

SUPPORT ELEMENTS FOR STRESS-FREE CLAMPING AND LOW-VIBRATION MACHINING

- > clamping force up to 50 kN
- > observe safety factor for supporting force.
- > operating pressure up to 400 bar
- > pistons with internal thread
- > wipers to protect against contamination
- > oil supply via oil channels in device body or via threaded port
- > various design variants:
 - block version
 - installation version
 - screw-in version
 - flange version

To be able to absorb machining forces, the supporting force should be matched to the clamping force.
Supporting force min. 2 x clamping force

PRODUCT OVERVIEW:

Type	Supporting force [kN]	Supporting stroke [mm]	Positioning	No. of models	Operating mode
6961F/L	8,0 - 20,0	6,0 - 10,0	spring/Air	6	single acting
6962F/L	8,0 - 20,0	6,0 - 10,0	spring/Air	6	single acting
6964F/L	4,4 - 55,6	6,5 - 19,0	spring/Air	12	single acting
6964H	4,4 - 17,0	6,5 - 12,5	hydraulic	5	single acting

PRODUCT EXAMPLES:

NO. 6961F



- > Supporting force: 8 - 20 kN
- > 3 design variants

NO. 6964F



- > Supporting force: 4,4 - 55,6 kN
- > 1 design variant

NO. 6964H

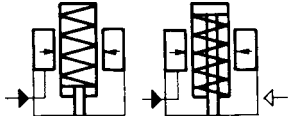


- > Supporting force: 4,4 - 17 kN
- > 2 design variants

No. 6961F/L

Support Element, block type

spring advanced or air advancing,
max. operating pressure 400 bar,
min. operating pressure 50 bar.



Order no.	Article no.	Contact force F1* [N]	Support force F2 [kN]	Stroke H [mm]	Vol. [cm ³]	Piston area [cm ²]	Weight [g]
65250	6961F-08	20-32	8	6	5,5	2,00	1100
65268	6961F-12	32-41	12	8	8,0	3,14	1800
65276	6961F-20	40-72	20	10	13,0	4,90	3100
65284	6961L-08	170	8	6	5,5	2,00	1100
65292	6961L-12	270	12	8	8,0	3,14	1800
65300	6961L-20	440	20	10	13,0	4,90	3100

*Article No. 6961F-**: Contact force F1 dependent on spring pretensioning and setting travel.
Article No. 6961L-**: Contact force F1 dependent on air pressure at max. 10 bar.

Design:

Cylinder body from steel, burnished. Support pin case hardened and ground. Internal locking sleeve system Kostyrka. Special wiper prevents contamination. Support pin with internal thread. Home position retracted or extended, depending on function. Internal parts from stainless steel. Oil supply via threaded connection or oil channel in the fixture body.

Application:

Support element no. 6961F-**: Plunger extended, spring adjustable contact force.
Support element no. 6961L-**: Plunger retracted, pneumatic advance spring return.
These spring or pneumatic advancing hydraulic support elements provide additional support to avoid vibration or deflection during machining. Even large workpiece tolerances can be compensated (castings). Fitted directly below a clamping point they prevent distortion of the workpiece. The support elements can be matched with clamping cylinders of same nominal size into one circuit. To prevent the support plunger from possible slackening during a clamping procedure, it is advisable to connect a sequence valve (no. 6918-2) to control the support elements. Due to this fact, the support element is locked before the clamping procedure can be activated (fig. 1).
Being used as an additional support to prevent from bending and vibration, the element should be preceded by a sequence valve (no. 6918-2) in order to ensure supporting before clamping. In case the clamping force is higher than the support force, the clamping force has to be reduced by using a pressure reducing valve no. 6917 (fig. 2).

Features:

High resilience due to high operating pressure, matched to the forces of the clamping cylinder row.
Smooth contacting of the workpiece by adjustable spring or pneumatic pressure. Universal use in each position.
Easy attachment of thrust pieces in the piston rod thread.

Note:

For spring advanced types, there is risk of sucking in coolant! To avoid this, a breather hose has to be connected to the pneumatic port and moved to a protected area. Support pin must be protected against the entry of dirt and splash water by fitting a set screw or plug. The support elements must be properly vented! The vent port must always be on top. Failure to do so can cause destruction of the clamping element by the escaping diesel.

To be able to absorb machining forces, the supporting force should be matched to the clamping force. Supporting force min. 2 x clamp force
Supporting elements are not suitable for absorbing transverse forces.

Hydraulic diagrams:

fig. 1

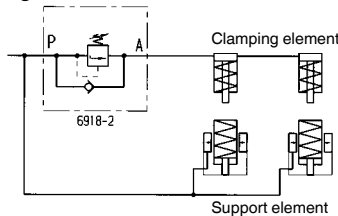
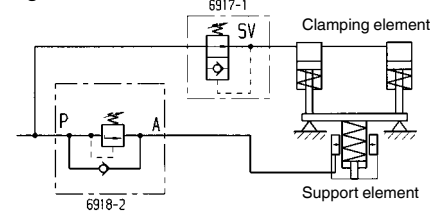


fig. 2



O-ring

Order no.	Dimension [mm]	Weight [g]
161554	8,0 x 1,5	1



CAD

Subject to technical alterations.

No. 6962F/L

Support Element, cartridge flange

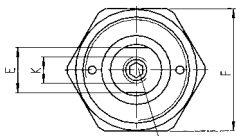
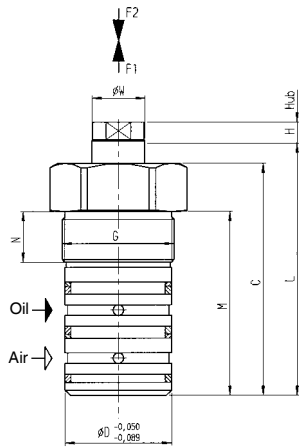
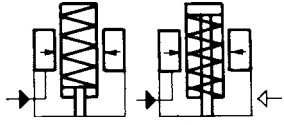
spring advanced or air advancing,
max. operating pressure 400 bar,
min. operating pressure 50 bar.



CAD

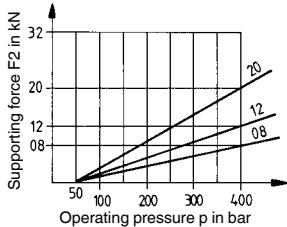
Order no.	Article no.	Contact force F1* [N]	Support force F2 [kN]	Stroke H [mm]	Vol. [cm ³]	Piston area [cm ²]	Weight [g]
65052	6962F-08	20-32	8	6	5,5	2,00	500
65078	6962F-12	32-41	12	8	8,0	3,14	700
65094	6962F-20	40-72	20	10	13,0	4,90	1100
65060	6962L-08	170	8	6	5,5	2,00	500
65086	6962L-12	270	12	8	8,0	3,14	700
65102	6962L-20	440	20	10	13,0	4,90	1100

*Article No. 6962F-**: Contact force F1 dependent on spring pretensioning and setting travel.
Article No. 6962L-**: Contact force F1 dependent on air pressure at max. 10 bar.



Contact force F1 (version 6962F) adjustable via threaded stud

Diagram:



0.004 mm/kN elastic change in length under load.

Design:

Cylinder body from steel, burnished. Support pin case hardened and ground. Internal locking sleeve system Kostyrka. Special wiper prevents contamination. Support pin with internal thread. Home position retracted or extended, depending on function. Internal parts from stainless steel. Oil supply via oil channel in fixture body.

Application:

Support element no. 6962F-**: Plunger extended, spring adjustable contact force.
Support element no. 6962L-**: Plunger retracted, pneumatic advance spring return.
These spring or pneumatic advancing hydraulic support elements provide additional support to avoid vibration or deflection during machining. Even large workpiece tolerances can be compensated (castings). Fitted directly below a clamping point they prevent distortion of the workpiece. The support elements can be matched with clamping cylinders of same nominal size into one circuit. To prevent the support plunger from possible slackening during a clamping procedure, it is advisable to connect a sequence valve (no. 6918-2) to control the support elements. Due to this fact, the support element is locked before the clamping procedure can be activated (fig. 1, page 96). Being used as an additional support to prevent from bending and vibration, the element should be preceded by a sequence valve (no. 6918-2) in order to ensure supporting before clamping. In case the clamping force is higher than the support force, the clamping force has to be reduced by using a pressure reducing valve no. 6917.

Features:

High resilience due to high operating pressure, matched to the forces of the clamping cylinder row. Smooth contacting of the workpiece by adjustable spring or pneumatic pressure. The threaded type allows the supporting element to be accommodated in fixtures in a space-saving manner. Easy attachment of thrust pieces and/or thrust bolts in the piston rod thread.

Note:

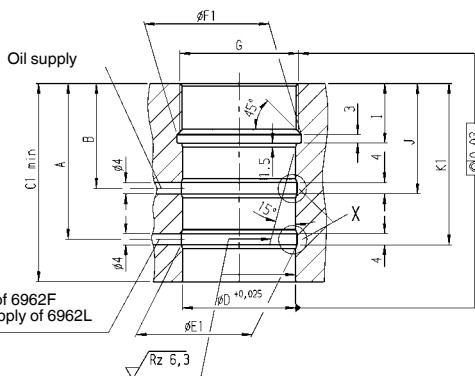
For spring advanced types, there is risk of sucking in coolant! To avoid this, a breather hose has to be connected to the pneumatic port and moved to a protected area. Support pin must be protected against the entry of dirt and splash water by fitting a set screw or plug. The support elements must be properly vented! The vent port must always be on top. Failure to do so can cause destruction of the clamping element by the escaping diesel.

To be able to absorb machining forces, the supporting force should be matched to the clamping force. Supporting force min. 2 x clamp force
Supporting elements are not suitable for absorbing transverse forces.

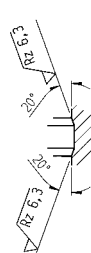
Dimensions:

Order no.	Article no.	C	dia. D	E	F	G	K	L	M	N	dia. W	Z
65052	6962F-08	74	36	SW14	SW41	M38x1,5	M 8	81,0	57	12,5	16	SW4
65078	6962F-12	87	40	SW17	SW46	M42x1,5	M10	94,5	69	19,0	20	SW5
65094	6962F-20	104	45	SW22	SW50	M48x1,5	M12	113,5	85	22,0	25	SW6
65060	6962L-08	74	36	SW14	SW41	M38x1,5	M8	81,0	57	12,5	16	SW4
65086	6962L-12	87	40	SW17	SW46	M42x1,5	M10	94,5	69	19,0	20	SW5
65102	6962L-20	104	45	SW22	SW50	M48x1,5	M12	113,5	85	22,0	25	SW6

Installation dimensions:



Detail X



Installation dimensions:

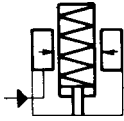
Order no.	Article no.	A	B	C1 min.	dia. D H7	dia. E1	dia. F1	G	I	J	K1
65052	6962F-08	44,5	27,5	58	36	37	40	M38x1,5	14,5	29,5	46,5
65078	6962F-12	55,0	37,0	70	40	41	44	M42x1,5	21,0	39,0	57,0
65094	6962F-20	71,0	48,0	86	45	46	50	M48x1,5	24,0	50,0	73,0
65060	6962L-08	44,5	27,5	58	36	37	40	M38x1,5	14,5	29,5	46,5
65086	6962L-12	55,0	37,0	70	40	41	44	M42x1,5	21,0	39,0	57,0
65102	6962L-20	71,0	48,0	86	45	46	50	M48x1,5	24,0	50,0	73,0

Subject to technical alterations.

No. 6964F

Support Element, base-flange-mounting

Normally extended. Spring advanced, max. operating pressure 350 bar, min. operating pressure 50 bar.



CAD

Order no.	Article no.	Contact force F1 [N]	Support force at 350 bar [kN]	Stroke C [mm]	Vol. [cm ³]	Weight [g]
66852	6964F-04	4,5 - 9,0	4,4	6,5	0,16	281
66878	6964F-11	9,0 - 26,5	11,0	9,5	0,33	660
66894	6964F-33	40 - 80	33,4	12,5	1,64	2019
66910	6964F-55	49 - 71	55,6	19,0	4,26	4291

Design:

Cylinder body from steel, hardened. Support pin with internal thread case hardened and ground. Wiper to protect against dirt and cooling water. Internal parts from stainless steel. Oil supply via threaded port.

Application:

The support element is used as an extra support to prevent sagging and vibration of a workpiece.

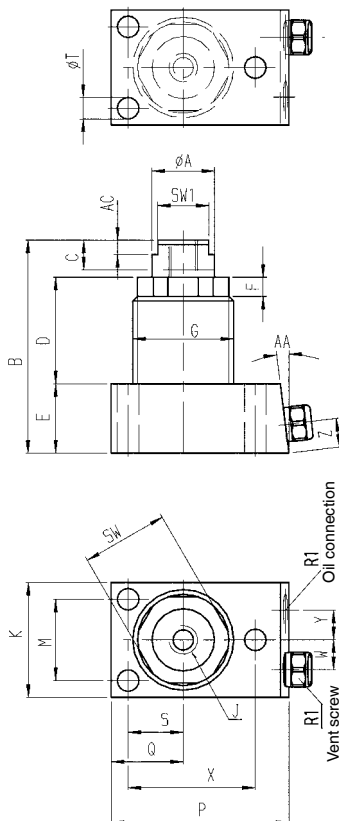
Features:

Element with high load capacity and low height. Spring extension: the plunger is normally extended. Variable spring setting permits sensitive adjustment of contact force.

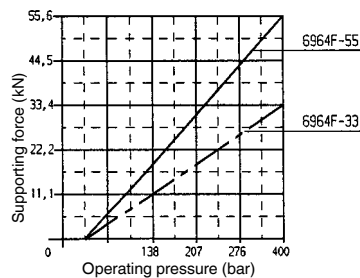
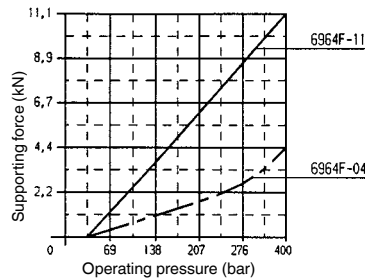
Note:

Support pin must be protected against the entry of dirt and splash water by fitting a set screw or plug. When placing into operation, ensure that all air is bled from the system. Failure to do so can cause destruction of the clamping element by the escaping diesel.

To be able to absorb machining forces, the supporting force should be matched to the clamping force. Supporting force min. 2 x clamp force
Supporting elements are not suitable for absorbing transverse forces.



Diagrams:



0.004 mm/kN elastic change in length under load.

Dimensions:

Order no.	Article no.	dia. A	B	D	E	F	G	SW	SW1	J x depth	K	M	P	Q	R1	S	dia. T	W	X	Y	Z	AA	AC
66852	6964F-04	16,0	56,0	25,0	24,0	5,5	M26x1,5	23	-	M8x7,5	33,5	24,5	44,5	17,5	G1/8	13,0	5,5	9	31,0	9	8,5	7°	-
66878	6964F-11	20,5	70,5	33,0	25,0	6,5	M35x1,5	30	-	M10x11,5	41,5	30,0	59,0	24,0	G1/8	18,0	7,0	10	43,0	10	8,5	7°	-
66894	6964F-33	38,0	111,0	68,5	25,0	12,5	Ø 57	50	28,5	M12x15	63,5	52,5	76,0	31,5	G1/8	26,0	7,0	16	61,0	16	10,3	-	4
66910	6964F-55	51,0	133,0	76,0	31,5	12,5	Ø 76	70	41,5	M16x20	89,0	73,0	97,0	44,5	G1/8	36,5	9,0	24	81,5	24	10,3	-	4

Subject to technical alterations.

No. 6964L

Support Element, base-flange-mounting

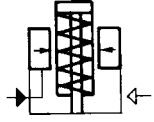
Normally retracted. Air advanced, max. operating pressure 350 bar, min. operating pressure 50 bar.



CAD

Order no.	Article no.	Contact force F1	Support force at 350 bar	Stroke C	Vol.	Weight
		[N]	[kN]	[mm]	[cm ³]	[g]
66936	6964L-04	17,5*	4,4	6,5	0,16	255
66621	6964L-11	35,5*	11,0	9,5	0,33	665
66688	6964L-33	89,0*	33,4	12,5	1,64	2023
66704	6964L-55	253,3*	55,6	19,0	4,26	4300

* Contact force with 1.7 bar air pressure.



Design:

Cylinder body from steel, hardened. Support pin with internal thread case hardened and ground. Wiper to protect against dirt and cooling water. Internal parts from stainless steel. Oil supply via threaded port.

Application:

The support element is used as an extra support to prevent sagging and vibration of a workpiece.

Features:

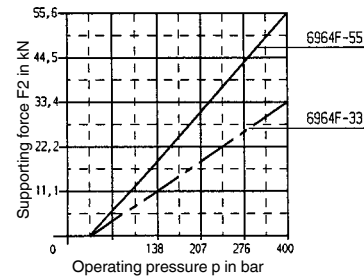
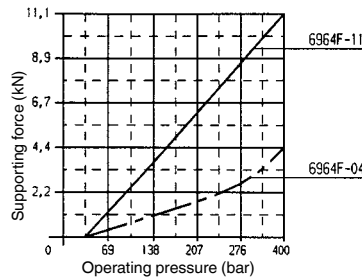
Element with high load capacity and low height. Pneumatic: the plunger is normally retracted. Sensitive adjustment of contact force by varying the air pressure.

Note:

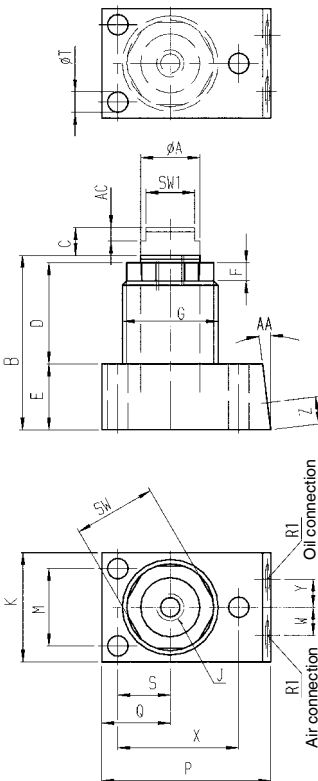
Support pin must be protected against the entry of dirt and splash water by fitting a set screw or plug. When placing into operation, ensure that all air is bled from the system. Failure to do so can cause destruction of the clamping element by the escaping diesel.

To be able to absorb machining forces, the supporting force should be matched to the clamping force. Supporting force min. 2 x clamp force
Supporting elements are not suitable for absorbing transverse forces.

Diagrams:



0.004 mm/kN elastic change in length under load.



Dimensions:

Order no.	Article no.	dia. A	B	D	E	F	G	SW	SW1	J x depth	K	M	P	Q	R1	S	dia. T	W	X	Y	Z	AA	AC
66936	6964L-04	16,0	49,5	25,0	24,0	5,5	M26x1,5	23	-	M6x7,5	33,5	24,5	44,5	17,5	G1/8	13,0	5,5	9	31,0	9	8,5	7°	-
66621	6964L-11	20,5	61	33,0	25,0	6,5	M35x1,5	30	-	M8x6,0	41,0	30,0	59,0	24,0	G1/8	18,0	7,0	10	43,0	10	8,5	7°	-
66688	6964L-33	38,0	98	68,5	25,0	12,5	Ø 57	50	28,5	M12x15,0	63,5	52,5	76,0	31,5	G1/8	26,0	7,0	16	61,0	16	10,3	-	4
66704	6964L-55	51,0	114	76,0	31,5	12,5	Ø 76	70	41,5	M16x20,0	89,0	73,0	97,0	44,5	G1/8	36,5	9,0	24	81,5	24	10,3	-	4

Subject to technical alterations.

No. 6964H

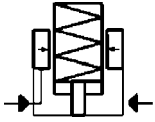
Support Element, base-flange-mounting

Normally retracted. Hydraulic advanced. Spring force for contact, max. operating pressure 350 bar, min. operating pressure 50 bar.



CAD

Order no.	Article no.	Contact force F1 [N]	Support force at 350 bar [kN]	Stroke C [mm]	Q max. [l/min]	Vol. [cm ³]	Weight [g]
66746	6964H-11-2	13,5-44,5	11	6,5	2,13	3,0	845
325878	6964H-17-3	26,5 - 53,5	17	12,5	2,13	10,5	1920



Design:

Cylinder body from steel, hardened. Support pin with internal thread case hardened and ground. Wiper to protect against dirt and cooling water. Internal parts from stainless steel. Oil supply via threaded port.

Application:

The support element is used as an extra support to prevent sagging and vibration of a workpiece.

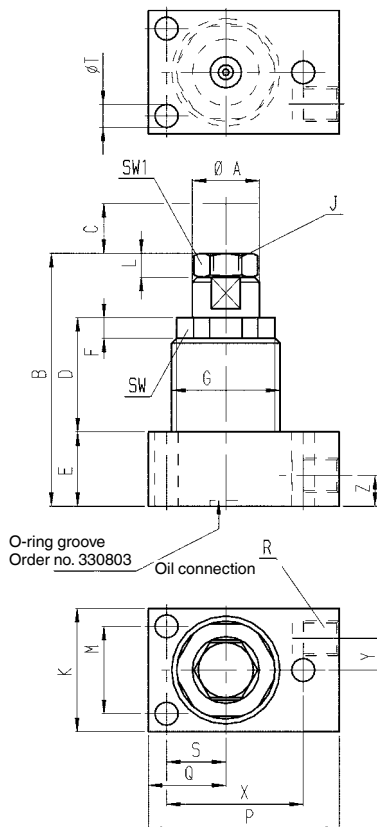
Features:

Element with high load capacity and low height. Hydraulic and spring: the plunger is normally retracted. When pressure is applied, the support pin advances with a weak spring-applied force to contact the workpiece. The spring force varies with the stroke. As the hydraulic pressure rises, the support plunger is hydraulically clamped. When the pressure is released, the support plunger returns to the retracted position. Very high repeatability ensures optimum production quality.

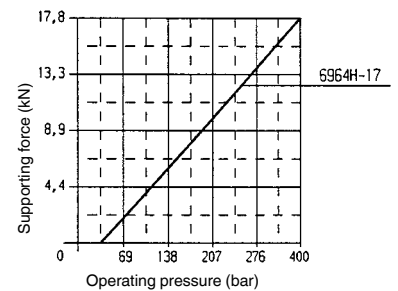
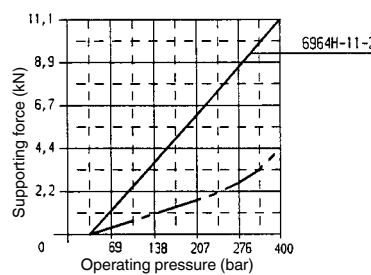
Note:

Support pin must be protected against the entry of dirt and splash water by fitting a set screw or plug. When placing into operation, ensure that all air is bled from the system. Failure to do so can cause destruction of the clamping element by the escaping diesel.

To be able to absorb machining forces, the supporting force should be matched to the clamping force. Supporting force min. 2 x clamp force
Supporting elements are not suitable for absorbing transverse forces.



Diagrams:

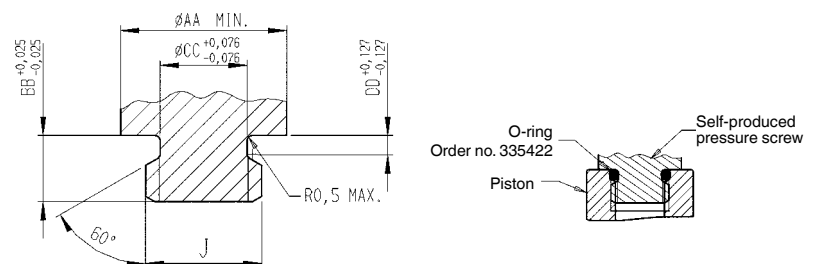


0.004 mm/kN elastic change in length under load.

O-ring

Order no.	o-ring	Weight [g]
181289	6,00 x 1,50	1
335422	9,25 x 1,78	1

Production dimensions with self-production of the clamping screw for support element



Dimensions:

Order no.	Article no.	dia. A	B	D	E	F	G	SW	SW1	J x depth	K	L	M	P	Q	R	S	dia. T	X	Y	Z	ϕAA	BB	ϕCC	DD
66746	6964H-11-2	20,5	82,5	34	31,5	9,0	M35x1,5	30	19	M12x6,5	41,5	5	30,2	58,5	24,0	G1/8	18,3	7,1	43,1	10,5	10,5	14,1	6,35	9,91	1,78
325878	6964H-17-3	38,0	82,5	40	25,0	12,5	M60x1,5	54	19	M12x6,5	73,0	5	52,4	81,0	36,5	G1/8	26,2	7,1	62,6	16,0	10,5	14,1	6,35	9,91	1,78

Subject to technical alterations.

No. 6964F

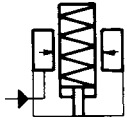
Support Element, cartridge flange

Normally extended. Spring advanced, max. operating pressure 350 bar, min. operating pressure 50 bar.



CAD

Order no.	Article no.	Contact force F1 [N]	Support force at 350 bar [kN]	Stroke C [mm]	Vol. [cm ³]	Md max. [Nm]	Weight [g]
165092	6964F-04-1	4,5-9,0	4,4	6,5	0,16	40,5	160
165100	6964F-11-1	9,0-26,5	11,0	9,5	0,33	40,5	320



Design:

Cylinder body from steel, hardened. Support pin with internal thread case hardened and ground. Wiper to protect against dirt and cooling water. Internal parts from stainless steel. Oil supply via oil channel in fixture body.

Application:

The support element is used as an extra support to prevent sagging and vibration of a workpiece.

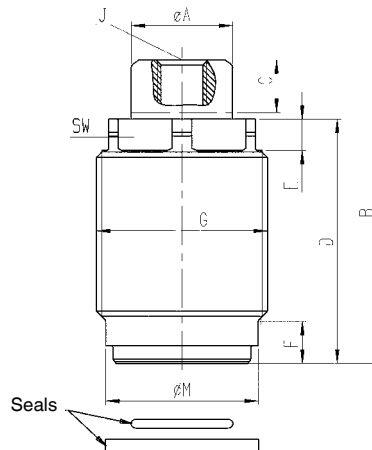
Features:

Element with high load capacity and low height. Spring extension: the plunger is normally extended. Variable spring setting permits sensitive adjustment of contact force.

Note:

Support pin must be protected against the entry of dirt and splash water by fitting a set screw or plug. When placing into operation, ensure that all air is bled from the system. Failure to do so can cause destruction of the clamping element by the escaping diesel.

To be able to absorb machining forces, the supporting force should be matched to the clamping force. Supporting force min. 2 x clamp force
Supporting elements are not suitable for absorbing transverse forces.



O-ring

Order no.	fits	Weight [g]
479550	6964F-04-1; 6964L-04-1	1
479618	6964F-11-1; 6964L-11-1	1

Seal

Order no.	fits	Weight [g]
346270	6964F-04-1; 6964L-04-1	2
479592	6964F-11-1; 6964L-11-1	1

Dimensions:

Order no.	Article no.	dia. A	B	D	E	F	G	J x depth	dia. M	SW
165092	6964F-04-1	16,0	47,5	40,5	5,5	7,5	M26 x 1,5	M8x7,5	24	23
165100	6964F-11-1	20,5	62,0	49,5	6,5	8,5	M35 x 1,5	M10x11,5	31	30

Installation dimensions:

Order no.	Article no.	a	b	Øc	dia. d	e	f	Øg	Øh	Øk
165092	6964F-04-1	M26 x 1,5-6H	15,5	24,20 +0,025	24,5	5,7	7,0	7,5	20,4	1,6 ±0,1
165100	6964F-11-1	M35 x 1,5-6H	16,4	31,16 +0,075	33,5	6,7	8,0	14,0	26,5	1,6 ±0,3

Installation dimensions:

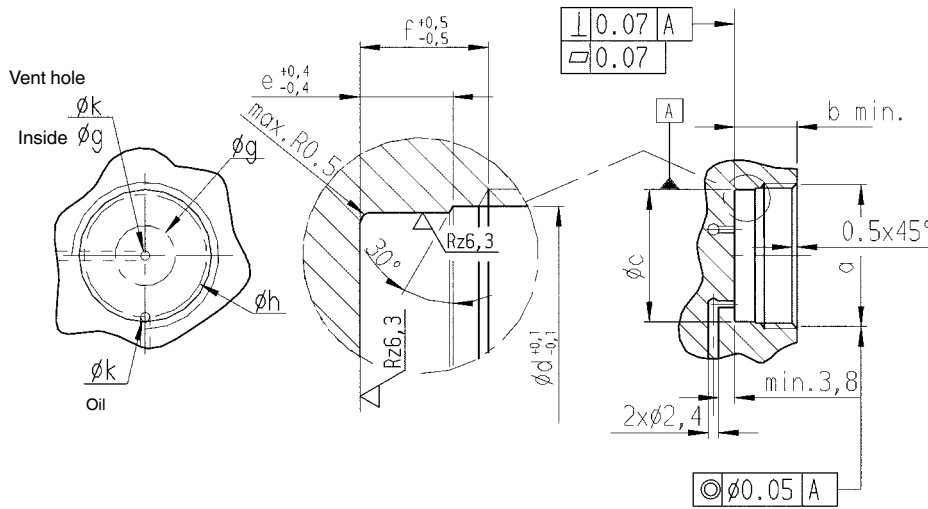
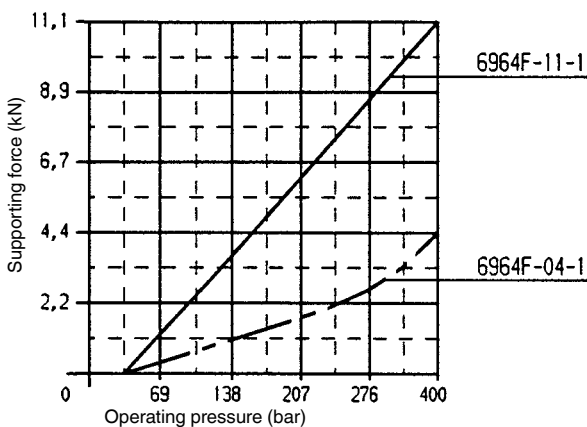


Diagram:



No. 6964L

Support Element, cartridge flange

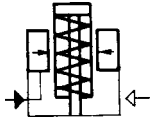
Normally retracted. Air advanced, max. operating pressure 350 bar, min. operating pressure 50 bar.



CAD

Order no.	Article no.	Contact force F1 [N]	Support force at 350 bar [kN]	Stroke C [mm]	Vol. [cm ³]	Md max. [Nm]	Weight [g]
165167	6964L-04-1	17,5*	4,4	6,5	0,16	40,5	150
165183	6964L-11-1	35,5*	11,0	9,5	0,33	40,5	340

* Contact force with 1.7 bar air pressure.



Design:

Cylinder body from steel, hardened. Support pin with internal thread case hardened and ground. Wiper to protect against dirt and cooling water. Internal parts from stainless steel. Oil supply via oil channel in fixture body.

Application:

The support element is used as an extra support to prevent sagging and vibration of a workpiece.

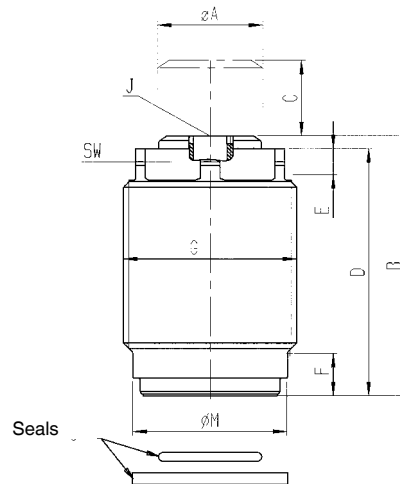
Features:

Element with high load capacity and low height. Pneumatic: the plunger is normally retracted. Sensitive adjustment of contact force by varying the air pressure.

Note:

Support pin must be protected against the entry of dirt and splash water by fitting a set screw or plug. When placing into operation, ensure that all air is bled from the system. Failure to do so can cause destruction of the clamping element by the escaping diesel.

**To be able to absorb machining forces, the supporting force should be matched to the clamping force. Supporting force min. 2 x clamp force
Supporting elements are not suitable for absorbing transverse forces.**



O-ring

Order no.	fits	Weight [g]
479550	6964F-04-1; 6964L-04-1	1
479618	6964F-11-1; 6964L-11-1	1

Seal

Order no.	fits	Weight [g]
346270	6964F-04-1; 6964L-04-1	2
479592	6964F-11-1; 6964L-11-1	1

Dimensions:

Order no.	Article no.	dia. A	B	D	E	F	G	J x depth	dia. M	SW
165167	6964L-04-1	16,0	41,0	40,5	5,5	7,5	M26x1,5	M6x7,5	24	23
165183	6964L-11-1	20,5	52,5	49,5	6,5	8,5	M35x1,5	M8x6,0	31	30

Installation dimensions:

Order no.	Article no.	a	b	Øc	dia. d	e	f	Øg	Øh	Øk
165167	6964L-04-1	M26x1,5-6H	15,5	24,2 +0,025	24,5	5,7	7,0	7,5	20,4	1,6 ±0,1
165183	6964L-11-1	M35x1,5-6H	16,4	31,16 +0,075	33,5	6,7	8,0	14,0	26,5	1,6 ±0,3

Installation dimensions:

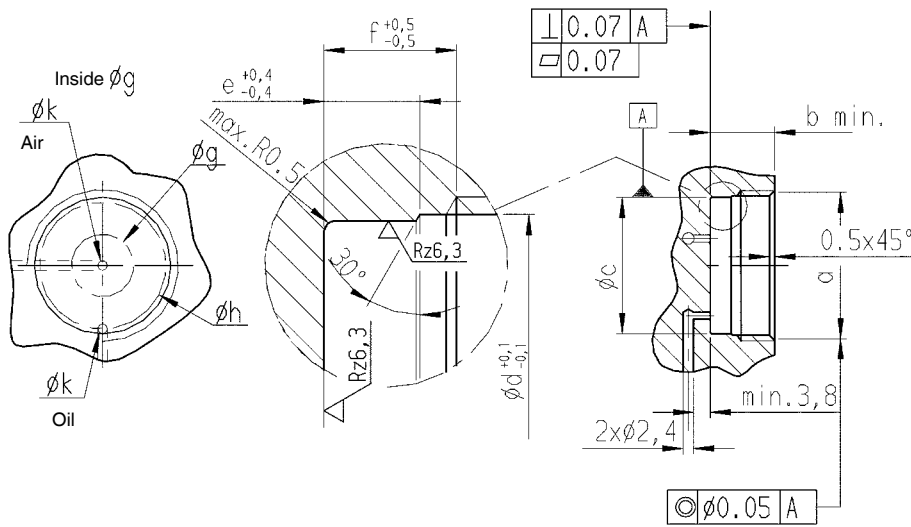
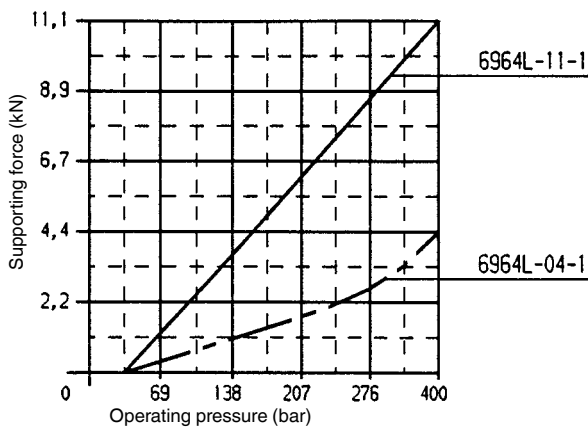


Diagram:



0.004 mm/kN elastic change in length under load.

No. 6964H

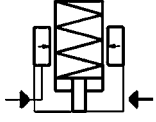
Support Element, cartridge flange

Normally retracted. Hydraulic advanced.
Spring force for contact,
max. operating pressure 350 bar,
min. operating pressure 50 bar.



CAD

Order no.	Article no.	Contact force F1 [N]	Support force at 350 bar [kN]	Stroke C [mm]	max. oil flow rate [l/min.]	Vol. [cm ³]	Md max. [Nm]	Weight [g]
165225	6964H-04-1	4,4-26,7	4,4	6,5	2,13	2,5	40,5	180
66720	6964H-11-1	13,5-44,5	11,0	6,5	2,13	3,0	54,0	380
165241	6964H-17-1	27,0-53,0	17,0	12,5	2,13	10,5	136,0	1150



Design:

Cylinder body from steel, hardened. Support pin with internal thread case hardened and ground. Wiper to protect against dirt and cooling water. Internal parts from stainless steel. Oil supply via oil channel in fixture body.

Application:

The support element is used as an extra support to prevent sagging and vibration of a workpiece.

Features:

Element with high load capacity and low height. Hydraulic and spring: the plunger is normally retracted. When pressure is applied, the support pin advances with a weak spring-applied force to contact the workpiece. The spring force varies with the stroke. As the hydraulic pressure rises, the support pin is hydraulically clamped. When the pressure is released, the support pin returns to the retracted position. Very high repeatability ensures optimum production quality.

Note:

Support pin must be protected against the entry of dirt and splash water by fitting a set screw or plug. When placing into operation, ensure that all air is bled from the system. Failure to do so can cause destruction of the clamping element by the escaping diesel.

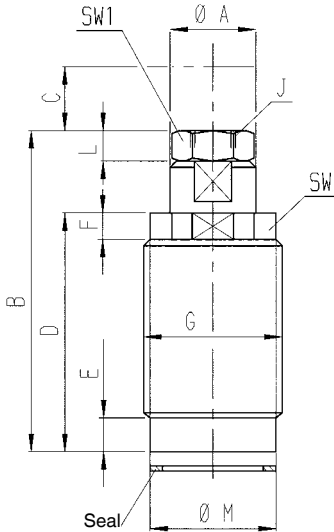
To be able to absorb machining forces, the supporting force should be matched to the clamping force. Supporting force min. 2 x clamp force
Supporting elements are not suitable for absorbing transverse forces.

O-ring

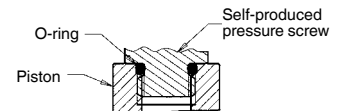
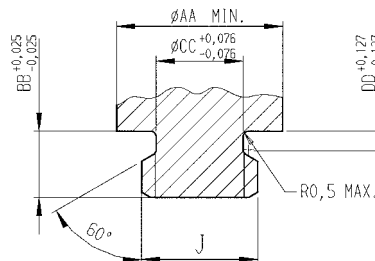
Order no.	o-ring	Weight [g]
181289	6,00 x 1,50	1
335422	9,25 x 1,78	1

Seal

Order no.	fits	Weight [g]
550124	6964H-04-1	2
550125	6964H-11-1	2
474445	6964H-17-1	2



Production dimensions with self-production of the clamping screw for support element



Dimensions:

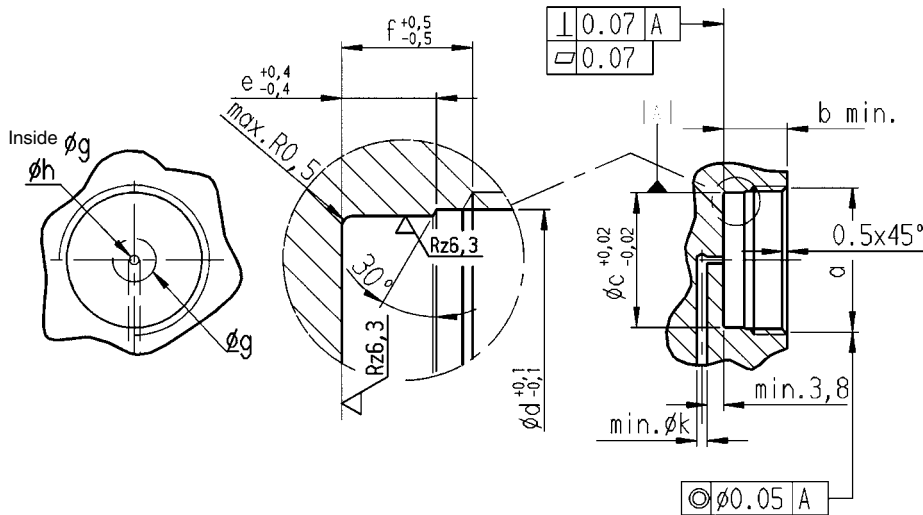
Order no.	Article no.	dia. A	B	D	E	F	G	J x depth	L	dia. M	SW	SW1	ØAA	BB	ØCC	DD	o-ring
165225	6964H-04-1	16,0	53,5	42,5	7,0	5,5	M26x1,5	M8x5,0	3,5	23,3	23	13	9,75	5,00	6,05	1,19	6,00 x 1,50
66720	6964H-11-1	20,5	72,0	55	9,5	9,0	M35x1,5	M12x6,5	5,0	29,7	30	19	14,10	6,35	9,91	1,78	9,25 x 1,78
165241	6964H-17-1	38,0	72,5	55	6,5	12,5	M60x1,5	M12x6,5	5,0	54,8	54	19	14,10	6,35	9,91	1,78	9,25 x 1,78

Subject to technical alterations.

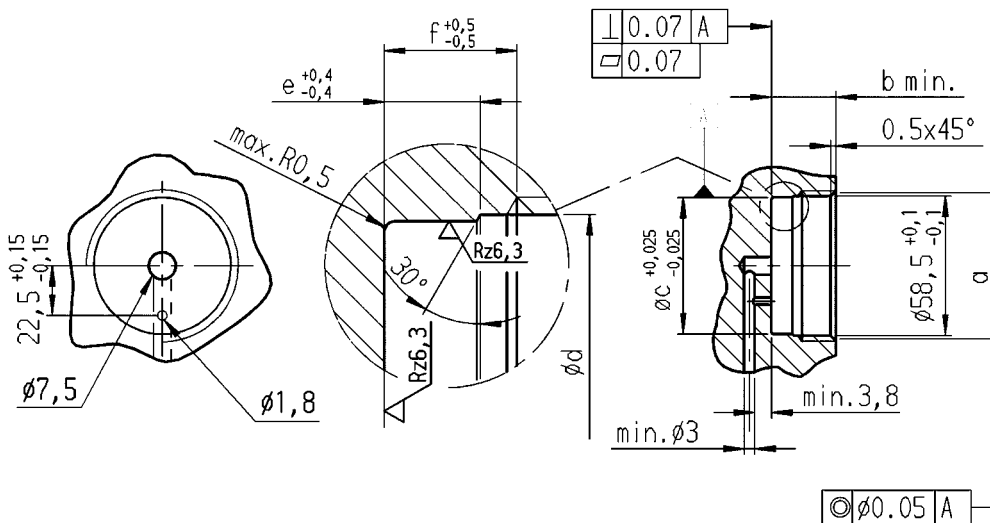
Installation dimensions:

Order no.	Article no.	a	b	Øc	dia. d	e	f	Øg	Øh	Øk
165225	6964H-04-1	M26x1,5-6H	14,5	23,44	24,5 ±0,1	4,5	6,0	7,5	1,6 ±0,3	2
66720	6964H-11-1	M35x1,5-6H	19,0	29,90	33,5 ±0,1	5,0	6,4	19,0	3,0	3
165241	6964H-17-1	M60x1,5-6H	15,0	55,00	58,5 ±0,1	4,0	5,3	-	-	-

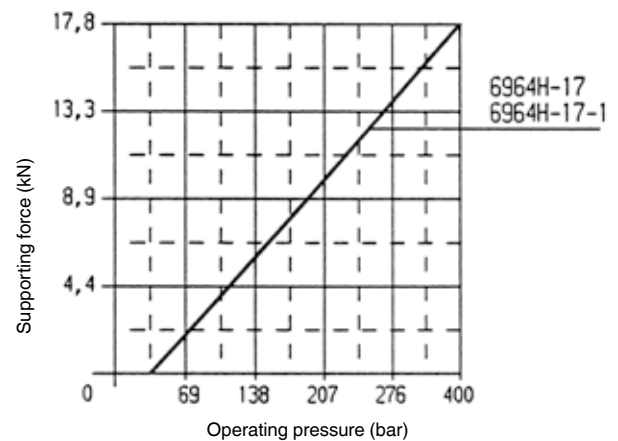
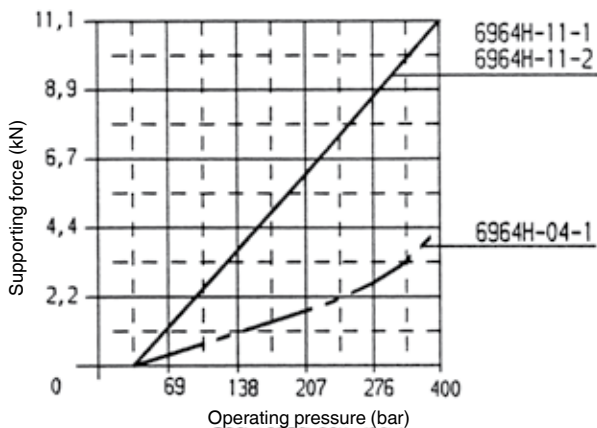
Installation dimensions No. 6964H-04-1 and -11-1



Installation dimensions No. 6964H-17-1



Diagrams:



0.004 mm/kN elastic change in length under load.

No. 6964H-xx-20

Splash protection



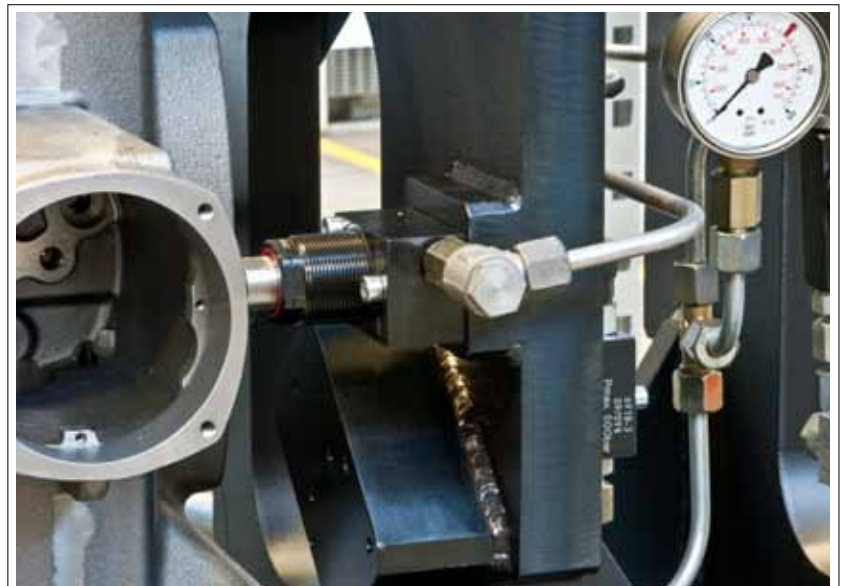
Order no.	Article no.	Weight [g]
326520	6964H-04-20	6
326546	6964H-11-20	12
326561	6964H-17-20	33

Application:

For protection against entry of chips and splash water.

Note:

Use only for hydraulic support element. Observe mounting position!



Subject to technical alterations.



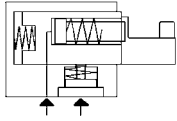
No. 6965

Hydraulic Compensating Clamp

Single acting, with spring return, max. operating pressure 100 bar.



Order no.	Article no.	max. clamping force [kN]	max. locking force [kN]	Clamping stroke [mm]	Compensating stroke [mm]	Pin dia.	Weight [g]
320333	6965-08-00	2	1	12	3	16,0*	1675
320341	6965-08-01	2	1	12	3	5,5	1675
320358	6965-08-02	2	1	12	3	8,5	



Design:

Housing from steel, burnished. Piston from case-hardened steel, hardened and ground. Complete with four fixing screws M6 x 70 and O-ring for flange seal. Oil supply via threaded connection or oil channel in the fixture body.

Application:

The Hydraulic Compensating Clamp is employed in fixtures for the distortion-free, floating clamping and support of workpieces. It is possible to use several Hydraulic Compensating Clamps without distorting a workpiece.

Features:

The floating piston has a compensating stroke of 3 mm, thereby also permitting the clamping of workpieces with large shape deviations or differing and inaccurate drill hole tolerances. Immediately after the clamping process, the support piston is clamped, specifically in a clamped position, via a sequence valve! The workpiece holder on the adjustable clamp is easy to change and is therefore simply and quickly adapted to the various workpiece contours.

Note:

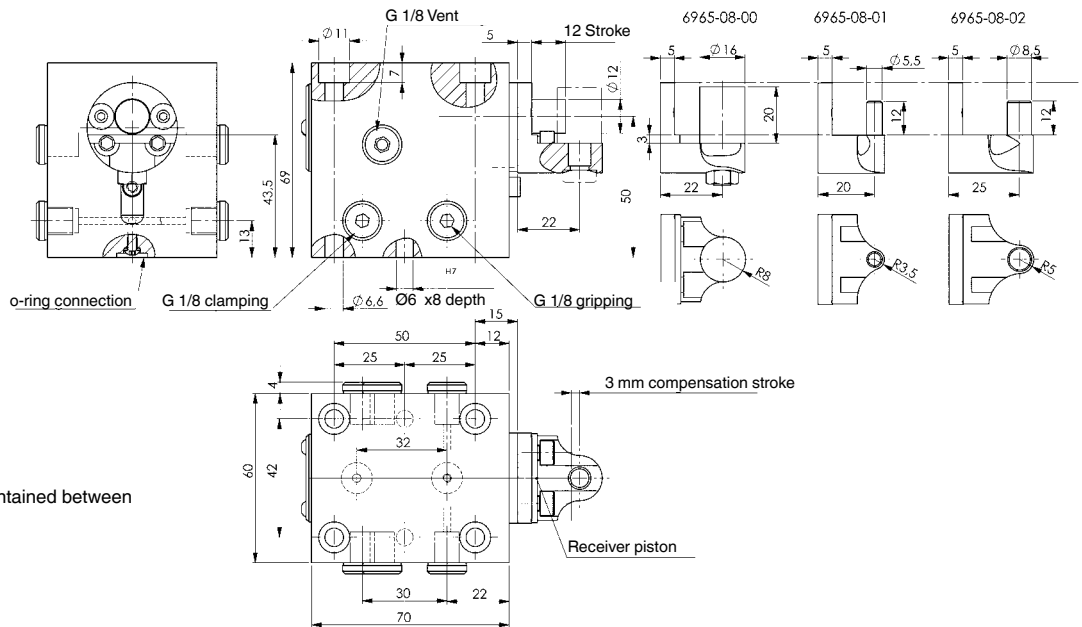
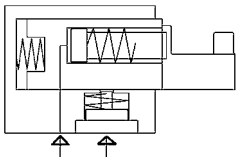
Please do not operate a Hydraulic Compensating Clamp without a workpiece in place; doing so can damage the return spring or cause it to set and lose force.

For single acting cylinders there is risk of sucking in coolant through the breather port. In such cases the breather port has to be piped to a clean protected area. The system has to be completely vented during installation.

O-ring

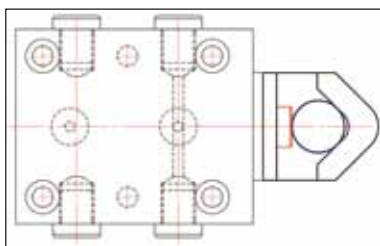
Order no.	Dimension [mm]	Weight [g]
550265	6,0 x 2,5	1

Application diagram:

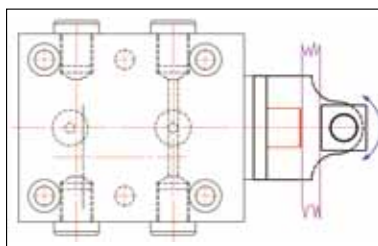


Note:

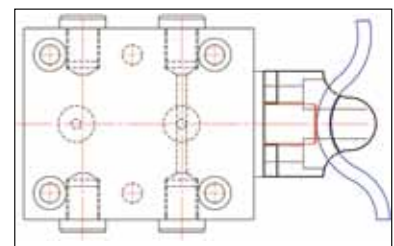
A delay of at least 2 sec. should be maintained between gripping and clamping.



Clamping of workpiece with moulded lugs



Clamping at heat fin



Clamping to CAD-data geometry

Subject to technical alterations.

