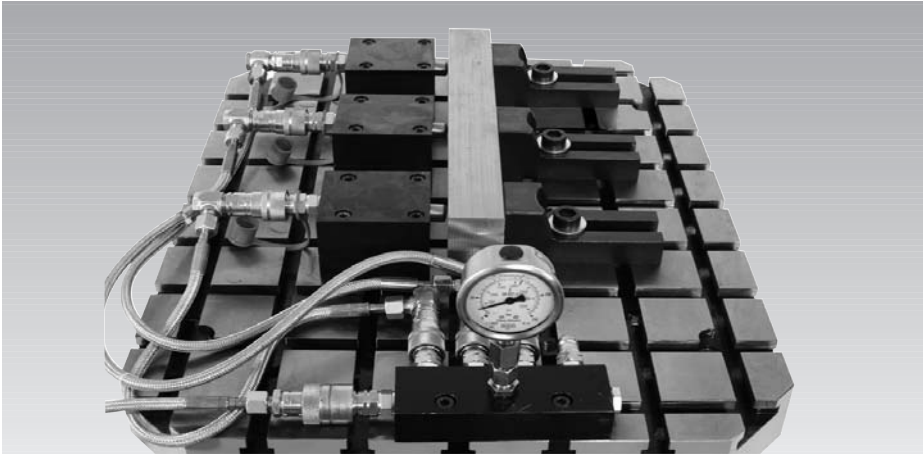


matrix - Hydraulic Workpiece Clamping System clamping sets with clamping and locking elements single acting, max. operating pressure 200 bar



Application

matrix clamping sets with clamping and locking elements are especially suitable for clamping of workpieces with smooth support surface directly on the machine tool table. Construction of a clamping fixture is not required. Preparations are limited to place the stops and the clamping elements in the existing T-slots.

matrix allows the flexible adaptation of very different workpieces and offers all advantages of hydraulic workpiece clamping.

Description

Clamping sets with single-acting clamping and locking elements and all required parts to clamp workpieces hydraulically directly onto the machine table.

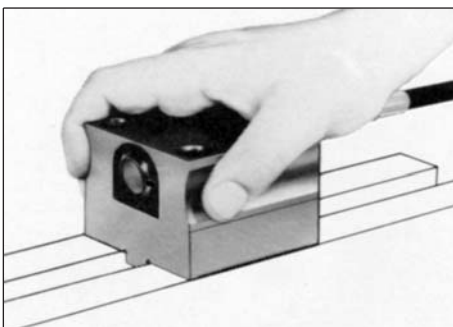
matrix consists of:

- Clamping and locking elements
- Low-clamping stops
- Distributor bar with pressure gauge
- Distributor bar with sequence valve (optional)
- Hydraulic high-pressure hoses with couplings
- Fixing parts
- Hydraulic clamping pump (optional)

Function

1. Clamping and locking element

In depressurised mode the elements are manually pushed in the T-slots to the workpiece.



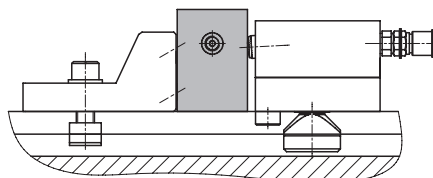
After pressurising the clamping elements are hydraulically clamped by T-slot screws onto the machine table.

At the same time the workpiece is clamped by clamping bolts against the low-clamping stops.

Since the clamping force for clamping of the elements onto the machine table is at least 10 times the workpiece clamping force, displacement of the clamping elements is excluded. The adjusting range of the T-slot screw is designed so that the admissible tolerances as per DIN 650 can be bridged. Due to the inclined position of the clamping piston by approx. 3° a low-clamping effect is obtained. The vertical force component equals approx. 5% of the clamping force available.

2. Low-clamping stop

In the low-clamping stop two spring bolts are angularly mounted, which protrude slightly the actual support surface. If the workpiece is pushed against the stop by the opposite clamping element, these bolts move back and result in a little low-clamping effect.



Advantages

- Direct clamping on the machine tool table
- Hydraulic fixing of the clamping elements
- No additional fixture costs
- Economic, especially with small batch sizes
- Clamping sets immediately ready for use
- Simple adaptation for parts families by displacement of the clamping elements
- 2 sizes available
- Clamping with minimum deformation by exact adjustment and uniform clamping forces
- Quick and uniform clamping
- Quick unclamping
- Simple production of hydraulic fixtures by fixing the elements onto a base plate
- Maintenance-free elements
- Saving compared with individual purchase

Important notes

Considerable injuries can be caused to fingers in the effective area of the clamping arm. Therefore pay attention especially during start-up of the system.

When inserting the element into an existing T-slot, the T-slot screw has to be screwed in so that it protrudes max. 1 mm to the actual size G (see page 3).

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




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Part numbers
Accessories

Part-nos. and parts included in the clamping sets

Clamping force at 200 bar Part-No.:		4.0 [kN]		6.2 [kN]	
		4415-510	4415-520	4415-610	4415-620
	1731-803	3	3		
	1732-803			3	3
	3216-004	3	3		
	3220-004			3	3
	T-slot screw	3411-070	3		
	T-slot screw	3411-090		3	3
	Disk	3300-086	3		
	Disk	3300-523		3	3
	Hexagon socket screw DIN 912	3301-156	3		
	Hexagon socket screw DIN 912	3300-521		3	3
	Hydraulic clamping pump	8804-006	1		
	Hydraulic oil, 1 litre	9895-001	1		
	Hand lever	0990-103	1		
	Locking flange	3533-466	1		
	Distributor bar	2360-219	1	1	1
	Hose 500 mm long	9375-616	2	2	2
	Hose 750 mm long	9375-636	1	1	1
	Hose 1000 mm long	9375-619	1	1	1
	Hose 2500 mm long	9375-623	1	1	1
	Screw-in plug	3610-006	4	4	4
	Tube male stud coupling	9208-003	8	8	8
	Swivel banjo coupling	9208-004	4	4	4
	Couplings and	9384-106			
	Dust caps	9384-300	3	3	3
	Coupling nipples and	9384-206			
	Dust caps	9384-400			

Components of clamping elements

Accessories:

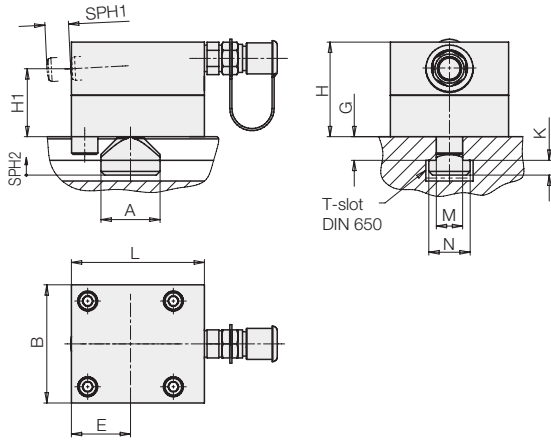
Work supports	from data sheet B 1.900
Pressure switch	see data sheet F 9.731
Hydraulic high-pressure hoses	see data sheet F 9.360
Fittings, hydraulic oil, seamless precision steel tubes	see data sheet F 9.300
Pressure gauge,	
Hydraulic intensifier	see data sheet D 8.755
Distributor, quadruple	Part-no. 3534-395

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Technical characteristics Dimensions

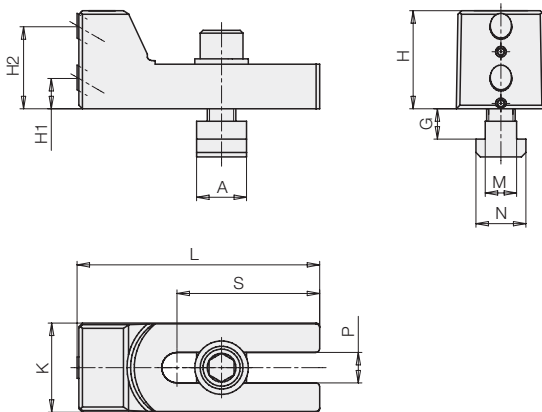
Clamping and locking element



Clamping and locking element

Part-No.:	1731-803	1732-803
T-slot as per DIN 650 [mm]	18	22
Clamping stroke SPH1 [mm]	12	15
Locking stroke SPH2 [mm]	3	3
Operating pressure, min. [bar]	10	10
Oil volume/ 1 mm locking stroke [cm ³]	2,63	4,22
Oil volume/ 10 mm clamping stroke [cm ³]	2,01	3,14
A [mm]	40	50
B [mm]	80	100
E [mm]	40	50
G MIN [mm]	16	20
G MAX [mm]	24	29
H [mm]	64	80
H1 [mm]	46	57
K [mm]	10	14
L [mm]	90	110
M [mm]	18	22
N [mm]	28	35

Low-clamping stop



Low-clamping stop

Part-No.:	3216-004	3220-004
T-slot as per DIN 650 [mm]	18	22
A [mm]	28	35
G MIN [mm]	16	20
G MAX [mm]	24	29
H [mm]	55	70
H1 [mm]	17	22
H2 [mm]	46	57
K [mm]	50	64
L [mm]	136	145
M [mm]	18	22
N [mm]	28	35
S [mm]	80	80
P [mm]	17	21

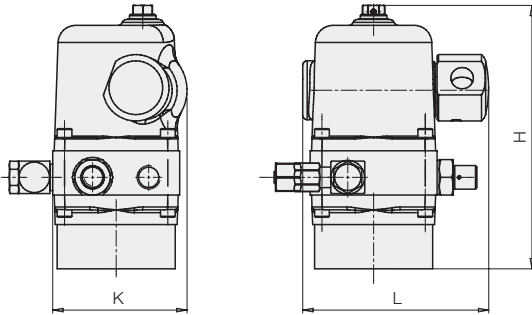
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Technical characteristics Dimensions

Hydraulic clamping pump



Hydraulic clamping pump Part-no. 8804-006

Max. operating pressure	[bar]	200
Oil volume V	[cm ³]	300
Oil volume, usable	[cm ³]	150
Displacement per stroke	[cm ³]	4
Weight	[kg]	6,1
H	[mm]	178
K	[mm]	91
L	[mm]	126

The *matrix* clamping sets with hydraulic clamping pumps are supplied with hand lever 0990-103 as well as 1 litre hydraulic oil HLP 32.

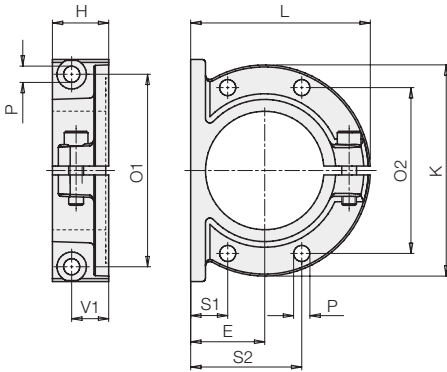
Accessory

Suitable hand lever	Part-no. 0990-103
Suitable foot pedal	Part-no. 0990-102

Further variants, data and accessories see data sheets D 8.800 and D 8.817.

Locking flange

for hydraulic clamping pump

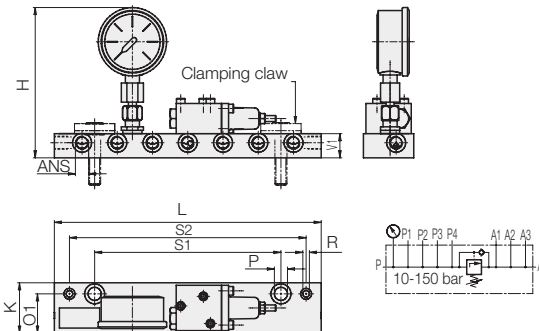


Locking flange Part-no. 3533-466

E	[mm]	50
H	[mm]	38
K	[mm]	143
L	[mm]	121
O1	[mm]	130
O2	[mm]	112
P	[mm]	11
S1	[mm]	25
S2	[mm]	75
V1	[mm]	25

Further flanges and accessories see data sheet D8.800

Distributor bar



Distributor bar without sequence valve Part-No.: 2360-219

Distributor bar with sequence valve Part-No.: 2360-218

Min. sequence pressure	[bar]	30
Connecting thread	ANS	6 x G1/4
H	[mm]	approx. 150
K	[mm]	50
L	[mm]	150
O1	[mm]	39
P	[mm]	13
R	[mm]	6,5
S1	[mm]	80
S2	[mm]	120
V1	[mm]	24

Description

Sequence valves are used in power workholding for pressure-dependent sequence controls. In this application this function is used to extend and lock the clamping and support elements.

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