

Rotary indexing tables DHTG



Rotary indexing tables DHTG

Key features

FESTO

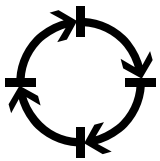
At a glance

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

Actuation options

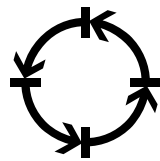
Clockwise

- Just one valve required



Anti-clockwise

- Just one valve required



Reciprocating motion

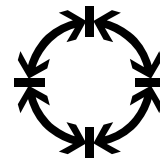
- Following conversion with reciprocating motion kit
- Two valves required



Variable actuation

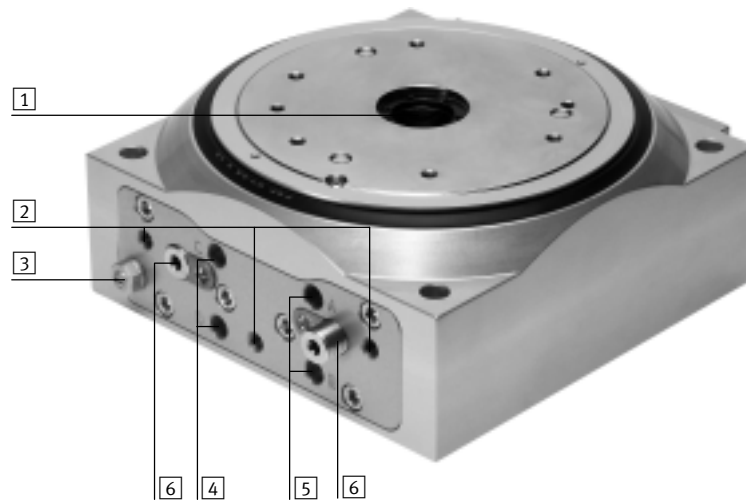
Left, right, reciprocating motion

- Following conversion with reciprocating motion kit
- Two valves required



The technology in detail

- 1 Through-hole for energy throughfeed
- 2 Thread for position sensing
- 3 One-way flow control valve for regulating speed
- 4 Supply port for reciprocating operation
- 5 Supply port for clockwise or anti-clockwise rotation
- 6 Adjusting screw for cushioning adjustment

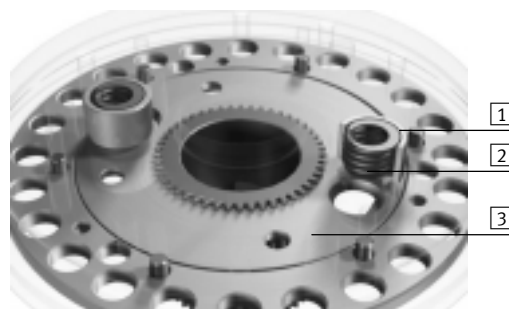


Overload protection

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.

- 1 Securing pin
- 2 Spring
- 3 Toothed segment

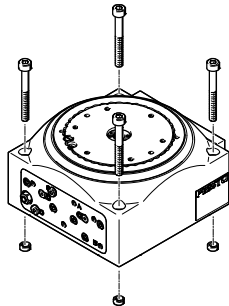


Rotary indexing tables DHTG

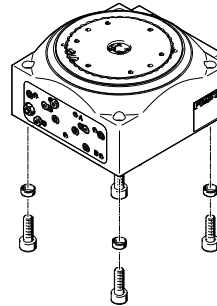
Key features

Mounting options

Direct mounting from above



Direct mounting from below



Typical applications

Basic rotary table

- Handling with minimum space requirement



Rotary table with rotary distributor


- For the transfer of compressed air and vacuum to the rotary table
- With 1 or 2 separate ducts



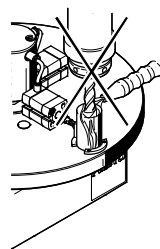
Rotary table with stationary centre section

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

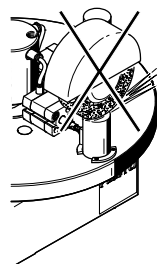


 Note
The rotary indexing tables are not designed for the following or similar sample applications:

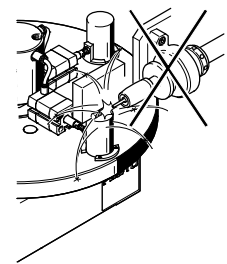
- Machining
- Aggressive media



- Grinding dust



- Welding spatter



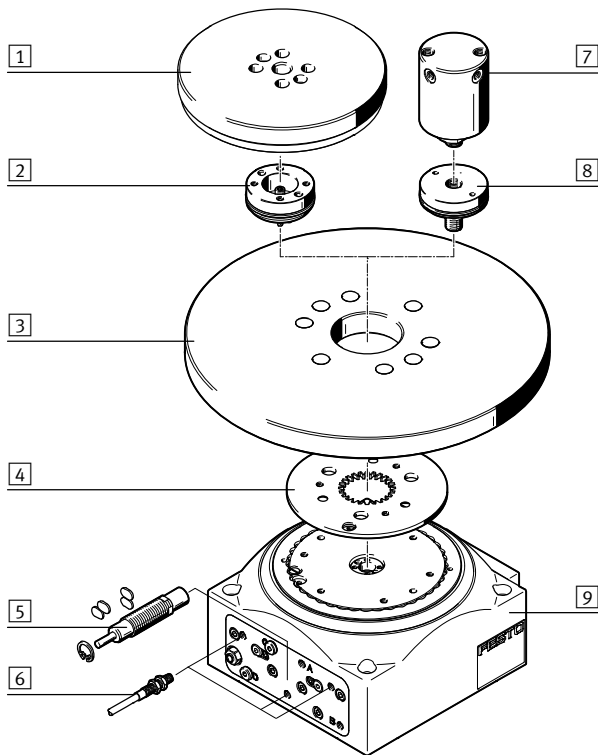
Rotary indexing tables DHTG

Type codes

		DHTG	-	90	-	8	-	A
Series								
DHTG	Rotary indexing table							
Size								
Indexing stations								
Position sensing								
A	For proximity sensor							

Rotary indexing tables DHTG

Peripherals overview



Variants and accessories		
Type	Brief description	→ Page/Internet
1	Unmachined plate, fixed	Example of representation, not included in scope of delivery
2	Adapter kit DADG-AK	For mounting the unmachined plate DADG-UPF on the rotary table
3	Unmachined plate, rotating	Example of representation, not included in scope of delivery
4	Indexing conversion kit DADM-CK	The indexing steps can be adjusted at any time using the kit
5	Reciprocating motion kit DADM-TK	Allows conversion from movement in one direction to reciprocating movement
6	Proximity sensors SIEN	For sensing the switching position of the rotary indexing table
7	Rotary distributor GF	Distributes the compressed air conducted through the centre of the rotary indexing table to the actuators on the unmachined rotating plate. Cannot be used in combination with the fixed unmachined plate DADG-UPF
8	Adapter kit DADG-AK-...-...G...	For mounting the rotary distributor on the rotary indexing table
9	Rotary indexing table DHTG	Flexible range of applications: Anti-clockwise and clockwise rotation or reciprocating motion

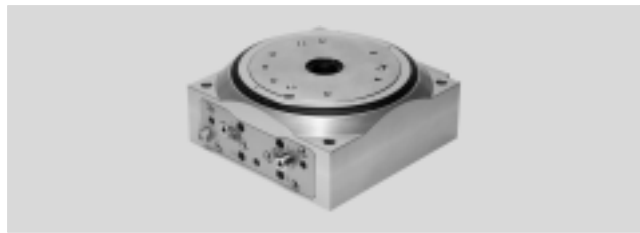
Rotary indexing tables DHTG

FESTO

Technical data

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			
Mode of operation	Double-acting			
Type of mounting	Via through-holes 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	
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	→ 8			
Position sensing	For inductive proximity sensors			
Product weight [kg]	2.0	4.5	10	24

- 1) Parallelism of the upper plate surface relative to the housing support
- 2) Measured on the upper surface of the plate at the plate edge relative to the housing support
- 3) Measured on the internal diameter of the plate relative 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 stations and the switching frequency (→ 9)

Note

The "clockwise" rotation of the table can be controlled via an internal flow control valve in combination with the reciprocating motion kit.

For "anti-clockwise" rotation, external actuation via an additional one-way flow control valve GRLA is needed.

Operating and environmental conditions	
Operating medium	Compressed air in accordance with ISO 8573-1:2010 [7:4:4]
Note on operating/pilot medium	Operation with lubricated medium 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
Protection class	IP54
Corrosion resistance class CRC ¹⁾	2

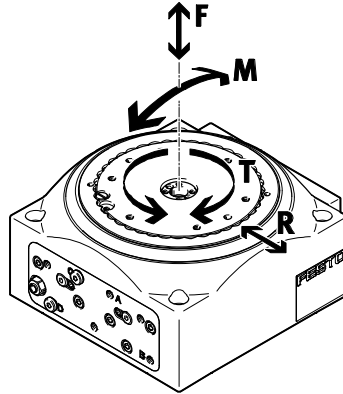
- 1) Corrosion resistance class 2 to Festo standard 940 070
Components subject to moderate corrosion stress. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents

Rotary indexing tables DHTG

Technical data

Static characteristic load values

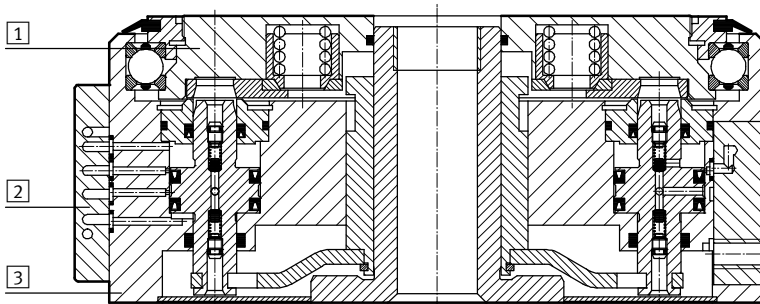
The indicated forces and torques refer to the locked table and can also act on the table plate.



Size		65	90	140	220
Forces					
Max. axial force F	[N]	1,000	2,000	4,000	5,000
Max. radial force R	[N]	2,000	5,000	6,000	8,000
Torques					
Max. tilting moment M	[Nm]	100	150	300	500
Max. tangential moment 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)
Note on material Free of copper and PTFE Conforms to RoHS	

Rotary indexing tables DHTG

Technical data

Calculation of 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 working piston.
 The cycle time is calculated as follows:
 Cycle time = Switching time + Processing time + Dwell time.

In the switching frequency graph, the max. achievable switching frequency is read in relation to the mass moment of inertia. From this the switching time can be calculated using $T = 60/f$. The processing time is calculated from the time required by

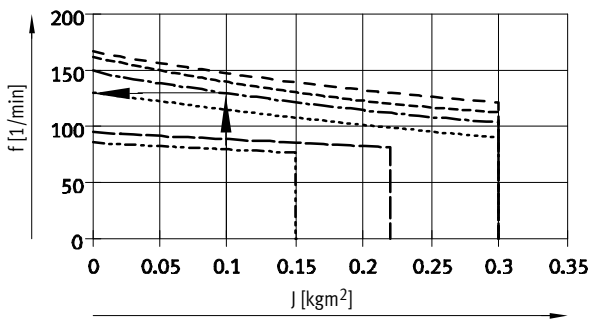
the respective customer application (e.g. time for component removal, press-in time, etc.). A dwell time may be necessary if the cycle time is shorter than the min. possible cycle time.

Calculation example

DHTG-140 with 8 stations and a mass moment of inertia of 0.1 kgm^2 .

The customer application requires 300 ms per step for the insertion and removal of parts.

Switching frequency in rpm



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

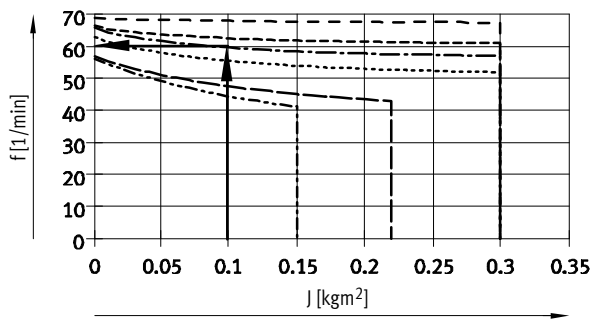
Dwell time = Min. permissible cycle time – Switching time – Processing time

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

Given the fact that the switching time + processing time is smaller 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, between the switching an additional dwell time of 256 ms must be allowed for in the control sequence.

Max. permissible cycle frequency



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

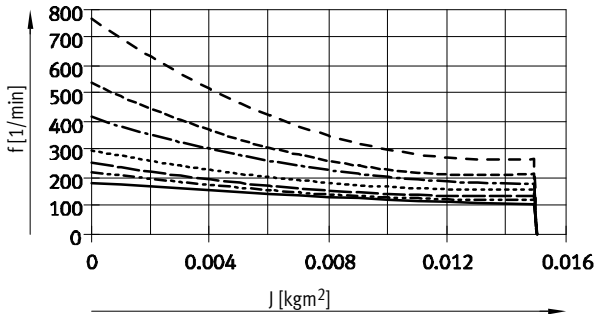
Rotary indexing tables DHTG

Technical data

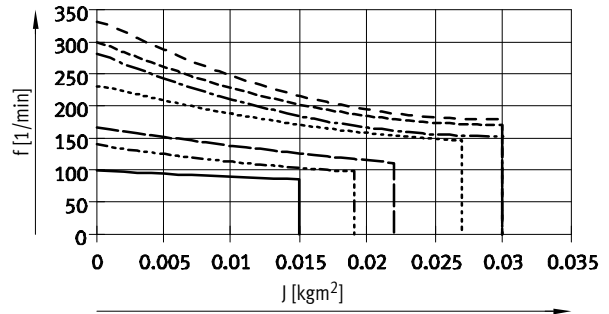
FESTO

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

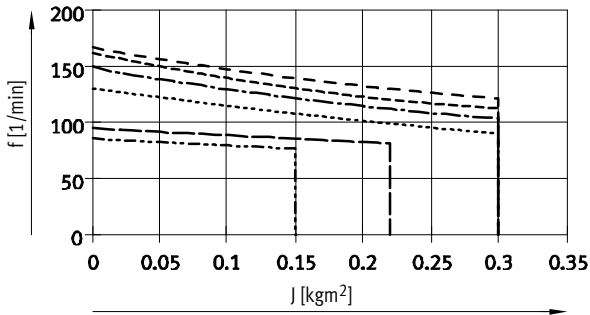
Size 65



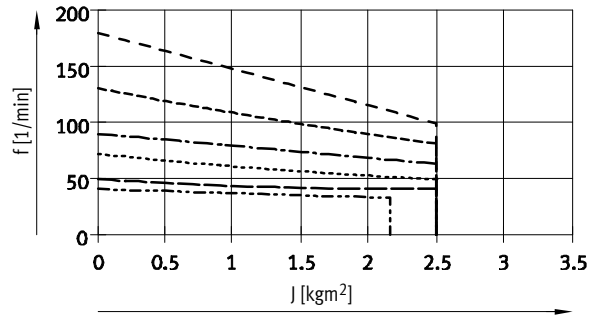
Size 90



Size 140

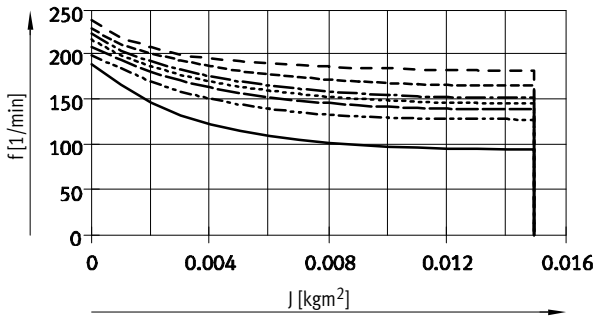


Size 220

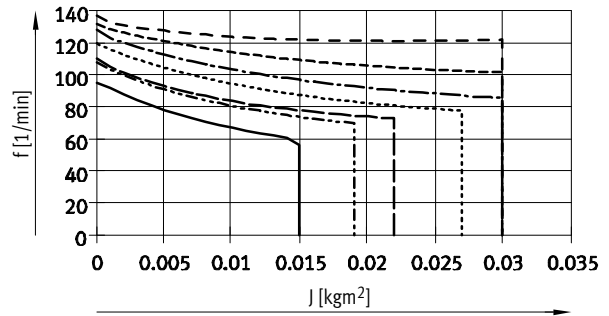


Max. permissible cycle frequency f as a function of mass moment of inertia J

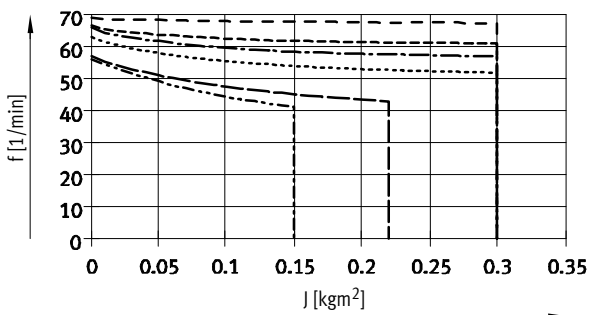
Size 65



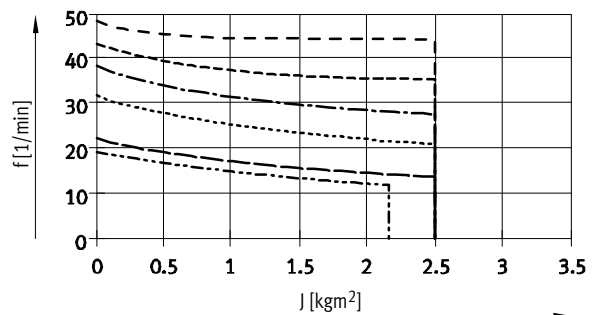
Size 90



Size 140



Size 220



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

Rotary indexing tables DHTG

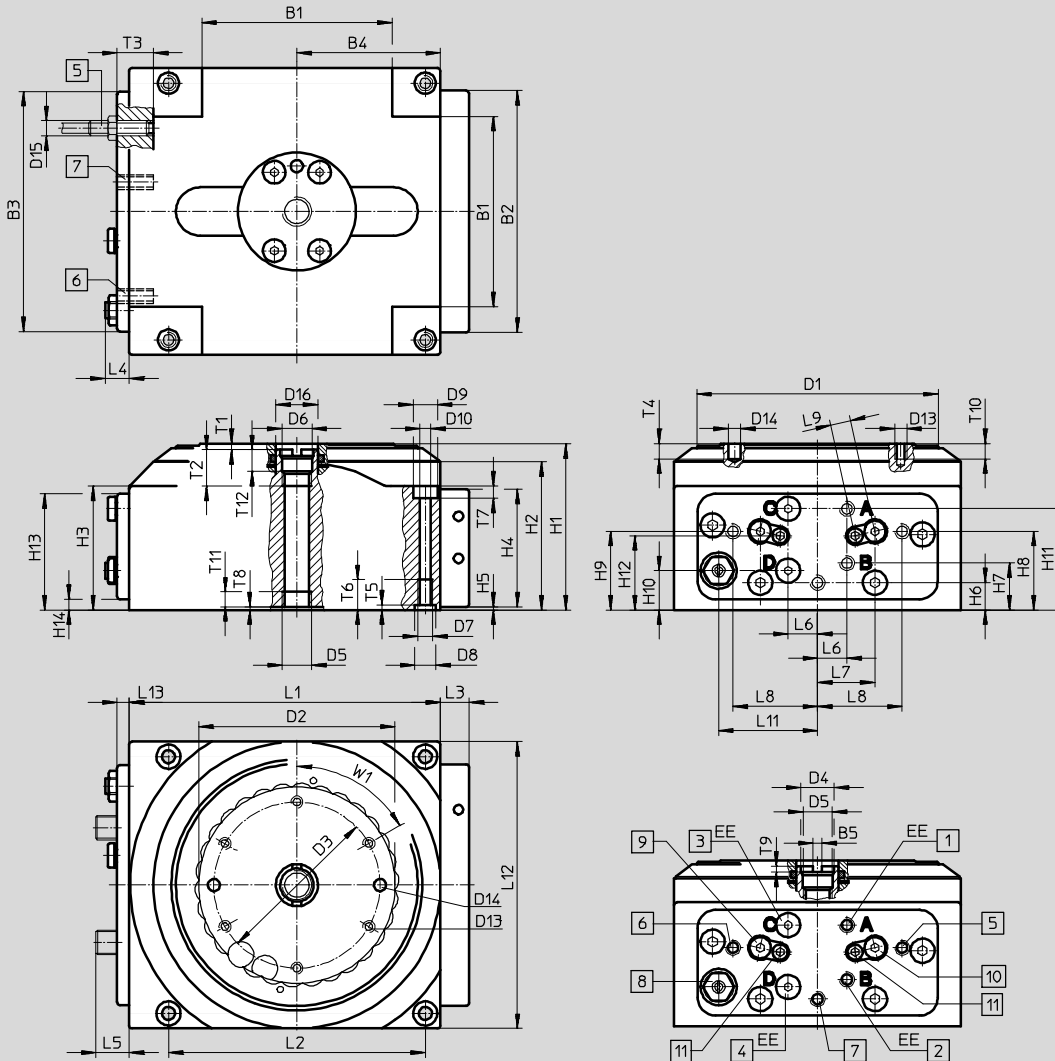
Technical data

FESTO

Dimensions

Download CAD data → www.festo.com

Size 65



- | | | | |
|--|--|--|---|
| <p>1 Supply port: unlock and rotate (reciprocating motion: unlock)</p> <p>2 Supply port: lock and return stroke (reciprocating motion: lock)</p> <p>3 Blanking plug; (reciprocating motion: supply port for clockwise turning)</p> | <p>4 Blanking plug; (reciprocating motion: supply port for anti-clockwise turning)</p> <p>5 Sensor turned for clockwise rotation (sensor basic setting for anti-clockwise rotation)</p> <p>6 Sensor basic setting for clockwise rotation (sensor turned for anti-clockwise rotation)</p> | <p>7 Sensor lock</p> <p>8 One-way flow control valve</p> <p>9 Adjustment of end position cushioning for anti-clockwise operation and reciprocating operation (non-applicable for clockwise rotation)</p> | <p>10 Adjustment of end position cushioning for clockwise operation and reciprocating operation (non-applicable for anti-clockwise rotation)</p> <p>11 Tightening of end position cushioning 2.5 Nm</p> |
|--|--|--|---|

Rotary indexing tables DHTG

Technical data

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⁾ □
65	1	9	15,5	26	26	13	33,5	24,5	38,5	3,5	103	85

Size	L3	L4	L5 ²⁾ max	L6	L7	L8	L9	L11	L12 ±0,1	L13 +0,1	T1 ±1	T2 min
65	9,5	8	11	9,75	19	28	6,7	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

Rotary indexing tables DHTG

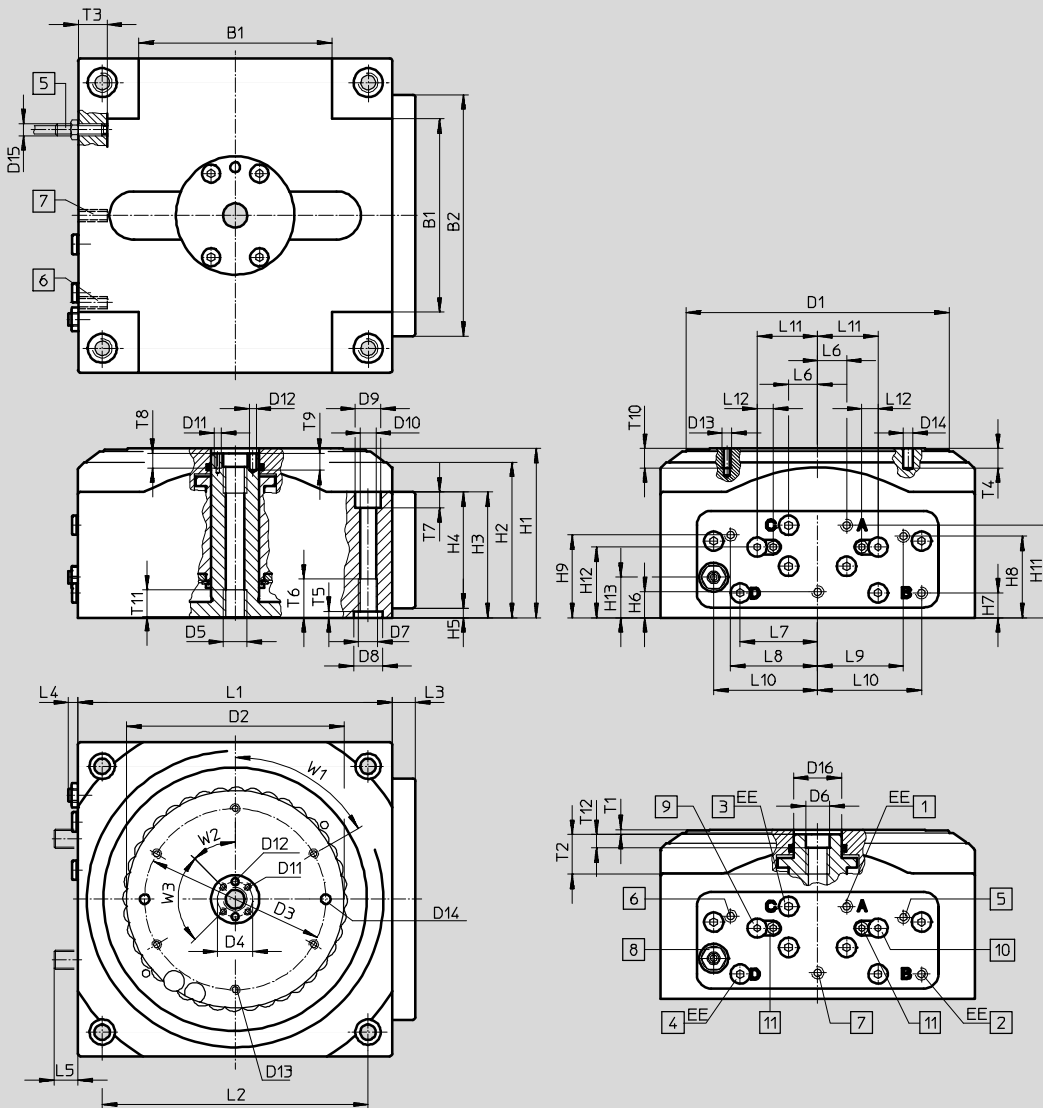
Technical data

FESTO

Dimensions

Download CAD data → www.festo.com

Size 90



- | | | | |
|--|--|--|---|
| <p>1 Supply port: unlock and rotate (reciprocating motion: unlock)</p> <p>2 Supply port: lock and return stroke (reciprocating motion: lock)</p> <p>3 Blanking plug; (reciprocating motion: supply port for clockwise turning)</p> | <p>4 Blanking plug; (reciprocating motion: supply port for anti-clockwise turning)</p> <p>5 Sensor turned for clockwise rotation (sensor basic setting for anti-clockwise rotation)</p> <p>6 Sensor basic setting for clockwise rotation (sensor turned for anti-clockwise rotation)</p> | <p>7 Sensor lock</p> <p>8 One-way flow control valve</p> <p>9 Adjustment of end position cushioning for anti-clockwise operation and reciprocating operation (non-applicable for clockwise rotation)</p> | <p>10 Adjustment of end position cushioning for clockwise operation and reciprocating operation (non-applicable for anti-clockwise rotation)</p> <p>11 Tightening of end position cushioning 2.5 Nm</p> |
|--|--|--|---|

Rotary indexing tables DHTG

Technical data

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 □ ±0,1	L2 ¹⁾ □	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 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

Rotary indexing tables DHTG

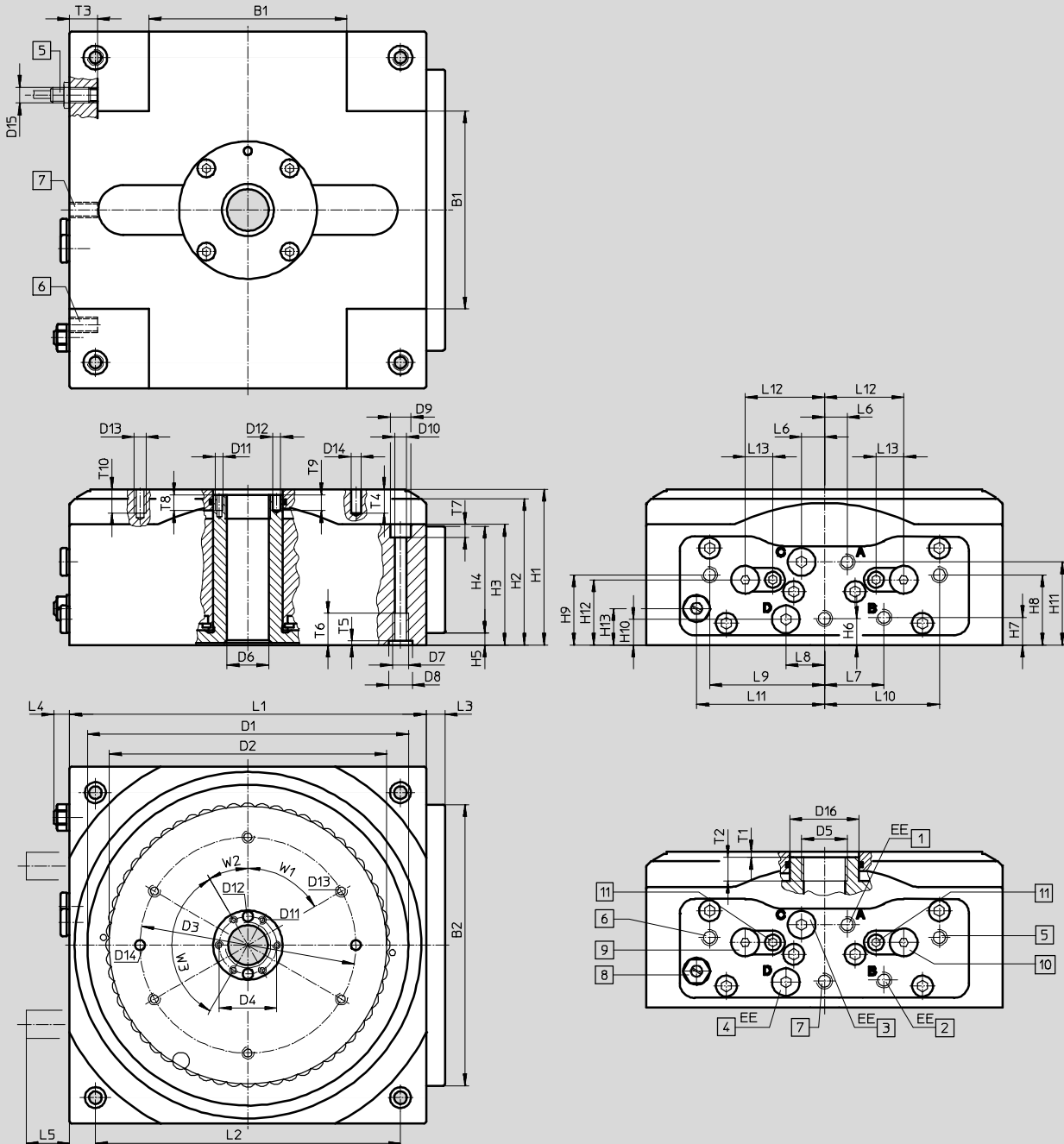
Technical data

FESTO

Dimensions

Sizes 140, 220

Download CAD data → www.festo.com



- | | | | |
|---|---|---|--|
| <ul style="list-style-type: none"> 1 Supply port: unlock and rotate (reciprocating motion: unlock) 2 Supply port: lock and return stroke (reciprocating motion: lock) 3 Blanking plug; (reciprocating motion: supply port for clockwise turning) | <ul style="list-style-type: none"> 4 Blanking plug; (reciprocating motion: supply port for anti-clockwise turning) 5 Sensor turned for clockwise rotation (sensor basic setting for anti-clockwise rotation) 6 Sensor basic setting for clockwise rotation (sensor turned for anti-clockwise rotation) | <ul style="list-style-type: none"> 7 Sensor lock 8 One-way flow control valve 9 Adjustment of end position cushioning for anti-clockwise operation and reciprocating operation (non-applicable for clockwise rotation) | <ul style="list-style-type: none"> 10 Adjustment of end position cushioning for clockwise operation and reciprocating operation (non-applicable for anti-clockwise rotation) 11 Tightening of end position cushioning 2.5 Nm |
|---|---|---|--|

Rotary indexing tables DHTG

Technical data

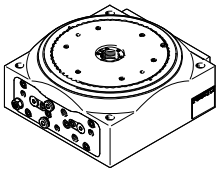
Size	B1 ³⁾ ±2	B2	D1 ∅	D2 ∅	D3 ¹⁾ ∅	D4 ¹⁾ ∅	D5	D6 ∅	D7	D8 ∅ H8	D9 ∅	D10 ∅	D11	D12 ∅ H8
140	100	142	159	140	109	29	M23x1	22	M8	12	10,5	6,4	M4	4
220	150	212	239	220	165	67	–	58,4	M10	15	13,5	8,4	M5	5

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 □ ±0,1	L2 ¹⁾ □	L3	L4 +1	L5 ²⁾ max	L6	L7	L8	L9	L10	L11
140	13	42	33	18,5	180	154	9,5	8,25	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

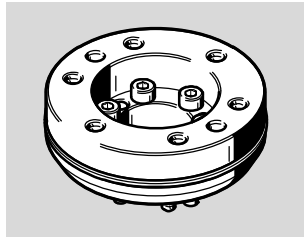
Ordering data		Size	Indexing stations	Part No.	Type
	65	2	548076	DHTG-65-2-A	
		3	555448	DHTG-65-3-A	
		4	548077	DHTG-65-4-A	
		6	548078	DHTG-65-6-A	
		8	548079	DHTG-65-8-A	
		12	548080	DHTG-65-12-A	
		24	548081	DHTG-65-24-A	
		90	2	548082	DHTG-90-2-A
	3		555449	DHTG-90-3-A	
	4		548083	DHTG-90-4-A	
	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		

Rotary indexing tables DHTG

Accessories

FESTO

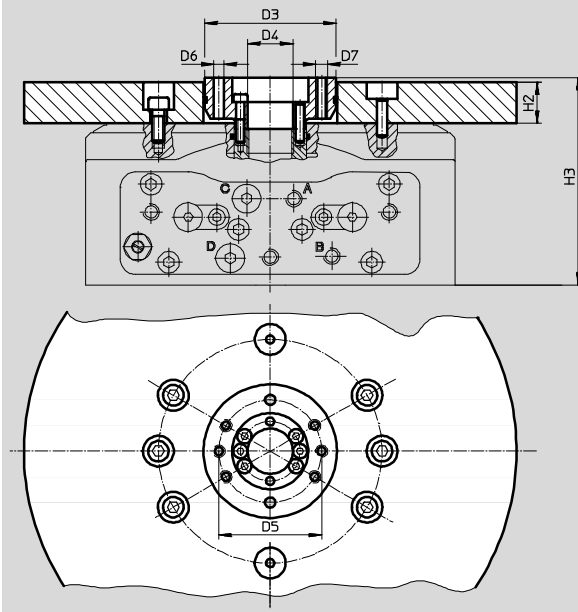
Adapter kit
DADG-AK



Dimensions

Download CAD data → www.festo.com

With rotating unmachined plate and adapter kit for mounting a fixed unmachined 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

Rotary indexing tables DHTG

Accessories

Rotary distributor
 GF-..., single
 GF-...-2, multiple

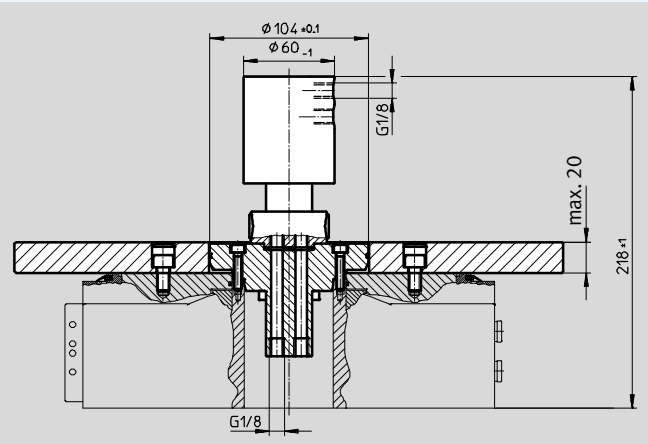
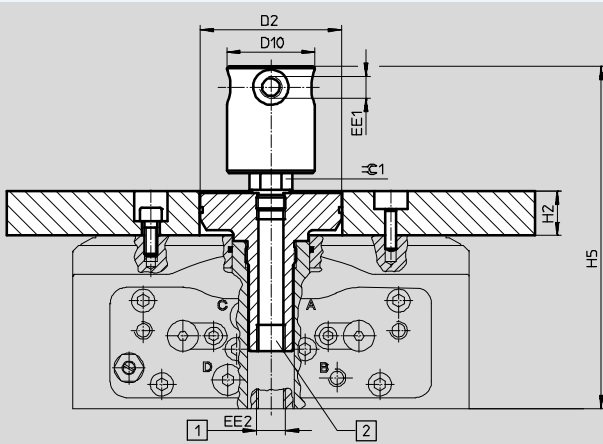


Dimensions

Download CAD data → www.festo.com

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

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



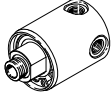
- 1 External supply port for DHTG-65/90
- 2 Internal supply port for DHTG-140/220


Size	D2	D10 Ø +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

Rotary indexing tables DHTG

Accessories

FESTO

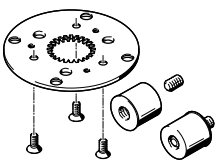
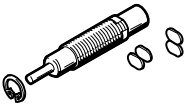
Ordering data – Rotary distributor GF			
	For size	Part No.	Type
	Single		
	65, 90	539290	GF-1/8-M5
	140	539291	GF-1/4-1/8
	220	539292	GF-1/2-1/4
	Multiple		
	220	539287	GF-1/8-2


Ordering data – Adapter kit DADG-AK			
	For size	Part No.	Type
	Single		
	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	



Rotary indexing tables DHTG

Accessories

FESTO

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 sensors, inductive				Technical data → Internet: sien	
	For size	Contact	Connection	Part No.	Type
	65, 90	N/O contact	Plug	150371	SIEN-M5B-PS-S-L
		N/C contact	Plug	150375	SIEN-M5B-PO-S-L
	140, 220	N/O contact	Cable	150386	SIEN-M8B-PS-K-L
			Plug	150387	SIEN-M8B-PS-S-L
		N/C contact	Cable	150390	SIEN-M8B-PO-K-L
			Plug	150391	SIEN-M8B-PO-S-L

Ordering data – Connecting cables				Technical data → Internet: nebu	
	Electrical connection, left	Electrical connection, right	Cable length [m]	Part No.	Type
	Straight socket, M8x1, 3-pin	Cable, open end, 3-wire	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-wire	2.5	541338	NEBU-M8W3-K-2.5-LE3
			5	541341	NEBU-M8W3-K-5-LE3