

Rotary indexing tables DHTG

FESTO

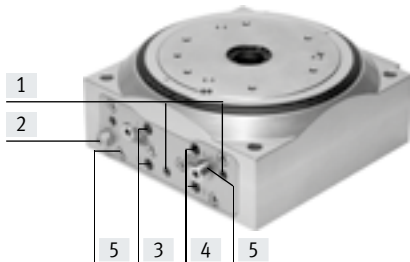


Key features

At a glance

- Sturdy mechanical system
- Easy project planning and commissioning
- Indexing stations: 2, 3, 4, 6, 8, 12, 24
- Integrated functions:
 - Overload protection
 - Sensor function
 - Cushioning adjustment
 - Speed setting
 - Changing the direction of rotation

The technology in detail

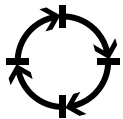


- [1] Thread for position sensing
- [2] One-way flow control valve for regulating speed
- [3] Compressed air supply port for reciprocating motion
- [4] Compressed air supply port for clockwise or anticlockwise rotation
- [5] Adjusting screw for cushioning adjustment

Operating modes

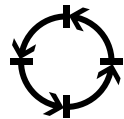
Clockwise

- Just one valve required



Anticlockwise

- Just one valve required



Reciprocating motion

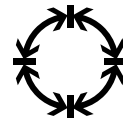
- After conversion with a reciprocating motion kit
- Two valves required



Variable actuation:

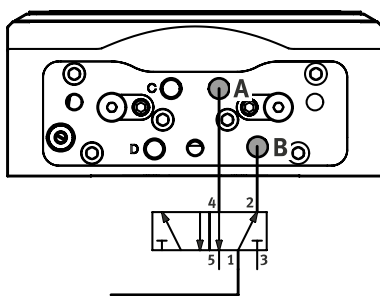
Left, right, reciprocating motion

- After conversion with a reciprocating motion kit
- Two valves required

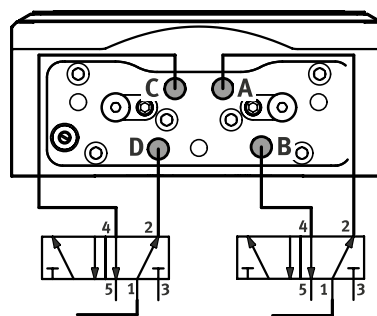


Examples of easy connections

Clockwise/anticlockwise



Reciprocating motion/flexible control



Key features

The technology in detail

Overload protection

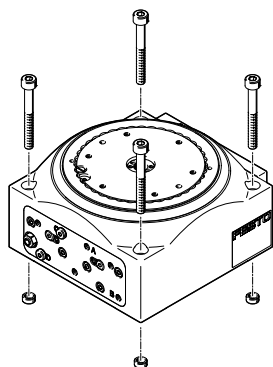
To prevent the rotary indexing table from being damaged by an excessive mass moment of inertia, e.g. during setting operation or in the event of shock absorber failure, sizes 140 and 220 feature overload protection.

If the mass moment of inertia is too large, the securing pin is pressed against the spring force by the resulting radial force. It then slides forward on the toothed segment.

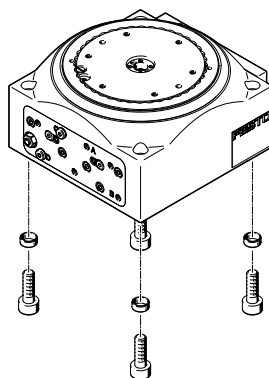
This shift in position between the index plate and toothed segment means that the securing pin can no longer engage and the rotary indexing table does not move. The table can be made ready for use again by turning it back.


Mounting options

Direct mounting from above



Direct mounting from below



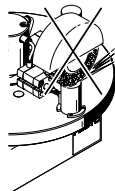
 Note

The rotary indexing tables are not designed for the following or similar application examples.

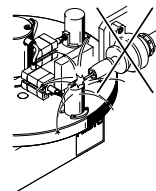
- Machining
- Aggressive media



- Grinding dust



- Welding spatter



Key features

Sample application

Rotating plate with stationary centre section

For mounting handling units or other devices in the centre of the rotary indexing table



Type codes

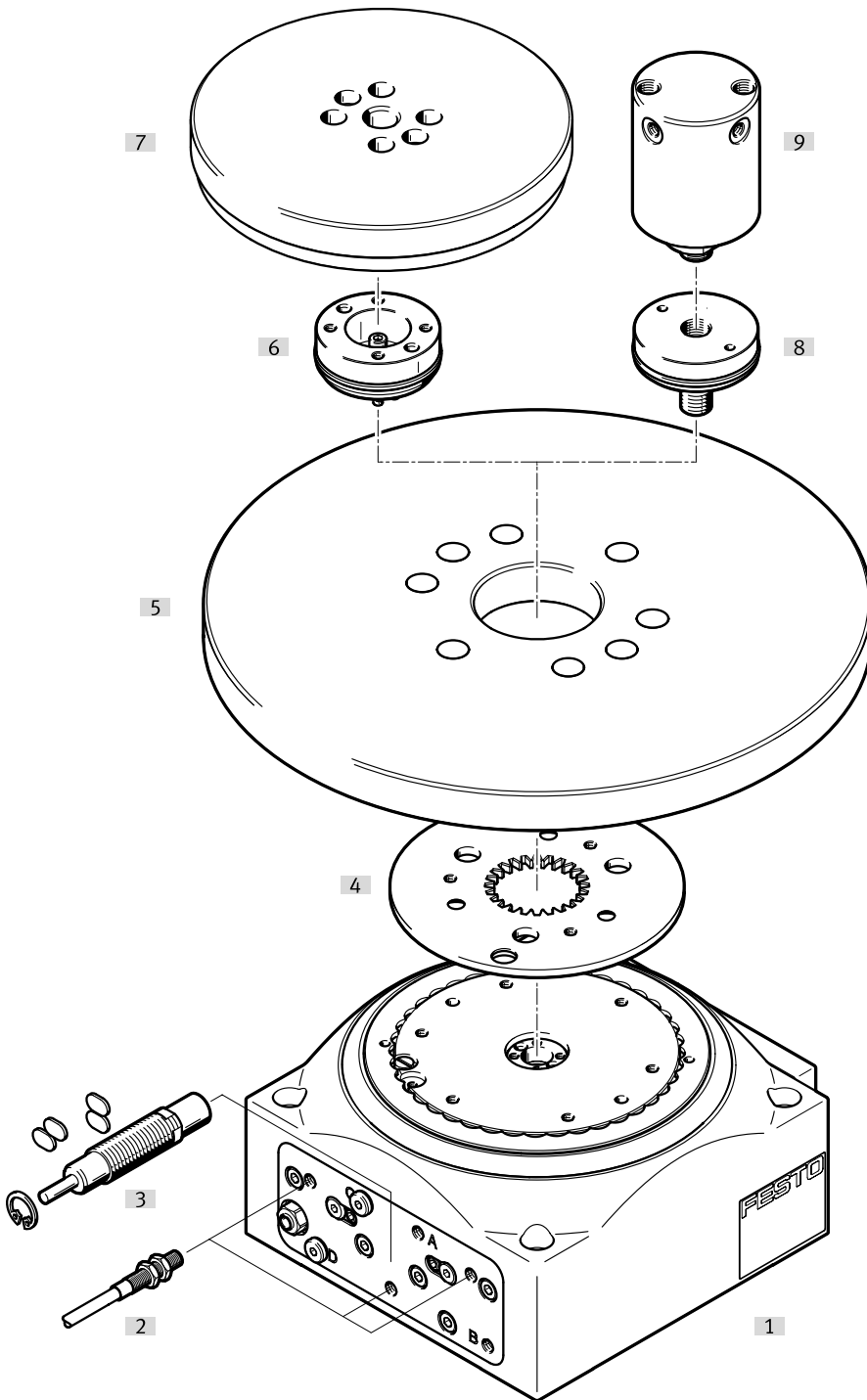
001	Series
DHTG	Rotary indexing table

002	Size
65	65
90	90
140	140
220	220

003	Indexing
2	2 indexing stations
3	3 indexing stations
4	4 indexing stations
6	6 indexing stations
8	8 indexing stations
12	12 indexing stations
24	24 indexing stations

004	Position sensing
A	For proximity sensor


Peripherals overview



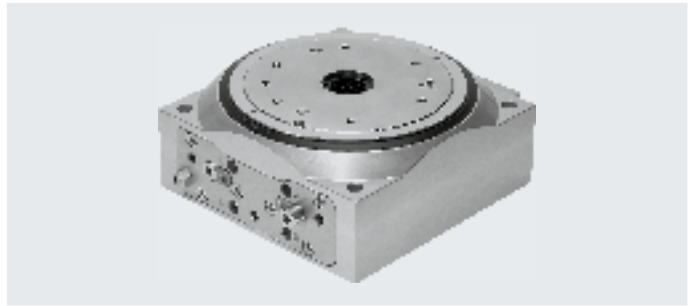
Peripherals overview

Variants and accessories		
Type	Description	→ Page/Internet
[1] Rotary indexing table DHTG	Flexible application range: anticlockwise rotation, clockwise rotation or reciprocating motion	8
[2] Proximity switch SIEN	For sensing the switching position of the rotary indexing table	21
[3] Reciprocating motion kit DADM-TK	Allows conversion from movement in one direction to reciprocating movement	21
[4] Indexing conversion kit DADM-CK	The indexing steps can be adjusted at any time using the kit	21
[5] Plate, rotary	Sample image (plates not available from Festo)	–
[6] Adapter kit DADG-AK	For mounting an unmachined plate on the rotary indexing table	19
[7] Plate, fixed	Sample image (plates not available from Festo)	–
[8] Adapter kit DADG-AK-...-...G...	For mounting the rotary distributor on the rotary indexing table	20
[9] Rotary distributor GF	Distributes the compressed air fed through the centre of the rotary indexing table to the actuators on the rotating blank plate. Cannot be used in combination with a fixed unmachined plate	20

Datasheet


-  Size
65, 90, 140, 220

- Indexing stations
2, 3, 4, 6, 8, 12, 24



General technical data					
Size	65	90	140	220	
Pneumatic connection	M5		G1/8		
Design	Gear coupling				
	Rack and pinion				
	Force-guided motion sequence				
Operating mode	Double-acting				
Type of mounting	Via through-hole and centring sleeve				
Mounting position	Any				
Cushioning	Adjustable shock absorber stroke, hard characteristic curve				
Indexing stations	2, 3, 4, 6, 8, 12, 24		3, 4, 6, 8, 12, 24		
Theoretical torque at 6 bar	[Nm]	2.1	4.4	18.1	58.9
Parallelism of plate ¹⁾	[mm]	≤0.04			
Axial eccentricity of plate ²⁾	[mm]	≤0.02			
Concentricity of plate ³⁾	[mm]	≤0.02			
Repetition accuracy of swivel angle	[°]	≤0.03			
Max. mass moment of inertia without flow control ⁴⁾	[kgm ²]	0.016	0.03	0.3	2.5
Cycle time without flow control		→ Page 10			
Position sensing		For inductive proximity switches			
Weight	[kg]	2.0	4.5	10	24

- 1) Parallelism of the plate surface relative to the housing support
- 2) Measured on the surface and at the edge of the plate in relation to the housing support
- 3) Measured on the inner diameter of the plate in relation to the housing
- 4) Operation with flow control can increase the mass moment of inertia by 50%. The service life of the shock absorber is reduced in this case. The mass moment of inertia depends on the number of indexing stations and the switching frequency (→ page 11)

-  **Note**

The "clockwise" rotation of the plate can be controlled via an internal flow control valve in combination with the reciprocating motion kit. For "anticlockwise" rotation, external actuation via an additional one-way flow control valve GRLA is needed.

Datasheet

Operating and environmental conditions

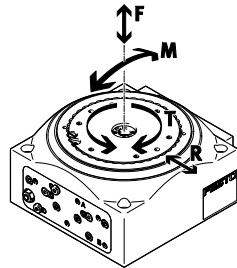
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]
Note on the operating/pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)
Operating pressure	[bar]	4 ... 8
Ambient temperature	[°C]	5 ... 60
Storage temperature	[°C]	-20 ... +80
Degree of protection		IP54 ²⁾
Corrosion resistance class CRC ¹⁾		2 - Moderate corrosion stress

1) More information: www.festo.com/x/topic/crc

2) The specified degree of protection applies to the top side of the rotary indexing table. The underside must be provided with appropriate external protection for the environment.

Static characteristic load values

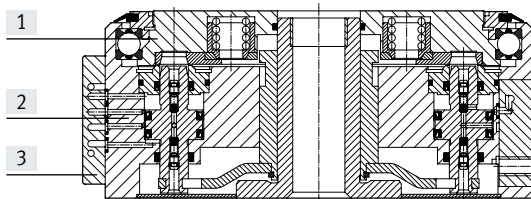
The indicated forces and torques refer to the locked table and can also act on the table plate.



Size		65	90	140	220
Forces					
Max. axial force F	[N]	1000	2000	4000	5000
Max. radial force R	[N]	2000	5000	6000	8000
Torque					
Max. tilting torque M	[Nm]	100	150	300	500
Max. tangential torque T	[Nm]	100	150	200	500

Materials

Sectional view



Rotary indexing table

[1]	Plate	Galvanised steel
[2]	Cover	Wrought aluminium alloy
[3]	Housing	Wrought aluminium alloy
-	Stops	Galvanised steel
-	Seals	NBR, TPE-U (PU)

Datasheet

Calculating the cycle time

The rotary indexing tables are equipped with a hydraulic shock absorber, which means that the max. frequency of the shock absorber must also be taken into account when calculating the cycle time.

The switching time comprises:

Switching time = Unlock, rotate, lock and return stroke of the working piston.

The cycle time is calculated as follows:

Cycle time = Switching time + Processing time + Dwell time.

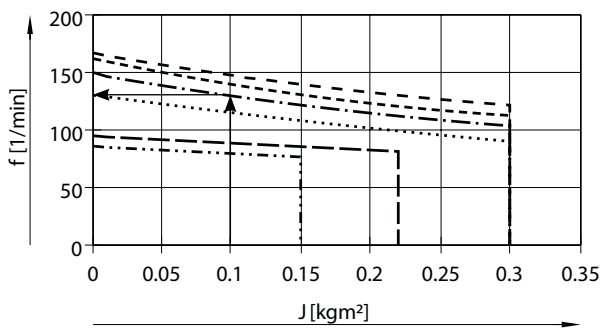
Calculation example

DHTG-140 with 8 stations and a mass moment of inertia of 0.1 kgm².

The customer application requires 300 ms per step for inserting and removing parts.

The max. achievable switching frequency in relation to the mass moment of inertia can be read off from the switching frequency graph. The switching time can be calculated from this based on $T = 60/f$. The processing time is calculated based on the time required for the customer application (e.g. time for component removal, press-in time, etc.). A dwell time may be necessary if the cycle time is shorter than the min. possible cycle time.

Switching frequency



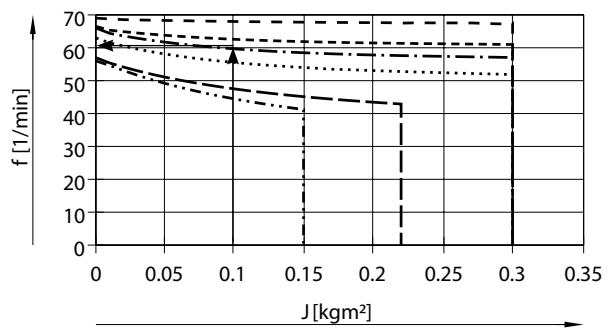
$$T_{\text{switching time}} = 1/f = 60 \text{ s}/130 = 0.461 \text{ s} = 461 \text{ ms}$$

Dwell time = Min. permissible cycle time - Switching time - Processing time

$$\text{Dwell time} = 1017 \text{ ms} - 461 \text{ ms} - 300 \text{ ms} = 256 \text{ ms.}$$

Given the fact that the switching time + processing time is shorter than the min. permissible cycle time, the rotary indexing table must stay in the end position before the next step is performed. In other words, an additional dwell time of 256 ms between the switching operations must be allowed for in the control sequence.

Max. permissible cycle frequency

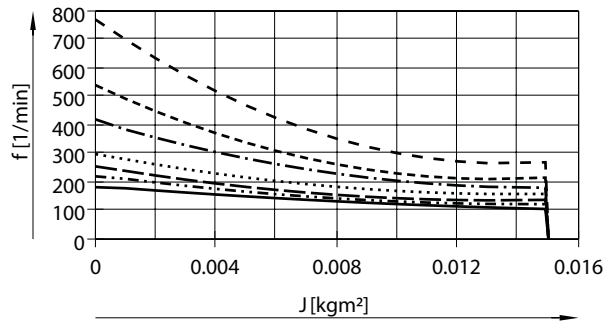


$$T_{\text{min. perm. cycle time}} = 60 \text{ s}/59 = 1.017 \text{ s} = 1017 \text{ ms}$$

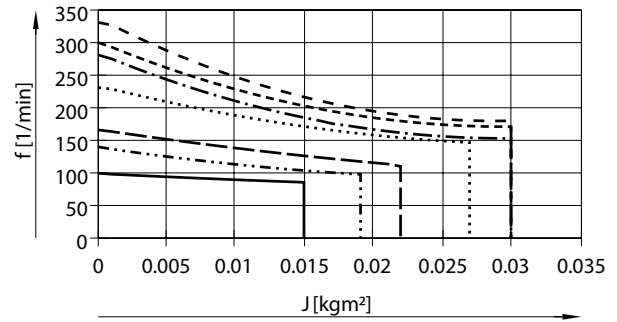
Datasheet

Mass moment of inertia J as a function of switching frequency f and number of indexing stations

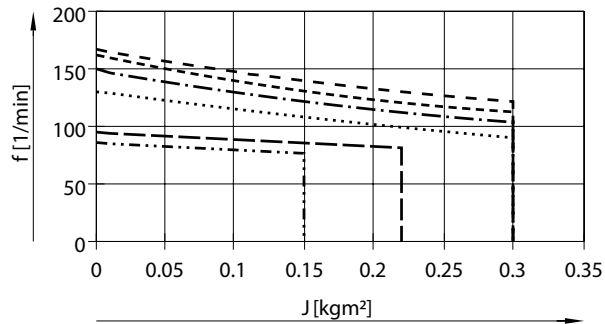
Size 65



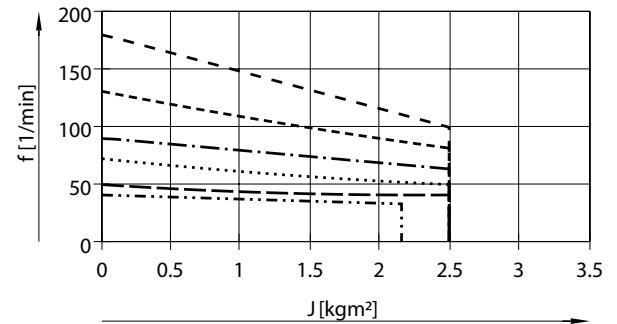
Size 90



Size 140

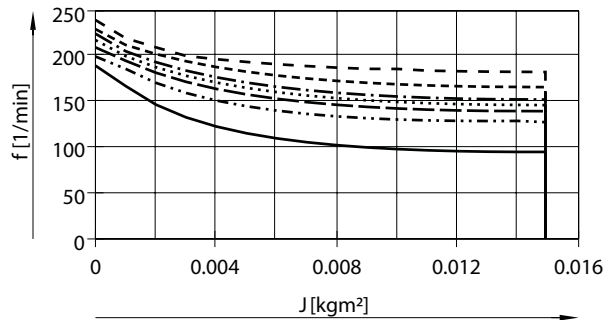


Size 220

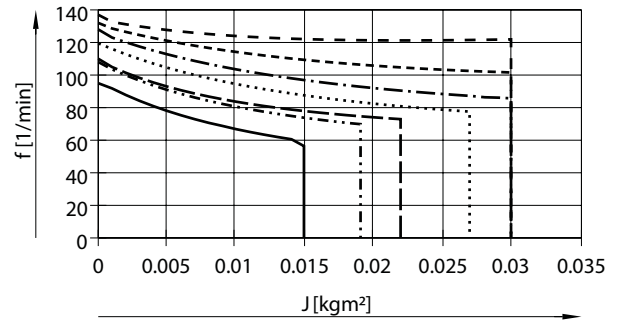


Max. permissible cycle frequency f as a function of mass moment of inertia J

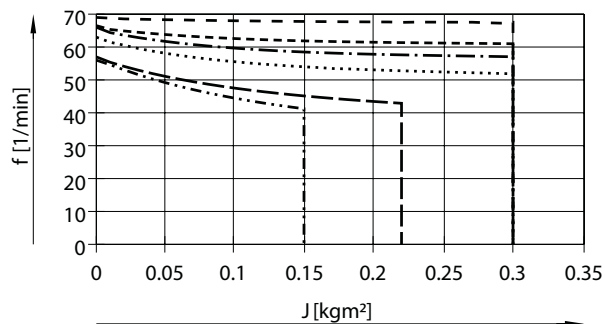
Size 65



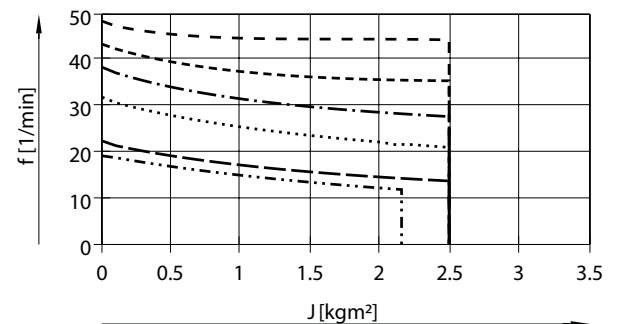
Size 90



Size 140



Size 220



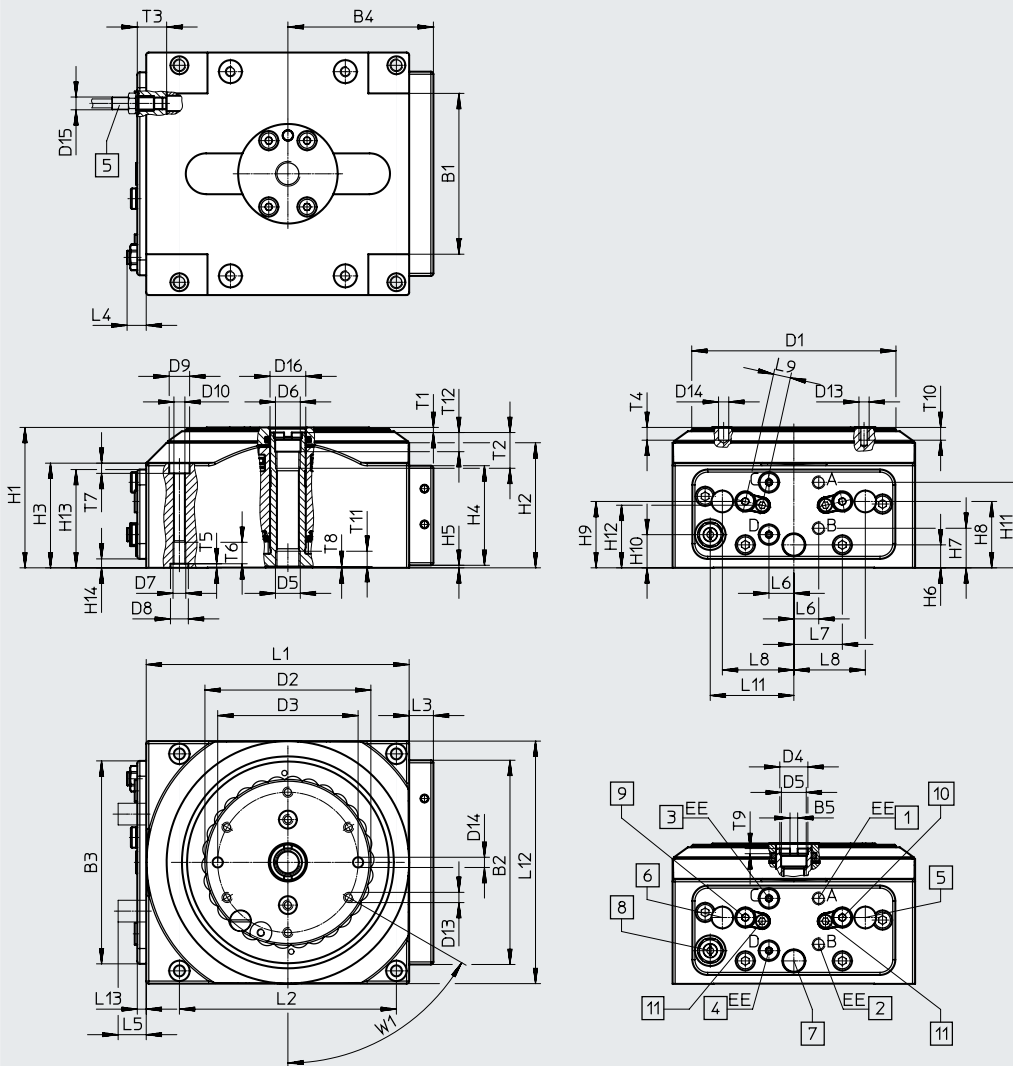
- 2 indexing stations
- 3 indexing stations
- 4 indexing stations
- 6 indexing stations
- 8 indexing stations
- 12 indexing stations
- 24 indexing stations

Datasheet

Dimensions

Download CAD data → www.festo.com

Size 65



- | | | |
|--|---|--|
| [1] Compressed air supply port: unlock and rotate (reciprocating motion: unlock) | [4] Sealing plug (for reciprocating motion: turn compressed air supply port anticlockwise) | [7] Lock sensing |
| [2] Compressed air supply port: lock and return stroke (reciprocating motion: lock) | [5] Sensor turned for clockwise rotation (sensor initial position for anticlockwise rotation) | [8] One-way flow control valve |
| [3] Sealing plug (for reciprocating motion: turn compressed air supply port clockwise) | [6] Sensor initial position for clockwise rotation (sensor turned for anticlockwise rotation) | [9] Adjustment of the end-position cushioning for anticlockwise rotation and reciprocating motion (not applicable for clockwise rotation) |
| | | [10] Adjustment of the end-position cushioning for clockwise rotation and reciprocating motion (not applicable for anticlockwise rotation) |
| | | [11] Lock nut for end-position cushioning |

Datasheet

Size	B1 ³⁾ ±2	B2	B3	B4	B5 +0.1	D1 ∅	D2 ∅	D3 ¹⁾ ∅	D4 ∅	D5	D6 ∅ H8	D7
65	63	80	79.5	47.5	3	80	65	55	11	G1/8	10	M5
Size	D8 ∅ H8	D9 ∅	D10 ∅	D13	D14 ∅ H8	D15	D16 ∅ H8	EE	H1 ±0.5	H2	H3	H4
65	7	8	4.3	M4	4	M5x0.5	14	M5	55	49	41	39
Size	H5	H6	H7	H8	H9	H10	H11	H12	H13	H14	L1 ±0.1	L2 ¹⁾ TM
65	1	9	15.5	26	26	13	33.5	24.5	38.5	3.5	103	85
Size	L3	L4 +1	L5 ²⁾ max	L6	L7	L8	L9	L11	L12 ±0.1	L13 +0.1	T1 ±1	T2 min
65	9.5	7.5	11	9.75	19	28	6.75	32.75	95	3.5	2	14
Size	T3 min	T4 min	T5 +0.1	T6 min	T7	T8	T9	T10 min	T11 min	T12	W1	
65	12	5	1.6	10	4	0.5	2	6	5	7	60°	

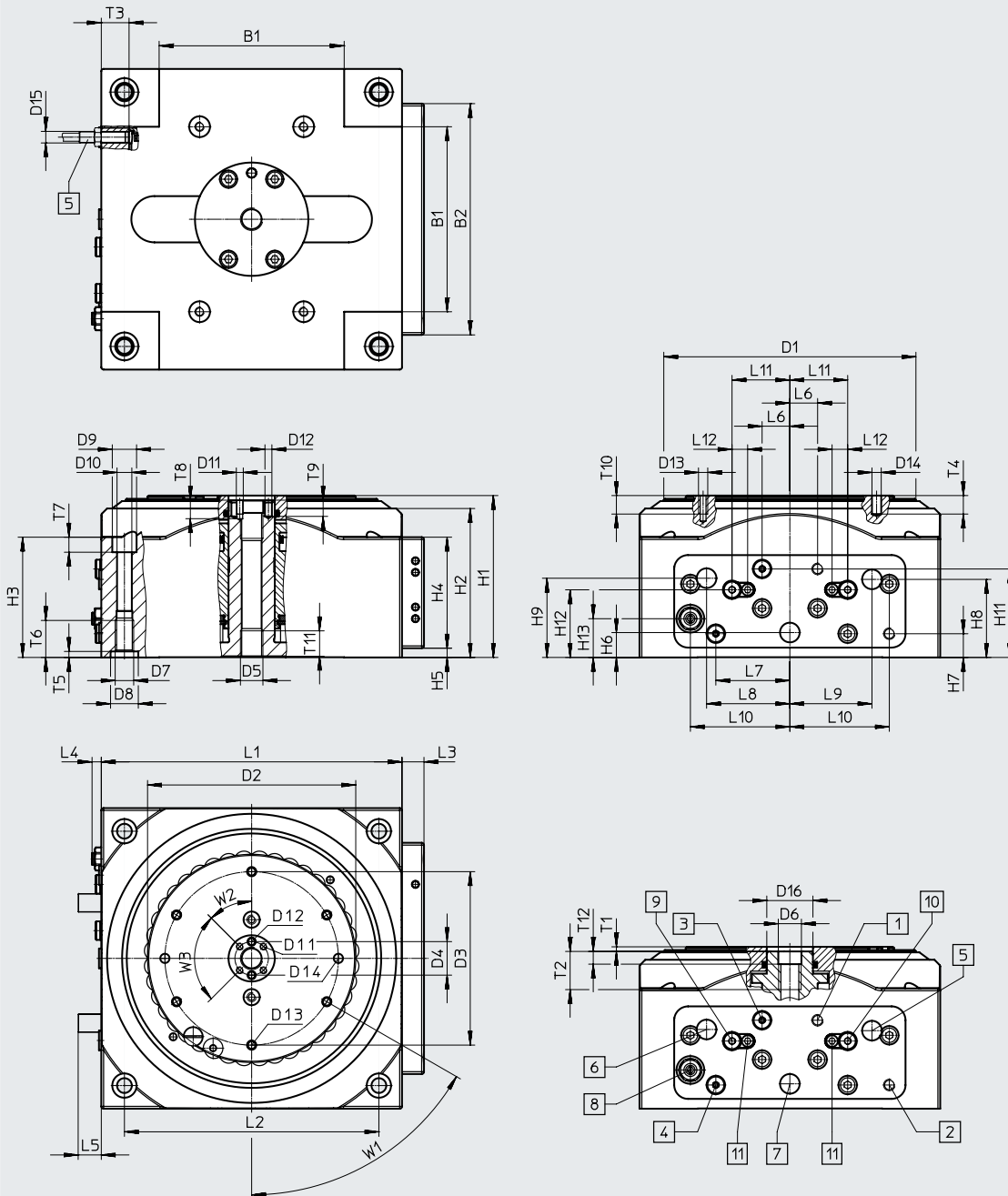
- 1) Tolerance between the centring holes: ±0.02
Tolerance between the threaded holes and countersinks: ±0.2
- 2) Max. projection of shock absorber adjustment
- 3) 0.1 +0.05 recessed

Datasheet

Dimensions

Download CAD data → www.festo.com

Size 90



- | | | |
|--|---|--|
| [1] Compressed air supply port: unlock and rotate (reciprocating motion: unlock) | [4] Sealing plug (for reciprocating motion: turn compressed air supply port anticlockwise) | [7] Lock sensing |
| [2] Compressed air supply port: lock and return stroke (reciprocating motion: lock) | [5] Sensor turned for clockwise rotation (sensor initial position for anticlockwise rotation) | [8] One-way flow control valve |
| [3] Sealing plug (for reciprocating motion: turn compressed air supply port clockwise) | [6] Sensor initial position for clockwise rotation (sensor turned for anticlockwise rotation) | [9] Adjustment of the end-position cushioning for anticlockwise rotation and reciprocating motion (not applicable for clockwise rotation) |
| | | [10] Adjustment of the end-position cushioning for clockwise rotation and reciprocating motion (not applicable for anticlockwise rotation) |
| | | [11] Lock nut for end-position cushioning |

Datasheet

Size	B1 ³⁾ ±2	B2	D1 ∅	D2 ∅	D3 ¹⁾ ∅	D4 ¹⁾ ∅	D5	D6 ∅ H8	D7	D8 ∅ H8	D9 ∅	D10 ∅
90	80	100	109	90	75	14.5	G1/8	10	M8	12	10.5	6.4
Size	D11	D12 ∅ H8	D13	D14 ∅ H8	D15	D16 ∅ H8	EE	H1 ±0.5	H2	H3	H4	H5
90	M3	3	M4	4	M5x0.5	20	M5	70	64.4	52	48	4
Size	H6	H7	H8	H9	H11	H12	H13	L1 TM ±0.1	L2 ¹⁾ TM	L3	L4	L5 ²⁾ max
90	10.75	10.25	33.75	34.25	38.25	29.25	16.75	130	110	9.5	4	10
Size	L6	L7	L8	L9	L10	L11	L12	T1 ±1	T2 min	T3	T4 min	
90	12	32	36	35.5	43	25	6.7	2	16.5	12	8	
Size	T5 +0.1	T6 min	T7	T8	T9 min	T10 min	T11 min	T12	W1	W2	W3	
90	2.6	16	6.5	6	5	8	11	5.5	60°	45°	90°	

1) Tolerance for centring hole ±0.02 mm
Tolerance for thread ±0.1 mm

2) Max. projection of shock absorber adjustment

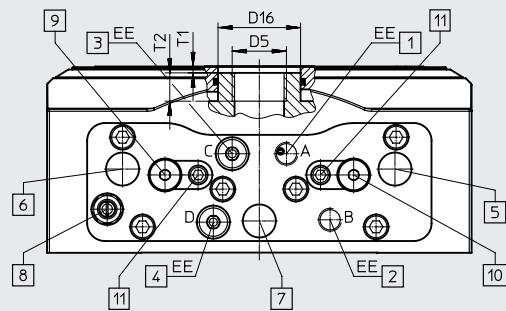
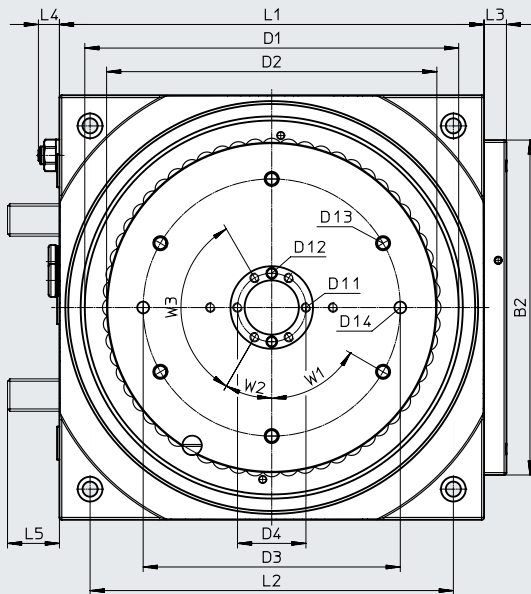
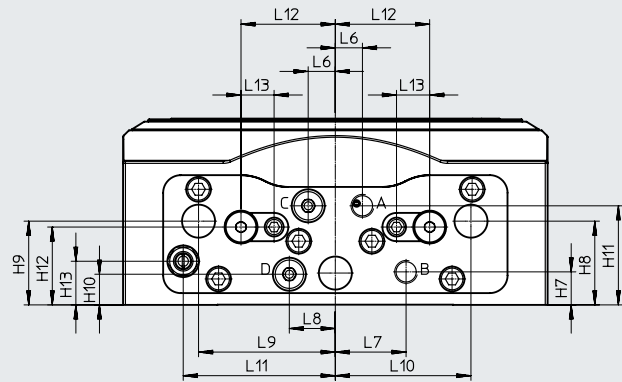
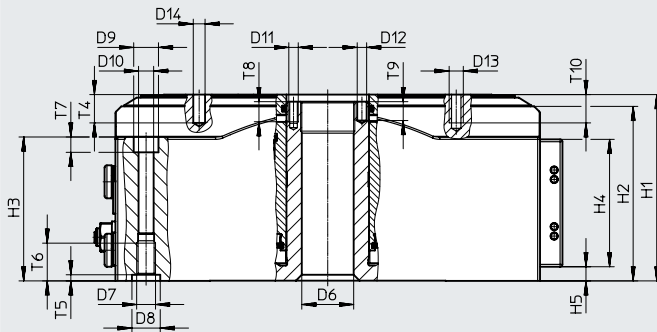
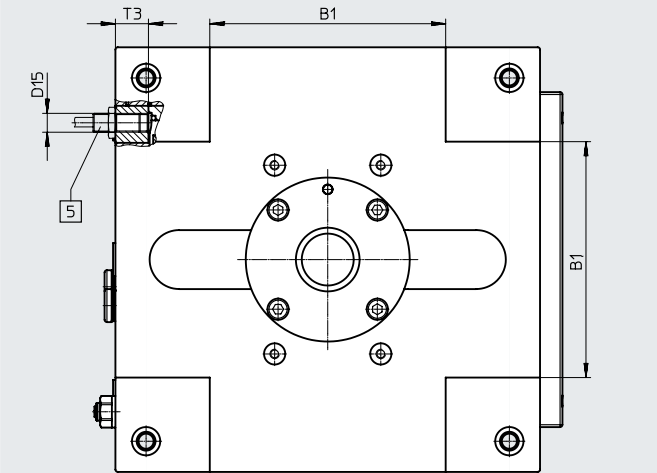
3) 0.1 +0.05 recessed

Datasheet

Dimensions

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Size 140, 220



- | | | |
|--|---|--|
| [1] Compressed air supply port: unlock and rotate (reciprocating motion: unlock) | [4] Sealing plug (for reciprocating motion: turn compressed air supply port anticlockwise) | [7] Lock sensing |
| [2] Compressed air supply port: lock and return stroke (reciprocating motion: lock) | [5] Sensor turned for clockwise rotation (sensor initial position for anticlockwise rotation) | [8] One-way flow control valve |
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| | | [10] Adjustment of the end-position cushioning for clockwise rotation and reciprocating motion (not applicable for anticlockwise rotation) |
| | | [11] Lock nut for end-position cushioning |

Datasheet

Size	B1 ³⁾ ±2	B2	D1 ∅	D2 ∅	D3 ¹⁾ ∅	D4 ¹⁾ ∅	D5	D6 ∅	D7	D8 ∅ H8	D9 ∅	D10 ∅	D11	D12 ∅ H8
140	100	142	159	140	109	29	M23x1	22	M8	12	10.5	6.4	M4	4
220	150	212	239	220	165	67	–	58.4	M10	15	13.5	8.4	M5	5

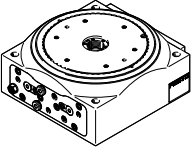
Size	D13	D14 ∅ H8	D15	D16 ∅ H8	EE	H1 ±0.5	H2	H3	H4	H5	H6	H7	H8	H9
140	M6	5	M8x1	35	G1/8	79	74	61	54	6	13.5	14	35.5	35.5
220	M8	6	M8x1	75	G1/8	89	83.5	68.5	64	4.5	13.5	24.5	15	15

Size	H10	H11	H12	H13	L1 TM ±0.1	L2 ¹⁾ TM	L3	L4 +1	L5 ²⁾ max	L6	L7	L8	L9	L10	L11
140	13	42	33	18.5	180	154	9.5	8.9	22	11.5	30	19.5	58	57.5	64.5
220	24.5	50.5	36.5	24	270	228	12	4.6	22	41	41	41	61	61	99.5

Size	L12	L13	T1 ±1	T2 min	T3 min	T4 min	T5 +0.1	T6 min	T7	T8 min	T9 min	T10 min	W1	W2	W3
140	40	14	3	12	14	8	2.6	16	6.5	8	8	11	60°	30°	120°
220	68	14	4	–	19	8	3.1	20	8.5	10	10	11	60°	30°	120°

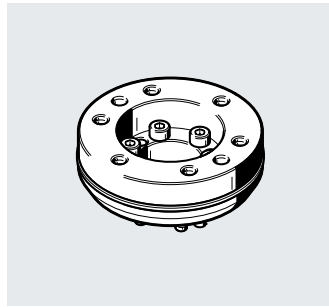
- 1) Tolerance between the centring holes: ±0.02
Tolerance between the threaded holes and countersinks: ±0.2
- 2) Max. projection of shock absorber adjustment
- 3) 0.1 +0.05 recessed

Datasheet

Ordering data	Size	Indexing stations	Part no.	Type	
	65	2	548076	DHTG-65-2-A	
		3	555448	DHTG-65-3-A	
		4	548077	DHTG-65-4-A	
		6	548078	DHTG-65-6-A	
		8	548079	DHTG-65-8-A	
		12	548080	DHTG-65-12-A	
		24	548081	DHTG-65-24-A	
		90	2	548082	DHTG-90-2-A
			3	555449	DHTG-90-3-A
			4	548083	DHTG-90-4-A
			6	548084	DHTG-90-6-A
			8	548085	DHTG-90-8-A
			12	548086	DHTG-90-12-A
			24	548087	DHTG-90-24-A
		140	3	555450	DHTG-140-3-A
			4	548088	DHTG-140-4-A
			6	548089	DHTG-140-6-A
			8	548090	DHTG-140-8-A
			12	548091	DHTG-140-12-A
			24	548092	DHTG-140-24-A
		220	3	555451	DHTG-220-3-A
			4	548093	DHTG-220-4-A
			6	548094	DHTG-220-6-A
			8	548095	DHTG-220-8-A
		12	548096	DHTG-220-12-A	
		24	548097	DHTG-220-24-A	

Accessories

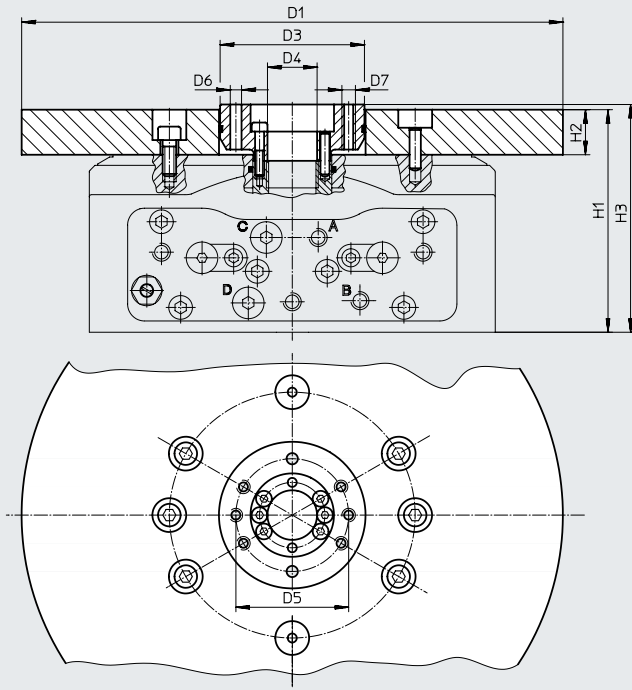
Adapter kit
DADG-AK



Dimensions

Download CAD data → www.festo.com

With rotary table and adapter kit DADG-AK for mounting a fixed plate



Size	D3 ∅ +0.2	D4 ∅ +0.2	D5 ∅	D6 ∅ H7	D7	H2 max.	H3 ±0.5
DADG-AK-65	29	5	20	4	M4	15	72
DADG-AK-90	39	9	30	4	M4	15	87
DADG-AK-140	64	22	50	5	M6	20	101
DADG-AK-220	104	58.4	90	6	M8	20	111

Ordering data – Adapter kit DADG-AK

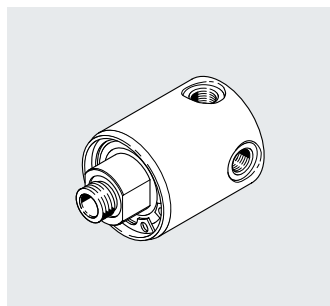
	For size	Part no.	Type
	65	555424	DADG-AK-65
	90	555425	DADG-AK-90
	140	555426	DADG-AK-140
	220	555427	DADG-AK-220

Accessories

Rotary distributor

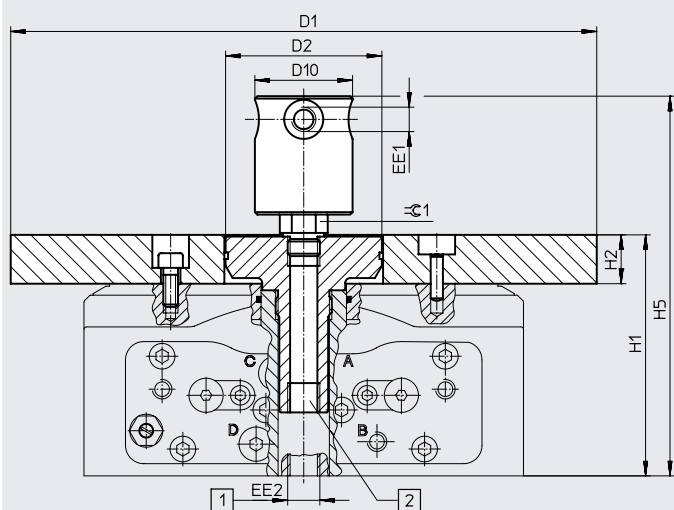
GF-..., single

GF-...-2, multiple



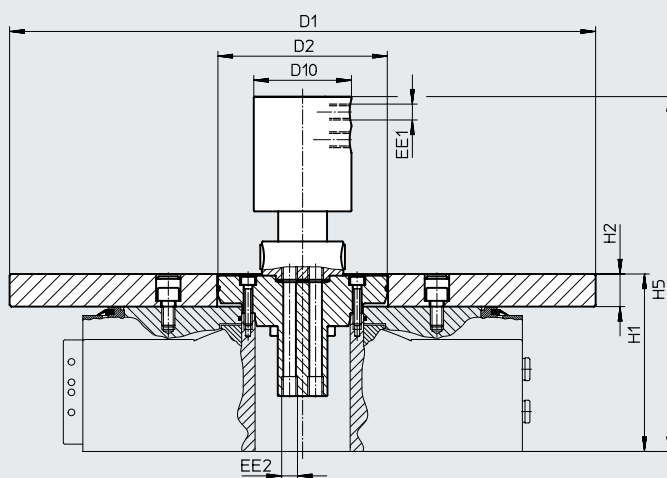
Dimensions

With rotary distributor GF-... (single) and adapter kit DADG-AK-...



Download CAD data → www.festo.com

With rotary distributor GF-1/8-2 (multiple) and adapter kit DADG-AK-220-2G18 – for size 220



Size	D2	D10 ∅ +0.2	EE1	EE2	H2 max.	H5 ±1	±1
DADG-AK-65-1G18 GF-1/8-M5	29	40	M5	G1/8	15	127.5	17
DADG-AK-90-1G18 GF-1/8-M5	39	40	M5	G1/8	15	142.5	17
DADG-AK-140-1G14 GF-1/4-1/8	64	40	G1/8	G1/4	20	155.5	17
DADG-AK-220-1G12 GF-1/2-1/4	104	60	G1/4	G1/2	20	187.5	27

Ordering data

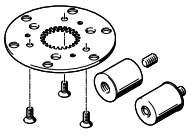
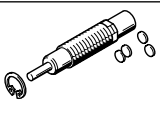
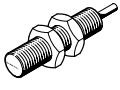
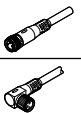
Rotary distributor GF

	For size	Part no.	Type
	Simple		
	65, 90	539290	GF-1/8-M5
	140	539291	GF-1/4-1/8
	220	539292	GF-1/2-1/4
	Multiple		
	220	539287	GF-1/8-2

Adapter kit DADG-AK

	For size	Part no.	Type
	Simple		
	65	555428	DADG-AK-65-1G18
	90	555429	DADG-AK-90-1G18
	140	555430	DADG-AK-140-1G14
	220	555431	DADG-AK-220-1G12
	Multiple		
	220	555432	DADG-AK-220-2G18

Accessories

Ordering data						
	For size	Indexing stations	Part no.	Type		
Indexing conversion kit DADM-CK						
	65	2	548098	DADM-CK-65-2		
		3	554389	DADM-CK-65-3		
		4	548099	DADM-CK-65-4		
		6	548100	DADM-CK-65-6		
		8	548101	DADM-CK-65-8		
		12	548102	DADM-CK-65-12		
		24	548103	DADM-CK-65-24		
	90	2	548104	DADM-CK-90-2		
		3	555445	DADM-CK-90-3		
		4	548105	DADM-CK-90-4		
		6	548106	DADM-CK-90-6		
		8	548107	DADM-CK-90-8		
		12	548108	DADM-CK-90-12		
		24	548109	DADM-CK-90-24		
	140	3	555446	DADM-CK-140-3		
		4	548110	DADM-CK-140-4		
		6	548111	DADM-CK-140-6		
		8	548112	DADM-CK-140-8		
		12	548113	DADM-CK-140-12		
		24	548114	DADM-CK-140-24		
	220	3	555447	DADM-CK-220-3		
		4	548115	DADM-CK-220-4		
		6	548116	DADM-CK-220-6		
		8	548117	DADM-CK-220-8		
12		548118	DADM-CK-220-12			
24		548119	DADM-CK-220-24			
Reciprocating motion kit DADM-TK						
	65	–	548120	DADM-TK-65		
	90		548121	DADM-TK-90		
	140		563304	DADM-TK-140		
	220		563305	DADM-TK-220		
Ordering data – Proximity switches, inductive						
Datasheets → Internet: sien						
	65, 90	N/O	Plug	150371	SIEN-M5B-PS-S-L	
		N/C	Plug	150375	SIEN-M5B-PO-S-L	
	140, 220	N/O	Cable	150386	SIEN-M8B-PS-K-L	
			Plug	150387	SIEN-M8B-PS-S-L	
		N/C	Cable	150390	SIEN-M8B-PO-K-L	
			Plug	150391	SIEN-M8B-PO-S-L	
Ordering data – Connecting cables						
Datasheets → Internet: nebu						
	Straight socket, M8x1, 3-pin	Cable, open end, 3-core	Cable length [m]	2.5	541333	NEBU-M8G3-K-2.5-LE3
			5	541334	NEBU-M8G3-K-5-LE3	
	Angled socket, M8x1, 3-pin	Cable, open end, 3-core	2.5	541338	NEBU-M8W3-K-2.5-LE3	
			5	541341	NEBU-M8W3-K-5-LE3	