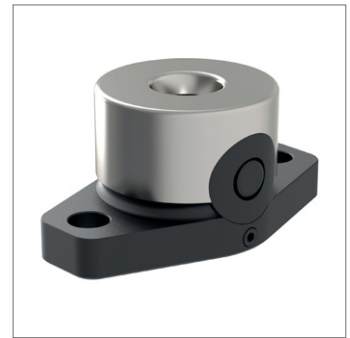
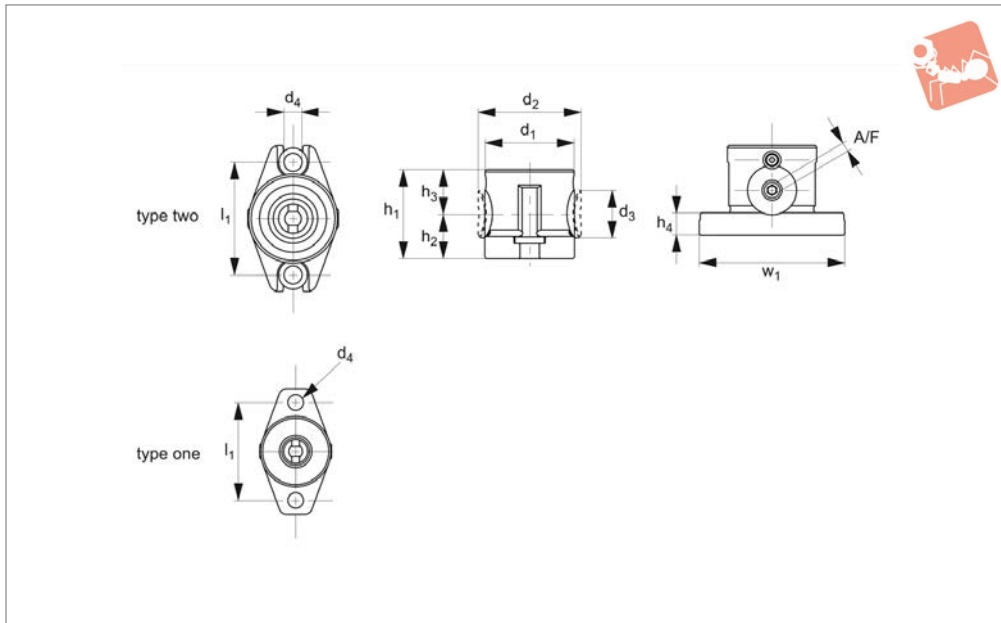




Clamping Module - Single flanged

Bore Clamping



12043

BORE CLAMPING

Material

Steel (AISI 4140), induction hardened, black oxide finish.

Technical Notes

For suitable clamping screws see part no.s

12046 through 12050.

For permissible cutting forces and corresponding workpiece weights when using the clamping module system, see technical pages.

Order No.	h_1 ± 0.01	h_2	h_3	l_1	w_1	Type	Size	d_1	d_2	d_3	d_4	h_4	A/F	Clamping force kN max.	Screw torque Nm max.	Weight g
12043.W0008	25	12.5	12.5	42	54	One	8	30	34.5	15	6.6	7	3	5	4	100
12043.W0011	40	20.0	20.0	50	65	Two	11	40	46.0	22	9.0	10	4	8	8	300
12043.W0016	63	33.0	30.0	75	95	Two	16	60	69.0	32	13.0	15	6	15	50	1400
12043.W0021	80	40.0	40.0	100	130	Two	21	80	91.0	44	17.0	20	8	25	50	3300



Simple Workholding Provides

Single Step Machining	Lower Fixture Cost	Better Machining Accuracy	Shorter Machining Time
No tool interference	Single fixture	Single setup	Simple toolpaths

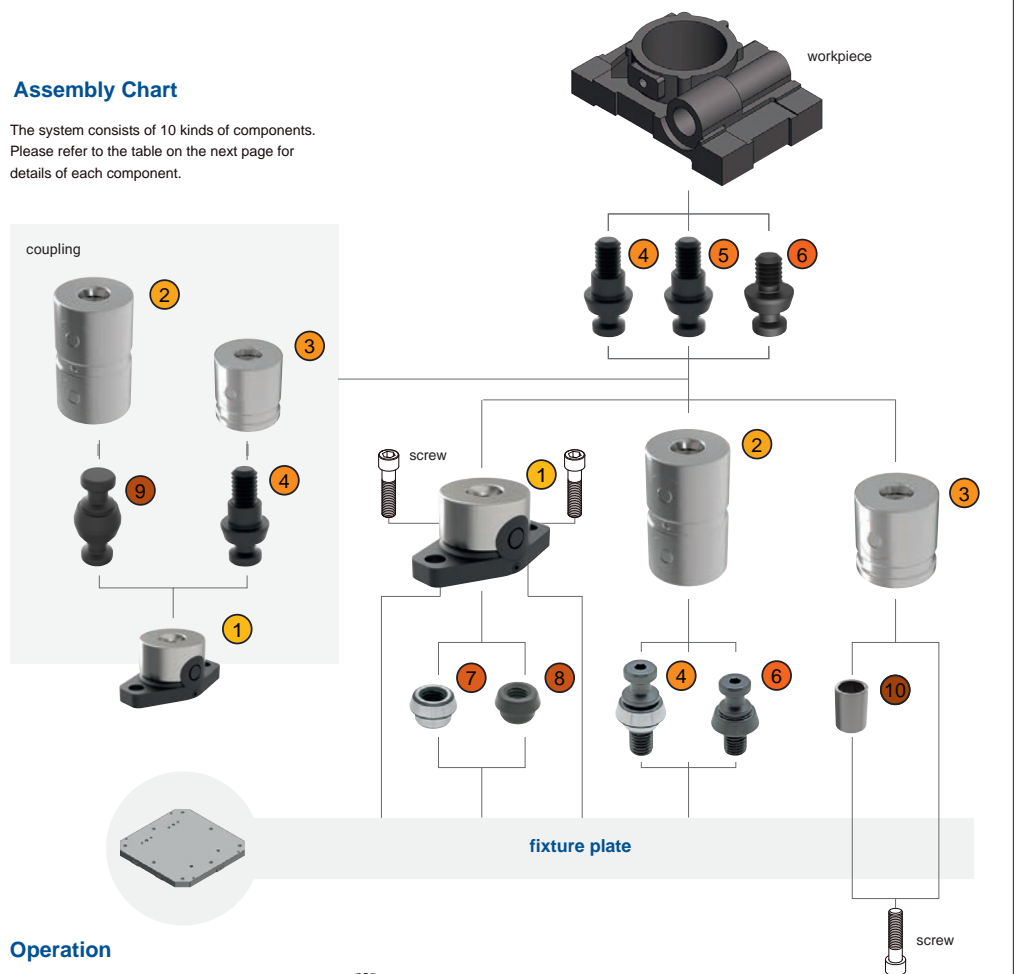
How to Use Modular Clamping System

Wixroyd Products

- ① 12043
- ② 12044
- ③ 12045
- ④ 12046.W0xxx
- ⑤ 12046.W4xxx
- ⑥ 12047
- ⑦ 12048.W02xx
- ⑧ 12048.W01xx
- ⑨ 12047
- ⑩ 12048.W00xx

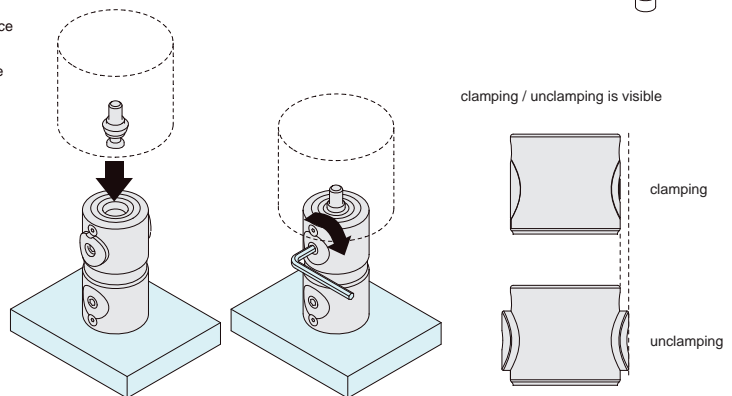
Assembly Chart

The system consists of 10 kinds of components. Please refer to the table on the next page for details of each component.



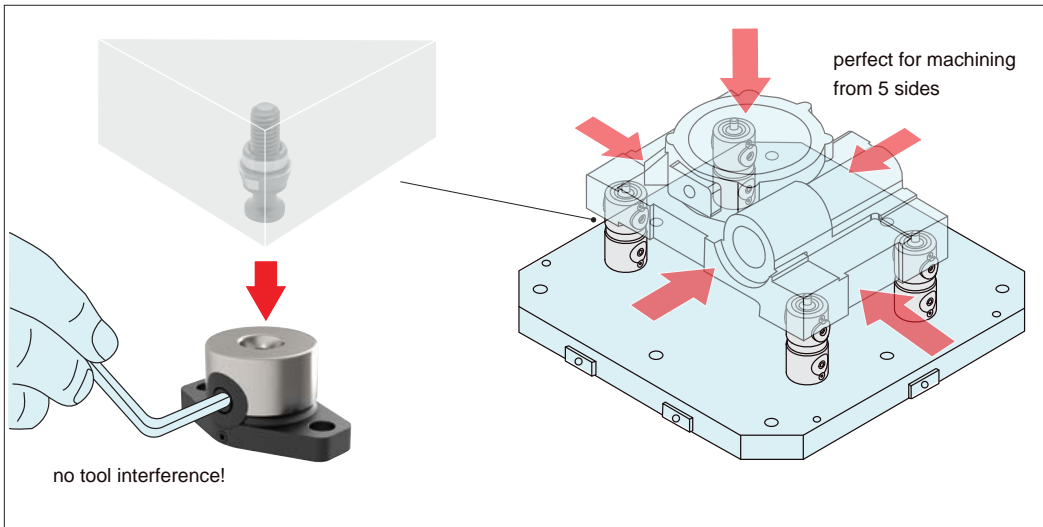
Operation

Install clamping screw on the workpiece and mount it on clamping module.
Tighten the locking screws on the side of the clamping module.



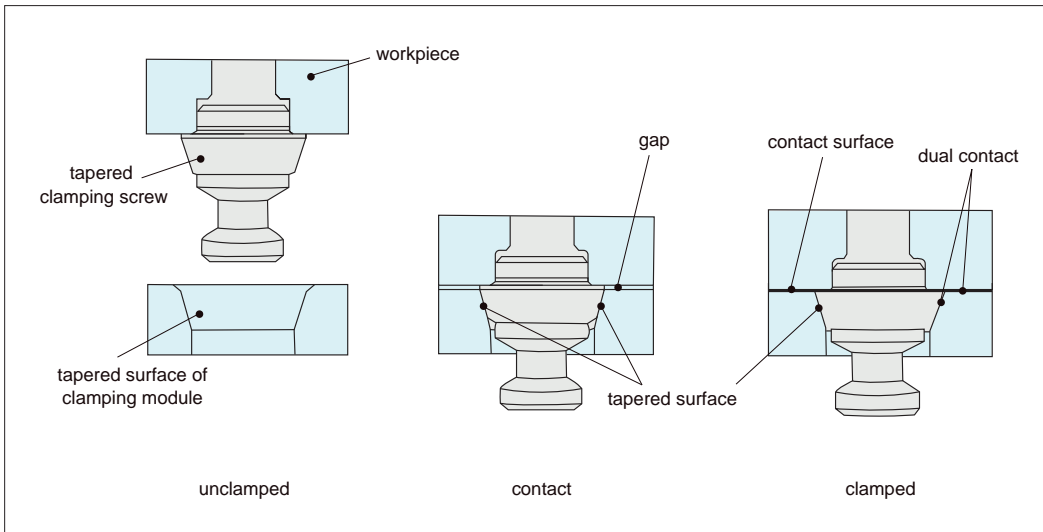


Application Example



Locating Mechanism

Dual surface contact at the tapered surfaces and contact surfaces provides 5 µm locating repeatability.



BORE CLAMPING

ov-W12043-A-T-W12049.5-A-T-modular-pull-clamping-system-b-rmh - Updated - 21-10-2022

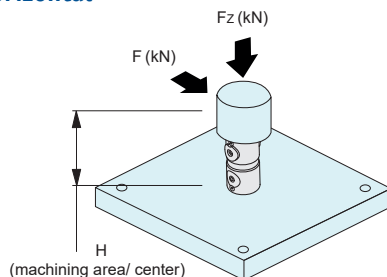
Permissible Cutting Force & Workpiece Weight for Clamping Module System 12043 to 12049

1 Module

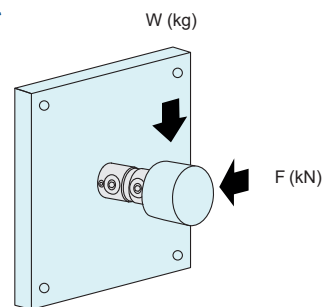
Note: Prepare a locator when the workpiece gets big rotating force.

Ensure the cutting force and the workpiece weight are within the allowable level.

Horizontal

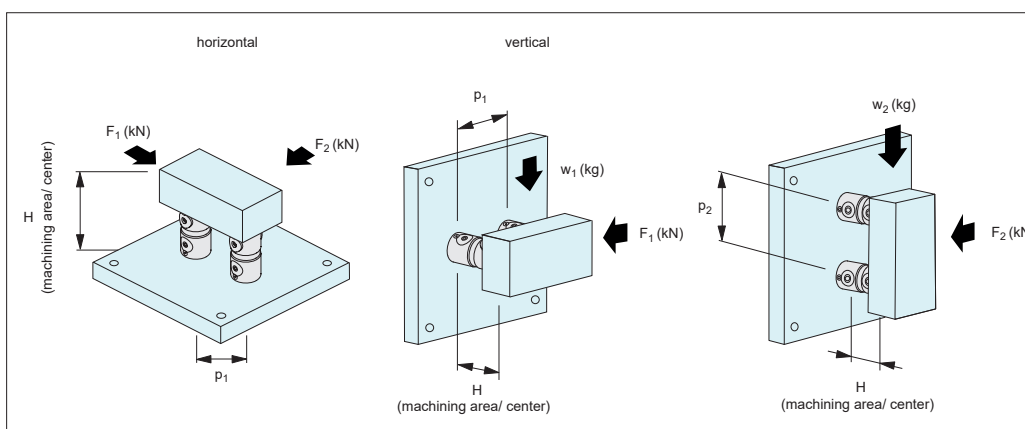


Vertical

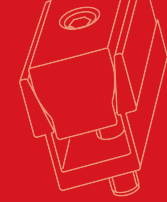


Part Number	Allowable Cutting Force		Allowable Workpiece Weight w(kg)
	F(kN)	Fz(kN)	
12043.W0008	50/H		50 x 100/H
12044.W0008	25/H	1.5	25 x 100/H
12045.W0008	25/H		25 x 100/H
12043.W0011	120/H		120 x 100/H
12044.W0011	70/H	2.5	70 x 100/H
12045.W0011	70/H		70 x 100/H
12043.W0016	250/H		250 x 100/H
12044.W0016	150/H	7.5	150 x 100/H
12045.W0016	150/H		150 x 100/H
12043.W0021	500/H		500 x 100/H
12044.W0021	300/H	15	300 x 100/H
12045.W0021	300/H		300 x 100/H

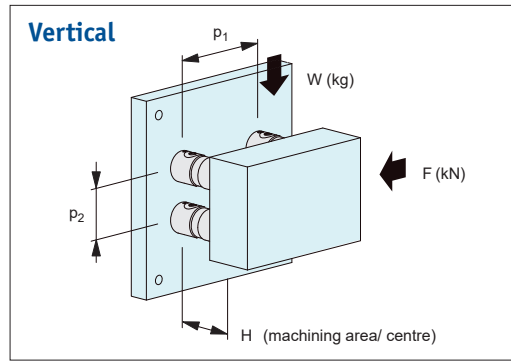
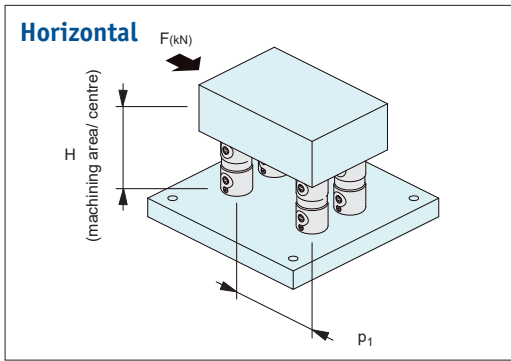
2 Modules



Part Number	Allowable Cutting Force			Allowable Workpiece Weight		
	F ₁ (kN)	F ₂ (kN)	Max(kN)	w ₁ (kg)	w ₂ (kg)	Max(kN)
12043.W0008	$(0.10p_1 + 180)H$	100/H		100x100/H	$(0.10p_2 + 180) \times 100/H$	
12044.W0008	$(0.05p_1 + 90)H$	50/H	1.8	50x100/H	$(0.05p_2 + 90) \times 100/H$	180
12045.W0008	$(0.05p_1 + 90)H$	50/H		50x100/H	$(0.05p_2 + 90) \times 100/H$	
12043.W0011	$(0.24p_1 + 432)H$	240/H		240x100/H	$(0.24p_2 + 432) \times 100/H$	
12044.W0011	$(0.14p_1 + 252)H$	140/H	3.2	140x100/H	$(0.14p_2 + 252) \times 100/H$	320
12045.W0011	$(0.14p_1 + 252)H$	140/H		140x100/H	$(0.14p_2 + 252) \times 100/H$	
12043.W0016	$(0.50p_1 + 900)H$	500/H		500x100/H	$(0.50p_2 + 900) \times 100/H$	
12044.W0016	$(0.30p_1 + 540)H$	300/H	6	300x100/H	$(0.30p_2 + 540) \times 100/H$	600
12045.W0016	$(0.30p_1 + 540)H$	300/H		300x100/H	$(0.30p_2 + 540) \times 100/H$	
12043.W0021	$(1.00p_1 + 1800)H$	1000/H		1000x100/H	$(1.00p_2 + 1800) \times 100/H$	
12044.W0021	$(0.60p_1 + 1080)H$	600/H	10	600x100/H	$(0.60p_2 + 1080) \times 100/H$	1000
12045.W0021	$(0.60p_1 + 1080)H$	600/H		600x100/H	$(0.60p_2 + 1080) \times 100/H$	

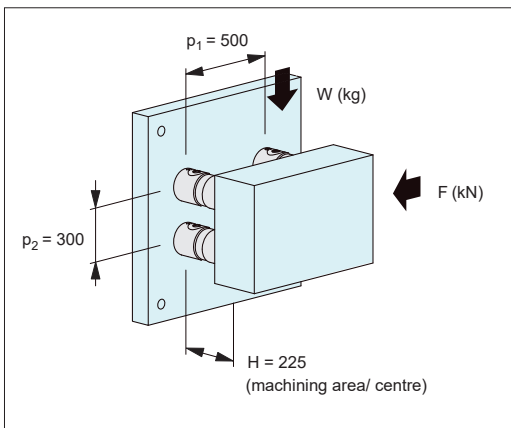


Permissible Cutting Force & Workpiece Weight for Clamping Module System 12043 to 12049



4 Modules

Part Number	Allowable Cutting Force		Allowable Workpiece Weight	
	F(kN)	Max(kN)	w(kg)	Max (kg)
12043.W0008	$2X (0.10p_1 + 180)/H$	3.6	$2X (0.10p_2 + 180) X100/H$	360
12044.W0008	$2X (0.05p_1 + 90)/H$		$2X (0.05p_2 + 90) X100/H$	
12045.W0008	$2X (0.05p_1 + 90)/H$	6.4	$2X (0.05p_2 + 90) X100/H$	640
12043.W0011	$2X (0.24p_1 + 432)/H$		$2X (0.24p_2 + 432) X100/H$	
12044.W0011	$2X (0.14p_1 + 252)/H$	12	$2X (0.14p_2 + 252) X100/H$	1200
12045.W0011	$2X (0.14p_1 + 252)/H$		$2X (0.14p_2 + 252) X100/H$	
12043.W0016	$2X (0.50p_1 + 900)/H$	20	$2X (0.50p_2 + 900) X100/H$	2000
12044.W0016	$2X (0.30p_1 + 540)/H$		$2X (0.30p_2 + 540) X100/H$	
12045.W0016	$2X (0.30p_1 + 540)/H$	20	$2X (0.30p_2 + 540) X100/H$	2000
12043.W0021	$2X (1.00p_1 + 1800)/H$		$2X (1.00p_2 + 1800) X100/H$	
12044.W0021	$2X (0.60p_1 + 1080)/H$	20	$2X (0.60p_2 + 1080) X100/H$	2000
12045.W0021	$2X (0.60p_1 + 1080)/H$		$2X (0.60p_2 + 1080) X100/H$	



Calculation Example

- Vertical mounting
- 4 pcs of 12044.W0016 (height 125mm)
- Pitch:
 $p_1 = 500\text{mm}$
 $p_2 = 300\text{mm}$
- Workpiece centre: $H = 225\text{mm}$
- F direction cutting force: 3kN
- Workpiece weight: 375kg

<Allowable Cutting Force F>
 $F = 2x(0.3X p_1 + 540)/H$
 $= 2x(0.3X 500 + 540)/225$
 $= 6.13\text{kN}$

*) Cutting force 3kN is within allowable value (6.13kN).

<Allowable Workpiece Weight W>
 $W = 2x(0.3X p_2 + 540)X100/H$
 $= 2x(0.3X 300 + 540)X100/225$
 $= 560\text{kg}$

*) Workpiece weight 375kg is within allowable value (560kg).

Height-W12043-A-T-W12049.5-b-rnh - Updated - 21-10-2022

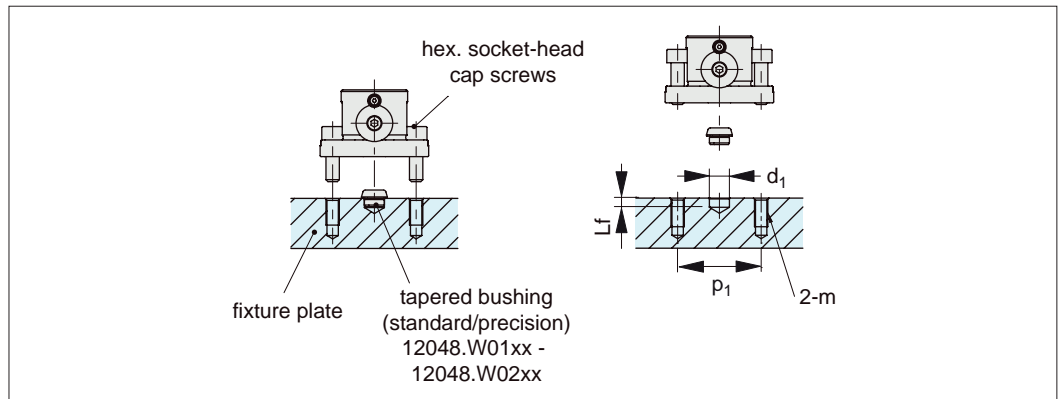


Installation Instructions Modular Clamping System

Mounting-Hole Dimension

Use 12048.W02xx tapered bushing (precision) for precise locating.

Use 12048.W01xx tapered bushing (standard) for rough locating.

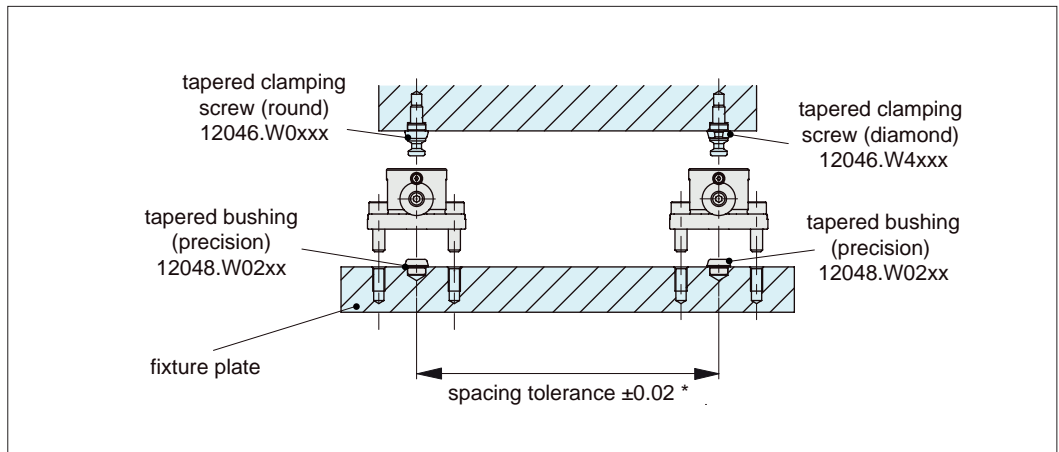


Part Number	d_1 (H7)	L_f	M	P_1
12043.W0008	8	5.5	M 6X1	42
12043.W0011	12	5.5	M 8X1.25	50
12043.W0016	18	6.5	M 12X1.75	75
12043.W0021	22	8	M 16X2	100

Spacing Tolerance

Spacing tolerance for 12048.W02xx tapered bushings (precision) should be ± 0.02 .

Spacing tolerance for 12048.W01xx tapered bushings (standard) should be ± 0.01 .

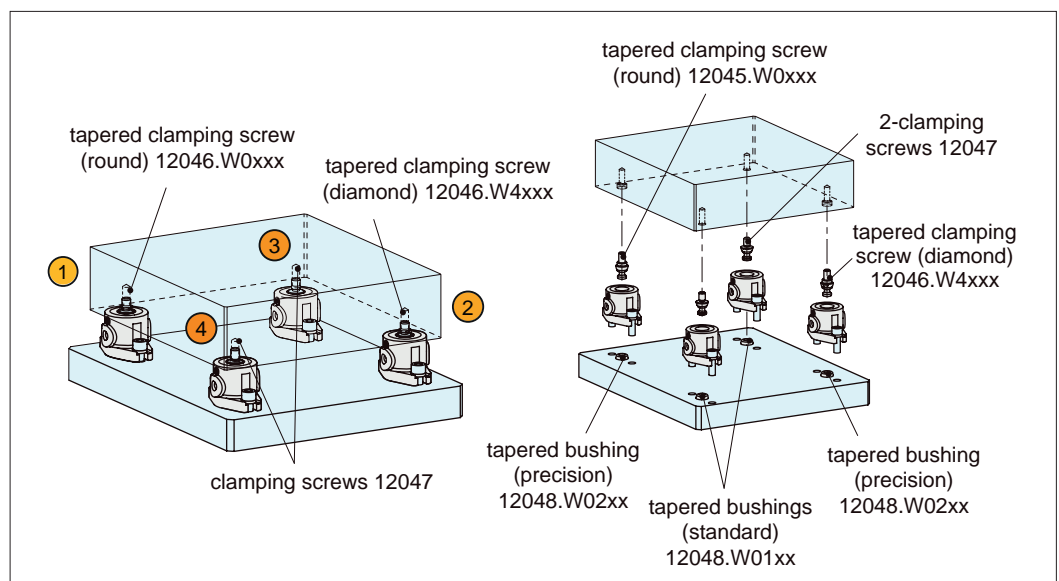


Tightening Order

Note: For 12043.W0008, use 2 pieces of round tapered clamping screw. Tighten these 2 screws in the same order to maintain the locating repeatability.

Tighten the locking screws in order of

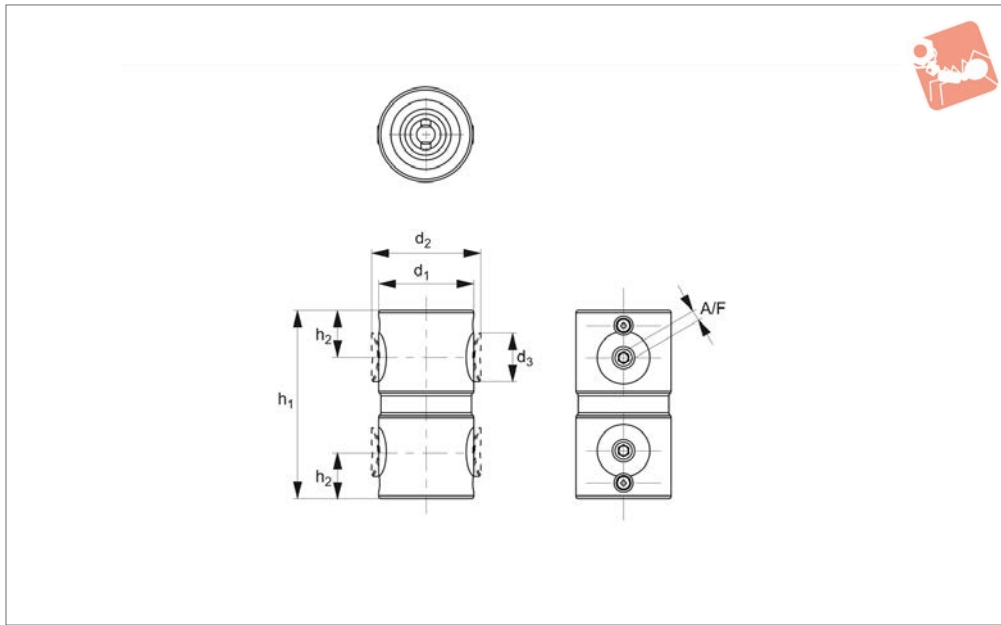
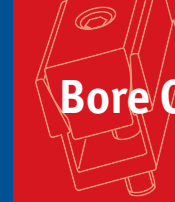
- ① Round tapered clamping screw
- ② Diamond tapered clamping screw
- ③ Clamping screw
- ④ Clamping screw





Clamping Module - Double unflanged

Bore Clamping



12044

BORE CLAMPING

Material

Steel (AISI 4140), induction hardened, black oxide finish.

Technical Notes

For suitable clamping screws see part no.s

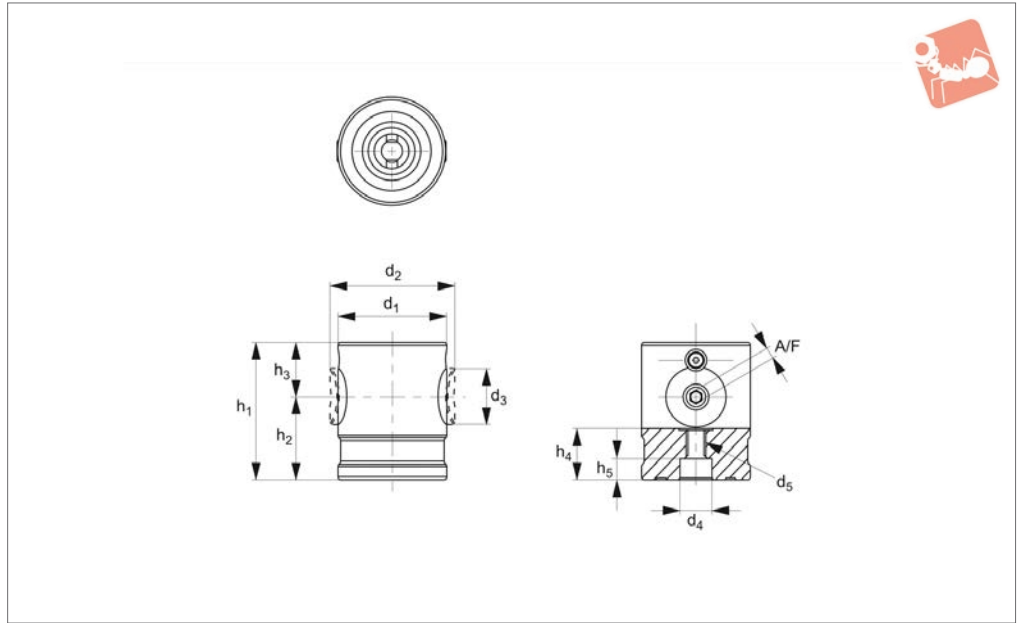
12046 through 12050.

For permissible cutting forces and corresponding workpiece weights when using the clamping module system, see technical pages.

Order No.	h_1 ± 0.01	h_2	Size	d_1	d_2	d_3	A/F	Clamping force kN max.	Screw torque Nm max.	Weight g
12044.W0008	50	12.5	8	30	34.5	15	3	5	4	200
12044.W0011	80	20.0	11	40	46.0	22	4	8	8	700
12044.W0016	125	30.0	16	60	69.0	32	6	15	22	2600
12044.W0021	160	40.0	21	80	91.0	44	8	25	50	5800



12045



BORE CLAMPING

Material

Steel (AISI 4140), induction hardened, black oxide finish.

Technical Notes

For suitable clamping screws see part no.s

12046 through 12050.

For permissible cutting forces and corresponding workpiece weights when using the clamping module system, see technical pages.

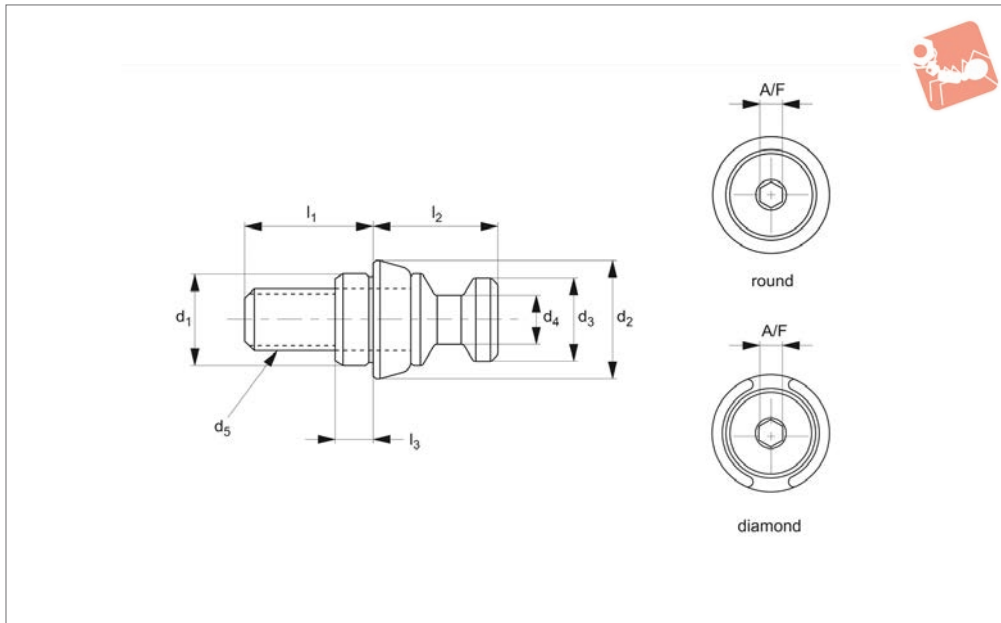
Order No.	h_1 ± 0.01	h_2	h_3	Size	d_1	d_2	d_3	d_4	d_5	h_4	h_5	A/F	Clamping force kN max.	Screw torque Nm max.	Weight g
12045.W0008	32	19.5	12.5	8	30	34.5	15	8	M 6x1,00	11.5	5.0	3	5	4	200
12045.W0011	50	30.0	20.0	11	40	46.0	22	12	M 8x1,25	18.0	7.5	4	8	8	500
12045.W0016	80	50.0	30.0	16	60	69.0	32	18	M12x1,75	25.0	10.5	6	15	22	1600
12045.W0021	100	60.0	40.0	21	80	91.0	44	22	M16x2,00	31.0	12.5	8	25	50	3800



Tapered Clamping Screws

round and diamond

Bore Clamping



12046

BORE CLAMPING

Material

Bushing: steel (C45E), black oxide finish, precision ground.

Screw: steel (SCM435), tempered, black oxide finish.

Technical Notes

For suitable clamping modules, see parts

12043, 12044 and 12045.

Round type can be used for mounting 12044 double clamping module to fixture plate.

Used together, round and diamond type tapered clamping screws can provide x and y location of workpiece with up to 5 micron

repeatability.

Order No.	l_1	Suitable clamping module size	Type	Size	d_1 tol. g6	d_2	d_3	d_4	d_5	l_2	l_3	A/F	Weight g
12046.W0061	13	8	Round	8	8	11,5	8	4,8	M 6x1,00	10,0	5,0	3	6
12046.W0062	17	11	Round	11	10	15,5	11	6,5	M 6x1,00	16,5	5,0	3	17
12046.W0081	17	11	Round	11	12	15,5	11	6,5	M 8x1,25	16,5	5,0	3	20
12046.W0082	17	16	Round	16	12	24,5	16	9,5	M 8x1,25	25,0	5,0	5	52
12046.W0121	24	16	Round	16	18	24,5	16	9,5	M12x1,75	25,0	6,0	5	70
12046.W0122	24	21	Round	21	18	31,5	21	13,0	M12x1,75	33,0	6,0	6	125
12046.W0161	30	21	Round	21	22	31,5	21	13,0	M16x2,01	33,0	7,5	6	150
12046.W4062	17	11	Diamond	11	10	15,5	11	6,5	M 6x1,01	16,5	5,0	3	17
12046.W4081	17	11	Diamond	11	12	15,5	11	6,5	M 8x1,26	16,5	5,0	3	20
12046.W4082	17	16	Diamond	16	12	24,5	16	9,5	M 8x1,26	25,0	5,0	5	52
12046.W4121	24	16	Diamond	16	18	24,5	16	9,5	M12x1,75	25,0	6,0	5	70
12046.W4122	24	21	Diamond	21	18	31,5	21	13,0	M12x1,75	33,0	6,0	6	125
12046.W4161	30	21	Diamond	21	22	31,5	21	13,0	M16x2,01	33,0	7,5	6	150



Installation Instructions Tapered Clamping Screws

How To Use

Note: For 12043.W0008, 12044.W0008 or 12045.W0011, use 2 pieces of round type.

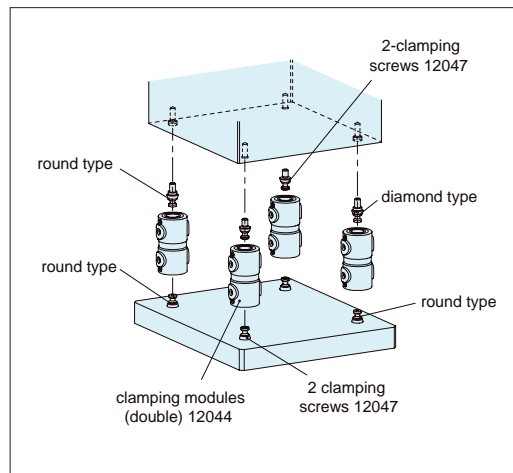
Round Type

- Can be used for locating 12044 clamping module (double).
- Can be used for locating a workpiece with diamond type.

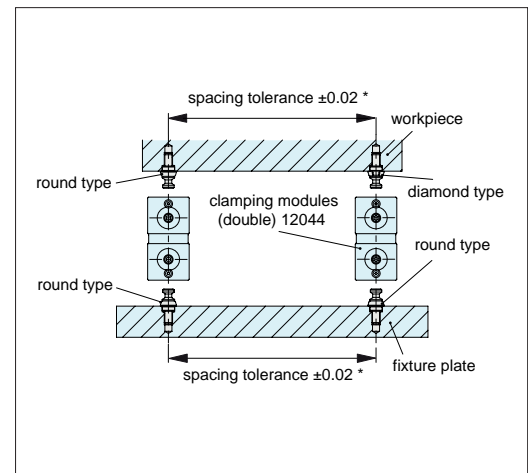
Diamond Type

- Can be used for locating a workpiece with round type.
- Fix the tapered bushing of diamond type after deciding the direction.

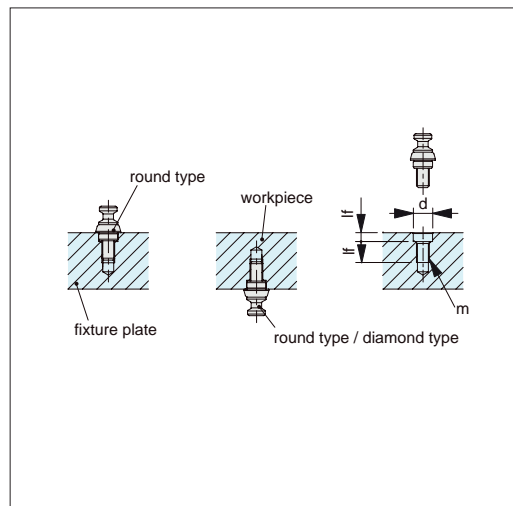
Application Example



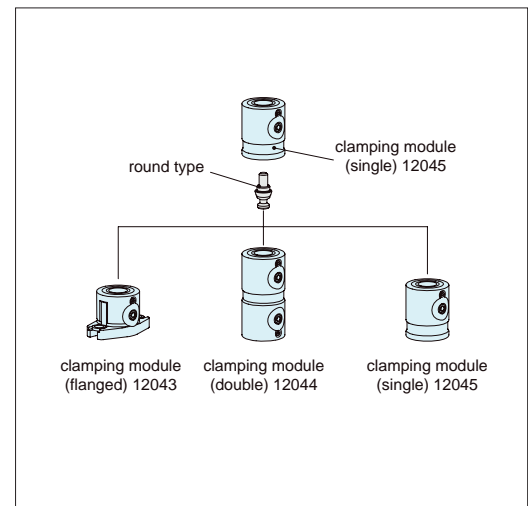
Spacing Tolerance



Mounting-Hole Dimension



Coupling of Clamping Module (Single)



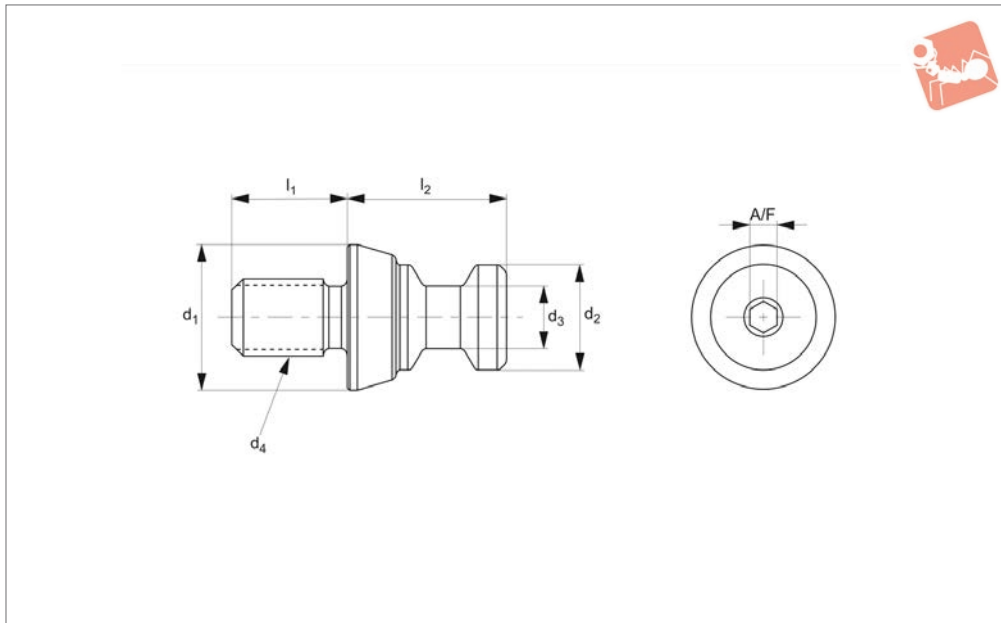
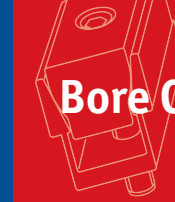
Part Number	d (H7)	Lf	Lf ₁	M
12046.WX061	8	9	5.5	M 6X1
12046.WX062	10	13	5.5	M 6X1
12046.WX081	12	13	5.5	M 8X1.25
12046.WX082	12	13	5.5	M 8X1.25
12046.WX121	18	19	6.5	M12X1.75
12046.WX122	18	19	6.5	M12X1.75
12046.WX161	22	23	8	M16X2

Round type can be used as a coupling for clamping module (single). Locating repeatability is 5 μm).



Tapered Clamping Screws floating

Bore Clamping



12047.1

BORE CLAMPING

Material

Bushing: steel (C45E), black oxide finish, precision ground.

Technical Notes

Can be used to couple double clamping modules (see part no.12044) together for

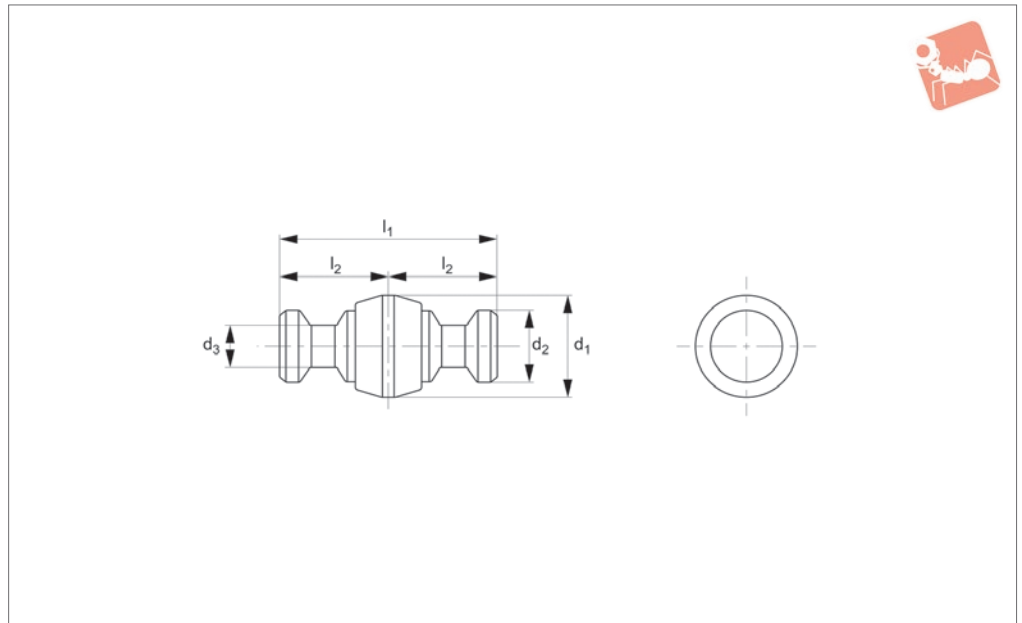
greater height.

Locating repeatability $\pm 0,2\text{mm}$.

Order No.	l_1	Suitable clamping module size	Type	Size	d_1	d_2	d_3	d_4	l_2	A/F	Weight g
12047.W0061	8	8	Floating	8	11	8	4,8	M 6x1,00	10,0	3	5
12047.W0062	9	11	Floating	11	15	11	6,5	M 6x1,00	16,5	3	13
12047.W0081	12	11	Floating	11	15	11	6,5	M 8x1,25	16,5	3	16
12047.W0082	12	16	Floating	16	24	16	9,5	M 8x1,25	25,0	5	46
12047.W0121	18	16	Floating	16	24	16	9,5	M12x1,75	25,0	5	57
12047.W0122	18	21	Floating	21	31	21	13,0	M12x1,75	33,0	6	108
12047.W0161	22	21	Floating	21	31	21	13,0	M16x2,01	33,0	6	125



12047.2



Material

Bushing: steel (C45E), black oxide finish, precision ground.

Technical Notes

Can be used to couple double clamping modules (see part no.12044) together for

greater height.

Locating repeatability $\pm 0,2\text{mm}$.

Order No.	l_1	Suitable clamping module 12044	Type	Size	d_1	d_2	d_3	l_2	Weight g
12047.W0011	33	11	Floating	11	15.5	11	6.5	16.5	24
12047.W0016	50	16	Floating	16	24.5	16	9.5	25.0	85
12047.W0021	66	21	Floating	21	31.5	21	13.0	33.0	190

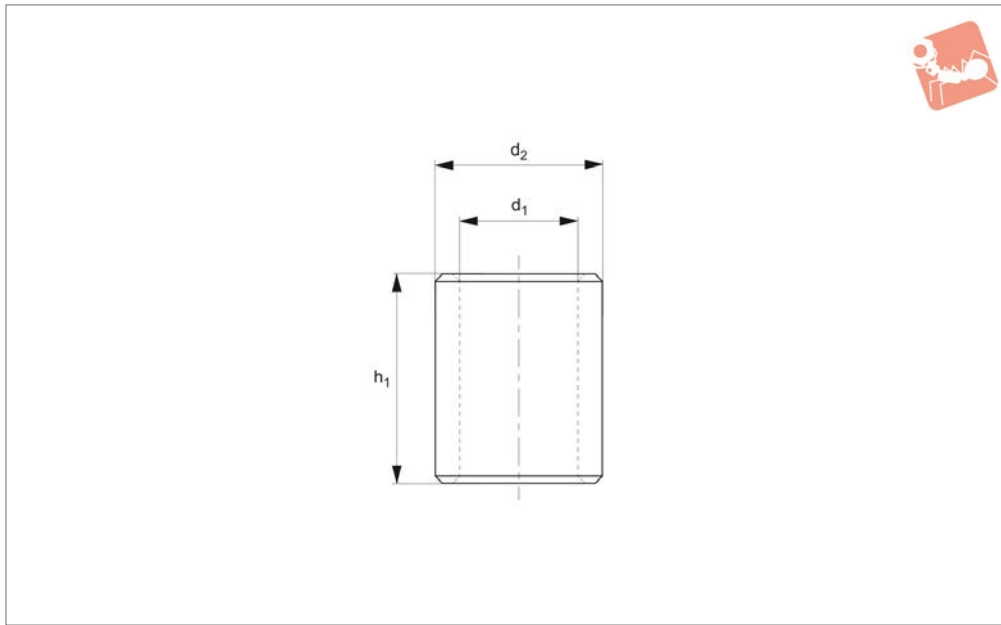


Locating Bush

for single clamping module 12045



Bore Clamping



12048.1

BORE CLAMPING

Material

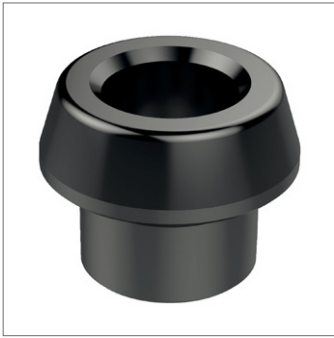
Steel (SK95), tempered, black oxide finish, precision ground.

single clamping module (see part no. 12045) location on the fixture plate. Can achieve clamping module locating repeatability of up to 0,04mm.

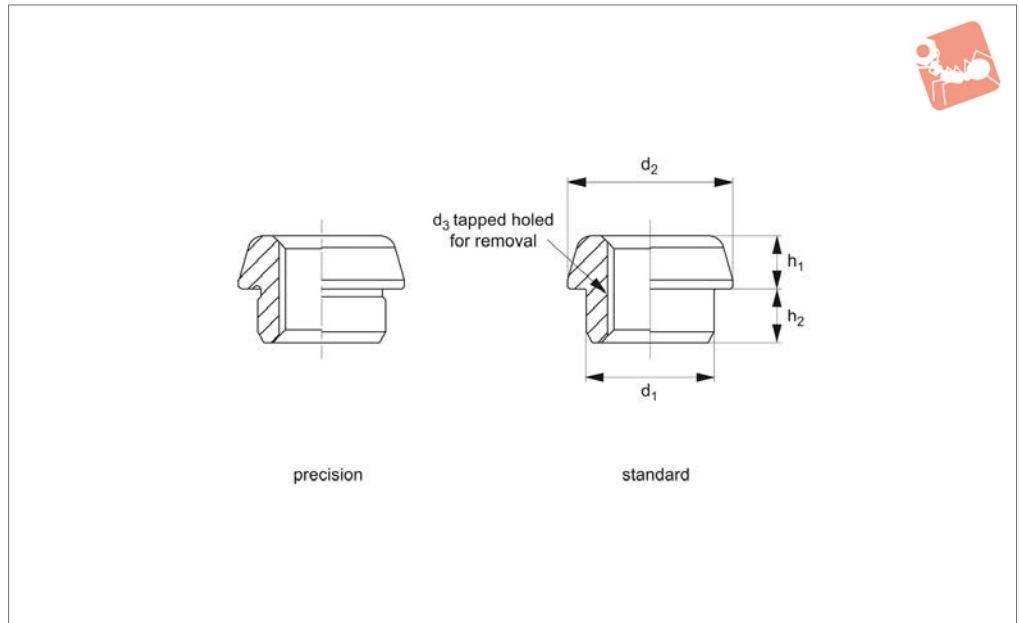
Technical Notes

Can be used to increase the accuracy of

Order No.	h_1	Suitable clamping module 12045	Size	d_1	d_2 tol. h6	Weight g
12048.W0008	11	8	8	6.0	8	2
12048.W0011	15	11	11	8.5	12	7
12048.W0016	22	16	16	12.5	18	22
12048.W0021	28	21	21	16.5	22	35



12048.2



Material

Steel (C45E), tempered, black oxide finish, precision ground (precision type only)

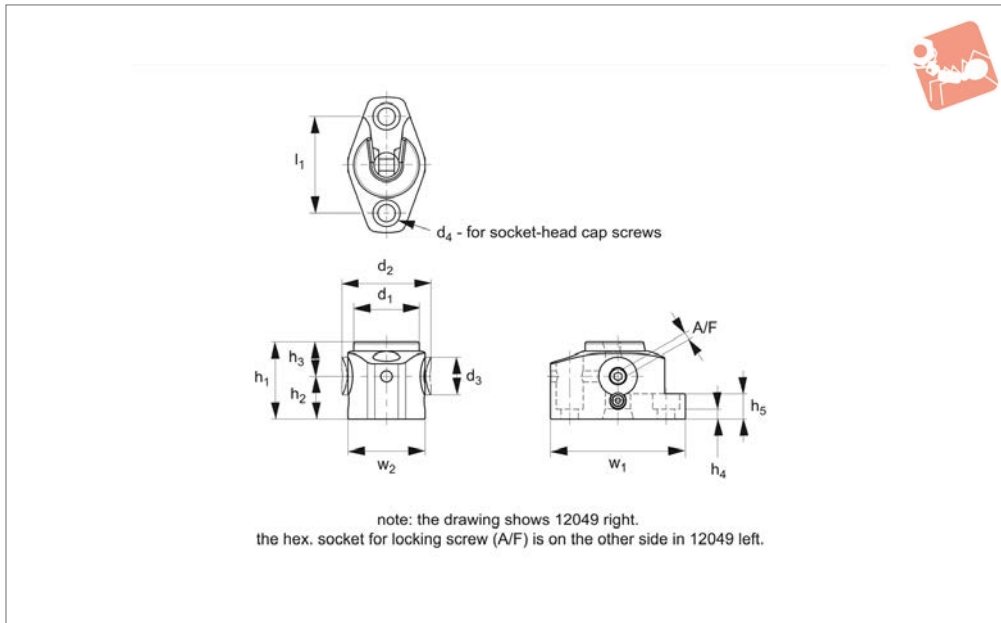
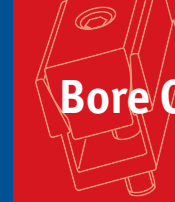
Technical Notes

Can be used to increase the accuracy of

flanged single clamping module (see part no. 12043) location on the fixture plate. Can achieve clamping module locating repeatability of up to 5 microns (precision type), or 0,1mm (standard type).

Only the precision type is precision ground for increased locating accuracy.

Order No.	h_1	h_2	Suitable clamping module 12043	Type	Size	d_2	d_3	Precision d_1 tol. g6	Standard d_1 -0.02 -0.05	Weight g
12048.W0108	4	5.0	8	Standard	8	11.5	M 6x1,00	-	8	4
12048.W0111	5	5.0	11	Standard	11	15.5	M 8x1,25	-	12	8
12048.W0116	8	6.0	16	Standard	16	24.5	M12x1,75	-	18	27
12048.W0121	10	7.5	21	Standard	21	31.5	M16x2,00	-	22	51
12048.W0208	4	5.0	8	Precision	8	11.5	M 6x1,00	8	-	4
12048.W0211	5	5.0	11	Precision	11	15.5	M 8x1,25	12	-	8
12048.W0216	8	6.0	16	Precision	16	24.5	M12x1,75	18	-	27
12048.W0221	10	7.5	21	Precision	21	31.5	M16x2,00	22	-	51



12049.1

BORE CLAMPING

Material

Steel (AISI 4140), induction hardened, black oxide finish, precision ground.

Technical Notes

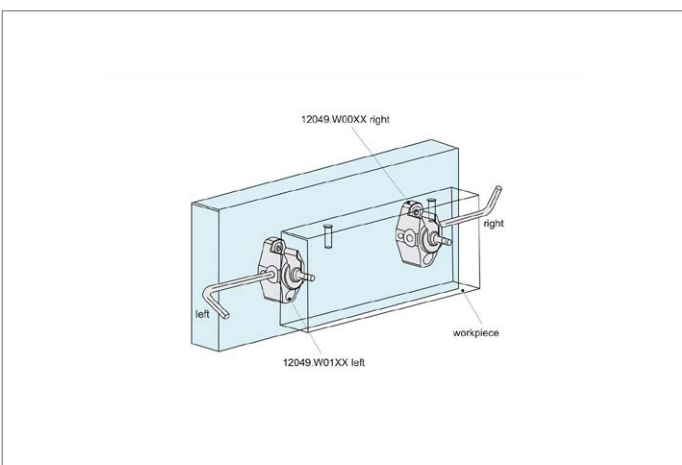
For suitable clamping screws see part no.s

12049.W0212 - .W0224.

For permissible cutting forces and corresponding workpiece weights when using the clamping module system, see technical pages.

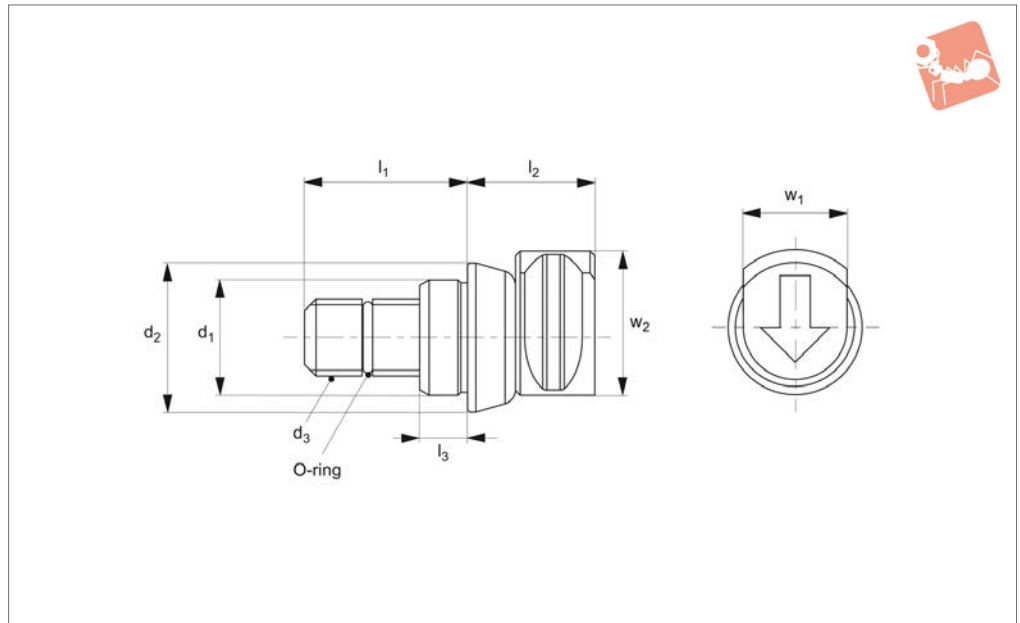
Diagram shown is for right hand version, left hand version only varies by location of locking screw A/F which is on the left hand side of module rather than right.

Order No.	h_1 ± 0.01	h_2	h_3	l_1	w_1	Type	Size	d_1	d_2	d_3	d_4	h_4	h_5	w_2	A/F	Clamping force kN max.	Screw torque Nm max.	Weight g
12049.W0012	40	22	18	50	70	Right	12	34	46	20	M 8	5	13	40	4	8	8	400
12049.W0019	63	35	28	75	100	Right	19	52	69	30	M12	8	20	60	6	15	22	1400
12049.W0024	80	44	36	100	140	Right	24	70	93	40	M16	10	26	80	8	25	50	3200
12049.W0112	40	22	18	50	70	Left	12	34	46	20	M 8	5	13	40	4	8	8	400
12049.W0119	63	35	28	75	100	Left	16	52	69	30	M12	8	20	60	6	15	22	1400
12049.W0124	80	44	36	100	140	Left	24	70	93	40	M16	10	26	80	8	25	50	3200





12049.2



Material

Bushing: steel (C45E), black oxide finish, precision ground.
Screw: steel (SCM 435), tempered, black

oxide finish.

O-ring: nitrile rubber.

Technical Notes

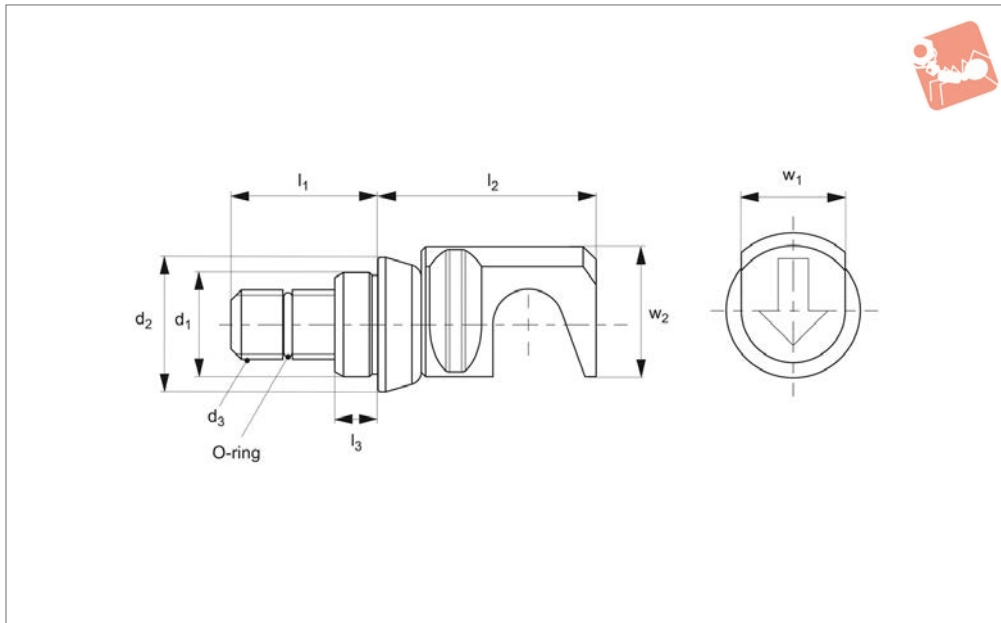
For suitable clamping modules see part no.12049.W0012 - .W0124.

Order No.	l_1	w_1	Suitable clamping module size	Type	Size	d_1 tol. g6	d_2	O-ring size	d_3	l_2	l_3	w_2	Weight g
12049.W0212	17	12	12	Precision	12	12	15,5	SS050 (CS1 I/D 5,0)	M 8x1,25	13,0	5,0	15,0	22
12049.W0219	24	19	19	Precision	19	18	24,5	S8 (CS1,5 I/D 7,5)	M12x1,75	21,5	6,0	23,5	81
12049.W0224	30	24	24	Precision	24	22	31,5	S12 (CS 1,5 I/D 11,5)	M16x2,00	27,0	7,5	30,0	170



Tapered Clamping Screws - Hook precision

Bore Clamping



12049.3

BORE CLAMPING

Material

Bushing: steel (C45E), black oxide finish, precision ground.
Screw: steel (SCM 435), tempered, black

oxide finish.

O-ring: nitrile rubber.

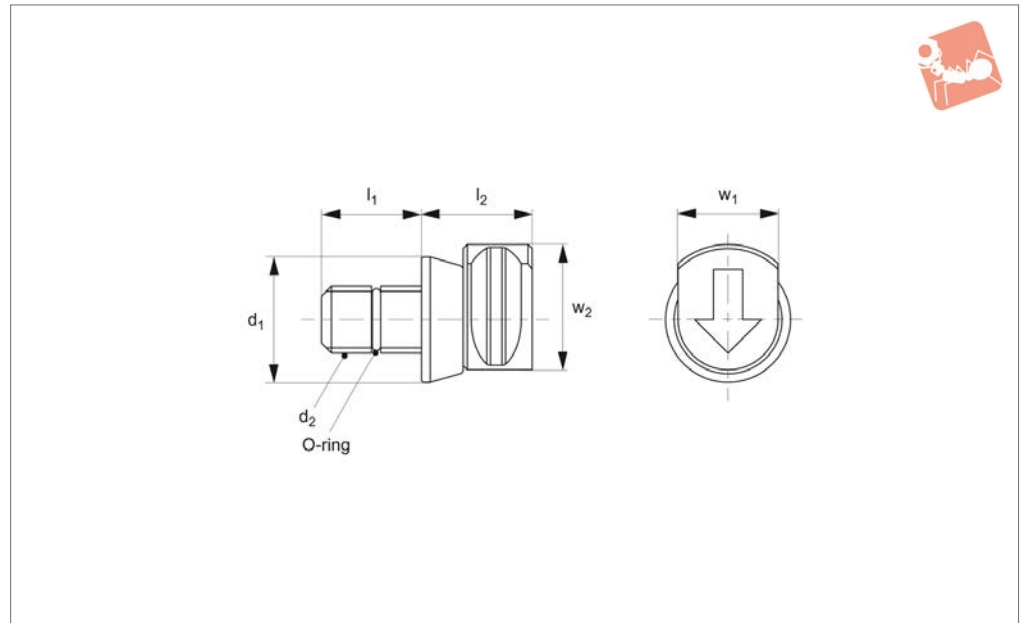
Technical Notes

For suitable clamping modules see part no. 12049.1.

Order No.	l_1	w_1	Suitable clamping module size	Type	Size	d_1 tol. g6	d_2	O-ring size	d_3	l_2	l_3	w_2	Weight g
12049.W0312	17	12	12	Precision	12	12	15,5	SS050 (CS1 I/D 5,0)	M 8x1,25	25	5,0	15,0	30
12049.W0319	24	19	19	Precision	19	18	24,5	S8 (CS1,5 I/D 7,5)	M12x1,75	40	6,0	23,5	115
12049.W0324	30	24	24	Precision	24	22	31,5	S12 (CS 1,5 I/D 11,5)	M16x2,00	51	7,5	30,0	235



12049.4



Material

Bushing: steel (C45E), black oxide finish, precision ground.
Screw: steel (SCM 435), tempered, black

oxide finish.

O-ring: nitrile rubber.

Technical Notes

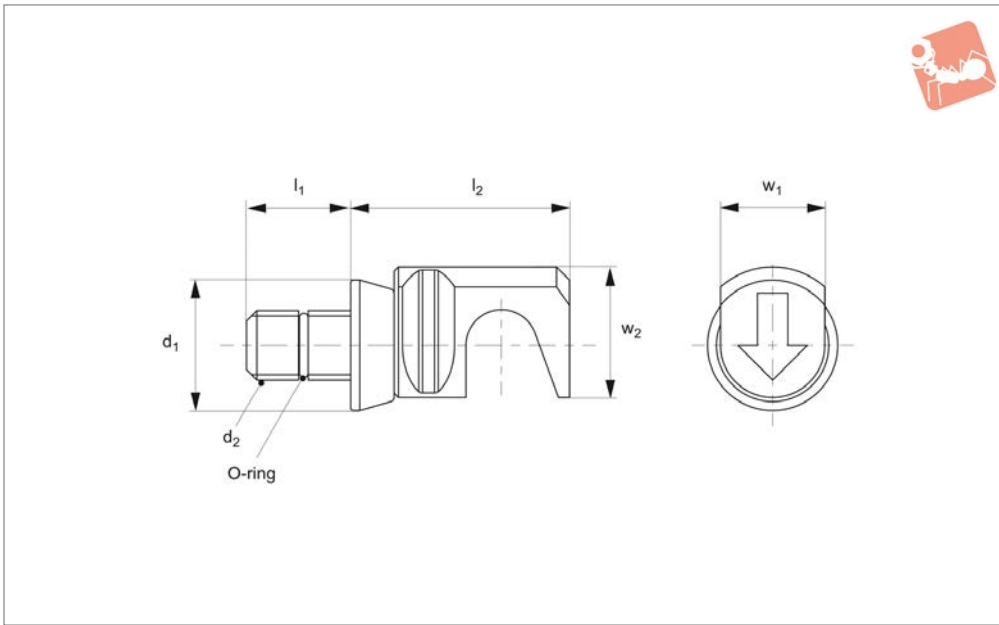
For suitable clamping modules see part no. 12049.1.

Order No.	l_1	w_1	Suitable clamping module size	Type	Size	d_1	d_2	O-ring size	l_2	w_2	Weight g
12049.W0412	12	12	12	Standard	12	15	M 8x1,25	SS050 (CS1 I/D 5,0)	13,0	15,0	18
12049.W0419	18	19	19	Standard	19	24	M12x1,75	S8 (CS1,5 I/D 7,5)	21,5	23,5	69
12049.W0424	22	24	24	Standard	24	31	M16x2,00	S12 (CS 1,5 I/D 11,5)	27,0	30,0	147



Clamping Screws - Hook standard

Bore Clamping



12049.5

BORE CLAMPING

Material

Bushing: C45E. Black oxide finish, precision ground.
Screw: steel (SCM 435), tempered, black

oxide finish.
O-ring: nitrile rubber.

Technical Notes

For suitable clamping modules see part no. 12049.1.

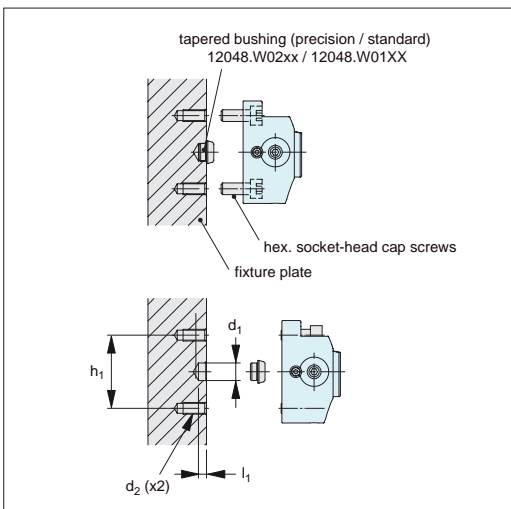
Order No.	l_1	w_1	Suitable clamping module size	Type	Size	d_1	d_2	O-ring size	l_2	l_3	w_2	Weight g
12049.W0512	12	12	12	Standard	12	15	M 8x1,25	SS050 (CS1 I/D 5,0)	25	5,0	15,0	26
12049.W0519	18	19	19	Standard	19	24	M12x1,75	S8 (CS1,5 I/D 7,5)	40	6,0	23,5	103
12049.W0524	22	24	24	Standard	24	31	M16x2,00	S12 (CS 1,5 I/D 11,5)	51	7,5	30,0	213



How To Use

- Use 12048.W02xx tapered bushing (precision) for precise locating.
- Use 12048.W01xx tapered bushing (standard) for rough locating.

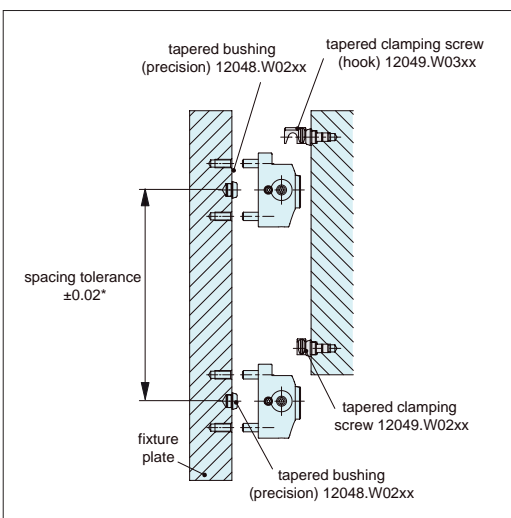
Mounting Hole Dimension



Part Number	d ₁ (H7)	l ₁	d ₂	h ₁
12049.W0012	12	5.5	M 8X1,25	50
12049.W0112	12	5.5	M 8X1,25	50
12049.W0019	18	6.5	M12X1,75	75
12049.W0119	18	6.5	M12X1,75	75
12049.W0024	22	8	M16X2	100
12049.W0124	22	8	M16X2	100

* The tolerance of dimension 'd₁' for tapered bushings (standard) should be ${}_{0}^{-0,1}$

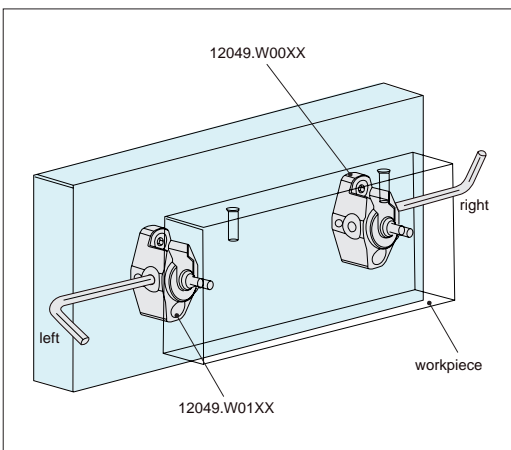
Spacing Tolerance



Spacing tolerance should be $\pm 0,02$ for tapered bushings (precision).

*Spacing tolerance should be $\pm 0,1$ for tapered bushings (standard).

Layout



Use 12049.W00xx for tightening from right side, 12049.W01xx for left side.



Clamping Modules for Vertically Mounted Fixtures



12049

Clamping & Height Setting

Clamping Modules for Vertically Mounted Fixtures

Firstly tighten the hook type clamping screw.

The first one becomes reference.

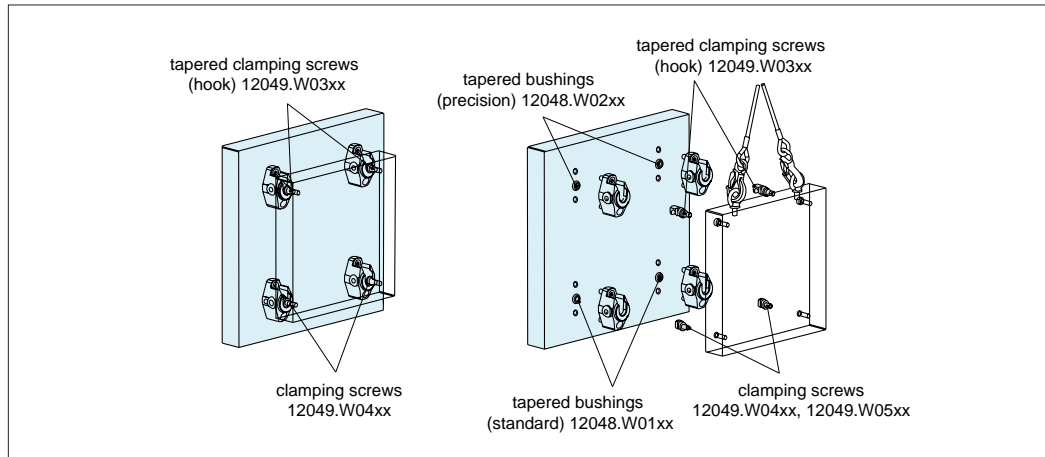
The products should be positioned as shown below.

12049.W03xx, 12049.W01xx and 12049.W02xx tapered clamping screws and 12048.W02xx tapered bushings (precision) should be used together, and 12049.W04xx and 12049.W05xx clamping screws and 12048.W01xx tapered bushings (standard) should also be used together.

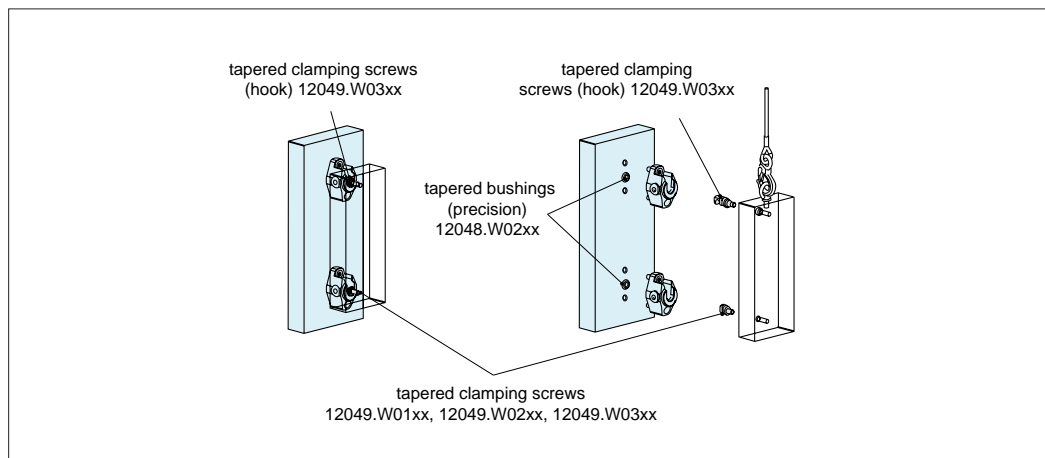
Application Example

Note: Do not remove the hoists until the unit fully clamped.

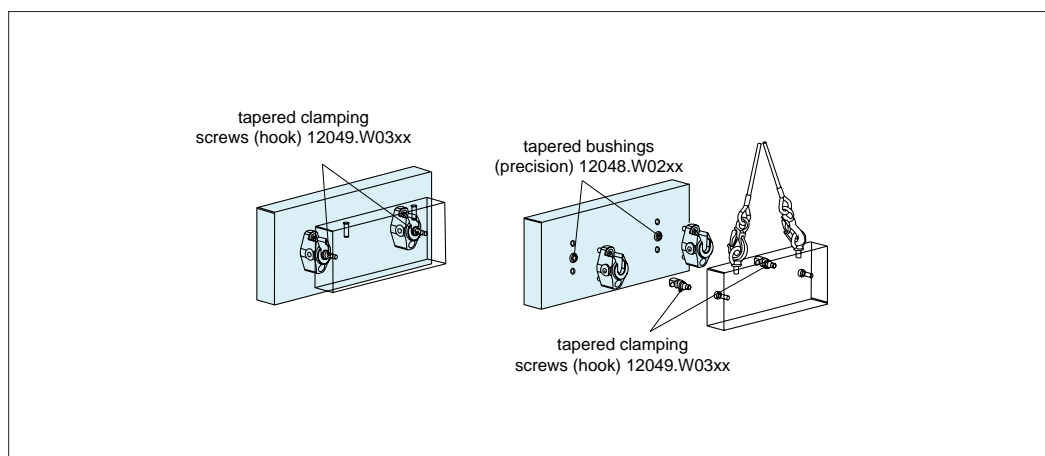
Example 1



Example 2



Example 3



BORE CLAMPING

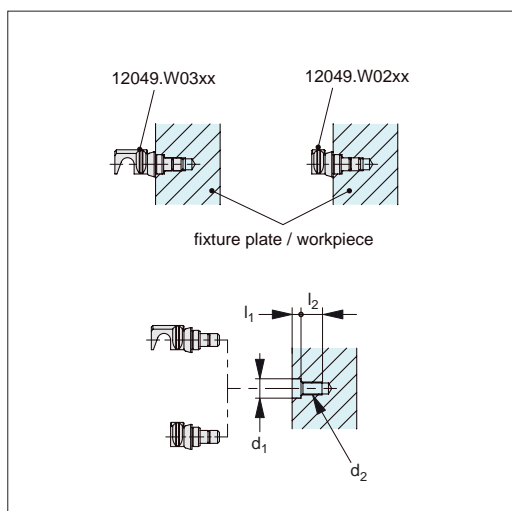
ov-W12049.1-A-T-W12049.5-A-T-clamping-modules-vertically-mounted-fixtures-rmh - Updated - 21-10-2022



Clamping Modules for Angle Mounted Fixtures

- Each clamping screw has commercially available O-ring to prevent rotation and keep the direction of arrow marking.
- O-ring should be replaced by the customer when it is worn.
- Tapered clamping screws can be used for locating fixture plate or workpiece.
- Clamping screws can be used for just clamping.

Mounting Hole Dimension

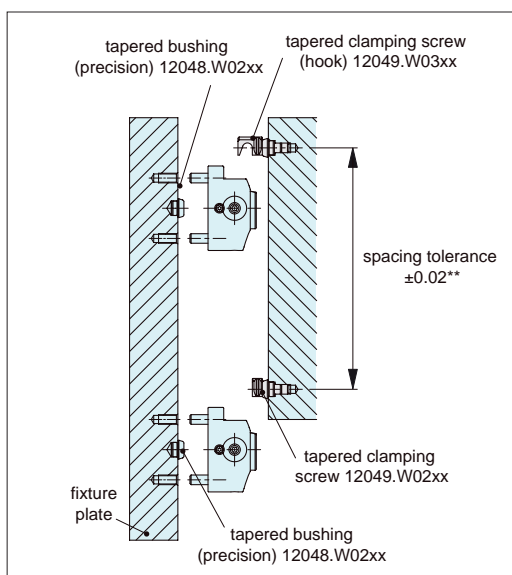


Part Number	d ₁ *	l ₁	l ₂	d ₂
12049.W0212	12	13	5.5	M 8X1,25
12049.W0312	12	13	5.5	M 8X1,25
12049.W0219	18	19	6.5	M12X1,75
12049.W0319	18	19	6.5	M12X1,75
12049.W0224	22	23	8	M16X2,00
12049.W0324	22	23	8	M16X2,00

* The hole tolerance should always be $\begin{matrix} -0,010 \\ -0,025 \end{matrix}$ when tapered clamping screws are always mounted on the fixture plate. Fixture plate and tapered bushing fit tightly and keep repeatability without chip incursion.

The hole tolerance should be H7 when mounting on workpiece. Tapered bushing can be easily mounted/ removed.

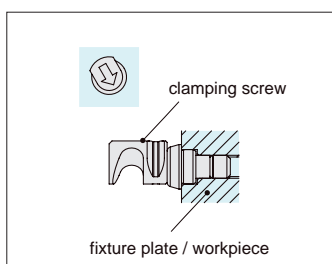
Spacing Tolerance



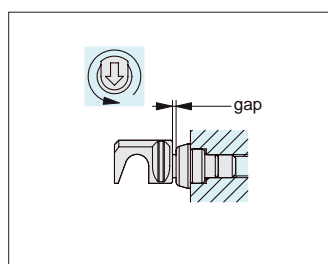
Spacing tolerance should be $\pm 0,02$ for tapered clamping screws.

**Spacing tolerance should be $\pm 0,2$ for clamping screws.

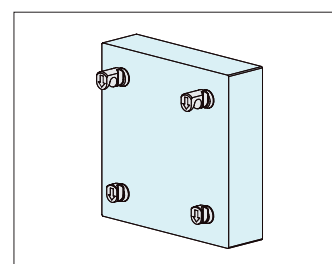
Installation



1. Fully tighten the clamping screw on fixture plate or workpiece.



2. Turn the screw counter clockwise within one turn until the arrow marking points downward. (There is a gap between clamping screw and tapered bushing)

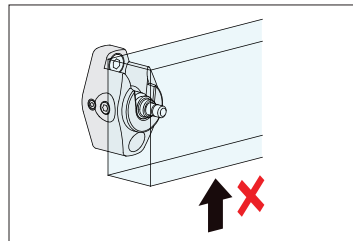
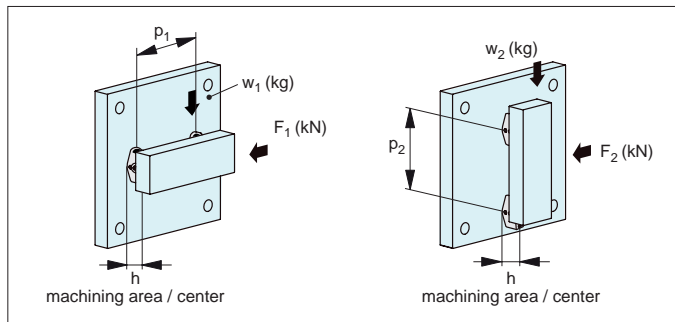


3. Install the clamping screws into the clamping modules.



Permissible Cutting Force & Workpiece Weight of Clamping Modules (Hook)

Ensure the cutting force and workpiece weight are within the allowable level.



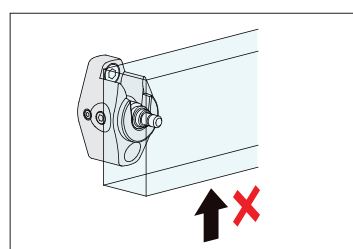
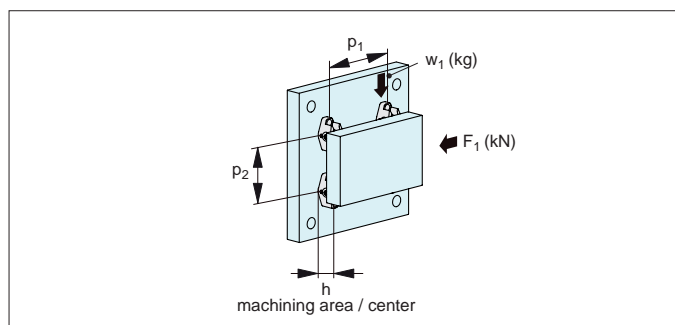
Note: Heavy cutting force in the open direction may cause workpiece move.

2 Modules

Permissible Cutting Force

Permissible Workpiece Weight

Part Number	F ₁ (kN)	F ₂ (kN)	Max (kN)	w ₁ (kg)	w ₂ (kg)	Max (kg)
12049.W0012 / W0112	$(0,24p_1 + 432)/h$	240/h	3,2	240 x100/h	$(0,24p_2 + 432) \times 100/h$	320
12049.W0019 / W0119	$(0,50p_1 + 900)/h$	500/h	6	500 x100/h	$(0,50p_2 + 900) \times 100/h$	600
12049.W0024 / W0124	$(1,00p_1 + 1800)/h$	1000/h	10	1000x100/h	$1,00p_2 + 1880) \times 100/h$	1000



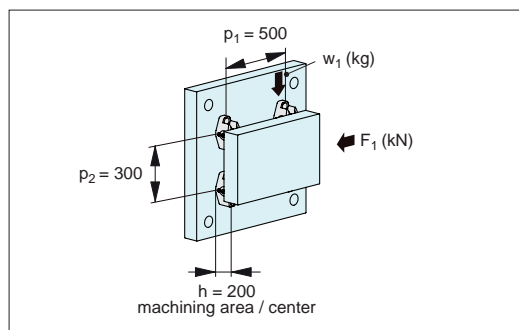
Note: Heavy cutting force in the open direction may cause workpiece move.

4 Modules

Permissible Cutting Force

Permissible Workpiece Weight

Part Number	F ₁ (kN)	Max (kN)	w ₁ (kg)	Max (kg)
12049.W0012 / W0112	$2x(0,24p_1 + 432)/h$	6.4	$2x(0,24p_2 + 432) \times 100/h$	640
12049.W0019 / W0119	$2x(0,50p_1 + 900)/h$	12	$2x(0,50p_2 + 900) \times 100/h$	1200
12049.W0024 / W0124	$2x(1,00p_1 + 1800)/h$	20	$2x(1,00p_2 + 1880) \times 100/h$	2000



- 4 pieces of 12049.W0019 (height 63mm)
- Pitch: p₁ = 500mm p₂ = 300mm
- Workpiece center: h = 200mm
- F₁ direction cutting force: 5kN
- Workpiece weight: 600kg

<Allowable Cutting Force F₁>

$$F_1 = 2x(0.5X p_1 + 900)/H$$

$$= 2x(0.5X 500 + 900)/200$$

$$= 11.5kN$$

*) Cutting force 5kN is within allowable value (11.5kN).

<Allowable Workpiece Weight W₁>

$$W_1 = 2x(0.5X p_2 + 900)X100/H$$

$$= 2x(0.5X 300 + 900)X100/200$$

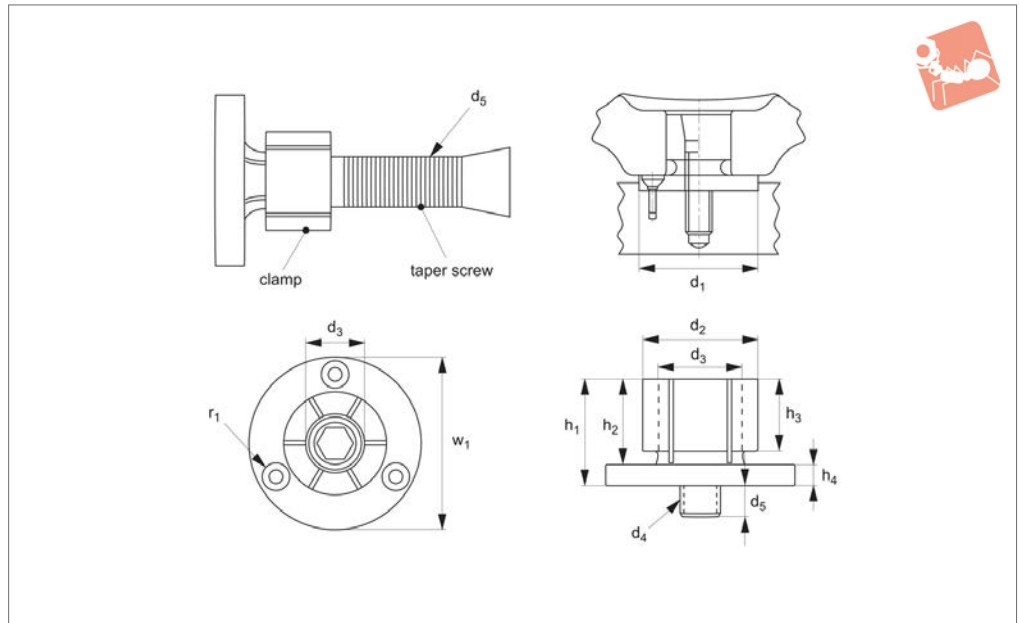
$$= 1050kg$$

*) Workpiece weight 600kg is within allowable value (1050kg).

Calculation Example



12051



Material

Body: mild steel.
Tapered screw: steel, heat-treated (coated to prevent seizing).
12051.W0250: aluminium (7075-T6) .

Technical Notes

For holding parts on an inside diameter, for high density machining on vertical or horizontal mills.
Diameter can range from 4,1mm to a maximum of 250mm!
This product can also be used as an expanding mandrel on a lathe.
Tighten with hex key or hydraulic pull cylinders.
The flange diameter of the base is held to a close tolerance for precision location in a machined pocket.

Tips

d_3 is the minimum diameter the „ d_2 “ dimension can be machined or turned down to.
Mounting screws included.

Important Notes

Installation for clamps 12051.W0010 to .W0051.

- Expand clamp 0,1mm over the relaxed diameter and machine to fit workpiece bore (on lathe or mill).
If using the clamp on a lathe then use the nut provided to tighten the taper screw. This nut is only used to machine the clamp.
- Machine a pocket in the fixture for the close tolerance „ d_1 “ dimension, and drill and tap mounting holes „ d_4 “.
- Drill and tap a hole „ d_5 “ in the centre of

the pocket for the tapered screw.

- A recessed dowel pin can be installed into the flange for extra rigidity if required.
- Range of expansion 0,13 - 0,64mm depending on clamp size.

Installation for clamps 12051.W0077 to .W0250.

- Insert machining locking ring (provided), tighten taper screw and machine clamp to required bore size.
- Release taper screw and remove locking ring prior to any machining of workpieces.
Note: 12051.W0175 and W0250 have four mounting holes on PCD as dimension „ d_4 “.

Order No.	h_1	h_2	h_3	d_1 +0.000 -0.050	Weight g
12051.W0010	10.7	7.6	6.1	20.0	23
12051.W0012	21.8	16.0	15.0	29.7	59
12051.W0014	24.9	19.0	15.0	31.5	109
12051.W0020	24.9	19.0	15.0	37.5	204
12051.W0027	28.6	22.2	17.5	50.0	213
12051.W0035	31.8	25.4	20.6	56.0	317
12051.W0042	39.6	31.8	27.0	69.5	593
12051.W0051	39.6	31.8	27.0	75.5	775
12051.W0077	45.5	37.6	32.3	107.5	1826
12051.W0103	45.5	37.6	32.3	132.9	2954
12051.W0175	45.5	37.6	32.3	132.9	6795
12051.W0250	45.5	37.6	32.3	152.4	5436

Order No.	d_3 min.	d_4	d_5	Stock d_2	h_4	r_1 on PCD	Torque to Nm max.	Holding force kN	Expansion from relaxed dia. max.
12051.W0010	4.1	M 2	4.1	7.4	3.0	M 2 at 13,7	0.7	1.1	0.1



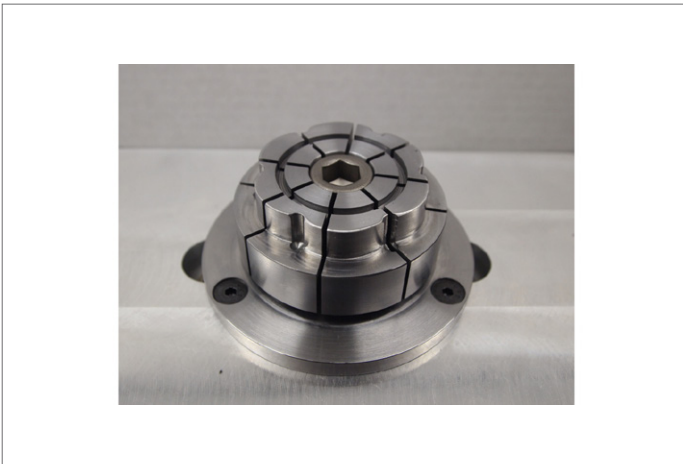
ID Xpansion Clamps - Machinable

for clamping internal bores



Bore Clamping

Order No.	d ₃ min.	d ₄	d ₅	Stock d ₂	h ₄	r ₁ on PCD	Torque to Nm max.	Holding force kN	Expansion from relaxed dia. max.
12051.W0012	7.1	M 4	7.2	12.4	5.9	M 3 at 21,0	5.0	4.2	0.3
12051.W0014	12.2	M 6	11.2	14.2	5.9	M 3 at 23,1	17.0	8.4	0.3
12051.W0020	13.5	M 8	13.2	20.0	5.9	M 3 at 29,0	34.0	11.1	0.4
12051.W0027	18.0	M10	16.3	27.0	6.4	M 4 at 39,4	60.0	20.0	0.4
12051.W0035	23.0	M12	20.3	35.3	6.4	M 4 at 45,5	150.0	26.2	0.4
12051.W0042	29.3	M16	21.4	42.0	7.9	M 5 at 55,9	280.0	44.5	0.4
12051.W0051	29.3	M16	21.4	51.5	7.9	M 5 at 63,9	280.0	44.5	0.4
12051.W0077	29.3	M16	19.3	77.7	7.9	M 6 at 92,6	280.0	44.5	0.4
12051.W0103	29.3	M16	19.3	103.0	7.9	M 6 at 118,1	280.0	44.5	0.4
12051.W0175	29.3	M16	19.3	175.0	7.9	M 6 at 118,1	280.0	44.5	0.5
12051.W0250	29.3	M16	19.3	250.2	7.9	M 6 at 133,4	170.0	26.0	1.0



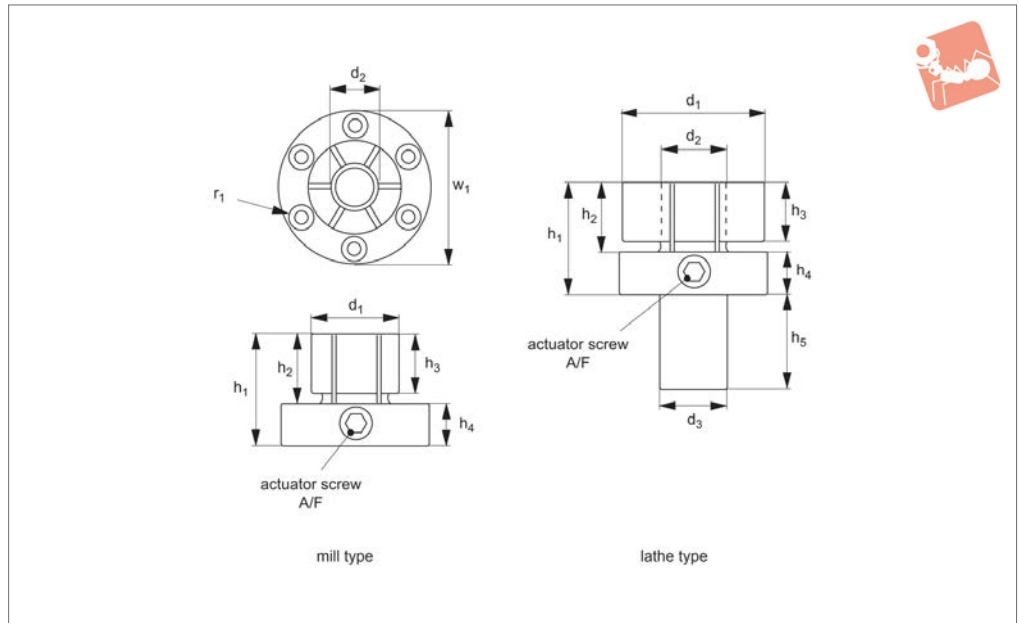
BORE CLAMPING



BORE CLAMPING



12052



Material

Mild steel body, with heat-treated tapered screw (coated to prevent seizing).

Technical Notes

For clamping blind holes from 17,8mm to 53mm.

Actuated from the side. The cam shaft and the plunger expand the clamp.

Tips

Actuated by turning a socket head cam shaft on the side which moves a tapered plunger to expand the clamp.

Two versions: one for milling (type: mill) and one for turning (type: lathe).

„d₂“ is the minimum diameter the „d₁“ dimension can be machined or turned down to.

Mounting screws included.

Important Notes

Installation Instructions:

ID Xpansion Clamps are designed for clamping on the inside diameter of a component. To install correctly, please follow the following guidelines:

1. Expand the clamp approximately 0,1mm over its relaxed diameter and machine diameter d₁ to suit bore of the workpiece, either on lathe or mill.

2. If machining the clamp on a lathe use the nut provided, on the back of the clamp, to tighten the tapered screw. This nut is used only to machine the clamp.

3. Machine a pocket in the fixture to the close tolerance of dimension w₁, and depth h₄.

4. Drill and tap mounting holes as per dimension r₁.

5. In the centre of the pocket, drill and tap a hole to dimension d₃ for the tapered screw.

6. For additional rigidity, a recessed dowel pin may be installed into the flange, if required.

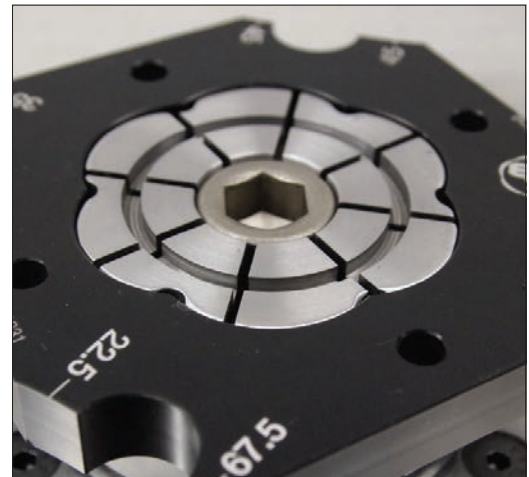
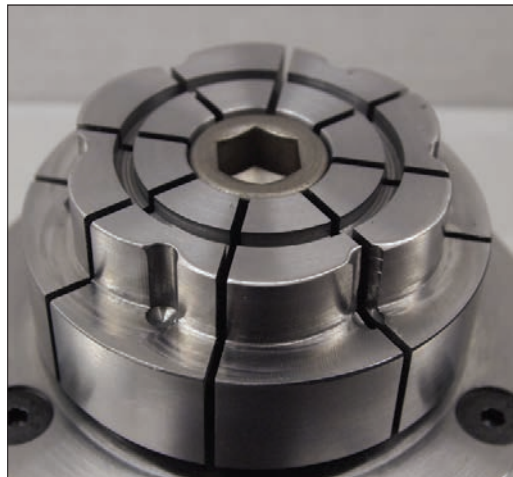
Order No.	h ₁	h ₂	h ₃	w ₁ +0.000 -0.05	Type	d ₁	d ₂ min.	d ₃	h ₄	h ₅	r ₁ on PCD	A/F	Torque to Nm max.	Holding force kN	Weight g
12052.W0828	41.3	22.2	17.5	50.0	Mill	28.7	17.8	-	19.0	-	Ø39,4 (M 4)	M 6	66	20	340.2
12052.W0853	44.4	25.4	21.3	-	Lathe	53.3	17.8	25	19.0	44.4	-	M 6	66	20	





ID Xpansion Clamp, Machinable

The ID Xpansion Clamp is the ideal way to hold multiple parts on an inside diameter for machining on your VMC or HMC.



ID Xpansion Clamps can be used to hold components with complex internal shapes, not just plain bores.

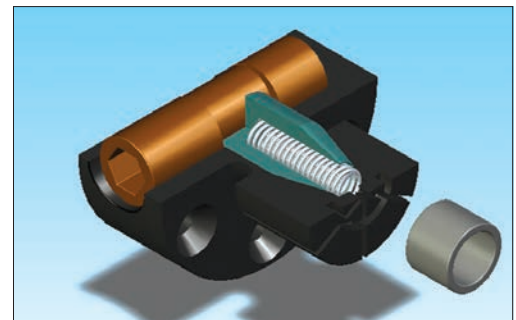
These machinable clamps are produced in 10 sizes and can hold internal diameters from 21,8 to 45,5mm.

- Low profile and ideal for secondary operations on lathe parts.
- Easily machined to size on lathe or mill.
- Excellent for palletised setups.
- Allow more parts per workcube or fixture plates.
- Body made of mild steel for machinability.
- Tighten with hex key, hydraulic pull cylinders or speed block.

BORE CLAMPING

Side-Loc Xpansion Clamp
machinable

Wixroyd introduces a new style clamp to its range of ID-Xpansion clamps, the Side-Loc Xpansion Clamp. Actuated by turning a socket head cam shaft on the side, it is ideal for clamping on blind internal diameters. The locking ring provides an accurate preset diameter and rigidity for machining. Like our original ID Xpansion clamps, the Side-Loc Xpansion Clamp has the dead length feature which is critical for close tolerance dimensions.

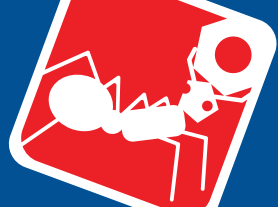


Clamp activated from the side with a standard hex key.

Designed in two styles, one for milling operations and one for lathe applications; the mill Side-Loc Xpansion Clamp can be machined from 28.4 to 18mm and the lathe version from 53 to 18mm.

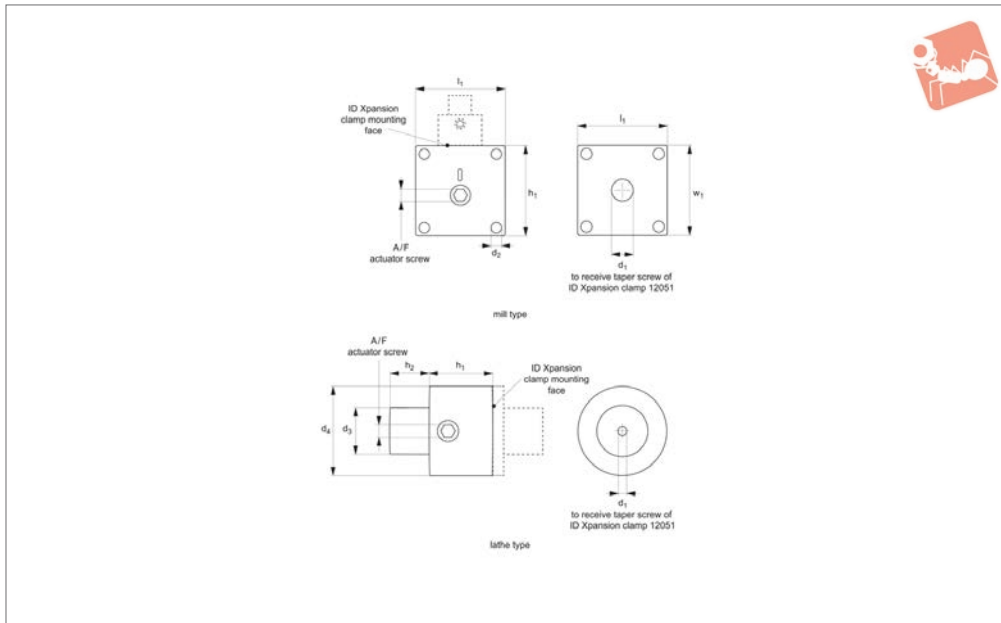
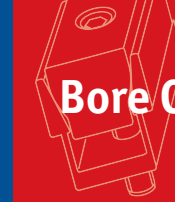


Side-Loc Xpansion Clamp, when the component obstructs the clamps tapered screw.



Manual Actuators for ID Xpansion clamps

Bore Clamping



12054

BORE CLAMPING

Material

Steel.

Technical Notes

Versatile manual actuators when combined with our ID Xpansion clamps 12051. Enables clamping of smaller internal diameters and blind holes. Mount corresponding ID Xpansion clamp. Mill type actuator is adaptable and can be used on both vertical and horizontal planes. Once installed the clamp can be actuated with use of an actuator screw (6mm A/F).

Tips

Order ID Xpansion clamp 12051 separately.

Important Notes

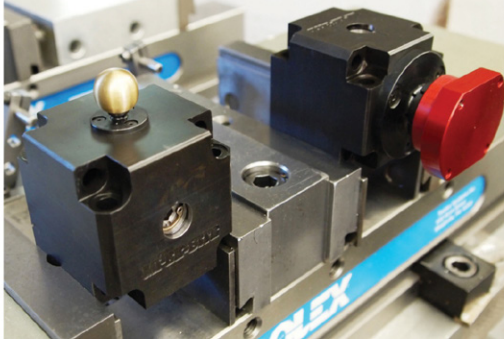
Manual actuators for mills and lathes. Introducing another new and innovative workholding system. Specifically designed to clamp on blind internal diameters smaller than our Side-Loc clamps would allow. We took the design a step further, by increasing the functionality to clamp smaller inside diameters. For the mill version the option of holding the workpiece in a

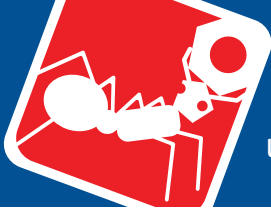
vertical or horizontal plane. By simply mounting our standard ID Xpansion clamps on these manual actuators, or using another style clamp that has a „straight draw“, you can now perform operations that previously required extensive hydraulic/pneumatic cylinders. Mill mounted manual actuators for ID Xpansion clamps are suitable for holding workpieces of very small blind internal diameters.

Order No.	h ₁	h ₂	l ₁	w ₁	Suitable for ID Xpansion clamp	Type	d ₁	d ₂ for	d ₃	d ₄	A/F
12054.W0002	57.2	-	57.2	57.2	.W0010	Mill	M 2	M 6	-	-	6
12054.W0004	57.2	-	57.2	57.2	.W0012	Mill	M 4	M 6	-	-	6
12054.W0006	57.2	-	57.2	57.2	.W0014	Mill	M 6	M 6	-	-	6
12054.W0008	57.2	-	57.2	57.2	.W0020	Mill	M 8	M 6	-	-	6
12054.W0010	57.2	-	57.2	57.2	.W0027	Mill	M10	M 6	-	-	6
12054.W0012	57.2	-	57.2	57.2	.W0035	Mill	M12	M 6	-	-	6
12054.W0102	38	25.4	-	-	.W0010	Lathe	M 2	-	25.0	56.9	6
12054.W0104	38	25.4	-	-	.W0012	Lathe	M 4	-	25.0	56.9	6
12054.W0106	38	25.4	-	-	.W0014	Lathe	M 6	-	25.0	56.9	6
12054.W0108	38	25.4	-	-	.W0020	Lathe	M 8	-	25.0	56.9	6
12054.W0110	38	25.4	-	-	.W0027	Lathe	M10	-	25.0	56.9	6
12054.W0112	38	25.4	-	-	.W0035	Lathe	M12	-	25.0	56.9	6
12054.W0550	-	-	-	-	-	Spare - Actuator Screw	-	-	-	-	-



BORE CLAMPING



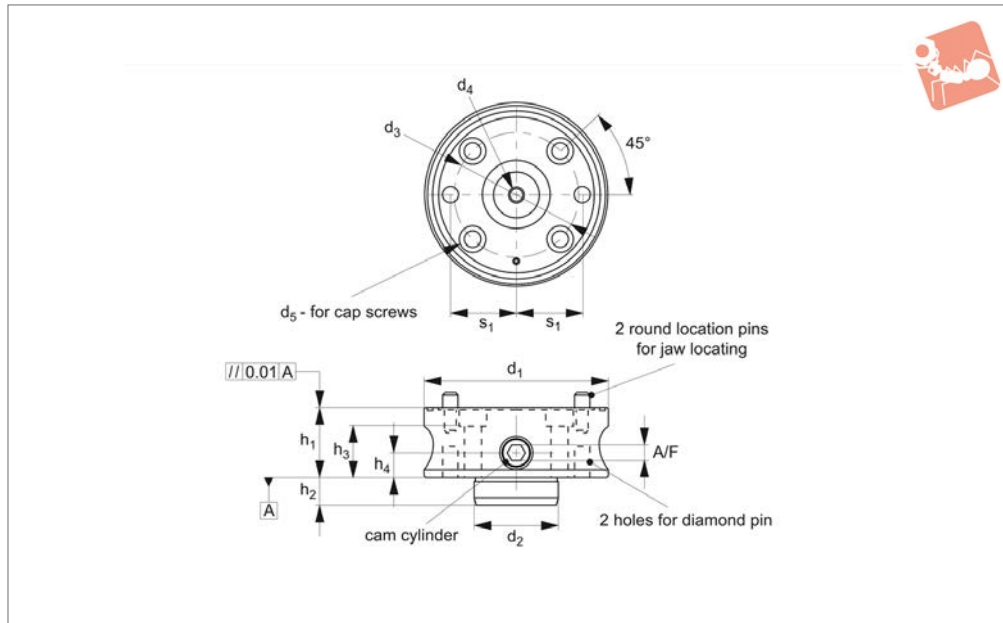


Flexible Form Clamping Base

use with flexible form holding jaws 12056 or 12057



Bore Clamping



12055.1

BORE CLAMPING

Material

Body: steel.

Technical Notes

For use with jaws part no.s 12056 and 12057 for clamping on the external of a component (jaw no. 12056) or for clam-

ping on internal bore of a component (jaw no. 12057). Order jaws separately.

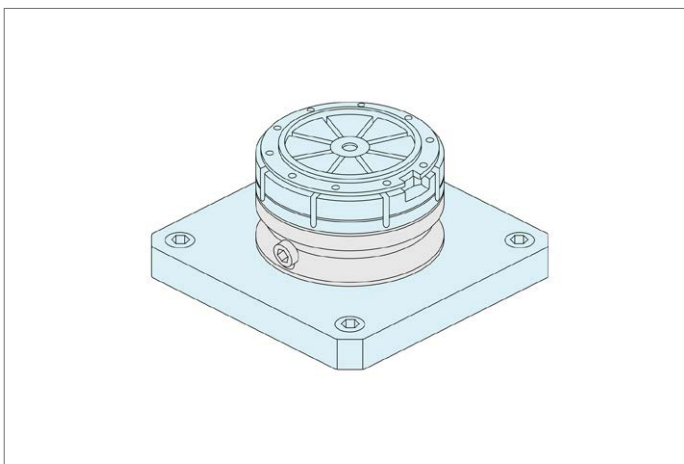
Supplied with one diamond locating pin to suit.

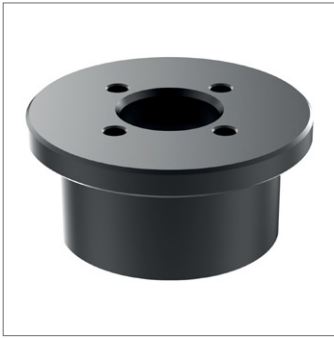
Can achieve part location repeatability of $\pm 0,03$ and jaw repeatability of $\pm 0,02$. Max.

clamping stroke of 0,3mm diameter.

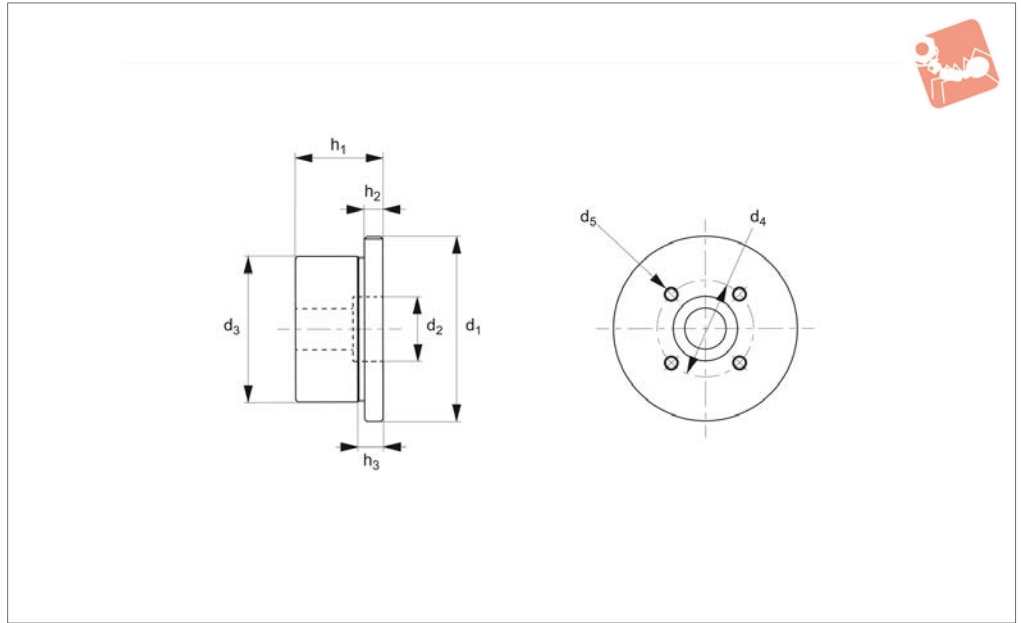
To prevent damage or deformation, do not tighten the cam cylinder without a holding jaw installed.

Order No.	h_1 ± 0.01	h_2	h_3	Type	Size	d_1	d_2 tol. G6	d_3	d_4	d_5	h_4	Stroke s_1 ± 0.02	A/F	Torque to Nm max.	External form no. 12056 clamping force kN	Internal form no. 12057 clamping force kN	Weight g
12055.W0065	35	27	12	Base	65	65	28	42	M 8x1,25	M 6	12	22	8	15	4,5	4,5	800
12055.W0090	40	30	14	Base	90	90	42	60	M10x1,5	M 8	14	30	8	25	7,0	7,0	1700
12055.W0120	45	33	16	Base	120	120	55	80	M10x1,5	M10	18	43	10	40	10,0	10,0	3500
12055.W0160	50	36	18	Base	160	160	63	110	M12x1,75	M12	24	60	10	40	12,0	10,0	7100





12055.2



Material

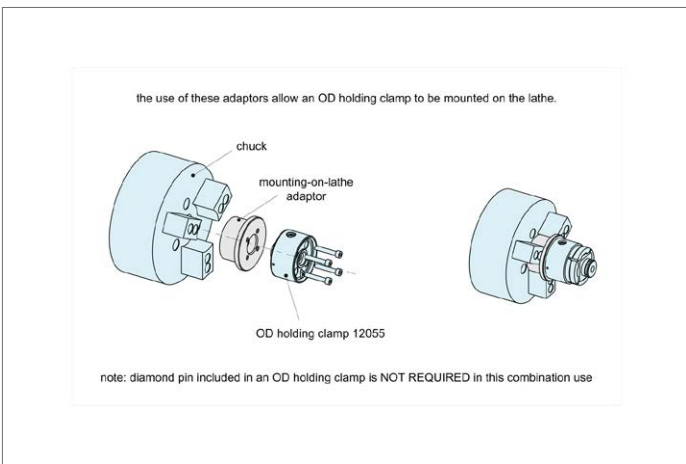
Steel, hardened and blackened.

form holding clamp (part no. 12055) to a lathe.

Technical Notes

Adaptor to enable mounting of flexible

Order No.	h_1	h_2	h_3	Suitable for clamping base 12055	Size	d_1	d_2	d_3	d_4	d_5	Weight g
12055.W1065	38	8	13	4.5	65	80	28	63	42	M 6x1,00	910
12055.W1090	43	8	15	7.0	90	100	42	80	60	M 8x1,25	1600





Form Holding Clamp installation

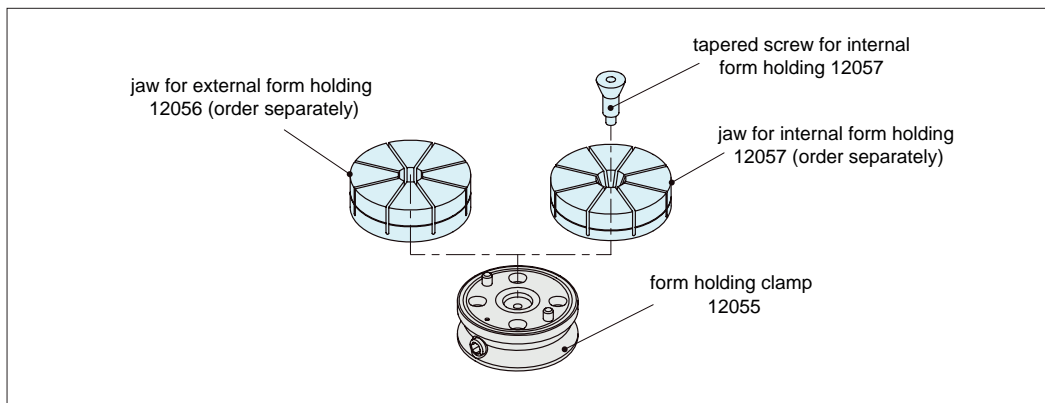


12055

Clamping & Height Setting

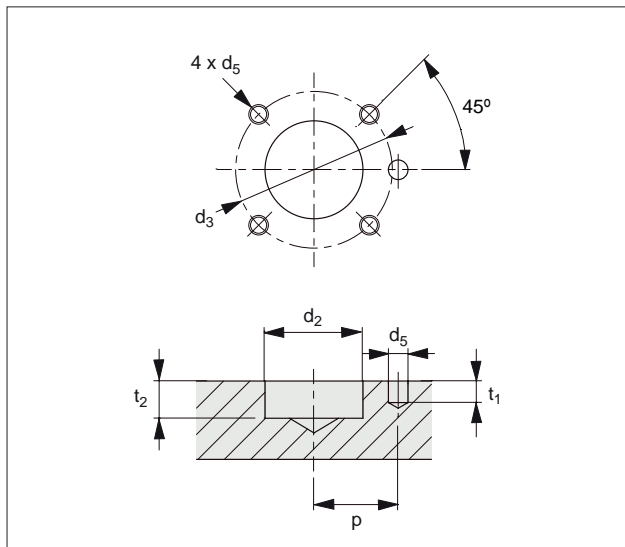
BORE CLAMPING

Feature



Two optional jaws allow clamping a workpiece both on its external form and internal form.

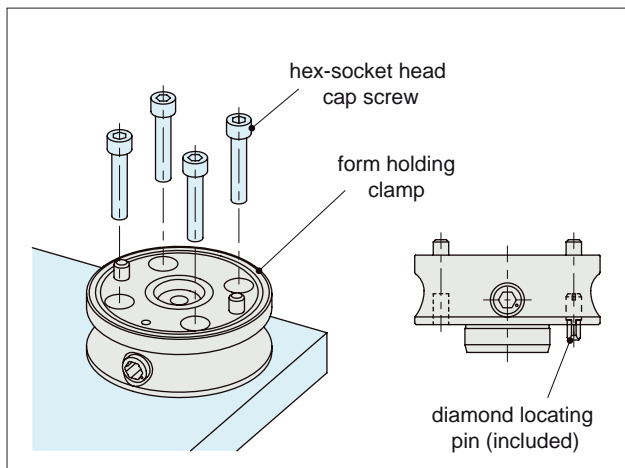
How to Use



Part Number	d ₂ (H7)	t ₁	d ₅ (G7)	t ₂
12055.W0065	28	13	6	6
12055.W0090	42	15	8	8
12055.W0120	55	19	10	11
12055.W0160	63	25	12	13

Part Number	P (±0,02)	d ₅	d ₃
12055.W0065	22	M 6X1	42
12055.W0090	30	M 8X1,25	60
12055.W0120	43	M10X1,5	80
12055.W0160	60	M12X1,75	110

Installation Instruction



Insert an included diamond locating pin into the body for locating and secure the body to the fixture plate with 4 socket-head cap screws.

Note: use either of the holes for the diamond locating pin for your application.

Dimension of Diamond Locating Pin

Part Number	diameter
12055.W0065	Ø 6h6
12055.W0090	Ø 8h6
12055.W0120	Ø 10h6
12055.W0160	Ø 12h6

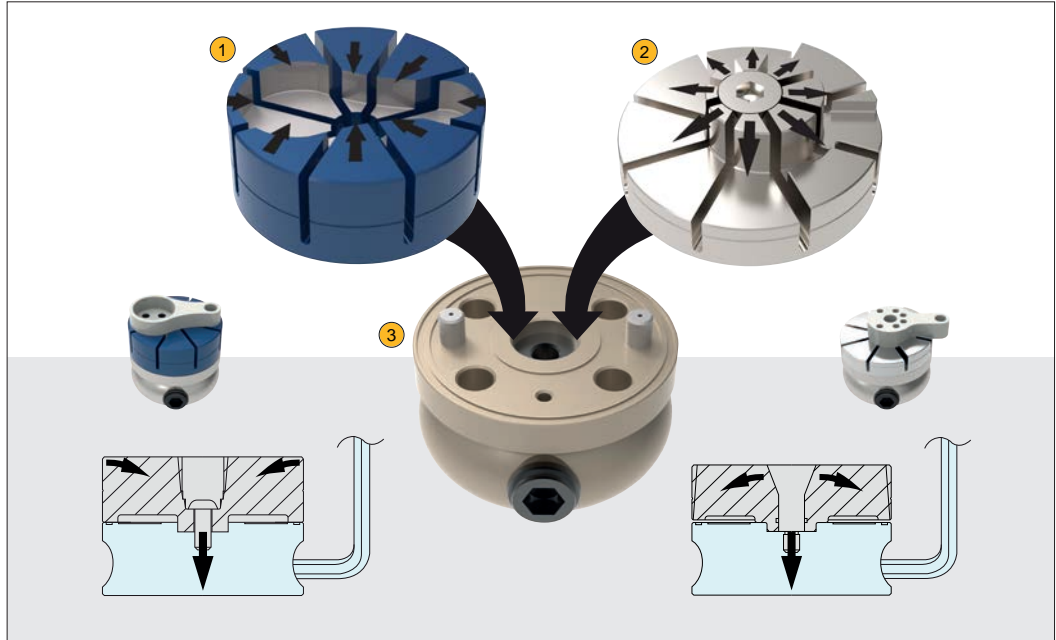
ov-W12055.1-A-T-W12055.2-A-T-installation-mh - Updated -24-10-2022



Versatile holding of complex shaped workpieces on either the external or internal form - quick, secure, versatile.

Single clamping base designed to accept either external form or internal form clamping jaws, fully flexible holding of custom forces.

- ① External Form Jaw - 12056
- ② Internal Form Jaw - 12057
- ③ Flexible Form Clamping Base - 12055



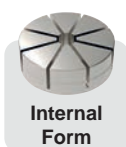
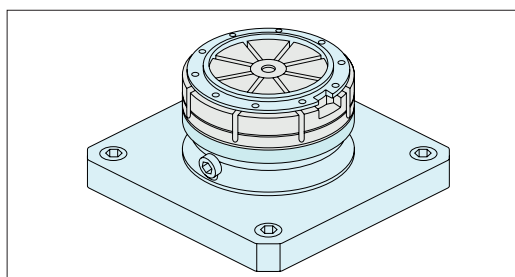
External

Parts 12055, 12056

Internal

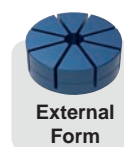
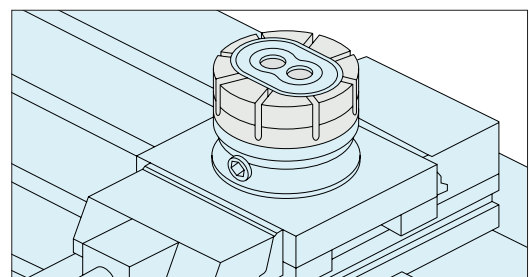
Parts 12055, 12057

	1 Prepare Jaw	2 Machine Jaw	3 Mount Workpiece	4 Tighten Cam Cylinder
External				
Internal				



Internal Form

Clamping Low Profile Workpiece
Parts 12055 and 10257. 8 jaw clamping sections distribute clamping force to workpiece for deformation prevention.



External Form

Fixture for Temporal Job
Parts 12055 and 10256. Can be mounted on the existing vise by attaching the clamp on plate.

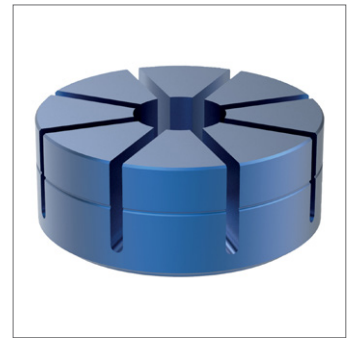
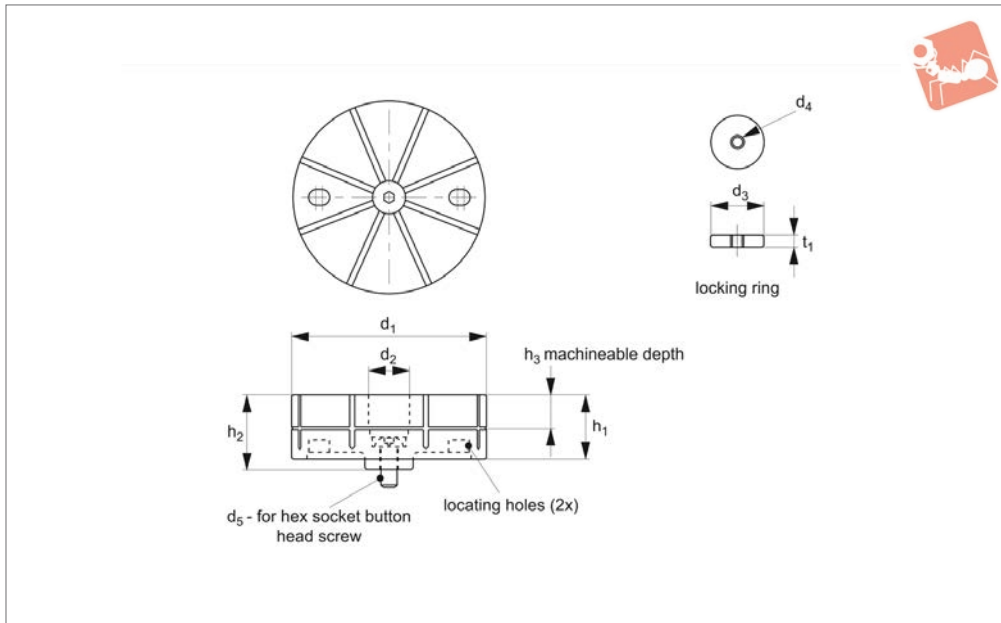
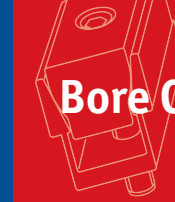
Note to control the tightening torque using adequate tools in reference to the data provided by the performance curve.



External Form Holding Jaws

for flexible form holding clamp no. 12055

Bore Clamping



12056

BORE CLAMPING

Material

Jaws: aluminium (A7075), silver anodised.
Locating ring: steel (C45E), tempered, nickel plated.

Ideal for die-cast and extruded parts.

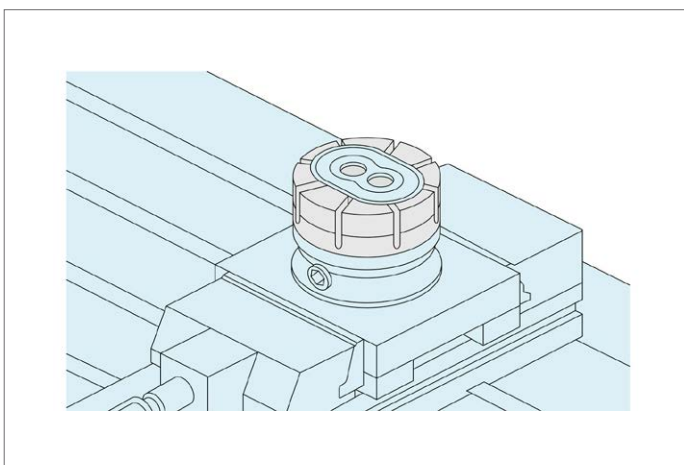
Used with flexible form clamping base no. 12055.

Supplied with O-ring, locking ring and socket button head screw to assist during machining of form.

Technical Notes

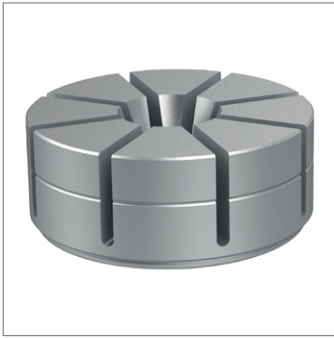
Offers 0,15mm clamping stroke on jaw.

Order No.	h_1	h_2	h_3	Suitable for clamping base 12055	Type	Size	d_1	d_2	d_3	d_4	d_5	t_1	Weight g
12056.W0065	26	25	10	.W0065	Jaw	65	65	21	20	M 5x0,80	M 8x20	4	200
12056.W0090	40	35	15	.W0090	Jaw	90	90	25	24	M 6x1,00	M 10x25	5	500
12056.W0120	46	40	20	.W0120	Jaw	120	120	25	24	M 6x1,00	M 10x25	5	1100
12056.W0160	52	45	25	.W0190	Jaw	160	160	29	28	M 8x1,25	M 12x25	6	2200

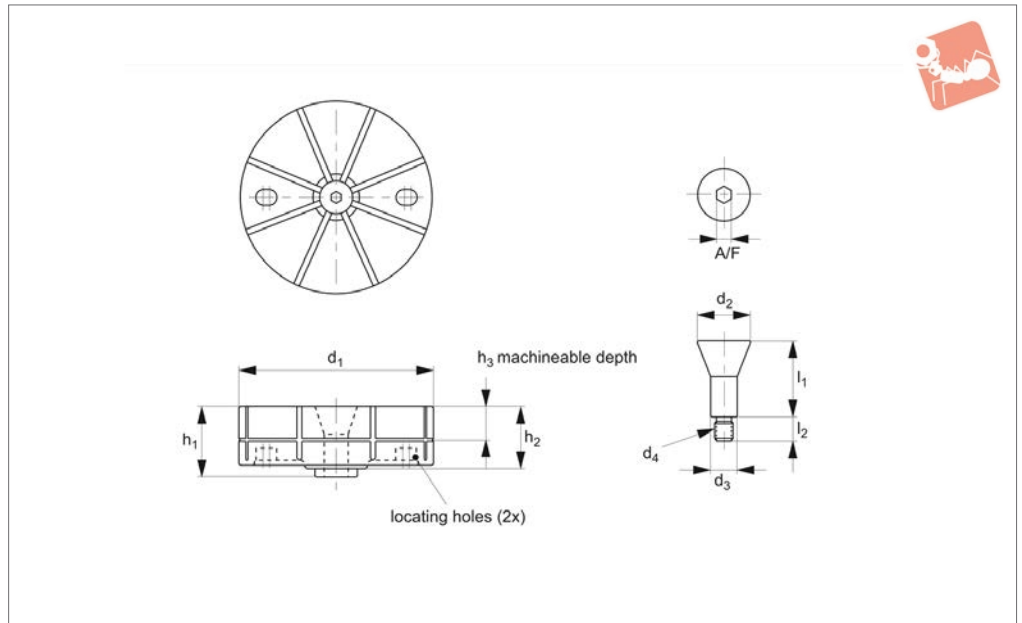




BORE CLAMPING



12057



Material

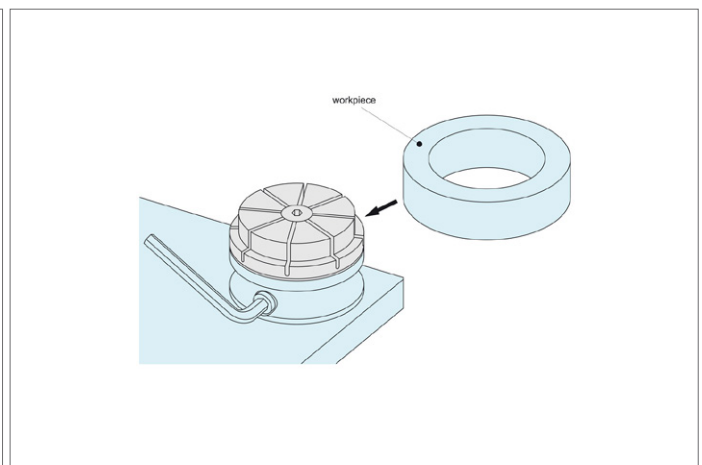
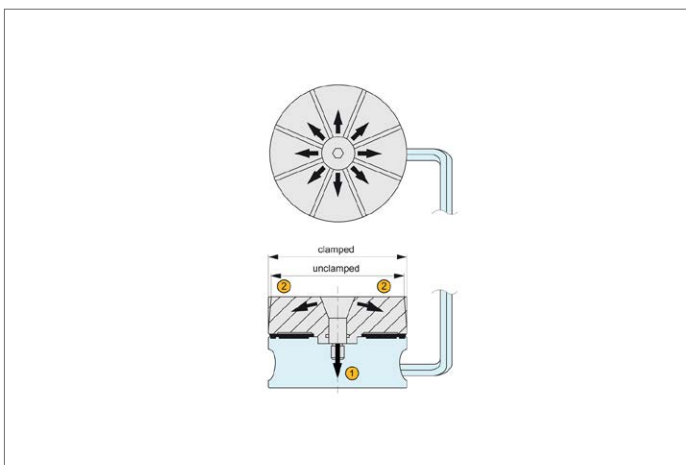
Jaws: aluminium (A7075), silver anodised.
Tapered screw: steel (C45E), tempered, nickel plated.

Technical Notes

Order jaw and tapered screw separately.

Tapered screw expands jaw outwards to hold irregular shaped workpieces securely.
Offers 0,15mm clamping stroke on jaw.
Ideal for die-cast and extruded parts.
Used with flexible form clamping base no. 12055.

Order No.	h_1	h_2	h_3	l_1	Suitable for clamping base 12055	Type	Size	d_1	d_2	d_3	d_4	l_2	A/F	Suitable for internal jaw 12057	Weight g
12057.W0065	28,5	25	10		.W0065	Jaw	65	65							200
12057.W0090	34,5	30	15		.W0095	Jaw	90	90							400
12057.W0120	40,5	35	20		.W0120	Jaw	120	120							900
12057.W0160	46,5	40	25		.W0160	Jaw	160	160							1900
12057.W2065				29		Screw	65		22,5	13,2	M 8x1,25	10	6	.W1065	50
12057.W2090				35		Screw	90		27,0	16,0	M10x1,5	11	8	W.1090	80
12057.W2120				41		Screw	120		29,0	13,0	M10x1,5	16	8	W.1120	100
12057.W2160				47		Screw	160		33,0	18,0	M12x1,75	14	10	W.1160	150





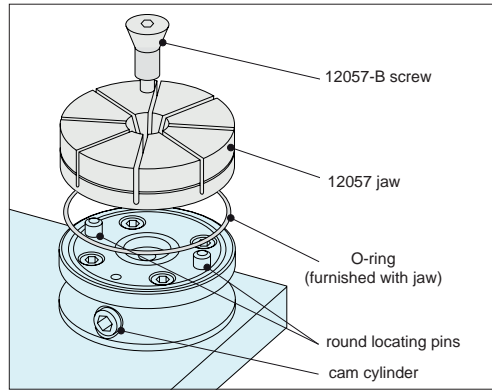
Installation and Machining of Jaw Profile



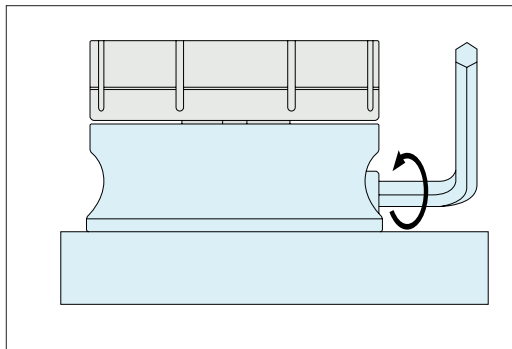
12057

Clamping & Height Setting

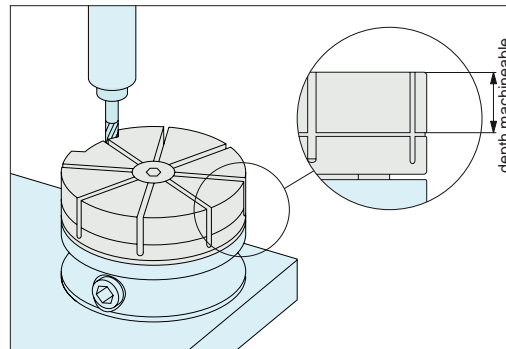
- Insert O-ring to the groove on top surface of the Flexible Form Holding Clamp 12055.
- Mount jaw 12057 to clamping base, align with locating pins and fix with tapered screw.



Prepare Jaw for Mounting



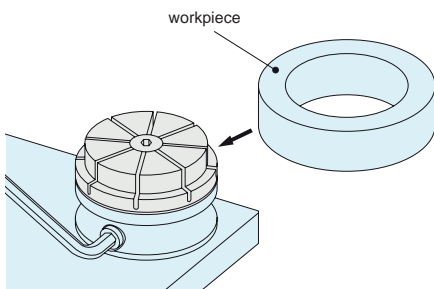
2.1 Loosen the clamping bases cam cylinder fully. Measure dimension of the jaw for machining. Tighten the cam cylinder until each jaw section expands a further 0.15mm beyond desired clamping dimensions.



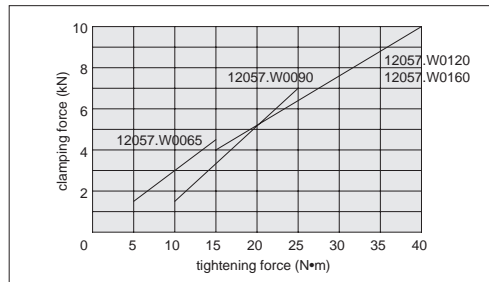
2.2 Machine the jaw to the contours of workpiece. (Do not machine the jaws beyond the machinable depth – see data tables of jaws 12056 and 12057 for dimension.)

Machine Jaw

After machining of jaw, loosen cam cylinder of clamp base and load workpiece. Tighten the cam cylinder again to clamp.

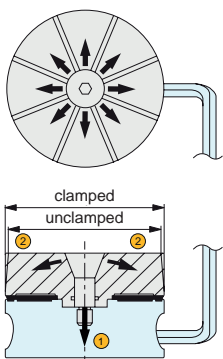


Take note of recommended tightening forces.



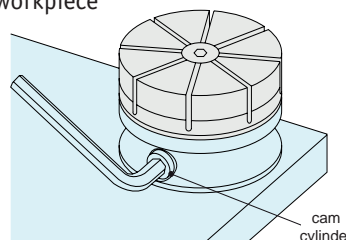
Note: Do not tighten the cam cylinder without the workpiece set to prevent damage and deformation. Tightening with the torque beyond allowable screw torque will lower the durability of the jaw.

Load Workpiece



- Tapered screw fixes jaw to clamping base and expands the jaws in eight directions for 'pre-holding' of irregularly-shaped workpieces.
- Final 0.15mm clamping stroke of the jaw is activated via the cam cylinder to provide final clamping of workpiece on its internal contours.

- When the cam cylinder is tightened, the tapered screw is pulled down.
- At the same time the 8 jaw sections expand to clamp the internal form of workpiece.



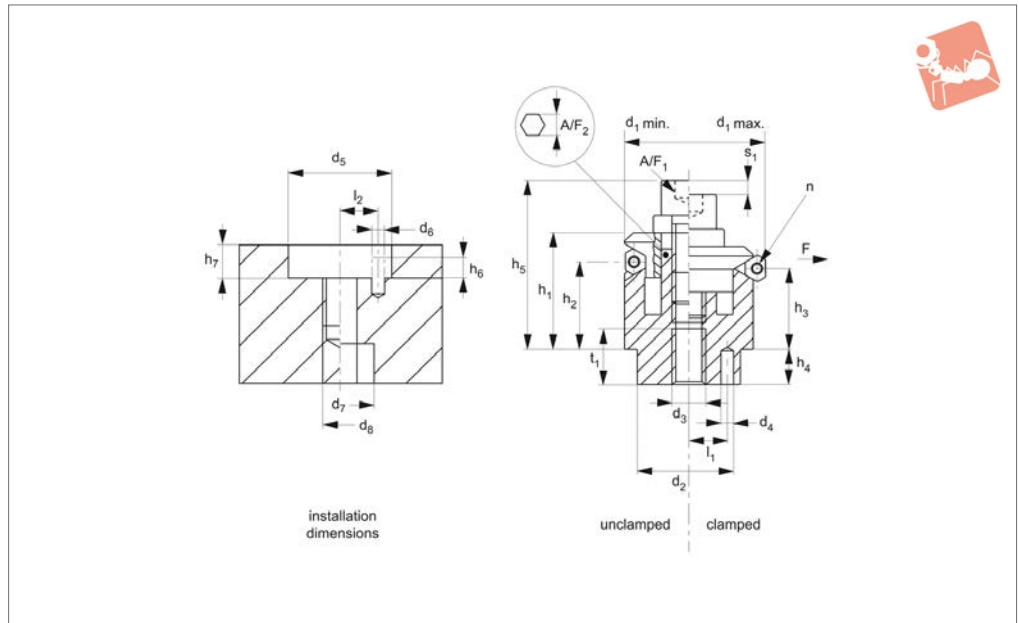
Function



BORE CLAMPING



12061



Material

Body: tool steel (1.2842), blackened.
 Top cone: steel, case hardened, blackened and ground.
 Ball: stainless steel (1.4112), hardened and burnished.
 Tension spring: stainless steel, 1.4310 (AISI 301)

Technical Notes

Suitable for concentric positioning and chucking inside holes with surfaces prone to damage.
 Locking pin for precise ball positioning.
 For deep installation applications, „ d_2 max.“ must be maintained for clearance.
 Repeatability and rotational accuracy,

$\pm 0,025$.

Tips

Suitable for perforated walls prone to damage, machining centres, welding devices, transfer units, assembly units etc.

Order No.	h_1 -1	h_2	h_3	l_1 ± 0.1	d_1 min.	d_1 max.	d_2 tol. F7	d_3	d_4 +0.3	d_6	d_7	Weight g
12061.W0214	14.3	9.8	8.6	4.5	14.5	18.5	12	M 4	2.0	2.0	4	19
12061.W0218	16.6	11.5	10.4	5.5	18.5	22.5	15	M 5	2.5	2.5	5	38
12061.W0222	19.7	14.1	13.0	7.0	22.5	26.5	20	M 6	3.0	3.0	6	62
12061.W0226	19.7	14.1	13.0	7.0	26.5	30.5	20	M 6	3.0	3.0	6	87
12061.W0230	23.2	14.0	11.7	9.0	30.5	38.5	25	M 6	4.0	4.0	6	133
12061.W0238	27.2	18.0	15.5	11.0	38.5	46.5	30	M 8	4.0	4.0	8	238
12061.W0246	27.2	18.0	15.7	11.0	46.5	54.5	30	M 8	4.0	4.0	8	327
12061.W0254	40.7	23.7	19.1	15.0	54.5	70.5	45	M10	5.0	5.0	10	658
12061.W0270	46.0	28.3	23.6	17.0	70.5	86.5	60	M12	5.0	5.0	12	1286
12061.W0286	51.1	30.3	25.6	25.0	86.5	102.5	60	M16	5.0	5.0	16	1778

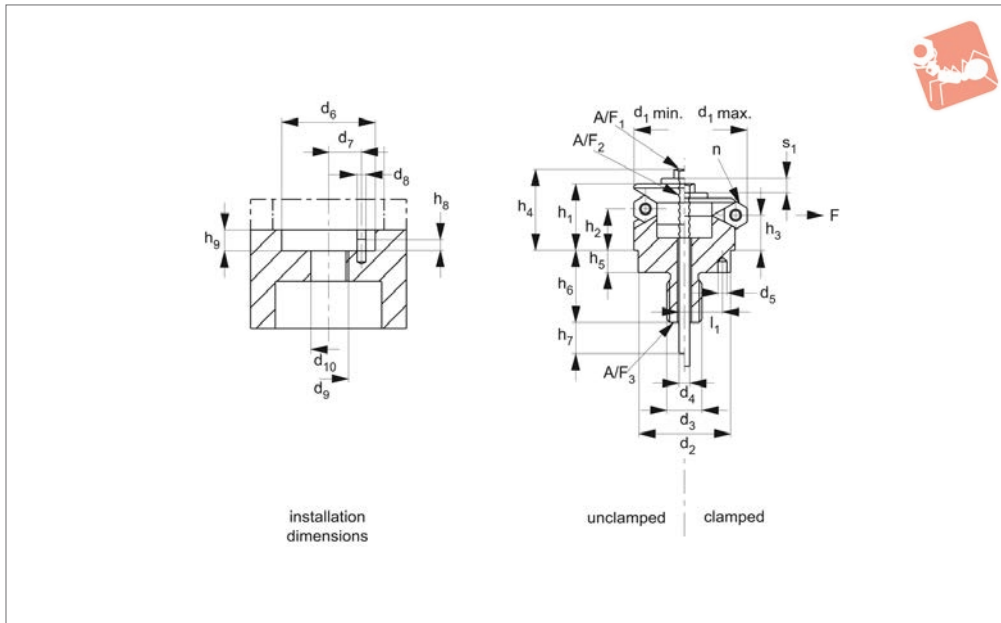
Order No.	d_8	Location hole d_5 tol. H7	h_4	h_5 -2	h_6	h_7	l_2	Stroke s_1	t_1	A/F_1	A/F_2	Clamping force kN max.	No. of segments n
12061.W0214	M 4	12	5.5	19.3	2.0	5.5	4.5	2.3	6	3	5	3.5	3
12061.W0218	M 5	15	7.5	22.8	2.5	7.5	5.5	2.3	7	4	5	4.5	3
12061.W0222	M 6	20	6.0	28.7	3.0	6.0	7.0	2.3	8	5	6	5.0	3
12061.W0226	M 6	20	6.0	28.9	3.0	6.0	7.0	2.3	8	5	6	5.0	3
12061.W0230	M 6	25	7.0	32.2	4.0	7.0	9.0	4.6	8	5	6	5.0	3
12061.W0238	M 8	30	7.5	39.2	4.0	7.5	11.0	4.6	10	6	8	6.5	6
12061.W0246	M 8	30	7.5	39.2	4.0	7.5	11.0	4.6	10	6	8	6.5	6
12061.W0254	M10	45	9.0	54.7	5.0	9.0	15.0	9.2	12	8	10	8.0	6
12061.W0270	M12	60	10.0	63.0	5.0	10.0	17.0	9.2	15	10	12	10.0	6
12061.W0286	M16	60	10.0	72.1	5.0	10.0	25.0	9.2	15	14	17	10.0	6



Internal Centering Clamps

rear actuated - for delicate components

Bore Clamping



12062

BORE CLAMPING

Material

Body: tool steel 1.2842, blackened.
 Top cone: steel 1.4112, case hardened, blackened and ground.
 Ball: steel, hardened and ground.
 Spring: steel (AISI 301, 1.4310).

Technical Notes

Suitable for concentric positioning and

chucking inside holes with surfaces prone to damage.
 Locking pin for precise ball positioning.
 Pull down version can be actuated from rear either manually, or via pneumatic hydraulic cylinder attached to thread „d₅“ at rear of clamp.
 For deep installation applications, „d₂

max“ must be maintained for clearance. Repeatability and rotational accuracy, ±0,025.

Tips

Suitable for perforated walls prone to damage, machining centres, welding devices, transfer units, assembly units etc.

Order No.	h ₁	h ₂	h ₃	l ₁ ±0.1	d ₁ min.	d ₁ max.	d ₂	d ₃	d ₄	d ₅ +0.3	d ₆ tol. H7	d ₇ ±0.1	d ₈	Weight g
12062.W0214	14.2	9.8	8.6	4.5	14.5	18.5	12	M 6	M 3	2.0	12	4.5	2.0	21
12062.W0218	16.6	11.5	10.4	5.5	18.5	22.5	15	M 8	M 4	2.5	15	5.5	2.5	46
12062.W0222	19.7	14.1	13.0	7.0	22.5	26.5	20	M10	M 5	3.0	20	7.0	3.0	78
12062.W0226	19.9	14.2	13.0	7.0	26.5	30.5	20	M10	M 5	3.0	20	7.0	3.0	96
12062.W0230	23.2	14.0	11.7	9.0	30.5	38.5	25	M12	M 6	4.0	25	9.0	4.0	143
12062.W0238	27.2	18.0	15.5	11.0	38.5	46.5	30	M12	M 6	4.0	30	11.0	4.0	250
12062.W0246	27.2	18.0	15.7	11.0	46.5	54.5	30	M12	M 6	4.0	30	11.0	4.0	340
12062.W0254	40.7	23.7	19.1	15.0	54.5	70.5	45	M14x1,5	M 8	5.0	45	15.0	5.0	680
12062.W0270	46.0	28.1	23.5	17.0	70.5	86.5	60	M16x1,5	M 8	5.0	60	17.0	5.0	1300
12062.W0286	51.1	30.1	25.5	25.0	86.5	102.5	60	M16x1,5	M10	5.0	60	25.0	5.0	2060

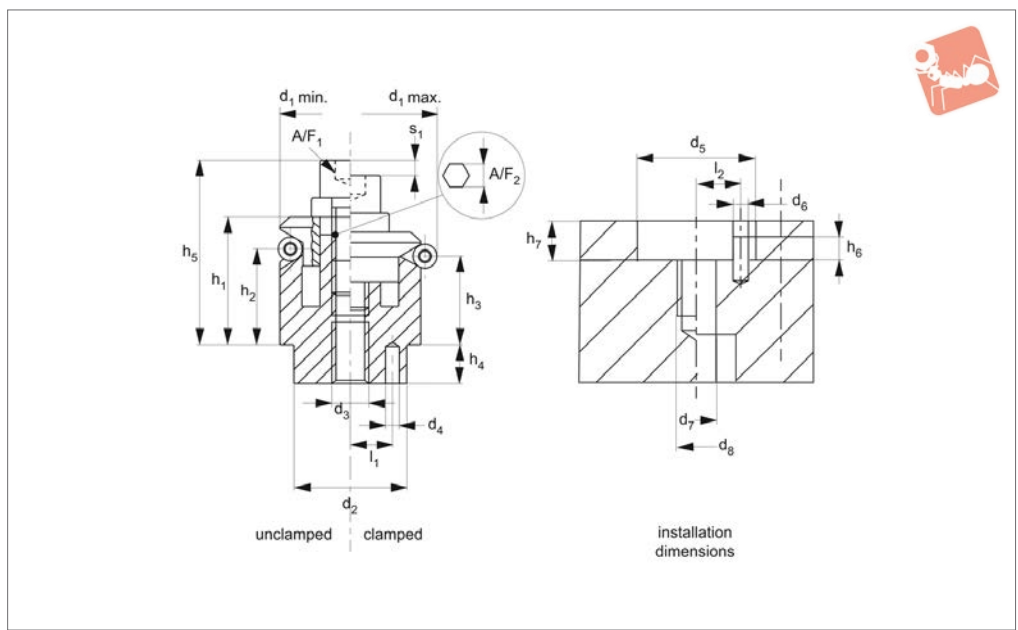
Order No.	d ₉	d ₁₀ +0.5	h ₄ -2	h ₅	h ₆ +1	h ₇ ≈	h ₈ +1	h ₉ +0.5	n ₁	Stroke s ₁	A/F ₁	A/F ₂	A/F ₃	Clamping force kN max.	Torque to Nm max.
12062.W0214	M 6	6	17.0	5.5	14.1	12	2.5	5.5	3	2.3	6	3	10	3.5	2
12062.W0218	M 8	8	20.5	7.5	18.2	14	3.5	7.5	3	2.3	7	5	13	4.0	5
12062.W0222	M10	10	24.4	6.0	17.4	15	3.5	6.0	3	2.3	8	6	16	4.5	10
12062.W0226	M10	10	24.6	6.0	17.4	15	3.5	6.0	3	2.3	8	6	16	4.5	10
12062.W0230	M12	12	28.8	7.0	21.9	20	3.5	7.0	3	4.6	10	6	18	4.5	17
12062.W0238	M12	12	33.1	7.5	22.5	20	4.5	7.5	6	4.6	10	8	18	6.5	17
12062.W0246	M12	12	33.1	7.5	22.5	20	6.5	7.5	6	4.6	10	8	18	6.5	17
12062.W0254	M14x1,5	14	50.0	9.0	24.9	32	6.5	9.0	6	9.2	13	10	21	8.0	43
12062.W0270	M16x1,5	16	55.3	10.0	29.4	20	6.5	10.0	6	9.2	13	12	24	10.0	43
12062.W0286	M16x1,5	16	61.5	10.0	29.4	25	6.5	10.0	6	9.2	16	12	24	12.5	79



BORE CLAMPING



12071



Material

Body: tool steel, blackened.
 Top cone: case hardened stainless steel 1.4112, blackened and ground.
 Ball: stainless steel, 1.4034. hardened and ground.
 Spring: stainless steel, 1.4310 (AISI 301).

max. " must be maintained for clearance. A locking pin can be used for precise ball positioning.
 Suitable for concentric positioning and chucking inside holes, repeatability and rotary accuracy $\pm 0,025$.

Important Notes

If machining delicate components, see parts 12061.

Technical Notes

For deep installation applications, „d₂

Tips

Precise self-centering, providing clamping and positioning of components.

Order No.	h ₁ -1	h ₂	h ₃	l ₁ ±0.1	d ₁ min.	d ₁ max.	d ₂ tol. f7	d ₃	d ₄ +0.3	d ₅ tol. H7	d ₆	Weight g
12071.W0211	8.6	3.9	3.2	3.5	11.7	14.2	10	M 4	1.5	10	1.5	9.0
12071.W0214	14.2	9.8	8.6	4.5	14.5	18.5	12	M 4	2.0	12	2.0	20.0
12071.W0218	16.5	11.6	10.4	5.5	18.5	22.5	15	M 5	2.5	15	2.5	39.0
12071.W0222	19.6	14.1	12.9	7.0	22.5	26.5	20	M 6	3.0	20	3.0	60.0
12071.W0226	19.8	14.1	13.0	7.0	26.5	30.5	20	M 6	3.0	20	3.0	86.0
12071.W0230	23.2	14.1	11.8	9.0	30.5	38.5	25	M 6	4.0	25	4.0	125.0
12071.W0238	27.2	18.0	15.7	11.0	38.5	46.5	30	M 8	4.0	30	4.0	233.0
12071.W0246	27.1	18.0	15.7	11.0	46.5	54.5	30	M 8	4.0	30	4.0	323.0
12071.W0254	40.6	23.7	19.1	15.0	54.5	70.5	45	M10	5.0	45	5.0	653.0
12071.W0270	46.1	28.3	23.7	17.0	70.5	86.5	60	M12	5.0	60	5.0	1271.0
12071.W0286	51.2	30.3	25.6	25.0	86.5	102.5	60	M16	5.0	60	5.0	1783.0

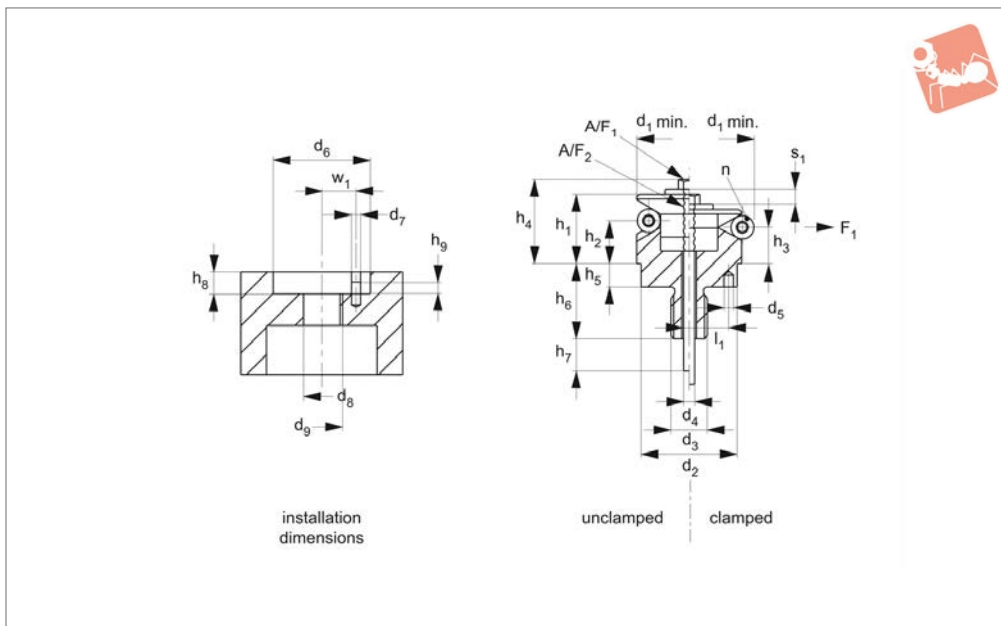
Order No.	d ₇	d ₈	h ₄	h ₅ -2	h ₆	h ₇ +0.5	l ₂ ±0.1	Stroke s ₁	t ₁	A/F ₁	A/F ₂	Clamping force kN max.	Torque to Nm max.
12071.W0211	4	M 4	3.5	14.7	2.0	3.5	3.5	1.3	4	3	-	0.5	5
12071.W0214	4	M 4	5.5	19.2	2.5	5.5	4.5	2.3	6	3	5	3.5	5
12071.W0218	5	M 5	7.5	22.7	3.5	7.5	5.5	2.3	7	4	5	4.5	10
12071.W0222	6	M 6	6.0	28.6	3.5	6.0	7.0	2.3	8	5	6	5.0	17
12071.W0226	6	M 6	6.0	28.8	3.5	6.0	7.0	2.3	8	5	6	5.0	17
12071.W0230	6	M 6	7.0	32.2	3.5	7.0	9.0	4.6	8	5	6	5.0	17
12071.W0238	8	M 8	7.5	39.2	4.5	7.5	11.0	4.6	10	6	8	6.5	43
12071.W0246	8	M 8	7.5	39.2	6.5	7.5	11.0	4.6	10	6	8	6.5	43
12071.W0254	10	M10	9.0	54.6	6.5	9.0	15.0	9.2	12	8	10	8.0	79
12071.W0270	12	M12	10.0	63.1	6.5	10.0	17.0	9.2	15	10	12	10.0	141
12071.W0286	16	M16	10.0	72.2	6.5	10.0	25.0	9.2	15	14	17	10.0	354



Internal Centering Clamps

rear actuated, for casts and forgings

Bore Clamping



12072

BORE CLAMPING

Material

Body: tool steel, blackened.
 Top cone: case hardened stainless steel 1.4112, blackened and ground.
 Ball: stainless steel, 1.4034, hardened and ground.
 Spring: stainless steel, 1.4310 (AISI 301).

Technical Notes

Suitable for concentric positioning and chucking inside holes, provided that small

ball impressions can be accepted.
 Pull down version can be actuated from rear either manually, or via pneumatic of hydraulic cylinder attached to thread „d₄“ at rear of clamp.
 For deep installation applications, „d₂ max.“ must be maintained for clearance.
 A locking pin can be used for precise ball positioning.
 Repeatability and rotational accuracy,

±0,025.

Tips

Suitable for; machining centres, welding devices, transfer units, assembly units etc.

Important Notes

If machining delicate components, see parts 12062.

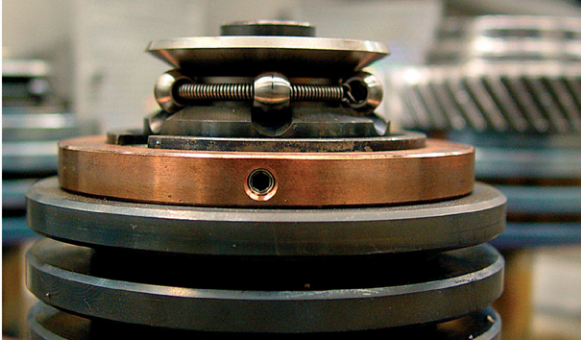
Order No.	h ₁	h ₂	h ₃	l ₁ ±0.1	w ₁ ±0.1	d ₁ min.	d ₁ max.	d ₂ tol. f7	d ₃	d ₄	d ₅ +0.3	d ₆ tol. H7	d ₇	d ₈	Weight g
12072.W0211	9.9	3.9	3.2	3.5	3.5	11.7	14.2	10	M 5	M 3	1.5	10	1.5	5	12
12072.W0214	14.2	9.8	8.6	4.5	4.5	14.5	18.5	12	M 6	M 3	2.0	12	2.0	6	21
12072.W0218	16.5	11.6	10.4	5.5	5.5	18.5	22.5	15	M 8	M 4	2.5	15	2.5	8	45
12072.W0222	19.6	14.1	12.9	7.0	7.0	22.5	26.5	20	M10	M 5	3.0	20	3.0	10	77
12072.W0226	19.8	14.1	13.0	7.0	7.0	26.5	30.5	20	M10	M 5	3.0	20	3.0	10	96
12072.W0230	23.2	14.1	11.8	9.0	9.0	30.5	38.5	25	M12	M 6	4.0	25	4.0	12	140
12072.W0238	27.1	18.0	15.5	11.0	11.0	38.5	46.5	30	M12	M 6	4.0	30	4.0	12	246
12072.W0246	27.2	18.0	15.7	11.0	11.0	46.5	54.5	30	M12	M 6	4.0	30	4.0	12	327
12072.W0254	40.6	23.7	19.1	15.0	15.0	54.5	70.5	45	M14x1,5	M 8	5.0	45	5.0	14	650
12072.W0270	46.1	28.3	23.7	17.0	17.0	70.5	86.5	60	M16x1,5	M 8	5.0	60	5.0	16	1272
12072.W0286	51.2	30.3	25.7	25.0	25.0	86.5	102.5	60	M16x1,5	M10	5.0	60	5.0	16	2042

Order No.	d ₉	h ₄ -2	h ₅	h ₆ +1	h ₇ ≈	h ₈ +0,5	h ₉	Stroke s ₁	A/F ₁	A/F ₂	A/F ₃	Torque to Nm max.	Clamping force F ₁ kN	Ball dia.	Number of balls n
12072.W0211	M 5	12.7	3.5	11.0	10	3.5	2.0	1.3	5.5	4	8	2	0.5	2.5	3
12072.W0214	M 6	17.0	5.5	14.1	12	5.5	2.5	2.3	5.5	3	10	2	3.5	4.0	3
12072.W0218	M 8	20.4	7.5	18.2	14	7.5	3.5	2.3	7.0	5	13	5	4.0	4.0	3
12072.W0222	M10	24.3	6.0	17.4	15	6.0	3.5	2.3	8.0	6	16	10	4.5	4.0	3
12072.W0226	M10	24.5	6.0	17.4	15	6.0	3.5	2.3	8.0	6	16	10	4.5	4.0	3
12072.W0230	M12	28.8	7.0	21.9	20	7.0	3.5	4.6	10.0	6	18	17	4.5	8.0	3
12072.W0238	M12	33.0	7.5	22.5	20	7.5	4.5	4.6	10.0	8	18	17	6.5	8.0	6
12072.W0246	M12	33.1	7.5	22.5	20	7.5	6.5	4.6	10.0	8	18	17	6.5	8.0	6
12072.W0254	M14x1,4	49.9	9.0	24.5	32	9.0	6.5	9.2	13.0	10	21	43	8.0	16.0	6



Order No.	d_9	h_4 -2	h_5	h_6 +1	h_7 \approx	h_8 +0.5	h_9	Stroke s_1	A/F_1	A/F_2	A/F_3	Torque to Nm max.	Clamping force F_1 kN	Ball dia.	Number of balls n
12072.W0270	M16x1,5	55.4	10.0	29.4	20	10.0	6.5	9.2	13.0	12	24	43	10.0	16.0	6
12072.W0286	M16x1,5	61.6	10.0	29.4	25	10.0	6.5	9.2	16.0	12	24	79	15.5	16.0	6

BORE CLAMPING





Self Centering Internal Clamps

**12061, 62 -
12071, 72**
Clamping & Height Setting

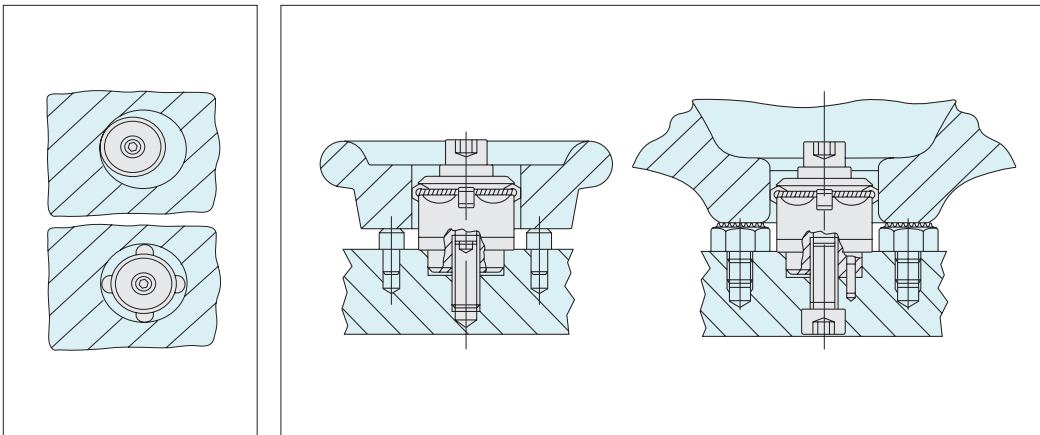
The internal centering clamp provides autocentric chucking inside both round and square holes, at the simple turn of a hexagon screw. Precise self-centering is achieved through the expansion of the ring of balls which, during clamping, are pressed outward across a precision cone. As the outer diameter of the clamp changes the balls transmit force between its body and the bore. The clamps are used in machining and welding fixtures, product assemblies and transfer units.



- Easy to use.
- Precise self-centering and downhold clamping minimising tolerance errors.
- 3 or 6 points of clamping for maximum stability.
- Clamping on uneven surfaces, such as casts and forgings.
- Low height clamping element.
- Bore sizes 11 to 102mm.
- Repeatable positioning accuracy $\pm 0,025$ and rotational accuracy $\pm 0,025$.
- Easily actuated by the turn of a screw.
- Clamping of workpieces with perforated walls without distortion.
- Actuation from above or below.

Advantages

Centering



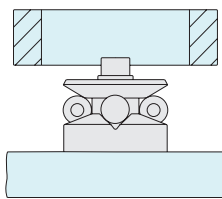
Manual from above

Manual, hydraulic or pneumatic from below

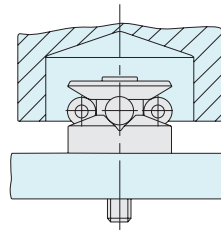
Actuation Models



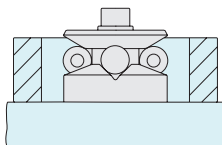
12061 - for delicate workpieces (non-marking).



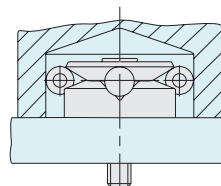
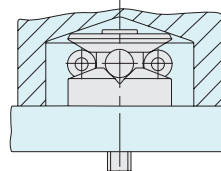
12062 - for delicate workpieces (non-marking).



12071 - for cast and more robust workpieces.

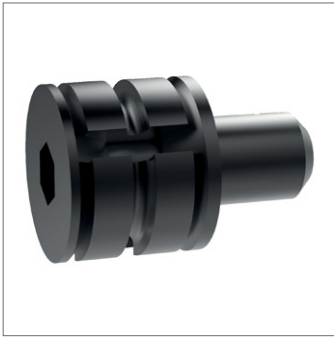


12072 - for cast and more robust workpieces.

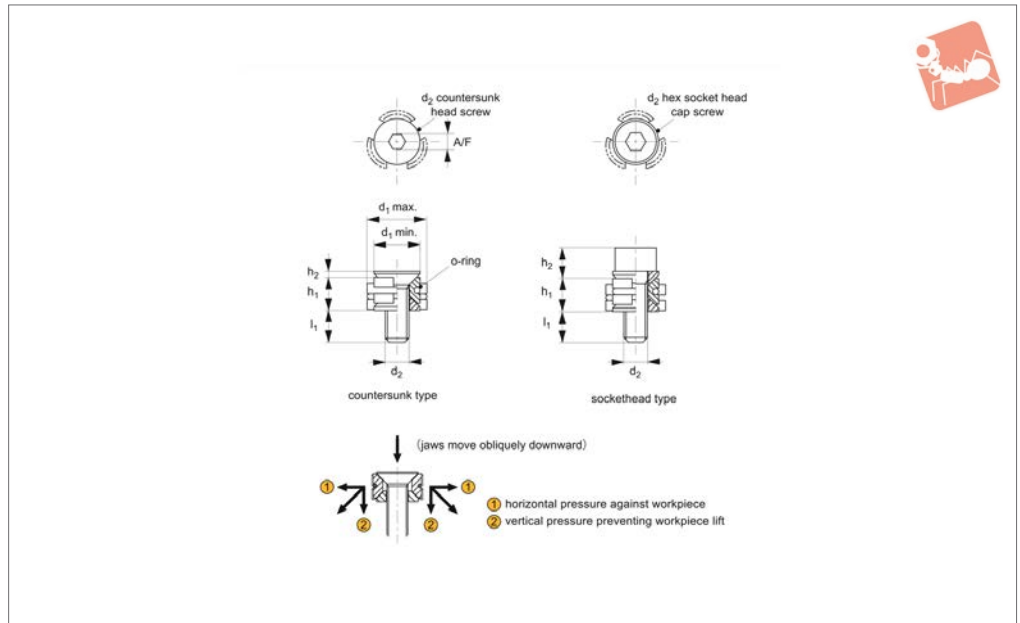




BORE CLAMPING



12074



Material

Steel (AISI 4140), 33-39 HRC, blackened.

Technical Notes

Compact clamps to hold workpiece on an inside diameter. Wedge construction

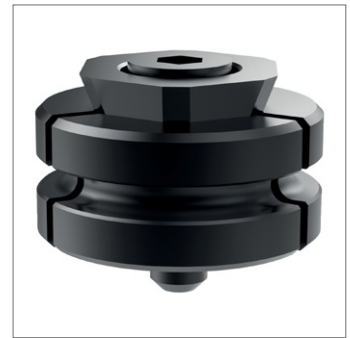
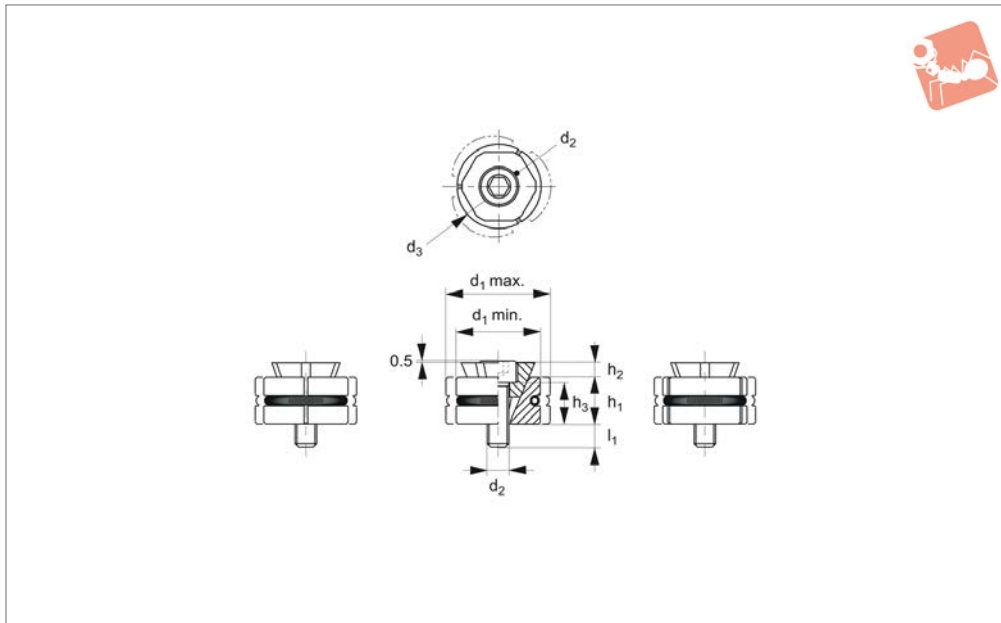
provides powerful clamping force. Generates both horizontal and vertical clamping force.

Tips

Clamps are suited to holding on cast or

roughed holes. Contact point nature of clamp may result in marking of workpiece. Not recommended for use in accurately finished holes.

Order No.	h_2	l_1 at d_1 max.	Type	d_1 min.	d_1 max.	d_2	h_1 at d_1 min.	h_1 at d_1 max.	A/F	Clamping force kN max.	Torque to Nm max.	Weight g
12074.W0008	0.9	7.3	Countersunk	8	10.3	M 4x0,70	4.6	5.5	3	2.1	0.9	3
12074.W0010	1.1	9.1	Countersunk	10	12.3	M 5x0,80	5.6	6.4	3	4.3	1.5	5
12074.W0012	1.3	11.2	Countersunk	12	16.3	M 6x1,00	7.0	8.6	4	7.3	2.1	9
12074.W0016	1.6	16.2	Countersunk	16	22.0	M 8x1,25	9.4	11.5	5	18.0	4.0	22
12074.W0108	5.1	7.1	Socket Head	8	10.3	M 4x0,70	4.6	5.5	3	2.7	1.5	4
12074.W0110	6.2	9.0	Socket Head	10	12.3	M 5x0,80	5.6	6.4	4	5.4	2.5	7
12074.W0112	7.9	10.6	Socket Head	12	16.3	M 6x1,00	7.0	8.6	5	9.1	5.0	11
12074.W0116	10.4	15.4	Socket Head	16	22.0	M 8x1,25	9.4	11.5	6	25.0	9.0	28



12075

BORE CLAMPING

Material

Steel (AISI 4140, 42CrMo4), 47-53 HRC, blackened.

Technical Notes

Clamps hold workpieces on an inside

diameter. Wedge construction provides powerful clamping force. Generates both horizontal and vertical clamping force.

Tips

Clamps are suited to holding on cast or

roughed holes. Contact point nature of clamp, may result in marking of workpiece. Not recommended for use in accurately finished holes.

Order No.	h_1	h_3 min.	h_3 max.	l_1 at d_1 max.	d_1 min.	d_1 max.	d_1	d_2	d_3	h_2 at d_1 min.	Clamping force kN max.	Torque to Nm max.	Weight g
12075.W0008	9	8.0	2.6	9.4	19.5	24	24	M 4 x 12	9.5	2.5	3.2	2	19
12075.W0012	13	11.5	5.0	13.0	23.5	29	29	M 6 x 18	11.5	4.0	10.5	5	43
12075.W0016	17	15.0	6.0	19.0	28.5	36	36	M 8 x 25	14.0	5.5	25.0	9	89