

- Modular and functional
- Sturdy and accurate
- Versatile system components

Specified types in accordance with ATEX directive for potentially explosive atmospheres

➔ www.festo.com/en/ex

Twin-piston semi-rotary drives DRQD

Key features

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



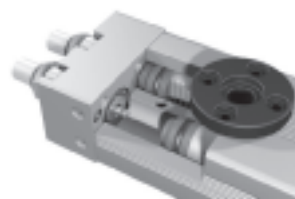
- Piston \varnothing 6 ... 50 mm

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



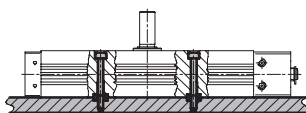
- Piston \varnothing 6 ... 50 mm
- Simple and space-saving installation of tubing through the hollow flanged shaft
- DRQD-...-SD...
1 ... 4 DUO tubes



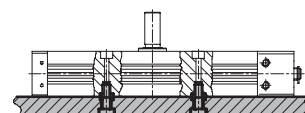
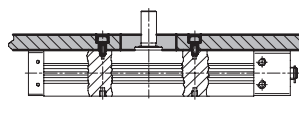
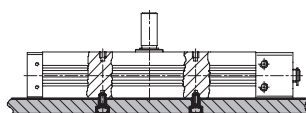
- Piston \varnothing 16 ... 50 mm
- Simple and space-saving installation of tubing and cables through the hollow flanged shaft
- DRQD-...-E...
1 ... 2 DUO tubes and 2 ... 4 electrical cables

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										1 / 7.4-2
	■	■	■	-	-	-	-	-	-	
Parallel grippers HGP										1 / 7.5-2
	■	■	■	■	■	■	■	■	■	
Radial grippers HGR										1 / 7.5-2
	■	■	■	■	■	■	■	■	■	
Parallel grippers HGPP										1 / 7.6-2
	-	-	-	■	■	■	■	■	■	
Parallel grippers HGPL										1 / 7.0-18
	-	-	-	■	■	■	■	■	■	
Semi-rotary drive DRQD	6	8	12	16	20	25	32	40	50	
Angle grippers HGWM-...-G8										1 / 7.4-2
	■	■	■	-	-	-	-	-	-	
Three-point gripper HGD										1 / 7.5-2
	-	■	■	■	■	■	■	■	■	
Angle grippers HGW										1 / 7.5-2
	■	■	■	■	■	■	■	■	■	
Parallel grippers HGPT										1 / 7.6-2
	-	-	■	■	■	■	■	■	■	
Parallel grippers HGPC										1 / 7.7-1
	-	-	■	■	■	■	-	-	-	

Swivel drives
Semi-rotary rack and pinion drives

4.2

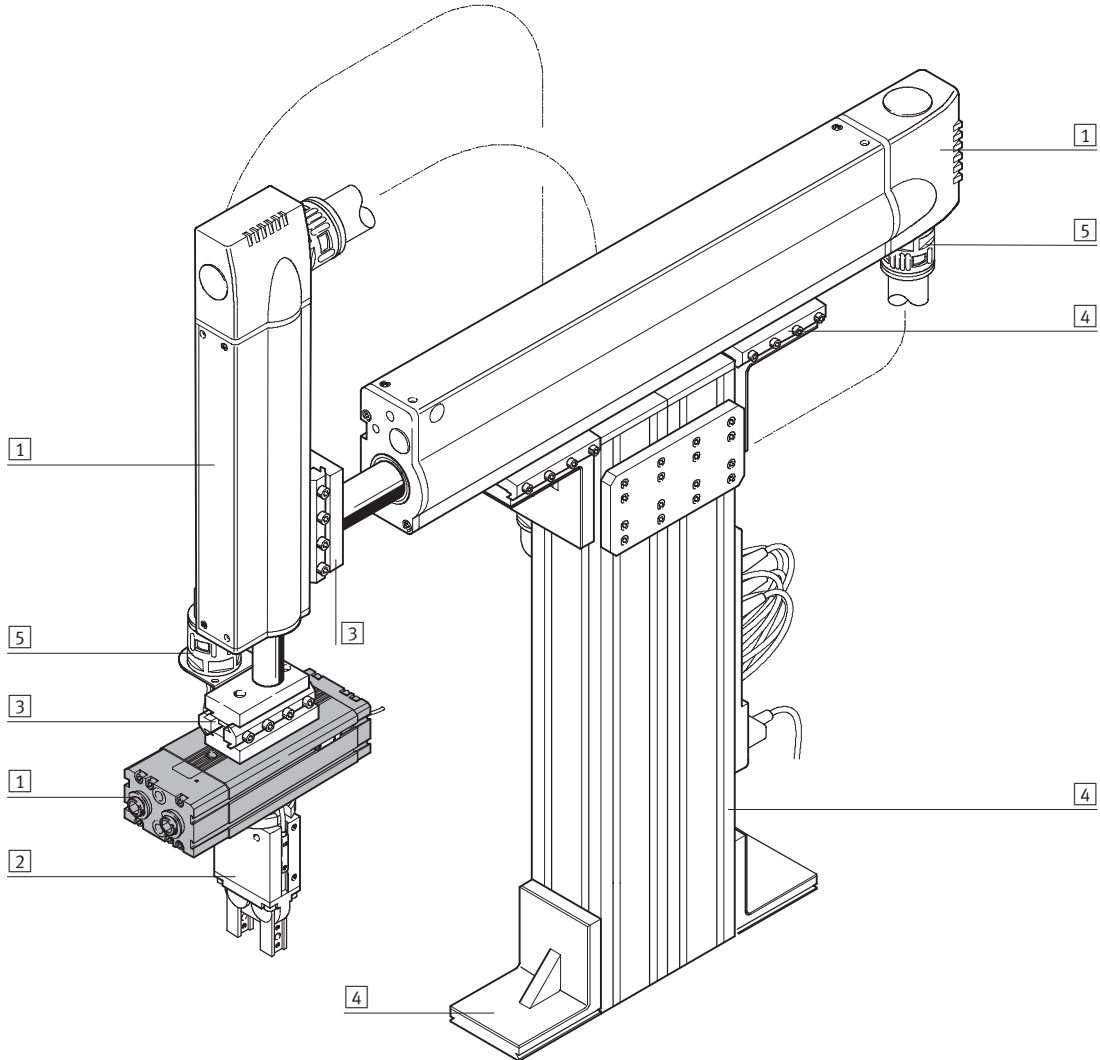
Twin-piston semi-rotary drives DRQD

System example

System product for handling and assembly technology

Swivel drives
Semi-rotary rack and pinion drives

4.2



Twin-piston semi-rotary drives DRQD

System example

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

Twin-piston semi-rotary drives DRQD

Product range overview



Swivel drives
Semi-rotary rack and pinion drives

4.2

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

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

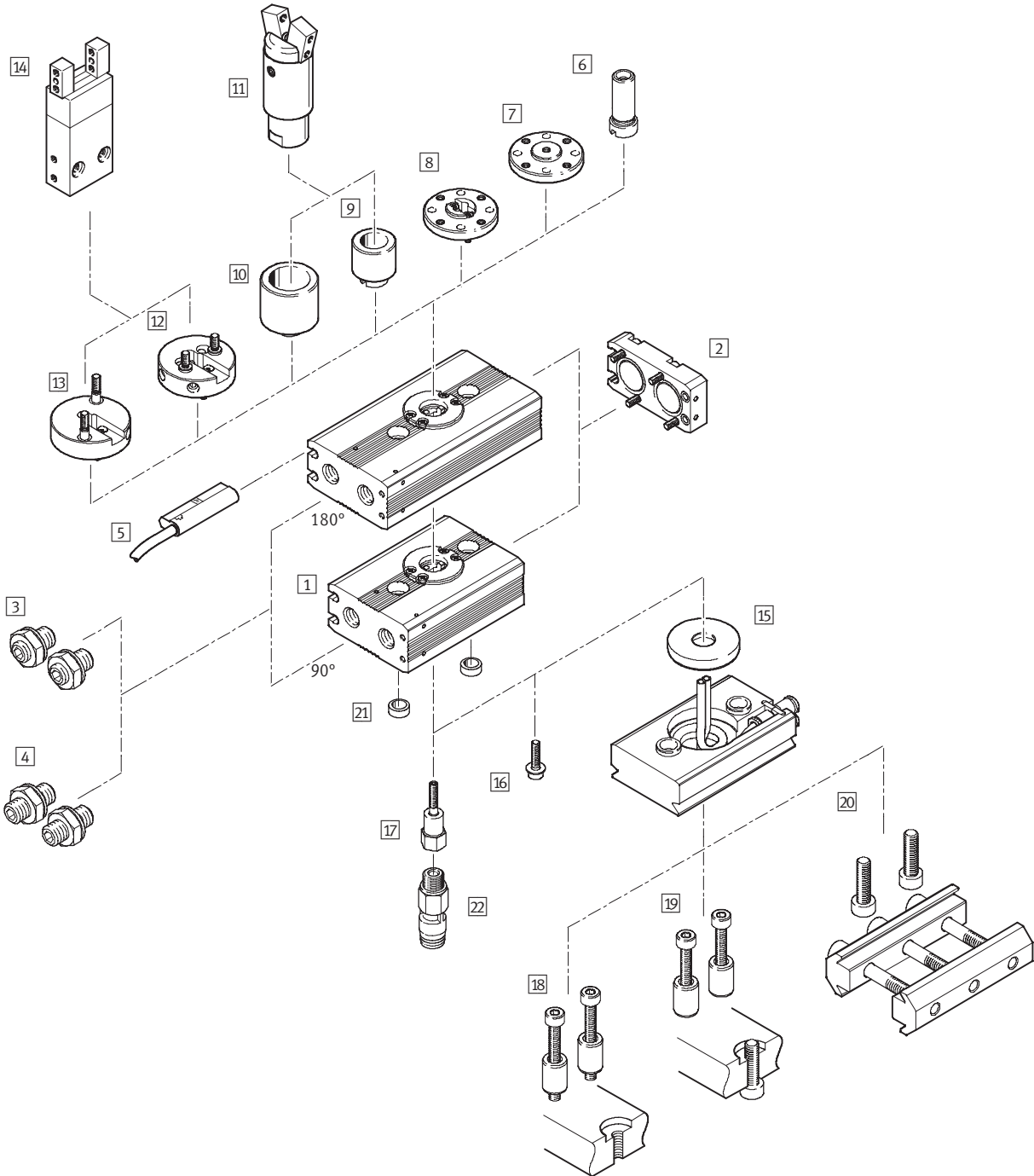
Type	Piston Ø [mm]	Intermediate position Z1	Energy through-feed SD..., E...	Adapter kits for grippers	→ Page
Basic version					
Semi-rotary drive DRQD	6, 8, 12	-	■	■	1 / 4.2-30
	16, 20, 25, 32, 40, 50	■	■	■	1 / 4.2-46

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

Peripherals overview



Piston \varnothing 6 ... 12



Swivel drives
Semi-rotary rack and pinion drives

4.2

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

Peripherals overview

FESTO

Variants, mounting attachments and accessories						
	Brief description	Piston Ø			→ Page	
		6	8	12		
1	Centre section	Centre section for 90° or 180° swivel angle	■	■	■	1 / 4.2-33
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	■	■	■	1 / 4.2-83
6	Spigot shaft ZW ¹⁾	Hollow with woodruff key	■	■	■	1 / 4.2-33
7	Flanged shaft FW ¹⁾	Hollow	■	■	■	
8	Flanged shaft FW-SD32	Hollow, for energy through-feed	-	■	■	
9	Adapters A08 ²⁾	For grippers HGWM-08-...-G8 and HGPM-08-...-G8	■	■	■	
10	Adapters A12 ²⁾	For grippers HGWM-12-...-G8 and HGPM-12-...-G8	■	■	■	1 / 7.4-2
11	Grippers HGPM/HGWM	HGPM-...-G8 and HGWM-...-G8	■	■	■	
12	Adapters AS1	For grippers HGP-06-A, HGR-10-A and HGW-10-A	-	■	■	
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	-	■	■	1 / 7.5-2
15	Energy through-feed SD32	2 tubes with O.D. 3 mm	-	■	■	1 / 4.2-38
16	Socket head screw ZS	Mounting of ZW and FW	■	■	■	1 / 4.2-33
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	■	■	■	1 / 4.2-38
21	Centring sleeve ZBH	For centring (2 pieces included in scope of delivery for DRQD)	■	■	■	
22	Rotary push-in fitting ³⁾ 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



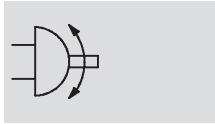
Swivel drives
Semi-rotary rack and pinion drives
4.2

		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	Adapter for parallel, three-point, angle and radial grippers																				
AS1	Adapter for parallel, three-point, angle and radial grippers																				
AS2	Adapter for parallel, three-point, angle and radial grippers																				
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

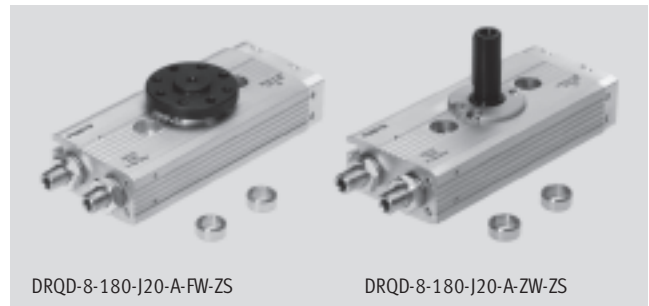
Function



- - Diameter
6 ... 12 mm
- - Force
0.16 ... 0.76 Nm
- - www.festo.com/en/Spare_parts_service

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		6	8	12
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		6	8	12
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	3
	180°	3.5	2.5	2
	SD32	-	A reduction of max. 5% of the values indicated above	
Repetition accuracy [°]		< 0.2		
Ambient temperature ¹⁾ [°C]		-10 ... +60		
Corrosion resistance class CRC ²⁾		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 → 1 / 4.2-37		
Max. permissible mass moment of inertia [kgm ²]		0.075 x 10 ⁻⁴	0.25 x 10 ⁻⁴	0.7 x 10 ⁻⁴
	The data applies to the variants ZW, FW, A... without grippers, unthrottled.			



Pneumatic sizing using Pro Pneu
www.festo.com/en/engineering

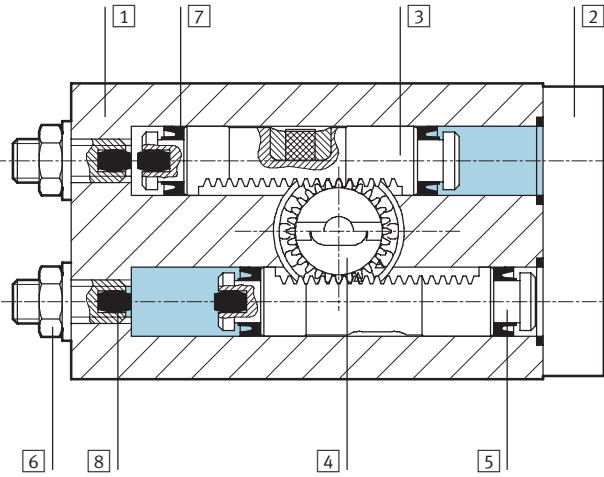
Weights [g]					
Piston Ø			6	8	12
Centre section	90°	J20	66	90	145
		J60	67	92	148
	180°	J20	82	111	177
		J60	83	113	180
Output shaft	ZW	2	4		
	FW	4	7		
Adapters	A08	6	11		
	A12	6	11		
	AS1	–	13		
	AS2	–	15		
Screws	ZS	1			
	HS	4			5
Flanged shaft with energy through-feed	SD32	–	71		
Mounting in combination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

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

Technical data

Materials

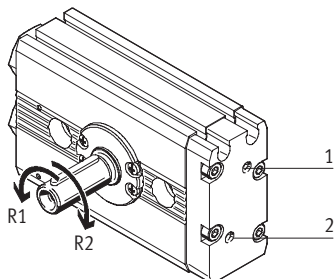
Sectional view



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

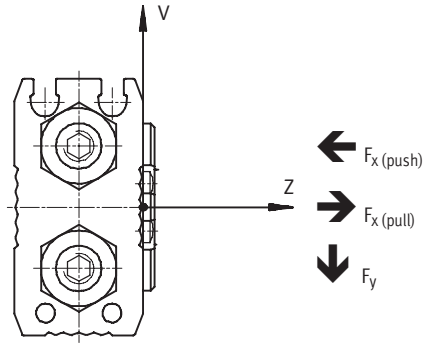


Swivel drives
Semi-rotary rack and pinion drives

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



Question:	Answer:
Is it permissible to statically load a semi-rotary drive DRQD-8-... with these combined forces?	Graph 1 (→ 1 / 4.2-37) indicates that the maximum permissible radial force is $F_{y, max. (stat.)} (5) = 193\text{ N}$ for a distance $Z = 5\text{ mm}$. Graph 3 (→ 1 / 4.2-37) indicates that the maximum axial force is $F_{x, push max. (stat.)} (12) = 169\text{ N}$ for a distance $V = 12\text{ mm}$.

The following equation applies to combined loads:

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

The following values are assumed:

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

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.

4.2

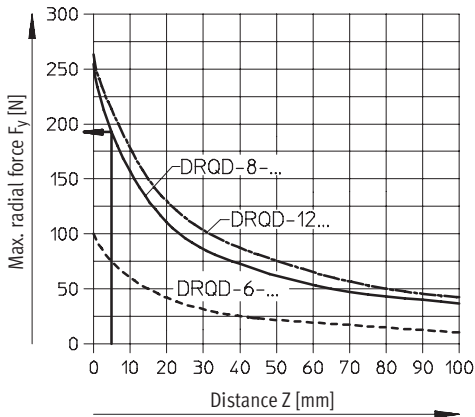
Twin-piston semi-rotary drives DRQD-6 ... 12

Technical data

Maximum static radial force

Graph 1

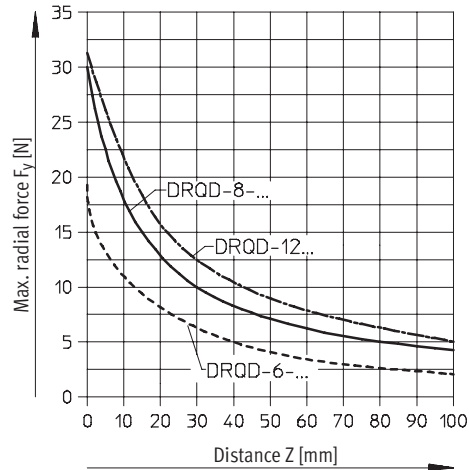
$$F_{y, \text{max. (stat.)}} = f(z)$$



Maximum dynamic radial force

Graph 2

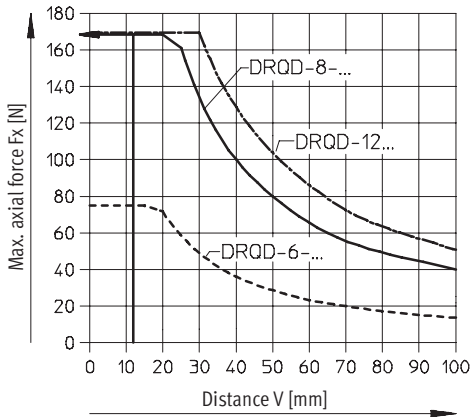
$$F_{y, \text{max. (dyn.)}} = f(z)$$



Maximum static pull and push axial forces

Graph 3

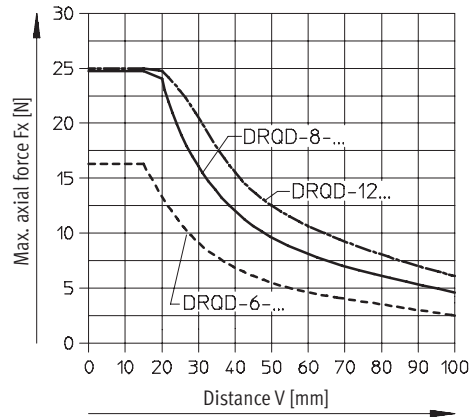
$$F_{x, \text{max. (stat.)}} = f(v)$$



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

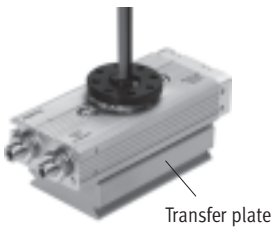
FESTO

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		8	12
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 ³]	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 °C)	
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

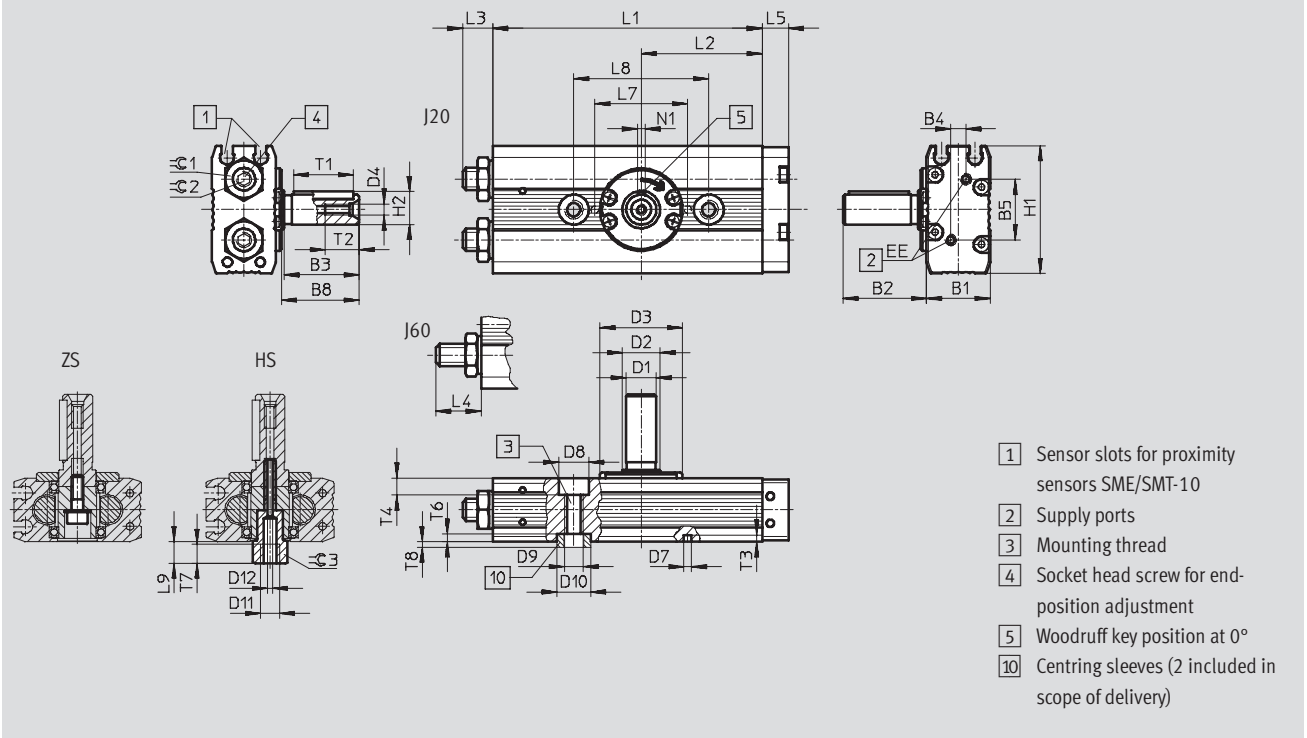
Technical data



Dimensions

Download CAD data → www.festo.com/en/engineering

ZW – Spigot shaft



∅	Swivel angle [°]	B1	B2	B3	B4	B5	B8	D1	D2	D3 ¹⁾	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



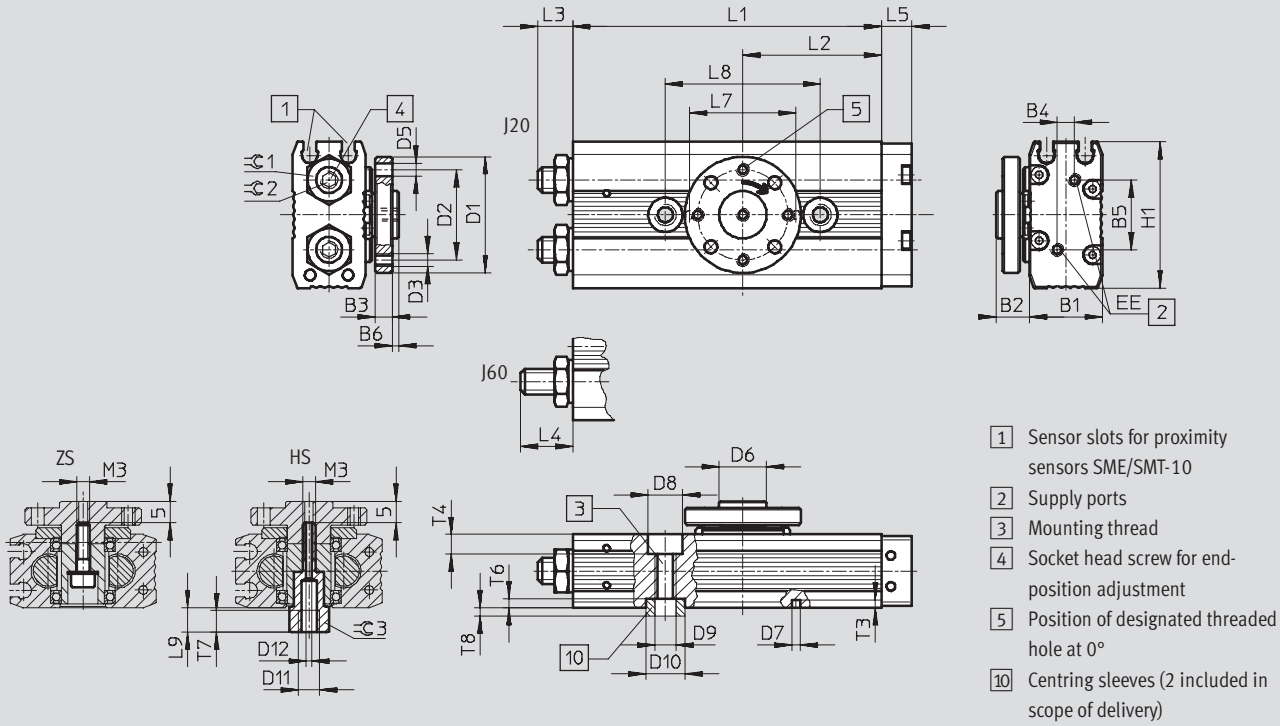
Swivel drives
Semi-rotary rack and pinion drives

4.2

Dimensions

Download CAD data → www.festo.com/en/engineering

FW – Flanged shaft



∅ [mm]	Swivel angle [°]	B1	B2	B3	B4	B5	B6	D1 ∅	D2 ∅	D3	D5 ∅ H7	D6 ∅ g7	D7 ∅ H8	D8 ∅ H8	D9	D10 ∅ H7	D11	D12 ∅
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																	

∅ [mm]	Swivel angle [°]	EE	H1	L1	L2	L3 max.	L4 max.	L5	L7 ±0.03	L8 ±0.03	L9	T3	T4	T6	T7	T8	≈C1	≈C2	≈C3
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															

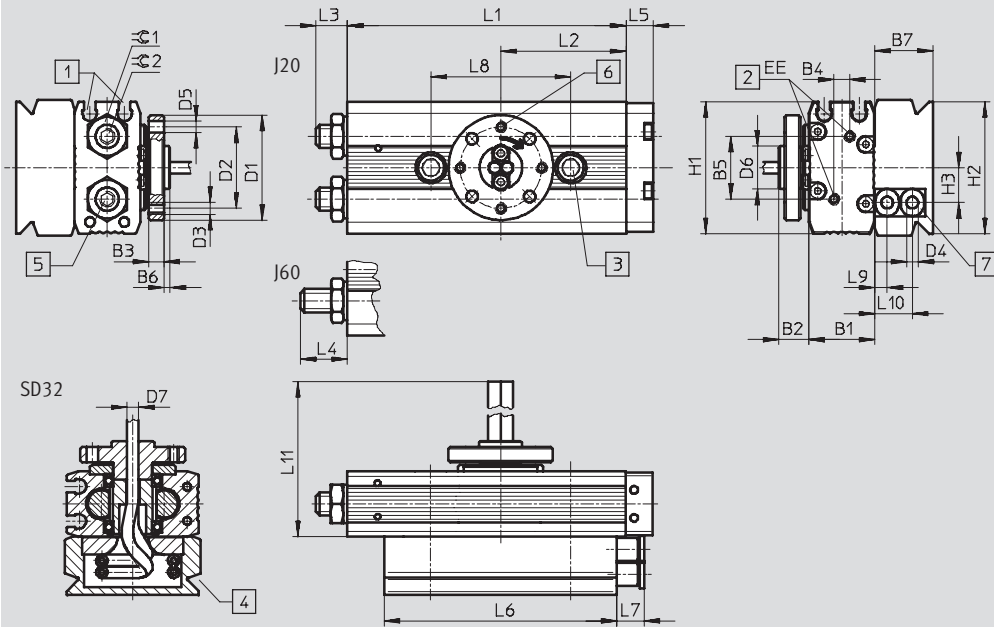
Twin-piston semi-rotary drives DRQD-6 ... 12

Technical data



Dimensions Download CAD data → www.festo.com/en/engineering

FW-SD32 – Energy through-feed



- 1 Sensor slots for proximity sensors SME/SMT-10
- 2 Supply ports
- 3 Mounting type B1, B2
- 4 Mounting type B3, dovetail profile
- 5 Socket head screw for end-position adjustment
- 6 Position of designated threaded hole at 0°
- 7 Supply port for energy through-feed

∅	Swivel angle	B1	B2	B3	B4	B5	B6	B7	D1	D2	D3	D4	D5	D6	D7	EE
[mm]	[°]								∅	∅	∅	∅	∅	∅	∅	
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



Swivel drives
Semi-rotary rack and pinion drives

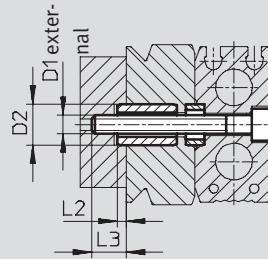
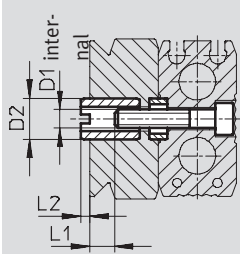
4.2

Dimensions – Mounting type

Download CAD data → www.festo.com/en/engineering

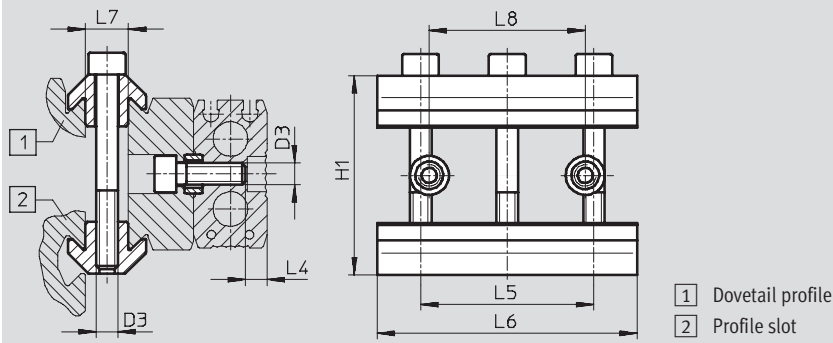
B1 – Counter screws in centring sleeves

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



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

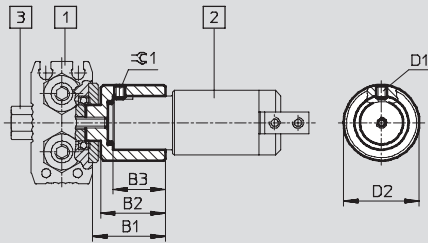
Technical data



Dimensions – Adapter for gripper

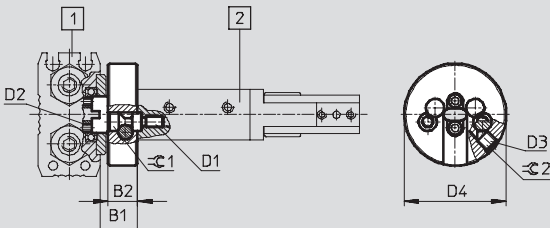
Download CAD data → www.festo.com/en/engineering

A08/A12

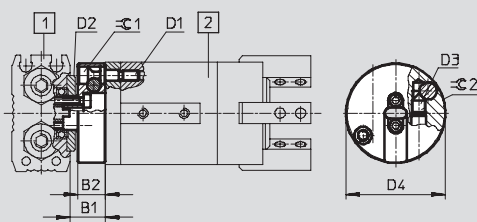


For adapter	1 Drive	2 Grippers	3 Type of screw	B1	B2	B3 ± 0.03	D1	D2 \varnothing	$\varnothing C1$
A08	DRQD-6-... DRQD-8-... DRQD-12-...	HGWM-08-...-G8 HGPM-08-...-G8	HS	15.2	13	9.6	M3	16	1.5
A12	DRQD-6-... DRQD-8-... DRQD-12-...	HGWM-12-...-G8 HGPM-12-...-G8	HS	20.2	19	14.6	M3	21	1.5

AS1



AS2



For adapter	1 Drive	2 Grippers	B1	B2	D1	D2	D3	D4 \varnothing	$\varnothing C1$	$\varnothing C2$
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



Swivel drives
Semi-rotary rack and pinion drives
4.2

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
Ordering example						
187 432	DRQD	- 8	- 180	- J60	- A	- A12

Ordering table

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

- | | |
|---|--|
| <p>1 ZW Not with energy through-feed SD32
Only with screw type ZS, HS</p> <p>2 FW Required for energy through-feed SD32
Only with screw type ZS, HS</p> | <p>3 A08, A12 Not with energy through-feed SD32
Only with screw type HS</p> <p>4 AS1, AS2 Required for energy through-feed SD32
Not with screw type ZS, HS</p> |
|---|--|

Transfer order code

DRQD - - - - **A** -

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

Ordering data – Modular products



→ **0 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

Swivel drives
Semi-rotary rack and pinion drives
4.2

Transfer order code

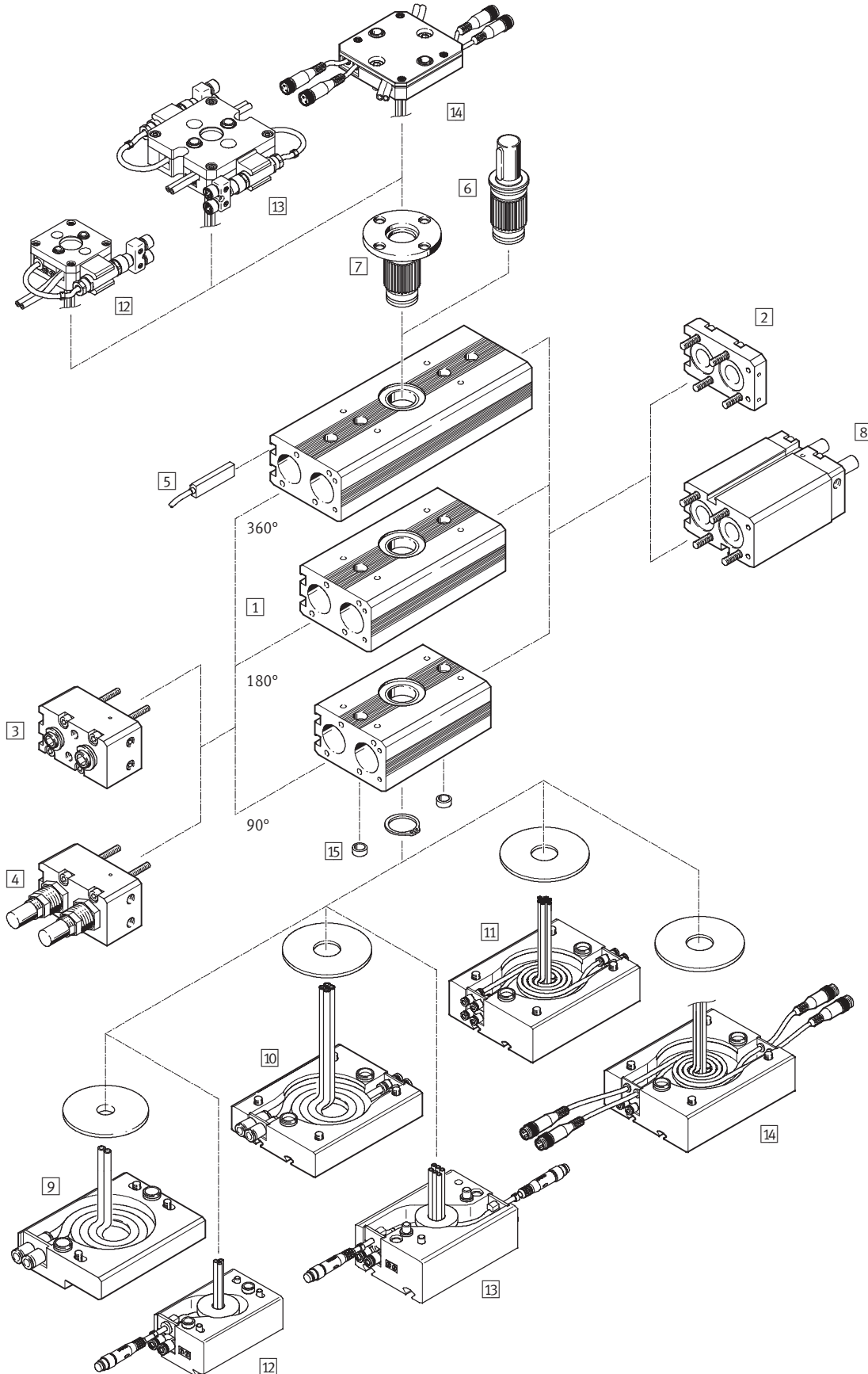
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Twin-piston semi-rotary drives DRQD-16 ... 50

Peripherals overview

FESTO

Piston \varnothing 16 ... 50



Swivel drives
Semi-rotary rack and pinion drives

4.2

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

Peripherals overview

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Variants, mounting attachments and accessories									
	Brief description	Piston Ø						→ Page	
		16	20	25	32	40	50		
1	Centre section	Centre section for 90°, 180° or 360° swivel angle	■	■	■	■	■	■	1 / 4.2-80
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	■	■	■	■	■	■	1 / 4.2-83
6	Spigot shaft ZW	With woodruff key	■	■	■	■	■	■	1 / 4.2-80
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°)	■	■	■	■	■	■	1 / 4.2-57
9	Energy through-feed SD32, SD42	2 tubes with O.D. 3 or 4 mm	■	■	■	■	-	-	1 / 4.2-58
	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)	■	■	■	■	■	■	

Swivel drives
Semi-rotary rack and pinion drives

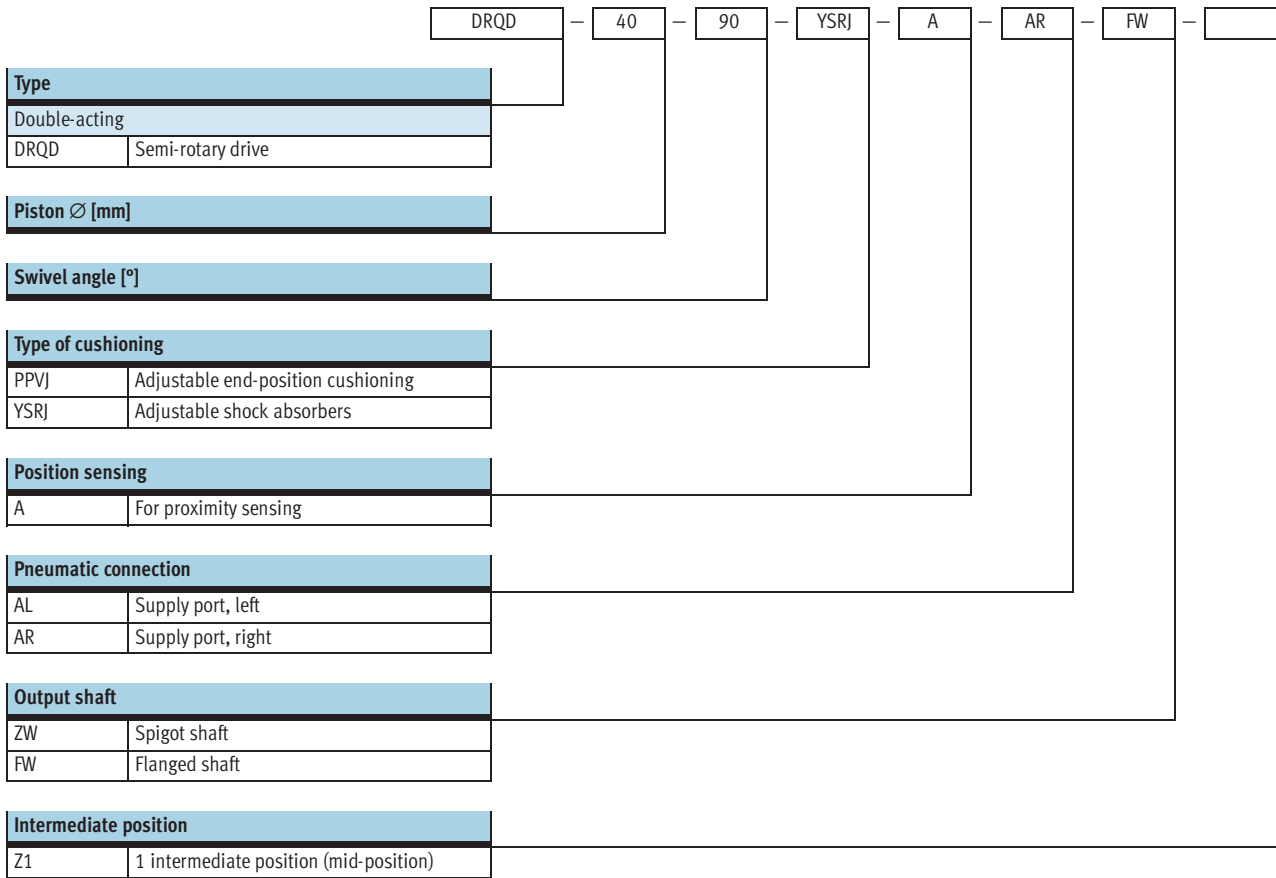
4.2

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

Type codes

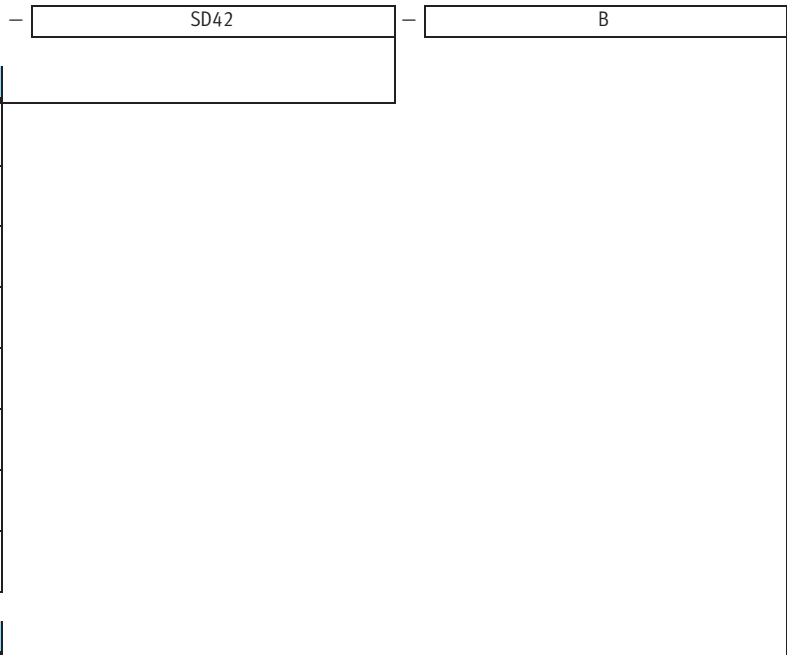


Swivel drives
Semi-rotary rack and pinion drives
4.2



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

Type codes

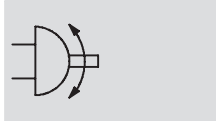


Twin-piston semi-rotary drives DRQD-16 ... 50

Technical data

FESTO

Function



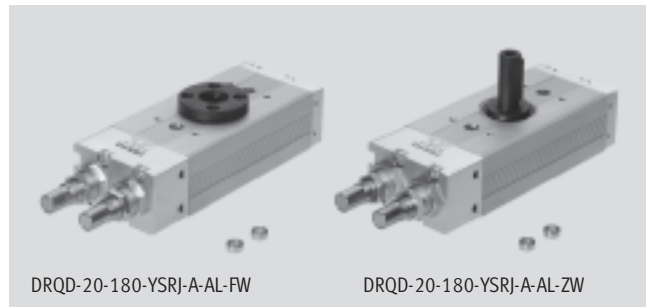
⊘ - Diameter
16 ... 50 mm

≡ - 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



DRQD-20-180-YSRJ-A-AL-FW

DRQD-20-180-YSRJ-A-AL-ZW

General technical data

Piston Ø	16	20	25	32	40	50
Pneumatic connection	M5			G1/8		G1/4
SD32	QS...-3 for tubing O.D. Ø 3 mm ¹⁾				-	-
SD42/SD48	QS...-4 for tubing O.D. Ø 4 mm ¹⁾				-	-
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

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 swivelling 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							
- ¹⁾ 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									
Piston Ø				16	20	25	32	40	50
Minimum cycle times in conjunction with Z1 (from the end position to the intermediate position)	[s]	PPVJ	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)	[°]	≤ 0.05							
		Z1	≤ 0.15			≤ 0.25	≤ 0.20	≤ 0.30	
Ambient temperature	[°C]	-10 ... +60							
Corrosion resistance class CRC ¹⁾	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									
Piston Ø				16	20	25	32	40	50
Theoretical torque at 6 bar	[Nm]	PPVJ	1.6	3.1	6.1	12.5	25	50	
			YSRJ	1.6	3.1	6.1	12.5	25	50
		Z1	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 → 1 / 4.2-55								
Max. permissible mass moment of inertia	[kgm ²]	PPVJ	5 x 10 ⁻⁴	10 x 10 ⁻⁴	20 x 10 ⁻⁴	40 x 10 ⁻⁴	200 x 10 ⁻⁴	500 x 10 ⁻⁴	
			YSRJ	Graphs → 1 / 4.2-53					
		PPVJ-Z1	5 x 10 ⁻⁴	10 x 10 ⁻⁴	20 x 10 ⁻⁴	40 x 10 ⁻⁴	200 x 10 ⁻⁴	500 x 10 ⁻⁴	
			YSRJ-Z1	-	-	-	-	1000 x 10 ⁻⁴	2000 x 10 ⁻⁴
The data applies to the variants ZW, FW, without grippers and unthrottled.									



Pneumatic sizing using Pro Pneu
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Weights [g]										
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



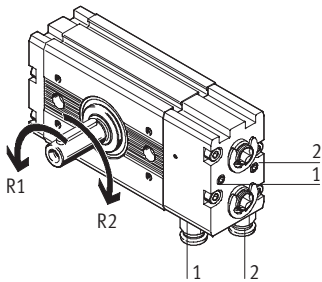
Swivel drives
Semi-rotary rack and pinion drives

4.2

Direction of rotation of the drive shaft

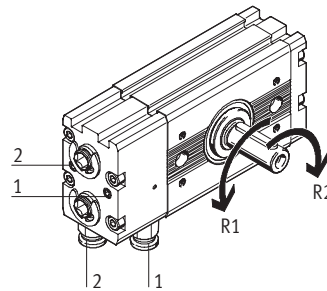
Connection cap on right (AR)

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



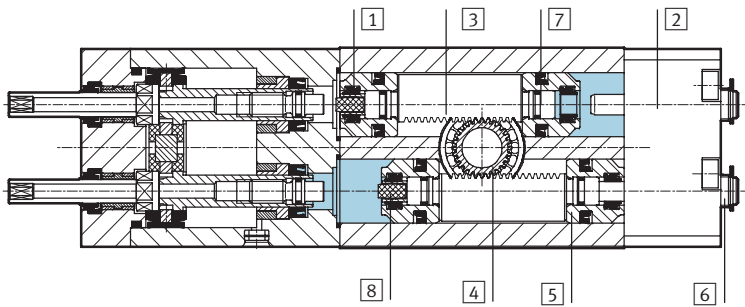
Connection cap on left (AL)

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



Materials

Sectional view



Piston Ø	16	20	25	32	40	50
Basic drive						
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			
Function end cap PPVJ						
-	Cushioning seal		Nitrile rubber/polyurethane		Polyurethane	
-	Buffer sleeve, regulating screw		Anodised aluminium			
Function end cap YSRJ						
-	Buffer		Delrin			
-	Rod wiper seal		Nitrile rubber/polyurethane			
Energy through-feed SD.../E...						
-	Transfer plate/sliding disc		Anodised aluminium			
-	DUO spiral tubing		Polyurethane			
Z1 intermediate position module						
-	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

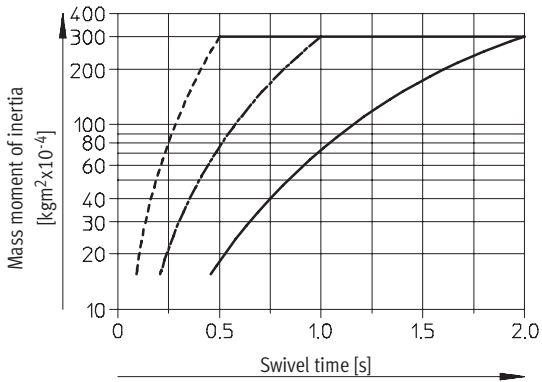
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Swivel drives
Semi-rotary rack and pinion drives

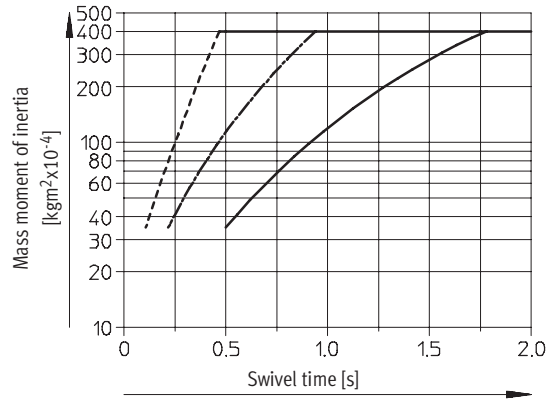
4.2

Maximum permissible mass moments of inertia on the drive shaft

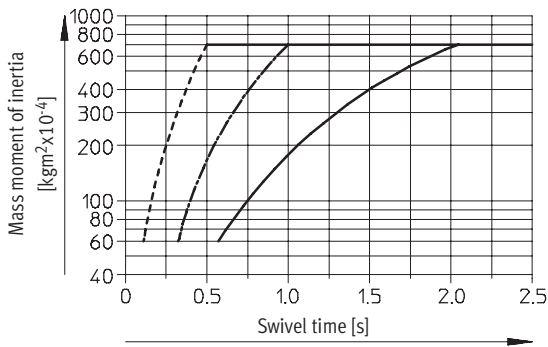
DRQD-16-...-YSRJ



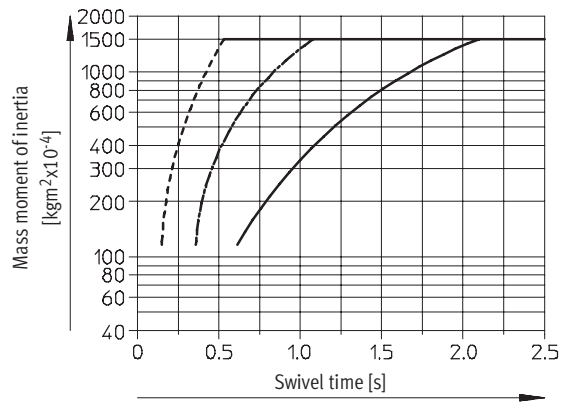
DRQD-20-...-YSRJ



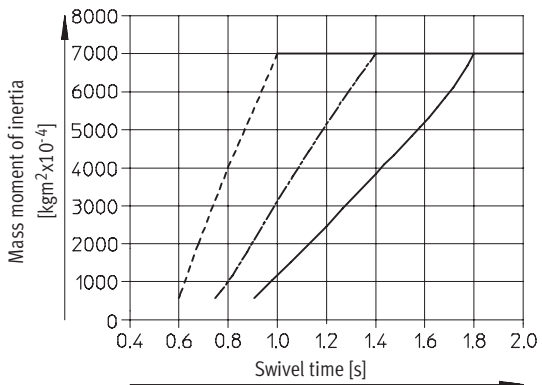
DRQD-25-...-YSRJ



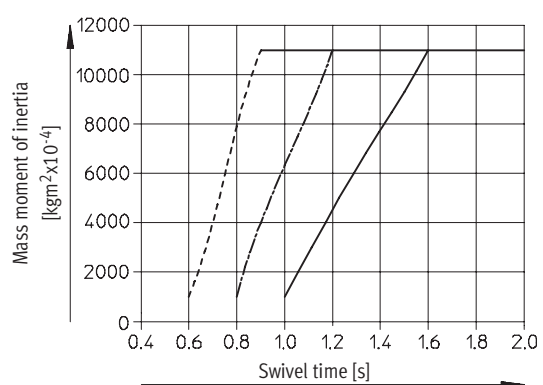
DRQD-32-...-YSRJ



DRQD-40-...-YSRJ



DRQD-50-...-YSRJ



- 90°
- · - · - 180°
- 360°

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

Technical data

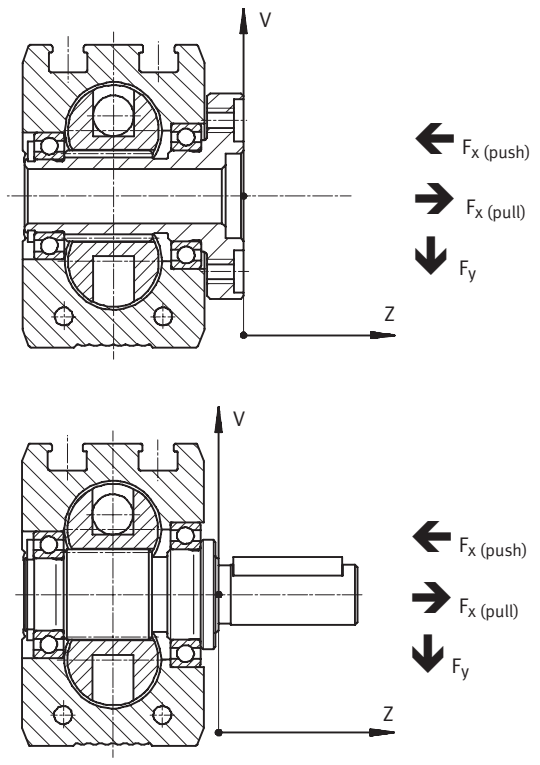


Swivel drives
Semi-rotary rack and pinion drives

4.2

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 (→ diagram of flanged shaft on right).



Question:	Answer:
Is it permissible to statically load a DRQD-16-...-FW semi-rotary drive with these combined forces?	<p>According to graph 1 (→ 1 / 4.2-55), a distance of $Z = 15\text{ mm}$ results in a maximum permissible radial force $F_{y, \text{max. (stat.)}}(15) = 400\text{ N}$.</p> <p>According to graph 3 (→ 1 / 4.2-55), a distance of $V = 25\text{ mm}$ results in a maximum permissible axial force $F_{x, \text{push max. (stat.)}}(25) = 550\text{ N}$.</p>

The following equation applies to combined loads:	The following values are assumed:	With values inserted:
$\frac{F_{y(z)}}{F_{y, \text{max. (z)}}} + \frac{F_{x, \text{push (v)}}}{F_{x, \text{push, max. (v)}}} + \frac{F_{x, \text{pull (v)}}}{F_{x, \text{pull, max. (v)}}} \leq 1$	<p>$F_{y(15)} = 300\text{ N}$ $F_{x, \text{push (stat.)}}(25) = 100\text{ N}$ $F_{y, \text{max. (stat.)}}(15) = 400\text{ N}$ $F_{x, \text{max. (stat.)}}(25) = 550\text{ N}$</p>	<p>$\frac{300\text{ N}}{400\text{ N}} + \frac{100\text{ N}}{550\text{ N}} \leq 1$ $0.75 + 0.182 \leq 1$ $0.932 \leq 1$</p> <p>Thus the drive may be statically loaded with the forces indicated above.</p>

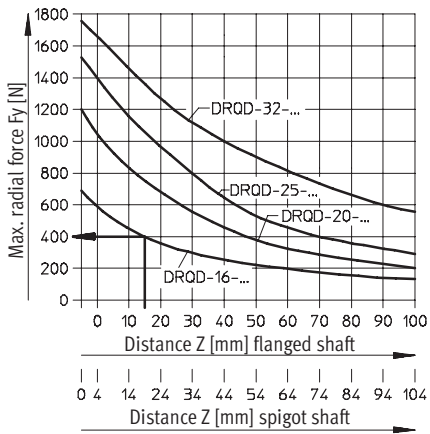
Twin-piston semi-rotary drives DRQD-16 ... 50

Technical data

Maximum static radial force

Graph 1

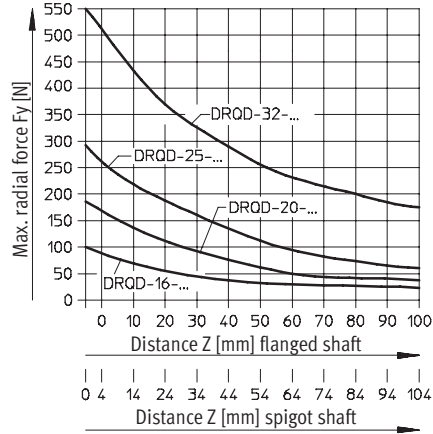
$$F_{y, \text{max. (stat.)}} = f(z)$$



Maximum dynamic radial force

Graph 2

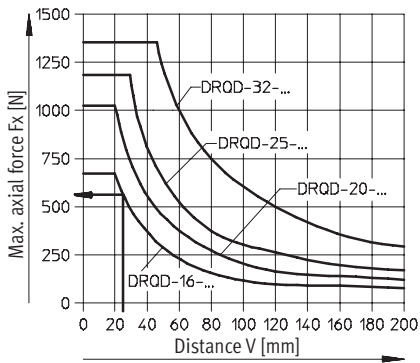
$$F_{y, \text{max. (dyn.)}} = f(z)$$



Maximum static axial pushing force

Graph 3

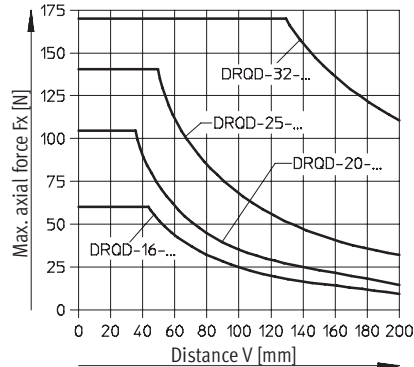
$$F_{x, \text{push max. (stat.)}} = f(v)$$



Maximum dynamic axial pushing force

Graph 4

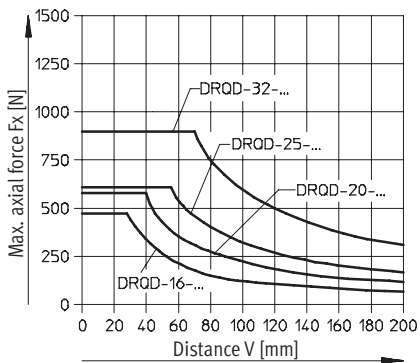
$$F_{x, \text{push max. (dyn.)}} = f(v)$$



Maximum static axial pulling force

Graph 5

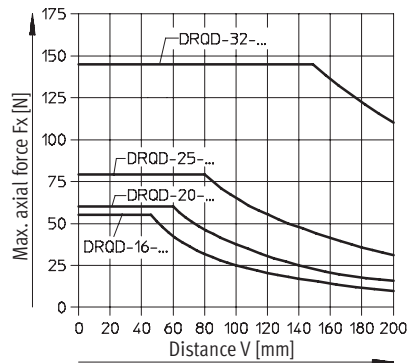
$$F_{x, \text{pull max. (stat.)}} = f(v)$$



Maximum dynamic axial pulling force

Graph 6

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



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

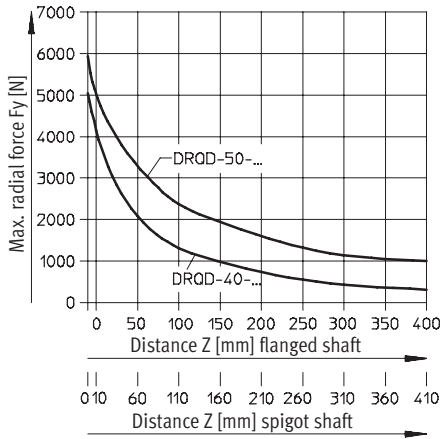
Technical data

FESTO

Maximum static radial force

Graph 1

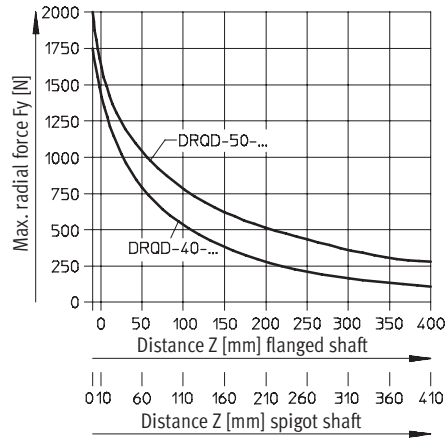
$$F_{y, \text{max. (stat.)}} = f(z)$$



Maximum dynamic radial force

Graph 2

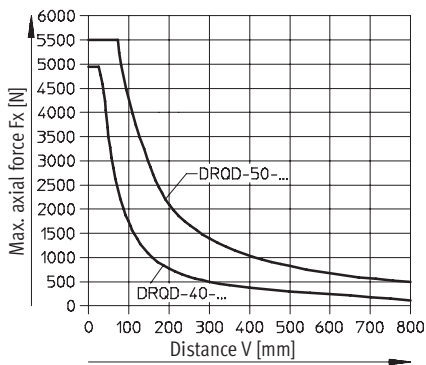
$$F_{y, \text{max. (dyn.)}} = f(z)$$



Maximum static axial pushing force

Graph 3

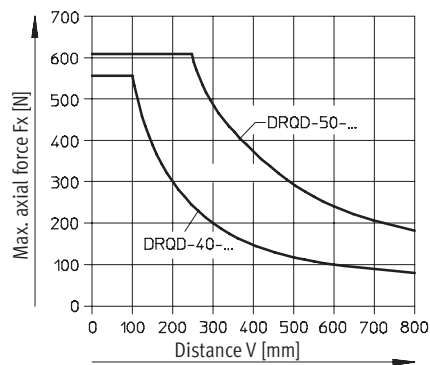
$$F_{x, \text{push max. (stat.)}} = f(v)$$



Maximum dynamic axial pushing force

Graph 4

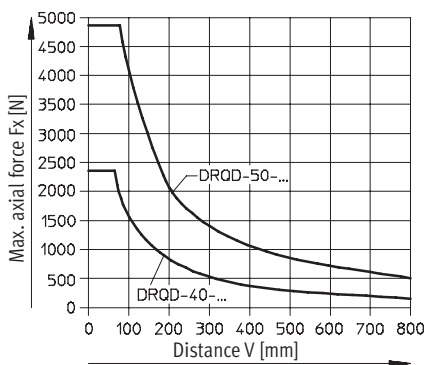
$$F_{x, \text{push max. (dyn.)}} = f(v)$$



Maximum static axial pulling force

Graph 5

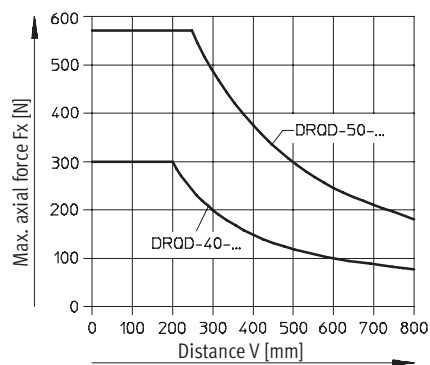
$$F_{x, \text{pull max. (stat.)}} = f(v)$$



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

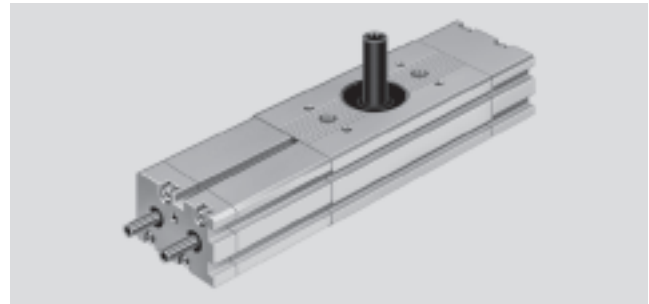


Z1 intermediate position module

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 $\pm 10^\circ$ 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

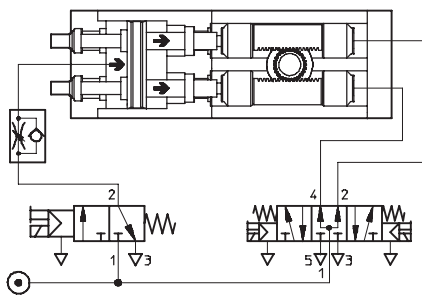
In order for the mid-position module to function, the DRQD basic actuator must be pressurised at both sides.

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

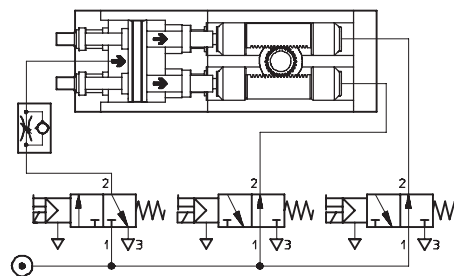
- DRQD basic drive with a 5/3-way valve, mid-position pressurised



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:
→ 1 / 4.2-51

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

Technical data



Energy through-feed

DRQD-...-SD...

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).

DRQD-...-E...

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...



Transfer plate

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

Technical data

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 ³]	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		

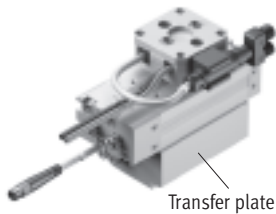
Twin-piston semi-rotary drives DRQD-16 ... 50

Technical data

FESTO

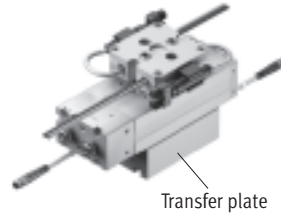
Energy through-feed

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		16	20	25	32	40	50
Piston \varnothing							
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 ³]	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 °C)					
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

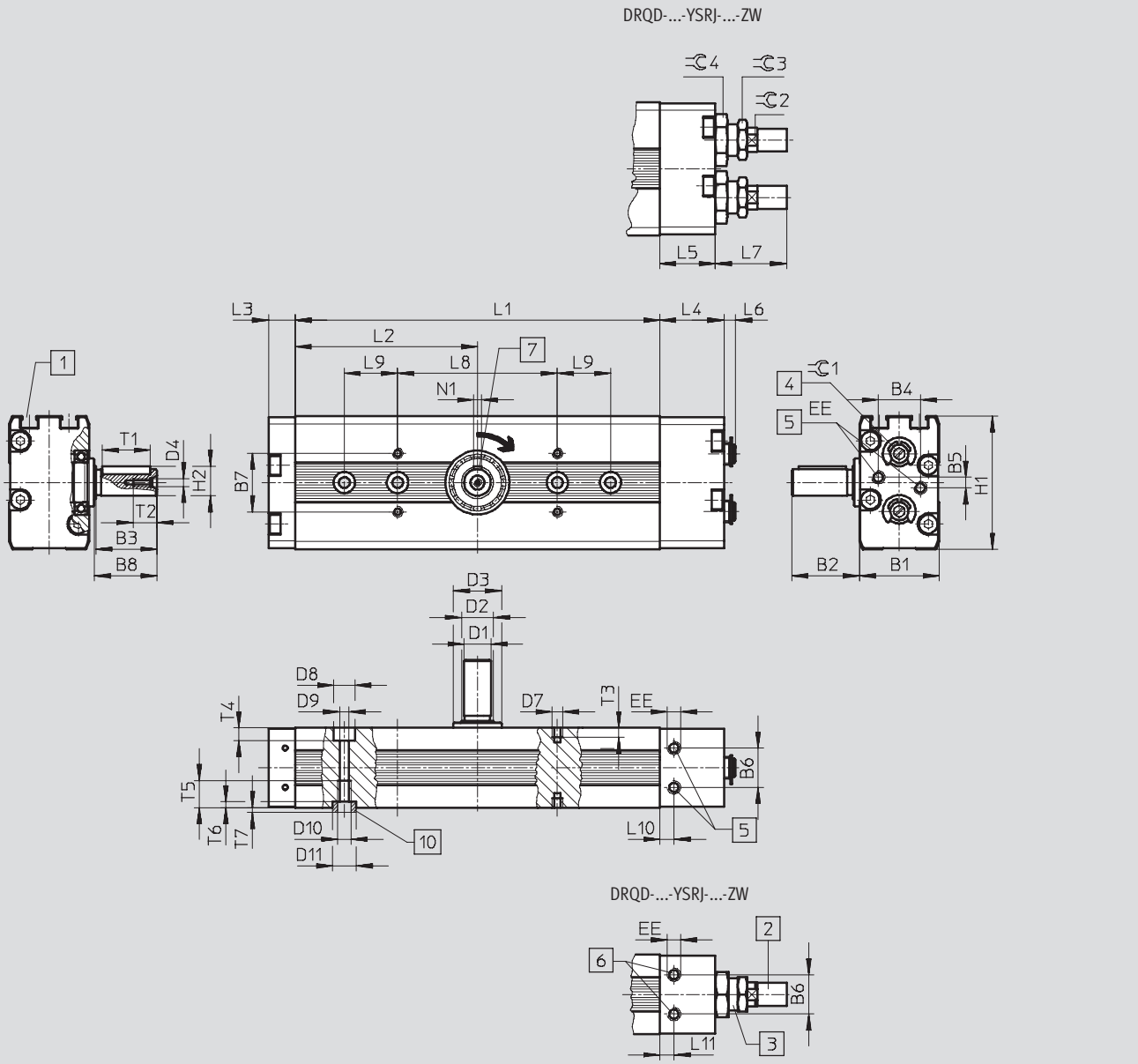
Technical data

FESTO

Dimensions

Download CAD data → www.festo.com/en/engineering

ZW – Spigot shaft



- | | | | |
|---|---|---|---|
| <p>1 T-slots for proximity sensors SME/SMT-8</p> <p>2 Self-adjusting shock absorber for end-position cushioning</p> | <p>3 Adjustable sleeve for end-position adjustment for type DRQD-...-YSRJ</p> <p>4 Socket head screw for end-position adjustment with integral regulating screw for end-position cushioning</p> | <p>5 Variant PPVJ: both supply ports on one end cap, optionally at front or side</p> <p>6 Variant YSRJ: Both supply ports on one end cap, front side only</p> | <p>7 Woodruff key position at 0°</p> <p>10 Centring sleeves (2 included in scope of delivery)</p> |
|---|---|---|---|

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

Technical data



Dimensions																Download CAD data → www.festo.com/en/engineering			
∅	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 $\frac{3}{8}$	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

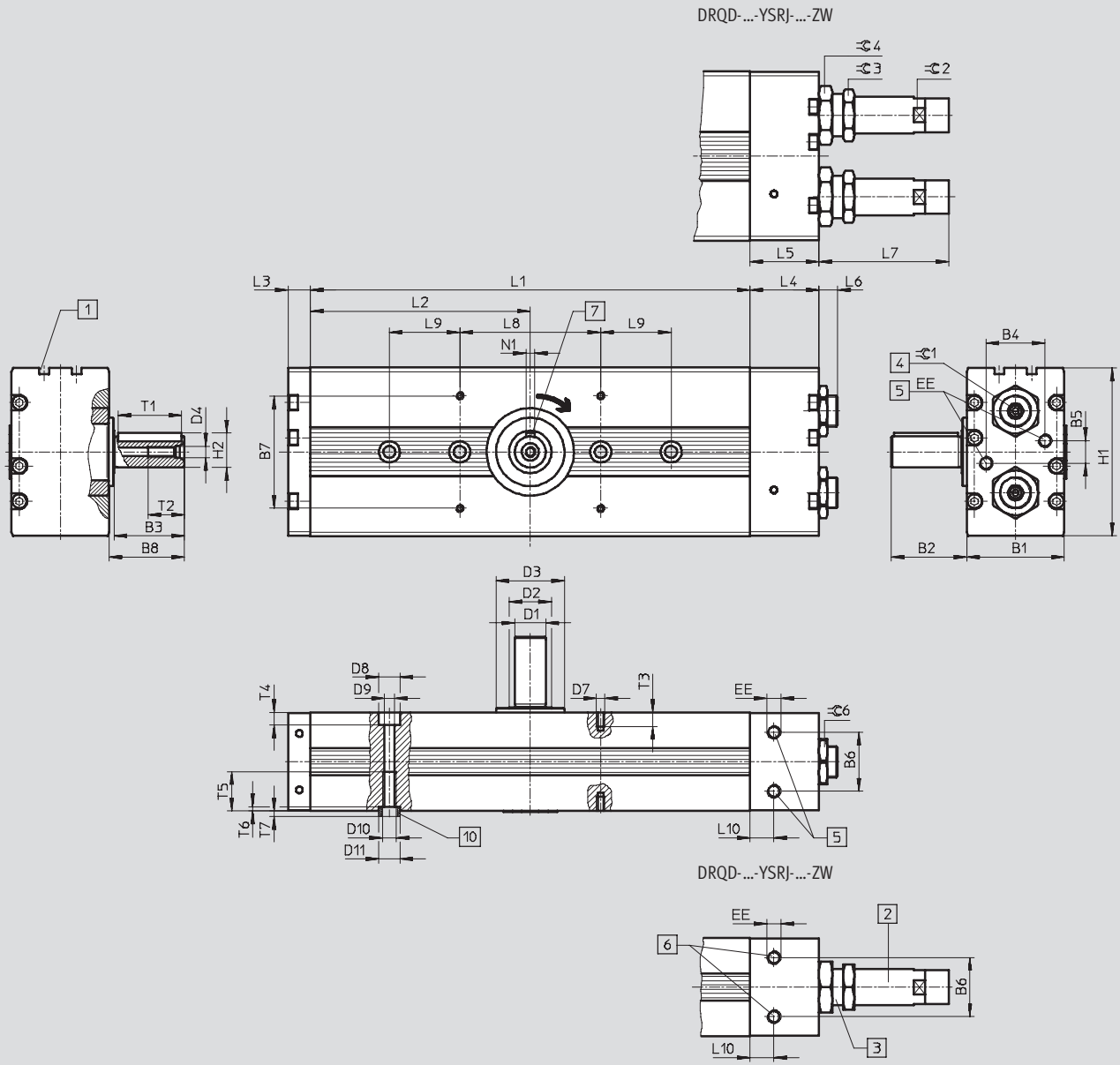


Dimensions

Download CAD data → www.festo.com/en/engineering

ZW – Spigot shaft

Swivel drives
Semi-rotary rack and pinion drives
4.2



- | | | | |
|---|---|---|---|
| <p>1 T-slots for proximity sensors SME/SMT-8</p> <p>2 Self-adjusting shock absorber for end-position cushioning</p> | <p>3 Adjustable sleeve for end-position adjustment for type DRQD-...-YSRJ</p> <p>4 Socket head screw for end-position adjustment with integral regulating screw for end-position cushioning</p> | <p>5 Variant PPVJ: both supply ports on one end cap, optionally at front or side</p> <p>6 Variant YSRJ: both supply ports on one end cap, front side only</p> | <p>7 Woodruff key position at 0°</p> <p>10 Centring sleeves (2 included in scope of delivery)</p> |
|---|---|---|---|

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

Technical data

Dimensions																Download CAD data → www.festo.com/en/engineering	
∅	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 ∅ H7	EE	H1	H2	L1	L2	L3	L4	L5	L6		L7		L8
												min.	max.	min.	max.	
40	90	M10	15	G1/8	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	G1/4	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
[mm]	[°]	±0.03		P9		+2										
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														

Swivel drives
Semi-rotary rack and pinion drives

4.2

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

Technical data

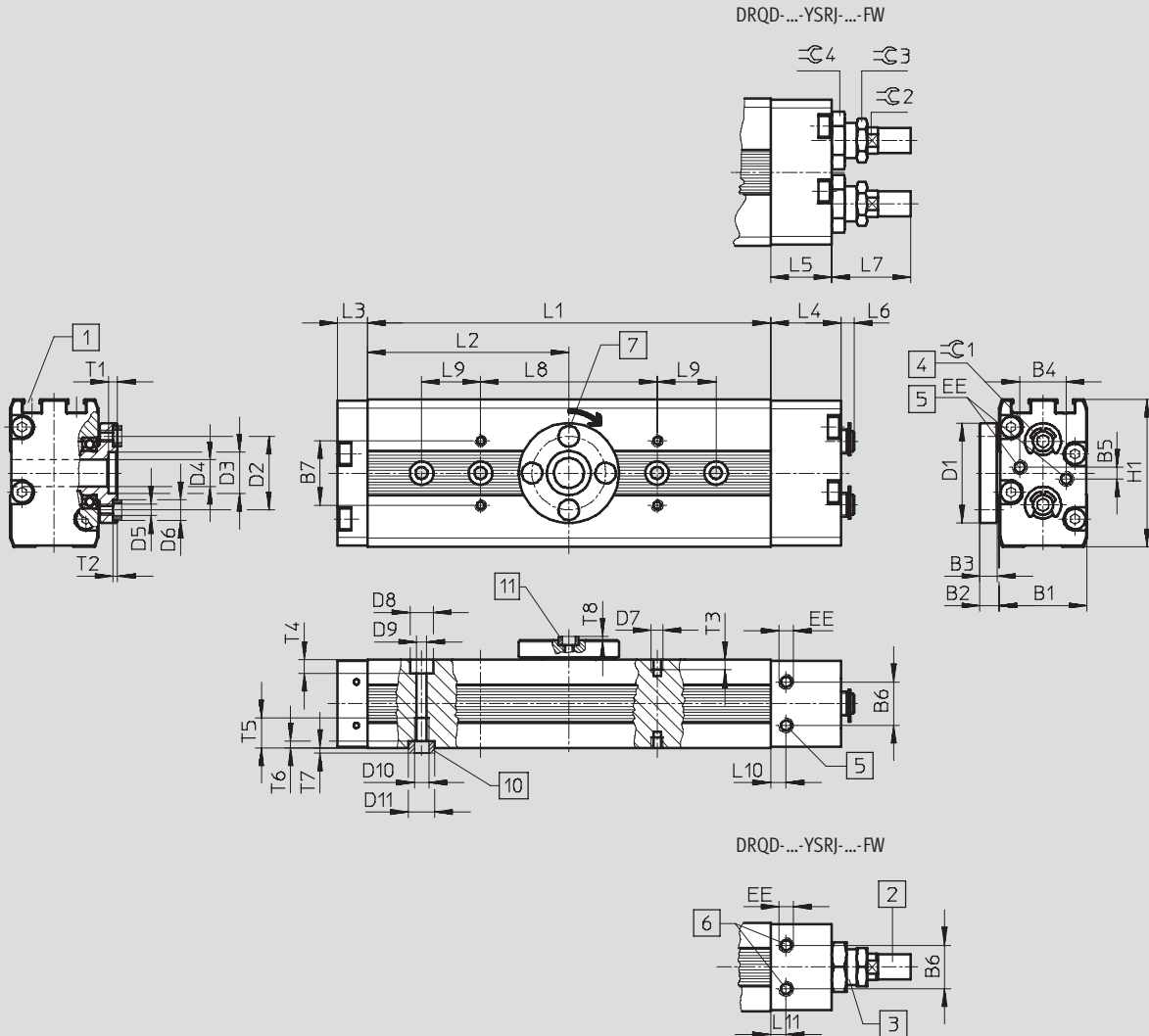


Swivel drives
Semi-rotary rack and pinion drives
4.2

Dimensions

Download CAD data → www.festo.com/en/engineering

FW – Flanged shaft



- | | | | |
|---|---|--|--|
| <p>1 T-slots for proximity sensors SME/SMT-8</p> <p>2 Self-adjusting shock absorber for end-position cushioning</p> | <p>3 Adjustable sleeve for end-position adjustment for type DRQD-...-YSRJ</p> <p>4 Socket head screw for end-position adjustment with integral regulating screw for end-position cushioning</p> | <p>5 Variant PPV: both supply ports on one end cap, optionally at front or side</p> <p>6 Variant YSRJ: both supply ports on one end cap, front side only</p> | <p>7 Position of centring hole at 0°</p> <p>10 Centring sleeves (2 included in scope of delivery)</p> <p>11 Centring sleeves (not included in scope of delivery)</p> |
|---|---|--|--|

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

Technical data



Download CAD data → 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	∅ 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
[mm]	[°]	±0.03														
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

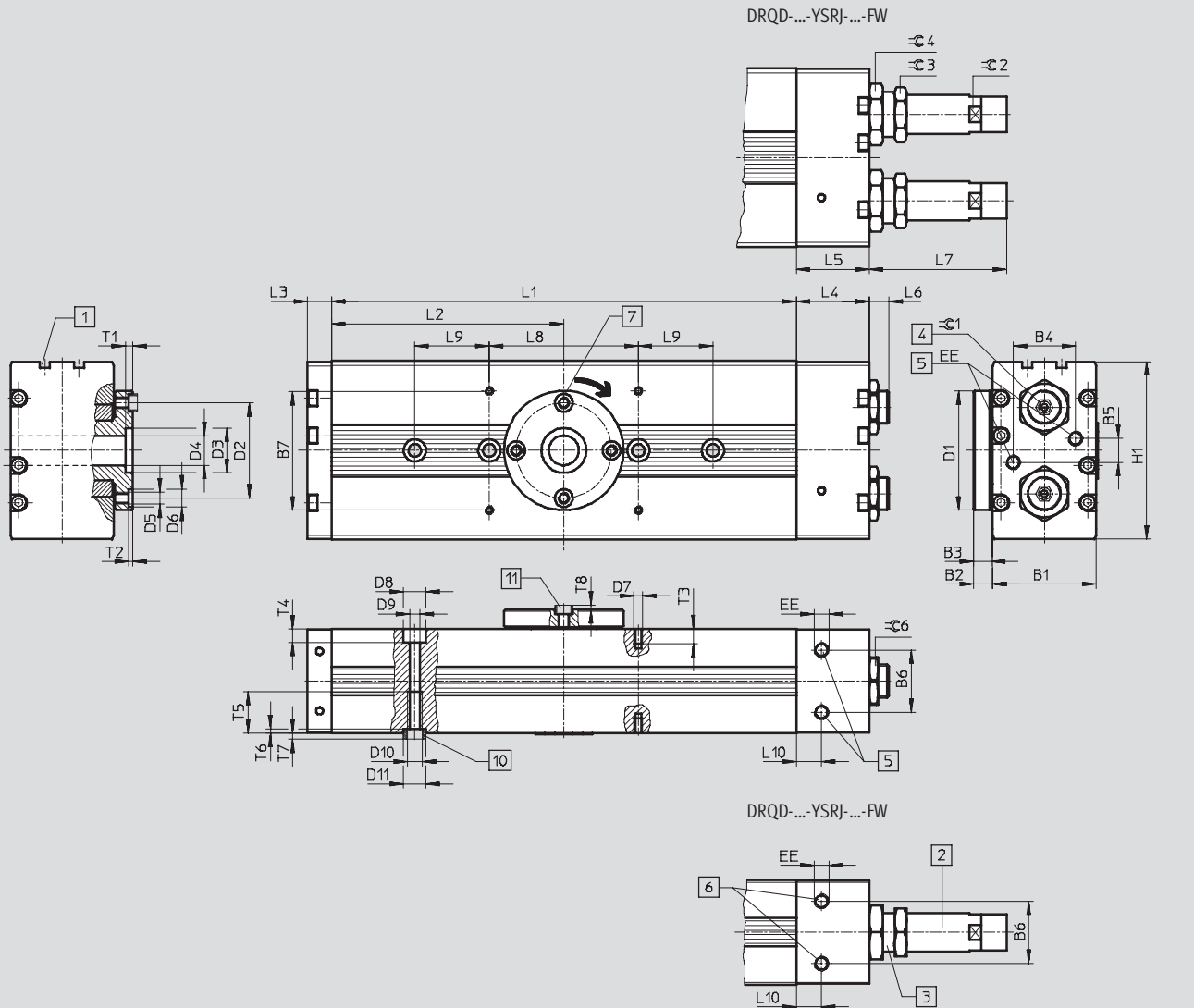
Technical data

FESTO

Dimensions

Download CAD data → www.festo.com/en/engineering

FW – Flanged shaft



- | | | | |
|---|---|--|--|
| <p>1 T-slots for proximity sensors SME/SMT-8</p> <p>2 Self-adjusting shock absorber for end-position cushioning</p> | <p>3 Adjustable sleeve for end-position adjustment for type DRQD-...-YSRJ</p> <p>4 Socket head screw for end-position adjustment with integral regulating screw for end-position cushioning</p> | <p>5 Variant PPV: both supply ports on one end cap, optionally at front or side</p> <p>6 Variant YSRJ: both supply ports on one end cap, front side only</p> | <p>7 Woodruff key position at 0°</p> <p>10 Centring sleeves (2 included in scope of delivery)</p> <p>11 Centring sleeves (not included in scope of delivery)</p> |
|---|---|--|--|

Swivel drives
Semi-rotary rack and pinion drives
4.2

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



Technical data

Dimensions																Download CAD data → www.festo.com/en/engineering	
∅	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													

Swivel drives
Semi-rotary rack and pinion drives

4.2

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

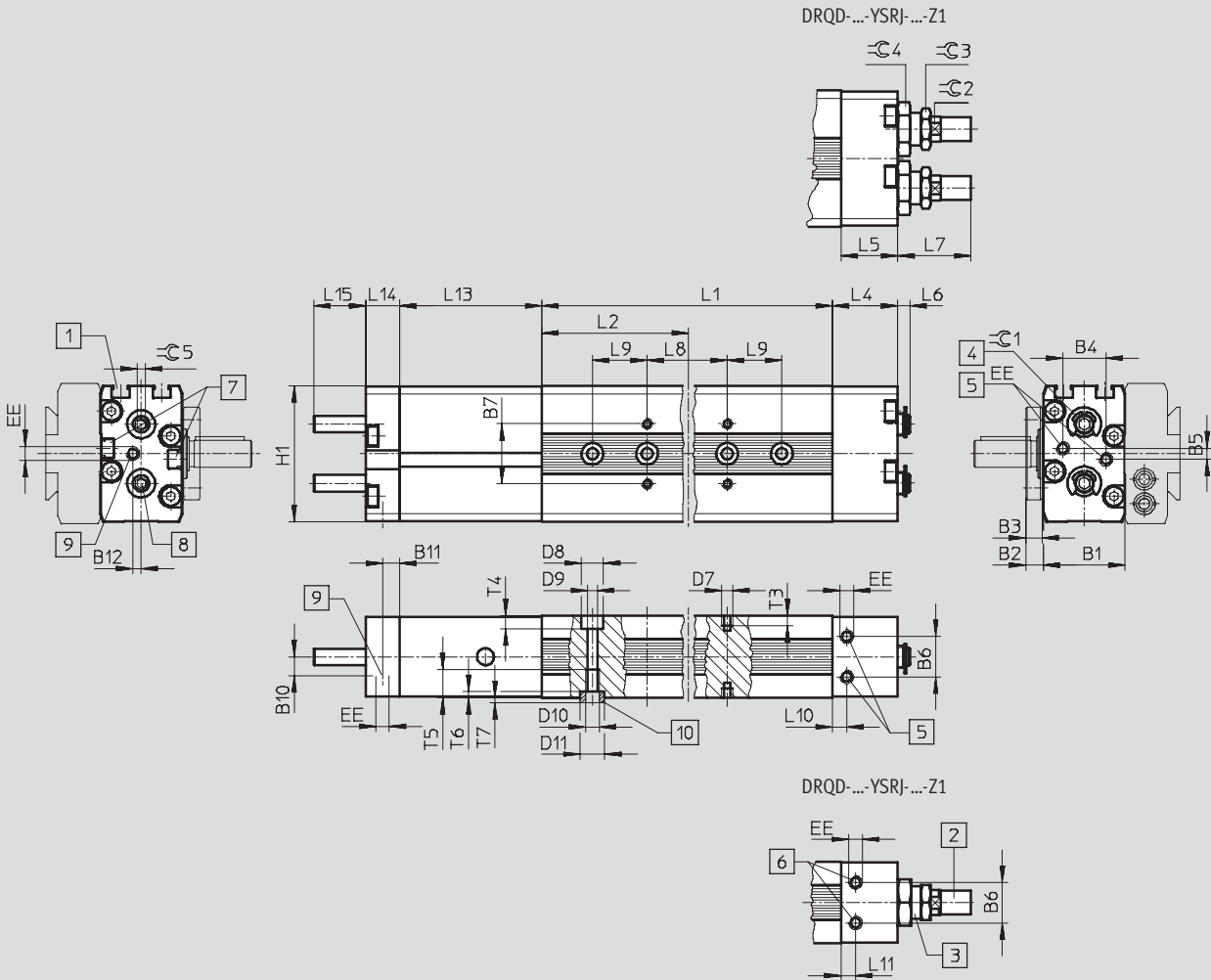
Technical data



Dimensions

Download CAD data → www.festo.com/en/engineering

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



- | | | | |
|---|--|--|---|
| <p>1 T-slots for proximity sensor SME/SMT-8 for end-position sensing</p> <p>2 Self-adjusting shock absorber for end-position cushioning</p> <p>3 Adjustable sleeve for end-position adjustment for type DRQD-...-YSRJ</p> | <p>4 Socket head screw for end-position adjustment with integral regulating screw for end-position cushioning</p> <p>5 Variant PPVJ: both supply ports on one end cap, optionally at front or side</p> | <p>6 Variant YSRJ: both supply ports on one end cap, front side only</p> <p>7 T-slots for proximity sensor SME/SMT-8 for mid-position sensing</p> <p>8 Socket head screw for mid-position adjustment (slightly recessed)</p> | <p>9 Supply port for mid-position module at cap, optionally at side or front</p> <p>10 Centring sleeves (2 included in scope of delivery)</p> |
|---|--|--|---|

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

Technical data

Download CAD data → 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 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														

Swivel drives
Semi-rotary rack and pinion drives
4.2

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

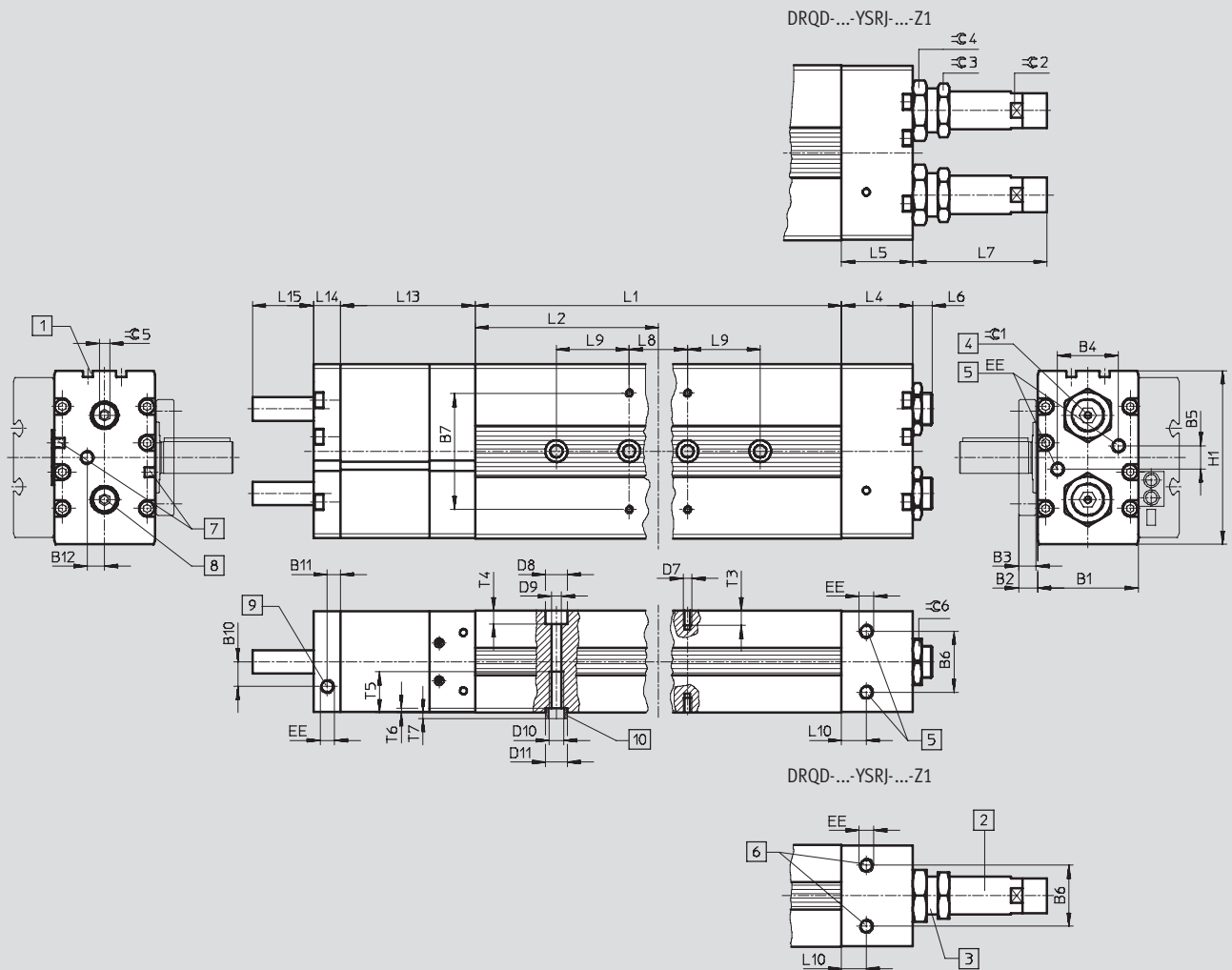
Technical data

FESTO

Dimensions

Download CAD data → www.festo.com/en/engineering

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



- 1 T-slots for proximity sensor SME/SMT-8 for end-position sensing
- 2 Self-adjusting shock absorber for end-position cushioning
- 3 Adjustable sleeve for end-position adjustment for type DRQD-...-YSRJ
- 4 Socket head screw for end-position adjustment with integral regulating screw for end-position cushioning
- 5 Variant PPVJ: both supply ports on one end cap, optionally at front or side
- 6 Variant YSRJ: both supply ports on one end cap, front side only
- 7 T-slots for proximity sensor SME/SMT-8 for mid-position sensing
- 8 Socket head screw for mid-position adjustment (slightly recessed)
- 9 Supply port for mid-position module at cap, optionally at side or front
- 10 Centring sleeves (2 included in scope of delivery)

Swivel drives
Semi-rotary rack and pinion drives
4.2

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



Technical data

Dimensions		Download CAD data → www.festo.com/en/engineering													
∅	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						
[mm]	[°]														
40	90	15	G $\frac{1}{8}$	120	146.8	73.4	49	41.5	5	14.6	85.1	96.4	100	-	17
	180				201.8	100.9								-	
	360				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
	180				262.8	131.4								50	
	360				405.8	202.9								100	

∅	Swivel angle	L13	L14	L15		T3	T4	T5	T6	T7	≈C1	≈C2	≈C3	≈C4	≈C5	≈C6
				min.	max.											
[mm]	[°]															
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															

Swivel drives
Semi-rotary rack and pinion drives
4.2

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

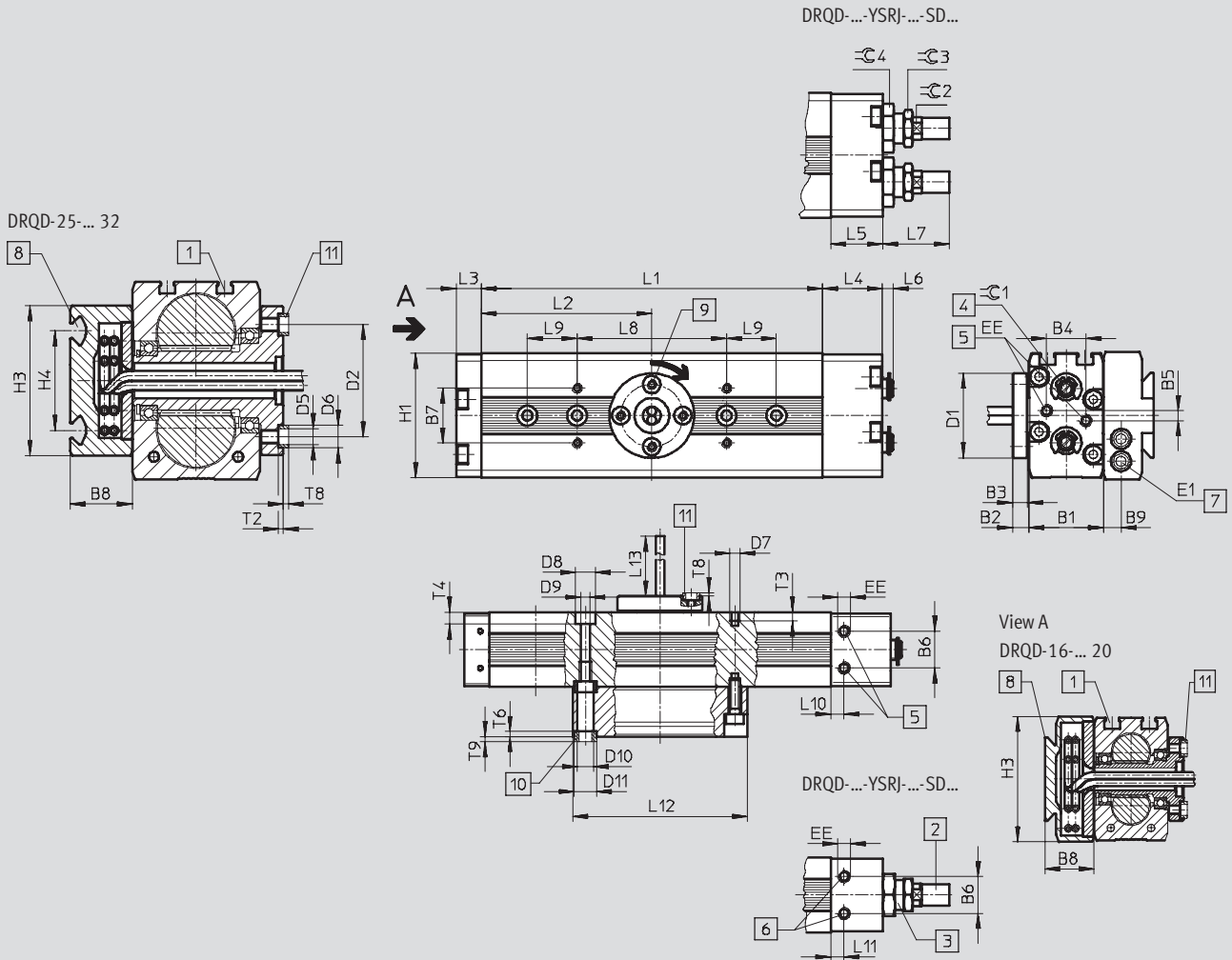
Technical data

FESTO

Dimensions

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FW-SD – Energy through-feed



- | | | | |
|---|---|--|--|
| <p>1 T-slots for proximity sensors SME/SMT-8</p> <p>2 Self-adjusting shock absorber for end-position cushioning</p> <p>3 Adjustable sleeve for end-position adjustment for type DRQD-...-YSRJ</p> | <p>4 Socket head screw for end-position adjustment with integral regulating screw for end-position cushioning</p> <p>5 Variant PPV: both supply ports on one end cap, optionally at front or side</p> | <p>6 Variant YSRJ: both supply ports on one end cap, front side only</p> <p>7 Supply port for energy through-feed</p> <p>8 Mounting option via dovetail profile (for \varnothing 16 to 20 mm) or profile slot nut (grid dimensions 40 mm for \varnothing 25 to 32 mm) → 1 / 4.2-82</p> | <p>9 Position of designated centring hole at 0°</p> <p>10 Centring sleeves (2 included in scope of delivery) → 1 / 4.2-82</p> <p>11 Centring sleeves (not included in scope of delivery)</p> |
|---|---|--|--|

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

Technical data

FESTO

Dimensions																	Download CAD data → www.festo.com/en/engineering	
∅	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	
														∅	∅	min.	max.
[mm]	[°]	H13	H7		∅												
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	G $\frac{1}{8}$	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
														∅	∅	∅	∅
[mm]	[°]	±0.03	±0.03				min.										
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

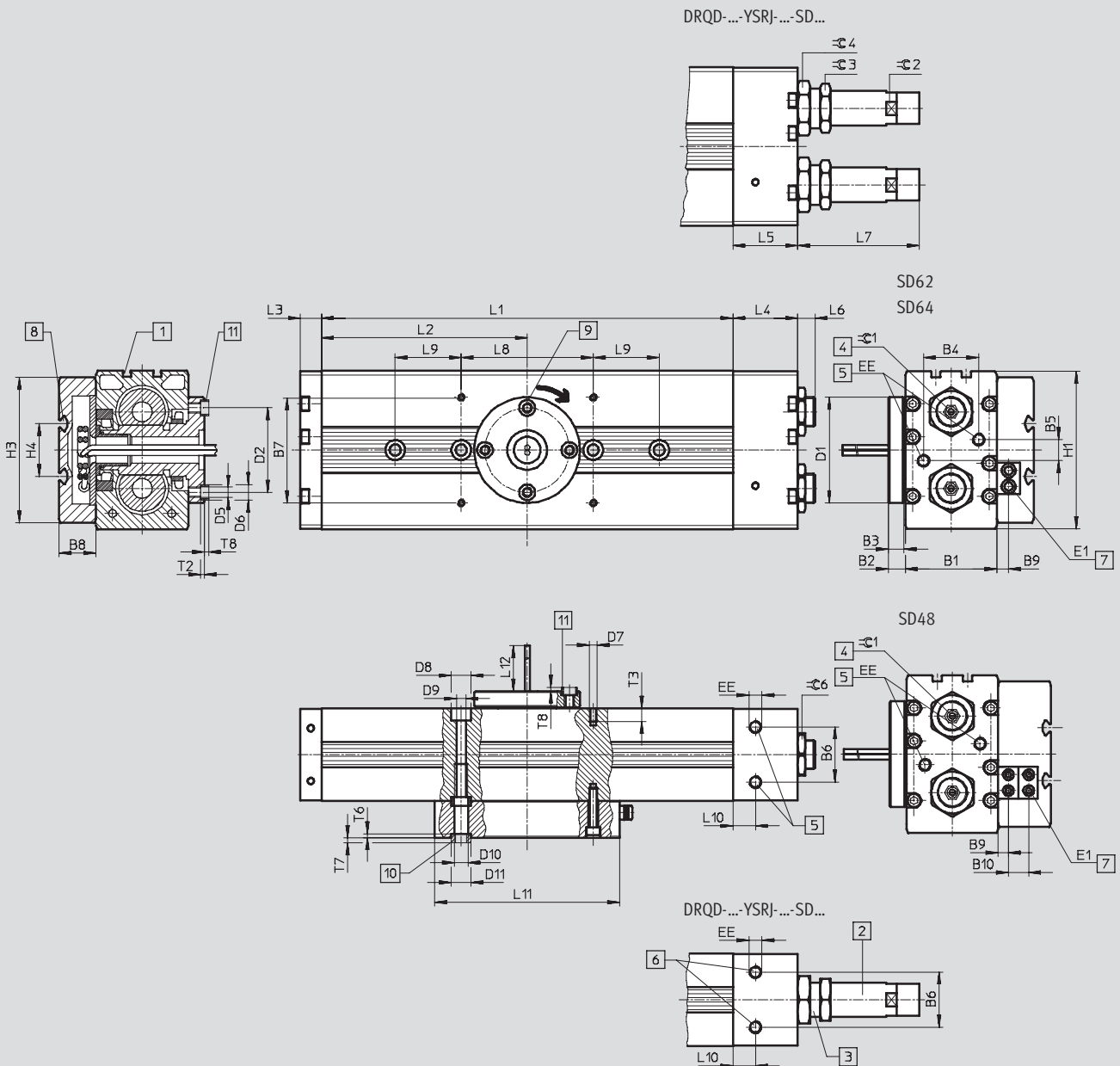
Technical data

FESTO

Dimensions

Download CAD data → www.festo.com/en/engineering

FW-SD – Energy through-feed



- | | | | |
|---|--|--|--|
| <p>1 T-slots for proximity sensors SME/SMT-8</p> <p>2 Self-adjusting shock absorber for end-position cushioning</p> <p>3 Adjustable sleeve for end-position adjustment for type DRQD-...-YSRJ</p> | <p>4 Socket head screw for end-position adjustment with integral regulating screw for end-position cushioning</p> <p>5 Variant PPVJ: both supply ports on one end cap, optionally at front or side</p> | <p>6 Variant YSRJ: both supply ports on one end cap, front side only</p> <p>7 Supply port for energy through-feed</p> <p>8 Mounting option via profile slot nut (grid dimensions 40 mm) → 1 / 4.2-82</p> | <p>9 Position of designated centring hole at 0°</p> <p>10 Centring sleeves (2 included in scope of delivery) → 1 / 4.2-82</p> <p>11 Centring sleeves (not included in scope of delivery)</p> |
|---|--|--|--|

Swivel drives
Semi-rotary rack and pinion drives
4.2

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

Technical data



Download CAD data → www.festo.com/en/engineering

Dimensions																				
∅	Swivel angle	Variant	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	D1	D2	D3	D4	D5	D6	D7	D8
[mm]	[°]												∅	∅	∅	∅		∅		∅
														±0.05	H7			H7		H13
40	90	SD62/SD64	70	13	12	42	4	42	80	28	9	–	80	64	30	20	M8	12	M6	15
		SD48								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
		SD48								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
		SD48								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
		SD48								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
		SD48								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
		SD48								40	7.75	15.5								

∅	Swivel angle	Variant	D9	D10	D11	EE	E1	H1	H3	L1	L2	L3	L4	L5	L6		L7	
															∅	∅	∅	H7
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
		SD48																
	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
		SD48																
	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
		SD48																
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
		SD48																
	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
		SD48																
	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
		SD48																

∅	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.											
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

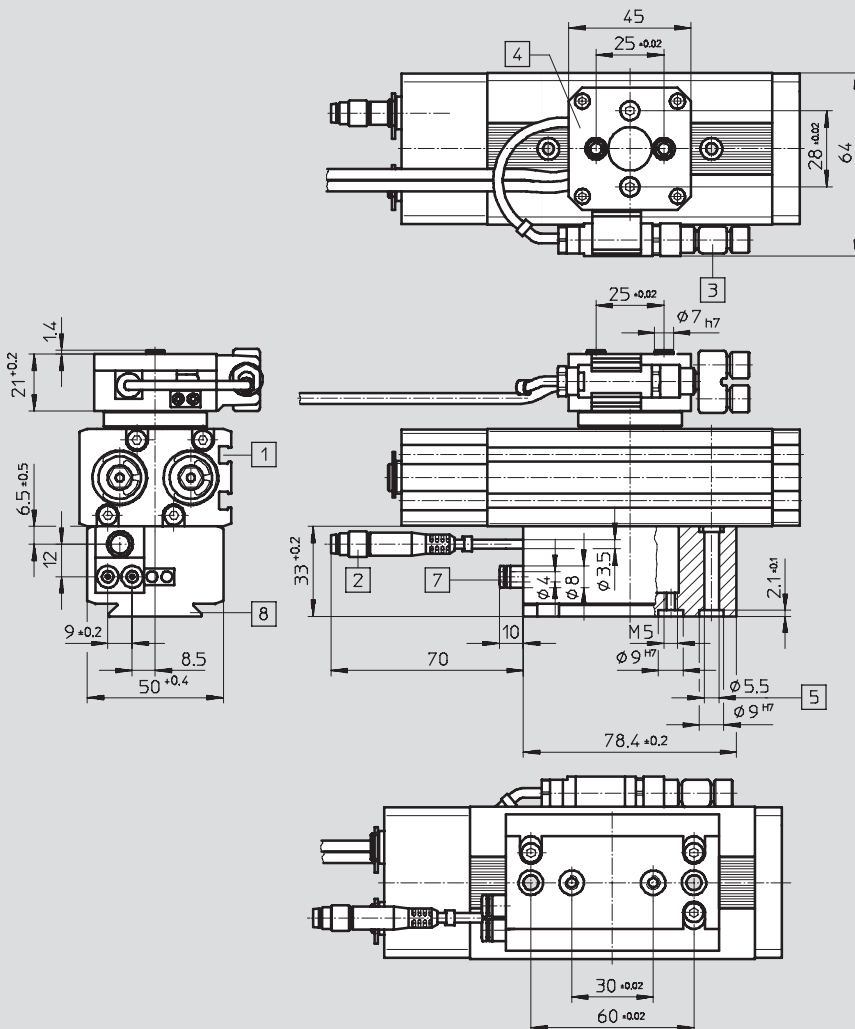
Technical data

FESTO

Dimensions

Download CAD data → www.festo.com/en/engineering

FW E422 – Energy through-feed



- | | | |
|--|---|--|
| 1 T-slots for proximity sensors SME/SMT-8 | 4 Output plate can be repositioned by 90° | 7 Supply port for energy through-feed for tubing O.D. 4 mm |
| 2 Plug M8x1, 4-pin | 5 Screw-through option with screw M4 | 8 Mounting option via dovetail connection |
| 3 Socket M8x1 for proximity sensor SME/SMT | | |

Swivel drives
Semi-rotary rack and pinion drives

4.2

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

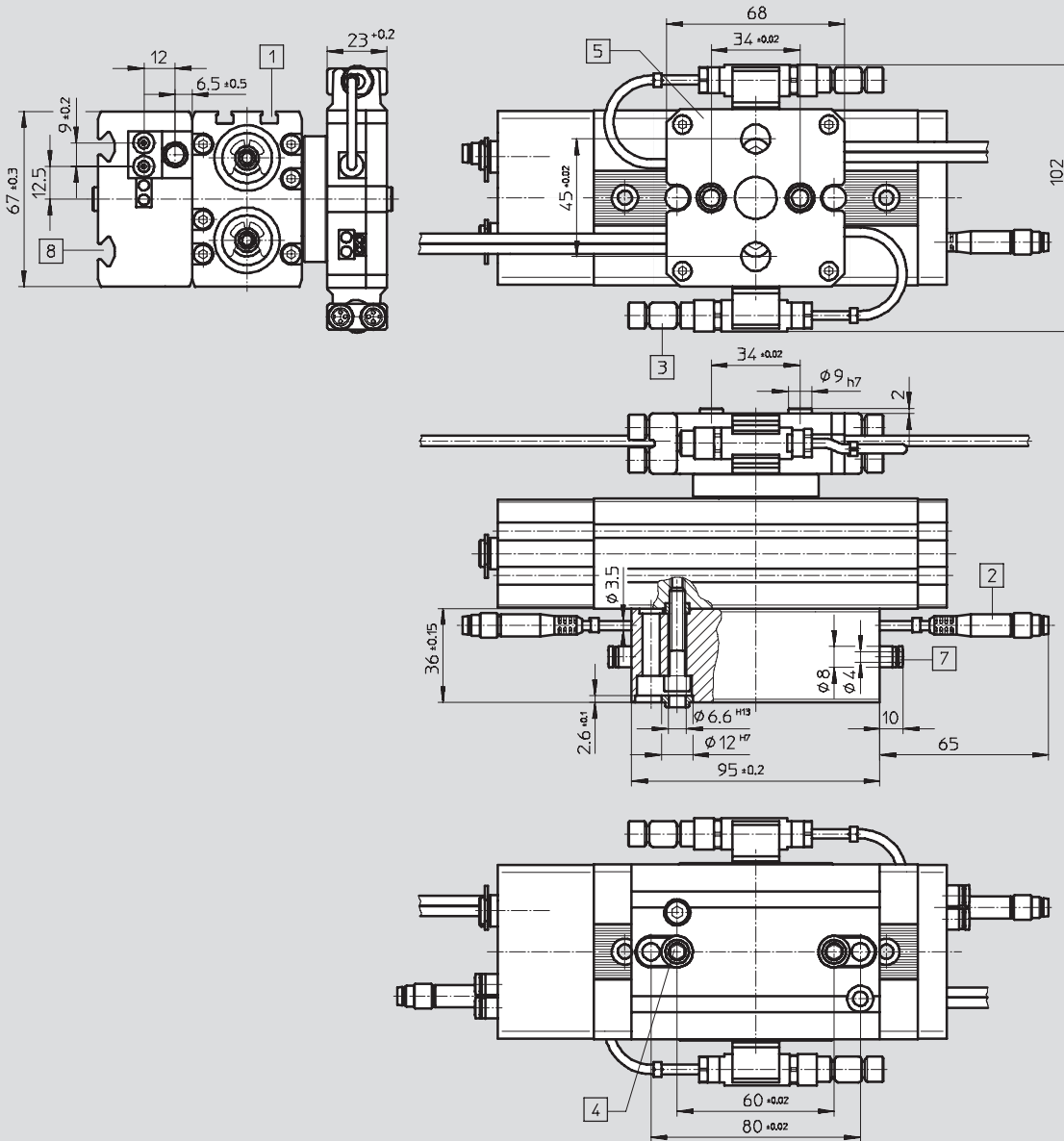
Technical data

FESTO

Dimensions

Download CAD data → 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 |
| 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 | | |

Swivel drives
Semi-rotary rack and pinion drives

4.2

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

Technical data



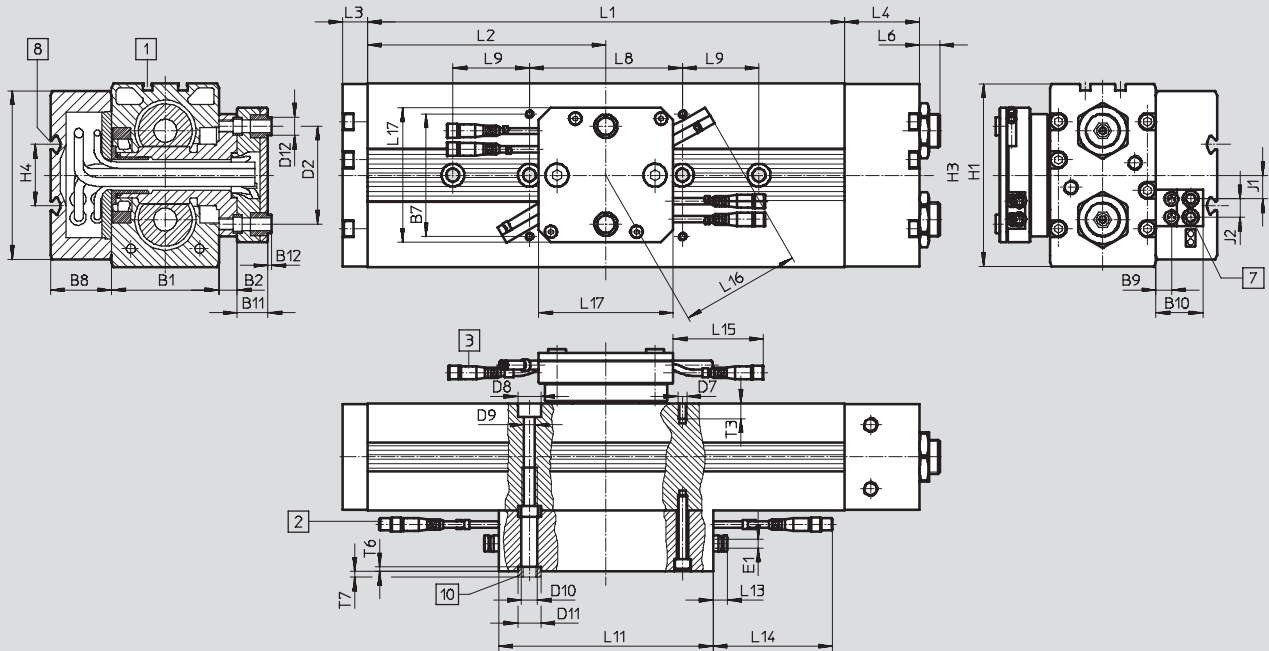
Swivel drives
Semi-rotary rack and pinion drives

4.2

Dimensions

Download CAD data → 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) → 1 / 4.2-82
- 10** Centring sleeves (2 pieces included in scope of delivery) → 1 / 4.2-82



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

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

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

Technical data

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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	

Swivel drives
Semi-rotary rack and pinion drives

4.2

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

Ordering data – Modular products



Swivel drives
Semi-rotary rack and pinion drives
4.2

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					
Ordering example							
197 373	DRQD	- 40	- 280	- YSRJ	- A	- AR	- FW

Ordering table

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

- 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



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

Ordering table									
Size	16	20	25	32	40	50	Condi- tions	Code	Enter code
0 Intermediate position	1 intermediate position (mid-position)						4	-Z1	
Energy through-feed	2x tubing O.D. 3 mm				-	-		-SD32	
	2x tubing O.D. 4 mm				-	-		-SD42	
	-	-	-	-	8x tubing O.D. 4 mm			-SD48	
	-	-	-	-	2x tubing O.D. 6 mm			-SD62	
	-	-	-	-	4x tubing O.D. 6 mm			-SD64	
	2x tubing O.D. 4 mm, 1x 4-pin cable to 2x 3-pin cable		-	-	-	-		-E422	
	-	-	4x tubing O.D. 4 mm, 2x 4-pin cable to 4x 3-pin cable		-	-		-E444	
-	-	-	-	4x tubing O.D. 6 mm, 4x 3-pin cable			-E644		
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	

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

Swivel drives
Semi-rotary rack and pinion drives

4.2

Transfer order code


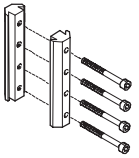

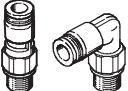
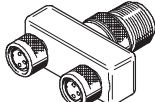
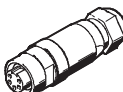
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Twin-piston semi-rotary drives DRQD

Accessories



Swivel drives
Semi-rotary rack and pinion drives
4.2



Ordering data						
	For Ø	Remarks	Design	Part No.	Type	PU ¹⁾
Centring sleeve ZBH						Technical data → 1 / 10.1-3
	6	For centring the drive on attachments		186 717	ZBH-7	10
	8 ... 32			150 927	ZBH-9	
	40/50			191 409	ZBH-15	
	16 ... 32	For centring attachments on the flanged shaft FW		186 717	ZBH-7	
	40/50			189 653	ZBH-12	
Adapter kit HMSV						Technical data → Volume 5
	16/20	Mounting via dovetail profile for variant with energy through-feed SD... and E...		177 647	HMSV-1	1
Slot nut NST						Technical data → 1 / 10.1-3
	25 ... 50	Mounting via profile slot nut for variant with energy through-feed SD... and E...		150 914	NST-5-M5	1
Rotary push-in fitting						Technical data → Volume 3
	6 ... 12 Only in combination with hollow bolt HS	With ball bearing, for standard O.D. tubing	Straight	153 526	QSR-M5-4	1
			L-shape	153 529	QSRL-M5-4	
T-connector NEDU						Technical data → Volume 4
	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		544 391	NEDU-M8D3-M8T4	1
Cable socket NECU						Technical data → Volume 4
	16 ... 32	Included in the scope of delivery if semi-rotary drive DRQD is ordered with energy through-feed E422 and E444.		544 392	NECU-M8G4	1



1) Packaging unit quantity



Twin-piston semi-rotary drives DRQD




Accessories

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Ordering data – Proximity sensors for C-slot, magneto-resistive					Technical data → www.festo.com/catalogue/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 → www.festo.com/catalogue/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 → www.festo.com/catalogue/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 → www.festo.com/catalogue/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

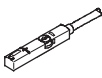


Twin-piston semi-rotary drives DRQD



Accessories

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Swivel drives
Semi-rotary rack and pinion drives

4.2

Ordering data – Proximity sensors for T-slot, magnetic reed					Technical data → www.festo.com/catalogue/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	Contacting	Cable, 3-wire	2.5	543 862	SME-8M-DS-24V-K-2,5-OE
				5.0	543 863	SME-8M-DS-24V-K-5,0-OE
			Cable, 3-wire	2.5	543 872	SME-8M-ZS-24V-K-2,5-OE
			Plug M8x1, 3-pin	0.3	543 861	SME-8M-DS-24V-K-0,3-M8D
	Insertable in the slot lengthwise, flush with the cylinder profile	Contacting	Cable, 3-wire	2.5	150 855	SME-8-K-LED-24
			Plug M8x1, 3-pin	0.3	150 857	SME-8-S-LED-24
N/C contact						
	Insertable in the slot lengthwise, flush with the cylinder profile	Contacting	Cable, 3-wire	7.5	160 251	SME-8-O-K-LED-24

Ordering data – Connecting cables				Technical data → www.festo.com/catalogue/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
	Straight socket, M12x1, 5-pin	Cable, open end, 3-wire	2.5	541 363	NEBU-M12G5-K-2.5-LE3
			5	541 364	NEBU-M12G5-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
	Angled socket, M12x1, 5-pin	Cable, open end, 3-wire	2.5	541 367	NEBU-M12W5-K-2.5-LE3
			5	541 370	NEBU-M12W5-K-5-LE3

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