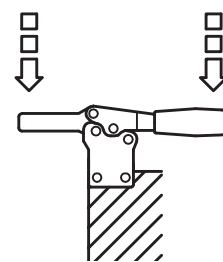
**Handles:** Red polyurethane, resistant to oils, grease and other chemical agents.

**Performance:** Form N and **form NX** with open clamping lever and two flanged washers. Form P and **form PX** with full clamping lever and bolt retainers to be welded in the desired position and angle.

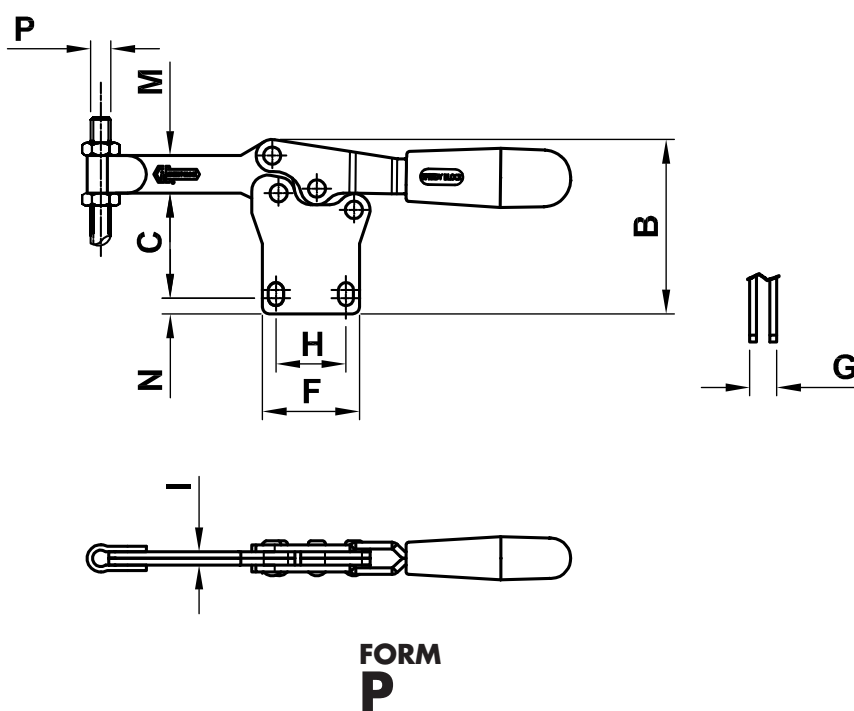
**Spindles:** To be ordered separately (see Accessories on page 76)

**Features and applications:** The main feature of this series is the low profile of the tool; these tools are designed to prevent the operator's fingers from being crushed by the levers when opening. During the closing, the clamping lever is guided laterally to ensure greater stability against possible transverse stresses.

A special grease is placed between two contacting surfaces during assembly.



**FORM  
N**



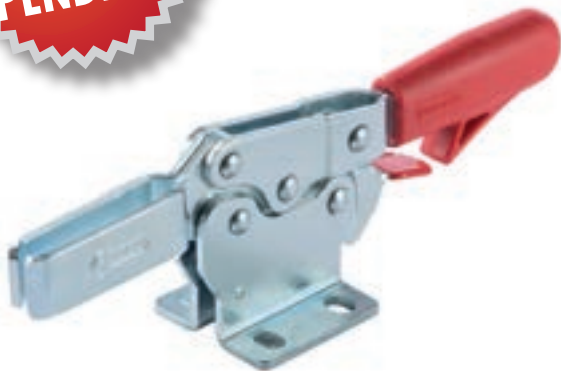
**FORM  
P**

Code	Description	Stainless steel Code	Stainless steel	A	B	C	D	F	G	H	I	L	M	N	O	P	Q	Fh1 (daN)	Fh2 (daN)	gr.
AD080	75/N	DS080	75/NX	118	44,5	24÷25,5	40	28	8	13,5		5,5	11	4,5	20	M5	4,5	90	135	88
AD090	75/P	DS090	75/PX	118,5	44,5	24÷25,5	40,5	28	8	13,5	4		11	4,5		M5	4,5	90	135	88
AD140	130/N	DS140	130/NX	170	64	35÷38	56	36	10	26		6,5	16	7	32	M6	5,5	100	200	200
AD150	130/P	DS150	130/PX	171	64	35÷38	57	36	10	26	5		16	7		M6	5,5	100	200	200
AD275	230/N	DS275	230/NX	195	74,5	42÷44,5	65	44	12	26		8,5	18	6,75	37	M8	6,5	170	330	330
AD285	230/P	DS285	230/PX	197	74,5	42÷44,5	67	44	12	26	6		18	6,75		M8	6,5	170	330	340
AD375	355/N			269	102	60÷62	100	60	14	41		10	22	7,5	58	M10	8,5	180	400	700
AD385	355/P			271	102	60÷62	102	60	14	41	7		22	7,5		M10	8,5	180	400	720
AD475	455/N			308	119	68÷69,5	115	70	18	41,5		12,4	26	11,75	65	M12	8,5	320	620	1200
AD485	455/P			310	119	68÷69,5	117	70	18	41,5	10		26	11,75		M12	8,5	320	620	1230



## HORIZONTAL SERIES

**PATENT  
PENDING**



### HORIZONTAL SERIES WITH FOLDED BASE AND WITH ANTI-RELEASE LEVER

Some sizes of this series are also produced in stainless steel and are shown below in red.

**Material:** Galvanized steel or **AISI 304 stainless steel**  
**Riveted pivots:** Galvanized steel or **AISI 304 stainless steel**

**Supporting bushes:** Hardened and ground steel (for sizes  $\geq 355$ )

**Handles:** Red polyurethane resistant to oils, grease and other chemical agents.

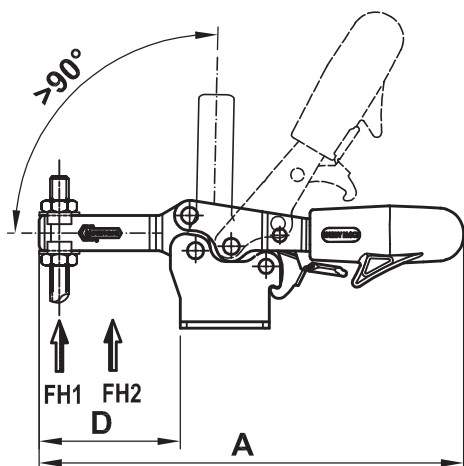
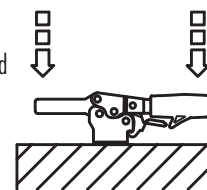
**Performance:** Form ML and **form MLX** with open clamping lever and two flanged washers.

Form OL and **form OLX** with full clamping lever and bolt retainers to be welded in the desired position and angle.

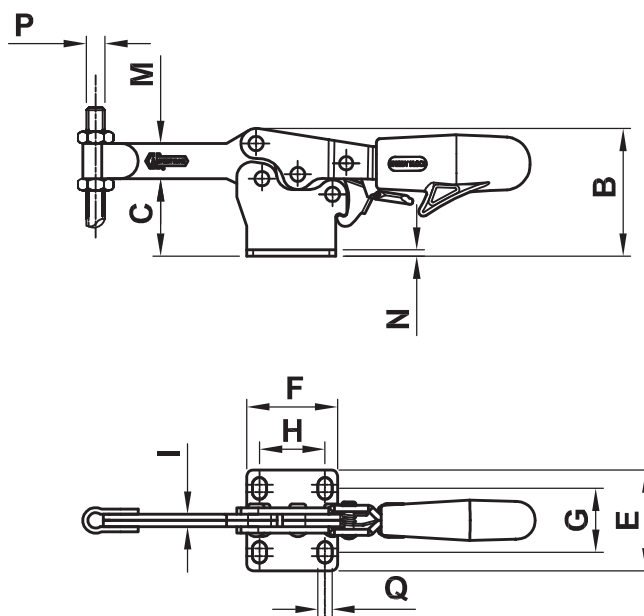
**Spindles:** To be ordered separately (see Accessories on page 76)

**Features and applications:** The main feature of this series is the special anti-release lever with the purpose of avoiding any accidental openings caused by vibrations; these tools are designed to prevent the operator's fingers from being crushed by the levers when opening. During the closing, the clamping lever is guided laterally to ensure greater stability against possible transverse stresses.

A special grease is placed between two contacting surfaces during assembly.



**FORM  
ML**



**FORM  
OL**

Code	Description	Stainless steel Code	Stainless steel	A	B	C	D	E	F	G	H	I	L	M	N	O	P	Q	Fh1 (daN)	Fh2 (daN)	gr.
AD092	75/ML	DS100	75/MLX	118	37	20	39	26	28	16÷19	13,5		5,3	11	2	20	M5	4,5	90	135	90
AD096	75/OL	DS104	75/OLX	118,5	37	20	39,5	26	28	16÷19	13,5	4		11	2		M5	4,5	90	135	90
AD152	130/ML	DS152	130/MLX	171,5	51	30,5	56,5	40	36	22,4÷28,4	26		6,3	16	2,5	32	M6	5,6	100	200	200
AD156	130/OL	DS156	130/OLX	172	51	30,5	57	40	36	22,4÷28,4	26	5		16	2,5		M6	5,6	100	200	200
AD290	230/ML	DS287	230/MLX	196	61,5	36,5	65	44	44	26÷31,5	26		8,5	18	3	37	M8	6,6	170	330	320
AD294	230/OL	DS291	230/OLX	196,5	61,5	36,5	66	44	44	26÷31,5	26	6		18	3		M8	6,6	170	330	330
AD390	355/ML			269	83	50	100	58	60	38,8÷43	41		10,5	22	3,5	58	M10	8,6	180	400	750
AD394	355/OL			270	83	50	101	58	60	38,8÷43	41	7		22	3,5		M10	8,6	180	400	750
AD490	455/ML			305	99	60	114	65	70	40÷43	41,5		12,5	26	4	65	M12	8,7	320	620	1200
AD494	455/OL			306,5	99	60	115,5	65	70	40÷43	41,5	10		26	4		M12	8,7	320	620	1220



**PATENT  
PENDING**



## HORIZONTAL SERIES WITH STRAIGHT BASE AND WITH ANTI-RELEASE LEVER

Some sizes of this series are also produced in stainless steel and are shown below in red.

**Material:** Galvanized steel or **AISI 304 stainless steel**  
**Riveted pivots:** Galvanized steel or **AISI 304 stainless steel**

**Supporting bushes:** Hardened and ground steel (for sizes  $\geq 355$ )

**Handles:** Red polyurethane resistant to oils, grease and other chemical agents.

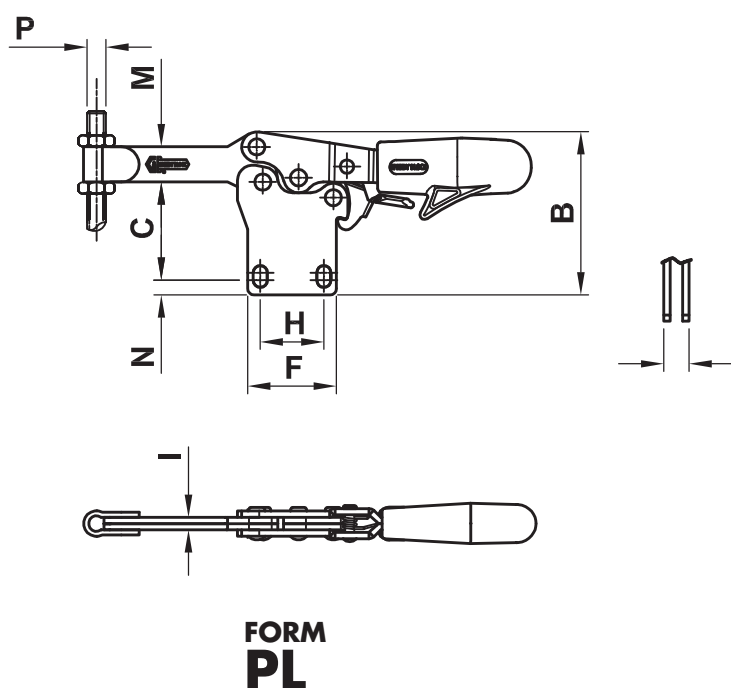
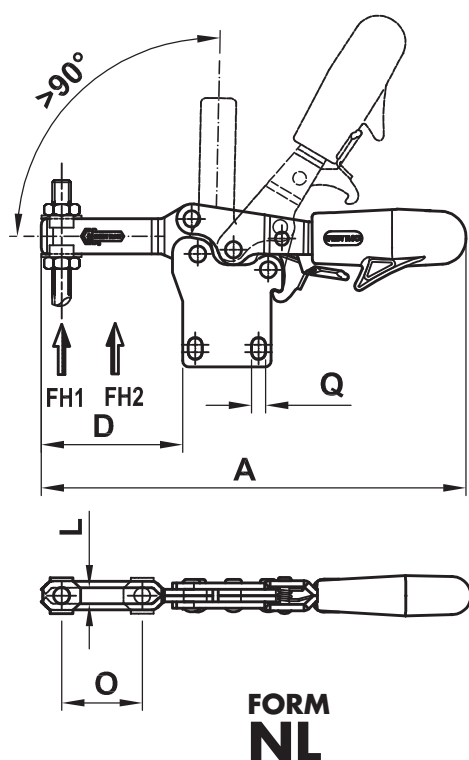
**Performance:** Form NL and **form NLX** with open clamping lever and two flanged washers.

Form PL and **form PLX** with full clamping lever and bolt retainers to be welded in the desired position and angle.

**Spindles:** To be ordered separately (see Accessories on page 76)

**Features and applications:** The main feature of this series is the special anti-release lever with the purpose of avoiding any accidental openings caused by vibrations; these tools are designed to prevent the operator's fingers from being crushed by the levers when opening. During the closing, the clamping lever is guided laterally to ensure greater stability against possible transverse stresses.

A special grease is placed between two contacting surfaces during assembly.



Code	Description	Stainless steel Code	Stainless steel	A	B	C	D	F	G	H	I	L	M	N	O	P	Q	Fh1 (daN)	Fh2 (daN)	gr.
AD094	75/NL	DS102	75/NLX	118	45,5	24÷25,5	39	28	8	13,5		5,3	11	5÷3,5	20	M5	4,5	90	135	90
AD098	75/PL	DS106	75/PLX	118,5	45,5	24÷25,5	39,5	28	8	13,5	4	11	11	5÷3,5		M5	4,5	90	135	90
AD154	130/NL	DS154	130/NLX	171,5	64,5	35÷38	56,5	36	10	26		6,3	16	8,8÷5,8	32	M6	5,6	100	200	200
AD158	130/PL	DS158	130/PLX	172	64,5	35÷38	57	36	10	26	5	16	16	8,8÷5,8		M6	5,6	100	200	200
AD292	230/NL	DS289	230/NLX	196	75,5	42÷44,5	65	44	12	26		8,5	18	9÷6,5	37	M8	6,6	170	330	320
AD296	230/PL	DS293	230/PLX	196,5	75,5	42÷44,5	66	44	12	26	6	18	18	9÷6,5		M8	6,6	170	330	330
AD392	355/NL			269	102	60÷62	100	60	14	41		10,5	22	9,6÷7,5	58	M10	8,6	180	400	730
AD396	355/PL			270	102	60÷62	101	60	14	41	7	22	22	9,6÷7,5		M10	8,6	180	400	750
AD492	455/NL			305	120	68÷69,5	114	70	18	41,5		12,5	26	12,5÷11	65	M12	8,7	320	620	1200
AD496	455/PL			306,5	120	68÷69,5	115,5	70	18	41,5	10	26	26	12,5÷11		M12	8,7	320	620	1220

# HORIZONTAL SERIES



## HORIZONTAL SERIES WITH FRONT BASE

Some sizes of this series are also produced in stainless steel and are shown below in red.

**Material:** Galvanized steel or **AISI 304 stainless steel**

**Riveted pivots:** Galvanized steel or **AISI 304 stainless steel**

**Supporting bushes:** Hardened and ground steel (for sizes  $\geq 355$ )

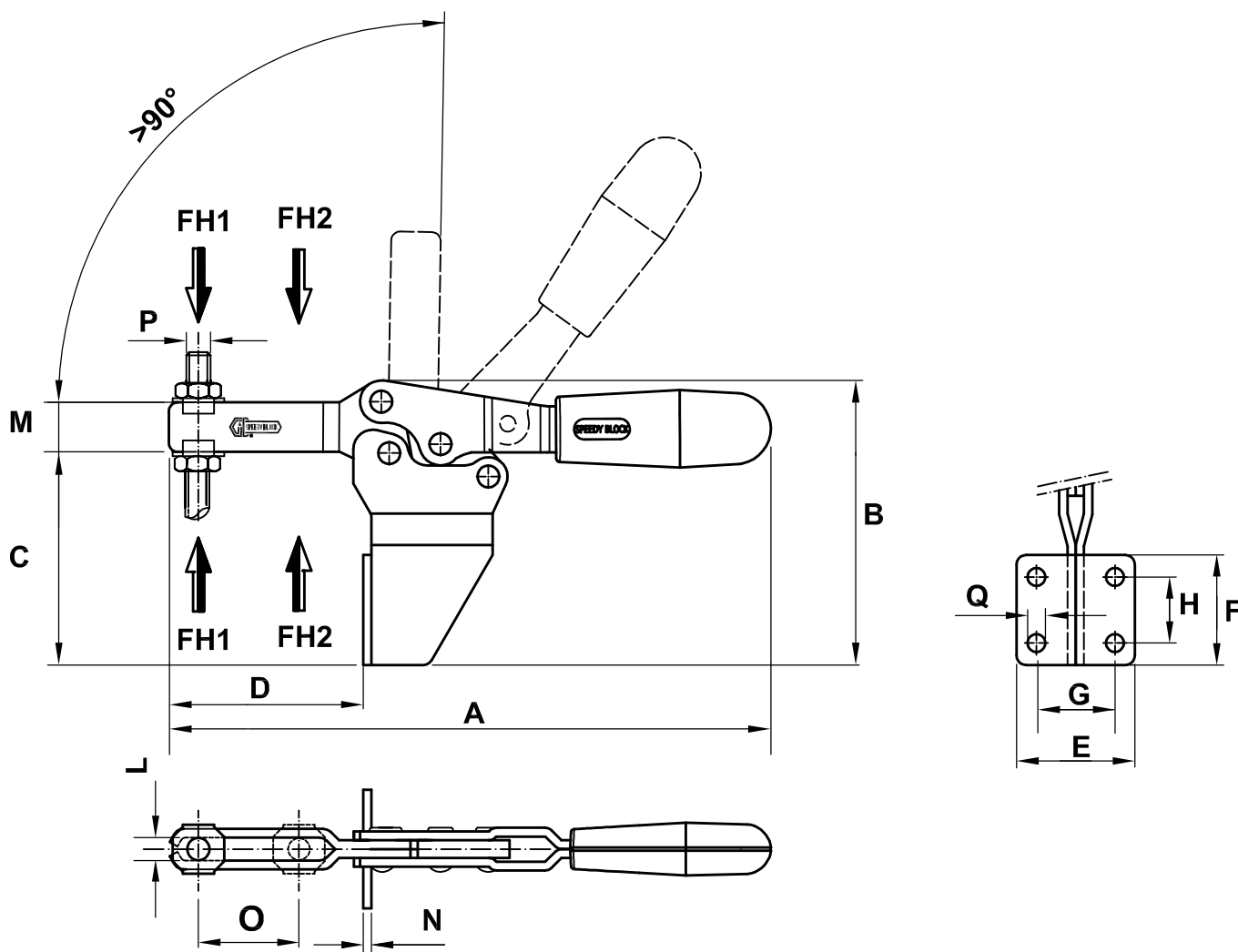
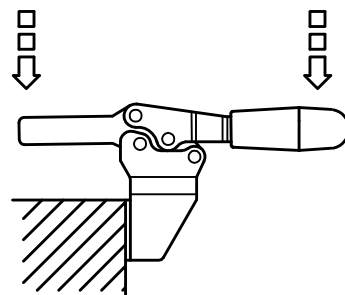
**Handles:** Red polyurethane resistant to oils, grease and other chemical agents.

**Performance:** Form MF and **form MFX** with open clamping lever and two flanged washers.

**Spindles:** To be ordered separately (see Accessories on page 76)

**Features and applications:** The main feature of this series is the front mount; these tools are designed to prevent the operator's fingers from being crushed by the levers when opening. During the closing, the clamping lever is guided laterally to ensure greater stability against possible transverse stresses.

A special grease is placed between two contacting surfaces during assembly.



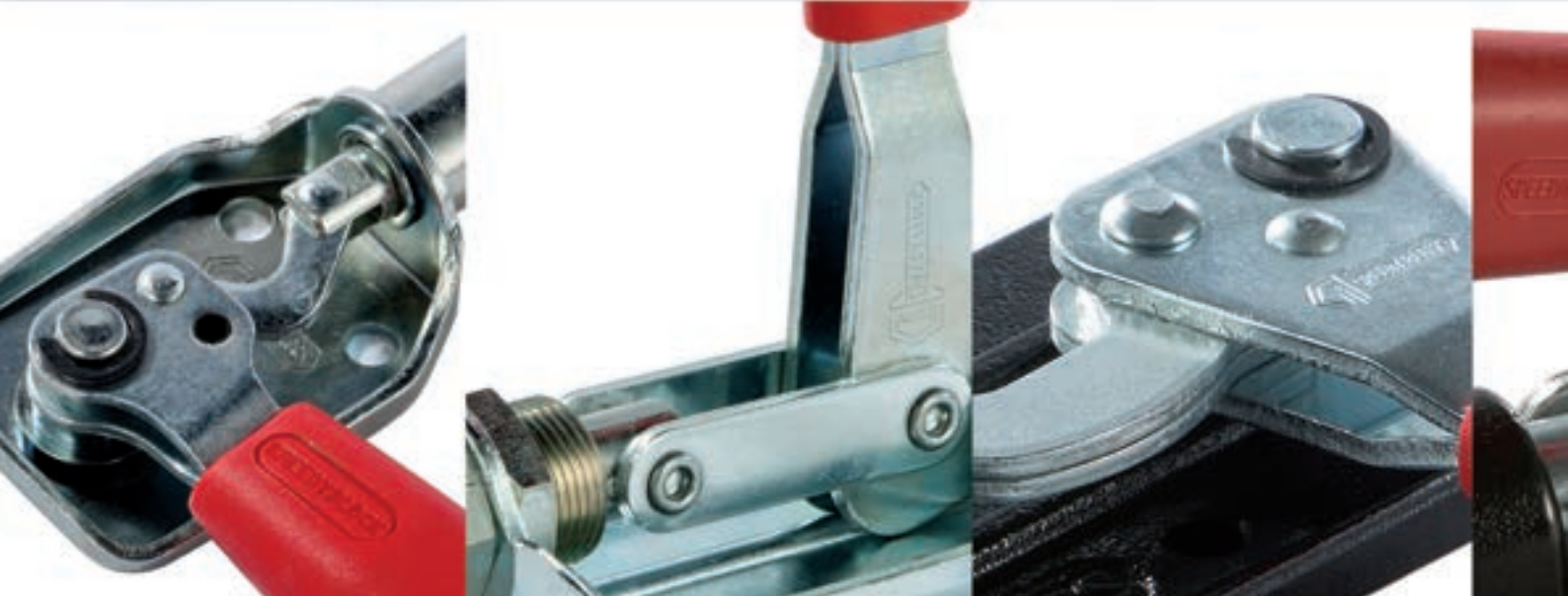
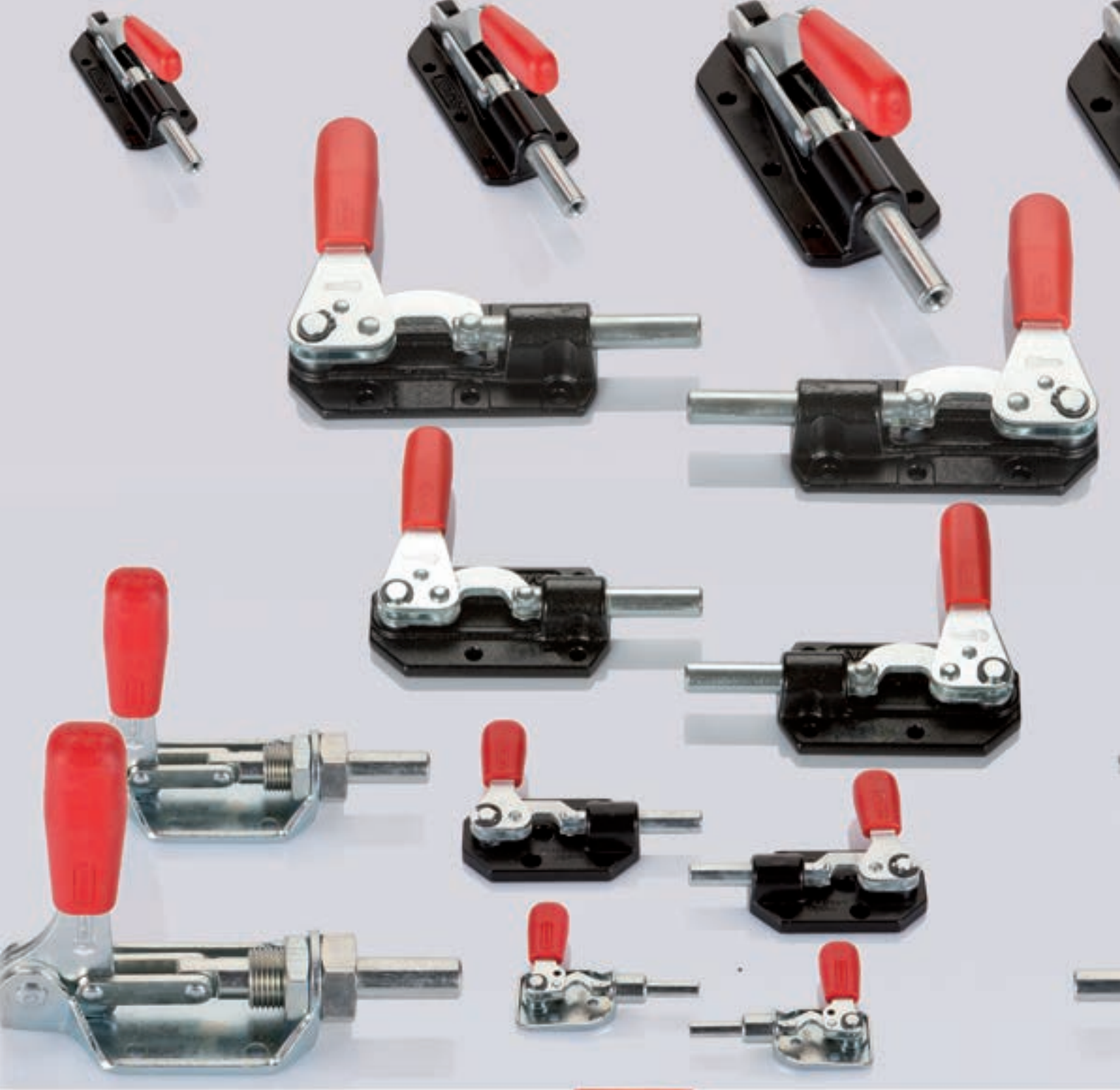
Code	Description	Stainless steel Code	Stainless steel	A	B	C	D	E	F	G	H	L	M	N	O	P	Q	Fh1 (daN)	Fh2 (daN)	gr.
AD076	75/MF	DS076	75/MFX	118	62	45	36	30	25,5	18	13,5	5,5	11	2	20	M5	4,5	90	135	105
AD136	130/MF	DS136	130/MFX	171,5	85	64	54	39	35	26	22	6,5	16	2,5	32	M6	5,5	100	200	240
AD271	230/MF	DS271	230/MFX	196	102	77	62	43	40	28,5	24	8,5	18	3	37	M8	6,5	170	330	400
AD371	355/MF			269	135	102	96	52	52	32	32	10,5	22	3,5	58	M10	8,5	180	400	830



## APPLICATIONS









# STRAIGHT-LINE ACTION SERIES

In this series, the circular movement of the control lever is transformed into a linear movement of the push rod. Excepted for models 120/AS and 300/AS, this series works and clamps either by pushing or pulling. The light version meets clamping requirements from 80 to 720 daN, while the heavy series from 120 to 4500 daN.

## PERFORMANCE

**FOR THE LIGHT SERIES:** Push rod, guide sleeve and other parts in galvanized sheet steel.

The main feature of the ASD/ASS models is the low force application point as well as the very reduced encumbrance in the vertical. Models 80-165-340/AS have the possibility of front mounting with an external thread that enables rotation of the control lever to the most favourable position for use. The bracket increases the range of applications.

**FOR THE HEAVY SERIES:** Based made of black varnished brass for size 70. Base made of forged black varnished steel for the other sizes. Components in galvanized case hardening sheet steel. Galvanized steel push rods. Supporting bushes and pivots undergo case hardening.



## STRAIGHT-LINE ACTION SERIES



### PUSH AND PULL STRAIGHT-LINE ACTION SERIES

**Material:** Galvanized steel

**Riveted pivots, sliding push bar and bearing:** Galvanized steel

**Handles:** Red polyurethane resistant to oils, grease and other chemical agents.

#### Performance:

Form ASS

push clamping with clockwise control lever rotation

traction clamping with anti-clockwise control lever rotation

Form ASD

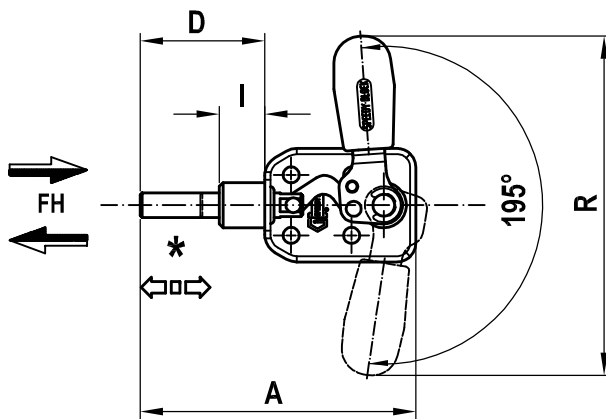
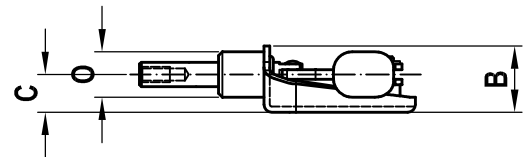
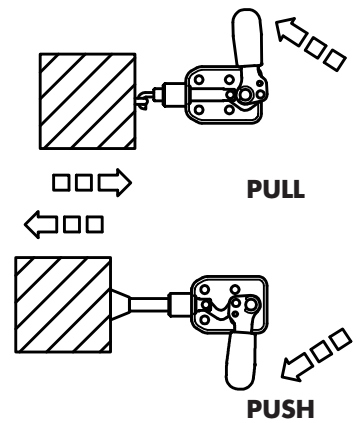
traction clamping with anti-clockwise control lever rotation

traction clamping with clockwise control lever rotation

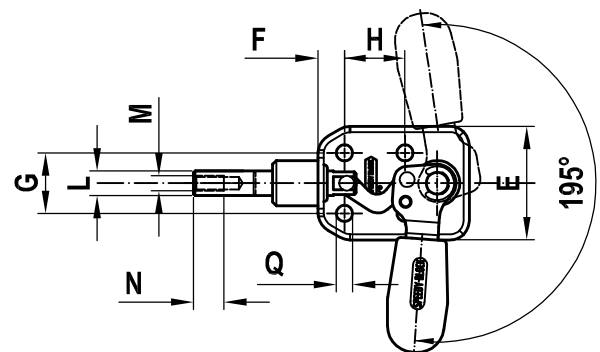
**Spindles:** To be ordered separately (see Accessories on page 76)

**Features and applications:** The main feature of this series is its low force application point as well as the very reduced encumbrance in the vertical.

A special grease is placed between two contacting surfaces during assembly.



**FORM  
ASD**



**FORM  
ASS**

Code	Description	A	B	C	D	E	F	G	H	I	L	M	N	O	Q	R	*	Fh (daN)	gr.
AG050	50/ASD	73	17,5	10	33	30,5	7	16	16	12	6,5	M4	9	12	4,3	90	16	80	60
AG055	50/ASS	73	17,5	10	33	30,5	7	16	16	12	6,5	M4	9	12	4,3	90	16	80	60

## STRAIGHT-LINE ACTION SERIES



### PUSH AND PULL STRAIGHT-LINE ACTION SERIES

**Material:** Galvanized steel

**Riveted pivots, push bar and control lever:** Galvanized steel

**Basic clamp body:** Black varnished brass for size 70; hot forged steel and painted black for the other sizes.

**Handles:** Red polyurethane resistant to oils, grease and other chemical agents.

#### Performance:

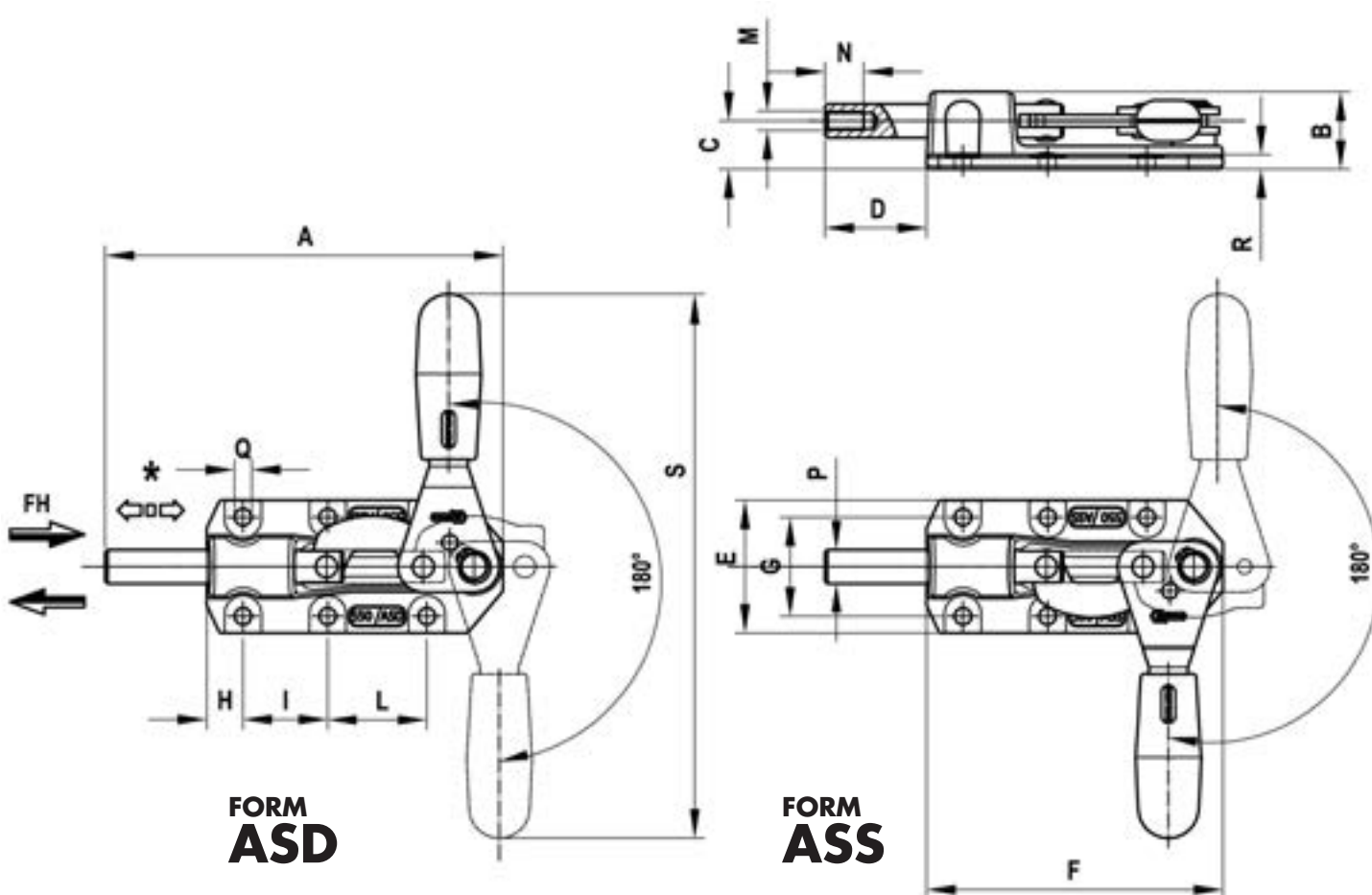
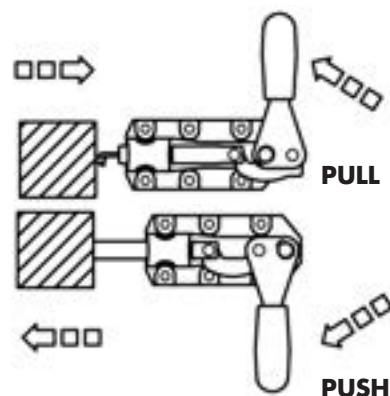
ASS Form push clamping with clockwise control lever rotation  
traction clamping with anti-clockwise control lever rotation

ASD Form traction clamping with anti-clockwise control lever rotation  
traction clamping with clockwise control lever rotation

**Spindles:** To be ordered separately (see Accessories on page 76)

**Features and applications:** The main feature of this series is its low force application point as well as the very reduced encumbrance in the vertical.

A special grease is placed between two contacting surfaces during assembly.



Code	Description	A	B	C	D	E	F	G	H	I	L	M	N	P	Q	R	S	*	Fh (daN)	gr.
AG075	70/ASD	85	19,5	12	22	36	64	26	13	26		M6	12	8,5	4,3	6	98	20	90	160
AG080	70/ASS	85	19,5	12	22	36	64	26	13	26		M6	12	8,5	4,3	6	98	20	90	160
AG165	160/ASD	117	25	15	32	46	85	33,5	11,5	36,5		M6	12	11	5,5	7	158	30	130	350
AG170	160/ASS	117	25	15	32	46	85	33,5	11,5	36,5		M6	12	11	5,5	7	158	30	130	350
AG175	550/ASD	164,5	32	20	42	55	122,5	41	15	35	41	M8	16	14	7	7	225	42	450	720
AG180	550/ASS	164,5	32	20	42	55	122,5	41	15	35	41	M8	16	14	7	7	225	42	450	720

## STRAIGHT-LINE ACTION SERIES



### ONLY PUSH STRAIGHT-LINE ACTION SERIES

**Material:** Galvanized steel

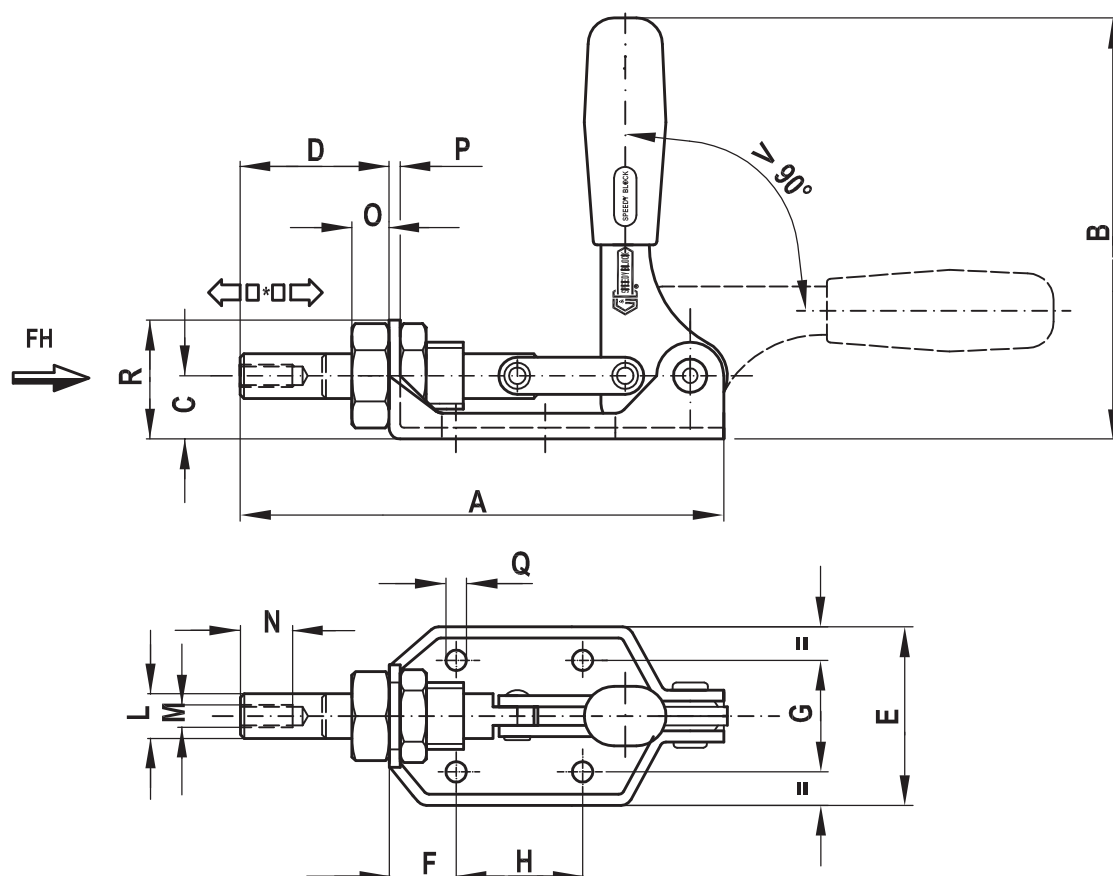
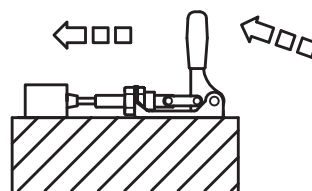
**Riveted pivots, push bar, sliding bearing and nut:** Galvanized steel

**Handles:** Red polyurethane resistant to oils, grease and other chemical agents.

**Spindles:** To be ordered separately

(see Accessories on page 76)

**Features and applications:** The tools of this series can only be pushed. A special grease is placed between two contacting surfaces during assembly.



Code	Description	A	B	C	D	E	F	G	H	L	M	N	O	P	Q	R	*	Fh (daN)	gr.
AG120	120/AS	130	111	17	40	48	18	30	34	12	M6	12	10	3	5,5	32	20	360	350
AG300	300/AS	167	140	20	57	58	18	34	50	14	M8	16	12	3	6,5	36	33	720	560



## STRAIGHT-LINE ACTION SERIES



### PUSH AND PULL STRAIGHT-LINE ACTION SERIES

**Material:** Galvanized steel

**Riveted pivots, push bar and control lever:** Galvanized steel

**Basic clamp body:** Black varnished brass for size 70; hot forged steel and painted black for the other sizes.

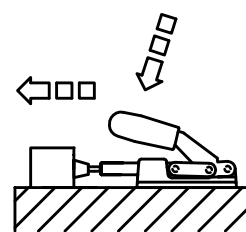
**Handles:** Red polyurethane resistant to oils, grease and other chemical agents.

**Spindles:** To be ordered separately (see Accessories on page 76)

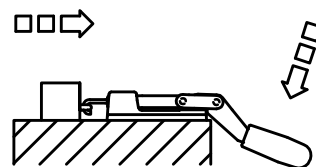
**Features and applications:** The tools of this series can either be pushed or pulled.

A special grease is placed between two contacting surfaces during assembly.

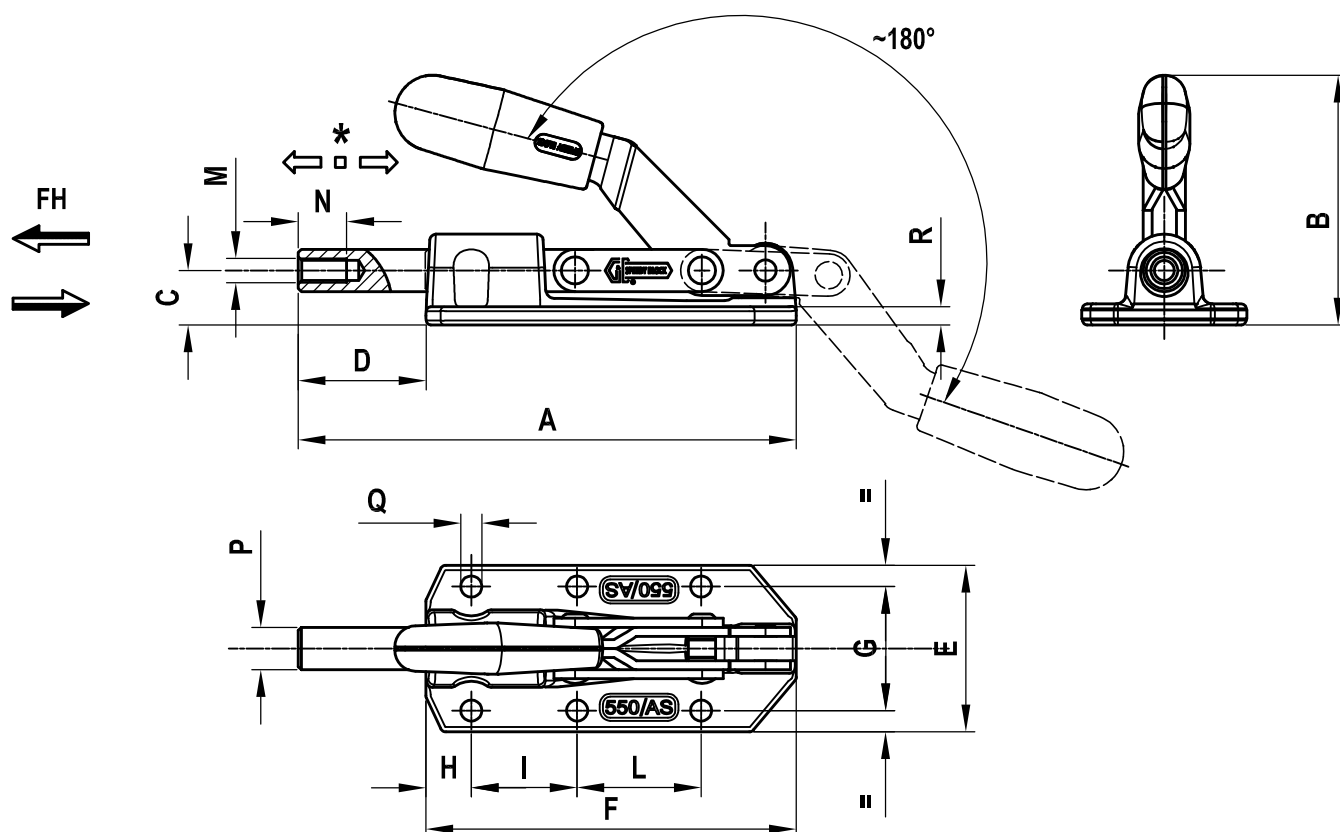
This pneumatic actuated series is found on page 72.



**PUSH**



**PULL**



Code	Description	A	B	C	D	E	F	G	H	I	L	M	N	P	Q	R	*	Fh (daN)	gr.
AG070	70/AS	86	42,5	12	22	36	64	26	13	26		M6	12	8,5	4,3	6	20	120	165
AG160	160/AS	116	56	15	31	46	85	33,5	11,5	36,5		M6	12	11	5,5	7	30	280	360
AG351	360/AS	122	72	25	32	45,5	90	33,5	30	36,5		M8	15	12	5,5	7	32	560	480
AG355	550/AS	164,5	75	18	42	55	122,5	41	15	35	41	M8	16	14	7	7	42	800	750
AG361	1100/AS	182	95	25	49	57	133	41	15	35	41	M10	18	16	8,5	8	50	1600	1060
AG371	2100/AS	238	118,5	35	61	70	177	50	35	50	50	M12	22	20	8,5	10	60	2500	2280
AG381	3100/AS	316	137	40	100	76	216	54	40	70	70	M14	25	22	11	10	100	4500	3350

## STRAIGHT-LINE ACTION SERIES



### PUSH AND PULL STRAIGHT-LINE ACTION SERIES

The sizes of this series are also produced in stainless steel and are shown below in red.

**Material:** Galvanized steel or **AISI 304 stainless steel**

**Riveted pivots, push bar, bushing fixing screws and sliding bearing and ring:**

Galvanized steel or **AISI 304 stainless steel**

**Sliding bushes:** Galvanized steel or **AISI 303 steel**

**Mounting bracket (to be ordered separately):**

Galvanized steel or **AISI 304 stainless steel**

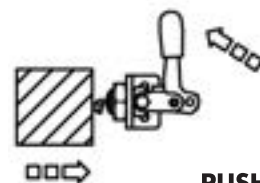
**Handles:** Red polyurethane resistant to oils, grease and other chemical agents.

**Spindles:** To be ordered separately (see Accessories on page 76)

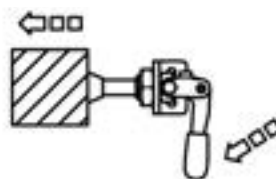
**Features and applications:** Thanks to the front thread, the tools of this series can be mounted directly on the equipment used and the control lever can be turned to the most favourable position for use.

The mounting bracket (order separately) increases the possibility of use.

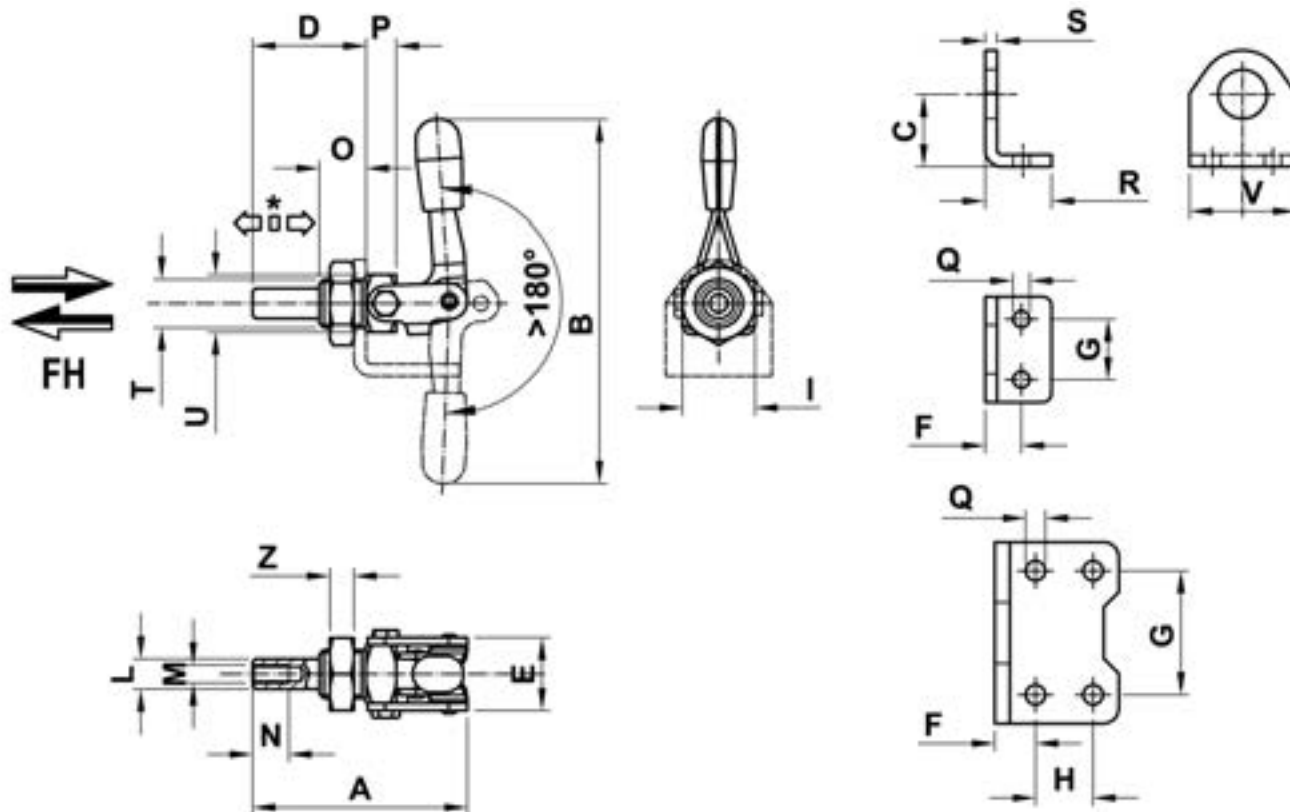
A special grease is placed between two contacting surfaces during assembly.



**PUSH**



**PULL**

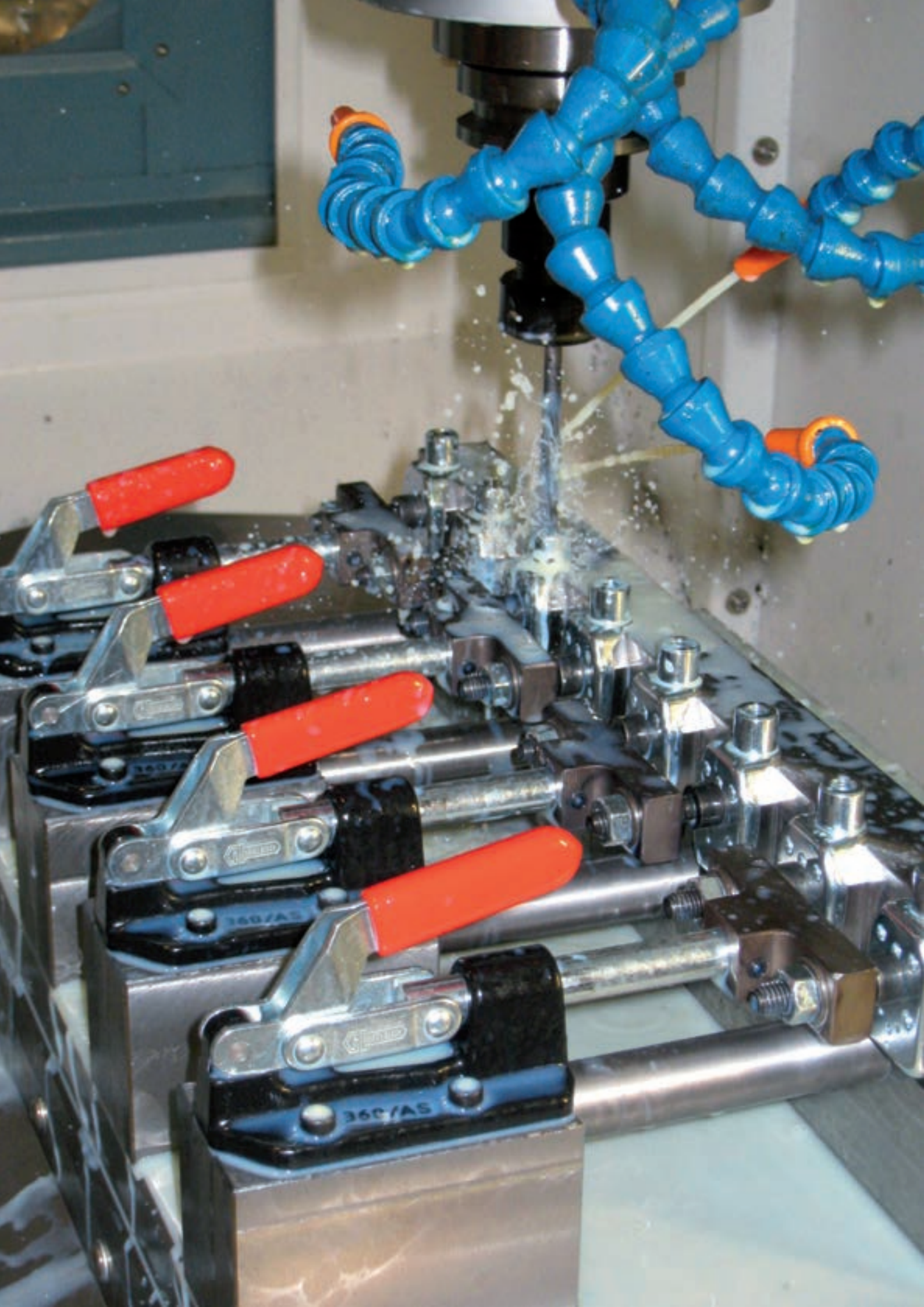


Code	Description	Stainless steel Code	Stainless steel	A	B	D	E	I	L	M	N	O	P	T	U	Z	*	Fh (daN)	gr.
AG401	80/AS	AS401	80/ASX	71	120	38	24	24	10	M6	12	15,5	10	M16X1,5	19	8	21	300	135
AG406	165/AS	AS406	165/ASX	113	194	59	28	30	12	M8	15	20	16	M20X1,5	22	9	38	540	335
AG411	340/AS	AS411	340/ASX	173	256	90	38	36	16	M10	18	22	28	M24X2	30	10	66	700	835

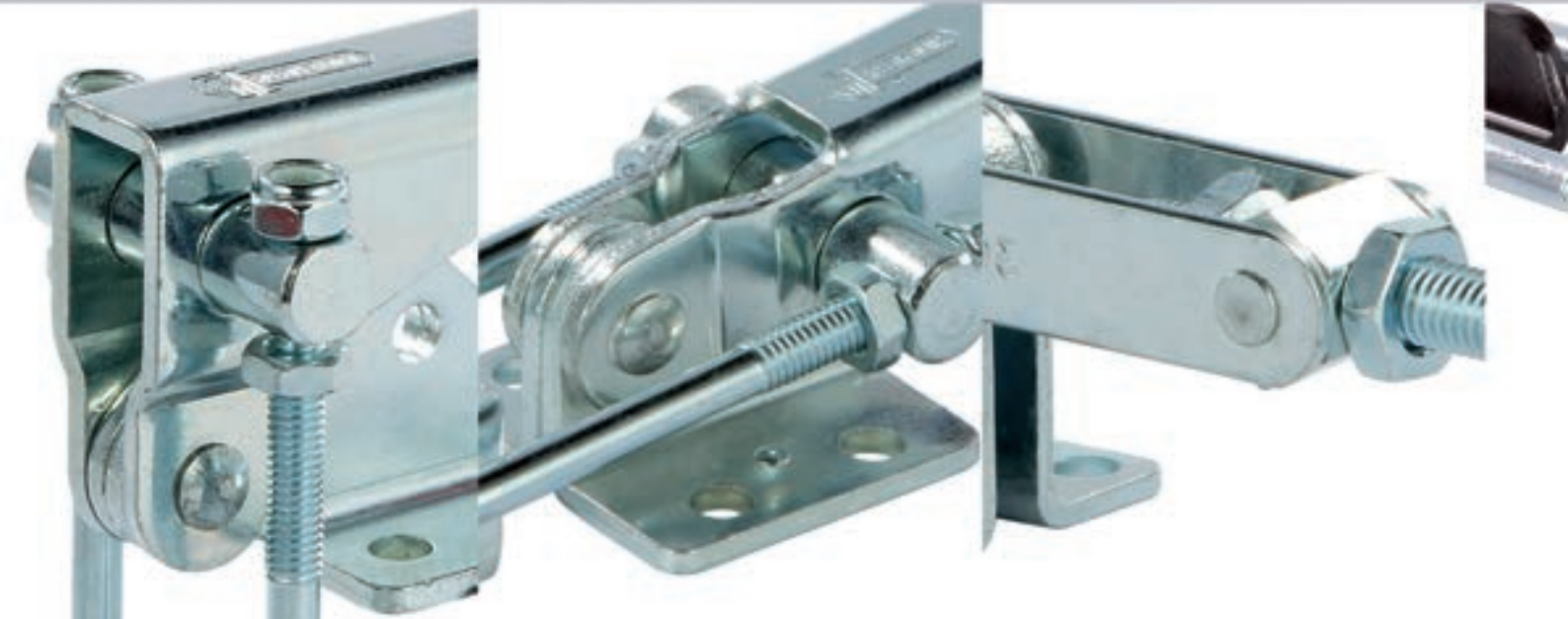
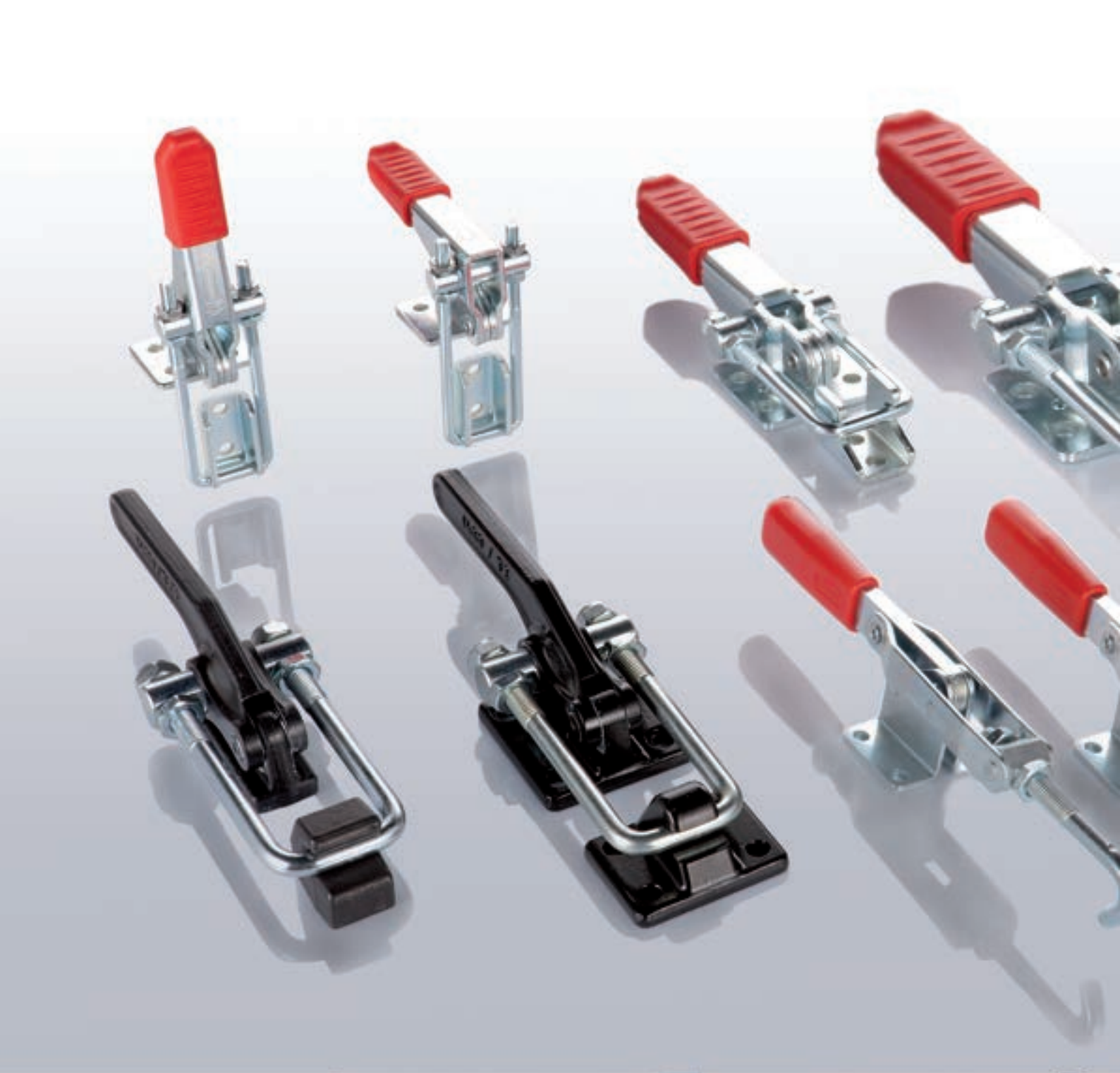
  

Code	Description	Stainless steel Code	Stainless steel	C	F	G	H	Q	R	S	V	Supporto per modello
AG416	30080	AS416	30080X	24	8	20	-	5,5	22	4	35	80/AS - 80/ASX
AG421	30165	AS421	30165X	32	13,5	41	19	6,5	41	5	60	165/AS - 165/ASX
AG426	30340	AS426	30340X	48	19	55	25	8,5	59	5	75	340/AS - 340/ASX











# LATCH SERIES

The circular movement of the control lever is transformed into linear movement of the rod. This series is mostly used to fasten hinged lids and for containers. Available with forces from 160 to 750 daN, and in the heavy series from 1700 to 4000 daN. The push bars can be adjusted within the stroke (height D). The main features of the different models are:

**FOR T - TF - T2 MODELS:** • Support base parallel to the force line of action. • In the closed position, the control lever is parallel to the support base.

**FOR T3 MODELS:** • Support base perpendicular to the force line of action. • In the closed position, the control lever is parallel to the support base.

**FOR T4 MODELS:** • Support base perpendicular to the force line of action. • In the closed position, the control lever is perpendicular to the support base.

## PERFORMANCE

**LIGHT SERIES:** Components in sheet steel. Draw hook in steel. Galvanized finish.

**HEAVY SERIES:** Control lever base body and hooking bracket in weldable forged steel and varnished black; Push bars and supporting pivots in steel.

## LATCH SERIES



### LATCH SERIES (LIGHT PERFORMANCE)

**Material:** Zinc coated plates

**Riveted pivots and rod:** Galvanized steel

**Handles:** Red polyurethane resistant to oils, grease and other chemical agents.

#### Performance:

Form T is supplied with a pivot for traction;

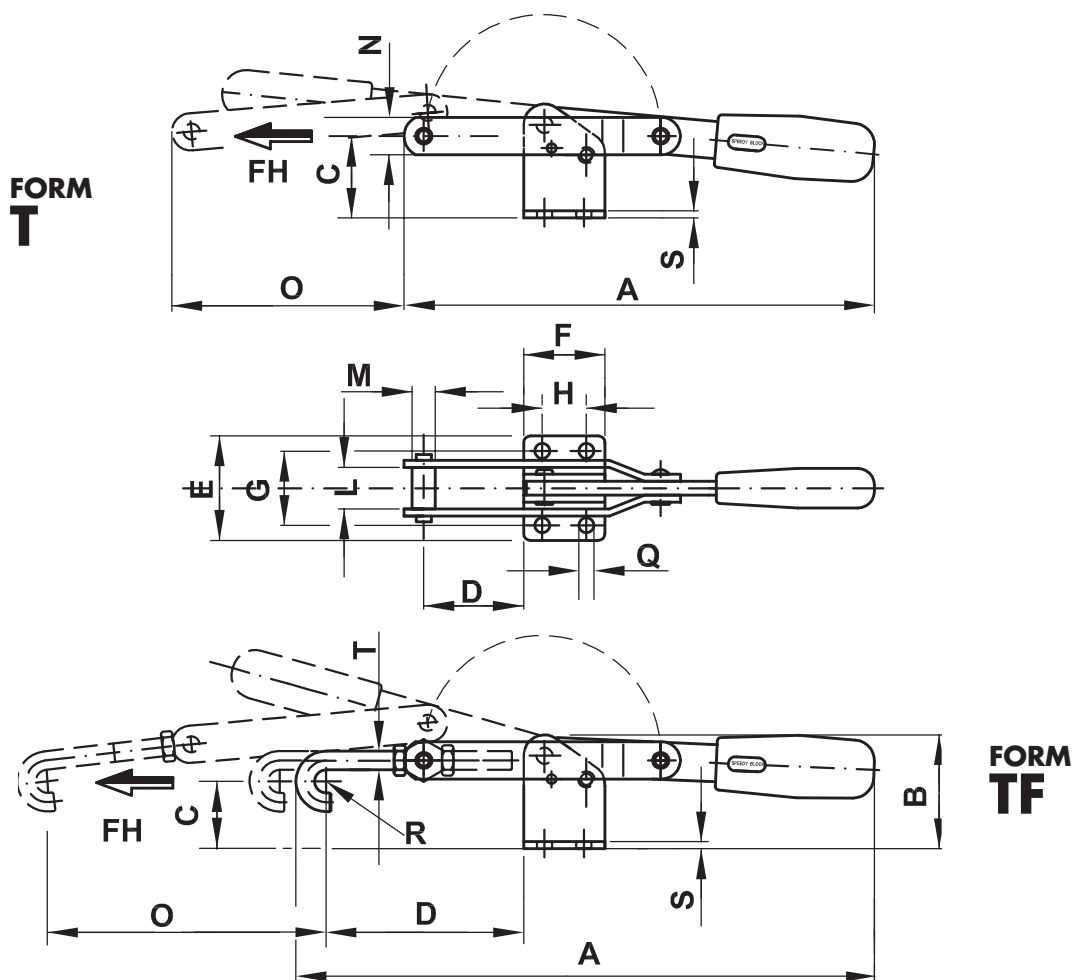
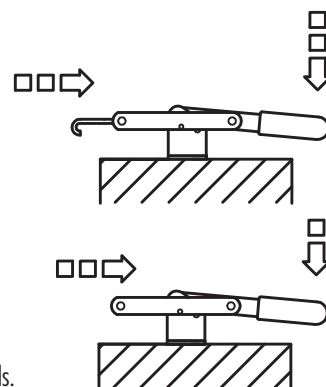
Form TF is supplied with a coupling hook for traction

#### Features and applications:

The tools of this series ensure a perfect closing of lids.

The position of the threaded rod can be adjusted within a certain range (see dimension "D") to meet the requirements of use.

A special grease is placed between two contacting surfaces during assembly.



Code	Description	A	B	C	D	E	F	G	H	L	M	N	O	Q	R	S	T	Fh (daN)	gr.
AL200	200/T	203	49	37	43	45	35	32	19	18	10	16	100	6,5		3		200	300
AL205	200/TF	250	49	29	85÷105	45	35	32	19			16	100	6,5	5	3	M8	200	380
AL300	300/T	226	49	35	43	60	48	45	32	21	10	18	104	8,5		3		300	460
AL305	300/TF	305	49	25	90÷120	60	48	45	32			18	104	8,5	6	3	M10	300	560
AL400	400/T	278	60,5	43	45,5	84	54	60,5	28,5	26	14	25	160	10,5		5		400	1000
AL405	400/TF	343	60,5	30	105÷135	84	54	60,5	28,5	26		25	160	10,5	7	5	M12	400	1200





## DOUBLE ROD SERIES (LIGHT PERFORMANCE)

The sizes of this series are also produced in stainless steel and are shown below in red.

**Material:** Galvanized steel or **AISI 304 stainless steel**

**Riveted pivots and rod:** Galvanized steel or **AISI 304 stainless steel**

**Swinging pivot:** Galvanized steel or **AISI 303 stainless steel**

**Handles:** Red polyurethane resistant to oils, grease and other chemical agents.

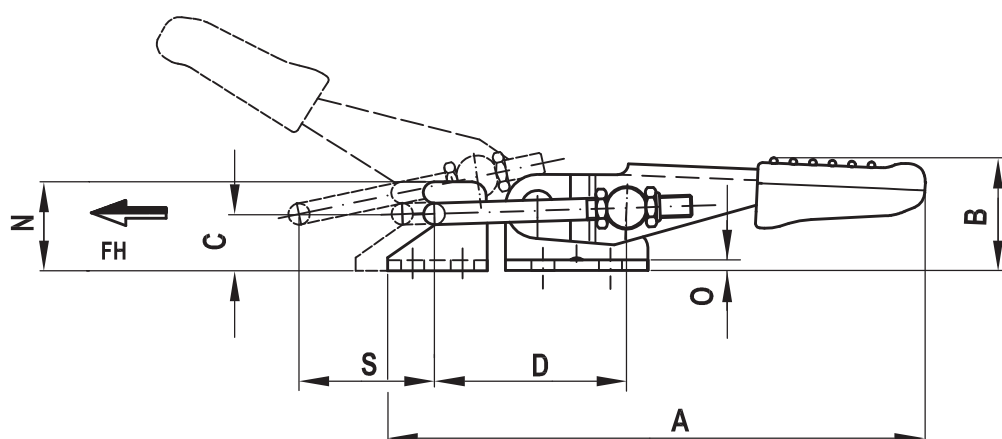
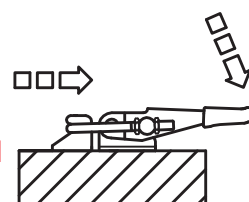
**Performance:** The tool comes with a double rod, bracket and nuts.

**Features and applications:** The tools of this series ensure a perfect closing of lids.

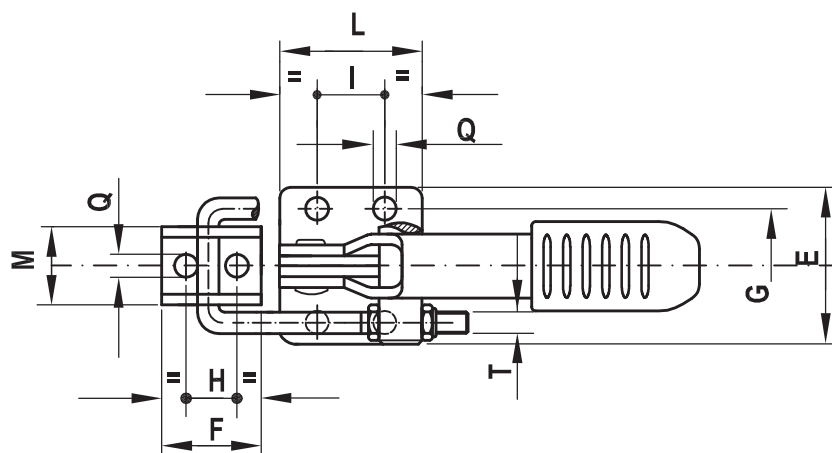
The support base is parallel to the force line of action.

In the closed position, the control lever is parallel to the support base.

A special grease is placed between two contacting surfaces during assembly.



**FORM  
T2**



Code	Description	Stainless steel Code	Stainless steel	A	B	C	D	E	F	G	H	I	L	M	N	O	Q	S	T	Fh (daN)	gr.
AL500	160/T2	AS500	160/T2X	98	25	12	35÷44	28	20	19	10	16	26	14	18	2	4,3	25	M4	160	85
AL505	320/T2	AS505	320/T2X	152	30	16	54÷63	44	28	32	14,3	19	40	22	25	3	6,5	48	M6	320	250
AL510	700/T2	AS510	700/T2X	220	42	24	70÷90	54	38	38	19	41,5	60	26	36	3,5	8,5	58	M8	750	600

## LATCH SERIES



### DOUBLE ROD SERIES (LIGHT PERFORMANCE)

The sizes of this series are also produced in stainless steel and are shown below in red.

**Material:** Galvanized steel or **AISI 304 stainless steel**

**Riveted pivots and rod:** Galvanized steel or **AISI 304 stainless steel**

**Swinging pivot:** Galvanized steel or **AISI 303 stainless steel**

**Handles:** Red polyurethane resistant to oils, grease and other chemical agents.

**Performance:** The tool comes with a double rod, bracket and nuts.

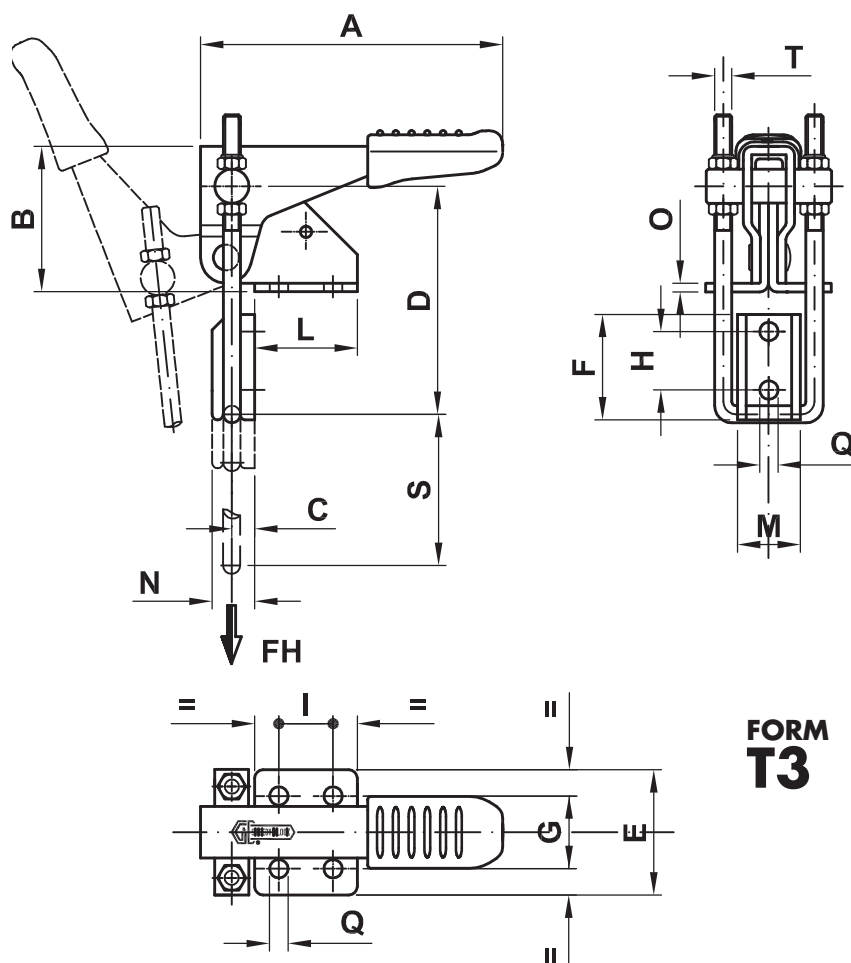
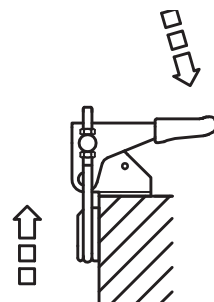
#### Features and applications:

The tools of this series ensure a perfect closing of lids.

The support base is perpendicular to the force line of action.

In the closed position, the control lever is parallel to the support base.

A special grease is placed between two contacting surfaces during assembly.



**FORM  
T3**

Code	Description	Stainless steel Code	Stainless steel	A	B	C	D	E	F	G	H	I	L	M	N	O	Q	S	T	Fh (daN)	gr.
AL530	160/T3	AS530	160/T3X	68	36	5	48÷58	35	25,5	22	14,3	13	26	14	10	2	4,3	34,5	M4	160	100
AL535	320/T3	AS535	320/T3X	106	52,5	8	75÷95	44	37	25,5	20,5	19	36	22	15	3	6,5	53	M6	320	320
AL540	700/T3	AS540	700/T3X	147	66	13	98÷122	54	48,5	36,5	27	32	52	26	23	3,5	8,5	64	M8	750	680



## DOUBLE ROD SERIES (LIGHT PERFORMANCE)

**Material:** Galvanized steel

**Riveted pivots and rod:** Galvanized steel

**Swinging pivot:** Galvanized steel

**Handles:** Red polyurethane resistant to oils, grease and other chemical agents.

### Performance:

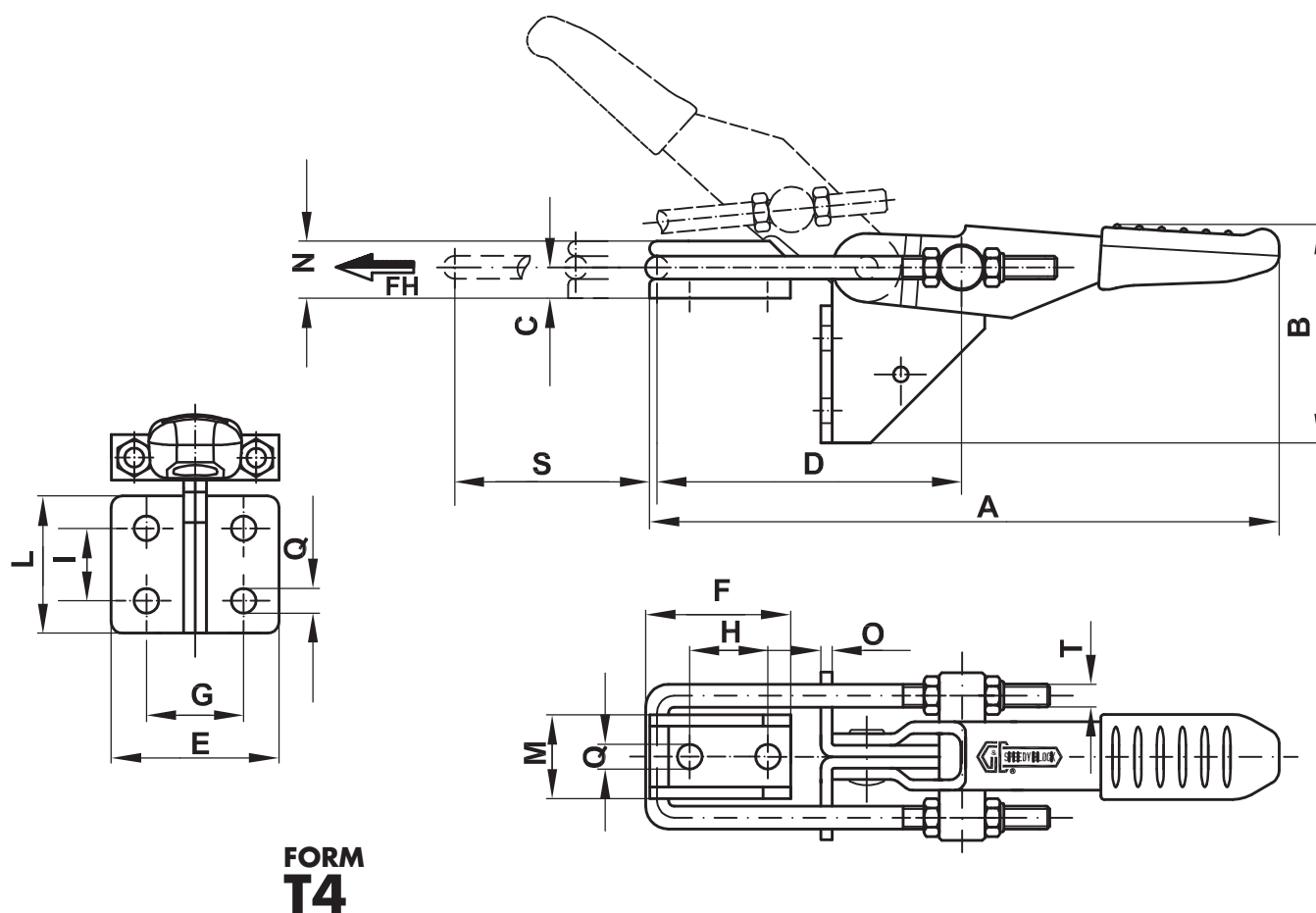
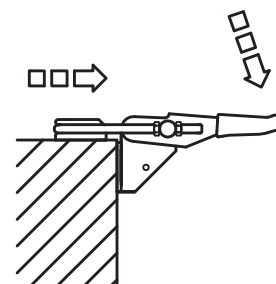
The tool comes with a double rod, bracket and nuts.

**Features and applications:** The tools of this series ensure a perfect closing of lids.

The support base is perpendicular to the force line of action.

In the closed position, the control lever is perpendicular to the support base.

A special grease is placed between two contacting surfaces during assembly.



Code	Description	A	B	C	D	E	F	G	H	I	L	M	N	O	Q	S	T	Fh (daN)	gr.
AL560	160/T4	99	40	5	48÷58	35	25,5	22	14,3	13	26	14	10	2	4,3	32	M4	160	95
AL565	320/T4	152	57,5	8	75÷95	44	37	25,5	20,5	19	36	22	15	3	6,5	53	M6	320	295
AL570	700/T4	225	82	13	98÷122	54	48,5	36,5	27	32	52	26	23	3,5	8,5	64	M8	750	655



# HEAVY LATCH SERIES



## DOUBLE ROD SERIES (HEAVY PERFORMANCE)

The sizes of this series are also produced in stainless steel and are shown below in red.

**Material:** Hot-stamped, weldable, black varnished steel or hot-stamped **AISI 304 stainless steel**.

**Pivot:** Hardened, ground and knurled steel to prevent rotation.

**Bar, swinging pivot and nuts:** Galvanized steel or **AISI 303 stainless steel**

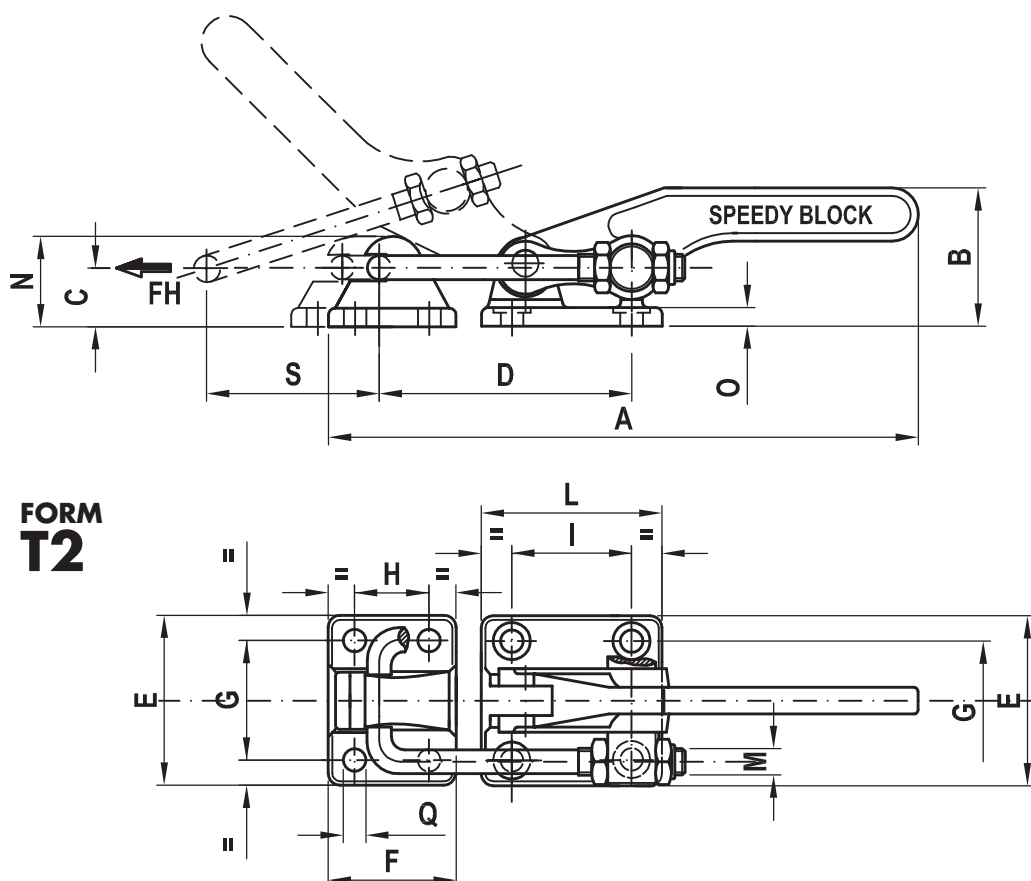
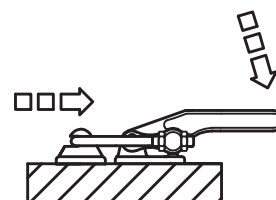
**Performance:** The tool comes with a double rod, bracket and nuts.

**Features and applications:** The tools of this series ensure a perfect closing of lids. The construction features and materials chosen make these tools highly resistant.

The support base is parallel to the force line of action.

In the closed position, the control lever is parallel to the support base.

A special grease is placed between two contacting surfaces during assembly.



Code	Description	Stainless steel Code	Stainless steel	A	B	C	D	E	F	G	H	I	L	M	N	O	Q	S	Fh (daN)	FhX (daN)	gr.
AL600	1400/T2	AS580	1400/T2X	220	52	21	93÷105	64	48	45	28	45	68	M10	34	7	8,5	63	1700	1400	1110
AL610	2800/T2	AS585	2800/T2X	273	65	27	113÷123	80	60	57	35	57	85	M12	42	9	10,5	78	4000	3000	2070



## DOUBLE ROD SERIES WELDABLE (HEAVY PERFORMANCE)

The sizes of this series are also produced in stainless steel and are shown below in red.

**Material:** Hot-stamped, weldable, black varnished steel or hot-stamped **AISI 304 stainless steel**.

**Pivot:** Hardened, ground and knurled steel to prevent rotation

**Bar, swinging pivot and nuts:** Galvanized steel or **AISI 303 stainless steel**

**Performance:** The tool comes with a double rod, bracket and nuts.

### Features and applications:

The tools of this series ensure a perfect closing of lids.

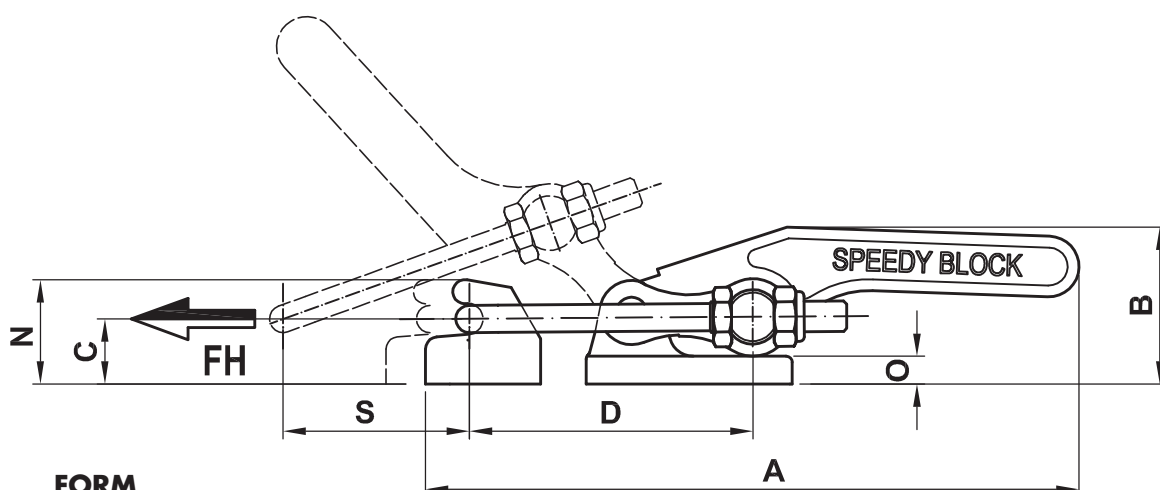
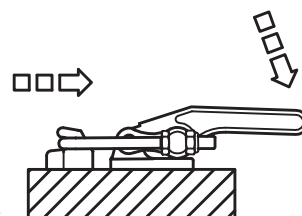
The shape of the base plate and the hooking bracket are made in a way so that they can be easily welded to the tool to be used.

The construction features and materials chosen make these tools highly resistant.

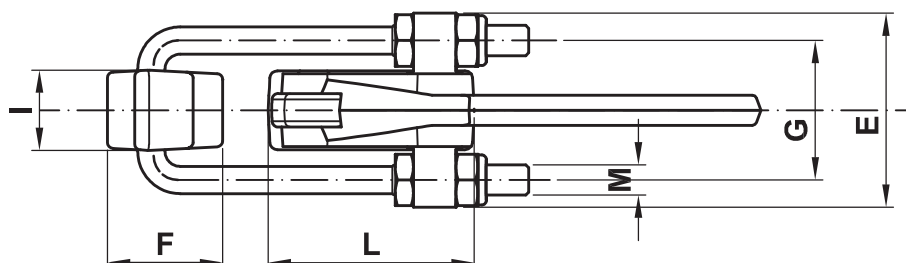
The support base is parallel to the force line of action.

In the closed position, the control lever is parallel to the support base.

A special grease is placed between two contacting surfaces during assembly.



**FORM  
T2S**



Code	Description	Stainless steel Code	Stainless steel	A	B	C	D	E	F	G	I	L	M	N	O	S	Fh (daN)	FhX (daN)	gr.
AL620	1400/T2S	AS590	1400/T2SX	216	52	21	93÷105	64	38	46	26,5	68	M10	34,5	9,2	63	1700	1400	930
AL630	2800/T2S	AS595	2800/T2SX	257	65	27	102÷123	80	50	55	32	80	M12	43	12,7	78	4000	3000	1708

# HEAVY LATCH SERIES



## DOUBLE ROD SERIES (HEAVY PERFORMANCE)

**Material:** Hot-stamped, weldable, black varnished steel

**Pivot:** Hardened, ground and knurled steel to prevent rotation.

**Bar, swinging pivot and nuts:** Galvanized steel

**Performance:** The tool comes with a double rod, bracket and nuts.

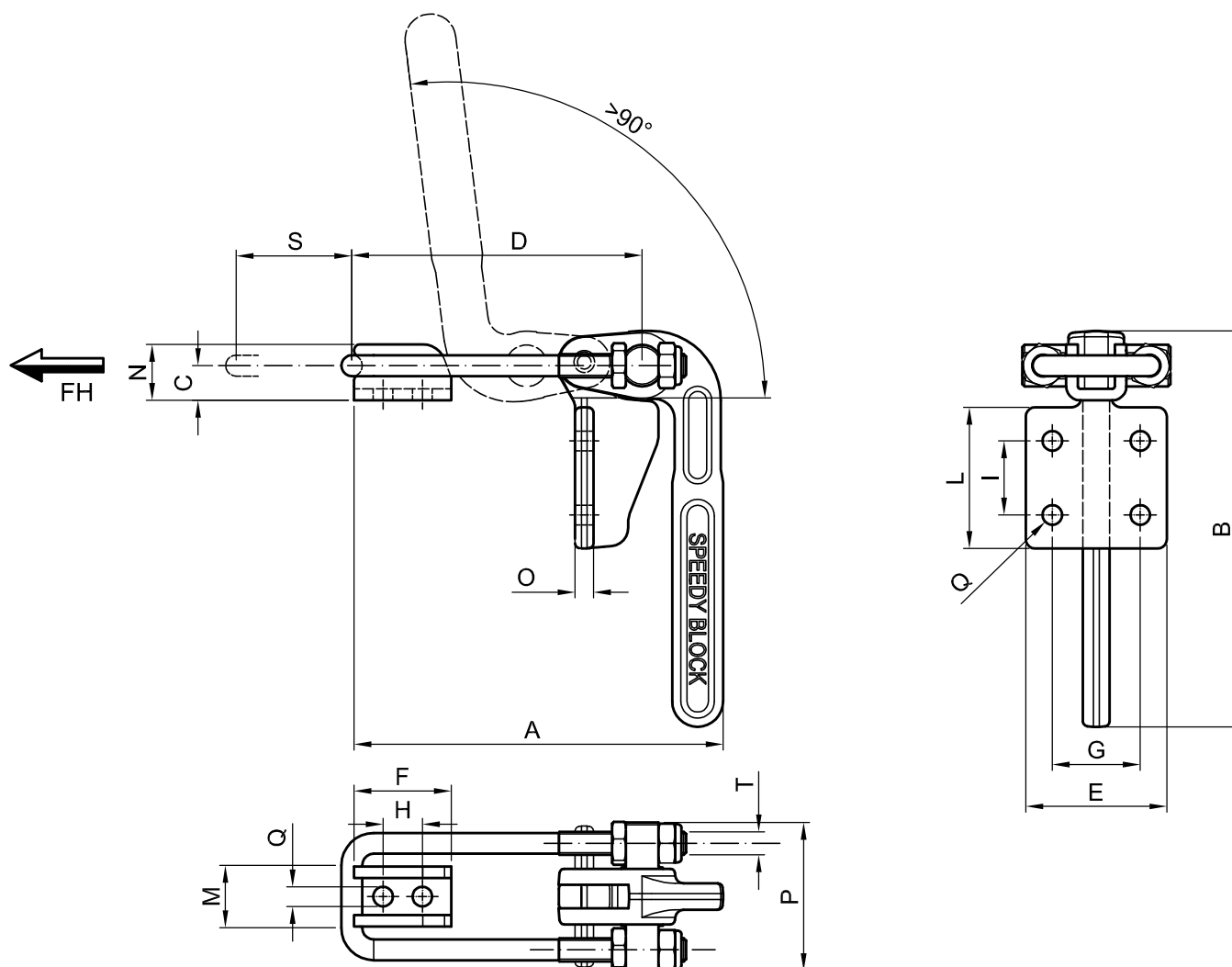
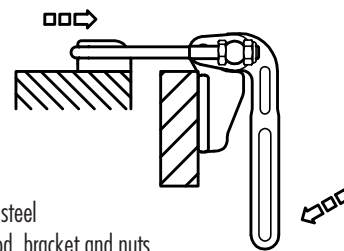
**Features and applications:** The tools of this series ensure a perfect closing of lids.

The construction features and materials chosen make these tools highly resistant.

The support base is perpendicular to the force line of action.

In the closed position, the control lever is parallel to the support base.

A special grease is placed between two contacting surfaces during assembly.



Code	Description	A	B	C	D	E	F	G	H	I	L	M	N	O	P	Q	S	T	Fh (daN)	gr.
AL550	1400/T3	159,5	171	15	104,5÷125,5	61	42	38	17	32	61	26	24	8	64	8,5	50	M10	1200	1235





## DOUBLE ROD SERIES

### WELDABLE

#### (HEAVY PERFORMANCE)

**Material:** Hot-stamped, weldable, black varnished steel

**Pivot:** Hardened, ground and knurled steel to prevent rotation.

**Bar, swinging pivot and nuts:** Galvanized steel

**Performance:** The tool comes with a double rod, bracket and nuts.

**Features and applications:** The tools of this series ensure a perfect closing of lids.

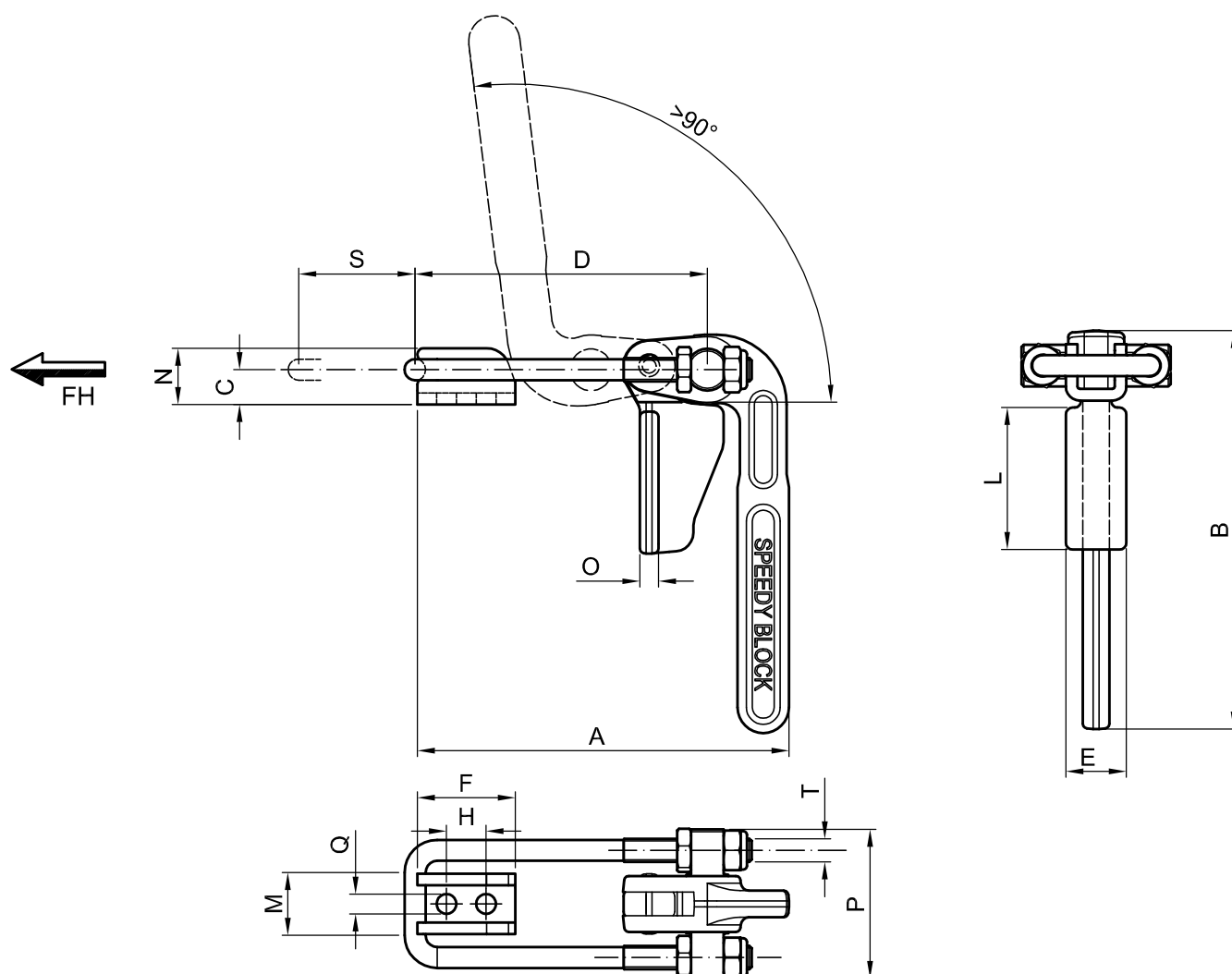
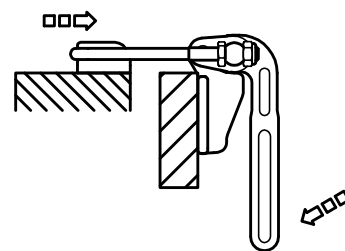
The construction features and materials chosen make these tools highly resistant.

The shape of the base plate and the hooking bracket are made in a way so that they can be easily welded to the tool to be used.

The support base is perpendicular to the force line of action.

In the closed position, the control lever is parallel to the support base.

A special grease is placed between two contacting surfaces during assembly.



Code	Description	A	B	C	D	E	F	H	L	M	N	O	P	Q	S	T	Fh (daN)	gr.
AL552	1400/T3S	159,5	171	15	104,5÷125,5	61	42	17	61	26	24	8	64	8,5	50	M10	1200	1115





# LATCH SERIES WITH SAFETY LOCK

**DEVICE WITH LATCH MAKES ACCIDENTAL OPENINGS IMPOSSIBLE. REQUIRES THE USE OF ONLY ONE HAND.**

If the tool must be used on machines or with applications in the presence of strong stress or vibrations, in which an accidental and undesired opening is likely, it is necessary to ensure a secure grip by means of a latch.

**Fig. 1** shows the tool in the closed position; in this position it is not possible to open the tool.

In **Fig. 2**, the consent button (see arrow) has been pressed and the tool can be opened. The tool is opened and the end of the stroke is reached when rotating the control lever (**Fig. 3 and 4**) in the direction of the arrow. Then, when the lever is retracted in the direction opposite that of rotation (**Fig. 5 and 6**), the rod, which is invoked by a device, automatically rises and frees the work surface.

To close the tool again, return to the point shown in **Fig. 3**, then the path shown in **Fig. 2** is retraced when holding down the release button. Finally, when closing the tool (**Fig. 1**), the locking device, which is invoked by a spring, is inserted automatically. The entire cycle is carried out with one hand.

Fig. 1

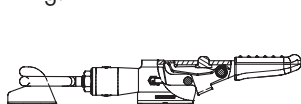


Fig. 2

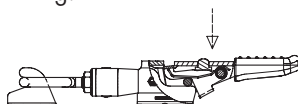


Fig. 3

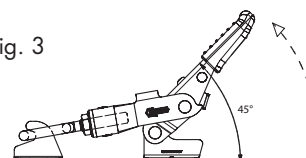


Fig. 4

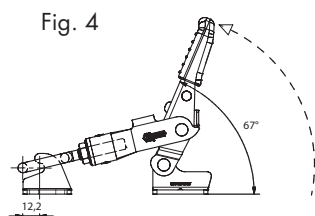


Fig. 5

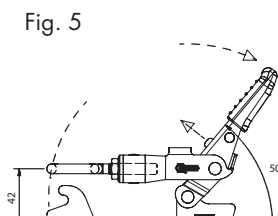
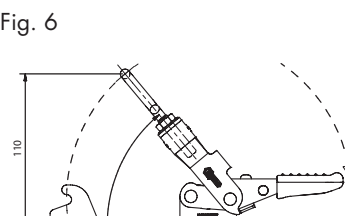


Fig. 6





## LATCH SERIES WITH SAFETY LOCK



### T5 LATCH SERIES WITH SAFETY LOCK (LIGHT PERFORMANCE)

The sizes of this series are also produced in stainless steel and are shown below in red.

**Material:** Burnished steel part and riveted pivots in galvanized steel or **AISI 304 stainless steel**.

Turned parts in galvanized steel or **AISI 303 stainless steel**.

**Handles:** Red polyurethane resistant to oils, grease and other chemical agents.

**Rod:** Burnished steel or **AISI 304 stainless steel**. To be ordered separately.

**Features and applications:** The tool can be opened with only one hand, disengage the working surface (the clamping lever opens by itself) and close it again for the next operation (the operation is described on page 53)

It is possible to choose from three different optional rods (to be ordered separately):

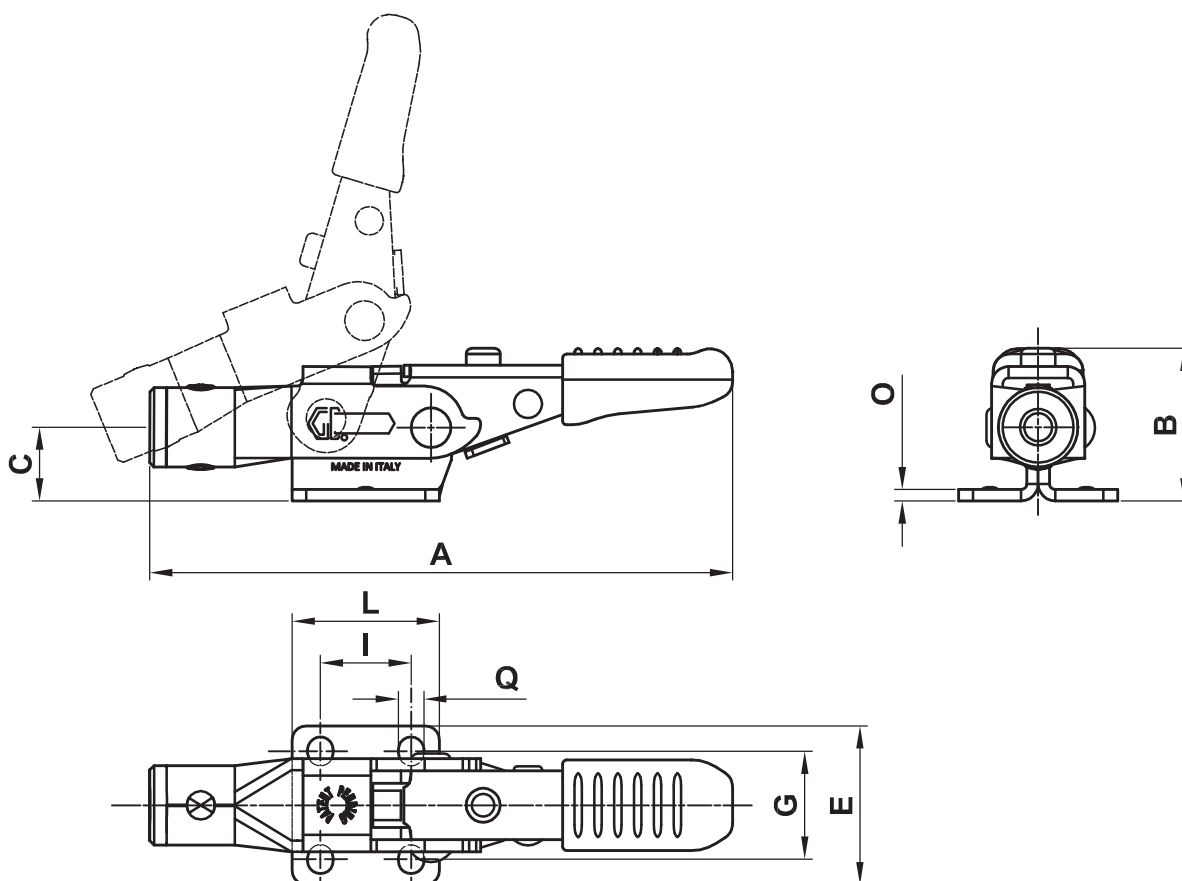
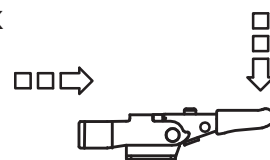
Eye bolt rod "TG", T-shaped rod "TT", Hook Rod "TU".

The construction features and materials chosen make these tools highly resistant.

The support base is parallel to the force line of action.

In the closed position, the control lever is parallel to the support base.

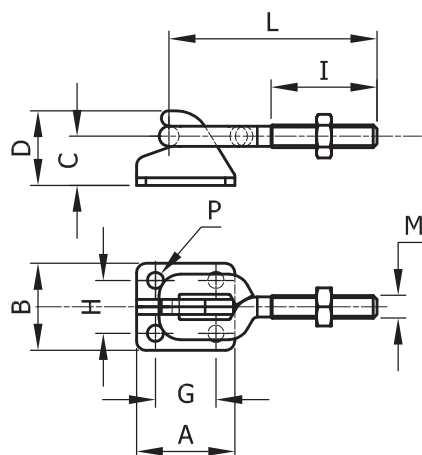
A special grease is placed between two contacting surfaces during assembly.



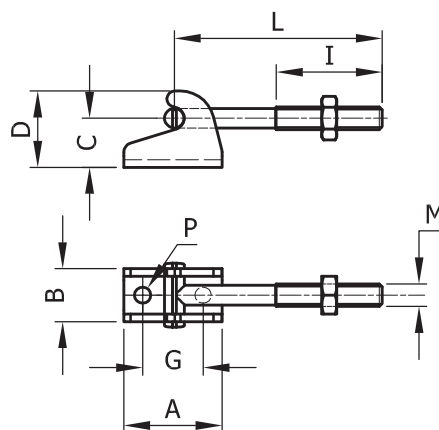
Code	Description	Stainless steel Code	Stainless steel	A	B	C	E	G	I	L	O	Q	Fh (Dan)	gr
AL575	160/T5	AS545	160/T5X	103	26,8	13	28	19	16	26	2	4,5	175	100
AL580	320/T5	AS550	320/T5X	153	38,5	19	44	32	19	40	3	6,7	400	295
AL585	700/T5	AS555	700/T5X	222	53	28	54	38,1	41,5	60	3,5	8,5	750	690

# LATCH SERIES WITH SAFETY LOCK

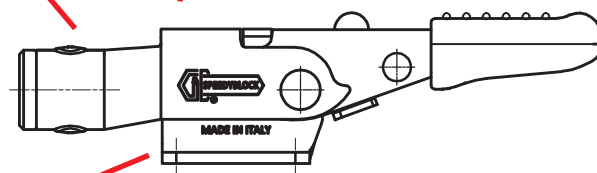
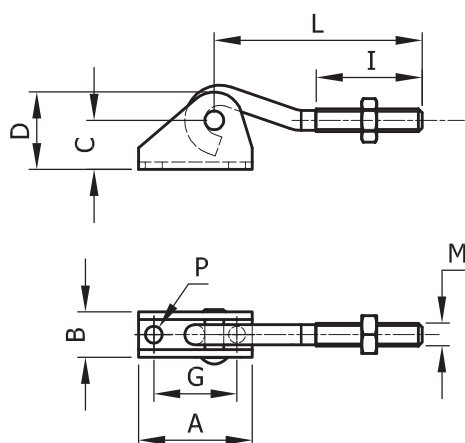
## TG Eye bolt rod



## TT T-shaped rod



## TU Hook rod



Code	Description	Stainless steel Code	Stainless steel	A	B	C	D	G	H	I	L	M	P
AU400	160/TG	AU420	160/TGX	26	23	13	19,8	16	14,30	28	55,5	M6	4,5
AU406	320/TG	AU426	320/TGX	35	34	19	30	19	22,30	34	76,5	M8	6,7
AU412	700/TG	AU432	700/TGX	50	41	28	40,5	31	25,40	42	95,5	M10	8,5
Code	Description	Stainless steel Code	Stainless steel	A	B	C	D	G	I	L	M	P	
AU402	160/TU	AU422	160/TUX	35	14	13	20,4	25,4	28	54,5	M6	4,5	
AU408	320/TU	AU428	320/TUX	38	18	19	28	25,4	34	76,5	M8	6,7	
AU414	700/TU	AU434	700/TUX	50	26	28	39	31	43	93	M10	8,5	
Code	Description	Stainless steel Code	Stainless steel	A	B	C	D	G	I	L	M	P	
AU404	160/TT	AU424	160/TTX	26	14	13	20	16	28	55	M6	4,5	
AU410	320/TT	AU430	320/TTX	35	18	19	30	19	34	76,5	M8	6,7	
AU416	700/TT	AU436	700/TTX	50	26	28	40,5	31	43	93	M10	8,5	

## LATCH SERIES WITH SAFETY LOCK



### T5 LATCH SERIES WITH SAFETY LOCK (HEAVY PERFORMANCE)

**Material:** Sheet metal parts and riveted pivots in burnished steel.

Turned parts made of burnished steel

**Handles:** Red polyurethane resistant to oils, grease and other chemical agents.

**Performance:** The tool comes with an eye bolt bar and hooking bracket.

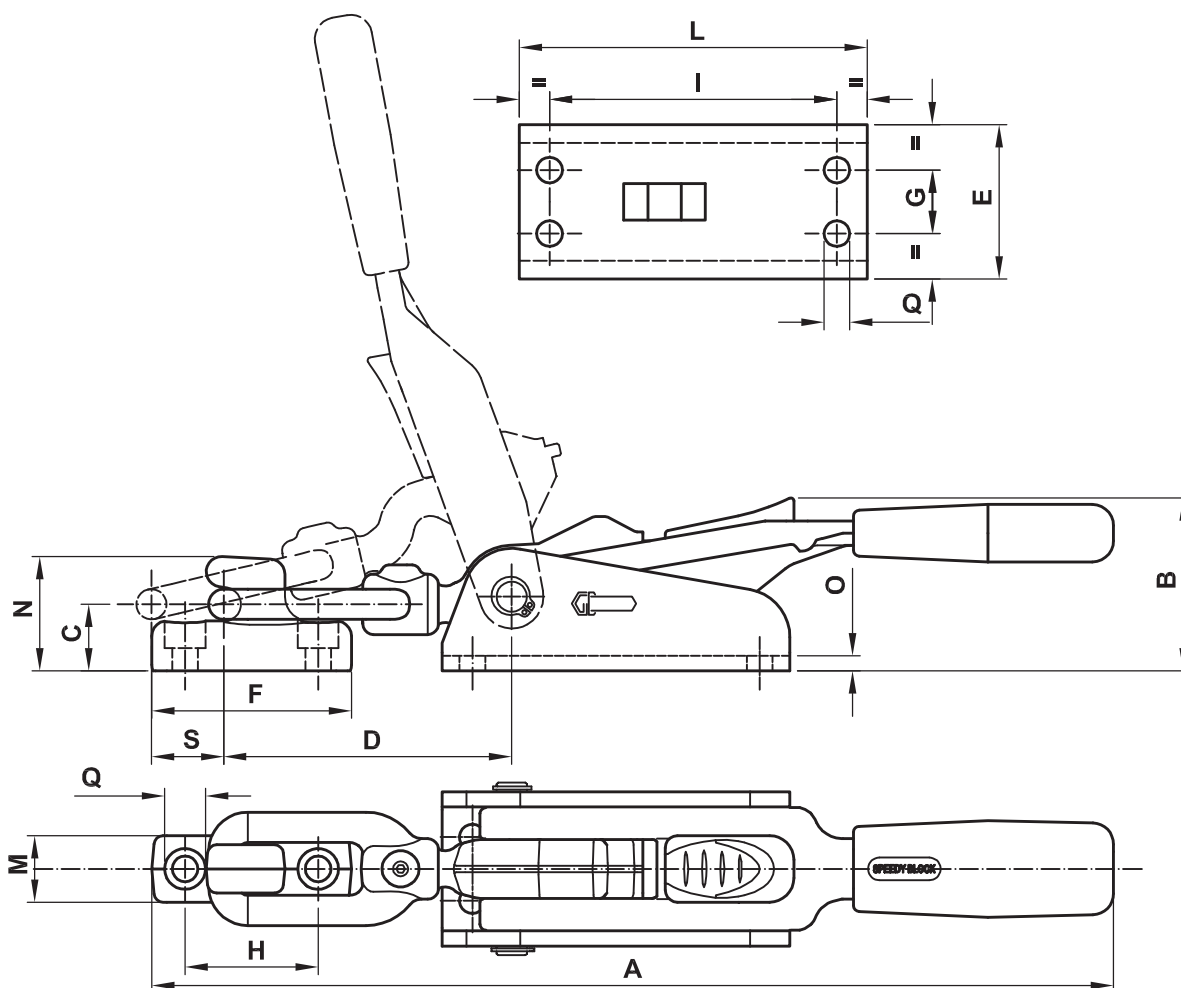
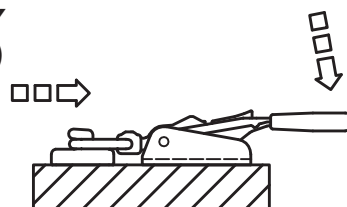
**Features and applications:** The tool can be opened with only one hand, disengage the working surface (the clamping lever opens by itself) and close it again for the next operation (the operation is described on page 53)

The construction features and materials chosen make these tools highly resistant.

The support base is parallel to the force line of action.

In the closed position, the control lever is parallel to the support base.

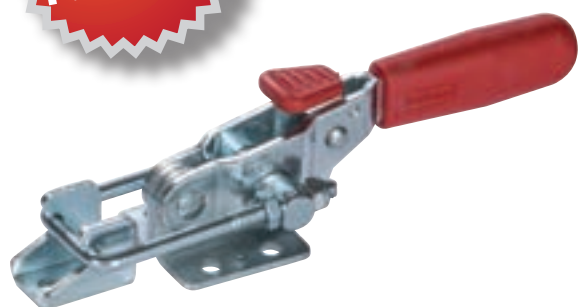
A special grease is placed between two contacting surfaces during assembly.



Code	Description	A	B	C	D	E	F	G	H	I	L	M	N	O	Q	S	Fh (daN)	gr.
AL590	1400/T5	318	57	22	95-105	51	66	21	44	95	115	22	38	5	8,5	24	1500	1600

## LATCH SERIES WITH SAFETY LOCK

**PATENT  
PENDING**



**NEW**

### DOUBLE ROD SERIES WITH SAFETY LOCK (LIGHT PERFORMANCE)

The sizes of this series are also produced in **AISI 316 stainless steel** and are shown below in red.

#### Material:

Galvanized steel or **AISI 316 stainless steel**

#### Riveted pivots and rod:

Galvanized steel or **AISI 316 stainless steel**

#### Swinging pivot:

Galvanized steel or **AISI 316 stainless steel**

#### Handles:

Red polyurethane resistant to oils, grease and other chemical agents.

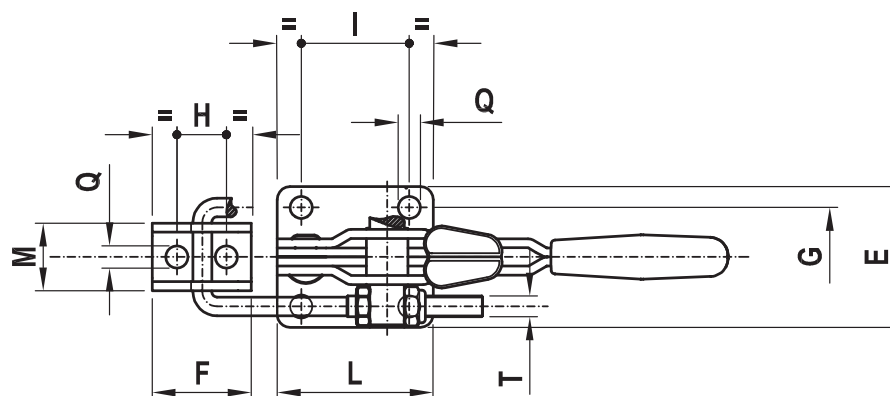
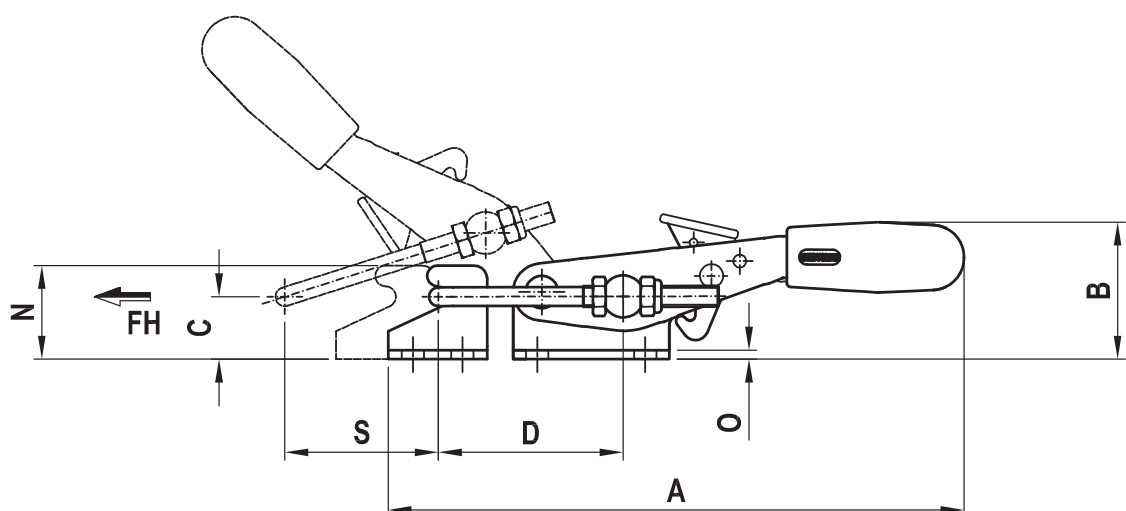
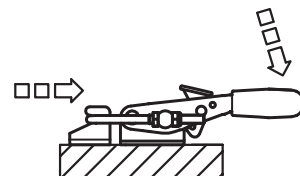
#### Performance:

The tool comes with a double rod, bracket and nuts

#### Features and applications:

The main feature of this series is the special anti-release lever with the purpose of avoiding any accidental openings caused by vibrations.

The tools of this series ensure a perfect closing of lids. The support base is perpendicular to the force line of action. In the closed position, the control lever is parallel to the support base. A special grease is placed between two contacting surfaces during assembly.



Code	Description	Stainless steel Code	Stainless steel	A	B	C	D	E	F	G	H	I	L	M	N	O	Q	S	T	Fh (Dan)	gr.	gr. inox
AL780	160/T6	AS600	160/T16	101	31	12	35÷44	28	20	19	10	16	26	14	18	2	4,3	25	M4	160	92	95
AL785	320/T6	AS605	320/T16	169	45	16	54÷63	44	28	32	14,3	19	40	22	25	3	6,5	44	M6	320	307	331
AL790	700/T6	AS610	700/T16	221	56	24	70÷90	54	38	38	19	41,5	60	26	36	3,5	8,5	58	M8	750	627	644



## LATCH SERIES WITH SAFETY LOCK

**PATENT  
PENDING**



**NEW**

### DOUBLE ROD SERIES WITH SAFETY LOCK (HEAVY PERFORMANCE)

The sizes of this series are also produced in stainless steel and are shown below in red.

#### Material:

Hot-stamped, weldable, black varnished steel or hot-stamped **AISI 304 stainless steel**.

#### Pivot:

Hardened, ground and knurled steel to prevent rotation.

#### Bar, swinging pivot and nuts:

Galvanized steel or **AISI 303 stainless steel**.

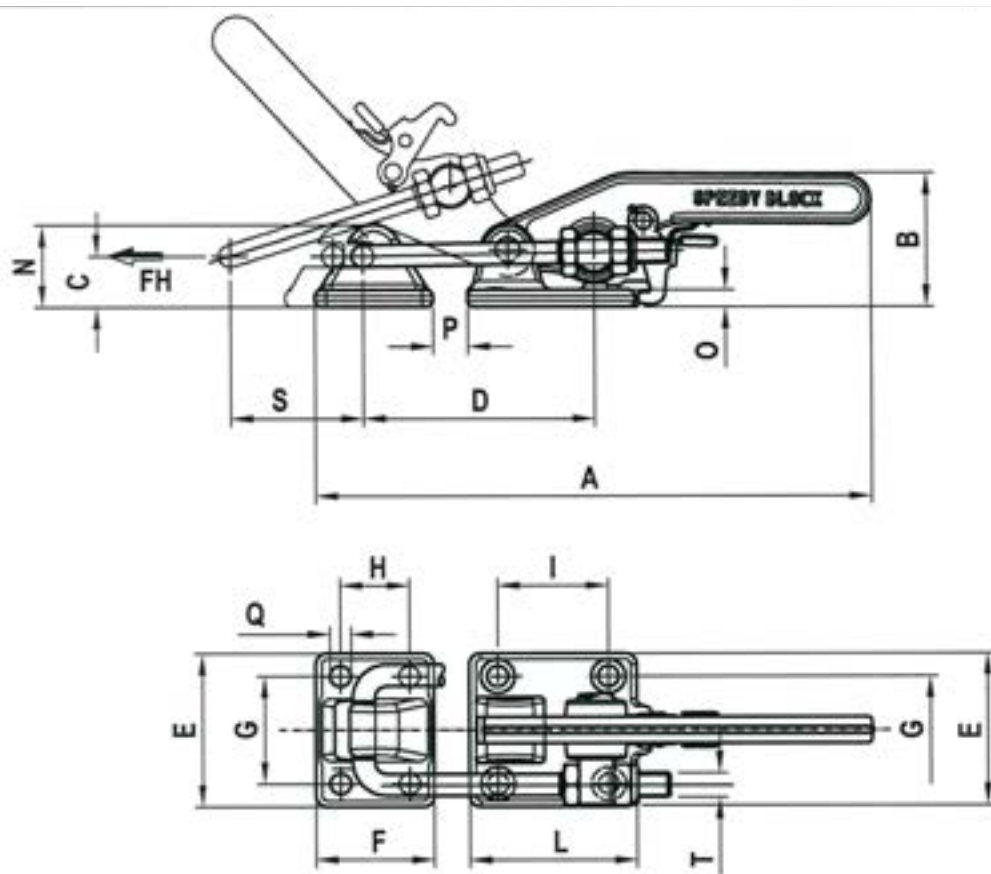
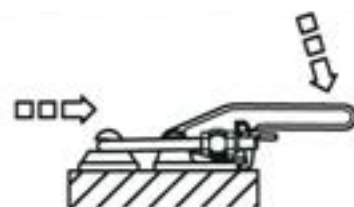
**Performance:** The tool comes with a double rod, bracket and nuts.

#### Features and applications:

The main feature of this series is the special anti-release lever with the purpose of avoiding any accidental openings caused by vibrations. The tools of this series ensure a perfect closing of lids. The construction features and materials chosen make these tools highly resistant. The support base is perpendicular to the force line of action.

In the closed position, the control lever is parallel to the support base.

A special grease is placed between two contacting surfaces during assembly.



Code	Description	Stainless steel Code	Stainless steel	A	B	C	D	E	F	G	H	I	L	N	O	P	Q	S	T	Fh (daN)	gr.	gr.inox
AL795	1700/T6	AS615	1700/T6X	226	55	21	94÷106	64	48	45	28	45	68	34	7	14	8,5	54÷58	M10	1700	1400	1110
AL800	4000/T6	AS620	4000/T6X	282	68	27	112÷124	80	60	57	35	57	85	42	9	14	10,5	62÷65	M12	4000	3000	2100

## LATCH SERIES WITH SAFETY LOCK

**PATENT  
PENDING**



**NEW**

### DOUBLE ROD SERIES WELDABLE WITH SAFETY LOCK (HEAVY PERFORMANCE)

The sizes of this series are also produced in stainless steel and are shown below in red.

#### Material:

Hot-stamped, weldable, black varnished steel or hot-stamped **AISI 304 stainless steel**.

#### Pivot:

Hardened, ground and knurled steel to prevent rotation.

#### Bar, swinging pivot and nuts:

Galvanized steel or **AISI 303 stainless steel**.

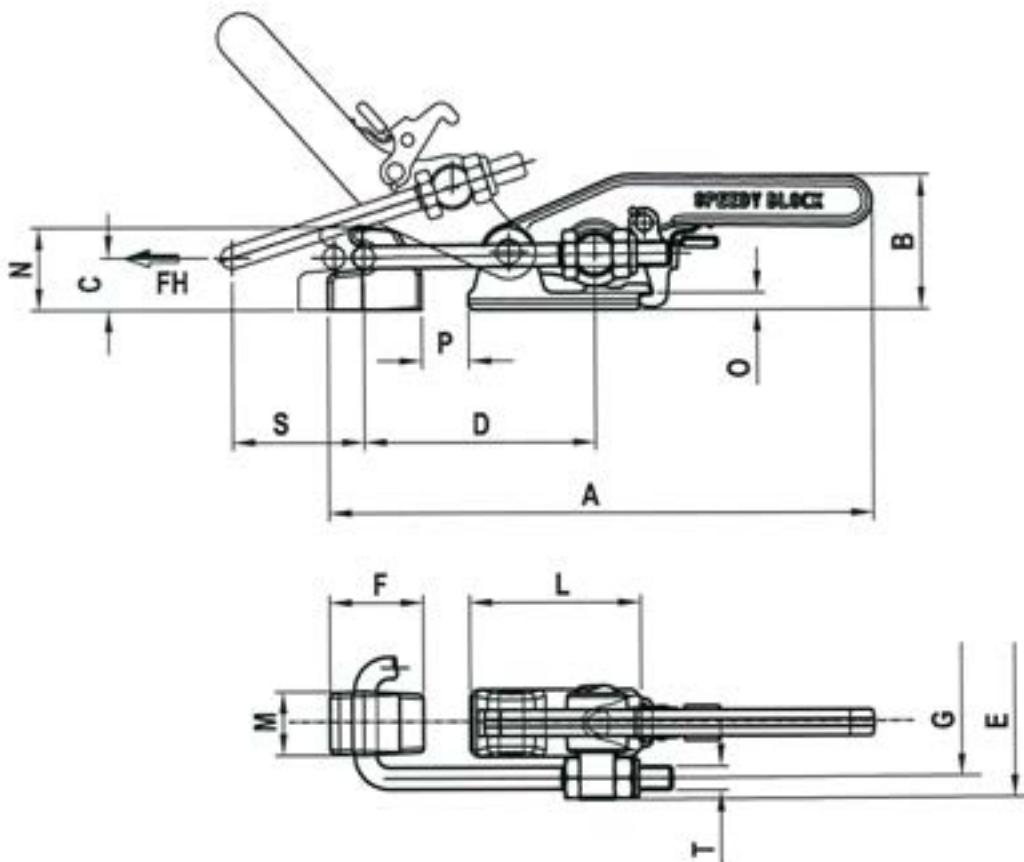
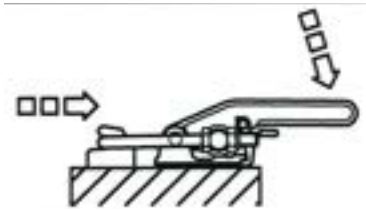
**Performance:** The tool comes with a double rod, bracket and nuts.

#### Features and applications:

The main feature of this series is the special anti-release lever with the purpose of avoiding any accidental openings caused by vibrations. The tools of this series ensure a perfect closing of lids. The construction features and materials chosen make these tools highly resistant. The support base is perpendicular to the force line of action.

In the closed position, the control lever is parallel to the support base.

A special grease is placed between two contacting surfaces during assembly.



Code	Description	Stainless steel Code	Stainless steel	A	B	C	D	E	F	G	L	M	N	O	P	S	T	Fh (daN)	FhX (daN)	gr.
AL805	1700/T6S	AS625	1700/T6SX	221	55	21	94÷106	64	38	46	68	26,5	34,5	7	19	54÷58	M10	1700	1400	1110
AL810	4000/T6S	AS630	4000/T6SX	277	68	27	112÷124	80	50	55	85	32	43	9	19	62÷65	M12	4000	3000	2100





# ROTATIONAL SERIES

The rotational moulding of the plastic requires clamping devices able to work in a quick and safe way at very high temperatures (240-300°C.) without any hesitation when opening and clamping. So, we have achieved a full series of clamps suitable to this type of work. This series is in part a spin off from the Speedy Block's mass production with the contribution of suitable alterations (couplings with different tolerances, modified geometries, different finishings, etc.), and in part is achieved following the suggestions and expectations of the users which urged their design.





## VERTICAL SERIES



### VERTICAL SERIES FOR HIGH TEMPERATURES

**Material:** Burnished steel

**Riveted pivots:** Burnished steel

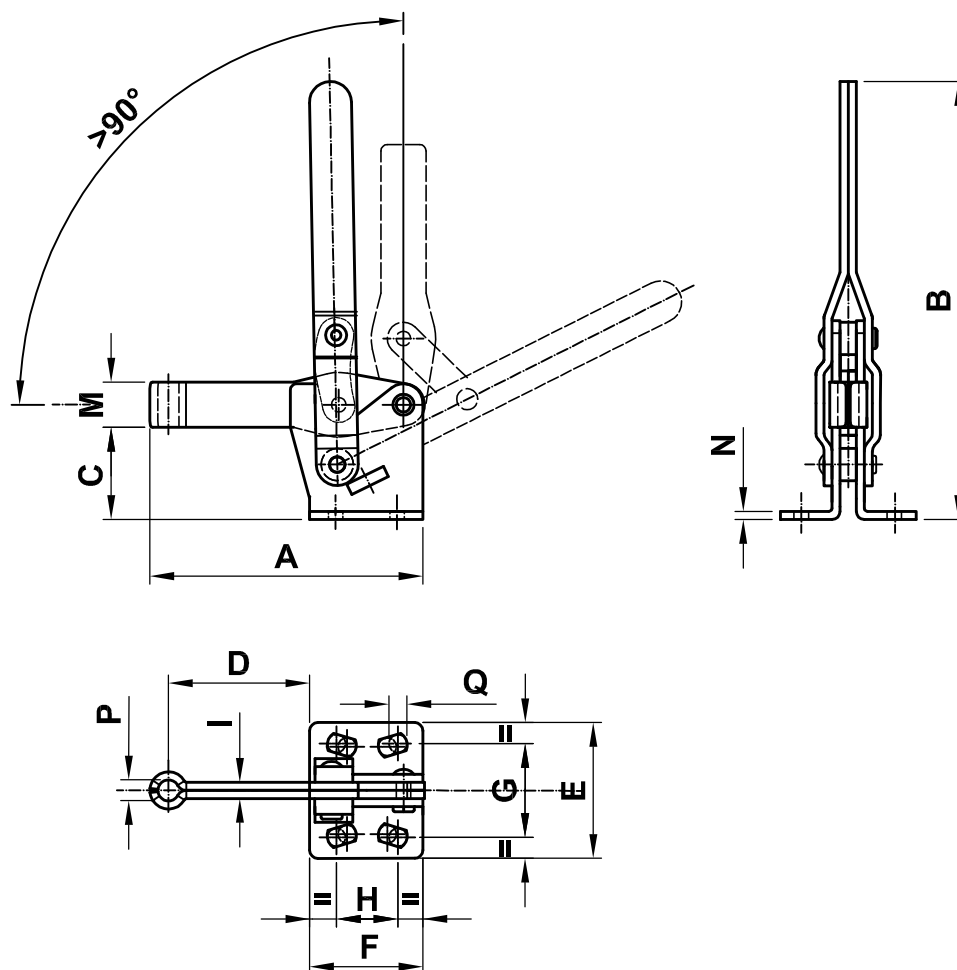
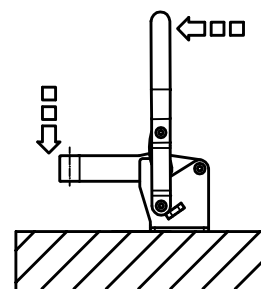
**Supporting bushes:** Hardened and ground steel.

**Performance:** With eye bolt clamping lever for inserting the spindle.

**Spindles:** To be ordered separately (see Accessories on page 76)

**Features and applications:** The tools of this series are generally used in rotational forging, as it is able to operate at high temperatures (240-300°C).

This is made possible thanks to their finish, the interposition of special copper grease between the parts and appropriate tolerances between the couplings.



Code	Description	A	B	C	D	E	F	G	H	I	M	N	P	Q	Fh1 (daN)	Fh2 (daN)	gr.
AR530	130/ER	85	136	28	44	42	35	27÷29	12,5÷19	5	16	2,5	6,5	5,6	160	300	210
AR540	230/ER	110	164	33,5	60	45	43	32	19÷20	6	18	3	8	6,7	200	320	330
AR550	330/ER	128	189	43	69	65	50	45÷46	29÷32	7	22	3,5	10,5	8,5	240	400	519

# HORIZONTAL SERIES



## HORIZONTAL SERIES FOR HIGH TEMPERATURES

**Material:** Burnished steel

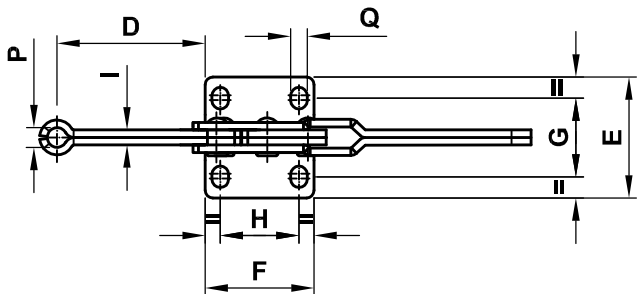
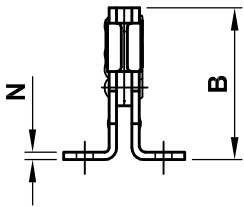
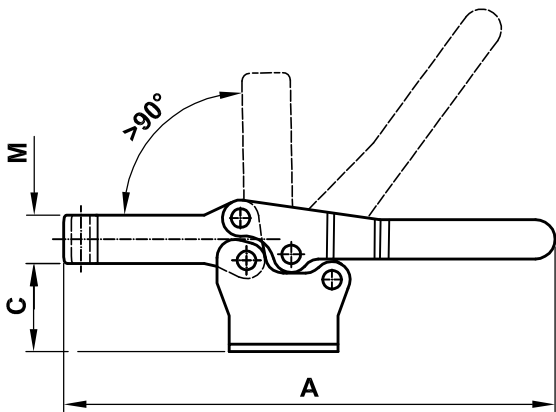
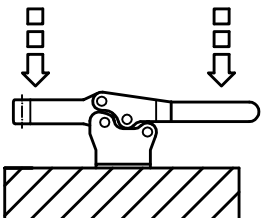
**Riveted pivots:** Burnished steel

**Supporting bushes:** Hardened and ground steel.

**Performance:** With eye bolt clamping lever for inserting the spindle.

**Spindles:** To be ordered separately (see Accessories on page 76)

**Features and applications:** The tools of this series are generally used in rotational forging, as it is able to operate at high temperatures (240-300°C). This is made possible thanks to their finish, the interposition of special copper grease between the parts and appropriate tolerances between the couplings.



Code	Description	A	B	C	D	E	F	G	H	I	M	N	P	Q	Fh1 (daN)	Fh2 (daN)	gr.
AR145	130/OR	165	51	30,5	50	40	36	22,4÷28,4	26	5	16	2,5	6,5	5,6	100	200	185
AR280	230/OR	190	61,5	36,5	56	44	44	26÷31,5	26	6	18	3	8,5	6,6	170	330	300
AR380	355/OR	260,5	83	50	89,5	58	60	38,8÷43	41	7	22	3,5	10,5	8,6	180	400	700

## PULL-ACTION SERIES



### DOUBLE PULL-ACTION SERIES FOR HIGH TEMPERATURES

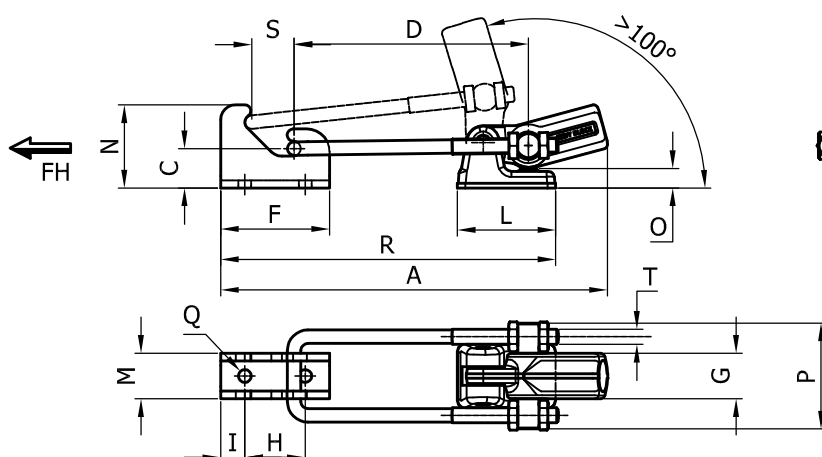
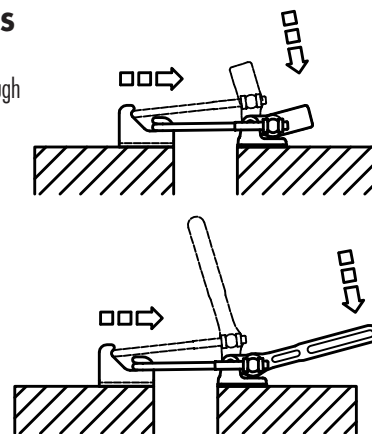
**Material:** Base and lever in hot pressed rough steel

**Rod:** Rough steel

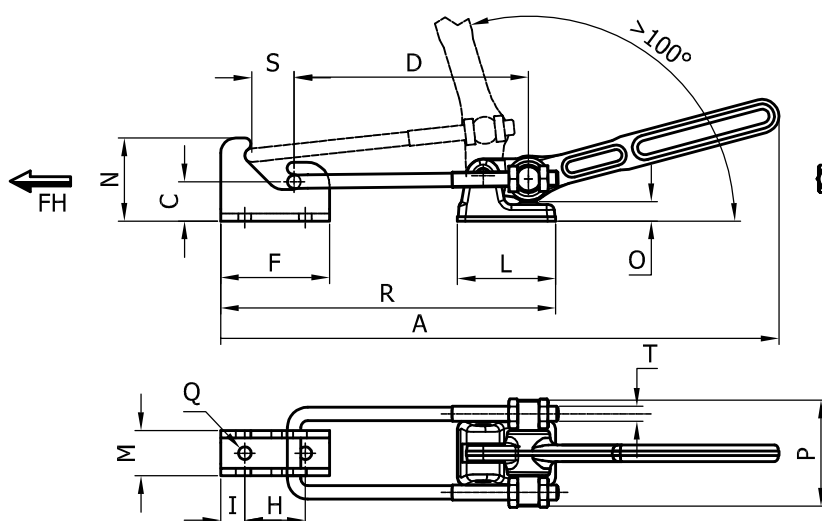
**Hooking bracket:** Rough steel.

**Performance:** The tool comes with a bar with hooking bracket and nuts.

**Features and applications:** The tools of this series are generally used in rotational forging, as it is able to operate at high temperatures (240-300°C). This is made possible thanks to their finish, the interposition of special copper grease between the parts and appropriate tolerances between the couplings.



FORM  
**1500/T2S**



FORM  
**1510/T2S**

Code	Description	A	B	C	D	E	F	G	H	I	L	M	N	P	Q	R	S	T	Fh1 (daN)	gr.
AL750	1500/T2S	256	55	26	155	43	72	30	40	16	65	30	55	70	8,5	222	28	M10	1500	1240
AL755	1510/T2S	369	80,5	26	155	43	72	11	40	16	65	30	55	70	8,5	222	28	M10	1500	1320

## C SERIES



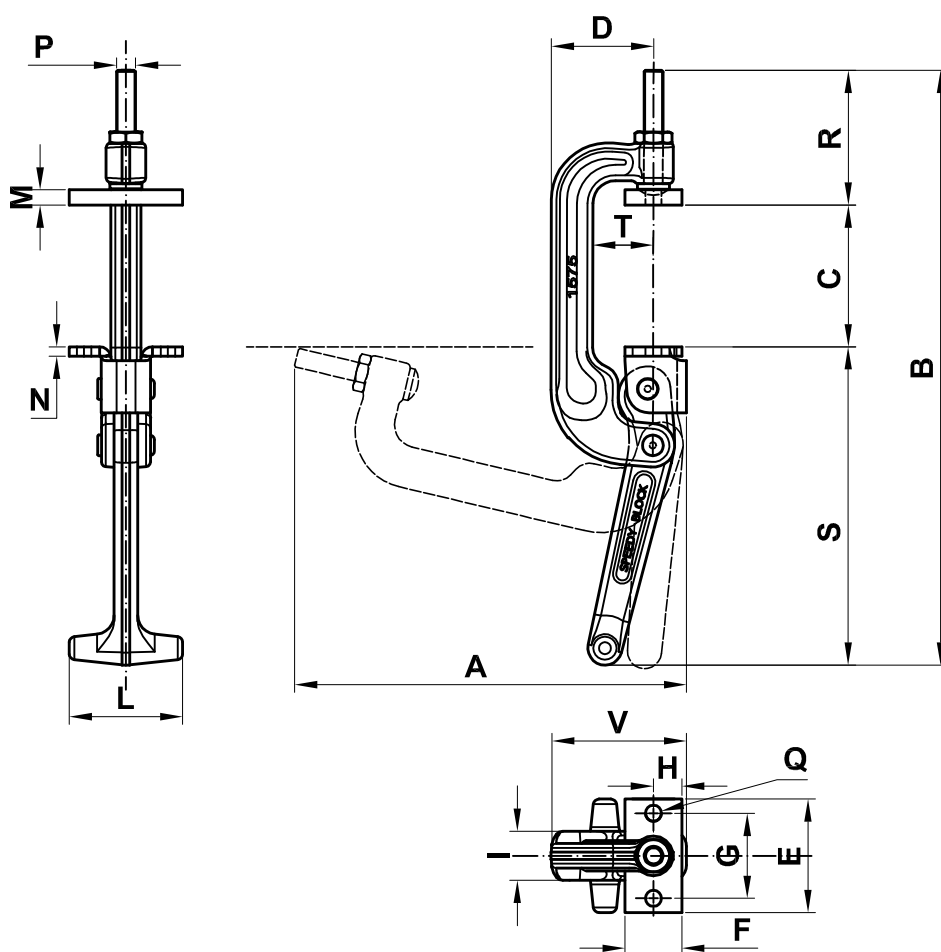
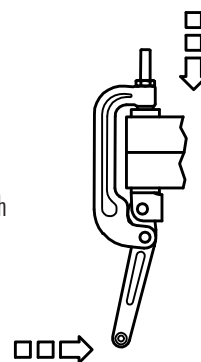
### C SERIES FOR HIGH TEMPERATURES

**Material:** The sheet metal parts are made from steel; The other parts are made of hot-stamped weldable steel.

**Performance:** The tool comes complete with adjusting screw and bearing plate.

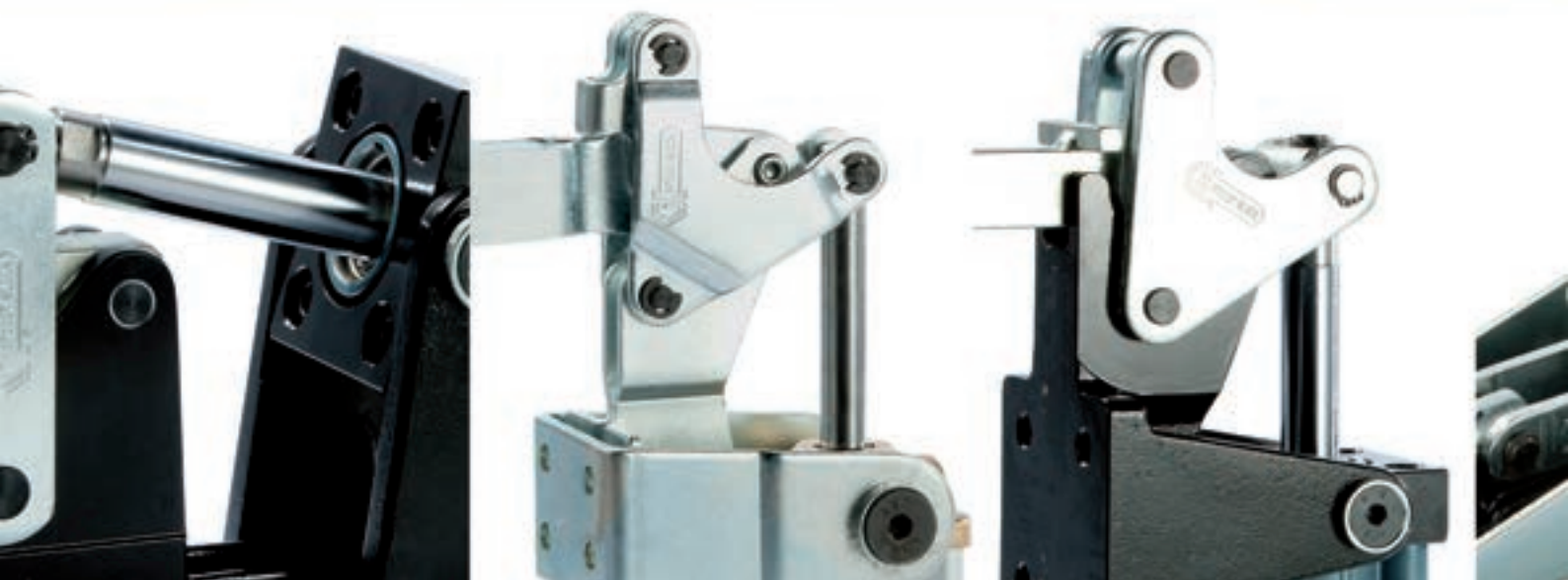
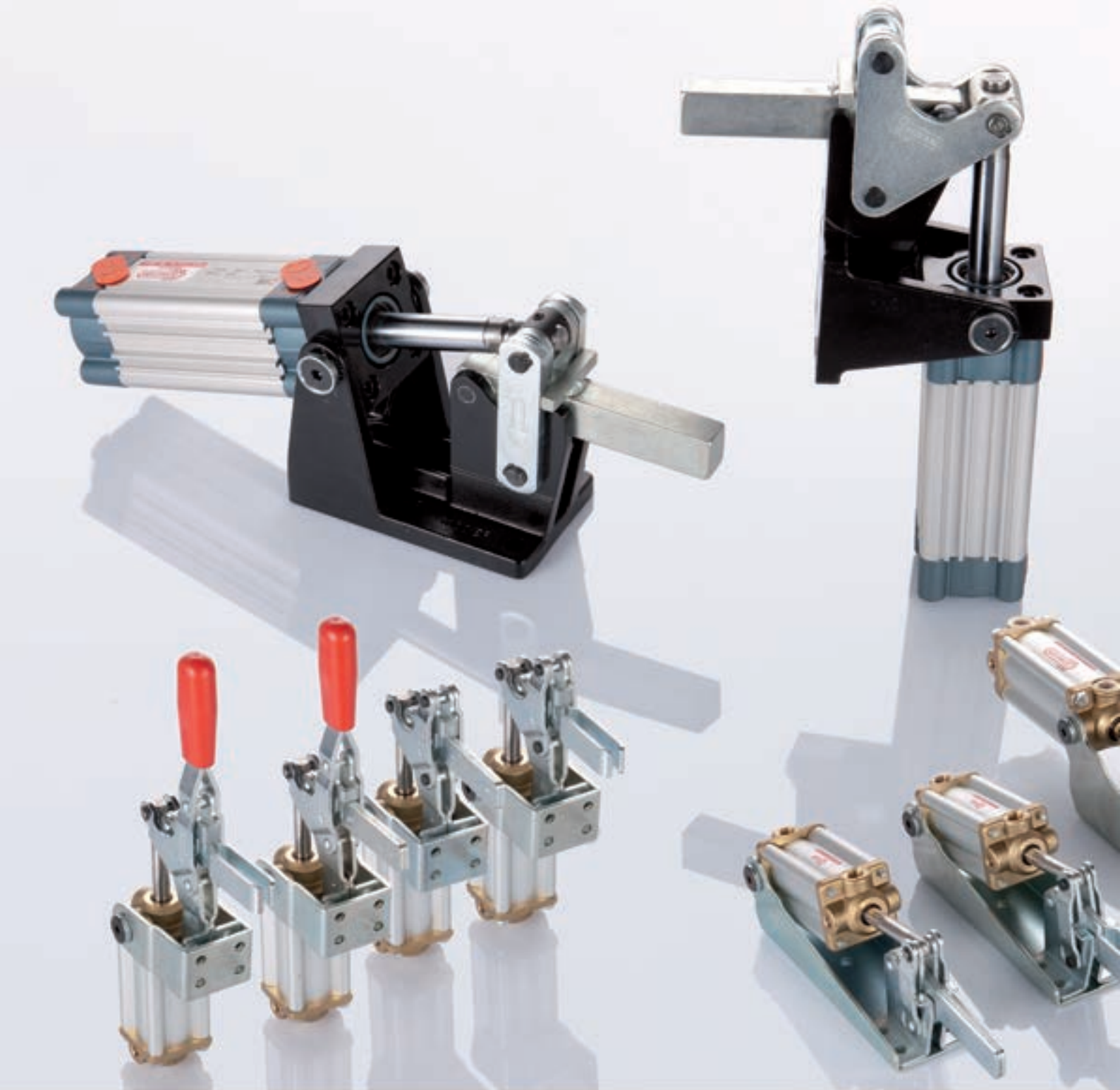
**Features and applications:** The tools of this series are generally used in rotational forging, as it is able to operate at high temperatures (240-300°C).

This is made possible thanks to their finish, the interposition of special copper grease between the parts and appropriate tolerances between the couplings.



Code	Description	A	B	C	D	E	F	G	H	I	L	M	N	P	Q	R	S	T	V	Fh1 (daN)	gr.
AL758	1540	173	280	40	54	60	30	45	15	26	60	8	5	M10	8,5	71	168	32	72	1500	1110
AL760	1575	207	315	75	54	60	30	45	15	26	60	8	5	M10	8,5	71	168	32	72	1500	1190







# PNEUMATIC SERIES

This series combines the advantages of toggle action (even in case of pressure loss the tool remains closed) with the possibilities offered by the pneumatics:

- Constant FS clamping force independent of the operation.
- Possibility of actuating several devices at the same time.
- Possibility of actuating various points; remote control performed also by machines.
- Several versions are available with magnetic cylinders that enable positioning control without contacts, to obtain electric command impulses in certain clamping situations.

The pneumatic series also contains vertical and push rod series with Fs clamping forces between 50 and 240 daN and Fh retaining forces from 70 to 450 daN for the light series; and Fs from 340 daN to 430 daN with Fh from 1000 to 2000 daN for the heavy series. The use of a filter - reducer - lubricator group is essential for a long and smooth operation of the cylinder, while for a long duration of the mechanical components we recommend using suitable flow regulators and calibrating the speed of the motions desired, starting from a low speed and gradually increasing this speed. The cylinders of the heavy series (1000-2000/EPM/EPVM) already mount these flow regulators on the heads and they can be adjusted using a screw on the side of the air supply. Operating pressure between 2-6 bar. Ambient temperature -30° + 80°C. The Fs forces indicated in the catalogue were measured at a pressure of 4 bar.

## PERFORMANCE

**LIGHT SERIES:** Components in case-hardening sheet steel. Hardened and tempered supporting pivots. Supporting bushes (for sizes from 200 daN and over) undergo case-hardening and grinding.

**HEAVY SERIES:** Base made of black varnished spheroidal cast iron. Other parts made of galvanized (weldable) steel. Supporting pivots undergo case hardening.

Double-acting cylinder with adjustable shock absorption. The tools of this series are built so as to be easily disassembled: the pivots are fixed axially with Seeger rings. The clamping lever can be reworked after dismantling according to the required use.

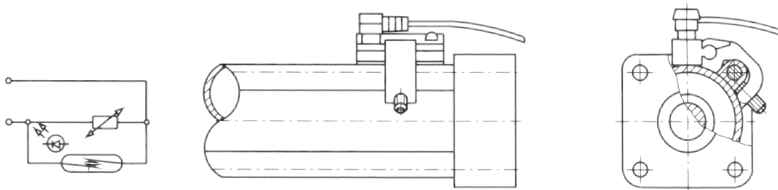
# PNEUMATIC SERIES

## THE PROXIMITY SWITCHES

are sensors capable of sensing the presence of a magnetic field and report it through an electric pulse. The tools of the magnetic pneumatic series are provided with magnetic cylinders that, since they are related by relative proximity switches, provide electric command and/or control impulses as they work. Since it is equipped with luminous LEDs, operates at a minimum voltage of 3 V, and in case of series connection, the voltage drop will be 3 V. for each. It is good practice to use a connecting cable that is as short as possible since this could harm the operation of the sensor due to the capacity of the cable, which is directly proportional to its length. For example, for a 10 meter cable we recommend the series application to an inductor sensor that annuls the effects of the capacity of the cable. DC positive pole is always connected to the brown wire, we recommend keeping an adequate distance between the electric cables and large ferrous objects as this could cause disturbances to the sensor due to the effects of mutual induction. The sensors are in a condition to feel a signal at a speed of 1 m/s.

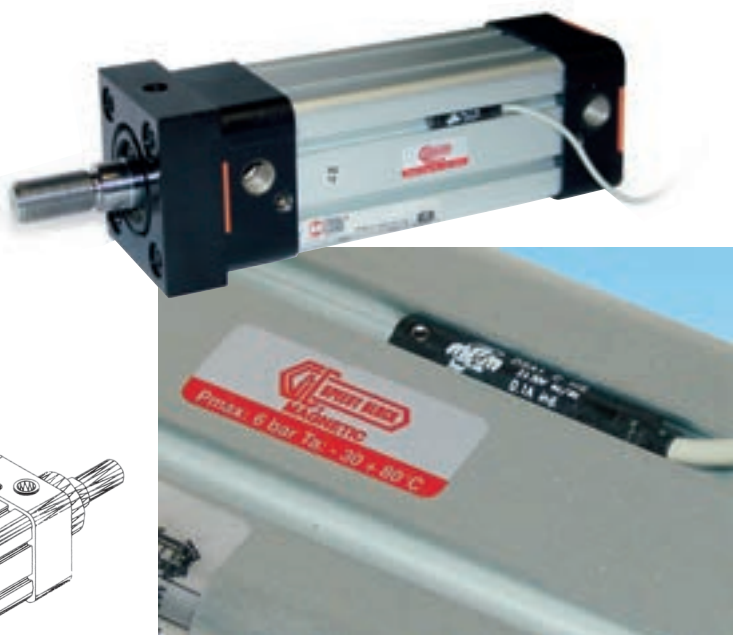
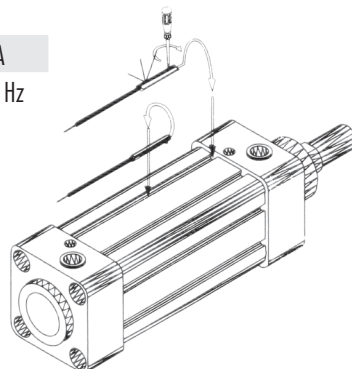
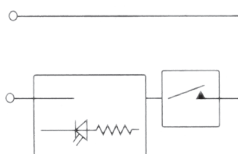
### ELECTRICAL DATA

<b>DC Voltage</b>	3-110 V
<b>AC Voltage</b>	3-110 V
<b>Current at 25°</b>	0.3 A
<b>Power</b>	10 VA
<b>Connection time</b>	0.6 mS
<b>Disconnection time</b>	0.1 mS
<b>Connection point</b>	110 Gauss
<b>Disconnection point</b>	60 Gauss
<b>Electrical life (pulses)</b>	10 <sup>7</sup>
<b>Contact resistance</b>	0.1 Ohm

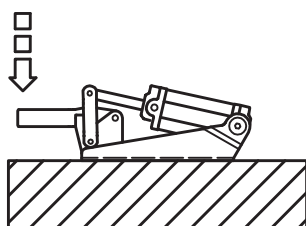


### ELECTRICAL DATA

<b>DC Voltage</b>	3-110V
<b>AC Voltage</b>	3-110 V
<b>Current at 25°</b>	200 mA
<b>Power</b>	6 w
<b>Connection time</b>	0.5 mS
<b>Disconnection time</b>	0.1 mS
<b>Connection point</b>	110 Gauss
<b>Disconnection point</b>	60 Gauss
<b>Electrical life (pulses)</b>	10 <sup>7</sup>
<b>Contact resistance</b>	0.1 Ohm
<b>Voltage drop</b>	< 3
<b>V Nominal operating point</b>	25-30 A
<b>T Operating frequency</b>	Max. 500 Hz







## LIGHT PNEUMATIC SERIES

Some sizes of this series are also produced for Magnetic performance and are shown in the table below ("magnetic version")

**Material:** Sheet metal and galvanized steel riveted pivots. Hardened and ground steel rotation pivots.

### Performance:

Form AP3 with open clamping lever and two flanged washers.

Form EP3 with full clamping lever and bolt retainers.

Form APM just like AP3 but with magnetic cylinder for the detection of the position

Form EPM just like EP3 but with magnetic cylinder for the detection of the position

**Cylinder:** Maximum operating pressure 6 bar.

Maximum operating temperature 80°C

The AU460 model reed switch is used for detecting the position, for sizes 200 and 300; model AU450 is used for size 400 (See Accessories on page 76)

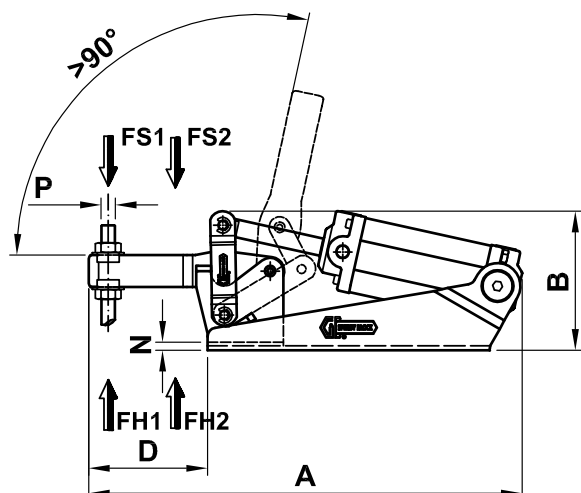
The proximity switches must be ordered separately.

**Spindles:** To be ordered separately (See Accessories on page 76)

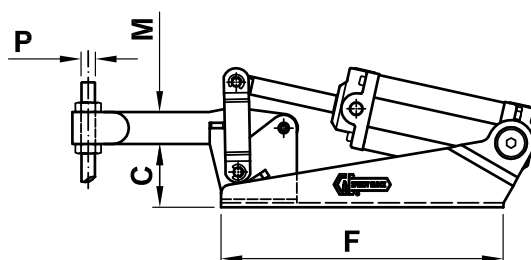
**Features and applications:** We recommend using a filter-reducer-lubricator group for a long and smooth operation of the cylinder, while for a long duration of the mechanical components we recommend using suitable flow regulators and calibrating the speed of the motions desired, starting from a low speed and gradually increasing this speed.

A special grease is placed between two contacting surfaces during assembly.

This manually actuated series is found on page 10.



**FORM  
AP3**



**FORM  
EP3**

Code	Description	Magnetic Version Code	Description	A	B	C	D	E	F	G	H	I	L	M	N	O	P	Q	R	S	T	Fh1 (daN)	Fh2 (daN)	Fs1 (daN)	Fs2 (daN)	gr.
AO020	70/AP3			163	51,5	21	38	42	92	24	15	6,5÷7	5,2	11	4		M5	4,5	1/8"	20	45	70	145	50	75	500
AO025	70/EP3			163	51,5	21	38	42	92	24	15	6,5÷7		11	4	4	M5	4,5	1/8"		45	70	145	50	75	500
AO041	125/AP3			200	70,5	30	50	47,5	150	29	19	8÷11,2	6,2	14	4,5		M6	5,5	1/8"	23	46	160	300	70	120	700
AO046	125/EP3			201	70,5	30	51	47,5	150	29	19	8÷11,2		14	4,5	5	M6	5,5	1/8"		46	160	300	70	120	700
AO161	200/AP3	AO162	200/APM	246	79	36	67,5	53	160	32	20	11,5÷12	8,5	18	5,5		M8	6,5	1/8"	40	56	220	350	90	150	1070
AO166	200/EP3	AO167	200/EPM	248	79	36	69,5	53	160	32	20	11,5÷12		18	5,5	6	M8	6,5	1/8"		56	220	350	90	150	1070
AO201	300/AP3	AO202	300/APM	304,5	98	48	78,5	74	195,5	46	29	8,5÷10,5	10,5	20	8,5		M10	8,5	1/4"	42	66	270	450	120	240	2100
AO206	300/EP3	AO207	300/EPM	306	98	48	80	74	195,5	46	29	8,5÷10,5		20	8,5	8	M10	8,5	1/4"		66	270	450	120	240	2100
AO301	400/AP3	AO302	400/APM	360	107,5	51	110	74	216	45	32	10	12,5	22	10		M12	8,5	1/4"	66	80	300	640	140	260	3100
AO306	400/EP3	AO307	400/EPM	362	107,5	51	112	74	216	45	32	10		22	10	10	M12	8,5	1/4"		80	300	640	140	260	3100



# PNEUMATIC SERIES



## LIGHT PNEUMATIC SERIES

The sizes of this series are also produced for Magnetic performance and are shown in the table below (see "magnetic version")

**Material:** Sheet metal and galvanized steel riveted pivots  
Hardened and ground steel rotation pivots.

### Performance:

Form APV3 with open clamping lever and two flanged washers.

Form EPV3 with full clamping lever and bolt retainers.

Form APVM just like APV3 but with magnetic cylinder for the detection of the position

Form EPVM just like EPV3 but with magnetic cylinder for the detection of the position

**Cylinder:** Maximum operating pressure 6 bar.

Maximum operating temperature 80°C

Model AU460 is the reed switch for detecting the position (See Accessories on page 76)

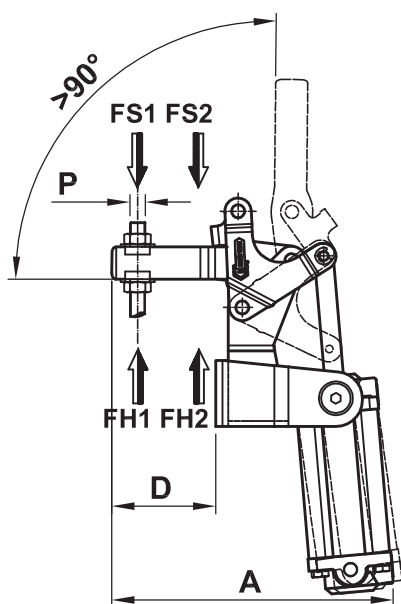
The proximity switches must be ordered separately.

**Spindles:** To be ordered separately (see Accessories on page 76)

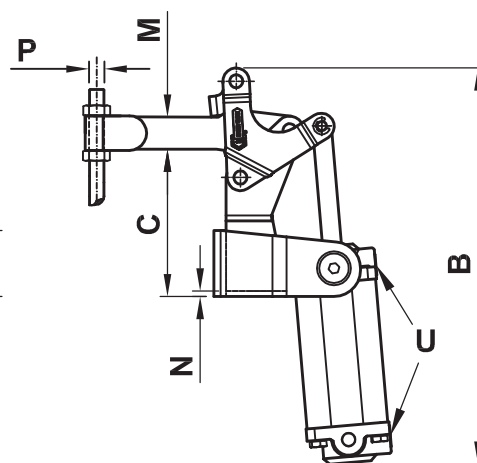
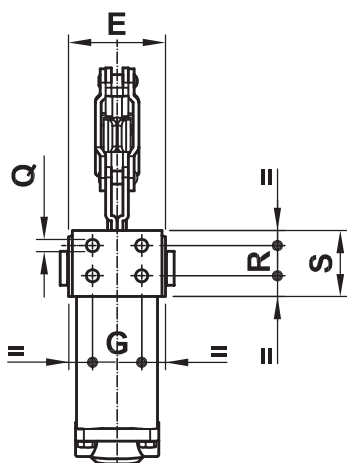
**Features and applications:** We recommend using a filter-reducer-lubricator group for a long and smooth operation of the cylinder, while for a long duration of the mechanical components we recommend using suitable flow regulators and calibrating the speed of the motions desired, starting from a low speed and gradually increasing this speed.

A special grease is placed between two contacting surfaces during assembly.

This manually actuated series is found on page 12.



**FORM  
APV3**



**FORM  
EPV3**

Code	Description	Magnetic Version Code	Description	A	B	C	D	E	G	H	I	L	M	N	O	P	Q	R	S	T	U	Fh1 (daN)	Fh2 (daN)	Fs1 (daN)	Fs2 (daN)	gr.
<b>A0181</b>	200/APV3	A0182	200/APVM	149	210	77	55	51	26	16		8,5	17	3	34	M8	6,5	16	35	59,5 1/8"	160	250	90	150	1200	
<b>A0186</b>	200/EPV3	A0187	200/EPVM	151	210	77	57	51	26	16	6		17	3		M8	6,5	16	35	59,5 1/8"	160	250	90	150	1200	
<b>A0221</b>	300/APV3	A0222	300/APVM	186	258	108	71	60,5	30	28		10,3	20	3	42	M10	8,5	30	50	68,5 1/4"	240	370	120	240	2450	
<b>A0226</b>	300/EPV3	A0227	300/EPVM	187,5	258	108	72,5	60,5	30	28	8		20	3		M10	8,5	30	50	68,5 1/4"	240	370	120	240	2450	



## LIGHT PNEUMATIC SERIES

Some sizes of this series are also made for Magnetic performance and are reported in the table below (see "magnetic version")

**Material:** Sheet metal and galvanized steel riveted pivots  
Hardened and ground steel rotation pivots.

### Performance:

Form APV3S with open clamping lever and two flanged washers.

Form EPV3S with full clamping lever and bolt retainers.

Form APVMS just like APV3S but with magnetic cylinder for the detection of the position

Form EPVMS just like EPV3S but with magnetic cylinder for the detection of the position

**Cylinder:** Maximum operating pressure 6 bar. Maximum operating temperature 80°C

Model AU460 is the reed switch for detecting the position (See Accessories on page 76)

The proximity switches must be ordered separately.

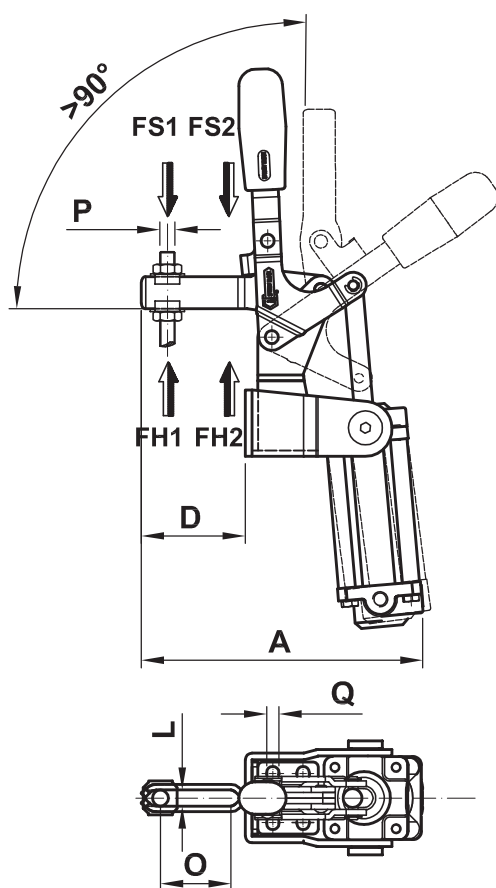
**Handles:** Red polyurethane resistant to oils, grease and other chemical agents.

**Spindles:** To be ordered separately (see Accessories on page 76)

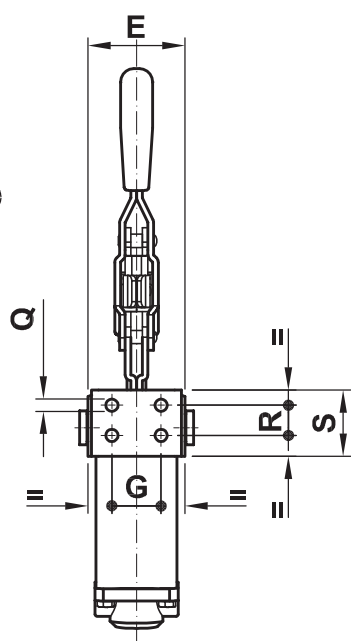
**Features and applications:** The tools of this series are used when there is a need for pneumatic closing (generally simultaneous closing of the tools remotely) but manual and single opening is mandatory. We recommend using a filter-reducer-lubricator group for a long and smooth operation of the cylinder, while for a long duration of the mechanical components we recommend using suitable flow regulators and calibrating the speed of the motions desired, starting from a low speed and gradually increasing this speed.

A special grease is placed between two contacting surfaces during assembly.

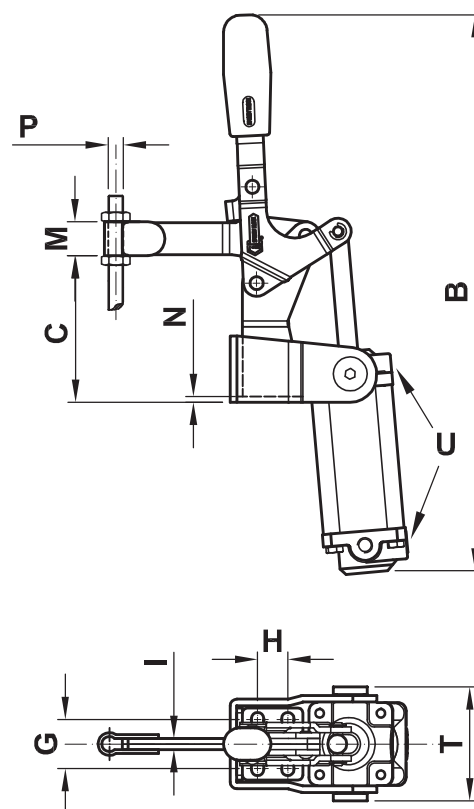
This manually actuated series is found on page 13.



**FORM  
APV3S**



**FORM  
EPV3S**



Code	Description	Magnetic Version Code	Description	A	B	C	D	E	G	H	I	L	M	N	O	P	Q	R	S	T	U	Fh1 (daN)	Fh2 (daN)	Fs1 (daN)	Fs2 (daN)	gr.
A0184	200/APV3S	A0185	200/APVMS	149	296	77	55	51	26	16		8,5	17	3	34	M8	6,5	16	35	59,5	1/8"	160	250	90	150	1200
A0189	200/EPV3S	A0190	200/EPVMS	151	296	77	57	51	26	16	6		17	3		M8	6,5	16	35	59,5	1/8"	160	250	90	150	1200
A0224	300/APV3S	A0225	300/APVMS	186	360	108	71	60,5	30	28		10,3	20	3	42	M10	8,5	30	50	68,5	1/4"	240	370	120	240	2450
A0229	300/EPV3S	A0230	300/EPVMS	187,5	360	108	72,5	60,5	30	28	8		20	3		M10	8,5	30	50	68,5	1/4"	240	370	120	240	2450

## PNEUMATIC SERIES



### HEAVY PNEUMATIC SERIES

**Material:** Base made of spheroidal cast iron;  
Lever in galvanized steel;  
Hardened and ground pivots.

**Cylinder:** Magnetic ISO standards (see introduction on page 65)

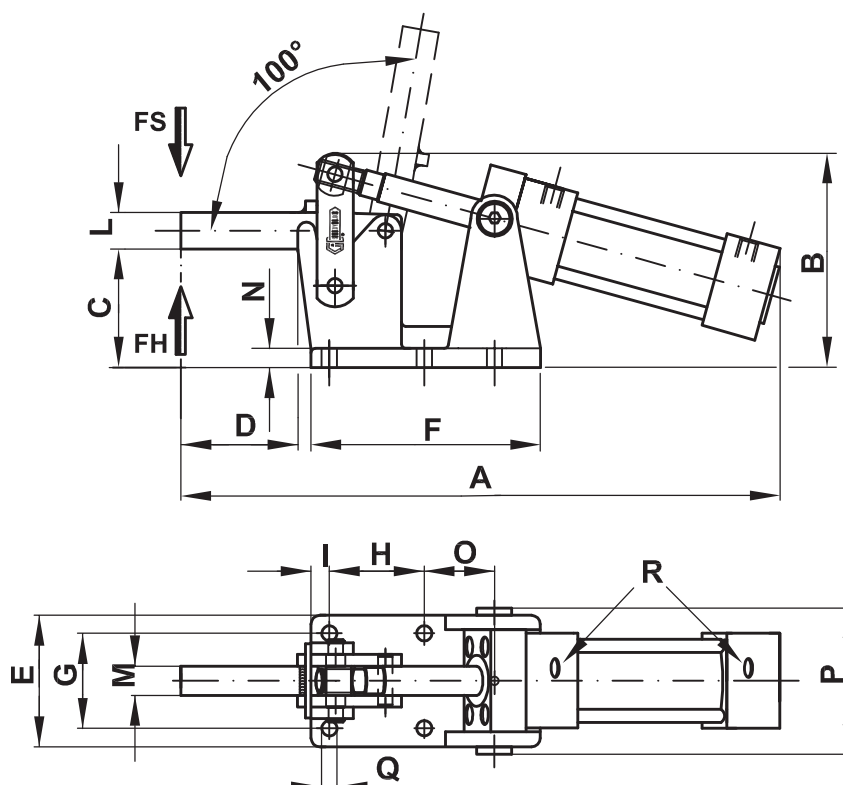
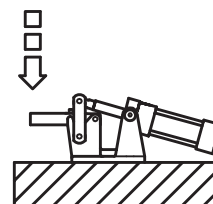
Maximum operating pressure 10 bar. Maximum operating temperature 80°C

Model AU470 is the reed switch for detecting the position (See Accessories on page 76) to be ordered separately.

**Features and applications:** These tools are designed to withstand high loads and a high number of operations.

We recommend using a filter-reducer-lubricator group for a long and smooth operation of the cylinder, while for a long duration of the mechanical components we recommend using the flow regulators found on the head for calibrating the speed of the motions desired, starting from a low speed and gradually increasing this speed.

A special grease is placed between two contacting surfaces during assembly.



Code	Description	A	B	C	D	E	F	G	H	I	L	M	N	O	P	Q	R	Fh (daN)	Fs (daN)	gr.
A0600	1000/EPM	410	146,5	80	80	90	155	65	65	12,5	25	20	13	48	102	10,5	1/4"	1000	320	6500
A0620	2000/EPM	487	171,5	90	100	100	176	70	70	15	35	20	13	56	112	10,5	3/8"	2000	380	9500



## HEAVY PNEUMATIC SERIES

**Material:** Base made of spheroidal cast iron;  
Lever in galvanized steel;  
Hardened and ground pivots.

**Cylinder:** Magnetic ISO standards (see introduction on page 65)

Maximum operating pressure 10 bar.

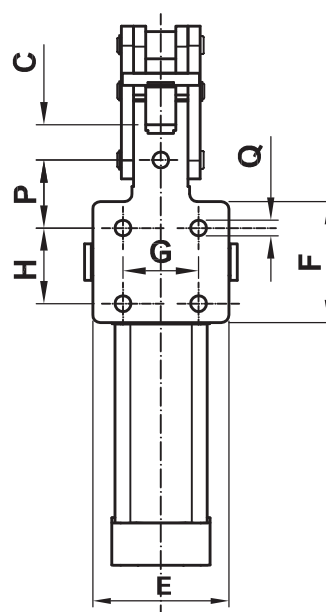
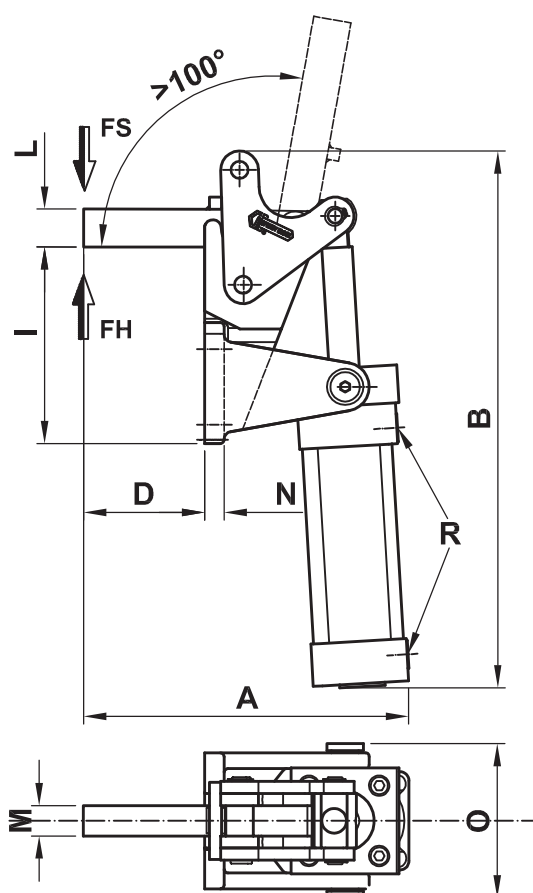
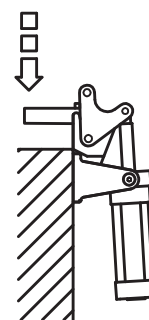
Maximum operating temperature 80°C

Model AU470 is the reed switch for detecting the position (See Accessories on page 76) to be ordered separately.

**Features and applications:** These tools are designed to withstand high loads and a high number of operations.

We recommend using a filter-reducer-lubricator group for a long and smooth operation of the cylinder, while for a long duration of the mechanical components we recommend using the flow regulators found on the head for calibrating the speed of the motions desired, starting from a low speed and gradually increasing this speed.

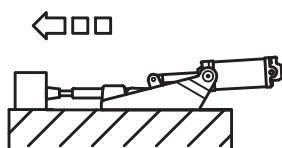
A special grease is placed between two contacting surfaces during assembly.



Code	Description	A	B	C	D	E	F	G	H	I	L	M	N	O	P	Q	R	Fh (daN)	Fs (daN)	gr.
A0605	1000/EPVM	215	355		80	90	80	50	50	130	25	20	13	102		10,5	1/4"	1000	340	6500
A0625	2000/EPVM	246,5	424	45	100	100	90	54	58	157	35	20	14	112	45	13	3/8"	2000	432	9000



## PNEUMATIC SERIES



### PUSH HEAVY PNEUMATIC SERIES

Some sizes of this series are also produced for Magnetic performance and are shown in the table below (see "magnetic version")

**Material:** Galvanized steel

**Riveted pivots, push bar and control lever:** Galvanized steel

**Basic clamp body:** Black varnished brass for size 70; hot forged steel and painted black for the other sizes.

**Performance:** Form SP3 Tool equipped with normal pneumatic cylinder.

Form SPM Tool equipped with magnetic pneumatic cylinder.

**Cylinder:** Maximum operating pressure 6 bar. Max. operating temperature 80°C.

The AU460 model reed switch is used for detecting the position, for sizes 360 and 1100; model AU450 is used for size 2100 (See Accessories on page 76)

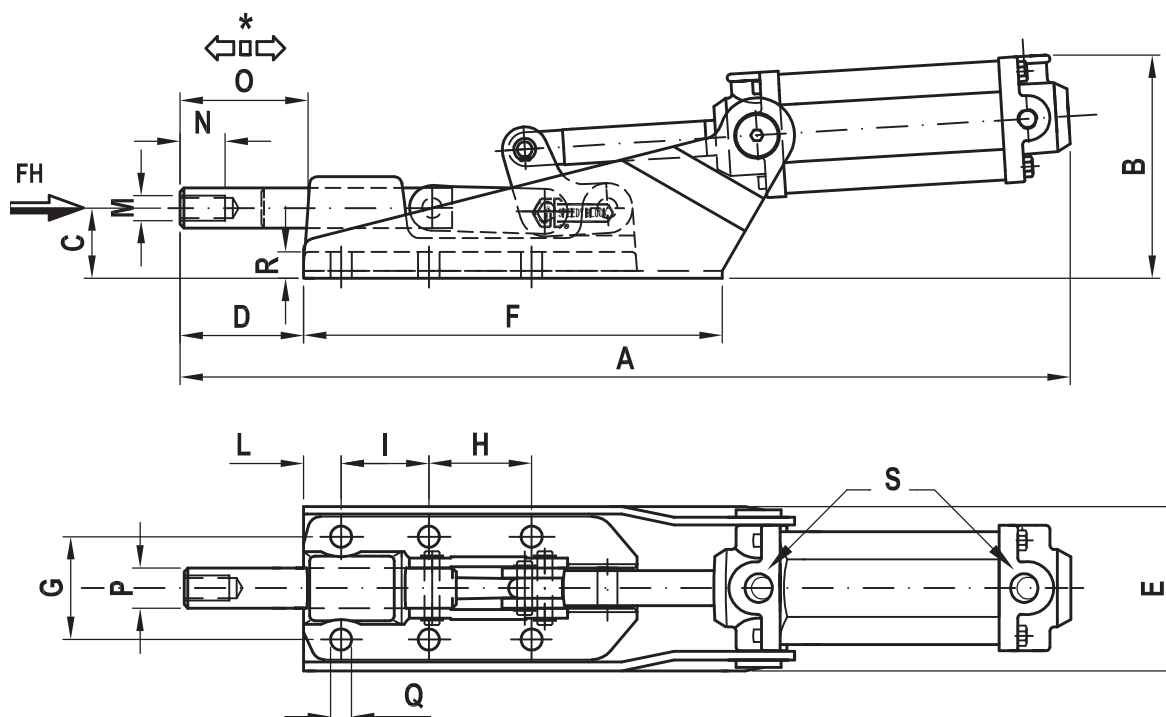
The proximity switches must be ordered separately.

**Spindles:** To be ordered separately (See Accessories on page 76)

**Features and applications:** We recommend using a filter-reducer-lubricator group for a long and smooth operation of the cylinder, while for a long duration of the mechanical components we recommend using suitable flow regulators and calibrating the speed of the motions desired, starting from a low speed and gradually increasing this speed.

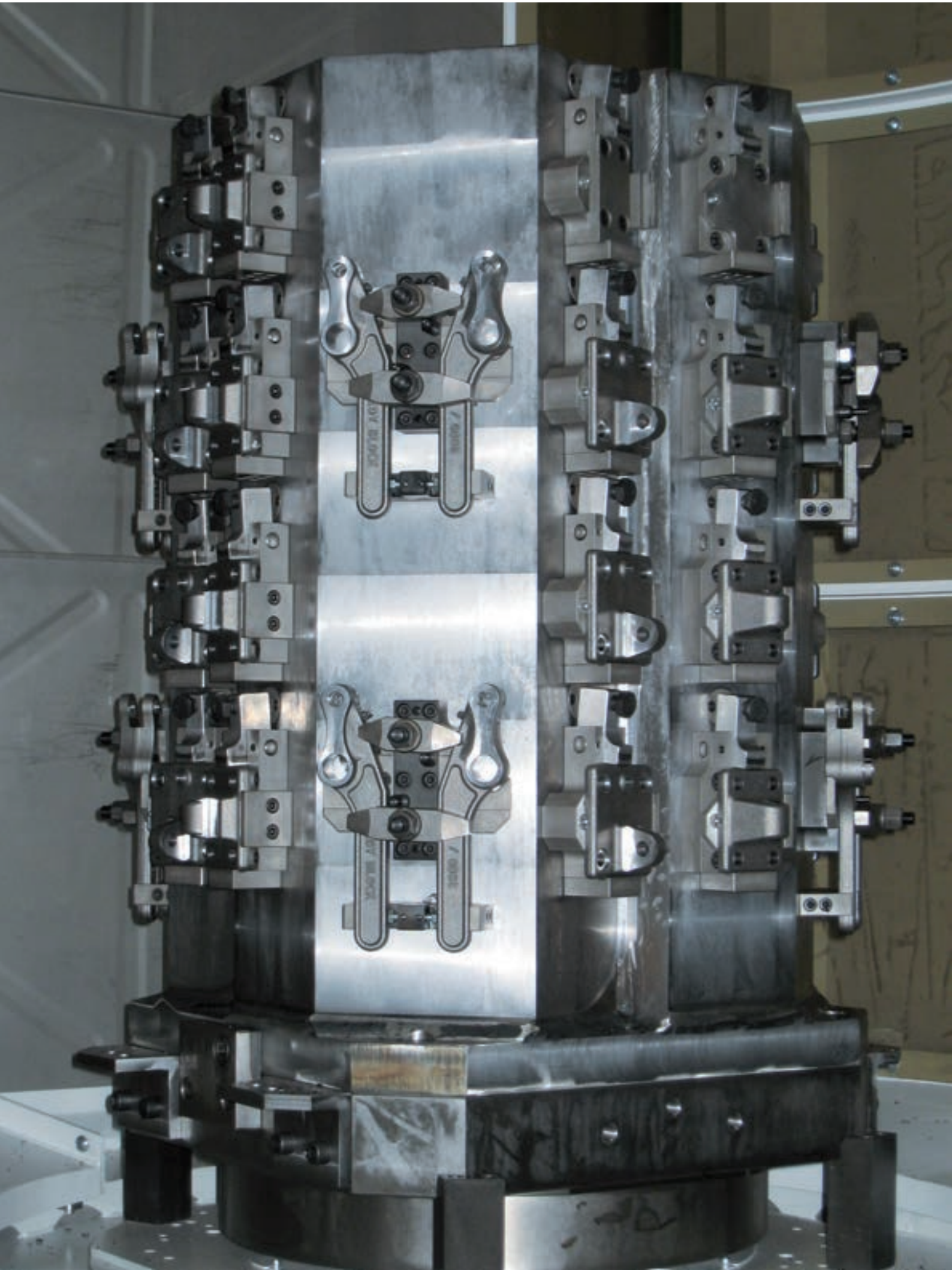
A special grease is placed between two contacting surfaces during assembly.

This manually actuated series is found on page 39.

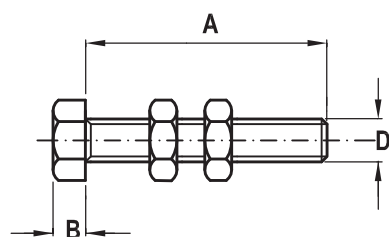


Code	Description	Magnetic Version Code	Description	A	B	C	D	E	F	G	H	I	L	M	N	O	P	Q	R	S	*	Fh (daN)	Fs (daN)	gr.
A0350	70/SP3			171	51	14	20	42	64	26	26		13	M6	12	22	8,5	4,3	8	1/8"	12	120	50	550
A0361	360/SP3	A0362	360/SPM	260	72,5	27,5	32	55	116	33,5	36,5		30	M8	15	34	12	5,5	9,5	1/8"	22	560	310	1300
A0371	1100/SP3	A0372	1100/SPM	355	89	28	49	66	167	41	41	35	15	M10	18	51,5	16	8,5	12	1/4"	32	1600	410	2400
A0381	2100/SP3	A0382	2100/SPM	468,5	100	38,5	61,5	81	231	50	50	50	35	M12	22	64,5	20	8,5	13	1/4"	45	2500	607	5000

## MANUFACTURING PROCESS



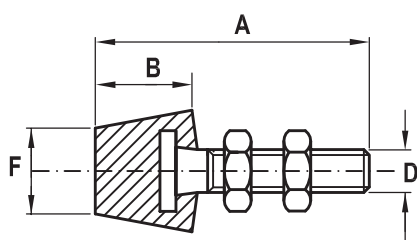
## ACCESSORIES



Hexagonal head spindle with 2 nuts.

**ALSO IN STAINLESS STEEL** (See table)

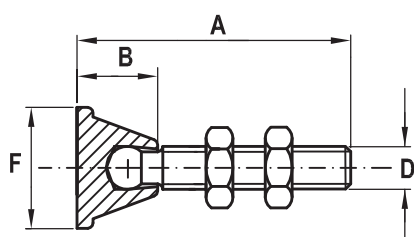
Code	Description	Stainless steel Code	Stainless steel	A	B	D
AU099	10099	AU509	50099	20	3	M4
AU100	10100	AU510	50100	35	3	M5
AU101	10101	AU511	50101	45	3,5	M6
AU102	10102	AU512	50102	55	4	M8
AU103	10103			65	5,5	M10
AU104	10104			80	7	M12
AU105	10105			120	8	M12



Spindle with head covered in neoprene and 2 nuts.

**ALSO IN STAINLESS STEEL** (See table)

Code	Description	Stainless steel Code	Stainless steel	A	B	D	F
AU140	10140	AU540	50140	45	11	M5	10
AU141	10141	AU541	50141	55	12	M6	13
AU142	10142	AU542	50142	68	16	M8	16
AU143	10143			80	20	M10	20

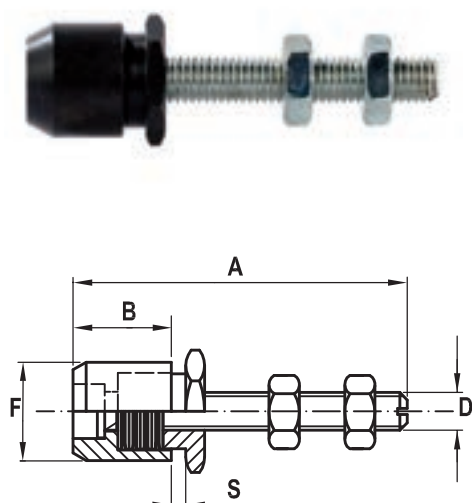


Head joint spindle and 2 nuts.

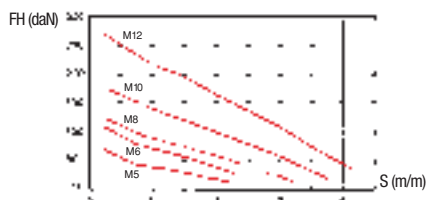
**ALSO IN STAINLESS STEEL** (See table)

Code	Description	Stainless steel Code	Stainless steel	A	B	D	F
AU120	10120	AU520	50120	36	9,5	M5	14
AU121	10121	AU521	50121	45	10	M6	16
AU122	10122	AU522	50122	65	12	M8	18
AU123	10123			75	14	M10	20
AU124	10124			85	16	M12	24
AU125	10125			125	16	M12	24

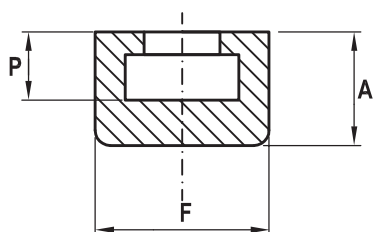
Spring spindle.



Code	Description	A	B	D	F
AU128	10128	45	13	M5	10
AU129	10129	50	15	M6	13
AU130	10130	70	17	M8	15
AU131	10131	85	20	M10	18
AU132	10132	106	24	M12	21

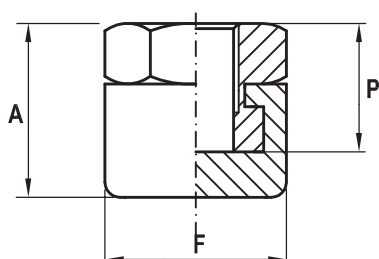


Neoprene cap for hexagonal head spindles.



Code	Description	A	F	P	For spindle
AU109	1099	6,5	11	4	10099-M4
AU110	1100	8	12	5,5	10100-M5
AU111	1101	10	15	6	10101-M6
AU112	1102	13	19	7,5	10102-M8
AU113	1103	16	24	9	10103-M10
AU114	1104	19	26	10,5	10104-10105-M12

Neoprene cap with threaded insert.



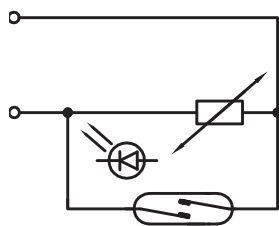
Code	Description	A	F	P	For spindle
AU200	1200	11	12	8,5	M5
AU201	1201	14	15	10	M6
AU202	1202	18	19	12,3	M8
AU203	1203	23,5	24	16,5	M10
AU204	1204	26	26	17,5	M12



## ACCESSORIES



Proximity switches.



### AU450 for models

400/APM/EPM - 2100/SPM

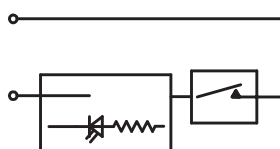
### AU460 for models

200/APM/EPM - 300/APM/EPM

200/APVM/EPVM - 200/APVMS/EPVMS

300/APVM/EPVM - 300/APVMS/EPVMS

360/SPM - 1100/SPM



### AU470 for models

1000/EPM/EPVM

2000/EPM/EPVM



Ergonomic handle

Code	Description	Used for series
AU150	10150	50/ASD-ASS 70/AS-ASD-ASS 80/AS 75/A-B-E-F-MF-M-N-O-P-ML-NL-OL-PL "Also for the Stainless steel series"
AU151	10151	120/AS 130/A-B-E-F-MF 130/M-N-O-P-ML-NL-OL-PL 360/AS LLA01 LLB01 LLE01 LLF01 "Also for the Stainless steel series"
AU152	10152	165/AS 200/AVF-EVF 200/APV3S-EPV3S-APVMS-EPVMS 230/A-B-E-F 230/M-N-O-P "Also for the Stainless steel series"
AU153	10153	200/AV-EV-T-TF 300/APV3S-EPV3S-APVMS-EPVMS-AVF-EVF-AS 330/A-B-E-F 550/AS-ASD-ASS
AU154	10154	300/AV-EV-T-TF 340/AS 355/M-N-O-P-MF 430/A-B-E-F 1100/AS LLA02 LLE02 LLB02 LLF02 "Also for the Stainless steel series"
AU155	10155	400/T-TF 455/M-N-O-P 530/A-B-E-F 2100/AS 3100/AS
AU156	10156	1000/F 2000/F LLE03 LLF03
AU157	10157	3000/F
AU158	10158	160/AS/ASD/ASS
AU159	10159	230/ML-NL-OL-PL "Also for the Stainless steel series"
AU160	10160	355/ML-NL-OL-PL
AU161	10161	455/ML-NL-OL-PL



Bended washer.

**ALSO IN STAINLESS STEEL** (See table)

Code	Description	Stainless steel Code	Stainless steel	Used for series	For spindle
<b>AU205</b>	20105	<b>AU505</b>	50105	25	M4
<b>AU206</b>	20106	<b>AU506</b>	50106	70-75	M5
<b>AU207</b>	20107	<b>AU507</b>	50107	125-130	M6
<b>AU208</b>	20108	<b>AU508</b>	50108	200-230	M8
<b>AU209</b>	20109			300-330-355	M10
<b>AU210</b>	20110			400-430-455-530	M12
<b>AU211</b>	20111			LL01	M6
<b>AU212</b>	20112			LL02	M10



Bolt retainer band

**ALSO IN STAINLESS STEEL** (See table)

Code	Description	Stainless steel Code	Stainless steel	Used for series	For spindle
<b>AU180</b>	10180	<b>AU580</b>	50180	70-75	M5
<b>AU181</b>	10181	<b>AU581</b>	50181	125	M6
<b>AU182</b>	10182	<b>AU582</b>	50182	200-230	M8
<b>AU183</b>	10183			300	M10
<b>AU184</b>	10184			330-355	M12
<b>AU185</b>	10185			400	M12
<b>AU186</b>	10186			430-455	M12
<b>AU189</b>	10189			130	M6
<b>AU190</b>	10190			530	M12

# ANALYTICAL INDEX

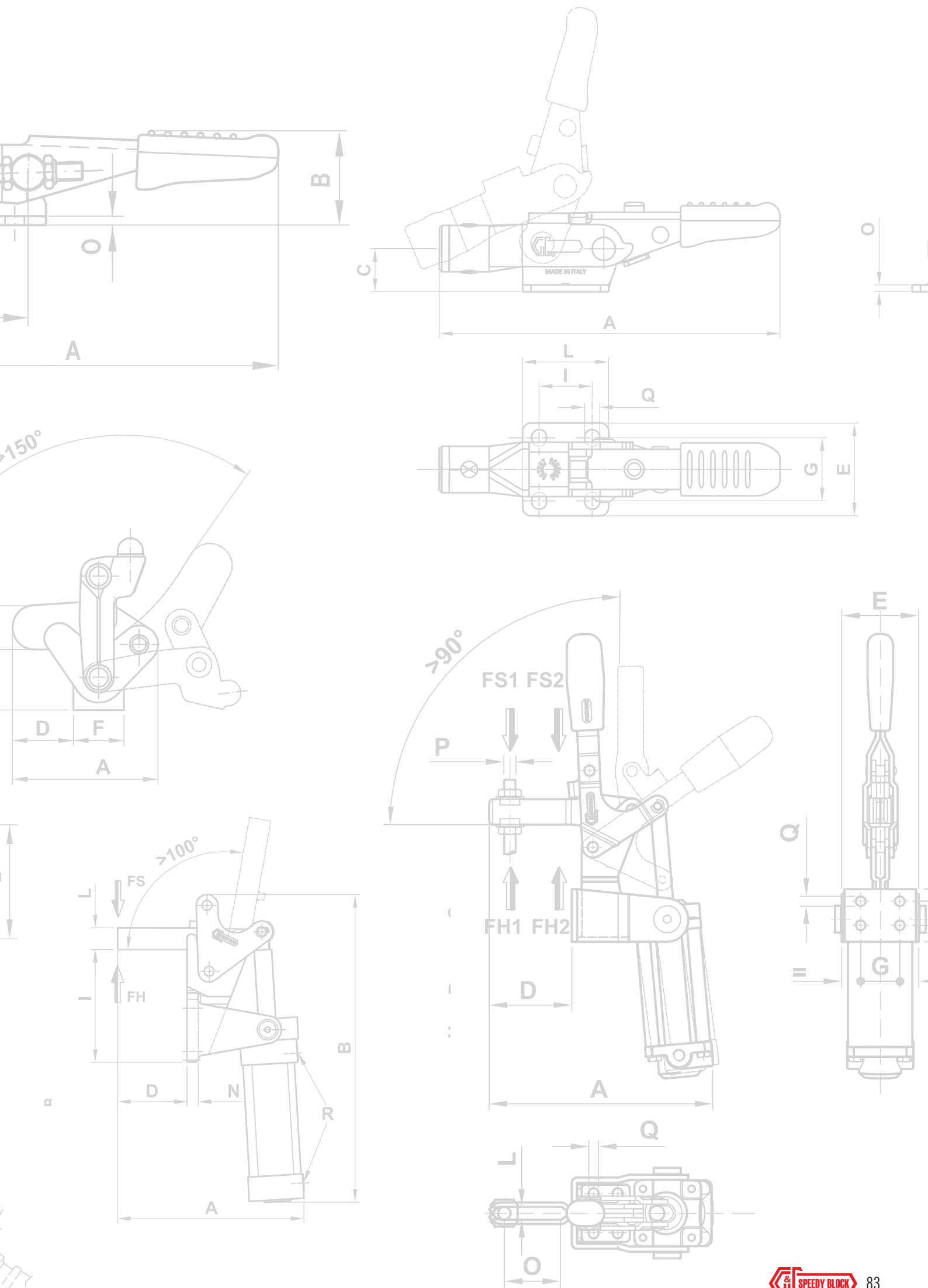
DESCRIPTION	CODE	PAGE	DESCRIPTION	CODE	PAGE	DESCRIPTION	CODE	PAGE
1099	AU109	77	20111	AU211	79	1500/T2S	AL750	64
1100	AU110	77	20112	AU212	79	1510/T2S	AL755	64
1101	AU111	77	30080	AG416	40	160/AS	AG160	39
1102	AU112	77	30165	AG421	40	160/ASD	AG165	37
1103	AU113	77	30340	AG426	40	160/ASS	AG170	37
1104	AU114	77	50099	AU509	76	160/T16	AS600	57
1200	AU200	77	50100	AU510	76	160/T2	AL500	45
1201	AU201	77	50101	AU511	76	160/T2X	AS500	45
1202	AU202	77	50102	AU512	76	160/T3	AL530	46
1203	AU203	77	50105	AU505	79	160/T3X	AS530	46
1204	AU204	77	50106	AU506	79	160/T4	AL560	47
1540	AL758	65	50107	AU507	79	160/T5	AL575	54
1575	AL760	65	50108	AU508	79	160/T5X	AS545	54
10099	AU099	76	50120	AU520	76	160/T6	AL780	57
10100	AU100	76	50121	AU521	76	160/TG	AU400	55
10101	AU101	76	50122	AU522	76	160/TGX	AU420	55
10102	AU102	76	50140	AU540	76	160/TT	AU404	55
10103	AU103	76	50141	AU541	76	160/TTX	AU424	55
10104	AU104	76	50142	AU542	76	160/TU	AU402	55
10105	AU105	76	50180	AU580	79	160/TUX	AU422	55
10120	AU120	76	50181	AU581	79	165/AS	AG406	40
10121	AU121	76	50182	AU582	79	165/ASX	AS406	40
10122	AU122	76	1000/EPM	AO600	72	1700/T6	AL795	58
10123	AU123	76	1000/EPVM	AO605	73	1700/T6S	AL805	59
10124	AU124	76	1000/F	AA900	14	1700/T6SX	AS625	59
10125	AU125	76	1100/AS	AG361	39	1700/T6X	AS615	58
10128	AU128	77	1100/SP3	AO371	74	200/AP3	AO161	69
10129	AU129	77	1100/SPM	AO372	74	200/APM	AO162	69
10130	AU130	77	120/AS	AG120	38	200/APV3	AO181	70
10131	AU131	77	125/AP3	AO041	69	200/APV3S	AO184	71
10132	AU132	77	125/EP3	AO046	69	200/APVM	AO182	70
10140	AU140	76	130/A	AA530	10	200/APVMS	AO185	71
10141	AU141	76	130/AX	AS150	10	200/AV	AA220	12
10142	AU142	76	130/B	AA532	11	200/AVF	AA221	13
10143	AU143	76	130/BX	AS155	11	200/EP3	AO166	69
10150	AU150	78	130/E	AA534	10	200/EPM	AO167	69
10151	AU151	24	130/ER	AR530	62	200/EPV3	AO186	70
10151	AU151	78	130/EX	AS160	10	200/EPV3S	AO189	71
10152	AU152	78	130/F	AA536	11	200/EPVM	AO187	70
10153	AU153	78	130/FX	AS165	11	200/EPVMS	AO190	71
10154	AU154	24	130/M	AD135	28	200/EV	AA225	12
10154	AU154	78	130/MF	AD136	32	200/EVF	AA226	13
10155	AU155	78	130/MFX	DS136	32	200/T	AL200	44
10156	AU156	24	130/ML	AD152	30	200/TF	AL205	44
10156	AU156	78	130/MLX	DS152	30	2000/EPM	AO620	72
10157	AU157	24	130/MX	DS135	28	2000/EPVM	AO625	73
10157	AU157	78	130/N	AD140	29	2000/F	AA905	14
10158	AU158	78	130/NL	AD154	31	2100/AS	AG371	39
10159	AU159	78	130/NLX	DS154	31	2100/SP3	AO381	74
10160	AU160	78	130/NX	DS140	29	2100/SPM	AO382	74
10161	AU161	78	130/O	AD145	28	230/A	AA540	10
10180	AU180	79	130/OL	AD156	30	230/AX	AS180	10
10181	AU181	79	130/OLX	DS156	30	230/B	AA542	11
10182	AU182	79	130/OR	AR145	63	230/BX	AS185	11
10183	AU183	79	130/OX	DS145	28	230/E	AA544	10
10184	AU184	79	130/P	AD150	29	230/ER	AR540	62
10185	AU185	79	130/PL	AD158	31	230/EX	AS190	10
10186	AU186	79	130/PLX	DS158	31	230/F	AA546	11
10189	AU189	79	130/PX	DS150	29	230/FX	AS195	11
10190	AU190	79	1400/T2	AL600	48	230/M	AD270	28
20105	AU205	79	1400/T2S	AL620	49	230/MF	AD271	32
20106	AU206	79	1400/T2SX	AS590	49	230/MFX	DS271	32
20107	AU207	79	1400/T2X	AS580	48	230/ML	AD290	30
20108	AU208	79	1400/T3	AL550	50	230/MLX	DS287	30
20109	AU209	79	1400/T3S	AL552	51	230/MX	DS270	28
20110	AU210	79	1400/T5	AL590	56	230/N	AD275	29

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DESCRIPTION	CODE	PAGE	DESCRIPTION	CODE	PAGE	DESCRIPTION	CODE	PAGE
230/NL	AD292	31	355/ML	AD390	30	75/BX	AS100	11
230/NLX	DS289	31	355/N	AD375	29	75/E	AA524	10
230/NX	DS275	29	355/NL	AD392	31	75/EX	AS105	10
230/O	AD280	28	355/O	AD380	28	75/F	AA526	11
230/OL	AD294	30	355/OL	AD394	30	75/FX	AS110	11
230/OLX	DS291	30	355/OR	AR380	63	75/M	AD075	28
230/OR	AR280	63	355/P	AD385	29	75/MF	AD076	32
230/OX	DS280	28	355/PL	AD396	31	75/MFX	DS076	32
230/P	AD285	29	360/AS	AG351	39	75/ML	AD092	30
230/PL	AD296	31	360/SP3	AO361	74	75/MLX	DS100	30
230/PLX	DS293	31	360/SPM	AO362	74	75/MX	DS075	28
230/PX	DS285	29	400/AP3	AO301	69	75/N	AD080	29
25/M	AD025	28	400/APM	AO302	69	75/NL	AD094	31
25/MX	DS025	28	400/EP3	AO306	69	75/NLX	DS102	31
2800/T2	AL610	48	400/EPM	AO307	69	75/NX	DS080	29
2800/T2S	AL630	49	400/T	AL400	44	75/O	AD085	28
2800/T2SX	AS595	49	400/TF	AL405	44	75/OL	AD096	30
2800/T2X	AS585	48	4000/T6	AL800	58	75/OLX	DS104	30
300/AP3	AO201	69	4000/T6S	AL810	59	75/OX	DS085	28
300/APM	AO202	69	4000/T6SX	AS630	59	75/P	AD090	29
300/APV3	AO221	70	4000/T6X	AS620	58	75/PL	AD098	31
300/APV3S	AO224	71	430/A	AA560	10	75/PLX	DS106	31
300/APVM	AO222	70	430/B	AA562	11	75/PX	DS090	29
300/APVMS	AO225	71	430/E	AA564	10	80/AS	AG401	40
300/AS	AG300	38	430/F	AA566	11	80/ASX	AS401	40
300/AV	AA320	12	455/M	AD470	28	LC01	AU250	24
300/AVF	AA321	13	455/ML	AD490	30	LC02	AU255	24
300/EP3	AO206	69	455/N	AD475	29	LC03	AU260	24
300/EPM	AO207	69	455/NL	AD492	31	LC04	AU265	24
300/EPV3	AO226	70	455/O	AD480	28	LLA01	AA600	18
300/EPV3S	AO229	71	455/OL	AD494	30	LLA02	AA630	18
300/EPVM	AO227	70	455/P	AD485	29	LLB01	AA605	19
300/EPVMS	AO230	71	455/PL	AD496	31	LLB02	AA635	19
300/EV	AA325	12	50/ASD	AG050	36	LLE01	AA610	18
300/EVF	AA326	13	50/ASS	AG055	36	LLE02	AA640	18
300/T	AL300	44	530/A	AA570	10	LLE03	AA660	18
300/TF	AL305	44	530/B	AA572	11	LLE04	AA680	18
3000/F	AA910	14	530/E	AA574	10	LLF01	AA615	19
30080X	AS416	40	530/F	AA576	11	LLF02	AA645	19
30165X	AS421	40	550/AS	AG355	39	LLF03	AA665	19
30340X	AS426	40	550/ASD	AG175	37	LLF04	AA685	19
3100/AS	AG381	39	550/ASS	AG180	37	LM01	AU280	24
320/T16	AS605	57	70/AP3	AO020	69	LM02	AU285	24
320/T2	AL505	45	70/AS	AG070	39	LM03	AU290	24
320/T2X	AS505	45	70/ASD	AG075	37	LM04	AU295	24
320/T3	AL535	46	70/ASS	AG080	37	LS01	AU230	24
320/T3X	AS535	46	70/EP3	AO025	69	LS02	AU235	24
320/T4	AL565	47	70/SP3	AO350	74	LS03	AU240	24
320/T5	AL580	54	700/T16	AS10	57	LS04	AU245	24
320/T5X	AS550	54	700/T2	AL510	45	LSC01	AA700	20
320/T6	AL785	57	700/T2X	AS510	45	LSC02	AA725	20
320/TG	AU406	55	700/T3	AL540	46	LSC03	AA750	20
320/TGX	AU426	55	700/T3X	AS540	46	LSC04	AA775	20
320/TT	AU410	55	700/T4	AL570	47	LSG01	AA705	21
320/TTX	AU430	55	700/T5	AL585	54	LSG02	AA730	21
320/TU	AU408	55	700/T5X	AS555	54	LSG03	AA755	21
320/TUX	AU428	55	700/T6	AL790	57	LSG04	AA780	21
330/A	AA550	10	700/TG	AU412	55	LSH01	AA710	22
330/B	AA552	11	700/TGX	AU432	55	LSH02	AA735	22
330/E	AA554	10	700/TT	AU416	55	LSH03	AA760	22
330/ER	AR550	62	700/TTX	AU436	55	LSH04	AA785	22
330/F	AA556	11	700/TU	AU414	55	PB01	AU300	24
340/AS	AG411	40	700/TUX	AU434	55	PB02	AU305	24
340/ASX	AS411	40	75/A	AA520	10	PB03	AU310	24
355/M	AD370	28	75/AX	AS095	10	PB04	AU315	24
355/MF	AD371	32	75/B	AA522	11			









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