

## Quarter turn actuators DFPB

**FESTO**



# Quarter turn actuators DFPB

Key features

## General

- The DFPB quarter turn actuator is a rack and pinion combination that converts the linear movement of the shaft. Quarter turn actuators based on this principle exhibit an identical torque characteristic across the entire rotation angle range of 90°.

## Function

- In addition to the ISO 5211 interface, all of the quarter turn actuators in the DFPB series have a so-called pressure relief slot at either end. This enables the DFPB to be mounted on all process valves regardless of whether or not the process valve features this slot, which is a requirement for the chemical industry. This greatly increases the applications of the process valves
- Standards-based (VDI/VDE 3845) hole patterns 30/80 as standard for direct mounting of a range of common peripheral devices such as sensor boxes for end position display and controllers for accurate positioning

## Design

- Compact design
- One housing for double and single-acting actuators
- Constant torque characteristic
- Long service life, low wear thanks to an innovative pressure-dependent lip seal
- The pressure relief slot in the housing means that all process valves can be used in the chemical industry, regardless of whether or not the process valve flange features this slot
- Operation with clockwise and anti-clockwise rotation thanks to the process valve connection to ISO 5211 on both sides

## Easy to clean

- Resistant to conventional cleaning agents
- Sturdy, non-slip and easy-to-clean aluminium housing offers greater safety even in corrosive atmospheres
- No countersunk holes, radii as per FDA directive
- Increased corrosion protection

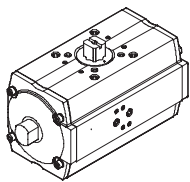
## Easy to mount

- Flexible attachment options thanks to choice of mounting adapters as accessory
- Extremely fine torque gradation for optimum adaptation to the process valve
- The DFPB actuator series is maintenance-free. When changing the seal, only 1 Allen key is needed to dismantle the entire actuator

## Variants

DFPB-...

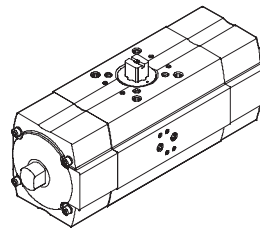
Double-acting



A spare part kit is available for each size of the quarter turn actuator DFPB. This includes all wearing parts such as seals, O-rings, slip bands and bearings needed to repair a DFPB.

DFPB-...-S

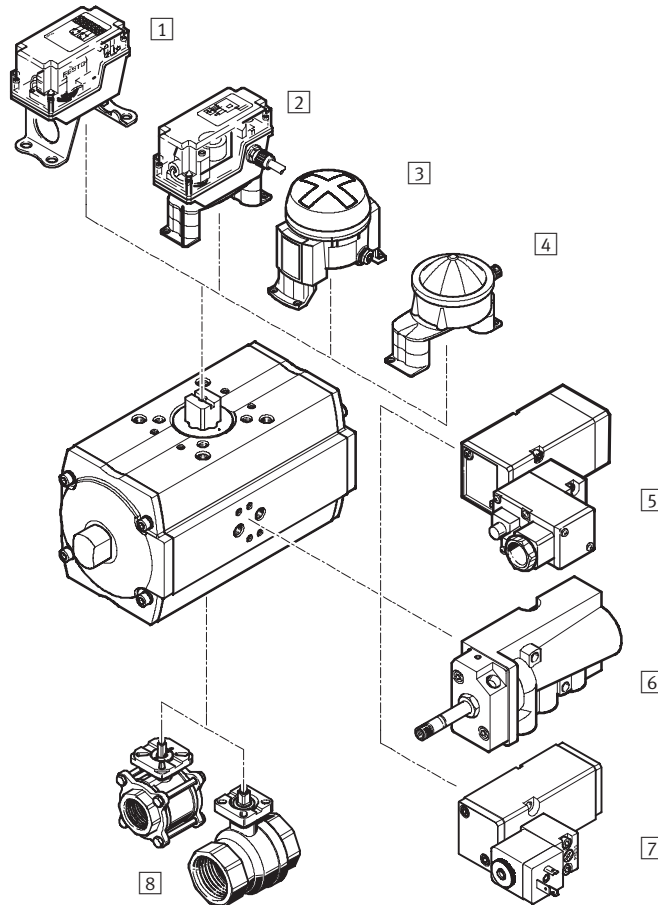
Single-acting



The single-acting actuators are each available with 4 different spring types S3-S6 for adapting to 4 pressure levels from 3 ... 6 bar.

# Quarter turn actuators DFPB

Peripherals overview



Mounting attachments and accessories		
	Brief description	→ Page/Internet
1	Limit switch attachment QH-DR-E	qh-dr-e
2	Limit switch attachment DAPZ	dapz
3	Limit switch attachment DAPZ	dapz
4	Limit switch attachment DAPZ	dapz
5	Solenoid valve MFH	mfh
	Solenoid valve MN1H	mn1h
	Solenoid valve MGTBH	mgtbh
6	Solenoid valve NVF3	nvf3
7	Solenoid valve VSNB	vsnb
8	Ball valve VAPB	vapb

# Quarter turn actuators DFPB

Type codes

DFPB - 10 - 90 - S - 3 - F03

Type	
DFPB	Quarter turn actuator

Size [Nm]	
10	Size 10
20	Size 20
30	Size 30
45	Size 45
65	Size 65
80	Size 80
120	Size 120
170	Size 170
230	Size 230
300	Size 300

**Swivel angle [°]**

Function	
-	Double-acting
S	Single-acting quarter turn actuator

Spring index	
3	
4	
5	
6	

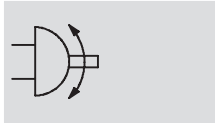
Flange pattern	
F03	Hole pattern F03
F04	Hole pattern F04
F05	Hole pattern F05
F0507	Hole pattern F05 and F07
F0710	Hole pattern F07 and F10


# Quarter turn actuators DFPB, double-acting

Technical data

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Function



 Swivel angle  
0 ... 90°



 Size  
10 ... 300

 Torque  
7 ... 270 Nm

General technical data										
Size	10	20	30	45	65	80	120	170	230	300
Flange hole pattern	F03	F04		F05			F0507	F0710		
Pneumatic connection	G $\frac{1}{8}$									
Constructional design	Rack and pinion									
Mode of operation	Double-acting									
Mounting position	Any									
Swivel angle [°]	0 ... 90									
End position adjustment range [°]	-4 ... +4									
Closing direction	Any									
Position sensing	No									
Cushioning	No									

Ambient conditions										
Size	10	20	30	45	65	80	120	170	230	300
Operating pressure [bar]	1 ... 8									
Nominal operating pressure [bar]	5.6									
Operating medium	Dried, filtered compressed air									
Ambient temperature <sup>1)</sup> [°C]	-20 ... +80									
Corrosion resistance class CRC <sup>2)</sup>	3									
CE mark (see declaration of conformity) → <a href="http://www.festo.com">www.festo.com</a>	EU explosion protection directive (ATEX)									
ATEX category gas	II 2G									
Explosion ignition protection type gas	c T4									
ATEX category dust	II 2D									
Explosion ignition protection type dust	c 125°C									
Explosion-proof ambient temperature <sup>1)</sup>	-20°C ≤ T <sub>a</sub> ≤ +80°C									

1) Note operating range of proximity sensors.

2) Corrosion resistance class 3 as per Festo standard 940 070

Components requiring higher corrosion resistance. External visible parts in direct contact with industrial atmospheres or media such as solvents and cleaning agents, with a predominantly functional requirement for the surface.

Air consumption [l/cycle] at 6 bar										
Size					Size					
DFPB-10	0.18				DFPB-80	1.66				
DFPB-20	0.45				DFPB-120	2.42				
DFPB-30	0.62				DFPB-170	3.5				
DFPB-45	0.89				DFPB-230	4.72				
DFPB-65	1.33				DFPB-300	6.07				

## Quarter turn actuators DFPB, double-acting

Technical data

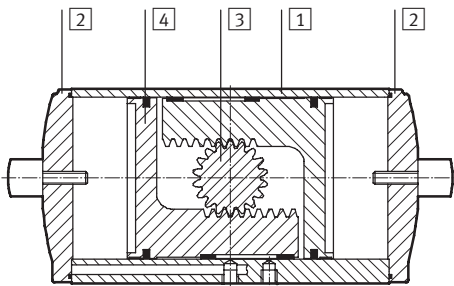
Weight [g]										
Size	10	20	30	45	65	80	120	170	230	300
Product weight	500	1,000	1,300	1,700	2,200	2,600	4,200	5,200	7,100	7,800

Actual torque [Nm]										
Size	10	20	30	45	65	80	120	170	230	300
Torque <sup>1)</sup>	7	18	29	38	53	71	106	154	210	270

<sup>1)</sup>Torque at nominal operating pressure and 0° swivel angle

### Materials

Sectional view



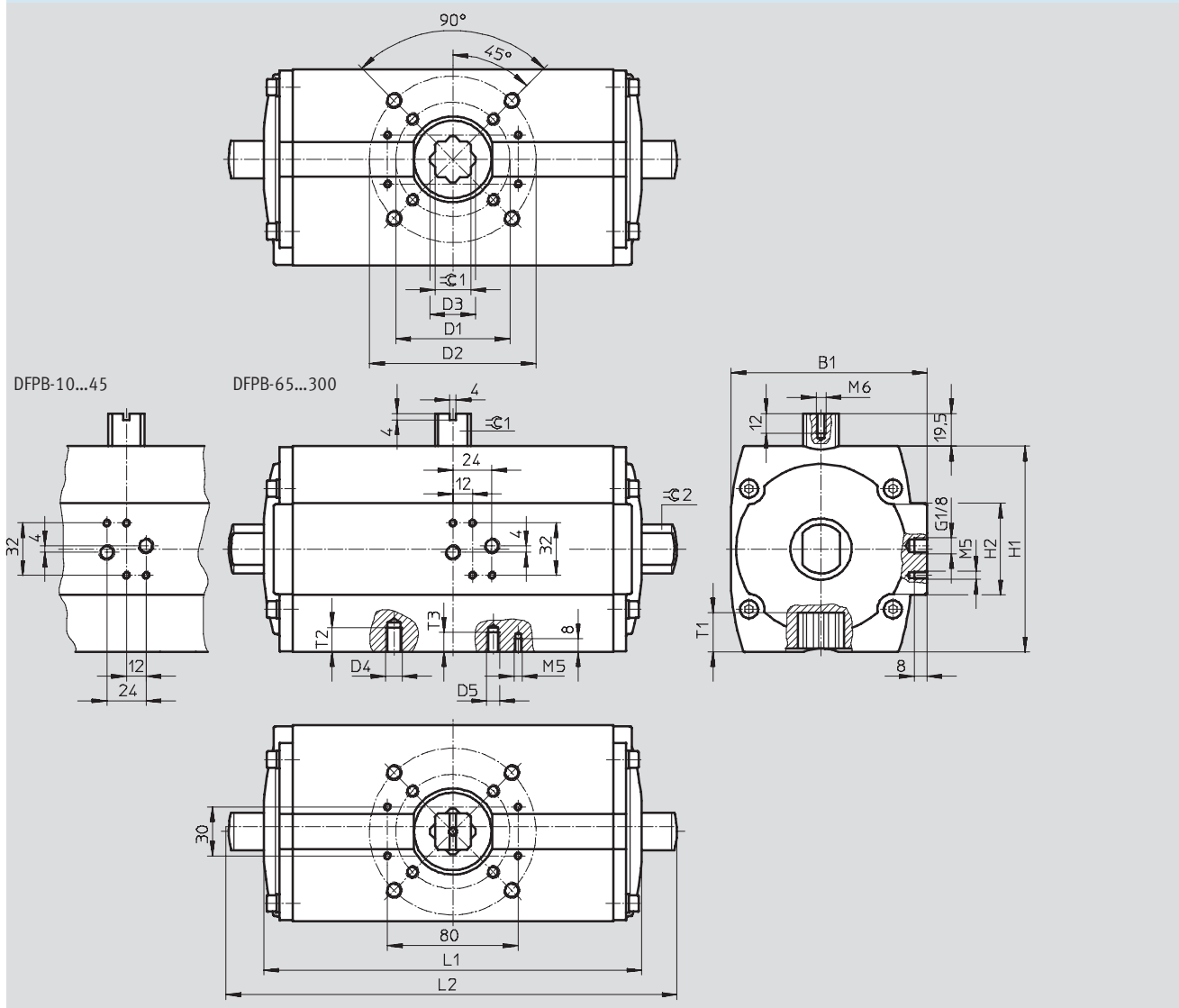
Quarter turn actuator		
1	Housing	Anodised aluminium
2	End cap	Die-cast aluminium, coated
3	Shaft	Anodised aluminium
4	Piston	Die-cast aluminium
-	Screws	High-alloy stainless steel
-	Seals	Polyurethane, nitrile rubber

# Quarter turn actuators DFPB, double-acting

Technical data

**Dimensions**

Download CAD data → [www.festo.com](http://www.festo.com)



Size	B1	D1 ∅	D2 ∅	D3 ∅ min.	D4	D5	H1	H2	L1	L2	T1	T2 min.	T3 min.	⊖G1	⊖G2
DFPB-10	50	-	36	12.1	M5	-	49	45	111	135	10	8	-	9	11
DFPB-20	66		42	14.1			65	49	130.6	154.6	12				
DFPB-30	79.5		126.2	157.8			152		183.6						
DFPB-45			159.3	190	16		9	14							
DFPB-65	96.5		50	18.1	M6		100	183.6	215.2	19	12	9		17	
DFPB-80		120	50	70	22.2	M8	M6	126	56	181.4	224.4	19	12	9	17
DFPB-120	120	70	102	28.2	M10	M8	156	70	231.5	274.5	24	15	12	22	23
DFPB-170									234.2	277.2					
DFPB-230	145	70	102	28.2	M10	M8	156	70	265.1	308.1	24	15	12	22	
DFPB-300									265.1	308.1					

## Quarter turn actuators DFPB, double-acting

Technical data

Ordering data		Ordering data	
Part No.	Type	Part No.	Type
Size 10		Size 80	
557 539	DFPB-10-090-F03	557 544	DFPB-80-090-F05
Size 20		Size 120	
557 540	DFPB-20-090-F04	557 545	DFPB-120-090-F0507
Size 30		Size 170	
557 541	DFPB-30-090-F04	557 546	DFPB-170-090-F0710
Size 45		Size 230	
557 542	DFPB-45-090-F05	557 547	DFPB-230-090-F0710
Size 65		Size 300	
557 543	DFPB-65-090-F05	557 548	DFPB-300-090-F0710

Ordering data – Wearing parts kits		Ordering data – Wearing parts kits	
Part No.	Type	Part No.	Type
Size 10		Size 80	
–	DFPB-10-R-090-SP	–	DFPB-80-R-090-SP
Size 20		Size 120	
–	DFPB-20-R-090-SP	–	DFPB-120-R-090-SP
Size 30		Size 170	
–	DFPB-30-R-090-SP	–	DFPB-170-R-090-SP
Size 45		Size 230	
–	DFPB-45-R-090-SP	–	DFPB-230-R-090-SP
Size 65		Size 300	
–	DFPB-65-R-090-SP	–	DFPB-300-R-090-SP

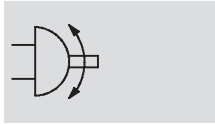



# Quarter turn actuators DFPB, single-acting

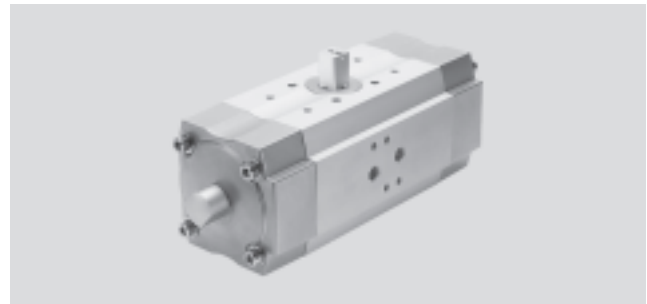
Technical data




## Function



 Swivel angle  
0 ... 90°



 Size  
20-S ... 150-S

 Torque  
5.92 ... 99 Nm

General technical data							
Size	20-S	30-S	40-S	60-S	80-S	110-S	150-S
Flange hole pattern	F05			F0507	F0710		
Pneumatic connection	G $\frac{1}{8}$						
Constructional design	Rack and pinion						
Mode of operation	Single-acting						
Mounting position	Any						
Swivel angle [°]	90						
End position adjustment range [°]	-4 ... +4						
Closing direction	Any						
Position sensing	No						
Cushioning	No						

Ambient conditions							
Size	20-S	30-S	40-S	60-S	80-S	110-S	150-S
Operating pressure <sup>1)</sup> [bar]	1 ... 8						
Nominal operating pressure [bar]	5.6						
Operating medium	Dried, filtered compressed air						
Ambient temperature <sup>2)</sup> [°C]	-20 ... +80						
Corrosion resistance class CRC <sup>3)</sup>	3						
CE mark (see declaration of conformity) → <a href="http://www.festo.com">www.festo.com</a>	EU explosion protection directive (ATEX)						
ATEX category gas	II 2G						
Explosion ignition protection type gas	c T4						
ATEX category dust	II 2D						
Explosion ignition protection type dust	c 125°C						
Explosion-proof ambient temperature <sup>2)</sup>	-20°C ≤ T <sub>a</sub> ≤ +80°C						

1) Minimum operating pressures vary for single-acting quarter turn actuators depending on spring quantity

2) Note operating range of proximity sensors.

3) Corrosion resistance class 3 as per Festo standard 940 070

Components requiring higher corrosion resistance. External visible parts in direct contact with industrial atmospheres or media such as solvents and cleaning agents, with a predominantly functional requirement for the surface.

Air consumption [l/cycle] at 6 bar			
Size		Size	
DFPB-20-S	0.44	DFPB-80-S	1.75
DFPB-30-S	0.66	DFPB-110-S	2.36
DFPB-40-S	0.83	DFPB-150-S	3.04
DFPB-60-S	1.21		

# Quarter turn actuators DFPB, single-acting

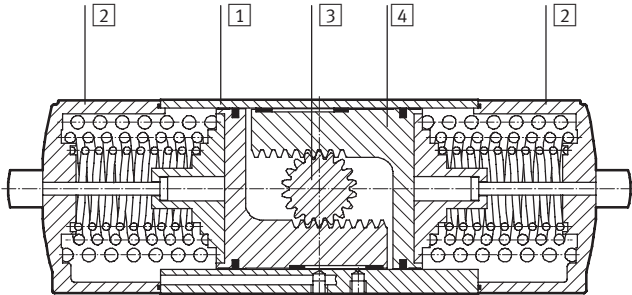
Technical data

Weight [g]							
Size	20-S	30-S	40-S	60-S	80-S	110-S	150-S
Product weight <sup>1)</sup>	3,100	4,400	5,200	8,800	10,700	16,700	18,800

1) S6 version

## Materials

Sectional view



Quarter turn actuator		
1	Housing	Wrought aluminium alloy
2	End cap	Die-cast aluminium, coated
3	Shaft	Anodised aluminium
4	Piston	Die-cast aluminium
-	Springs	Steel
-	Screws	High-alloy stainless steel
-	Seals	Nitrile rubber

# Quarter turn actuators DFPB, single-acting

Technical data

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Actual torque [Nm] as a function of operating pressure [bar] and swivel angle [°]						
Type	Nominal swivel angle	Springs	Operating pressure [bar]			
Springs	[°]		3	4	5	6
Size DFPB 20-S						
3	0	12.1	12	20	28.1	36.1
	90	18.2	5.92	14	22	30
4	0	16.2	–	16	24	32.1
	90	24.2	–	7.9	15.9	24
5	0	20.2	–	–	20	28
	90	30.3	–	–	9.87	17.9
6	0	24.2	–	–	–	24
	90	36.4	–	–	–	11.8
Size DFPB 30-S						
3	0	18.1	16.7	28.3	39.9	51.5
	90	27.1	7.68	19.3	30.9	42.5
4	0	24.1	–	22.3	33.9	45.5
	90	36.2	–	10.2	21.8	33.5
5	0	30.2	–	–	27.9	39.5
	90	45.2	–	–	12.8	24.4
6	0	36.2	–	–	–	33.5
	90	54.3	–	–	–	15.4
Size DFPB 40-S						
3	0	22.6	20.2	34.5	48.8	63.1
	90	33.9	8.93	23.2	37.5	51.8
4	0	30.2	–	27	41.3	55.6
	90	45.2	–	11.9	26.2	40.5
5	0	37.7	–	–	33.7	48
	90	56.6	–	–	14.9	29.2
6	0	45.2	–	–	–	40.5
	90	67.9	–	–	–	17.9
Size DFPB 60-S						
3	0	33	31.3	52.7	74.2	95.6
	90	49.5	14.8	36.2	57.7	79.1
4	0	44	–	41.7	63.2	84.6
	90	66	–	19.7	41.2	62.6
5	0	55	–	–	52.2	73.6
	90	82.5	–	–	24.7	46.1
6	0	66	–	–	–	62.6
	90	99	–	–	–	29.6

## Quarter turn actuators DFPB, single-acting

Technical data

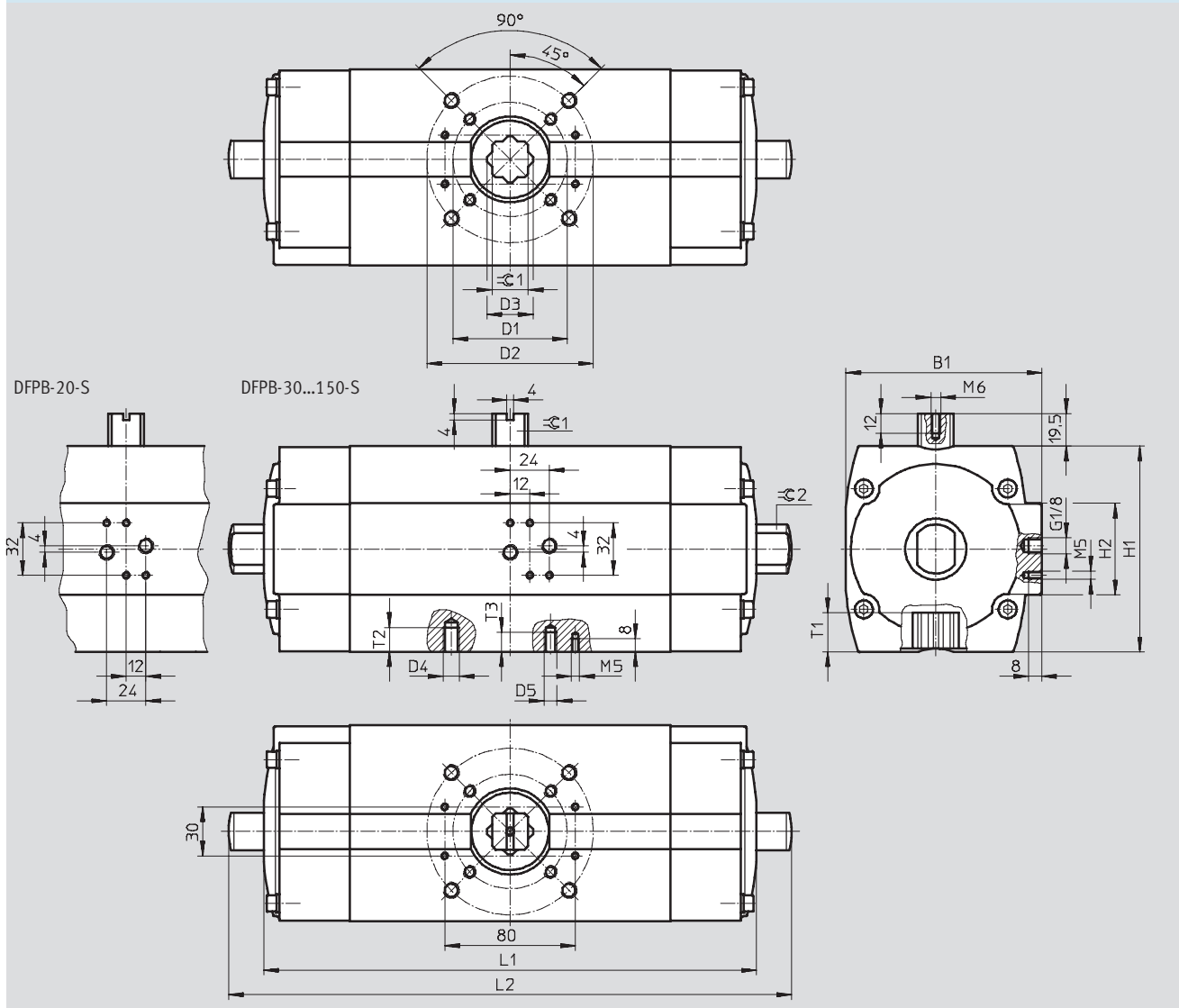
Actual torque [Nm] as a function of operating pressure [bar] and swivel angle [°]						
Type	Nominal swivel angle	Springs	Operating pressure [bar]			
Springs	[°]		3	4	5	6
<b>Size DFPB 80-S</b>						
3	0	47.7	43.4	73.7	104	134
	90	71.6	19.5	49.9	80.2	111
4	0	63.6	–	57.8	88.2	119
	90	95.4	–	26	65.4	86.7
5	0	79.5	–	–	72.3	103
	90	119	–	–	32.5	62.9
6	0	95.4	–	–	–	86.7
	90	143	–	–	–	39
<b>Size DFPB 110-S</b>						
3	0	64.3	58.9	100	141	182
	90	96.5	26.7	67.8	109	150
4	0	85.8	–	78.5	120	161
	90	129	–	35.6	76.7	118
5	0	107	–	–	98.1	139
	90	161	–	–	44.4	85.5
6	0	129	–	–	–	118
	90	193	–	–	–	53.3
<b>Size DFPB 150-S</b>						
3	0	82.8	77.9	131	185	239
	90	124	36.5	90	144	197
4	0	110	–	104	157	211
	90	166	–	48.6	102	156
5	0	138	–	–	130	183
	90	207	–	–	60.8	114
6	0	166	–	–	–	156
	90	249	–	–	–	72.9

# Quarter turn actuators DFPB, single-acting

Technical data

**Dimensions**

Download CAD data → [www.festo.com](http://www.festo.com)



Size	B1	D1 ∅	D2 ∅	D3 ∅ min.	D4	D5	H1	H2	L1	L2	T1	T2	T3	⌀C1	⌀C2
											min.	min.	min.		
DFPB-20-S	79.5						83		204	235.6					
DFPB-30-S	96.5	-	50	18.1	M6	-	100	49	234.3	265.9	16	9	-	14	17
DFPB-40-S									258.8	290.4					
DFPB-60-S	120	50	70	22.2	M8	M6	126	56	291.6	334.6	19	12	9	17	23
DFPB-80-S									341.7	384.7					
DFPB-110-S	145	70	102	28.2	M10	M8	156	70	377.5	420.5	24	15	12	22	
DFPB-150-S									408.4	451.4					

## Quarter turn actuators DFPB, single-acting

Technical data

Ordering data		Ordering data	
Part No.	Type	Part No.	Type
Size 20-S		Size 80-S	
557 549	DFPB-20-090-S3-F05	557 565	DFPB-80-090-S3-F0710
557 550	DFPB-20-090-S4-F05	557 566	DFPB-80-090-S4-F0710
557 551	DFPB-20-090-S5-F05	557 567	DFPB-80-090-S5-F0710
557 552	DFPB-20-090-S6-F05	557 568	DFPB-80-090-S6-F0710
Size 30-S		Size 110-S	
557 553	DFPB-30-090-S3-F05	557 569	DFPB-110-090-S3-F0710
557 554	DFPB-30-090-S4-F05	557 570	DFPB-110-090-S4-F0710
557 555	DFPB-30-090-S5-F05	557 571	DFPB-110-090-S5-F0710
557 556	DFPB-30-090-S6-F05	557 572	DFPB-110-090-S6-F0710
Size 40-S		Size 150-S	
557 557	DFPB-40-090-S3-F05	557 573	DFPB-150-090-S3-F0710
557 558	DFPB-40-090-S4-F05	557 574	DFPB-150-090-S4-F0710
557 559	DFPB-40-090-S5-F05	557 575	DFPB-150-090-S5-F0710
557 560	DFPB-40-090-S6-F05	557 576	DFPB-150-090-S6-F0710
Size 60-S			
557 561	DFPB-60-090-S3-F0507		
557 562	DFPB-60-090-S4-F0507		
557 563	DFPB-60-090-S5-F0507		
557 564	DFPB-60-090-S6-F0507		

Ordering data – Wearing parts kits		Ordering data – Wearing parts kits	
Part No.	Type	Part No.	Type
Size 20-S		Size 80-S	
-	DFPB-45-R-090-SP	-	DFPB-170-R-090-SP
Size 30-S		Size 110-S	
-	DFPB-65-R-090-SP	-	DFPB-230-R-090-SP
Size 40-S		Size 150-S	
-	DFPB-80-R-090-SP	-	DFPB-300-R-090-SP
Size 60-S			
-	DFPB-120-R-090-SP		