

Rotary indexing tables DHTG

FESTO



Rotary indexing tables DHTG

Key features

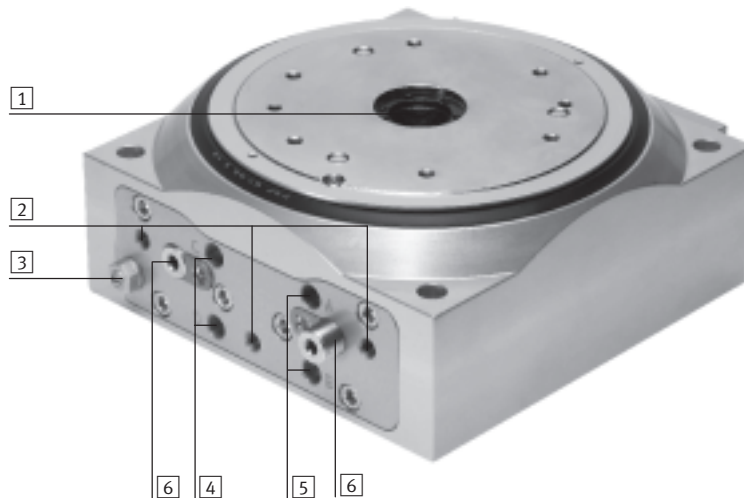
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At a glance

- Robust mechanics
- Simple planning and commissioning
- Number of stations: 2, 3, 4, 6, 8, 12, 24
- Smooth motion sequence, almost sinusoidal acceleration behaviour
- Control options:
 - Anti-clockwise
 - Clockwise
 - Reciprocating motion
- Integrated functions:
 - Overload protection
 - Sensor function
 - Cushioning adjustment
 - Speed setting
 - Changing the direction of rotation

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

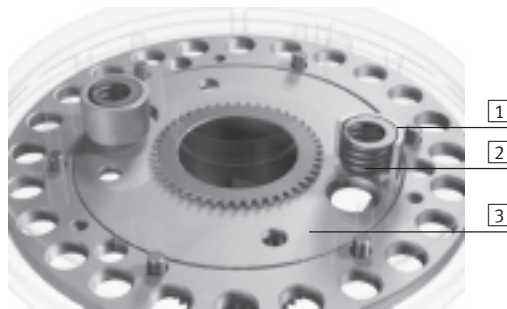


Overload protection

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.

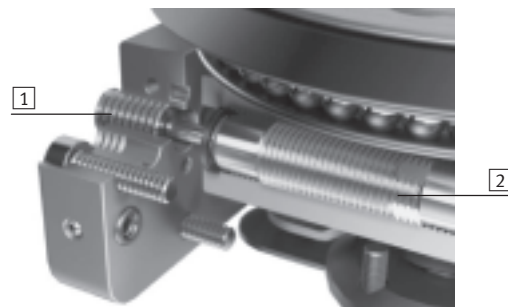
- 1 Securing pin
- 2 Spring
- 3 Toothed segment



Cushioning adjustment

The rotary indexing tables are equipped with a hydraulic shock absorber. The cushioning characteristics can be adjusted using the stop. This is carried out on the front side.

- 1 Stop screw
- 2 Shock absorber

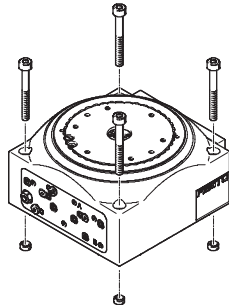


Rotary indexing tables DHTG

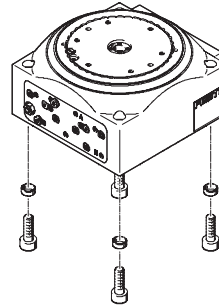
Key features

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

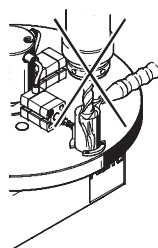
- For the mounting of handling units or other devices in the centre of the rotary indexing table



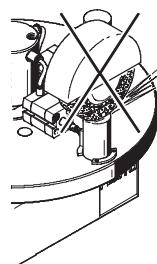
 Note

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

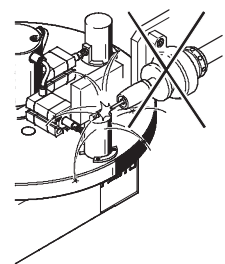
- Machining
- Aggressive media



- Grinding dust



- Welding spatter



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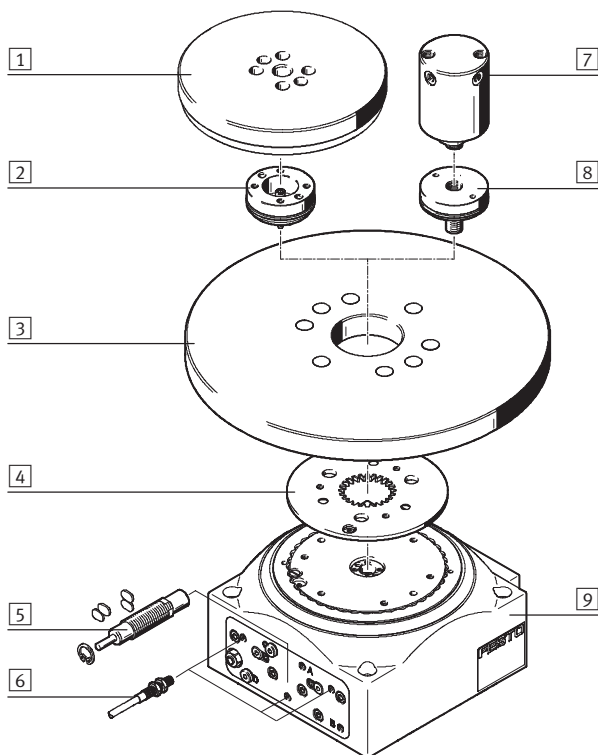
Type codes

FESTO

		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 DADG-UPF	For the mounting of handling units or other devices in the centre of the rotary indexing table	14
2 Adapter kit DADG-AK	For mounting the unmachined plate DADG-UPF on the rotary table	15
3 Unmachined plate, rotating DADG-UPT	Actuators can, depending on the application, be mounted on the unmachined rotating plate	14
4 Indexing conversion kit DADM-CK	The indexing steps can be adjusted at any time using the kit	18
5 Reciprocating motion kit DADM-TK	Allows conversion from movement in one direction to reciprocating movement	18
6 Proximity sensors SIEN	For sensing the switching position of the rotary indexing table	18
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	16
8 Adapter kit DADG-AK-...-G...	For mounting the rotary distributor on the rotary indexing table	17
9 Rotary indexing table DHTG	Flexible range of applications: Anti-clockwise and clockwise rotation or reciprocating motion	6

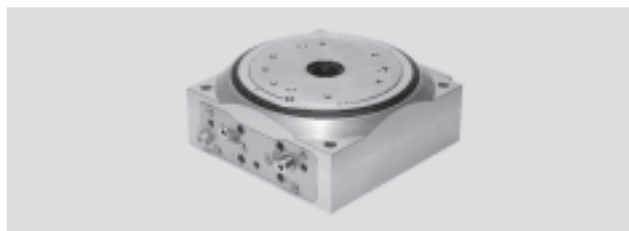
Rotary indexing tables DHTG

Technical data

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 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	[kgm ²]	0.016	0.03	0.3	2.5
Cycle time	➔ 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

Operating and environmental conditions	
Operating medium	Filtered compressed air, grade of filtration 40 µm, lubricated or unlubricated
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

 Note

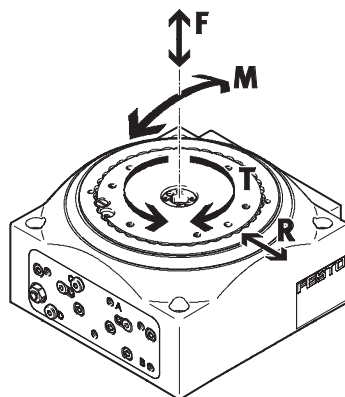
In order to be able to operate a large mass moment of inertia with the rotary indexing tables, they must be equipped with an exhaust air flow control valve.

Rotary indexing tables DHTG

Technical data

Static characteristic load values

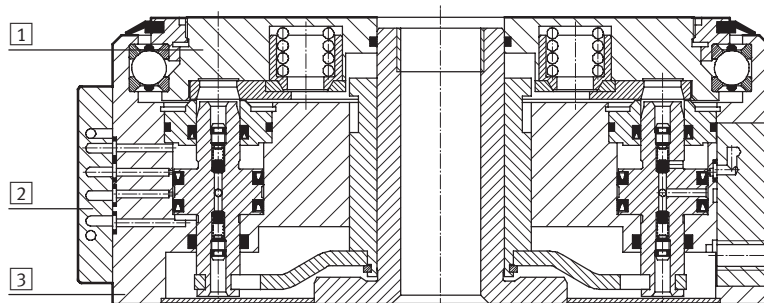
The indicated forces and torques refer to the locked table and can also act on the table plate.



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	Nitrile rubber, polyurethane
Note on material	Free of copper and PTFE
	Conforms to RoHS

Rotary indexing tables DHTG

Technical data

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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

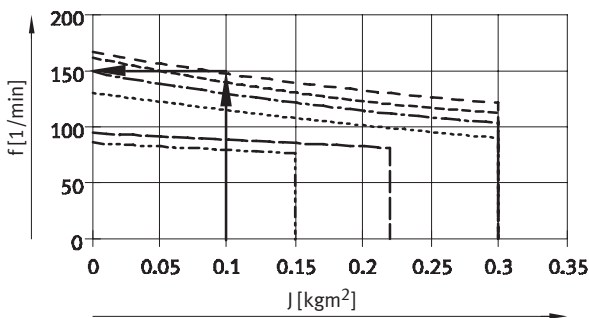
the respective customer application (e.g. time for component removal, press-in time, etc.). A dwell time may be necessary if the cycle time is shorter than the min. possible cycle time.

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



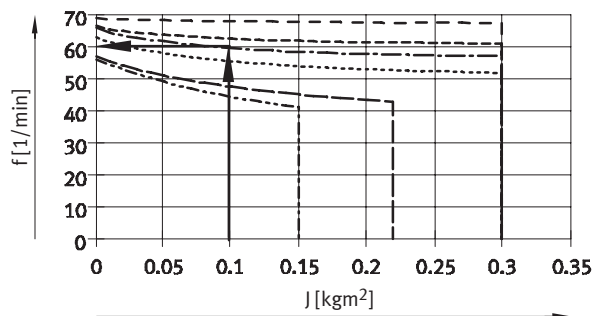
$$T_{\text{switching time}} = \frac{1}{f} = \frac{60s}{130} = 0.461s = 461ms$$

Dwell time = Min. permissible cycle time – Switching time – Processing time
Dwell time = 1017 ms – 461 ms – 300 ms = 256 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



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

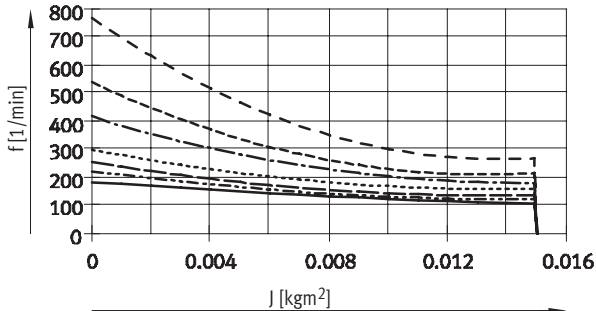
Rotary indexing tables DHTG

Technical data

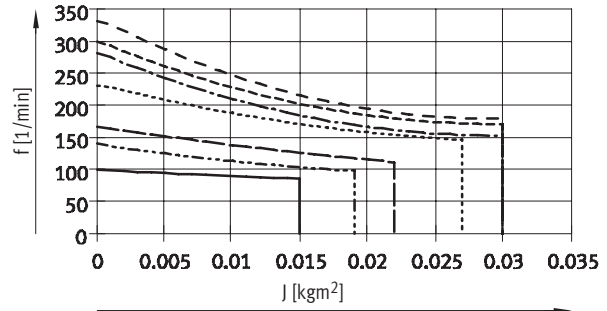
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Switching frequency f as a function of mass moment of inertia J

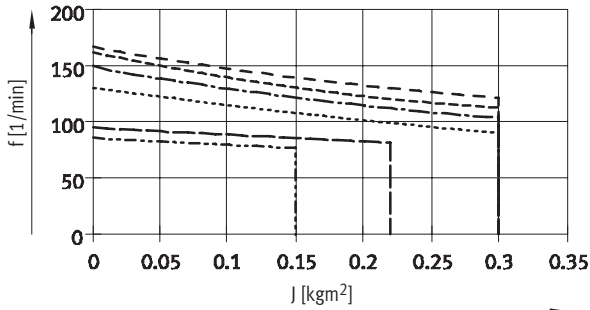
Size 65



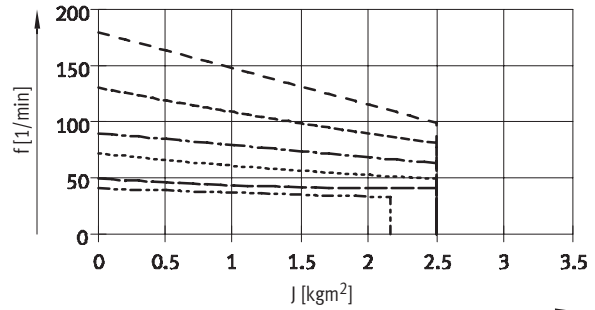
Size 90



Size 140

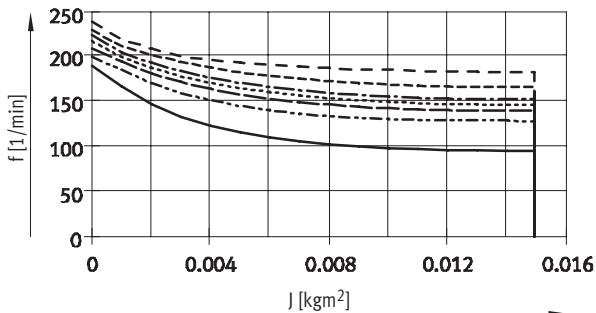


Size 220

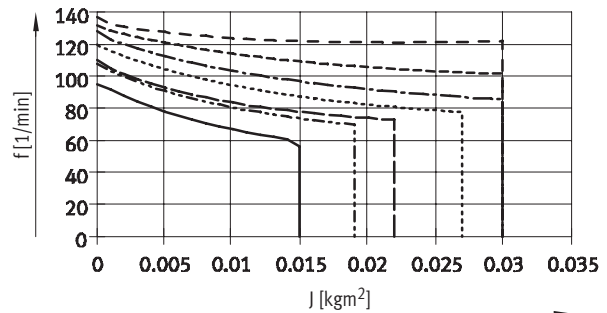


Max. permissible cycle frequency f as a function of mass moment of inertia J

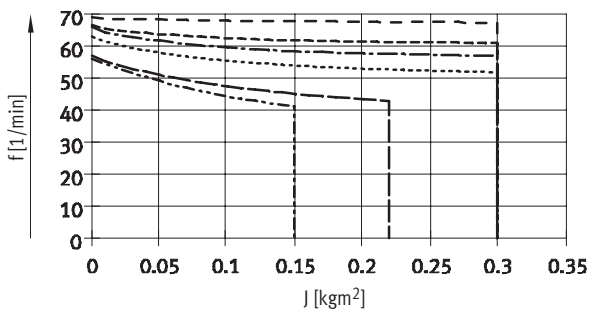
Size 65



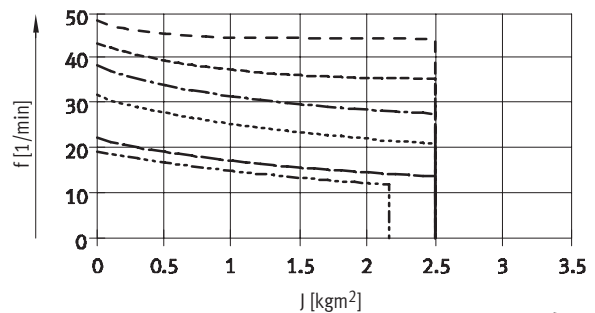
Size 90



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

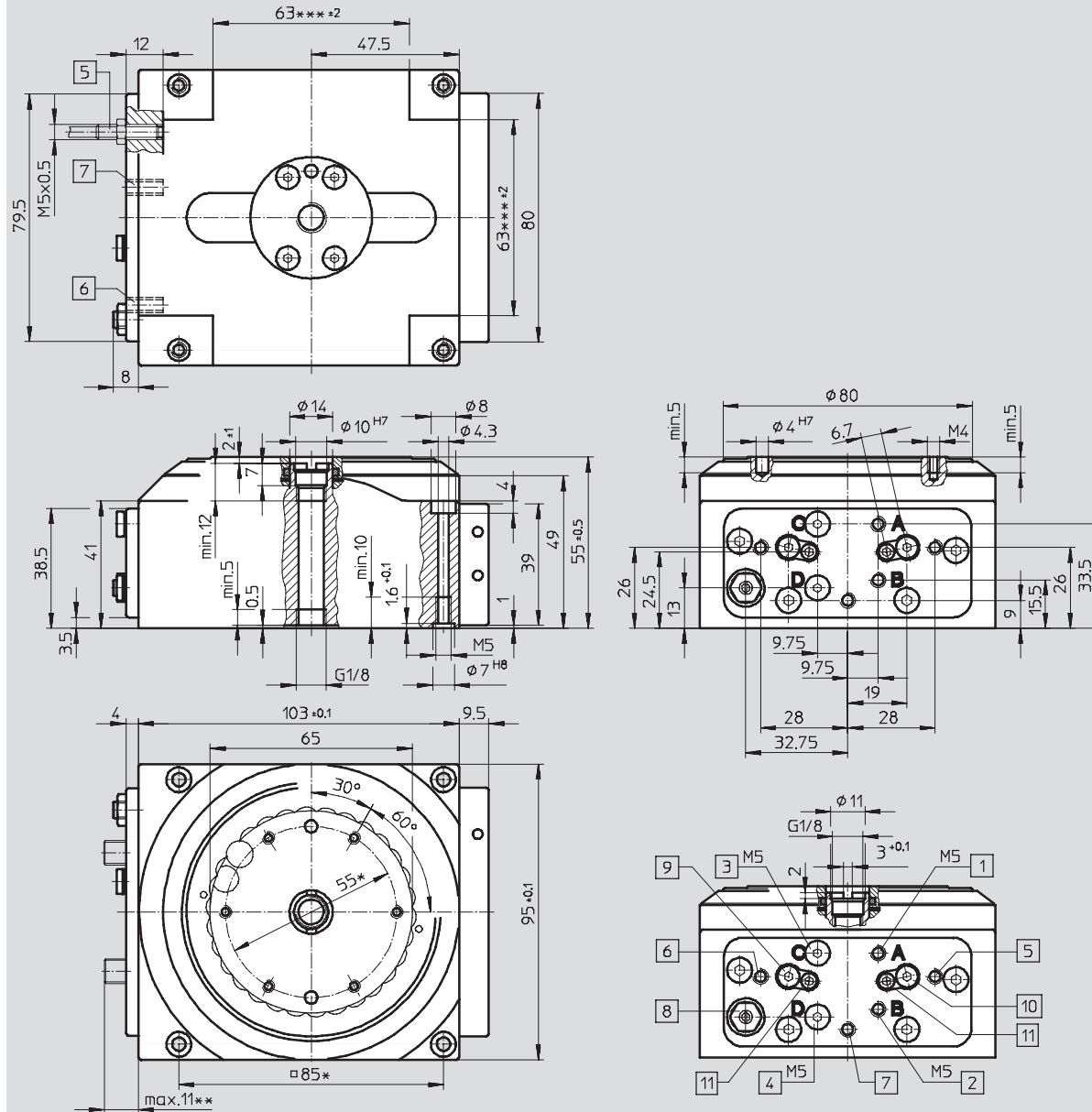
Technical data

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Dimensions

Download CAD data → www.festo.com

Size 65



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

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

Rotary indexing tables DHTG

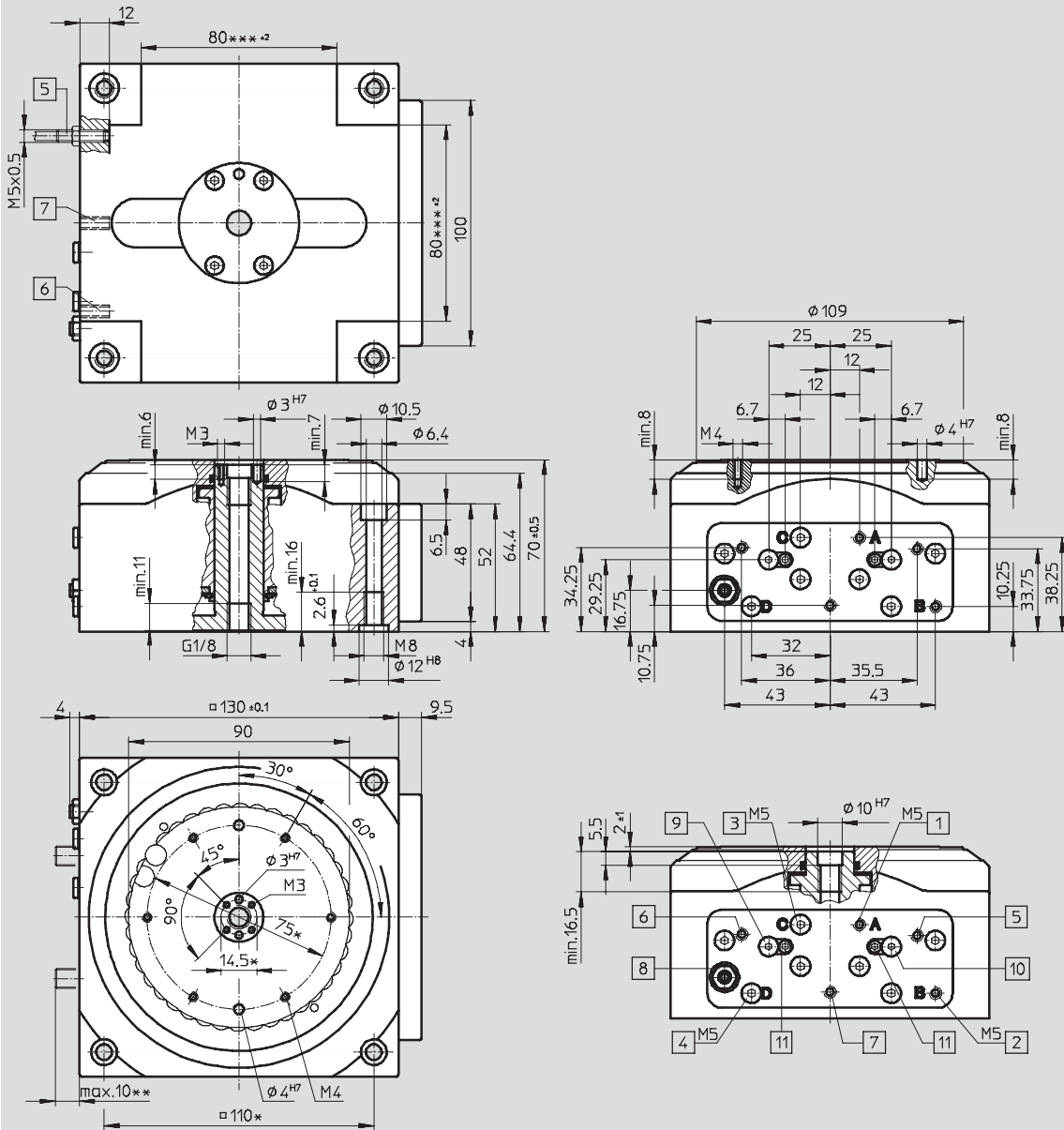
Technical data

FESTO

Dimensions

Download CAD data → www.festo.com

Size 90



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

- | | | | |
|--|---|--|---|
| 1 Supply port: unlock and rotate (reciprocating motion: unlock) | 4 Blanking plug; (reciprocating motion: supply port for anti-clockwise turning) | 7 Sensor lock | 10 Adjustment of end position cushioning for clockwise operation and reciprocating operation (non-applicable for anti-clockwise rotation) |
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Rotary indexing tables DHTG

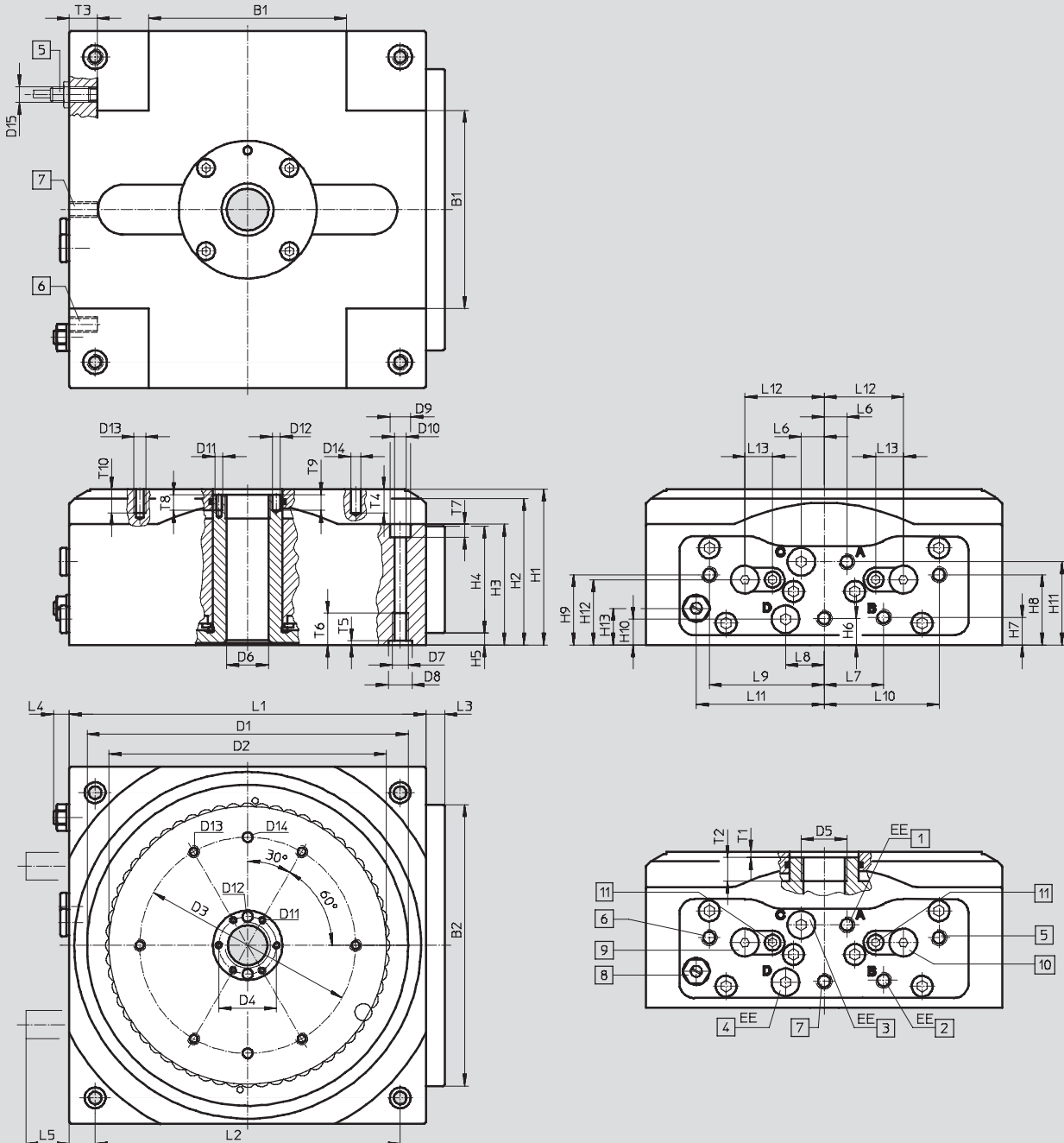
Technical data

FESTO

Dimensions

Sizes 140, 220

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

Rotary indexing tables DHTG

Technical data

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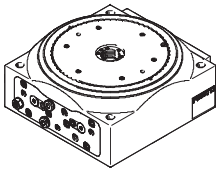
Ø	B1 ¹⁾ ±2	B2	D1 Ø	D2 Ø	D3 ²⁾ Ø	D4 ²⁾ Ø	D5	D6 Ø	D7	D8 Ø H8	D9 Ø	D10 Ø	D11
140	100	142	159	140	109	29	M23x1	22	M8	12	10.5	6.4	M4
220	100	212	239	220	165	67	–	58.4	M10	15	13.5	8.4	M5

Ø	D12 Ø H7	D13	D14 Ø H7	D15	EE	H1 ±0.5	H2	H3	H4	H5	H6	H7	H8
140	4	M6	5	M8x1	G1/8	79	74	61	54	6	13.5	14	35.5
220	5	M8	6	M8x1	G1/8	89	83.5	68.5	64	4.5	13.5	24.5	15

Ø	H9	H10	H11	H12	H13	L1 □ ±0.1	L2 ²⁾ □	L3	L4	L5 ³⁾ max.	L6	L7	L8	L9
140	35.5	13	42	33	18.5	180	154	9.5	8.25	22	11.5	30	19.5	58
220	15	24.5	50.5	36.5	24	270	228	12	4.6	22	41	41	41	61

Ø	L10	L11	L12	L13	T1 ±1	T2 min.	T3 min.	T4 min.	T5 +0.1	T6 min.	T7	T8 min.	T9 min.	T10 min.
140	57.5	64.5	40	14	3	12	14	12	2.1	16	6.5	8	8	12
220	61	99.5	68	14	4	–	19	12	3.1	20	8.5	10	10	13

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

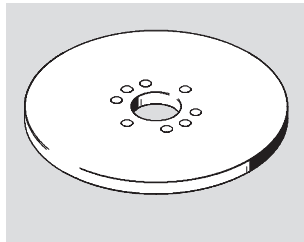
Ordering data				
	Size	Indexing stations	Part No.	Type
	65	2	548 076	DHTG-65-2-A
		3	555 448	DHTG-65-3-A
		4	548 077	DHTG-65-4-A
		6	548 078	DHTG-65-6-A
		8	548 079	DHTG-65-8-A
		12	548 080	DHTG-65-12-A
		24	548 081	DHTG-65-24-A
	90	2	548 082	DHTG-90-2-A
		3	555 449	DHTG-90-3-A
		4	548 083	DHTG-90-4-A
		6	548 084	DHTG-90-6-A
		8	548 085	DHTG-90-8-A
		12	548 086	DHTG-90-12-A
		24	548 087	DHTG-90-24-A
	140	3	555 450	DHTG-140-3-A
		4	548 088	DHTG-140-4-A
		6	548 089	DHTG-140-6-A
		8	548 090	DHTG-140-8-A
		12	548 091	DHTG-140-12-A
		24	548 092	DHTG-140-24-A
	220	3	555 451	DHTG-220-3-A
		4	548 093	DHTG-220-4-A
		6	548 094	DHTG-220-6-A
		8	548 095	DHTG-220-8-A
		12	548 096	DHTG-220-12-A
		24	548 097	DHTG-220-24-A

Rotary indexing tables DHTG

Accessories

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Unmachined table
DADG-UPT, rotating
DADG-UPF, fixed



 Note

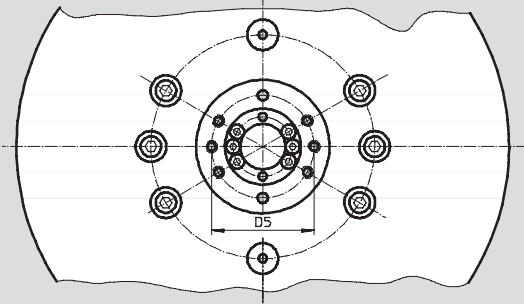
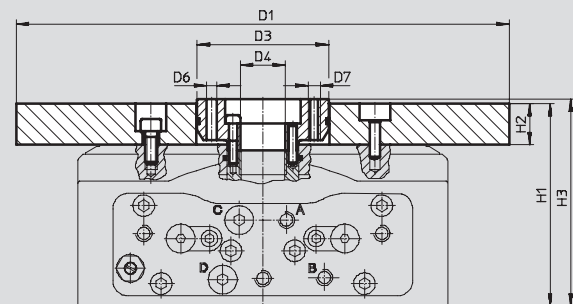
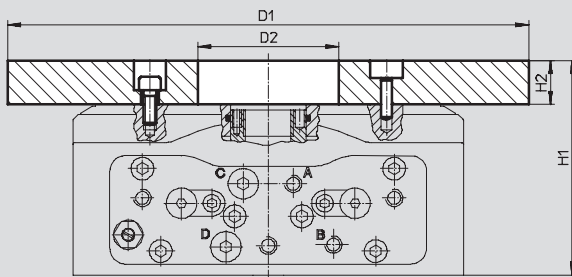
You can order unmachined plates with a standard hole pattern or individual interface via your local contact.

Dimensions

Download CAD data → www.festo.com

With rotating unmachined plate DADG-UPT

With rotating unmachined plate DADG-UPT and adapter kit DADG-AK for mounting the fixed unmachined plate DADG-UPF



Size	D1 ¹⁾ Ø ±0.3	D2 Ø +0.1	H1 ±0.5	H2 ²⁾ ±0.1
With rotating unmachined plate				
DADG-UPT-65	90 ... 170	30.3	70	15
DADG-UPT-90	120 ... 210	40.4	85	15
DADG-UPT-140	170 ... 350	65.3	99	20
DADG-UPT-220	250 ... 550	105.4	103	20

Size	D1 ¹⁾ Ø ±0.3	D3 Ø +0.2	D4 Ø +0.2	D5 Ø	D6 Ø H7	D7	H1 ±0.5	H2 ²⁾ ±0.1	H3 ±0.5
With rotating unmachined plate and adapter kit									
DADG-UPT-65 DADG-AK-65	90 ... 170	29	5	20	4	M4	70	15	72
DADG-UPT-90 DADG-AK-90	120 ... 210	39	9	30	4	M4	85	15	87
DADG-UPT-140 DADG-AK-140	170 ... 350	64	22	50	5	M6	99	20	101
DADG-UPT-220 DADG-AK-220	250 ... 550	104	58.4	90	6	M8	109	20	111

1) Plate diameter as required

2) Plate thickness can be reduced by up to 5 mm

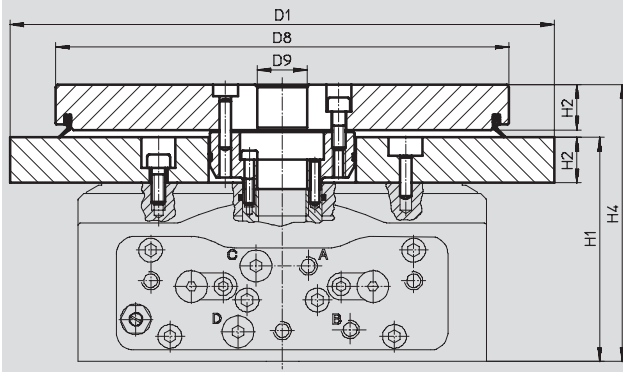
Rotary indexing tables DHTG

Accessories

Dimensions

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With rotating unmachined plate DADG-UPT and fixed unmachined plate DADG-UPF



Note

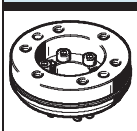
The adapter kit DADG-AK is required for mounting the fixed unmachined plate DADG-UPF.

Size	D1 ¹⁾ Ø ±0.3	D8 Ø ±0.3	D9 Ø +0.2	H1 ±0.5	H2 ²⁾ ±0.1	H4 ±0.5
DADG-UPT-65 DADG-UPF-65 DADG-AK-65	90 ... 170	50 ... 90	5	70	15	87
DADG-UPT-90 DADG-UPF-90 DADG-AK-90	120 ... 210	60 ... 120	10	85	15	102
DADG-UPT-140 DADG-UPF-140 DADG-AK-140	170 ... 350	100 ... 200	22	99	20	121
DADG-UPT-220 DADG-UPF-220 DADG-AK-220	250 ... 550	140 ... 300	60	109	20	131

1) Plate diameter as required

2) Plate thickness can be reduced by up to 5 mm

Ordering data – Adapter kit DADG-AK

	For size	Part No.	Type
	65	555 424	DADG-AK-65
	90	555 425	DADG-AK-90
	140	555 426	DADG-AK-140
	220	555 427	DADG-AK-220

Rotary indexing tables DHTG

Accessories

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Rotary distributor

GF-..., single

GF-...-2, multiple

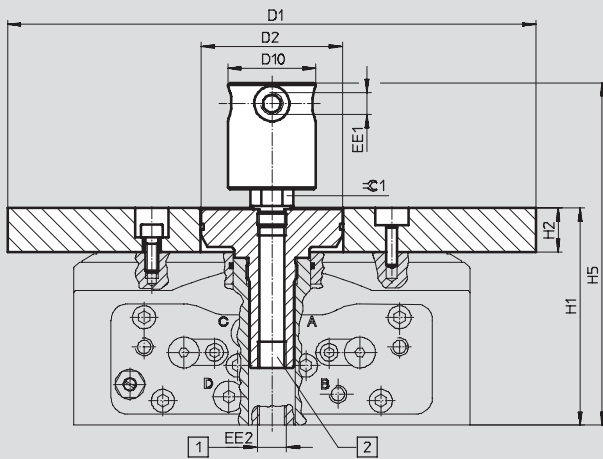


Dimensions

Download CAD data → www.festo.com

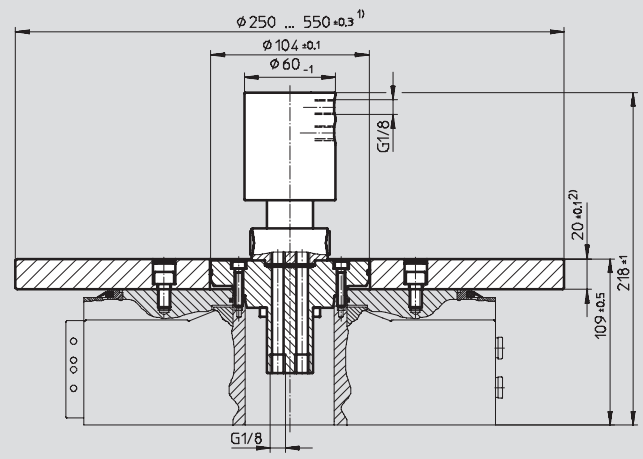
With rotary distributor GF-... (single) and adapter kit DADG-AK-...

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



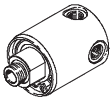
Size	D1 ¹⁾ Ø ±0.3	D2	D10 Ø +0.2	EE1	EE2	H1 ±0.5	H2 ²⁾ ±0.1	H5 ±1	≈ 1
DADG-UPT-65 DADG-AK-65-1G18 GF-1/8-M5	90 ... 170	29	40	M5	G1/8	70	15	127.5	17
DADG-UPT-90 DADG-AK-90-1G18 GF-1/8-M5	120 ... 210	39	40	M5	G1/8	85	15	142.5	17
DADG-UPT-140 DADG-AK-140-1G14 GF-1/4-1/8	170 ... 350	64	40	G1/8	G1/4	99	20	155.5	17
DADG-UPT-220 DADG-AK-220-1G12 GF-1/2-1/4	250 ... 550	104	60	G1/4	G1/2	109	20	187.5	27

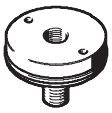
1) Plate diameter as required

2) Plate thickness can be reduced by up to 5 mm

Rotary indexing tables DHTG

Accessories

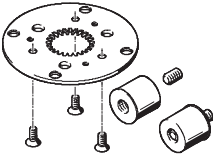
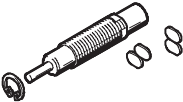
Ordering data – Rotary distributor GF			
	For size	Part No.	Type
	Single		
	65, 90	539 290	GF-1/8-M5
	140	539 291	GF-1/4-1/8
	220	539 292	GF-1/2-1/4
	Multiple		
	220	539 287	GF-1/8-2


Ordering data – Adapter kit DADG-AK			
	For size	Part No.	Type
	Single		
	65	555 428	DADG-AK-65-1G18
	90	555 429	DADG-AK-90-1G18
	140	555 430	DADG-AK-140-1G14
	220	555 431	DADG-AK-220-1G12
	Multiple		
	220	555 432	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	548 098	DADM-CK-65-2
		3	554 389	DADM-CK-65-3
		4	548 099	DADM-CK-65-4
		6	548 100	DADM-CK-65-6
		8	548 101	DADM-CK-65-8
		12	548 102	DADM-CK-65-12
		24	548 103	DADM-CK-65-24
	90	2	548 104	DADM-CK-90-2
		3	555 445	DADM-CK-90-3
		4	548 105	DADM-CK-90-4
		6	548 106	DADM-CK-90-6
		8	548 107	DADM-CK-90-8
		12	548 108	DADM-CK-90-12
		24	548 109	DADM-CK-90-24
	140	3	555 446	DADM-CK-140-3
		4	548 110	DADM-CK-140-4
		6	548 111	DADM-CK-140-6
		8	548 112	DADM-CK-140-8
		12	548 113	DADM-CK-140-12
		24	548 114	DADM-CK-140-24
	220	3	555 447	DADM-CK-220-3
		4	548 115	DADM-CK-220-4
		6	548 116	DADM-CK-220-6
		8	548 117	DADM-CK-220-8
		12	548 118	DADM-CK-220-12
		24	548 119	DADM-CK-220-24
Reciprocating motion kit DADM-TK				
	65	–	548 120	DADM-TK-65
	90		548 121	DADM-TK-90
	140		563 304	DADM-TK-140
	220		563 305	DADM-TK-220

Ordering data – Proximity sensors, inductive				Technical data → Internet: sien	
	For size	Contact	Connection	Part No.	Type
	65, 90	N/O contact	Cable	150 370	SIEN-M5B-PS-K-L
			Plug	150 371	SIEN-M5B-PS-S-L
		N/C contact	Cable	150 374	SIEN-M5B-PO-K-L
			Plug	150 375	SIEN-M5B-PO-S-L
	140, 220	N/O contact	Cable	150 386	SIEN-M8B-PS-K-L
			Plug	150 387	SIEN-M8B-PS-S-L
		N/C contact	Cable	150 390	SIEN-M8B-PO-K-L
			Plug	150 391	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	541 333	NEBU-M8G3-K-2.5-LE3
			5	541 334	NEBU-M8G3-K-5-LE3
	Angled socket, M8x1, 3-pin	Cable, open end, 3-wire	2.5	541 338	NEBU-M8W3-K-2.5-LE3
			5	541 341	NEBU-M8W3-K-5-LE3