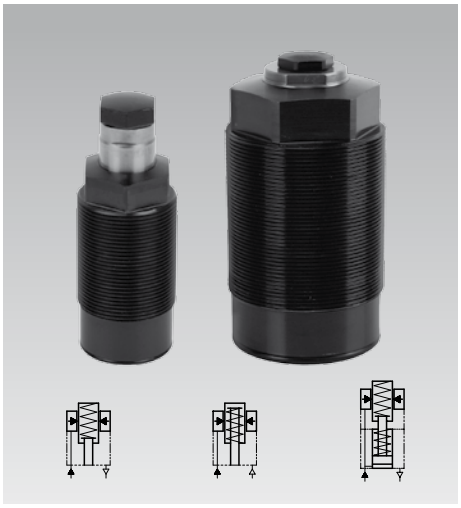
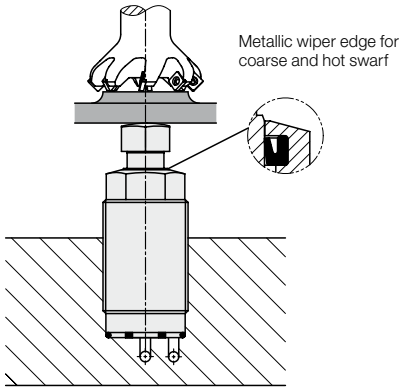
Threaded-Body Work Support

4 sizes, 3 types of function, with venting of the spring area single acting, max. operating pressure 500 bar



Advantages

- Space-saving threaded-body version
- 4 sizes available
- 3 types of function
- Contact force by spring or pneumatically adjustable (1941-X00)
- Support force up to 42 kN
- Metallic wiper edge
- Protected FKM wiper
- Inner parts protected against corrosion
- Venting of the spring area
- Connection of positive air pressure protection possible
- Installed orifice for flow rate limitation (1942-XXX)



Application

Hydraulic work supports are used to provide a self-adjusting rest for workpieces and avoid their vibration and deflection under machining loads.
The threaded-body design allows for space-saving and direct installation into the fixture body. Hydraulic oil supply and venting are made via drilled channels.

Description

In the body of the threaded-body work support a thin-walled locking bush is integrated, which locks cylindrically around the freely-movable support plunger when pressurising the element with hydraulic oil.
There are three variations of plunger actuation:

1. Spring force
2. Air pressure
3. Oil pressure combined with spring force

The penetration of liquids and swarf is prevented by a metallic wiper edge and a protected FKM wiper. If required, an additional positive air pressure connection can be connected to the venting port. For individual connection mounting bodies are available (see accessories).

Important notes!

Work supports are not suitable to compensate side loads. The support plunger must not be stressed by tensile load.

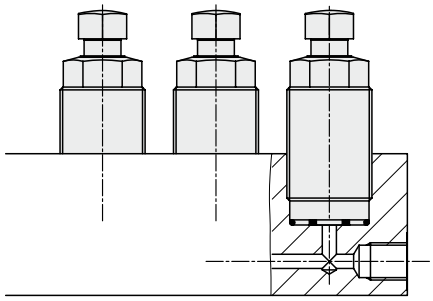
The admissible load force as per diagram is valid for static or dynamic load. Machining forces can generate vibrations, whose amplitude exceeds far an average value, and this can cause yielding of the support plunger. Remedy: increase the safety factor or the number of work supports.

In dry machining applications, with minimum quantity lubrication or in case of accumulation of very small swarf, there can be a swarf holdup in the area of the metallic wiper edge.
Remedy: Regular cleaning.

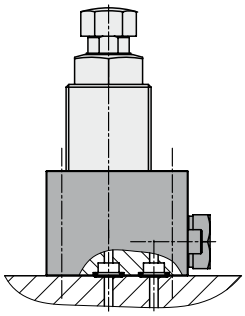
Operating conditions, tolerances and other data see data sheet A 0.100.

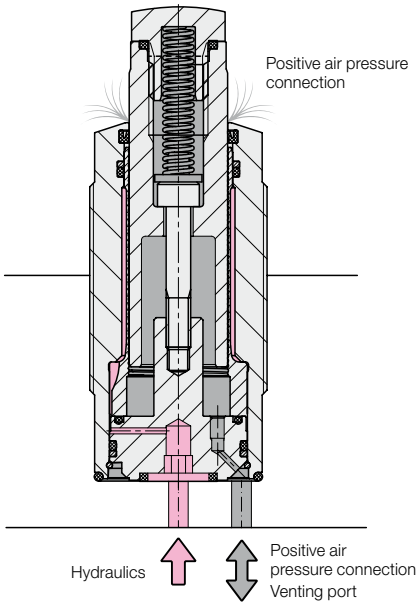
Installation and connecting possibilities

Drilled channels

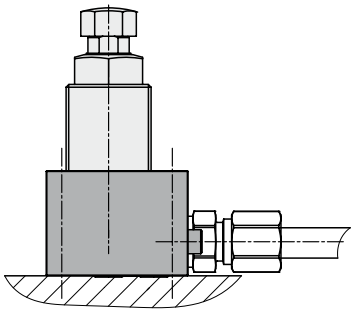


with accessory mounting body



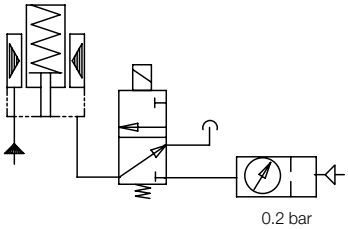


Pipe thread



Positive air pressure connection

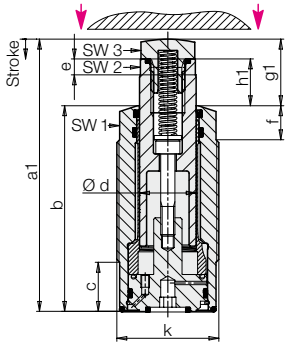
By connecting a slight overpressure of max. 0.2 bar, the complete venting system can be better protected against the penetration of liquids. The positive air pressure connection should only be switched on after extending the support plunger and switched off before retracting.



Venting port

To guarantee safe functioning of the work supports, a vent port is imperative. It is important that no liquids can penetrate into the venting system (see also page A 0.110).

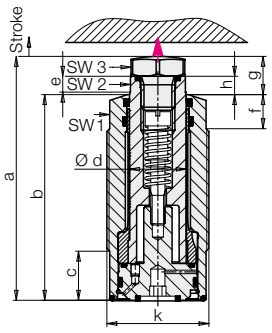
Spring force
Part-no. 1940-XXX



Off-position:
Support plunger extended
Contact by spring force

When inserting the workpiece, the support plunger is pushed back, the spring force has to be overcome (see Technical characteristics).
The support plunger will be locked by hydraulic pressure and can compensate forces in axis direction.
After unclamping, the support plunger still contacts the workpiece with spring force, until the workpiece will be unloaded from the fixture.

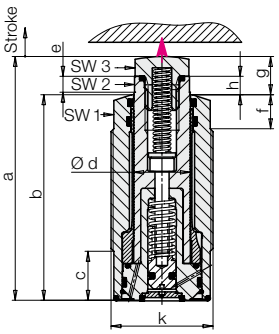
Air pressure
Part-no. 1941-XXX



Off-position:
Support plunger retracted
Extend and contact with air pressure

The support plunger contacts the workpiece by air pressure. The contact force is proportional to the air pressure less spring return force (see Technical characteristics).
The support plunger will be locked by hydraulic pressure and can compensate forces in axis direction.
For retraction, hydraulic and air pressure will be released and the support plunger retracts by spring force to its off-position.

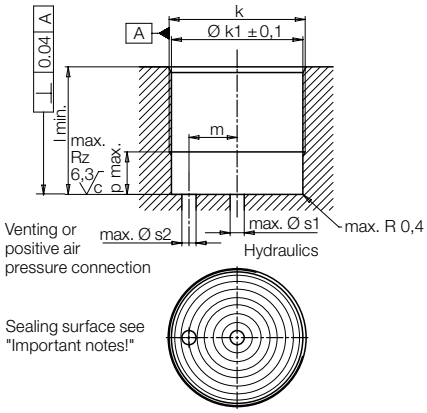
Oil pressure combined with spring force
Part-no. 1942-XXX



Off-position:
Support plunger retracted
Extend with hydraulic
Contact by spring force

The support plunger is extended by a hydraulically pressurised small piston and contacts the workpiece with spring force.
The support plunger will be locked by increasing hydraulic pressure and can compensate forces in axis direction.
For retraction, the hydraulic pressure will be released. The small piston retracts by spring force to its off-position and also retracts the support plunger.

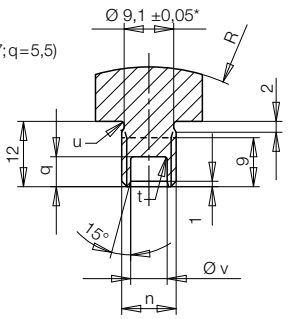
Porting details



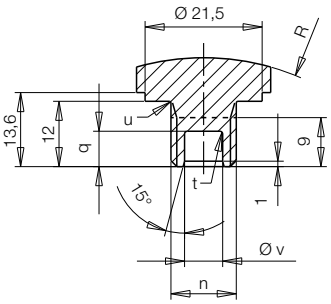
Important notes!
Machining
The code letter c in the surface finish symbol for the sealing surface stands for a concentric groove direction (see drawing), that is given in case of a lowered sealing surface.
In the case of circularly milled surfaces leakages can occur, since the grooves run at right angle to the sealing surface.
Pay attention when mounting:
The location hole must be dry and oil-free to avoid that no liquids penetrate into the spring area of the work supports.
When exchanging work supports:
To get a dry location hole, the hydraulic oil in the drilled channels must be sucked off.

Required dimensions for self-manufactured contact bolts

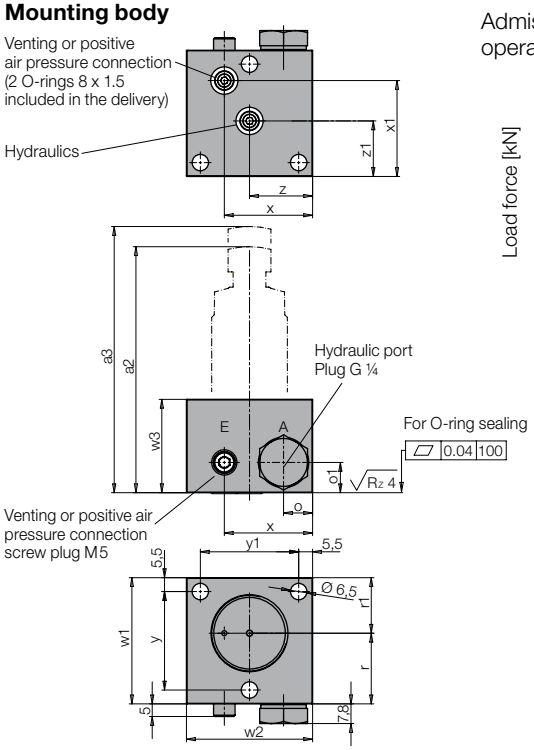
Valid for
1940-300
1941-300 (Øv = 6,7; q = 5,5)
1942-300
194X-400 (without undercut Ø 9,1)



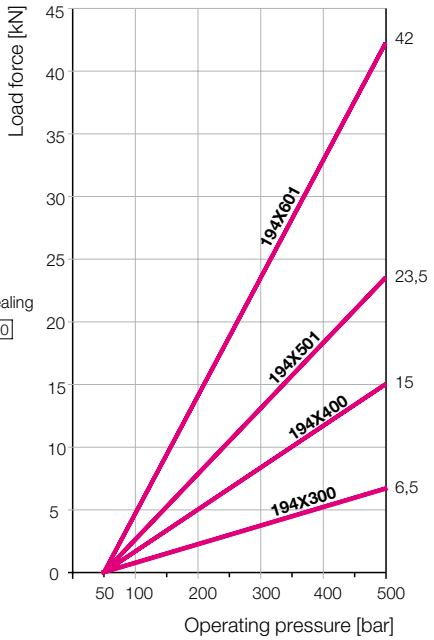
Valid for
194X-501
194X-601



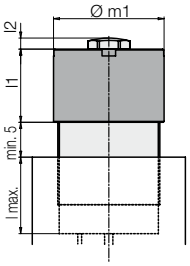
Mounting body



Admissible load force F as a function of the operating pressure p.



Protection cap (accessories)
The protection cap is fixed by means of the standard contact bolt to the support plunger.
It shall be used above all, if a strong coolant jet is directly directed onto the support plunger or the wiper edge.



Dimensions in the chart

Adm. load force (500 bar)	**[kN]**	**6.5**	**15**	**23.5**	**42**
Support plunger Ød	[mm]	16	20	28	32
Stroke	[mm]	8	10	10	16
Required oil per stroke (1942)	[cm^3]	0.5	0.8	1.5	3.2
Admissible flow rate	[cm^3/s]	25	25	25	25
Recommended minimum pressure	[bar]	50	50	50	50
Max. air pressure for positive air pressure connection	[bar]	0.2	0.2	0.2	0.2
Spring force min./max. 1940-XXX	[N]	10/13	14/25	22/35	34/65
Spring force min./max. 1941-XXX	[N]	20/30	19/31	21/34	31/52
Spring force min./max. 1942-XXX	[N]	10/13	14/25	22/35	32/61
Plunger contact force (1941) at 1 bar air pressure (deduct spring force)	[N]	20	31	61	80
Elastic deformation with load and 500 bar operating pressure	[µm/kN]	3.5	3.5	2.5	2.5
Operating temperature	[°C]	0…70	0…70	0…70	0…70
Tightening torque	[Nm]	60	100	200	400
Weight, approx.	[kg]	0.3	0.5	0.9	1.9
a	[mm]	75.5	86	90	115
a1	[mm]	83.5	96	100	131
a2	[mm]	94.5	106	107	132
a3	[mm]	102.5	116	117	148
b	[mm]	59	72.5	78	102.5
c	[mm]	8.5	17.5	20.5	20.5
e	[mm]	6	5.6	3	4
f	[mm]	10.5	12	12	18
g	[mm]	16.5	13.5	12	12.5
g1	[mm]	24.5	23.5	22	28.5
h	[mm]	6.5	6.5	4	4.5
h1	[mm]	14.5	16.5	14	20.5
k	[mm]	M30x1.5	M36x1.5	M48x1.5	M60x1.5
Øk1	[mm]	28.4	34.4	46.4	58.4
l min.	[mm]	21	35	42	46
l max.	[mm]	37.5	49	53.5	65.5
l1	[mm]	28	30	30	43
l2	[mm]	10	7	6.4	6.4
m	[mm]	10	12	17	22
Øm1	[mm]	35	40	52	65
n	[mm]	M10	M12	M12	M12
n1 max.	[mm]	21	19	26.5	36.5
n1 min.	[mm]	13	9	16.5	20.5
o	[mm]	11.5	11.5	12	12
o1	[mm]	12	12	12	12
p max.	[mm]	8	15	18	18
q	[mm]	19	15	6.5	0
r	[mm]	28	30.5	39	43
r1	[mm]	22	24.5	31	37
Øs1 max.	[mm]	8	10	14	16
Øs2 max.	[mm]	2	4	5	5
t	[mm]	0.5	0.2	0.5	0
u	[mm]	0.6	0.3	0.3	0.3
Øv	[mm]	6	6.9	7	0
w1	[mm]	50	55	70	80
w2	[mm]	50	50	60	68
w3	[mm]	40	55	60	63
x	[mm]	35	37	47	56
x1	[mm]	38	40.5	48	53
y	[mm]	39	44	59	69
y1	[mm]	39	39	49	57
z	[mm]	25	25	30	34
z1	[mm]	22	24.5	31	37
R	[mm]	35	45	45	45
SW1	[mm]	24	30	41	50
SW2	[mm]	13	17	22	27
SW3	[mm]	17	19	22	22
Part-no.					
Contact by spring force		**1940-300**	**1940-400**	**1940-501**	**1940-601**
Pneumatically extended		**1941-300**	**1941-400**	**1941-501**	**1941-601**
Hydraulically extended		**1942-300**	**1942-400**	**1942-501**	**1942-601**
Accessories					
Mounting body complete		**0346-815**	**0346-816**	**0346-817**	**0346-818**
Protection cap (splash guard)		**3546-110**	**3546-111**	**3546-112**	**3546-113**