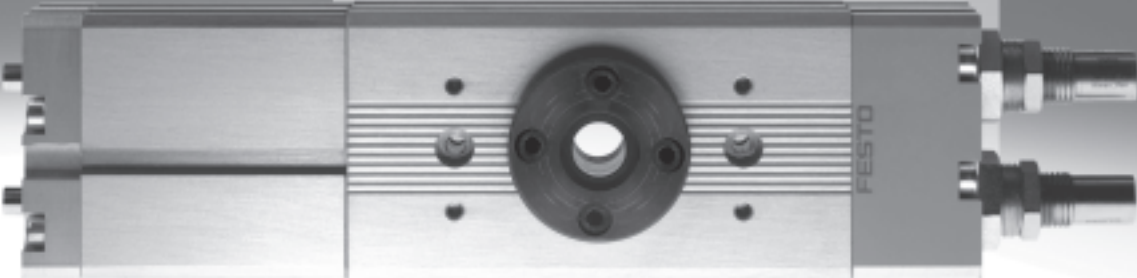


Semi-rotary drives DRQD, twin pistons



# Twin-piston semi-rotary drives DRQD

Key features

FESTO

## General

- Rack and pinion principle
- High accuracy
- Extremely good rigidity
- Backlash-free and dynamic
- Piston  $\varnothing$  6 ... 50 mm
- Torque 0.16 ... 50 Nm
- Swivel angle 0 ... 360°
- End-position adjustment -60 ... +6°
- Defined interfaces
- Choice of mounting options
- Supply port at one end
- Ideal for use in handling applications

## Wide choice of variants

### Spigot shaft



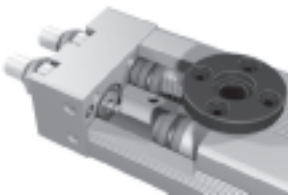
- Piston  $\varnothing$  6 ... 50 mm

### Flanged shaft



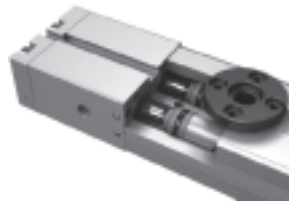
- Piston  $\varnothing$  6 ... 50 mm

### Adjustable end-position cushioning



- Piston  $\varnothing$  16 ... 50 mm
- Pneumatic
- With hydraulic shock absorbers

### Intermediate position



- Piston  $\varnothing$  16 ... 50 mm
- Allows positioning of the drive shaft in a mid-position

### Position sensing



- Piston  $\varnothing$  6 ... 50 mm
- For piston  $\varnothing$  6 ... 12 mm: proximity sensor SME/SMT-10
- For piston  $\varnothing$  16 ... 50 mm: proximity sensor SME/SMT-8

### Adapter kits for grippers and drive combinations



- Piston  $\varnothing$  6 ... 50 mm

### Energy through-feed



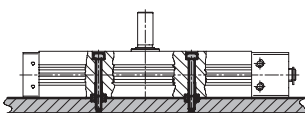
- Piston  $\varnothing$  6 ... 50 mm
- Simple and space-saving installation of tubing through the hollow flanged shaft
- DRQD-...-SD...  
1 ... 4 DUO tubes



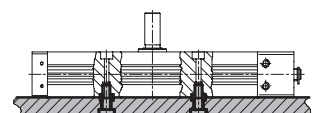
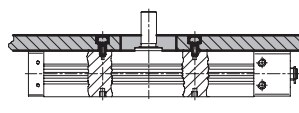
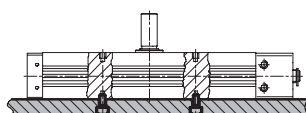
- Piston  $\varnothing$  16 ... 50 mm
- Simple and space-saving installation of tubing and cables through the hollow flanged shaft
- DRQD-...-E...  
1 ... 2 DUO tubes and 2 ... 4 electrical cables

## Mounting options

### using through holes













### via thread in housing profile



# Twin-piston semi-rotary drives DRQD

Features

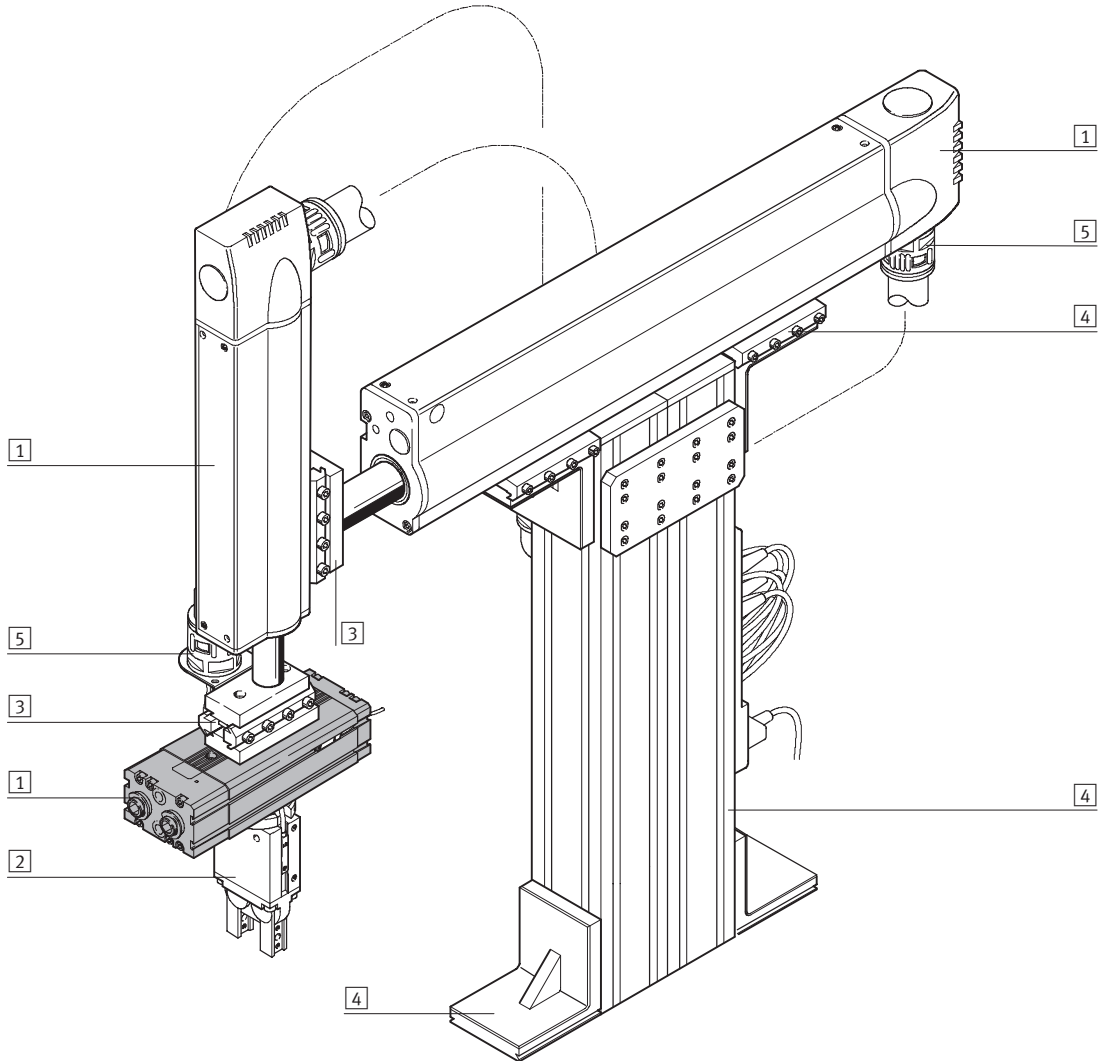
Possible combinations with grippers									
Semi-rotary drive DRQD	6	8	12	16	20	25	32	40	50
Parallel grippers HGPM-...-G8 → Internet: hgpm									
	■	■	■	-	-	-	-	-	-
Parallel grippers HGP → Internet: hgp									
	■	■	■	■	■	■	■	■	■
Radial grippers HGR → Internet: hgr									
	■	■	■	■	■	■	■	■	■
Parallel grippers HGPP → Internet: hgpp									
	-	-	-	■	■	■	■	■	■
Parallel grippers HGPL → Internet: hgpl									
	-	-	-	■	■	■	■	■	■
Angle grippers HGWM-...-G8 → Internet: hgwm									
	■	■	■	-	-	-	-	-	-
Three-point gripper HGD → Internet: hgd									
	-	■	■	■	■	■	■	■	■
Angle grippers HGW → Internet: hgw									
	■	■	■	■	■	■	■	■	■
Parallel grippers HGPT → Internet: hgpt									
	-	-	■	■	■	■	■	■	■
Parallel grippers HGPC → Internet: hgpc									
	-	-	■	■	■	■	-	-	-

# Twin-piston semi-rotary drives DRQD

System example

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System product for handling and assembly technology



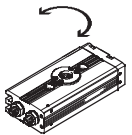
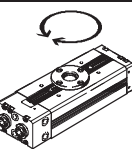
# Twin-piston semi-rotary drives DRQD

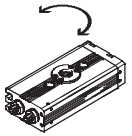
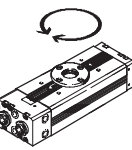
System example

System elements and accessories		
	Brief description	→ Page/Internet
1	Drive units	Wide range of combination options within handling and assembly technology drive
2	Grippers	Wide range of combination options within handling and assembly technology gripper
3	Adapters	For drive/drive and drive/gripper combinations adapter kit
4	Basic mounting components	Profiles and profile connectors as well as profile/drive connectors basic component
5	Installation components	For achieving a clear-cut, safe layout for electrical cables and tubing installation component
-	Axes	Wide range of combination options within handling and assembly technology axes
-	Motors	Servo and stepper motors, with or without gearing motor

# Twin-piston semi-rotary drives DRQD

Product range overview

Function	Version	Type	Piston Ø [mm]	Swivel angle [°]	Adjustable end-position range [°]	Position sensing A	End-position adjustment with flexible buffers in the end positions J...
Double-acting	Basic version						
		Semi-rotary drive DRQD	6, 8, 12	90	-20 ... +6°	■	■
				180	-60 ... +6°		
			16, 20, 25, 32, 40, 50	90	-20 ... +6°	■	-
180							
360 0 ... 340							

Function	Version	Type	Piston Ø [mm]	Output shaft		
				Spigot shaft ZW	Flanged shaft FW	Integrated adapter for direct mounting of grippers A...
Double-acting	Basic version					
		Semi-rotary drive DRQD	6, 8, 12	■	■	■
				■	■	-
			16, 20, 25, 32, 40, 50	■	■	-
■				■	-	

# Twin-piston semi-rotary drives DRQD

Product range overview

Type	Piston Ø [mm]	Type of cushioning		Pneumatic connection	
		Adjustable, pneumatic PPV]	Adjustable, hydraulic shock absorbers YSR]	left AL	right AR
<b>Basic version</b>					
Semi-rotary drive DRQD	6, 8, 12	-	-	-	■
	16, 20, 25, 32, 40, 50	■	■	■	■

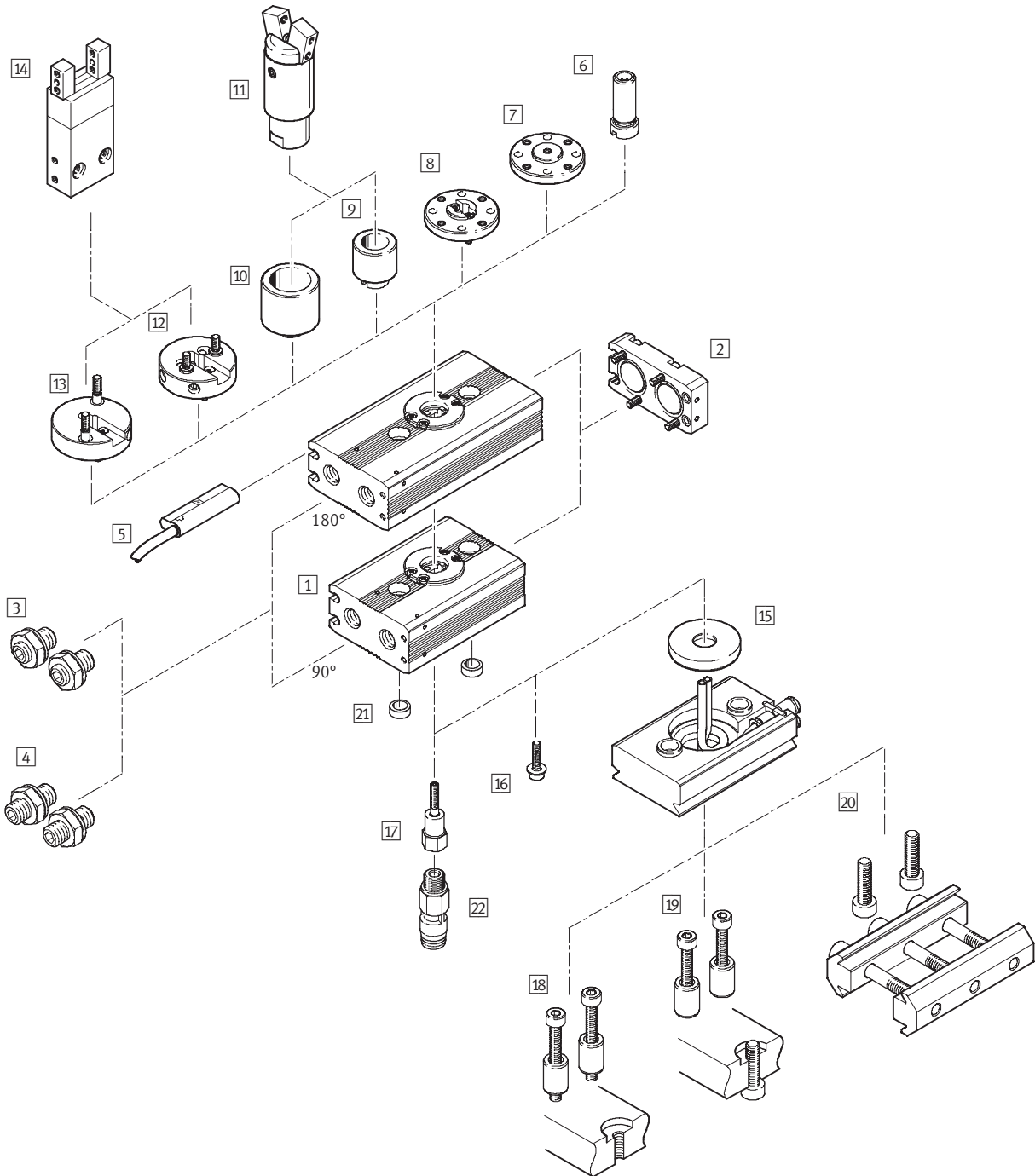
Type	Piston Ø [mm]	Intermediate position	Energy through-feed	Adapter kits for grippers	→ Page/Internet
		Z1	SD..., E...		
<b>Basic version</b>					
Semi-rotary drive DRQD	6, 8, 12	-	■	■	8
	16, 20, 25, 32, 40, 50	■	■	■	24

# Twin-piston semi-rotary drives DRQD-6 ... 12

Peripherals overview

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Piston  $\varnothing$  6 ... 12





# Twin-piston semi-rotary drives DRQD-6 ... 12

Peripherals overview

FESTO

Variants, mounting attachments and accessories						
	Brief description	Piston Ø			→ Page/Internet	
		6	8	12		
1	Centre section	Centre section for 90° or 180° swivel angle	■	■	■	11
2	Connector cap	With integrated compressed air directional function	■	■	■	
3	End-position adjustment J20	Flexible end position cushioning with adjustable end positions (-20 ... +6°)	■	■	■	
4	End-position adjustment J60	Flexible end position cushioning with adjustable end positions (-60 ... +6°)	■	■	■	
5	Position sensing A	Contactless via proximity sensors SME-/SMT-10	■	■	■	61
6	Spigot shaft ZW <sup>1)</sup>	Hollow with woodruff key	■	■	■	11
7	Flanged shaft FW <sup>1)</sup>	Hollow	■	■	■	
8	Flanged shaft FW-SD32	Hollow, for energy through-feed	-	■	■	
9	Adapters A08 <sup>2)</sup>	For grippers HGWM-08-...-G8 and HGPM-08-...-G8	■	■	■	
10	Adapters A12 <sup>2)</sup>	For grippers HGWM-12-...-G8 and HGPM-12-...-G8	■	■	■	
11	Grippers HGPM/HGWM	HGPM-...-G8 and HGWM-...-G8	■	■	■	
12	Adapters AS1	For grippers HGP-06-A, HGR-10-A and HGW-10-A	-	■	■	11
13	Adapters AS2	For grippers HGD-16-A	-	■	■	
14	Grippers HGP/HGD/HGR/HGW	HGP-06-A, HGD-16-A, HGR-10-A, HGW-10-A	-	■	■	hgp, hgd, hgr, hgw
15	Energy through-feed SD32	2 tubes with O.D. 3 mm	-	■	■	16
16	Socket head screw ZS	Mounting of ZW and FW	■	■	■	11
17	Hollow bolt HS	Mounting of ZW, FW, A08, A12 and air supply for attachments	■	■	■	
18	Type of mounting B1	For connection of DRQD/FW-SD32: Locking screws in centring sleeves	■	■	■	
19	Type of mounting B2	For connection of DRQD/FW-SD32: Through screws in attachment	■	■	■	
20	Type of mounting B3	For connection of DRQD/FW-SD32: Clamping via profile, grid 40 mm	■	■	■	
21	Centring sleeve ZBH	For centring (2 pieces included in scope of delivery for DRQD)	■	■	■	16
22	Rotary push-in fitting <sup>3)</sup> QS	Quick Star push-in fittings, rotatable with ball bearing	■	■	■	

1) The socket head screw ZS is included in the scope of delivery. The hollow bolt HS must be ordered separately

2) Only in conjunction with hollow bolt HS. The hollow bolt HS must be ordered separately

3) For energy through-feed in combination with HS

# Twin-piston semi-rotary drives DRQD-6 ... 12

Type codes

DRQD – 6 – 180 – J60 – A – A12 – – HS – B2 – B

**Type**

Double-acting	
DRQD	Semi-rotary drive

**Piston Ø [mm]**

**Swivel angle [°]**

**End-position adjustment [°]**

J20	-20 ... +6
J60	-60 ... +6

**Position sensing**

A	For proximity sensing
---	-----------------------

**Output shaft/adaptor**

ZW	Spigot shaft
FW	Flanged shaft
A08	Adapter for micro, angle and parallel grippers
A12	
AS1	Adapter for parallel, three-point, angle and radial grippers
AS2	

**Energy through-feed**

SD32	2 tubes with O.D. 3 mm
------	------------------------

**Type of screw**

ZS	Socket head screw
HS	Hollow bolt

**Type of mounting**

B1	Locking screws in centring sleeves
B2	Through screws in attachment
B3	Clamping via profile, 40 mm

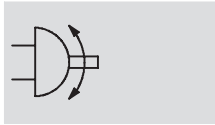
**User's manual**

	German
E	English
F	French
S	Spanish
I	Italian
V	Swedish
B	Express waiver – no user manual to be included (already available)

# Twin-piston semi-rotary drives DRQD-6 ... 12

Technical data

Function



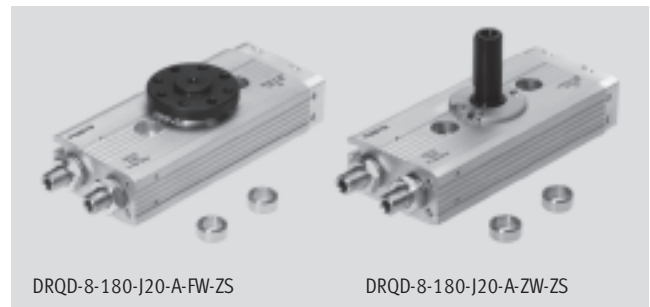
⌀ Diameter  
6 ... 12 mm

≡ Force  
0.16 ... 0.76 Nm

🔧 [www.festo.com/en/Spare\\_parts\\_service](http://www.festo.com/en/Spare_parts_service)

Variants

- 90° and 180° swivel angle
- Spigot or flanged shaft
- Adapters for grippers
- End-position adjustment
- Position sensing
- Energy through-feed
- Different types of mounting



DRQD-8-180-J20-A-FW-ZS

DRQD-8-180-J20-A-ZW-ZS

General technical data			
Piston Ø	6	8	12
Pneumatic connection	M3		
	HS	M5	
	SD32	-	QS...-3 for tube O.D. 3 mm
Constructional design	Semi-rotary drive with twin pistons based on the rack and pinion principle		
Cushioning	Flexible buffer at both ends		
Position sensing	For proximity sensing		
Type of mounting	Via through-hole		
	Via female thread		
Assembly position	Any		

Operating and environmental conditions			
Piston Ø	6	8	12
Operating medium	Filtered compressed air, lubricated or unlubricated		
Operating pressure [bar]	1 ... 8		
	SD32	-	1.5 ... 8
Adjustable end-position range per end position [°]	J20	-20 ... +6	
	J60	-60 ... +6	
Max. permissible swivelling frequency at 6 bar (for completed cycle of motion) [Hz]	90°	5	4
	180°	3.5	2.5
	SD32	-	A reduction of max. 5% of the values indicated above
Repetition accuracy [°]	< 0.2		
Ambient temperature <sup>1)</sup> [°C]	-10 ... +60		
Corrosion resistance class CRC <sup>2)</sup>	1		

1) Note operating range of proximity sensors

2) Corrosion resistance class 1 according to Festo standard 940 070

Components requiring low corrosion resistance. Transport and storage protection. Parts that do not have primarily decorative surface requirements, e.g. in internal areas that are not visible or behind covers

# Twin-piston semi-rotary drives DRQD-6 ... 12

Technical data

Forces and torques				
Piston Ø		6	8	12
Theoretical torque [Nm] at 6 bar		0.16	0.33	0.76
	SD32	-	0.28	0.72
		Note: If torque acts against the direction of rotation in the end position, a drive with a rating of twice the maximum theoretical torque should be selected.		
Max. permissible radial and axial forces		Diagrams → 15		
Max. permissible mass moment of inertia [kgm <sup>2</sup> ]		0.075 x 10 <sup>-4</sup>	0.25 x 10 <sup>-4</sup>	0.7 x 10 <sup>-4</sup>
		The data applies to the variants ZW, FW, A... without grippers, unthrottled.		



Pneumatic sizing using Pro Pneu  
[www.festo.com/en/engineering](http://www.festo.com/en/engineering)

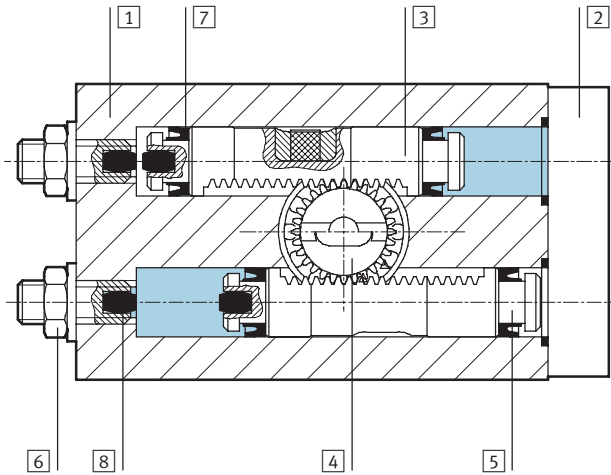
Weights [g]					
Piston Ø		6	8	12	
Centre section	90°	J20	66	90	145
		J60	67	92	148
	180°	J20	82	111	177
		J60	83	113	180
Output shaft	ZW	2	4		
	FW	4	7		
Adapters	A08	6	11		
	A12	6	11		
	AS1	-	13		
	AS2	-	15		
Screws	ZS	1			
	HS	4		5	
Flanged shaft with energy through-feed	SD32	-	71		
Mounting in combination with SD32	B1	-	17		
	B2	-	17	18	
	B3	-	81		

# Twin-piston semi-rotary drives DRQD-6 ... 12

Technical data

## Materials

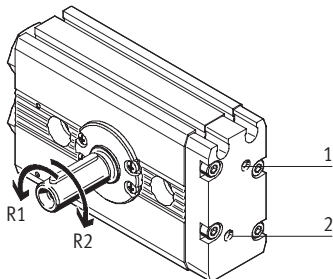
Sectional view



Piston Ø	6	8	12
1 Cylinder barrel (centre section)	Anodised aluminium		
2 Connector cap	Anodised aluminium		
3 Gear rack	Anodised aluminium		
4 Pinion	Stainless steel; milled teeth		
5 Piston	Anodised aluminium		
6 Threaded pin, hex nuts	Galvanised steel		
7 Piston seal	Nitrile rubber	Polyurethane	
8 Buffer for end-position cushioning	Nitrile rubber		
- DUO spiral tubing	Polyurethane		
- Woodruff key	Steel		
- Hollow bolt, centring sleeves	Stainless steel		
- Static seals	Steel, nitrile rubber		
- Material note	Copper, PTFE and silicone-free		

## Direction of rotation of the drive shaft

Pneumatic actuation of ports 1 or 2 produces a rotational movement in direction R1 or R2 respectively.



# Twin-piston semi-rotary drives DRQD-6 ... 12

Technical data

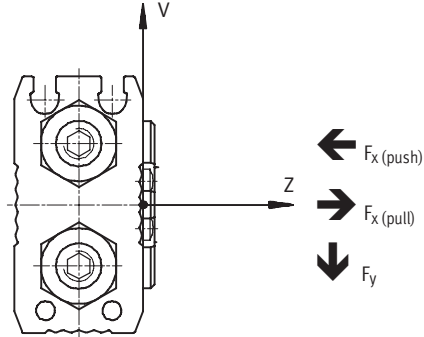
FESTO

## Max. permissible radial and axial forces on the drive shaft

### Combined load

A semi-rotary drive DRQD-8-... is to be statically loaded with a radial force  $F_y = 60\text{ N}$ , which is at a distance of  $Z = 5\text{ mm}$  from the housing, and an

axial force  $F_{x, \text{push}} = 30\text{ N}$ , which is at a distance of  $V = 12\text{ mm}$  from the shaft ( $\rightarrow$  diagram of flanged shaft on right).



### Question:

Is it permissible to statically load a semi-rotary drive DRQD-8-... with these combined forces?

### Answer:

Graph 1 ( $\rightarrow$  15) indicates that the maximum permissible radial force is  $F_{y, \text{max. (stat.)}}(5) = 193\text{ N}$  for a distance

$Z = 5\text{ mm}$ . Graph 3 ( $\rightarrow$  15) indicates that the maximum axial force is

$F_{x, \text{push max. (stat.)}}(12) = 169\text{ N}$  for a distance  $V = 12\text{ mm}$ .

The following equation applies to combined loads:

$$\frac{F_y(z)}{F_{y, \text{max. (z)}}} + \frac{F_{x, \text{push}}(v)}{F_{x, \text{push, max. (v)}}} + \frac{F_{x, \text{pull}}(v)}{F_{x, \text{pull, max. (v)}}} \leq 1$$

The following values are assumed:

$F_y(5) = 60\text{ N}$   
 $F_{x, \text{push (stat.)}}(12) = 30\text{ N}$   
 $F_{y, \text{max. (stat.)}}(5) = 193\text{ N}$   
 $F_{x, \text{max. (stat.)}}(12) = 169\text{ N}$

With values inserted:

$$\frac{60\text{ N}}{193\text{ N}} + \frac{30\text{ N}}{169\text{ N}} \leq 1$$

$$0.311 + 0.178 \leq 1$$

$$0.489 \leq 1$$

Thus the drive may be statically loaded with the forces indicated above.

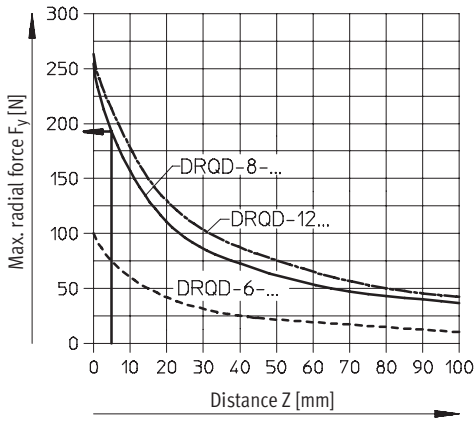
# Twin-piston semi-rotary drives DRQD-6 ... 12

Technical data

## Maximum static radial force

Graph 1

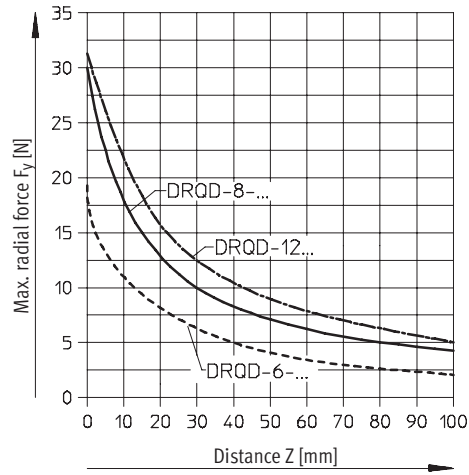
$$F_{y, \text{max. (stat.)}} = f(z)$$



## Maximum dynamic radial force

Graph 2

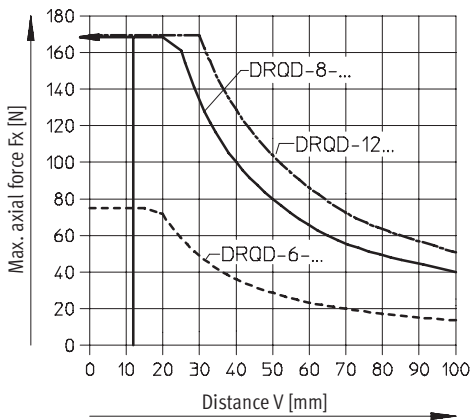
$$F_{y, \text{max. (dyn.)}} = f(z)$$



## Maximum static pull and push axial forces

Graph 3

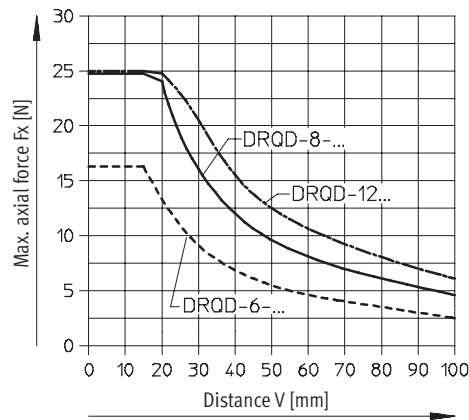
$$F_{x, \text{max. (stat.)}} = f(v)$$



## Maximum dynamic pull and push axial forces

Graph 4

$$F_{x, \text{max. (dyn.)}} = f(v)$$



# Twin-piston semi-rotary drives DRQD-6 ... 12

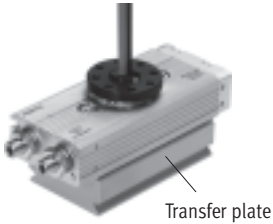
Technical data

## Energy through-feed

The energy through-feed consists of DUO tubing (two lengths of tubing are fused together into a pair), whereby each tube has an O.D. of 3 mm. Compressed air is supplied via the push-in

fittings in the transfer plate. Only Quick-Star push-in fittings may be used to connect compressed air tubing to consuming devices (e.g. grippers).

## DRQD-...-SD...



- For piston  $\varnothing$  8 ... 12
- Swivel angles of up to 180° are possible
- 1 DUO tube

Technical data		
Piston $\varnothing$	8	12
Number of spiral tubes	1 DUO tube	
Standard nominal flow rate per tube	[l/min]	min. 70
Theoretical air consumption per tube at 6 bar	[cm <sup>3</sup> ]	5.3
Operating pressure as a function of ambient temperature	[bar]	0 ... 10 (at -10 ... +30 °C) 0 ... 9 (at +30 ... +40 °C) 0 ... 7.8 (at +40 ... +60 °)
Push-in fittings for connection to consuming device	QS...-3 for tube O.D. of 3 mm	



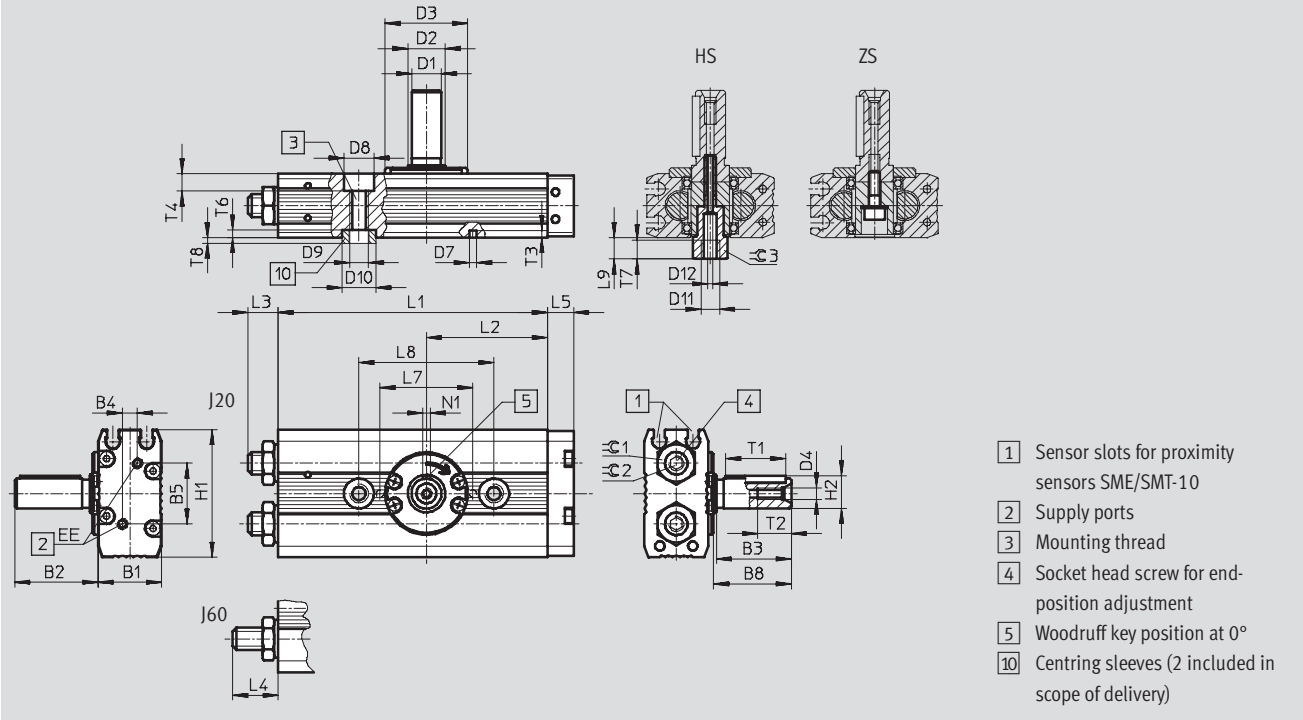
# Twin-piston semi-rotary drives DRQD-6 ... 12

Technical data

## Dimensions

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

ZW – Spigot shaft



∅	Swivel angle	B1	B2	B3	B4	B5	B8	D1	D2	D3 <sup>1)</sup>	D4	D7	D8	D9	D10	D11	D12	EE	H1	H2	
[mm]	[°]							∅ g7	∅ g6	∅ f7		∅ H8	∅ H8		∅ H7						
6	90	15.4	18.2	16	2	13.6	16.7	6	8	20	M2.5	2	6	M4	7	M5	1.3	M3	31	6.8	
	180																				
8	90	17	22.2	20	4	16.2	20.7	8	10	22	M3	-	8	M5	9	M5	1.3	M3	34	8.8	
	180																				
12	90	21	22.2	20	6	18.2	20.7	8	10	22	M3	-	8	M5	9	M5	1.3	M3	41	8.8	
	180																				

∅	Swivel angle	L1	L2	L3	L4	L5	L7	L8	L9	N1	T1	T2	T3	T4	T6	T7	T8	≡C1	≡C2	≡C3
[mm]	[°]			max.	max.		±0.03	±0.03		P9										
6	90	46.7	20.2	7.1	11.1	7.5	20	30	6.2	2	12	7	1.8	3.4	1.6	5	1.4	8	2.5	8
	180	61.8	27.75																	
8	90	54.2	23.45	8.1	12.1	7	-	36	5.7	2	16	9	-	4.6	2	5	2	10	3	8
	180	71.8	32.25																	
12	90	59.2	25.95	9.1	13.1	8	-	36	5.7	2	16	9	-	4.6	2	5	2	13	4	8
	180	76.8	34.75																	

1) Centring possible with D3

# Twin-piston semi-rotary drives DRQD-6 ... 12

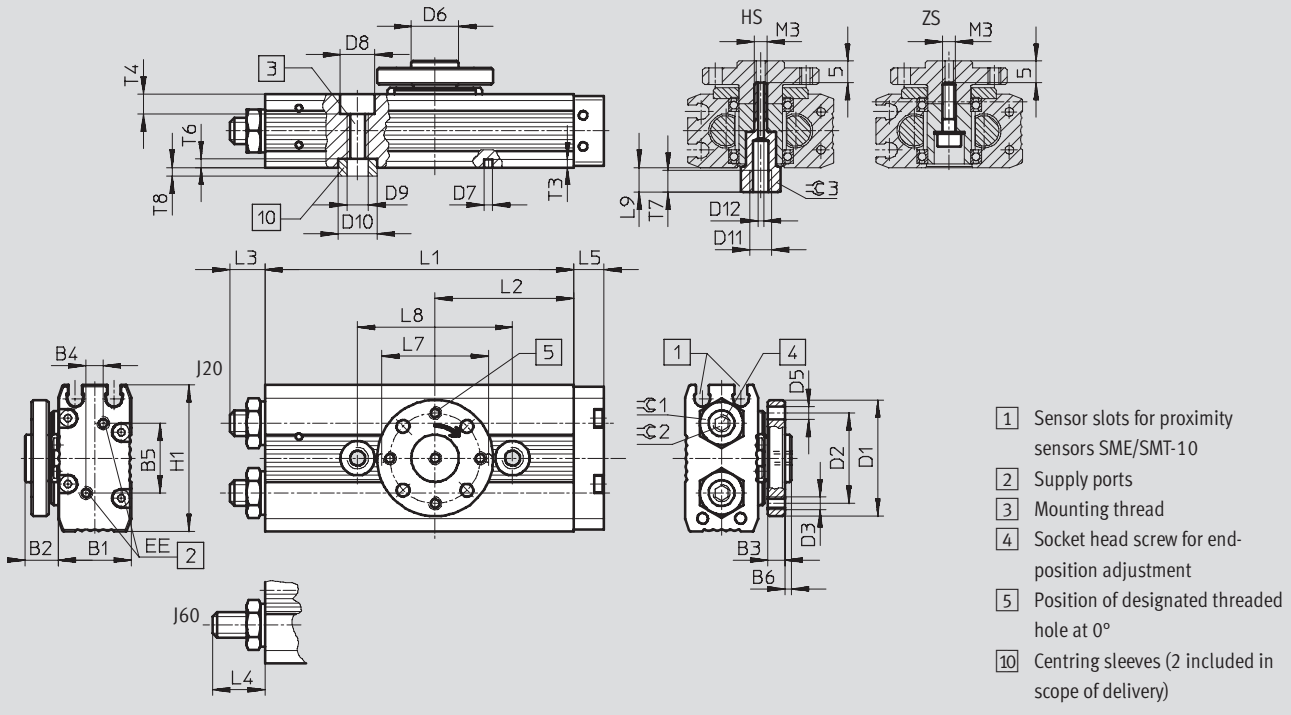
Technical data

FESTO

## Dimensions

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

FW – Flanged shaft



∅	Swivel angle [°]	B1	B2	B3	B4	B5	B6	D1	D2	D3	D5	D6	D7	D8	D9	D10	D11	D12
[mm]	[°]							∅	∅		∅ H7	∅ g7	∅ H8	∅ H8		∅ H7		∅
6	90	15.4	7.7	4	2	13.6	1.5	23	16	M3	3	8	2	6	M4	7	M5	1.3
	180																	
8	90	17	7.7	4	4	16.2	1.5	27	21	M3	3	11	-	8	M5	9	M5	1.3
	180																	
12	90	21	7.7	4	6	18.2	1.5	27	21	M3	3	11	-	8	M5	9	M5	1.3
	180																	

∅	Swivel angle [°]	EE	H1	L1	L2	L3	L4	L5	L7	L8	L9	T3	T4	T6	T7	T8	∅C1	∅C2	∅C3
[mm]	[°]					max.	max.		±0.03	±0.03									
6	90	M3	31	46.7	20.20	7.1	11.1	7.5	20	30	6.2	1.8	3.4	1.6	5	1.4	8	2.5	8
	61.8			27.75															
8	90	M3	34	54.2	23.45	8.1	12.1	7	-	36	5.7	-	4.6	2	5	2	10	3	8
	71.8			32.25															
12	90	M3	41	59.2	25.95	9.1	13.1	8	-	36	5.7	-	4.6	2	5	2	13	4	8
	76.8			34.75															

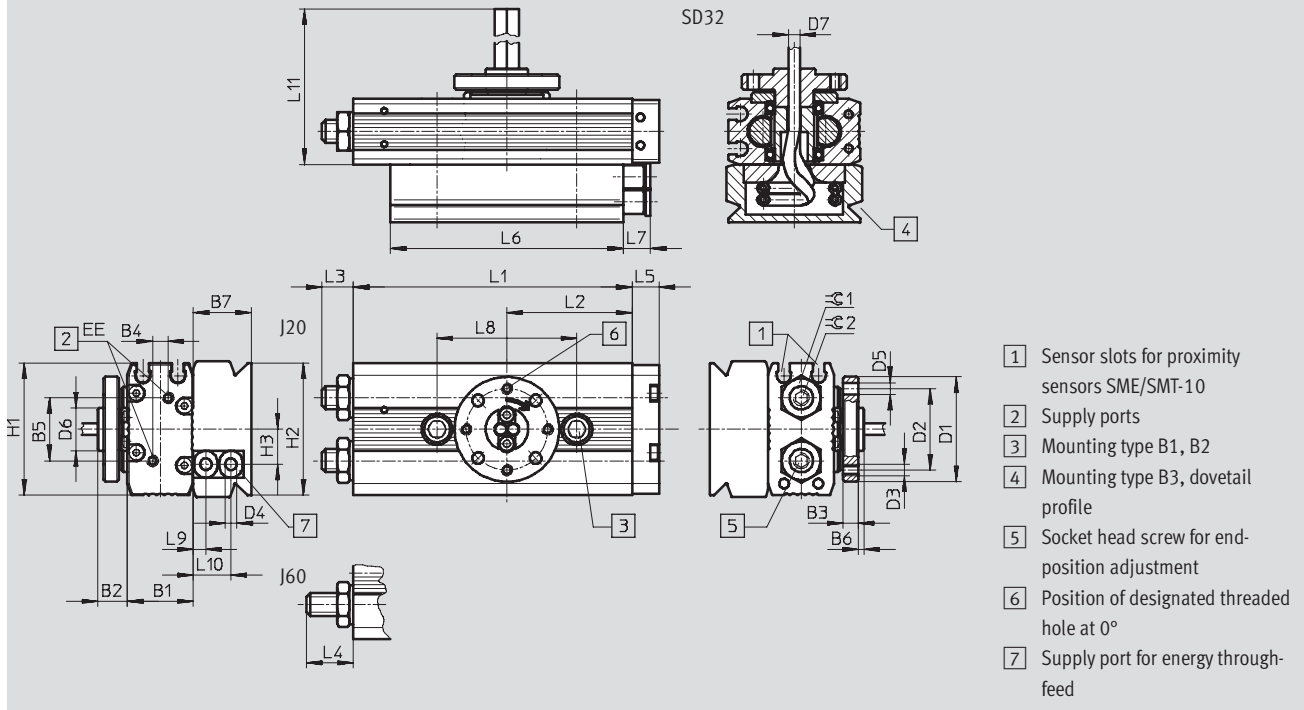
# Twin-piston semi-rotary drives DRQD-6 ... 12

Technical data

## Dimensions

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

FW-SD32 – Energy through-feed



∅	Swivel angle [°]	B1	B2	B3	B4	B5	B6	B7	D1	D2	D3	D4	D5	D6	D7	EE
[mm]	[°]								∅	∅	∅	∅	∅ H7	∅ g7	∅	
8	90	17	7.7	4	4	16.2	1.5	15	27	21	M3	3	3	11	3	M3
	180															M3
12	90	21	7.7	4	6	18.2	1.5	15	27	21	M3	3	3	11	3	M3
	180															M3

∅	Swivel angle [°]	H1	H2	H3	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	⊖C1	⊖C2
[mm]	[°]						max.	max.			±0.03						
8	90	34	35	9	54.2	23.45	8.1	12.1	7	60	7	36	3.2	9.7	292	10	3
	180				71.8	32.25											
12	90	41	35	9	59.2	25.95	9.1	13.1	8	60	7	36	3.2	9.7	292	13	4
	180				76.8	34.75											

# Twin-piston semi-rotary drives DRQD-6 ... 12

Technical data

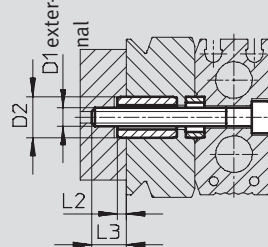
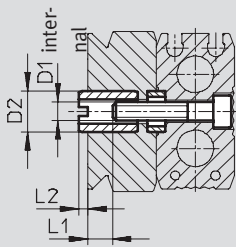
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## Dimensions – Mounting type

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

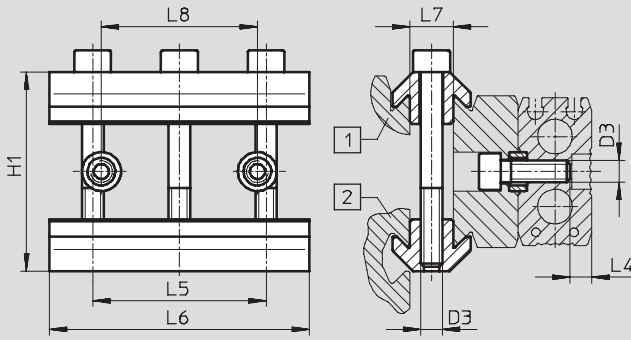
B1 – Counter screws in centring sleeves

B2 – Through screws in attachment



For $\varnothing$ [mm]	Swivel angle [°]	D11	D2 $\varnothing$ h7	L1	L2	L3
8	90	M4	9	4.9	2	8.2
	180					
12	90			5.9		9.2
	180					

## B3 – Clamping via profile



- 1 Dovetail profile
- 2 Profile slot

For $\varnothing$ [mm]	Swivel angle [°]	D3	H1	L4	L5	L6	L7 +0.1	L8 ±0.03
8	90	M5	46	5	40	60	10	36
	180							
12	90			9				
	180							

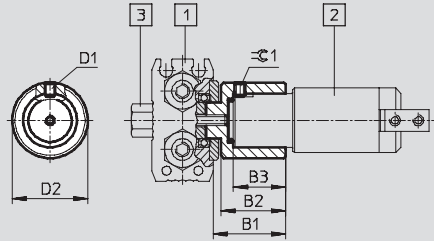
# Twin-piston semi-rotary drives DRQD-6 ... 12

Technical data

## Dimensions – Adapter for gripper

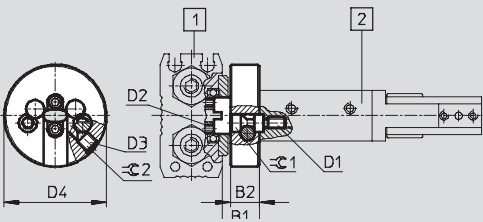
Download CAD data → [www.festo.com/en/engineering](http://www.festo.com/en/engineering)

### A08/A12

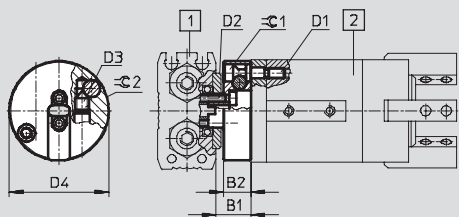


For adapter	1 Drive	2 Grippers	3 Type of screw	B1	B2	B3 ±0.03	D1	D2 Ø	∅C1
A08	DRQD-6-... DRQD-8-... DRQD-12-...	HGWM-08-...-G8 HGPM-08-...-G8	HS	15.2	13	9.6	M3	16	1.5
A12	DRQD-6-... DRQD-8-... DRQD-12-...	HGWM-12-...-G8 HGPM-12-...-G8	HS	20.2	19	14.6	M3	21	1.5

### AS1



### AS2



For adapter	1 Drive	2 Grippers	B1	B2	D1	D2	D3	D4 Ø	∅C1	∅C2
AS1	DRQD-8-... DRQD-12-...	HGP-06-... HGR-10-... HGW-10-...	10.2	8	M3	M2	M4	28	2.5	2
AS2	DRQD-8-... DRQD-12-...	HGD-16-...	10.2	8	M3	M2	M4	29	2.5	2

# Twin-piston semi-rotary drives DRQD-6 ... 12

Ordering data – Modular products

**M** Mandatory data →

Module No.	Function	Size	Swivel angle	End-position adjustment	Position sensing	Output shaft/ adapter
187 431	DRQD	6	90	J20	A	ZW
187 432		8	180	J60		FW
187 433		12				A08 A12 AS1 AS2
<b>Ordering example</b>						
<b>187 432</b>	<b>DRQD</b>	<b>- 8</b>	<b>- 180</b>	<b>- J60</b>	<b>- A</b>	<b>- A12</b>

**Ordering table**

Size	6	8	12	Condi- tions	Code	Enter code	
<b>M</b> Module No.	<b>187 431</b>	<b>187 432</b>	<b>187 433</b>				
Function	Semi-rotary drive with twin pistons				<b>DRQD</b>	DRQD	
Piston ∅ [mm]	6	8	12		-...		
Swivel angle	90°				<b>-90</b>		
	180°				<b>-180</b>		
End-position adjustment	Adjusting range +6°/-20°				<b>-J20</b>		
	Adjusting range +6°/-60°				<b>-J60</b>		
Position sensing	For proximity sensing				<b>-A</b>	-A	
Output shaft/adapter	Spigot shaft			1	<b>-ZW</b>		
	Flanged shaft			2	<b>-FW</b>		
	Adapter for HGWM-08		Adapter for HGPM-08/HGWM-08		3	<b>-A08</b>	
	Adapter for HGWM-12		Adapter for HGPM-12/HGWM-12		3	<b>-A12</b>	
	-		Adapter for HGW/HGR-10-A, HGP-6-A		4	<b>-AS1</b>	
	-		Adapter for HGD-16-A		4	<b>-AS2</b>	

- 1 **ZW** Not with energy through-feed SD32  
Only with screw type ZS, HS
- 2 **FW** Required for energy through-feed SD32  
Only with screw type ZS, HS

- 3 **A08, A12** Not with energy through-feed SD32  
Only with screw type HS
- 4 **AS1, AS2** Required for energy through-feed SD32  
Not with screw type ZS, HS

Transfer order code

**DRQD** -  -  -  - **A** -

# Twin-piston semi-rotary drives DRQD-6 ... 12

Ordering data – Modular products

Options			
Energy through-feed	Type of screw	Type of mounting	User's manual
SD32	ZS HS	B1 B2 B3	E F S I V B
- SD32	- HS	- B2	- B

Ordering table						
Size	6	8	12	Condi- tions	Code	Enter code
[0] Energy through-feed	2x tubing O.D. 3 mm			[5]	-SD32	
Type of screw	Socket head screw				-ZS	
	Hollow bolt				-HS	
Type of mounting	Mounting type 1			[6]	-B1	
	Mounting type 2			[6]	-B2	
	Mounting type 3			[6]	-B3	
Alternative language user docu- mentation (standard is German)	English				-E	
	French				-F	
	Spanish				-S	
	Italian				-I	
	Swedish				-V	
	Express waiver – no user manual to be included (already available)				-B	

[5] SD32 Only with mounting type B1, B2, B3

[6] B1, B2, B3 Only with energy through-feed SD32

Transfer order code

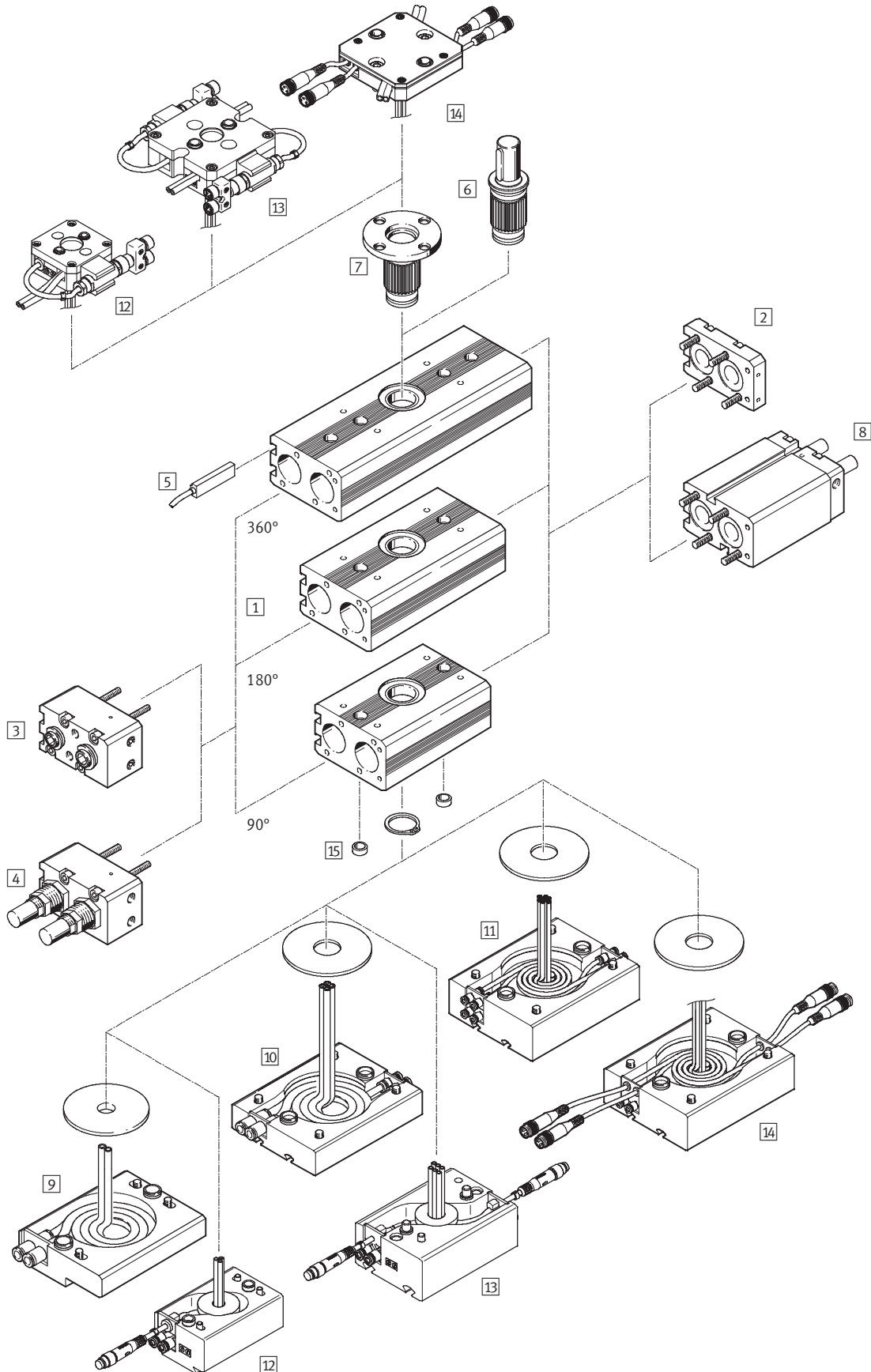
-  -  -  -

# Twin-piston semi-rotary drives DRQD-16 ... 50

Peripherals overview

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Piston  $\varnothing$  16 ... 50





# Twin-piston semi-rotary drives DRQD-16 ... 50

Peripherals overview

FESTO

Variants, mounting attachments and accessories								→ Page/Internet	
	Brief description	Piston Ø							
		16	20	25	32	40	50		
1	Centre section	Centre section for 90°, 180° or 360° swivel angle	■	■	■	■	■	■	58
2	End cap	With integrated compressed air directional function	■	■	■	■	■	■	
3	Connector cap PPVJ	Flexible end position cushioning with adjustable end positions (–20° ... +6°)	■	■	■	■	■	■	
4	Connector cap YSRJ	Adjustable shock absorbers with adjustable end positions (–20° ... +6°)	■	■	■	■	■	■	
5	Position sensing A	Contactless via proximity sensors SME-/SMT-8	■	■	■	■	■	■	61
6	Spigot shaft ZW	With woodruff key	■	■	■	■	■	■	58
7	Flanged shaft FW	Hollow, for energy through-feed	■	■	■	■	■	■	
8	Intermediate position Z1	Mid-position at centre of nominal angles of rotation of 90° and 180° (±10°)	■	■	■	■	■	■	35
9	Energy through-feed SD32, SD42	2 tubes with O.D. 3 or 4 mm	■	■	■	■	-	-	36
	Energy through-feed SD62	2 tubes with O.D. 6 mm	-	-	-	-	■	■	
10	Energy through-feed SD64	4 tubes with O.D. 6 mm	-	-	-	-	■	■	
11	Energy through-feed SD48	8 tubes with O.D. 4 mm	-	-	-	-	■	■	
12	Energy through-feed E422	2 tubes with O.D. 4 mm and 1 4-pin cable to 2 3-pin cables	■	■	-	-	-	-	
13	Energy through-feed E444	4 tubes with O.D. 4 mm and 2 4-pin cables to 4 3-pin cables	-	-	■	■	-	-	
14	Energy through-feed E644	4 tubes with O.D. 6 mm and 4 3-pin cables	-	-	-	-	■	■	
15	Centring sleeve ZBH	For centring (2 pieces included in scope of delivery for DRQD)	■	■	■	■	■	■	

# Twin-piston semi-rotary drives DRQD-16 ... 50

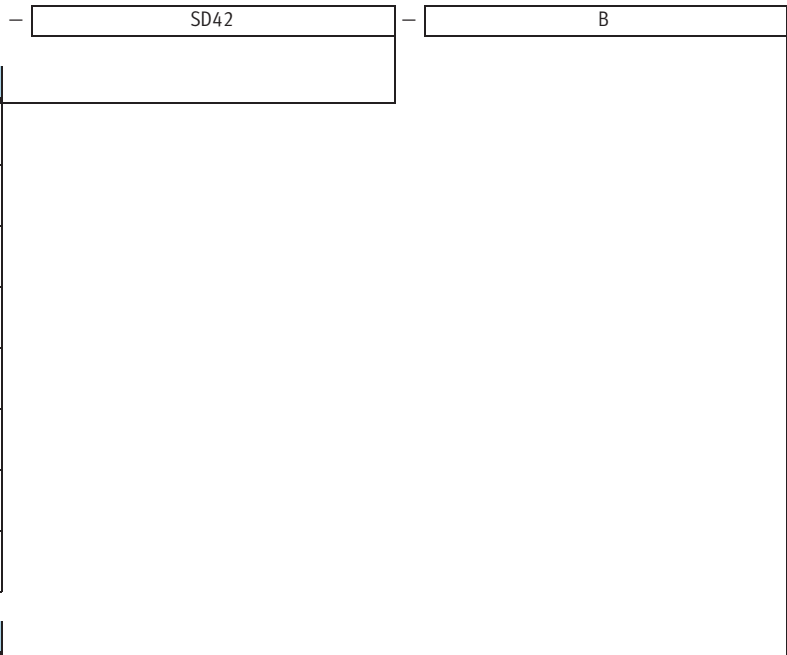
Type codes

		DRQD	-	40	-	90	-	YSRJ	-	A	-	AR	-	FW	-	
<b>Type</b>																
Double-acting																
DRQD	Semi-rotary drive															
<b>Piston <math>\varnothing</math> [mm]</b>																
<b>Swivel angle [°]</b>																
<b>Type of cushioning</b>																
PPVJ	Adjustable end-position cushioning															
YSRJ	Adjustable shock absorbers															
<b>Position sensing</b>																
A	For proximity sensing															
<b>Pneumatic connection</b>																
AL	Supply port, left															
AR	Supply port, right															
<b>Output shaft</b>																
ZW	Spigot shaft															
FW	Flanged shaft															
<b>Intermediate position</b>																
Z1	1 intermediate position (mid-position)															

# Twin-piston semi-rotary drives DRQD-16 ... 50

Type codes

FESTO



Energy through-feed	
SD32	2 tubes with O.D. 3 mm
SD42	2 tubes with O.D. 4 mm
SD48	8 tubes with O.D. 4 mm
SD62	2 tubes with O.D. 6 mm
SD64	4 tubes with O.D. 6 mm
E422	2 tubes with O.D. 4 mm and 1 4-pin cable to 2 3-pin cables
E444	4 tubes with O.D. 4 mm and 2 4-pin cables to 4 3-pin cables
E644	4 tubes with O.D. 6 mm and 4 3-pin cables

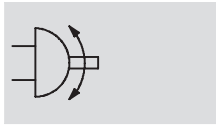
User's manual	
	German (standard)
E	English
F	French
S	Spanish
I	Italian
V	Swedish
B	Express waiver – no user manual to be included (already available)

# Twin-piston semi-rotary drives DRQD-16 ... 50

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Technical data

## Function



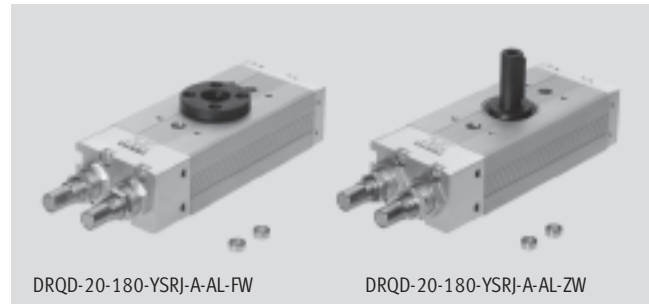
⊘ Diameter  
16 ... 50 mm

≡ Force  
1.6 ... 50 Nm

www.festo.com/en/  
Spare\_parts\_service

## Variants

- 90°, 180° and 360° or X swivel angle
- Spigot or flanged shaft
- Adjustable end-position cushioning or shock absorbers
- Position sensing
- Intermediate position
- Energy through-feed
- Different types of mounting



General technical data		16	20	25	32	40	50
Piston Ø		16	20	25	32	40	50
Pneumatic connection		M5			G $\frac{1}{8}$		G $\frac{1}{4}$
	SD32	QS...-3 for tubing O.D. $\varnothing$ 3 mm <sup>1)</sup>					-
	SD42/SD48	QS...-4 for tubing O.D. $\varnothing$ 4 mm <sup>1)</sup>					-
	E422	QS...-4 for tubing O.D. 4 mm			-		
	E444	-			QS...-4 for tubing O.D. 4 mm		-
SD62/SD64/ E644	-				QS...-6 for tubing O.D. 6 mm		
Constructional design		Semi-rotary drive with twin pistons based on the rack and pinion principle					
Cushioning	PPVJ	Adjustable, pneumatic					
	YSRJ	Adjustable, hydraulic shock absorbers					
Position sensing		For proximity sensing					
Type of mounting		Via through-hole					
		Via female thread					
Assembly position		Any					

Operating and environmental conditions		16	20	25	32	40	50	
Piston Ø		16	20	25	32	40	50	
Operating medium		Filtered compressed air, lubricated or unlubricated						
Operating pressure [bar]	PPVJ	1 ... 10						
	YSRJ	2 ... 10						
	Z1	1 ... 10						
Adjustable end-position range per end position [°]	PPVJ	-20 ... +6						
	YSRJ							
Max. permissible swiveling frequency at 6 bar (for completed cycle of motion) [Hz]	PPVJ	90°	4	3	2	1.2	1.2	1.2
		180°	3	2.2	1.3	0.8	0.9	0.9
		360°	1.5	1.2	0.8	0.5	0.5	0.5
	YSRJ	90°	2	2	1.5	1.2	1	0.9
		180°	1.8	1.8	1.5	1.2	1	0.8
		360°	1	1	0.9	0.8	0.7	0.6
SD.../E...		A reduction of max. 5% of the values indicated above						
- $\ddagger$ - Note: At temperatures < 0 °C, a max. frequency of 1 Hz applies in the case of variant YSRJ.								

# Twin-piston semi-rotary drives DRQD-16 ... 50

Technical data

Operating and environmental conditions				16	20	25	32	40	50
Piston Ø				16	20	25	32	40	50
Minimum cycle times [s] PPVJ 90° in conjunction with Z1 (from the end position to the intermediate position)	YSRJ	90°	0.20	0.22	0.18	0.21	0.20	0.18	
		180°	0.26	0.41	0.20	0.26	0.21	0.35	
	YSRJ	90°	0.20	0.22	0.17	0.20	0.47	0.35	
		180°	0.23	0.31	0.22	0.23	1.10	0.99	
Repetition accuracy [°] (approached from both ends)	Z1		≤ 0.05						
			≤ 0.15		≤ 0.25	≤ 0.20	≤ 0.30		
Ambient temperature [°C]				-10 ... +60					
Corrosion resistance class CRC <sup>1)</sup>				1					

1) Corrosion resistance class 1 according to Festo standard 940 070  
Components requiring low corrosion resistance. Transport and storage protection. Parts that do not have primarily decorative surface requirements, e.g. in internal areas that are not visible or behind covers

Forces and torques				16	20	25	32	40	50
Piston Ø				16	20	25	32	40	50
Theoretical torque at 6 bar [Nm] PPVJ	YSRJ	Z1	1.6	3.1	6.1	12.5	25	50	
			1.6	3.1	6.1	12.5	25	50	
			1.7	3.6	6.2	13.5	32.2	78.6	
				Note: If torque acts against the direction of rotation in the end position, a drive with a rating of twice the maximum theoretical torque should be selected.					
Max. permissible radial and axial forces				Graphs → 33					
Max. permissible mass moment of inertia [kgm <sup>2</sup> ] PPVJ	YSRJ	PPVJ-Z1	5 x 10 <sup>-4</sup>	10 x 10 <sup>-4</sup>	20 x 10 <sup>-4</sup>	40 x 10 <sup>-4</sup>	200 x 10 <sup>-4</sup>	500 x 10 <sup>-4</sup>	
			YSRJ-Z1	Graphs → 31					
				5 x 10 <sup>-4</sup>	10 x 10 <sup>-4</sup>	20 x 10 <sup>-4</sup>	40 x 10 <sup>-4</sup>	200 x 10 <sup>-4</sup>	500 x 10 <sup>-4</sup>
			-	-	-	-	1000 x 10 <sup>-4</sup>	2000 x 10 <sup>-4</sup>	
				The data applies to the variants ZW, FW, without grippers and unthrottled.					



Pneumatic sizing using Pro Pneu  
[www.festo.com/en/engineering](http://www.festo.com/en/engineering)

Weights [g]				16	20	25	32	40	50
Piston Ø				16	20	25	32	40	50
Connection cap AL/AR	PPVJ	116	220	358	609	1,170	2,320		
		YSRJ	140	240	441	917	2,170	4,270	
Centre section/output shaft	90°	ZW	379	609	1,026	1,891	3,330	6,860	
		FW	380	586	1,018	1,848	3,960	7,010	
	180°	ZW	467	753	1,267	2,325	4,340	8,850	
		FW	468	730	1,259	2,282	4,570	9,000	
	360°	ZW	643	1,039	1,741	3,199	6,350	12,890	
		FW	644	1,016	1,733	3,165	6,580	13,040	
End cap				40	53	82	140	370	610
Intermediate position	90°	Z1	235	315	550	805	2,510	3,960	
	180°	Z1	235	315	550	805	2,510	3,960	
Flanged shaft with energy through-feed	SD32	152		303					
		SD42	152		303				
	SD48	-				1,220			
	SD62	-				900			
	SD64	-				930			
	E422	400		-					
	E444	-		800					
	E644	-					2,700		

# Twin-piston semi-rotary drives DRQD-16 ... 50

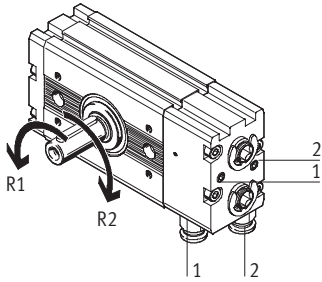
Technical data

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## Direction of rotation of the drive shaft

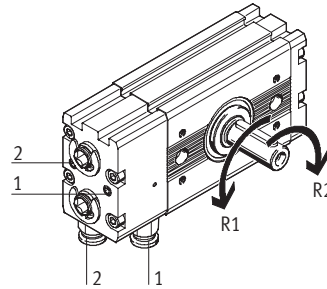
Connection cap on right (AR)

Pneumatic actuation of ports 1 or 2 produces a rotational movement in direction R1 or R2 respectively.



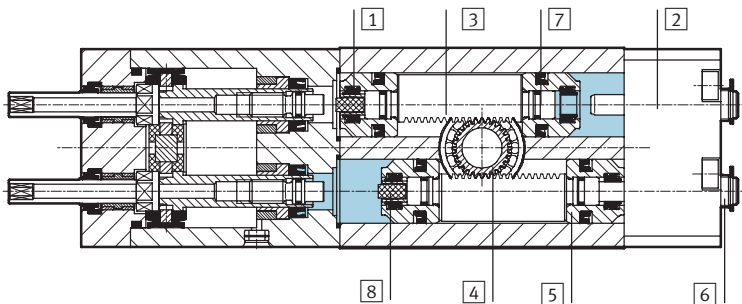
Connection cap on left (AL)

Pneumatic actuation of ports 1 or 2 produces a rotational movement in direction R1 or R2 respectively.



## Materials

Sectional view



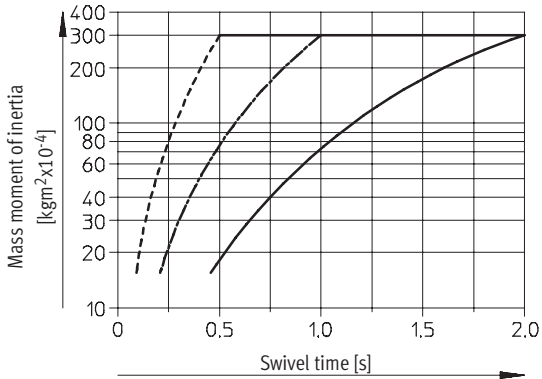
Piston $\varnothing$	16	20	25	32	40	50
<b>Basic drive</b>						
1	Cylinder barrel (centre section)		Anodised aluminium		Wrought aluminium alloy, anodised	
2	Connector cap		Anodised aluminium			
3	Gear rack		High-alloy stainless steel, hardened		High-alloy steel	
4	Pinion		Tempered steel			
5	Piston		Anodised aluminium			
6	Adjustable sleeve		Galvanised steel			
7	Piston seal		Polyurethane			
-	Material note		Copper, PTFE and silicone-free			
<b>Function end cap PPVJ</b>						
-	Cushioning seal		Nitrile rubber/polyurethane		Polyurethane	
-	Buffer sleeve, regulating screw		Anodised aluminium			
<b>Function end cap YSRJ</b>						
-	Buffer		Delrin			
-	Rod wiper seal		Nitrile rubber/polyurethane			
<b>Energy through-feed SD.../E...</b>						
-	Transfer plate/sliding disc		Anodised aluminium			
-	DUO spiral tubing		Polyurethane			
<b>Z1 intermediate position module</b>						
-	Piston		Stainless steel; nitrile rubber			
-	Piston rod, nut		Stainless steel			
-	Bearings		POM			
-	Rod wiper seal		Polyurethane			

# Twin-piston semi-rotary drives DRQD-16 ... 50

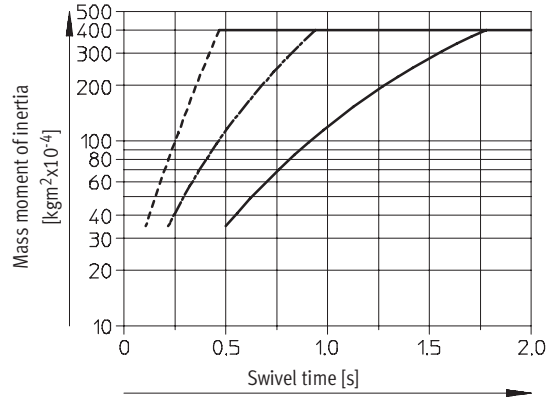
Technical data

## Maximum permissible mass moments of inertia on the drive shaft

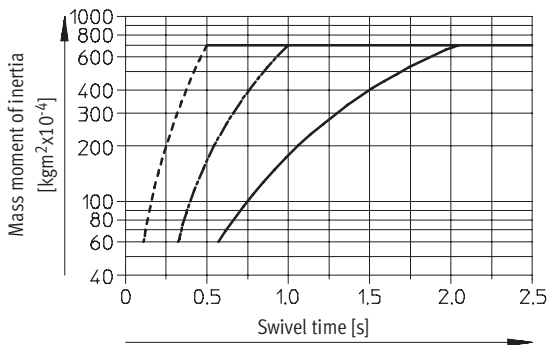
DRQD-16-...-YSRJ



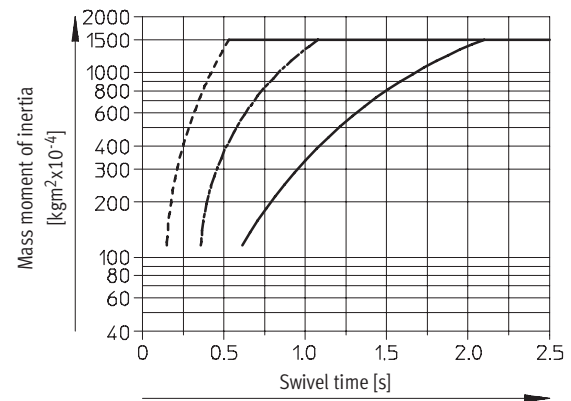
DRQD-20-...-YSRJ



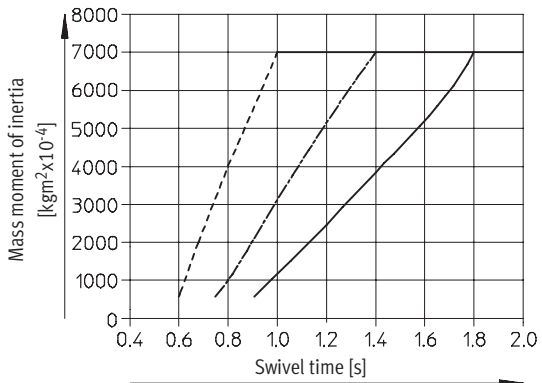
DRQD-25-...-YSRJ



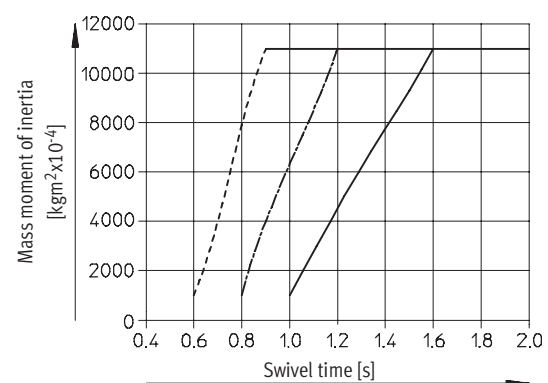
DRQD-32-...-YSRJ



DRQD-40-...-YSRJ



DRQD-50-...-YSRJ



- 90°
- .-.-.-.- 180°
- 360°

# Twin-piston semi-rotary drives DRQD-16 ... 50

Technical data

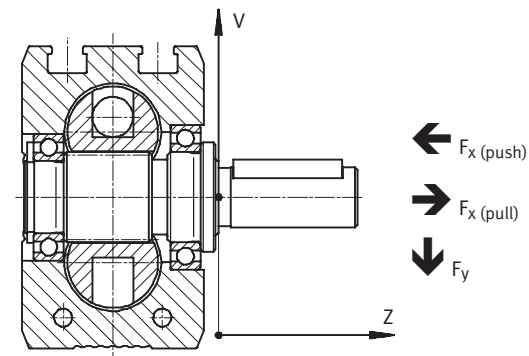
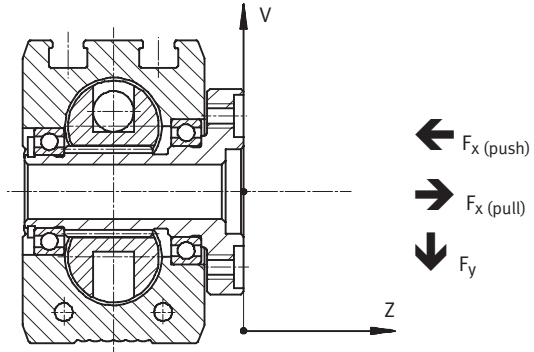
FESTO

## Max. permissible radial and axial forces on the drive shaft

### Combined load

A semi-rotary drive type DRQD-16-...-FW is to be statically loaded with a radial force  $F_y = 300\text{ N}$ , which is at a distance of  $Z = 15\text{ mm}$  from the

flanged shaft, and an axial force  $F_{x, \text{push}} = 100\text{ N}$ , which is at a distance of  $V = 25\text{ mm}$  from the shaft ( $\rightarrow$  diagram of flanged shaft on right).



### Question:

Is it permissible to statically load a DRQD-16-...-FW semi-rotary drive with these combined forces?

### Answer:

According to graph 1 ( $\rightarrow$  33), a distance of  $Z = 15\text{ mm}$  results in a maximum permissible radial force

$F_{y, \text{max. (stat.)}}(15) = 400\text{ N}$ .  
According to graph 3 ( $\rightarrow$  33), a distance of  $V = 25\text{ mm}$  results in a maxi-

mum permissible axial force  
 $F_{x, \text{push max. (stat.)}}(25) = 550\text{ N}$ .

### The following equation applies to combined loads:

$$\frac{F_y(z)}{F_{y, \text{max. (z)}}} + \frac{F_{x, \text{push}}(v)}{F_{x, \text{push, max. (v)}}} + \frac{F_{x, \text{pull}}(v)}{F_{x, \text{pull, max. (v)}}} \leq 1$$

### The following values are assumed:

$F_y(15) = 300\text{ N}$   
 $F_{x, \text{push (stat.)}}(25) = 100\text{ N}$   
 $F_{y, \text{max. (stat.)}}(15) = 400\text{ N}$   
 $F_{x, \text{max. (stat.)}}(25) = 550\text{ N}$

### With values inserted:

$$\frac{300\text{ N}}{400\text{ N}} + \frac{100\text{ N}}{550\text{ N}} \leq 1$$

$$0.75 + 0.182 \leq 1$$

$$0.932 \leq 1$$

Thus the drive may be statically loaded with the forces indicated above.



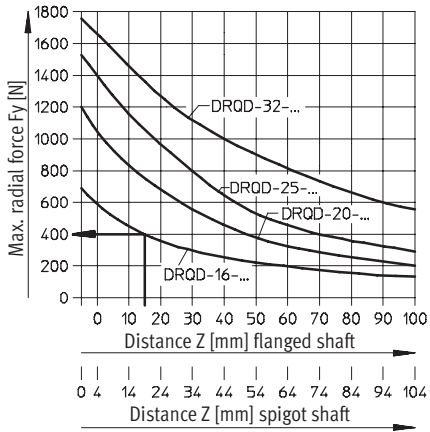
# Twin-piston semi-rotary drives DRQD-16 ... 50

Technical data

## Maximum static radial force

Graph 1

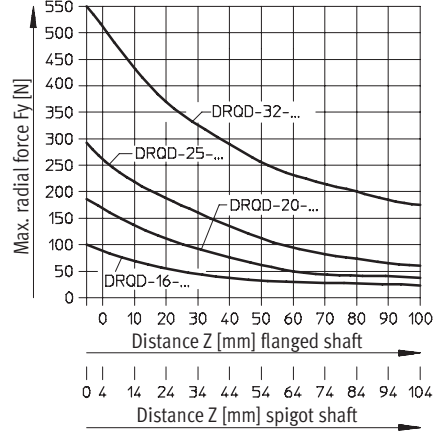
$$F_{y, \text{max. (stat.)}} = f(z)$$



## Maximum dynamic radial force

Graph 2

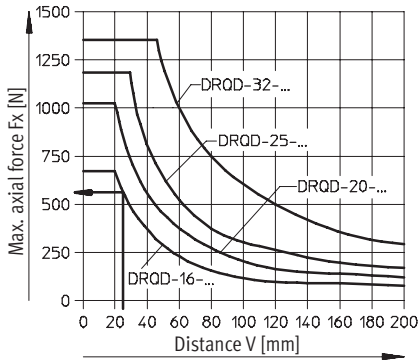
$$F_{y, \text{max. (dyn.)}} = f(z)$$



## Maximum static axial pushing force

Graph 3

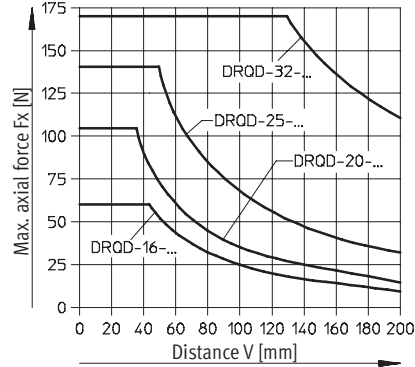
$$F_{x, \text{push max. (stat.)}} = f(v)$$



## Maximum dynamic axial pushing force

Graph 4

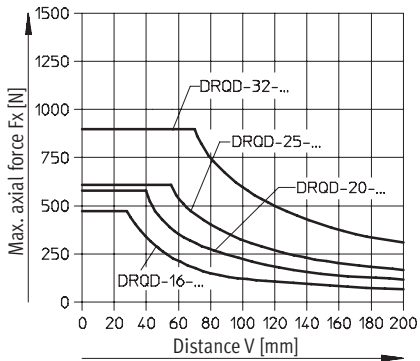
$$F_{x, \text{push max. (dyn.)}} = f(v)$$



## Maximum static axial pulling force

Graph 5

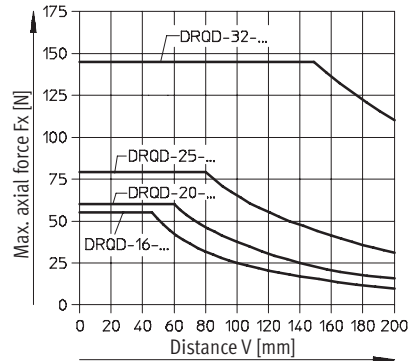
$$F_{x, \text{pull max. (stat.)}} = f(v)$$



## Maximum dynamic axial pulling force

Graph 6

$$F_{x, \text{pull max. (dyn.)}} = f(v)$$



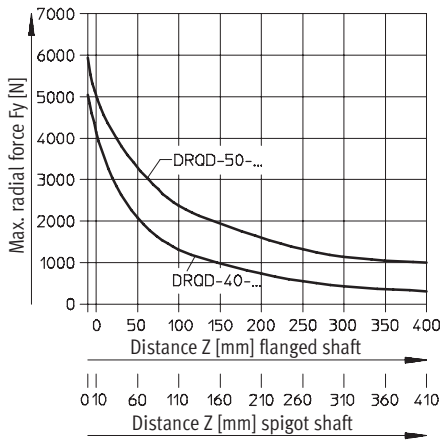
# Twin-piston semi-rotary drives DRQD-16 ... 50

Technical data

## Maximum static radial force

Graph 1

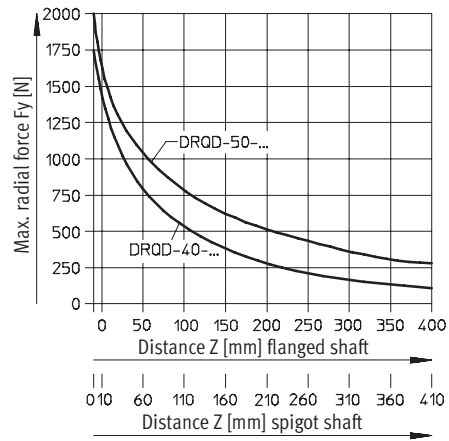
$$F_{y, \text{max. (stat.)}} = f(z)$$



## Maximum dynamic radial force

Graph 2

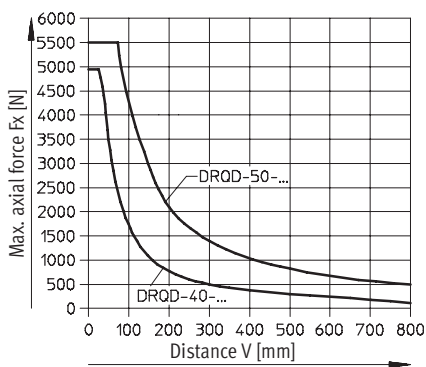
$$F_{y, \text{max. (dyn.)}} = f(z)$$



## Maximum static axial pushing force

Graph 3

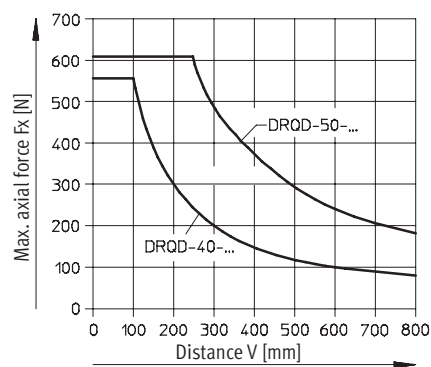
$$F_{x, \text{push max. (stat.)}} = f(v)$$



## Maximum dynamic axial pushing force

Graph 4

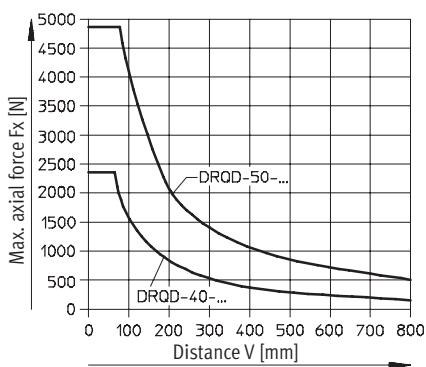
$$F_{x, \text{push max. (dyn.)}} = f(v)$$



## Maximum static axial pulling force

Graph 5

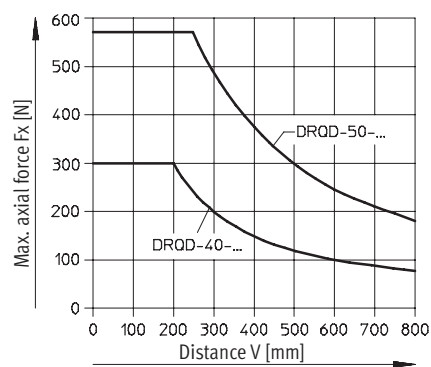
$$F_{x, \text{pull max. (stat.)}} = f(v)$$



## Maximum dynamic axial pulling force

Graph 6

$$F_{x, \text{pull max. (dyn.)}} = f(v)$$



# Twin-piston semi-rotary drives DRQD-16 ... 50

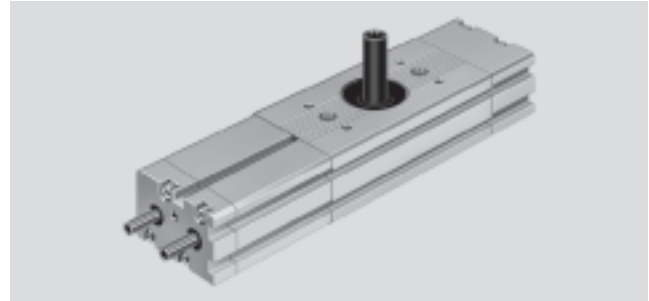
Technical data

## Z1 intermediate position module

For DRQD-16 ... 50

The intermediate position module is fitted in place of the end cap, and allows for adjustable, backlash-free positioning of the drive at 50% of its

nominal rotation angle. The intermediate position module is available for nominal rotation angles of 90° and 180°.



## Function

A piston incorporating two screw fastened piston rods is pressurised and shifts the semi-rotary drive gear racks until both make full contact with the

piston rods in the mid-position module. The mid-position can be accurately adjusted within a range of ±10° with the adjusting screws in the piston

rods. Thanks to the hollow shaft design of the piston rod, adjustment can be performed under pressure. The through rods in the mid-position

module are guided by means of multiple bearings in the cover and in the adapter.

## Actuation

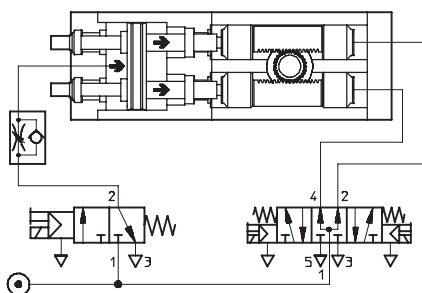
In order for the mid-position module to function, the DRQD basic actuator must be pressurised at both sides.

This can be accomplished with two different types of actuation:

### Actuation type 1

- Mid-position module (supply air must be restricted) with a 3/2-way valve

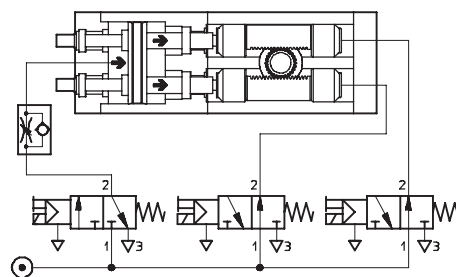
- DRQD basic drive with a 5/3-way valve, mid-position pressurised



### Actuation type 2

- Mid-position module (supply air must be restricted) with a 3/2-way valve

- DRQD basic drive with two 3/2-way valves, spring return



## Note

Even if the semi-rotary drives DRQD-16 to 32 have been equipped with shock absorbers (type YSRJ), the mid-position may not be loaded with

more than the max. permissible mass moment of inertia for the PPVJ variant! The reason for this is the cushioning: Whereas loads can be absorbed in the

end positions with the shock absorbers, the mid-position is only equipped with basic flexible cushioning. Additional information on the


permissible mass moment of inertia for the sizes 40 and 50 mm: → 29

# Twin-piston semi-rotary drives DRQD-16 ... 50

Technical data

Energy through-feed	
DRQD-...-SD...	DRQD-...-E...
The energy through-feed consists of one to max. four DUO tubes (fused tubing pair), whereby each tube has an O.D. of 3 ... 6 mm. Compressed air is supplied via the push-in fittings in	the transfer plate. Only Quick-Star push-in fittings may be used to connect compressed air tubing to consuming devices (e.g. grippers).
	The energy through-feed consists of one to max. two DUO tubes (fused tubing pair), whereby each tube has an O.D. of 4 ... 6 mm. Compressed air is supplied via the push-in fittings in the transfer plate. Only Quick-Star
	push-in fittings may be used to connect compressed air tubing to consuming devices (e.g. grippers). In addition, up to four proximity sensors can be connected by means of this energy through-feed.

DRQD-...-SD...



- For piston  $\varnothing$  16 ... 50
- Swivel angles of up to 360° are possible
- 1 ... 4 DUO tubes

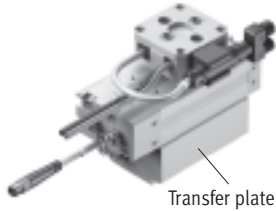
Technical data		16	20	25	32	40	50	
Piston $\varnothing$		16	20	25	32	40	50	
Number of DUO tubes	SD32	1				–		
	SD42	1				–		
	SD48	–				4		
	SD62	–				1		
	SD64	–				2		
Standard nominal flow rate (per tube) [l/min]	SD32	min. 70				–		
	SD42	min. 130				–		
	SD48	–				min. 130		
	SD62	–				min. 250		
	SD64	–				min. 250		
Theoretical air consumption per line at 6 bar [cm <sup>3</sup> ]	SD32	5.3				–		
	SD42	9.5				–		
	SD48	–				9.5		
	SD62	–				24.4		
	SD64	–				24.4		
Operating pressure as a function of ambient temperature [bar]		0 ... 10 (at –10 ... +30 °C)						
		0 ... 9 (at –30 ... +40 °C)						
		0 ... 7 (at –40 ... +60 °C)						
Tube O.D. on flanged shaft drive side [mm]	SD32	3				–		
	SD42	4				–		
	SD48	–				4		
	SD62	–				6		
	SD64	–				6		
Push-in fittings for connection to consuming device [mm]	SD32	QS-...-3 for tube O.D. 3 mm					–	
	SD42	QS-...-4 for tube O.D. 4 mm					–	
	SD48	–				QS-...-4 for tube O.D. 4 mm		
	SD62	–				QS-...-6 for tube O.D. 6 mm		
	SD64	–				QS-...-6 for tube O.D. 6 mm		

# Twin-piston semi-rotary drives DRQD-16 ... 50

Technical data

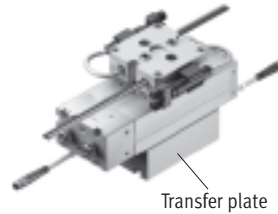
## Energy through-feed

DRQD-...-E422



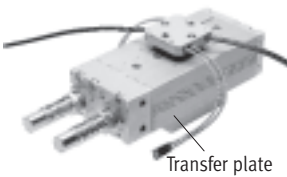
- For piston  $\varnothing$  16/20
- Swivel angles of up to 180° are possible
- 1 DUO tube with O.D. 4 mm
- 1 4-pin cable to 2 3-pin cables

DRQD-...-E444



- For piston  $\varnothing$  25/32
- Swivel angles of up to 180° are possible
- 2 DUO tubes each with O.D. 4 mm
- 2 4-pin cables to 4 3-pin cables

DRQD-...-E644



- For piston  $\varnothing$  40/50
- Swivel angles of up to 180° are possible
- 2 DUO tubes each with O.D. 6 mm
- 4 3-pin cables

## Technical data

Piston $\varnothing$		16	20	25	32	40	50
Number of DUO tubes	E422	1		–			
	E444	–		2		–	
	E644	–		–		2	
Standard nominal flow rate (per tube) [l/min]	E422	min. 130		–			
	E444	–		min. 130		–	
	E644	–		–		min. 250	
Theoretical air consumption per line at 6 bar [cm <sup>3</sup> ]	E422	9.5		–			
	E444	–		9.5		–	
	E644	–		–		24.4	
Operating pressure as a function of ambient temperature [bar]			0 ... 10 (at -10 ... +30 °C)				
			0 ... 9 (at +30 ... +40 °C)				
			0 ... 7 (at +40 ... +60 °)				
Tube O.D. on flanged shaft drive side [mm]	E422	4		–			
	E444	–		4		–	
	E644	–		–		6	
Push-in fittings for connection to consuming device [mm]	E422	QS-...-4 for tube O.D. 4 mm		–			
	E444	–		QS-...-4 for tube O.D. 4 mm		–	
	E644	–		–		QS-...-6 for tube O.D. 6 mm	

# Twin-piston semi-rotary drives DRQD-16 ... 32

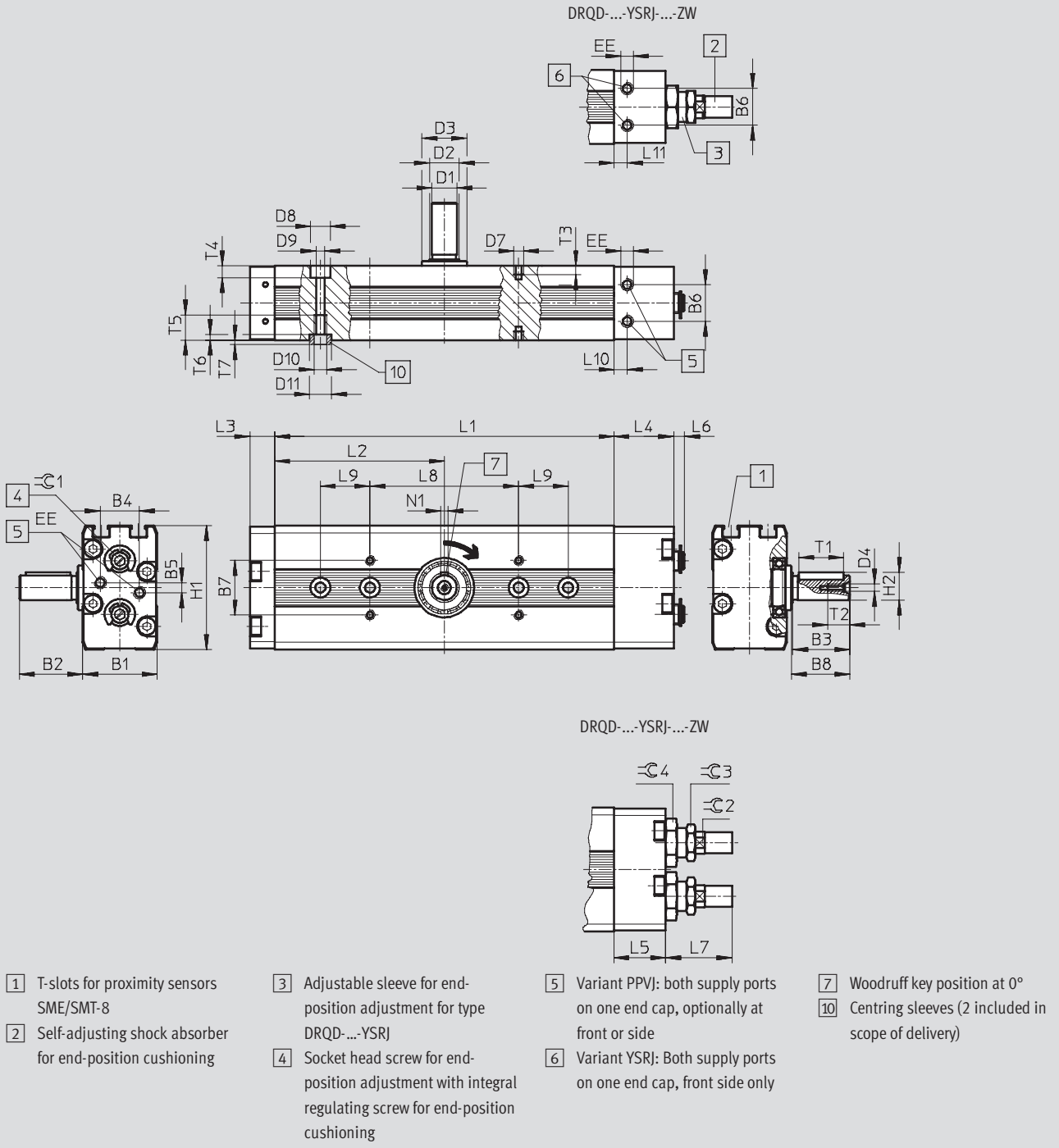
Technical data

FESTO

## Dimensions

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

ZW – Spigot shaft



# Twin-piston semi-rotary drives DRQD-16 ... 32

Technical data

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

Dimensions															
∅	Swivel angle	B1	B2	B3	B4	B5	B6	B7	B8	D1	D2	D3	D4	D7	D8
[mm]	[°]									∅ g6	∅	∅			∅ H13
16	90	30	25.5	23	17.8	4	14.8	22	23.5	10	12	18	M3	M4	8
	180														
	360														
20	90	36	32.5	30	21.8	4	19.8	26	30.5	12	15	24	M4	M4	8
	180														
	360														
25	90	42	42.5	40	24.8	4	24.8	30	40.5	16	20	30	M5	M5	10
	180														
	360														
32	90	51	52.5	50	29.8	2	29.8	36	50.5	20	25	35	M6	M5	10
	180														
	360														

∅	Swivel angle	D9	D10	D11	EE	H1	H2	L1	L2	L3	L4	L5	L6		L7		L8
													∅	∅ H7	min.	max.	
16	90	4.2	M5	9	M5	50	11.2	71	35.5	10	24	20.8	1.7	5.7	23.4	28.2	60
	180							93	46.5								
	360							137	68.5								
20	90	4.2	M5	9	M5	56	13.5	78.4	39.2	10	31.5	27	2.4	7	28.6	35.9	60
	180							104.8	52.4								
	360							157.6	78.8								
25	90	5.3	M6	9	M5	67	18	91.2	45.6	11	36.5	33	2.6	8.9	42	50.2	60
	180							124	62								
	360							189.2	94.6								
32	90	5.3	M6	9	G $\frac{1}{8}$	79	22.5	114.8	57.4	13	39	39	4.3	11.8	59.4	70.1	80
	180							155.6	77.8								
	360							237.4	118.7								

∅	Swivel angle	L9	L10	L11	N1	T1	T2	T3	T4	T5	T6	T7	∅C1	∅C2	∅C3	∅C4
[mm]	[°]	±0.03			P9											
16	90	-	7.6	5.3	3	18.1	9	3.5	5	10	2	2	4	9	13	17
	180	-														
	360	20														
20	90	-	8	5	4	25.1	10	3.5	5	12	2	2	7	11	15	19
	180	-														
	360	20														
25	90	-	11	5	5	36.1	12.5	5	6	12	2	2	7	15	19	24
	180	-														
	360	20														
32	90	-	13.1	8	6	45.1	16	5	6	14	2	2	8	20	27	32
	180	20														
	360	20														

# Twin-piston semi-rotary drives DRQD-40 ... 50

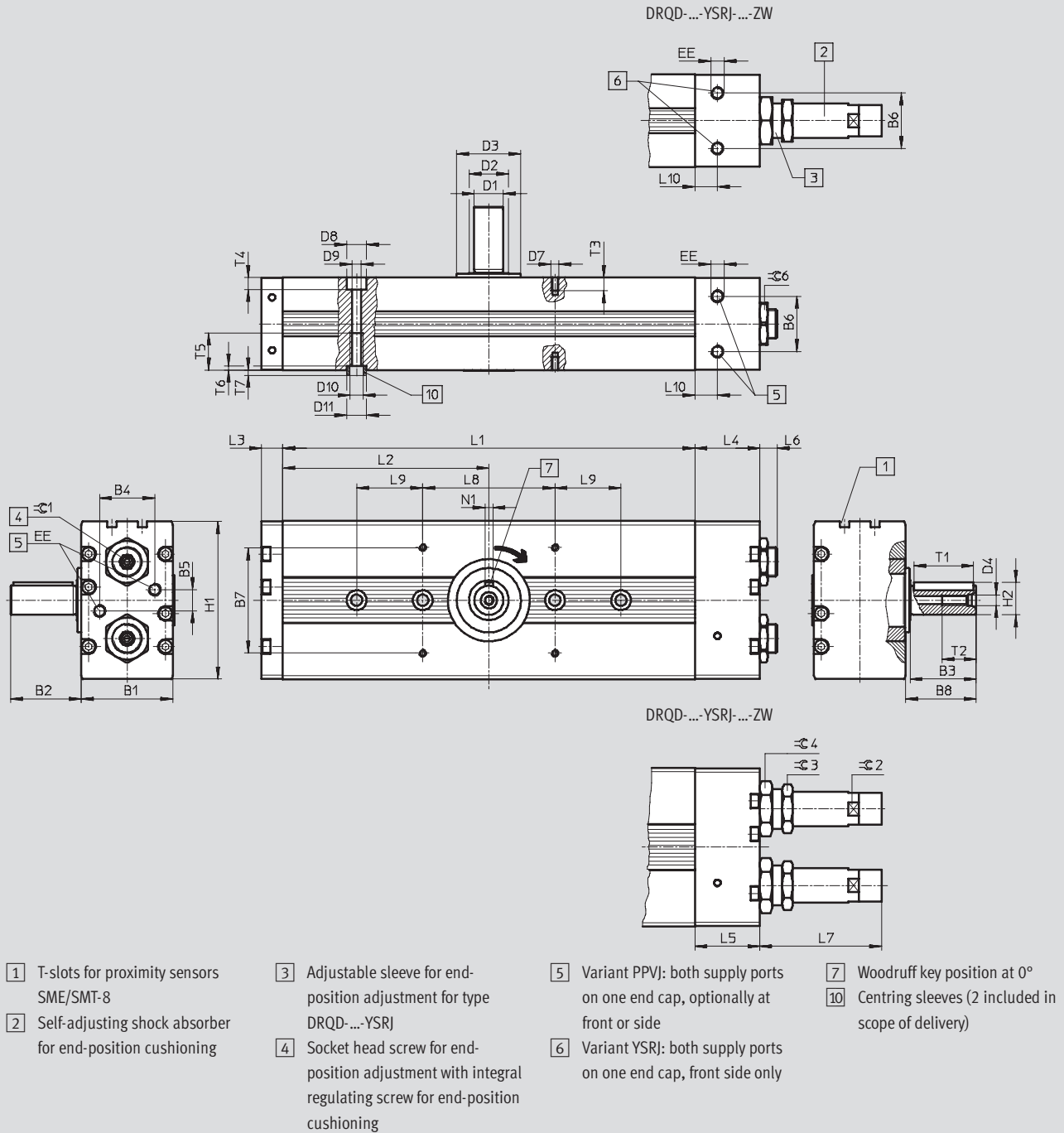
Technical data

FESTO

## Dimensions

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

ZW – Spigot shaft





# Twin-piston semi-rotary drives DRQD-40 ... 50

Technical data

Dimensions																	Download CAD data → <a href="http://www.festo.com/en/engineering">www.festo.com/en/engineering</a>
∅	Swivel angle	B1	B2	B3	B4	B5	B6	B7	B8	D1	D2	D3	D4	D7	D8	D9	
[mm]	[°]									∅ g6	∅	∅			∅ H13	∅	
40	90	70	53.5	50	42	4	42	80	50.5	22	30	48.5	M8	M6	15	8.5	
	180																
	360																
50	90	86	63.5	60	50	16	50	80	60.9	28	38	58.5	M12	M6	15	8.5	
	180																
	360																

∅	Swivel angle	D10	D11	EE	H1	H2	L1	L2	L3	L4	L5	L6		L7		L8
												∅ H7				
40	90	M10	15	G $\frac{1}{8}$	120	24.5	146.8	73.4	16	49	41.5	5	14.6	85.1	96.4	100
	180						201.8	100.9								
	360						311.8	155.9								
50	90	M10	15	G $\frac{1}{4}$	144	31	191.4	95.7	18	64	55	8	20.7	107.8	120.6	100
	180						262.8	131.4								
	360						405.8	202.9								

∅	Swivel angle	L9	L10	N1	T1	T2	T3	T4	T5	T6	T7	=C1	=C2	=C3	=C4	=C6
40	90	-	17	6	45.1	26	10	10	28	3	3	10	24	32	36	27
	180	-														
	360	50														
50	90	-	21.2	8	56.1	28	10	11	28	3	3	14	28	36	46	41
	180	50														
	360	100														

# Twin-piston semi-rotary drives DRQD-16 ... 32

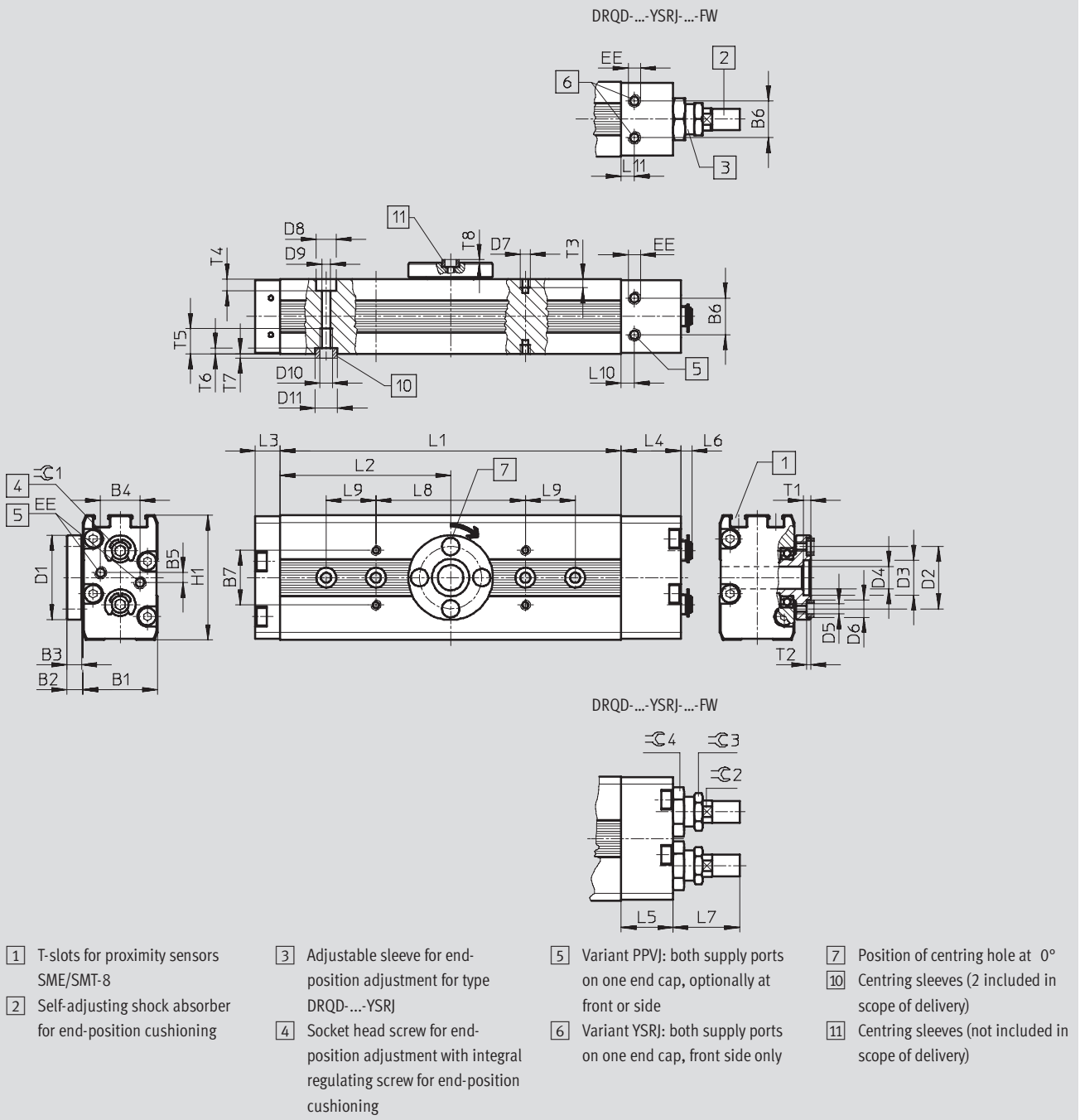
Technical data

**FESTO**

## Dimensions

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

FW – Flanged shaft



# Twin-piston semi-rotary drives DRQD-16 ... 32

Technical data

FESTO

Dimensions																	Download CAD data → <a href="http://www.festo.com/en/engineering">www.festo.com/en/engineering</a>
∅	Swivel angle	B1	B2	B3	B4	B5	B6	B7	D1	D2	D3	D4	D5	D6	D7	D8	
[mm]	[°]								∅	∅ ±0.025	∅ H8	∅		∅ H7		∅ H13	
16	90	30	6.5	6	17.8	4	14.8	22	34	25	14	9	M4	7	M4	8	
	180																
	360																
20	90	36	6.5	6	21.8	4	19.8	26	38	28	16	11	M4	7	M4	8	
	180																
	360																
25	90	42	9.5	9	24.8	4	24.8	30	48	34	16	12	M6	9	M5	10	
	180																
	360																
32	90	51	9.5	9	29.8	2	29.8	36	58	45	19	14	M6	9	M5	10	
	180																
	360																

∅	Swivel angle	D9	D10	D11	EE	H1	L1	L2	L3	L4	L5	L6		L7		L8
												∅	∅ H7	min.	max.	
16	90	4.2	M5	9	M5	50	71	35.5	10	24	20.8	1.7	5.7	23.4	28.2	60
	180						93	46.5								
	360						137	68.5								
20	90	4.2	M5	9	M5	56	78.4	39.2	10	31.5	27	2.4	7	28.6	35.9	60
	180						104.8	52.4								
	360						157.6	78.8								
25	90	5.3	M6	9	M5	67	91.2	45.6	11	36.5	33	2.6	8.9	42	50.2	60
	180						124	62								
	360						189.2	94.6								
32	90	5.3	M6	9	G $\frac{1}{8}$	79	114.8	57.4	13	39	39	4.3	11.8	59.4	70.1	80
	180						155.6	77.8								
	360						237.4	118.7								

∅	Swivel angle	L9	L10	L11	T1	T2	T3	T4	T5	T6	T7	T8	≈C1	≈C2	≈C3	≈C4
16	90	–	7.6	5.3	3	1.6	3.5	5	10	2	2	1.4	4	9	13	17
	180	–														
	360	20														
20	90	–	8	5	3	1.6	3.5	5	12	2	2	1.4	7	11	15	19
	180	–														
	360	20														
25	90	–	11	5	3	2	5	6	12	2	2	2	7	15	19	24
	180	–														
	360	20														
32	90	–	13.1	8	3	2	5	6	14	2	2	2	8	20	27	32
	180	20														
	360	20														

# Twin-piston semi-rotary drives DRQD-40 ... 50

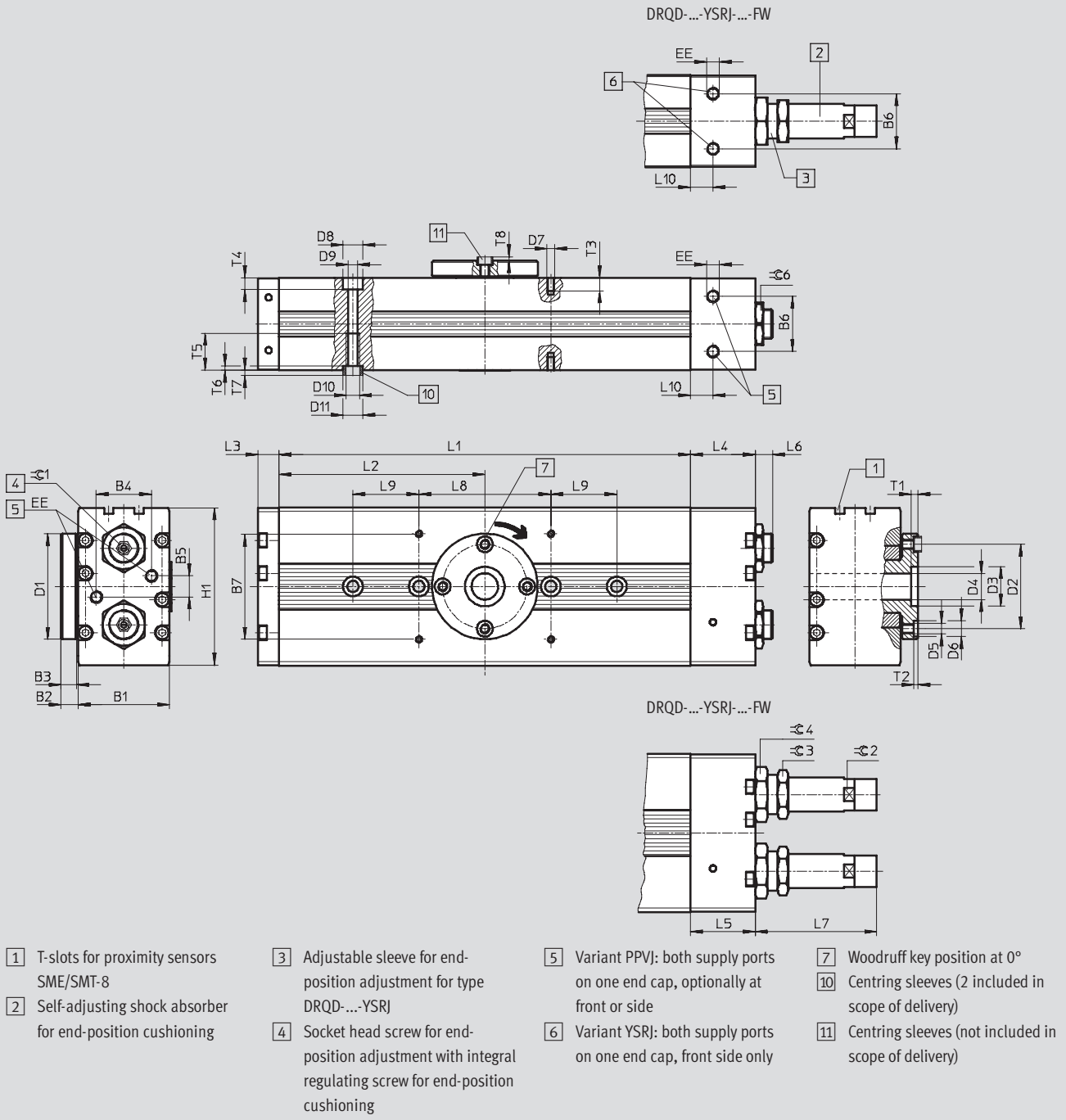
Technical data

FESTO

## Dimensions

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

FW – Flanged shaft



# Twin-piston semi-rotary drives DRQD-40 ... 50

Technical data

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

Dimensions																
∅	Swivel angle	B1	B2	B3	B4	B5	B6	B7	D1	D2	D3	D4	D5	D6	D7	D8
[mm]	[°]								∅	∅ ±0.025	∅ H7			∅ H7		∅ H13
40	90	70	13	12	42	4	42	80	80	64	30	20	M8	12	M6	15
	180															
	360															
50	90	86	13	12	50	16	50	80	85	64	30	24	M8	12	M6	15
	180															
	360															

∅	Swivel angle	D9	D10	D11	EE	H1	L1	L2	L3	L4	L5	L6		L7	
												∅	∅ H7	min.	max.
40	90	8.5	M10	15	G $\frac{1}{8}$	120	146.8	73.4	16	49	41.5	5	14.6	85.1	96.4
	180						201.8	100.9							
	360						311.8	155.9							
50	90	8.5	M10	15	G $\frac{1}{4}$	144	191.4	95.7	18	64	55	8	20.7	107.8	120.6
	180						262.8	131.4							
	360						405.8	202.9							

∅	Swivel angle	L8	L9	L10	T1	T2	T3	T4	T5	T6	T7	=C1	=C2	=C3	=C4	=C6
40	90	100	-	17	4	2.7	10	10	28	3	3	10	24	32	36	27
	180		-													
	360		50													
50	90	100	-	21.2	4	2.7	10	11	28	3	3	14	28	36	46	41
	180		50													
	360		100													

# Twin-piston semi-rotary drives DRQD-16 ... 32

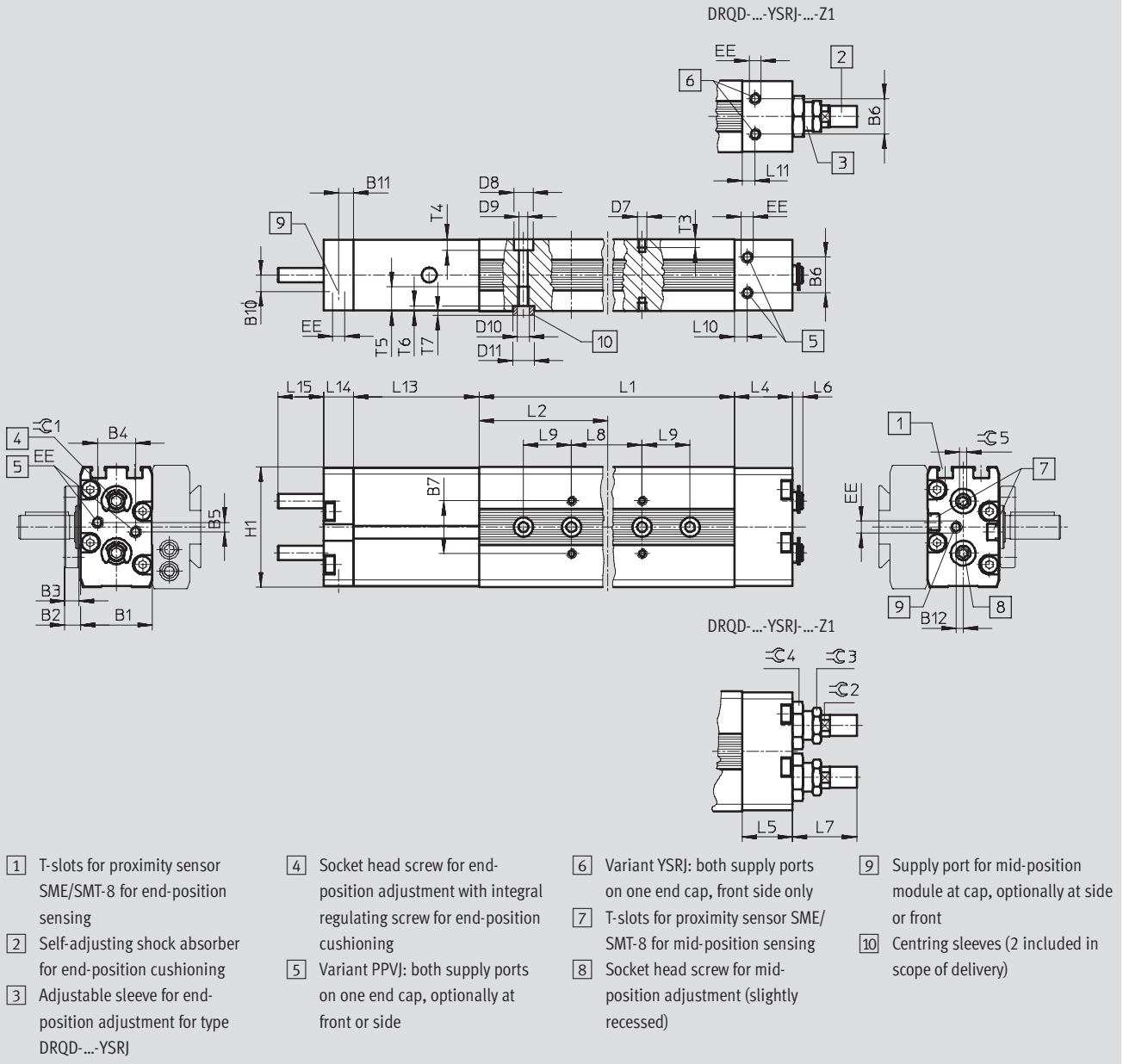
Technical data

FESTO

## Dimensions

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

Z1 – Intermediate position module (energy through-feed is optional)



# Twin-piston semi-rotary drives DRQD-16 ... 32

Technical data

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

Dimensions																
∅	Swivel angle	B1	B2	B3	B4	B5	B6	B7	B10	B11	B12	D7	D8	D9	D10	D11
[mm]	[°]												∅ H13	∅		∅ H7
16	90	30	6.5	6	17.8	4	14.8	22	6.4	4.5	3	M4	8	4.2	M5	9
	180															
20	90	36	6.5	6	21.8	4	19.8	26	6.5	4.5	5.6	M4	8	4.2	M5	9
	180															
25	90	42	9.5	9	24.8	4	24.8	30	9.1	6.9	8.2	M5	10	5.3	M6	9
	180															
32	90	51	9.5	9	29.8	2	29.8	36	9	8	9	M5	10	5.3	M6	9
	180															

∅	Swivel angle	EE	H1	L1	L2	L4	L5	L6		L7		L8	L9	L10	L11
								min.	max.	min.	max.				
16	90	M5	50	71	35.5	24	20.8	1.7	5.7	23.4	28.2	60	-	7.6	5.3
	180			93	46.5								-		
20	90	M5	56	78.4	39.2	31.5	27	2.4	7	28.6	35.9	60	-	8	5
	180			104.8	52.4								-		
25	90	M5	67	91.2	45.6	36.5	33	2.6	8.9	42	50.2	60	-	11	5
	180			124	62								-		
32	90	G $\frac{1}{8}$	79	114.8	57.4	39	39	4.3	11.8	59.4	70.1	80	-	13.1	8
	180			155.6	77.8								20		

∅	Swivel angle	L13	L14	L15		T3	T4	T5	T6	T7	≈C1	≈C2	≈C3	≈C4	≈C5
				min.	max.										
16	90	52.2	12.3	0	19.1	3.5	5	10	2	2	4	9	13	17	3
	180														
20	90	55.4	12.3	0	21.8	3.5	5	12	2	2	7	11	15	19	3
	180														
25	90	62.1	15	0	26	5	6	12	2	2	7	15	19	24	4
	180														
32	90	68.2	15.5	0	31.5	5	6	14	2	2	8	20	27	32	4
	180														

# Twin-piston semi-rotary drives DRQD-40 ... 50

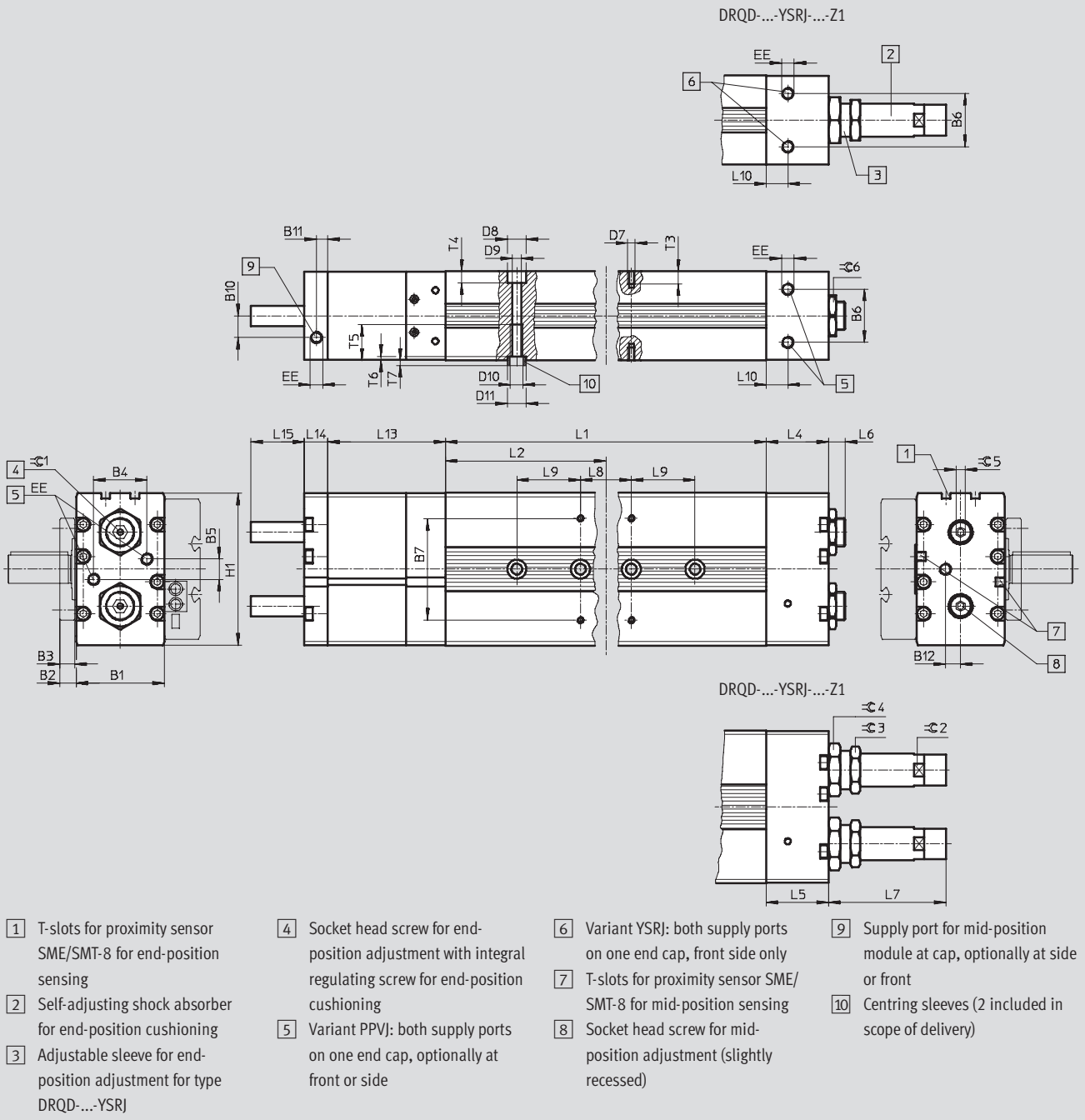
Technical data

FESTO

## Dimensions

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

Z1 – Intermediate position module (energy through-feed is optional)





# Twin-piston semi-rotary drives DRQD-40 ... 50

Technical data

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

Dimensions															
∅	Swivel angle	B1	B2	B3	B4	B5	B6	B7	B10	B11	B12	D7	D8	D9	D10
[mm]	[°]												∅ H13	∅	
40	90	70	13	12	42	4	42	80	92.5	9	12	M6	15	8.5	M10
	180														
	360														
50	90	86	13	12	50	16	50	80	105.7	9	14	M6	15	8.5	M10
	180														
	360														

∅	Swivel angle	D11	EE	H1	L1	L2	L4	L5	L6		L7		L8	L9	L10
									∅ H7						
40	90	15	G $\frac{1}{8}$	120	146.8	73.4	49	41.5	5	14.6	85.1	96.4	100	-	17
	201.8				100.9	-									
	311.8				155.9	50									
50	90	15	G $\frac{1}{4}$	144	191.4	95.7	64	55	8	20.7	107.8	120.6	100	-	21.2
	262.8				131.4	50									
	405.8				202.9	100									

∅	Swivel angle	L13	L14	L15		T3	T4	T5	T6	T7	=C1	=C2	=C3	=C4	=C5	=C6
				min.	max.											
40	90	92.5	18.5	0	41.95	10	10	28	3	3	10	24	32	36	7	27
	180															
	360															
50	90	105.7	20.5	0	52.95	10	11	28	3	3	14	28	36	46	7	41
	180															
	360															

# Twin-piston semi-rotary drives DRQD-16 ... 32

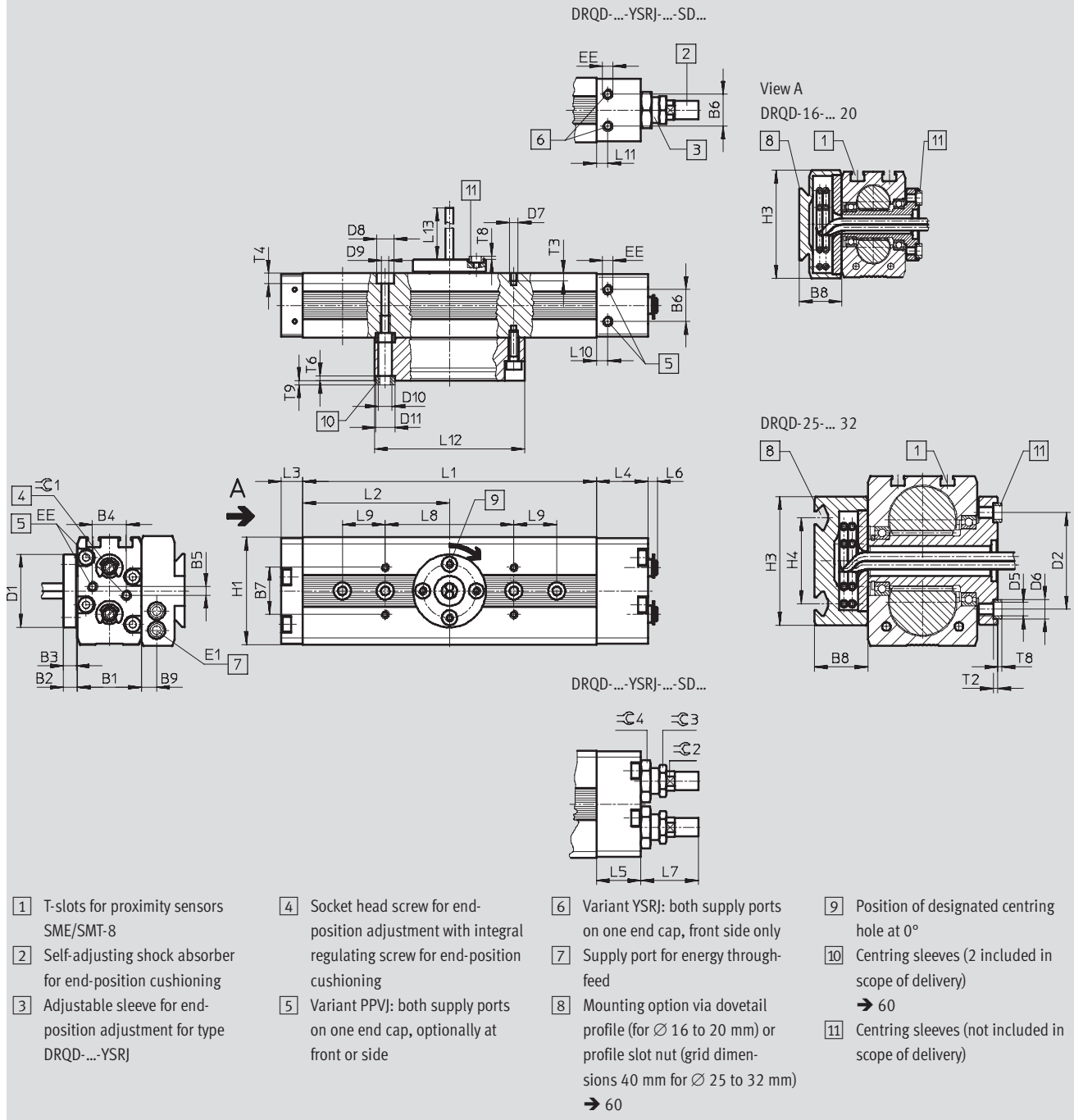
Technical data

FESTO

## Dimensions

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

FW-SD – Energy through-feed



# Twin-piston semi-rotary drives DRQD-16 ... 32

Technical data

FESTO

Dimensions																	Download CAD data → <a href="http://www.festo.com/en/engineering">www.festo.com/en/engineering</a>	
∅	Swivel angle	B1	B2	B3	B4	B5	B6	B7	B8	B9	D1	D2	D5	D6	D7	D8	D9	
[mm]	[°]										∅	∅ ±0.025		∅ H7		∅ H13	∅	
16	90	30	6.5	6	17.8	4	14.8	22	20	7	34	25	M4	7	M4	8	4.2	
	180																	
	360																	
20	90	36	6.5	6	21.8	4	19.8	26	20	7	38	28	M4	7	M4	8	4.2	
	180																	
	360																	
25	90	42	9.5	9	24.8	4	24.8	30	25	7	48	34	M6	9	M5	10	5.3	
	180																	
	360																	
32	90	51	9.5	9	29.8	2	29.8	36	25	7	58	45	M6	9	M5	10	5.3	
	180																	
	360																	

∅	Swivel angle	D10	D11	EE	E1	H1	H3	H4	L1	L2	L3	L4	L5	L6		L7			
														∅ H13	∅ H7	∅	∅	min.	max.
16	90	5.5	9	M5	4	50	51	-	71	35.5	10	24	20.8	1.7	5.7	23.4	28.2		
	180																	93	46.5
	360																	137	68.5
20	90	5.5	9	M5	4	56	51	-	78.4	39.2	10	31.5	27	2.4	7	28.6	35.9		
	180																	104.8	52.4
	360																	157.6	78.8
25	90	6.6	9	M5	4	67	60	40	91.2	45.6	11	36.5	33	2.6	8.9	42	50.2		
	180																	124	62
	360																	189.2	94.6
32	90	6.6	9	G1/8	4	79	60	40	114.8	57.4	13	39	39	4.3	11.8	59.4	70.1		
	180																	155.6	77.8
	360																	237.4	118.7

∅	Swivel angle	L8	L9	L10	L11	L12	L13	T2	T3	T4	T6	T8	T9	=C1	=C2	=C3	=C4
16	90	60	-	7.6	5.3	72	255	1.6	3.5	5	2.1	1.4	2	4	9	13	17
	180		-														
	360		20														
20	90	60	-	8	5	72	250	1.6	3.5	5	2.1	1.4	2	7	11	15	19
	180		-														
	360		20														
25	90	60	-	11	5	95	240	2	5	6	2.1	2	2	7	15	19	24
	180		-														
	360		20														
32	90	80	-	13.1	8	95	230	2	5	6	2.1	2	2	8	20	27	32
	180		20														
	360		20														

# Twin-piston semi-rotary drives DRQD-40 ... 50

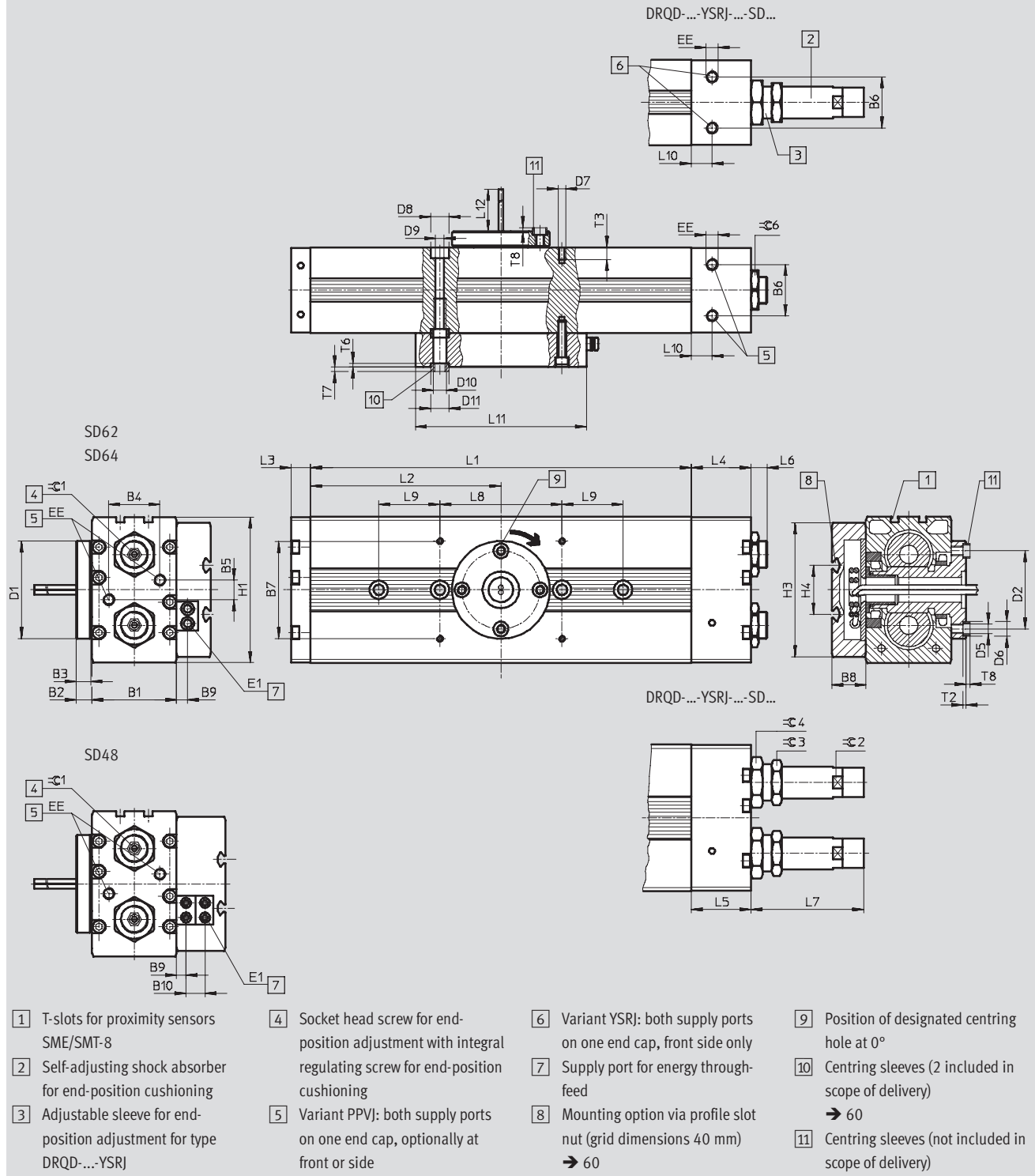
Technical data

FESTO

## Dimensions

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

FW-SD – Energy through-feed



# Twin-piston semi-rotary drives DRQD-40 ... 50

Technical data

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

Dimensions																				
∅ [mm]	Swivel angle [°]	Variant	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	D1	D2	D3	D4	D5	D6	D7	D8
			∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅
			±0.05 H7																	
40	90	SD62/SD64	70	13	12	42	4	42	80	28	9	–	80	64	30	20	M8	12	M6	15
		40								7.75	15.5									
	180	SD62/SD64	70	13	12	42	4	42	80	28	9	–	80	64	30	20	M8	12	M6	15
		40								7.75	15.5									
	360	SD62/SD64	70	13	12	42	4	42	80	28	9	–	80	64	30	20	M8	12	M6	15
		40								7.75	15.5									
50	90	SD62/SD64	86	13	12	50	16	50	80	28	9	–	85	64	30	24	M8	12	M6	15
		40								7.75	15.5									
	180	SD62/SD64	86	13	12	50	16	50	80	28	9	–	85	64	30	24	M8	12	M6	15
		40								7.75	15.5									
	360	SD62/SD64	86	13	12	50	16	50	80	28	9	–	85	64	30	24	M8	12	M6	15
		40								7.75	15.5									

∅ [mm]	Swivel angle [°]	Variant	D9	D10	D11	EE	E1	H1	H3	L1	L2	L3	L4	L5	L6		L7	
			∅	∅	∅	H7											min.	max.
40	90	SD62/SD64	8.5	M10	15	G1/8	6	120	110	146.8	73.4	16	49	41.5	5	14.6	85.1	96.4
		4																
	180	SD62/SD64	8.5	M10	15	G1/8	6	120	110	201.8	100.9	16	49	41.5	5	14.6	85.1	96.4
		4																
	360	SD62/SD64	8.5	M10	15	G1/8	6	120	110	311.8	155.9	16	49	41.5	5	14.6	85.1	96.4
		4																
50	90	SD62/SD64	8.5	M10	15	G1/4	6	144	110	191.4	95.7	18	64	55	8	20.7	107.8	120.6
		4																
	180	SD62/SD64	8.5	M10	15	G1/4	6	144	110	262.8	131.4	18	64	55	8	20.7	107.8	120.6
		4																
	360	SD62/SD64	8.5	M10	15	G1/4	6	144	110	405.8	202.9	18	64	55	8	20.7	107.8	120.6
		4																

∅ [mm]	Swivel angle [°]	Variant	L8	L9	L10	L11	L12	T1	T2	T3	T4	T5	T6	T7	T8	∅C1	∅C2	∅C3	∅C4	∅C6
			±0.03	±0.03						min.					±0.15					
40	90	SD62/SD64	100	–	17	140	42	4	2.7	10	10	28	3	3	2.3	10	24	32	36	27
		SD48																		
	180	SD62/SD64	100	–	17	140	42	4	2.7	10	10	28	3	3	2.3	10	24	32	36	27
		SD48																		
	360	SD62/SD64	100	50	17	140	42	4	2.7	10	10	28	3	3	2.3	10	24	32	36	27
		SD48																		
50	90	SD62/SD64	100	–	21.2	140	26	4	2.7	10	11	28	3	3	2.3	14	28	36	46	41
		SD48																		
	180	SD62/SD64	100	50	21.2	140	26	4	2.7	10	11	28	3	3	2.3	14	28	36	46	41
		SD48																		
	360	SD62/SD64	100	100	21.2	140	26	4	2.7	10	11	28	3	3	2.3	14	28	36	46	41
		SD48																		

# Twin-piston semi-rotary drives DRQD-16 ... 20

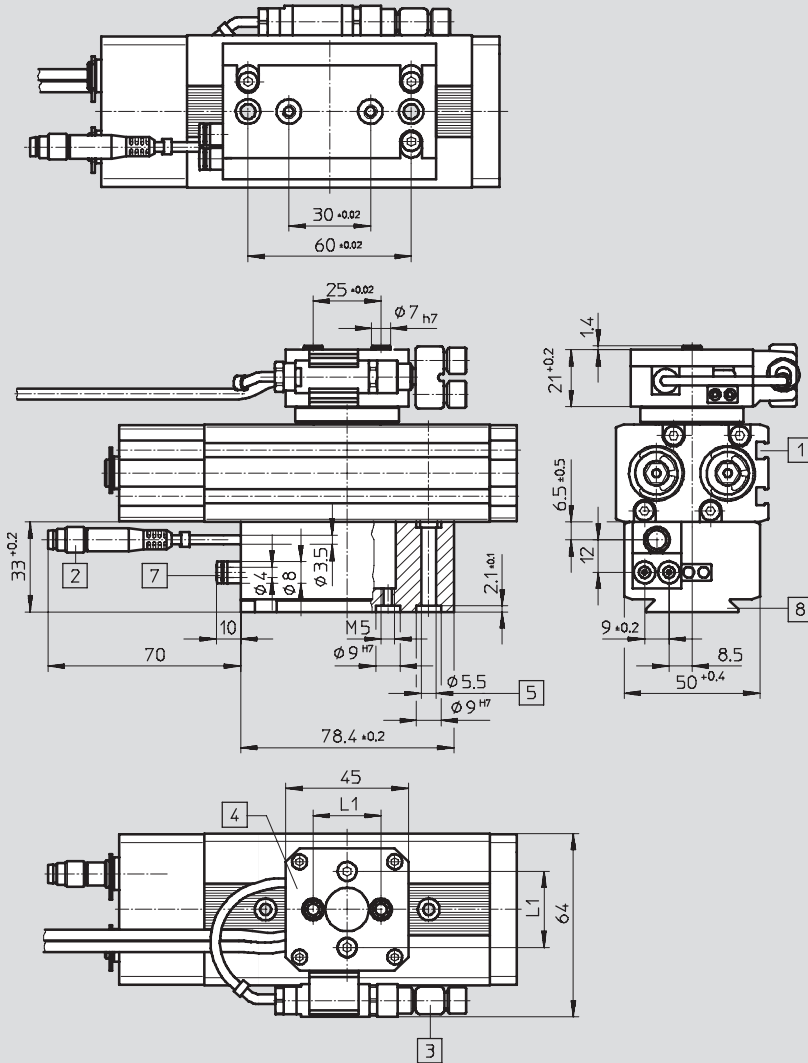
Technical data

FESTO

## Dimensions

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

FW E422 – Energy through-feed



L1  
for  $\phi 16$ :  $25 \pm 0,02$  mm  
for  $\phi 20$ :  $28 \pm 0,02$  mm

- 1 T-slots for proximity sensors SME/SMT-8
- 2 Plug M8x1, 4-pin
- 3 Socket M8x1 for proximity sensor SME/SMT

- 4 Output plate can be repositioned by 90°
- 5 Screw-through option with screw M4

- 7 Supply port for energy through-feed for tubing O.D. 4 mm
- 8 Mounting option via dovetail connection

# Twin-piston semi-rotary drives DRQD-25 ... 32

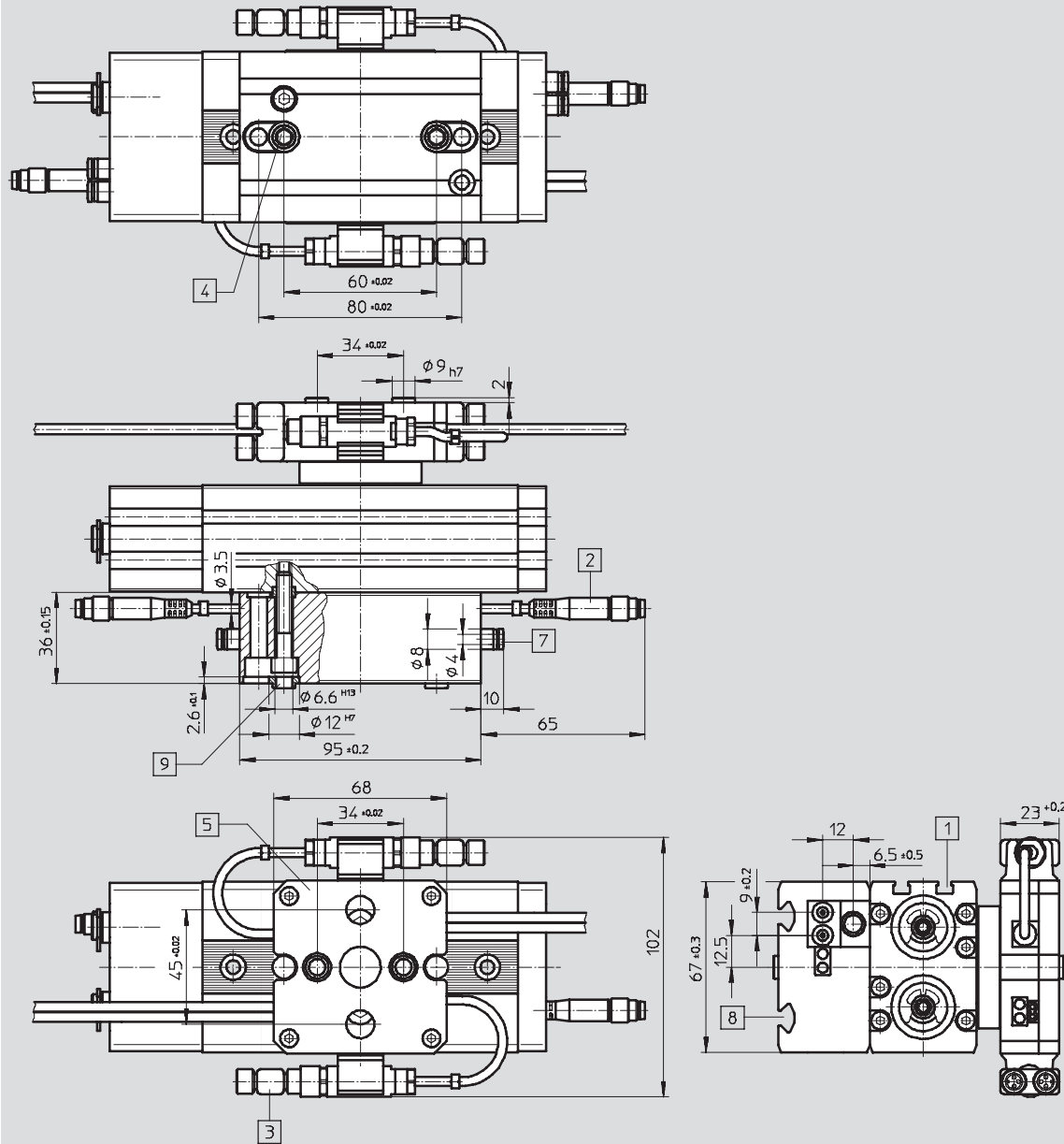
Technical data

FESTO

## Dimensions

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

FW-E444 – Energy through-feed



- |  |   |  |  |
|--|---|--|--|
| 1 T-slots for proximity sensors SME/SMT-8  | 4 Mounting via through-holes possible with screw M5 (retaining screws must be removed beforehand) | 7 Supply port for energy through-feed for tubing O.D. 4 mm | 9 Centring sleeves (2 pieces included in scope of delivery) → 60 |
| 2 Plug M8x1, 4-pin                         | 5 Centring hole can be repositioned by 90°  | 8 Mounting option via profile slot nut                     |  |
| 3 Socket M8x1 for proximity sensor SME/SMT |   |  |  |

# Twin-piston semi-rotary drives DRQD-40 ... 50

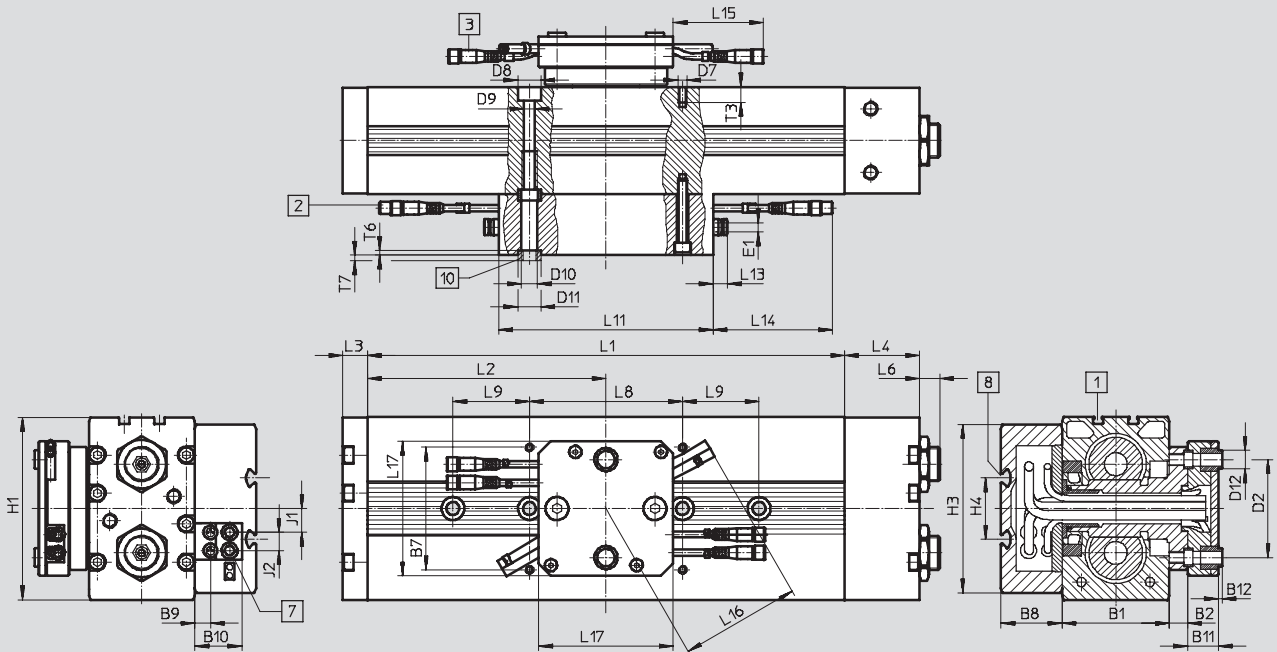
Technical data

FESTO

## Dimensions

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

FW-E644 – Energy through-feed



- 1 T-slots for proximity sensors SME/SMT-8
- 2 Plug M8x1
- 3 Socket M8x1
- 7 Supply port for energy through-feed for tubing O.D. 6 mm
- 8 Mounting option via profile slot nut (grid dimensions 40 mm) → 60
- 10 Centring sleeves (2 pieces included in scope of delivery) → 60

∅	Swivel angle	B1	B2	B7	B8	B9	B10	B11	B12	D2	D7	D8	D9	D10	D11	D12	E1	H1	H3	
[mm]	[°]	±0.2	+0.4 -0.3		+0.2 -0.1			±0.2		∅ ±0.2		∅ H13	∅	∅	∅ H7	∅ h7	∅			
40	90																			
	180	70	13	80	40	9.5	12.5	20	2.5	64	M6	15	8.5	M10	15	12	6	120	110	
	360																			
50	90																			
	80	86	13	80	40	9.5	12.5	20	2.5	64	M6	15	8.5	M10	15	12	6	144	110	
	360																			



∅	Swivel angle	H4	L1	L2	L3	L4	L6		L8	L9	L11	L13	L14	L15	L16	L17	T3	T6	T7
[mm]	[°]						min.	max.	±0.03	±0.03				ap- prox.	min.	min.		±0.15	
40	90		146.8	73.4						-									
	180	40	201.8	100.9	16	49	5	14.6	100	-	140	9.5	64	150	75	88	10	3	3
	360		311.8	155.9						50									
50	90		191.4	95.7						-									
	180	40	262.8	131.4	18	64	5	20.7	100	50	140	9.5	65	130	75	88	10	3	3
	360		405.8	202.9						50									



# Twin-piston semi-rotary drives DRQD-16 ... 50

Technical data

**FESTO**

Ordering data – Standard types				
DRQD	∅ [mm]	Swivel angle [°]	Part No.	Type
PPVJ – Adjustable end-position cushioning				
	AL – Connection on left			
	16	180	540 456	DRQD-16-180-PPVJ-A-AL-FW
	20		540 460	DRQD-20-180-PPVJ-A-AL-FW
	25		540 464	DRQD-25-180-PPVJ-A-AL-FW
	AR – Connection on right			
	16	180	540 457	DRQD-16-180-PPVJ-A-AR-FW
	20		540 461	DRQD-20-180-PPVJ-A-AR-FW
	25		540 465	DRQD-25-180-PPVJ-A-AR-FW
	YSRJ – Adjustable shock absorbers			
	AL – Connection on left			
	16	180	540 454	DRQD-16-180-YSRJ-A-AL-FW
	20		540 458	DRQD-20-180-YSRJ-A-AL-FW
	25		540 462	DRQD-25-180-YSRJ-A-AL-FW
	AR – Connection on right			
	16	180	540 455	DRQD-16-180-YSRJ-A-AR-FW
	20		540 459	DRQD-20-180-YSRJ-A-AR-FW
	25		540 463	DRQD-25-180-YSRJ-A-AR-FW

# Twin-piston semi-rotary drives DRQD-16 ... 50

Ordering data – Modular products

**M** Mandatory data →

Module No.	Function	Size	Swivel angle	Cushioning	Position sensing	Pneumatic connection	Output shaft
175 801	DRQD	16	90	PPVJ	A	AL	ZW
175 802		20	180	YSRJ		AR	FW
175 803		25	360				
175 804		32	1 ... 340				
197 373		40					
197 374		50					
<b>Ordering example</b>							
<b>197 373</b>	<b>DRQD</b>	- <b>40</b>	- <b>280</b>	- <b>YSRJ</b>	- <b>A</b>	- <b>AR</b>	- <b>FW</b>

**Ordering table**

Size	16	20	25	32	40	50	Condi- tions	Code	Enter code	
<b>M</b> Module No.	<b>175 801</b>	<b>175 802</b>	<b>175 803</b>	<b>175 804</b>	<b>197 373</b>	<b>197 374</b>				
Function	Semi-rotary drive with twin pistons							<b>DRQD</b>	DRQD	
Piston Ø [mm]	16	20	25	32	40	50		-...		
Swivel angle (standard)	90°								<b>-90</b>	
Adjusting range +6°/-20° (not preset)	180°								<b>-180</b>	
	360°							[1]	<b>-360</b>	
X-rotation angle	1° ... 70°, with centre section 90°								-...	
Adjusting range ±6°	100° ... 160°, with centre section 180°								-...	
Angle preset ±1°	190° ... 340°, with centre section 360°							[1]	-...	
Cushioning	Adjustable end-position cushioning								<b>-PPVJ</b>	
	Adjustable shock absorbers								<b>-YSRJ</b>	
Position sensing	For proximity sensing								<b>-A</b>	-A
Pneumatic connection	Connection on left								<b>-AL</b>	
	Connection on right								<b>-AR</b>	
Output shaft	Spigot shaft							[2]	<b>-ZW</b>	
	Flanged shaft							[3]	<b>-FW</b>	

[1] **190 ... 360** Not with energy through-feed E422, E444, E644

[2] **ZW** Not with energy through-feed SD32, SD42, SD48, SD62, SD64, E422, E444, E644

[3] **FW** Required for energy through-feed SD32, SD42, SD48, SD62, SD64, E422, E444, E644

**Transfer order code**

**DRQD** -  -  -  - **A** -  -

# Twin-piston semi-rotary drives DRQD-16 ... 50

Ordering data – Modular product system

**FESTO**

→ **0** Options

<b>Intermediate position</b>	<b>Energy through-feed</b>	<b>User's manual</b>
Z1	SD32 SD42 SD48 SD62 SD64 E422 E444 E644	E F S I V B
-	- <b>SD64</b> -	- <b>B</b> -

Ordering table											
Size	16	20	25	32	40	50	Condi- tions	Code	Enter code		
<b>0</b> Intermediate position	1 intermediate position (mid-position)						<b>4</b>	<b>-Z1</b>			
Energy through-feed	2x tubing O.D. 3 mm					-	-	<b>-SD32</b>			
	2x tubing O.D. 4 mm					-	-	<b>-SD42</b>			
	-	-	-	-	8x tubing O.D. 4 mm			<b>-SD48</b>			
	-	-	-	-	2x tubing O.D. 6 mm			<b>-SD62</b>			
	-	-	-	-	4x tubing O.D. 6 mm			<b>-SD64</b>			
	2x tubing O.D. 4 mm, 1x 4-pin cable to 2x 3-pin cable		-	-	-	-	-		<b>-E422</b>		
	-	-	4x tubing O.D. 4 mm, 2x 4-pin cable to 4x 3-pin cable		-	-	-		<b>-E444</b>		
	-	-	-	-	4x tubing O.D. 6 mm, 4x 3-pin cable				<b>-E644</b>		
Alternative language user docu- mentation (standard is German)	English								<b>-E</b>		
	French								<b>-F</b>		
	Spanish								<b>-S</b>		
	Italian								<b>-I</b>		
	Swedish								<b>-V</b>		
	Express waiver – no user manual to be included (already available)								<b>-B</b>		

**4** Z1 Cannot be combined with swivel angle (standard) 360° and X swivel angle



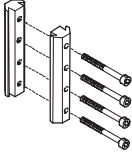

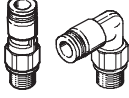
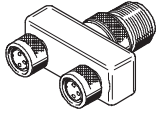
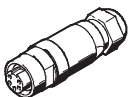
Transfer order code

-  -  -

# Twin-piston semi-rotary drives DRQD

Accessories

**FESTO**



Ordering data						
	For Ø	Remarks	Design	Part No.	Type	PU <sup>1)</sup>
Centring sleeve ZBH			Technical data → Internet: zbh			
	6	For centring the drive on attachments		<b>186 717</b>	<b>ZBH-7</b>	10
	8 ... 32			<b>150 927</b>	<b>ZBH-9</b>	
	40/50			<b>191 409</b>	<b>ZBH-15</b>	
	16/20	For centring attachments on the flanged shaft FW		<b>186 717</b>	<b>ZBH-7</b>	
	25/32			<b>150 927</b>	<b>ZBH-9</b>	
	40/50			<b>189 653</b>	<b>ZBH-12</b>	
Connecting sleeve ZBV			Technical data → Internet: zbv			
	25 ... 32	For centring the semi-rotary drive with a drive		<b>548 806</b>	<b>ZBV-12-9</b>	1
Adapter kit HMSV			Technical data → Internet: hmsv			
	16/20	Mounting via dovetail profile for variant with energy through-feed SD... and E...		<b>177 647</b>	<b>HMSV-1</b>	1
Slot nut NST			Technical data → Internet: nst			
	25 ... 50	Mounting via profile slot nut for variant with energy through-feed SD... and E...		<b>150 914</b>	<b>NST-5-M5</b>	1
Rotary push-in fitting			Technical data → Internet: qsr, qsrl			
	6 ... 12 Only in combination with hollow bolt HS	With ball bearing, for standard O.D. tubing	Straight	<b>153 526</b>	<b>QSR-M5-4</b>	1
			L-shape	<b>153 529</b>	<b>QSRL-M5-4</b>	
T-connector NEDU			Technical data → Internet: nedu			
	16 ... 32	Included in the scope of delivery if semi-rotary drive DRQD is ordered with energy through-feed E422 and E444. Suitable for connection of two proximity sensors SME/SMT-8 or SME/SMT-10		<b>544 391</b>	<b>NEDU-M8D3-M8T4</b>	1
Cable socket NECU			Technical data → Internet: necu			
	16 ... 32	Included in the scope of delivery if semi-rotary drive DRQD is ordered with energy through-feed E422 and E444.		<b>544 392</b>	<b>NECU-M8G4</b>	1



1) Packaging unit quantity



# Twin-piston semi-rotary drives DRQD




Accessories

FESTO

Ordering data – Proximity sensors for C-slot, magneto-resistive						Technical data → Internet: sm	
	Type of mounting	Switch output	Electrical connection, connection direction	Cable length [m]	Part No.	Type	
N/O contact							
	Insertable in the slot from above, flush with cylinder profile	PNP	Cable, 3-wire, in-line	2.5	525 915	SMT-10F-PS-24V-K2,5L-OE	
			Plug M8x1, 3-pin, in-line	0.3	525 916	SMT-10F-PS-24V-K0,3L-M8D	
			Plug M8x1, 3-pin, lateral	0.3	526 675	SMT-10F-PS-24V-K0,3Q-M8D	
	Insertable in the slot lengthwise	PNP	Plug M8x1, 3-pin, in-line	0.3	173 220	SMT-10-PS-SL-LED-24	
			Cable, 3-wire, in-line	2.5	173 218	SMT-10-PS-KL-LED-24	

Ordering data – Proximity sensors for C-slot, magnetic reed						Technical data → Internet: sm	
	Type of mounting	Switch output	Electrical connection, connection direction	Cable length [m]	Part No.	Type	
N/O contact							
	Insertable in the slot from above, flush with cylinder profile	Contacting	Plug M8x1, 3-pin, in-line	0.3	525 914	SME-10F-DS-24V-K0,3L-M8D	
			Cable, 3-wire, in-line	2.5	525 913	SME-10F-DS-24V-K2,5L-OE	
			Cable, 2-wire, in-line	2.5	526 672	SME-10F-ZS-24V-K2,5L-OE	
	Insertable in the slot lengthwise	Contacting	Plug M8x1, 3-pin, in-line	0.3	173 212	SME-10-SL-LED-24	
			Cable, 3-wire, in-line	2.5	173 210	SME-10-KL-LED-24	

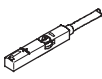


Ordering data – Connecting cables				Technical data → Internet: nebu	
	Electrical connection, left	Electrical connection, right	Cable length [m]	Part No.	Type
	Straight socket, M8x1, 3-pin	Cable, open end, 3-wire	2.5	541 333	NEBU-M8G3-K-2.5-LE3
			5	541 334	NEBU-M8G3-K-5-LE3
	Angled socket, M8x1, 3-pin	Cable, open end, 3-wire	2.5	541 338	NEBU-M8W3-K-2.5-LE3
			5	541 341	NEBU-M8W3-K-5-LE3



Ordering data – Proximity sensors for T-slot, magneto-resistive						Technical data → Internet: sm	
	Type of mounting	Switch output	Electrical connection	Cable length [m]	Part No.	Type	
N/O contact							
	Insertable in the slot from above, flush with cylinder profile	PNP	Cable, 3-wire	2.5	543 867	SMT-8M-PS-24V-K-2,5-OE	
			Plug M8x1, 3-pin	0.3	543 866	SMT-8M-PS-24V-K-0,3-M8D	
			Plug M12x1, 3-pin	0.3	543 869	SMT-8M-PS-24V-K-0,3-M12	
		NPN	Cable, 3-wire	2.5	543 870	SMT-8M-NS-24V-K-2,5-OE	
			Plug M8x1, 3-pin	0.3	543 871	SMT-8M-NS-24V-K-0,3-M8D	
	Insertable in the slot lengthwise, flush with the cylinder profile	PNP	Cable, 3-wire	2.5	175 436	SMT-8-PS-K-LED-24-B	
			Plug M8x1, 3-pin	0.3	175 484	SMT-8-PS-S-LED-24-B	
N/C contact							
	Insertable in the slot from above, flush with cylinder profile	PNP	Cable, 3-wire	7.5	543 873	SMT-8M-PO-24V-K7,5-OE	

# Twin-piston semi-rotary drives DRQD

Accessories

**FESTO**

Ordering data – Proximity sensors for T-slot, magnetic reed					Technical data → Internet: sm	
	Type of mounting	Switch output	Electrical connection	Cable length [m]	Part No.	Type
<b>N/O contact</b>						
	Insertable in the slot from above, flush with cylinder profile	Contacting	Cable, 3-wire	2.5	<b>543 862</b>	<b>SME-8M-DS-24V-K-2,5-OE</b>
				5.0	<b>543 863</b>	<b>SME-8M-DS-24V-K-5,0-OE</b>
			Plug M8x1, 3-pin	2.5	<b>543 872</b>	<b>SME-8M-ZS-24V-K-2,5-OE</b>
				0.3	<b>543 861</b>	<b>SME-8M-DS-24V-K-0,3-M8D</b>
	Insertable in the slot lengthwise, flush with the cylinder profile	Contacting	Cable, 3-wire	2.5	<b>150 855</b>	<b>SME-8-K-LED-24</b>
			Plug M8x1, 3-pin	0.3	<b>150 857</b>	<b>SME-8-S-LED-24</b>
<b>N/C contact</b>						
	Insertable in the slot lengthwise, flush with the cylinder profile	Contacting	Cable, 3-wire	7.5	<b>160 251</b>	<b>SME-8-O-K-LED-24</b>

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	<b>541 333</b>	<b>NEBU-M8G3-K-2.5-LE3</b>
			5	<b>541 334</b>	<b>NEBU-M8G3-K-5-LE3</b>
	Straight socket, M12x1, 5-pin	Cable, open end, 3-wire	2.5	<b>541 363</b>	<b>NEBU-M12G5-K-2.5-LE3</b>
			5	<b>541 364</b>	<b>NEBU-M12G5-K-5-LE3</b>
	Angled socket, M8x1, 3-pin	Cable, open end, 3-wire	2.5	<b>541 338</b>	<b>NEBU-M8W3-K-2.5-LE3</b>
			5	<b>541 341</b>	<b>NEBU-M8W3-K-5-LE3</b>
	Angled socket, M12x1, 5-pin	Cable, open end, 3-wire	2.5	<b>541 367</b>	<b>NEBU-M12W5-K-2.5-LE3</b>
			5	<b>541 370</b>	<b>NEBU-M12W5-K-5-LE3</b>

Ordering data – Slot cover for T-slot				
	Assembly	Length [m]	Part No.	Type
	insertable from above	2x 0.5	<b>151 680</b>	<b>ABP-5-S</b>