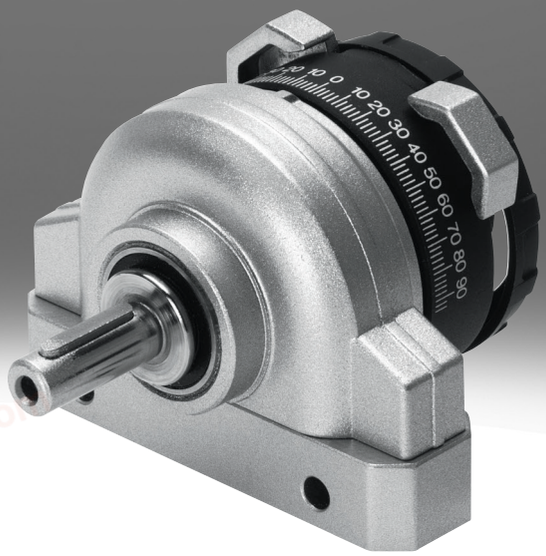
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Semi-rotary drive, metric DSR



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Characteristics

At a glance

- Double-acting semi-rotary drive with vane
- The swivel angle is infinitely adjustable over the entire swivel range
- The adjustable stop system is separate from the vane so that any forces are absorbed by the stop blocks
- The stops are cushioned in the end positions by elastic polymer pads.
- DSRL-...-FW:The versions with a hollow flange shaft allow liquid or gaseous media or tubing and electrical cables to be fed through.The force is transmitted directly and backlash-free via a splined shaft

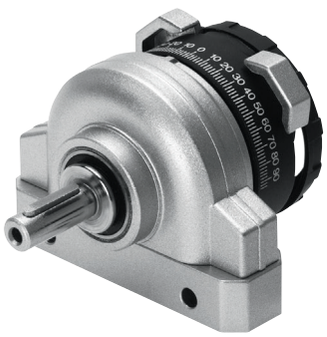
Cushioning

[P]	Elastic cushioning rings/plates on both sides

The drive is fitted with elastic polymer end-position cushioning.

Shaft

[_]	Spigot shaft
[FW]	Flanged shaft





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Type code

001	Series	
DSRL	Semi-rotary drive	
DSR	Semi-rotary drive	

002	Size [mm]	
10	10	
12	12	
16	16	
25	25	
32	32	
40	40	

003	Nominal swivel angle [°]	
180	180	

004	Cushioning	
P	Elastic cushioning rings/plates on both sides	

005	Shaft	
	Spigot shaft	
FW	Flanged shaft	

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Datasheet

General technical data

Size	10	12	16	25	32	40
Design	Vane					
Mode of operation	Double-acting					
Cushioning	Elastic cushioning rings/plates at both ends					
Cushioning angle	2.4 deg	2.2 deg	2.1 deg	1.8 deg	1.2 deg	0.9 deg
Position detection	Without					
Type of mounting	With through-hole					
Mounting position	optional					
Swivel angle	0 ... 180 deg					
Product weight	100 g	200 g	300 g	500 g	1,300 g	2,400 g

Operating and environmental conditions

Size	10	12	16	25	32	40
Operating medium	Compressed air to ISO 8573-1:2010 [7:-:-]					
Operating pressure [1]	2.5 ... 8 bar	2 ... 8 bar		1.5 ... 8 bar		
Ambient temperature [2]	-10 ... 60°C					

1) The minimum operating pressure can be increased by up to 0.5 bar after a rest period of 24 hours

2) Observe the operating range of the proximity switches

Weight

Size	10	12	16	25	32	40
Product weight	100	200	300	500	1,300	2,400

Materials

Material housing	Die-cast zinc
Material drive shaft	Steel, Nickel-plated
Material covering	PA-reinforced
Material seals	NBR
LABS (PWIS) conformity	VDMA24364-B2-L
RoHS status	RoHS compliant in accordance with EU directive

Forces and torques

Size	10	12	16	25	32	40
Theoretical torque at 0.6 MPa (6 bar, 87 psi)	0.5 Nm	1 Nm	2 Nm	5 Nm	10 Nm	20 Nm
Max. radial force [1]	30 N	45 N	75 N	120 N	200 N	350 N
Max. axial force [2]	10 N	18 N	30 N	50 N	75 N	120 N
Max. swivel frequency at 0.6 MPa (6 bar, 87 psi)	3 Hz					

1) On the output shaft at max. frequency

2) On the output shaft at max. frequency

Assembly instructions

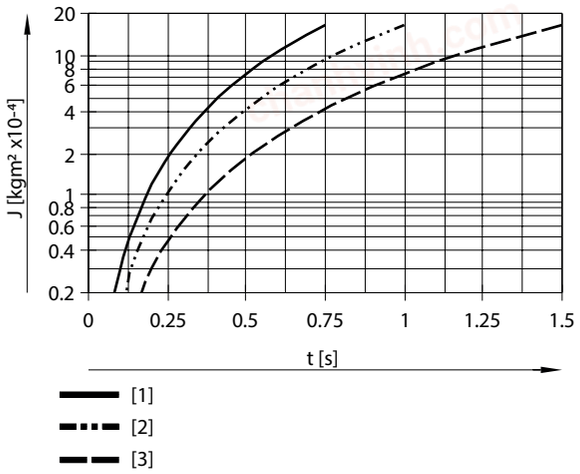
If the specified maximum permissible mass moments of inertia are exceeded, external stops must be used.The following must be noted in this case:
The stop must not fall below a minimum radius to the output shaft (rmin).The stop force must not exceed the maximum force.Because of the elastic stops, an exact end position can only be achieved using an external stop.
Size 10:Stop radius 13 mm / force 60 N
Size 12:Stop radius 15 mm / force 90 N
Size 16:Stop radius 17 mm / force 160 N
Size 25:Stop radius 21 mm / force 320 N
Size 32:Stop radius 28 mm / force 480 N
Size 40:Stop radius 40 mm / force 650 N

If the semi-rotary drives are throttled to swivel speeds below 180°/s, the drives must be operated with a minimum of 6 bar.A synchronisation fluctuation of ±30% is to be expected.An improvement in the synchronisation fluctuations and the swivel times shown in the graphs can only be achieved with throttle valves.

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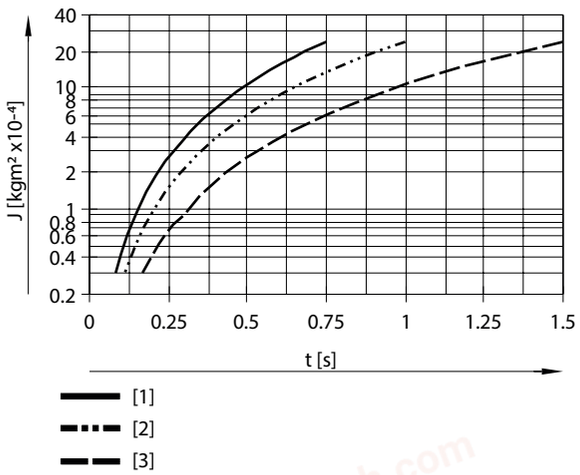
Datasheet

Mass moment of inertia m as a function of swivel time t and swivel angle for DSR/DSRL-10



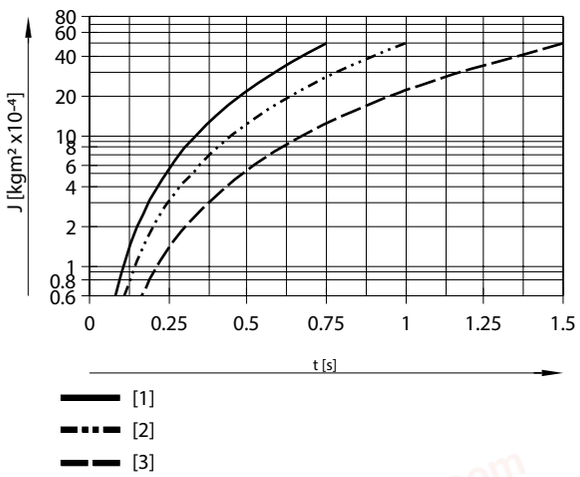
[1] Swivel angle 90°
[2] Swivel angle 120°
[3] Swivel angle 180°

Mass moment of inertia m as a function of swivel time t and swivel angle for DSR/DSRL-12



[1] Swivel angle 90°
[2] Swivel angle 120°
[3] Swivel angle 180°

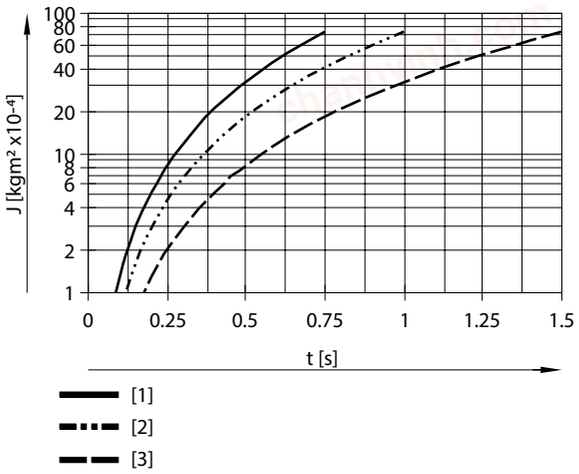
Mass moment of inertia m as a function of swivel time t and swivel angle for DSR/DSRL-16



[1] Swivel angle 90°
[2] Swivel angle 120°
[3] Swivel angle 180°

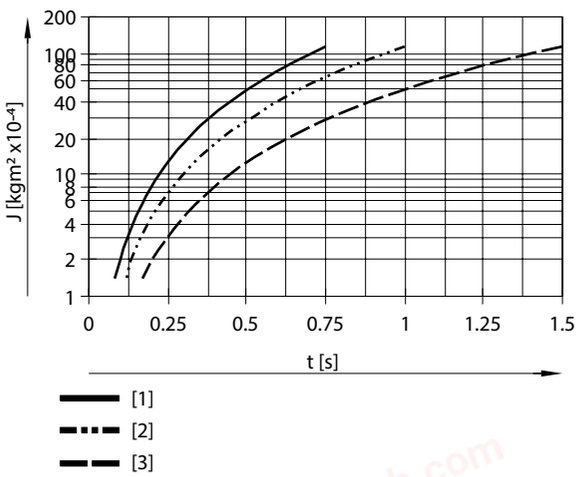
Datasheet

Mass moment of inertia m as a function of swivel time t and swivel angle for DSR/DSRL-25



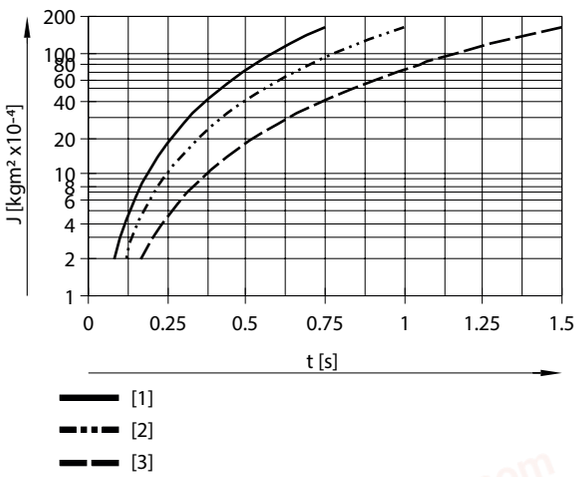
[1] Swivel angle 90°
[2] Swivel angle 120°
[3] Swivel angle 180°

Mass moment of inertia m as a function of swivel time t and swivel angle for DSR/DSRL-32



[1] Swivel angle 90°
[2] Swivel angle 120°
[3] Swivel angle 180°

Mass moment of inertia m as a function of swivel time t and swivel angle for DSR/DSRL-40

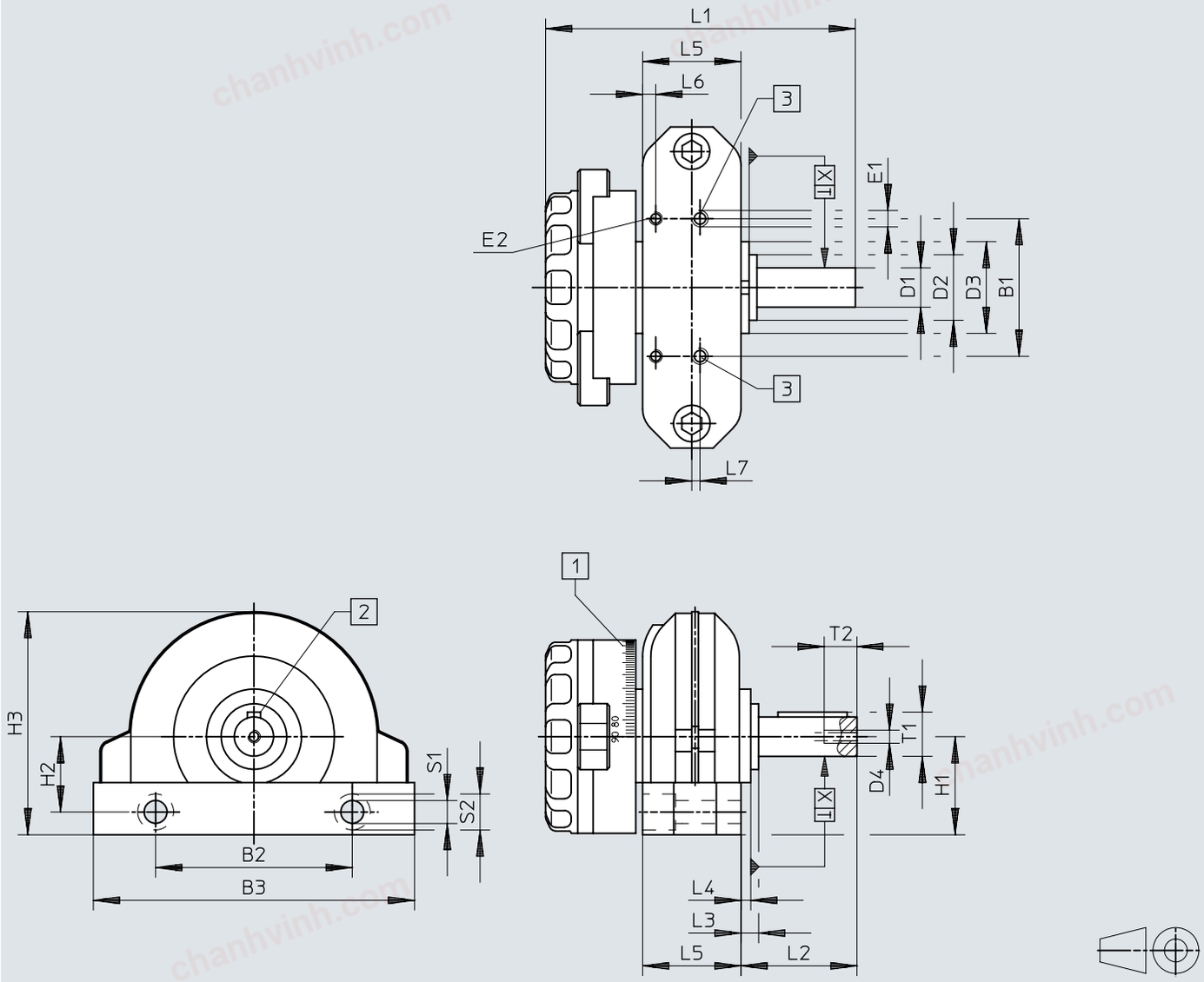


[1] Swivel angle 90°
[2] Swivel angle 120°
[3] Swivel angle 180°

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Dimensions

Dimensions – Quarter turn actuator DSR Download CAD data www.festo.com



[1] Angle scale for reading the swivelling angle
[2] Featherkey position at 0°
[3] Compressed air supply port
[4] The swivel angle is 180° and is pressure-dependent.The maximum cushioning angle per side is approx. 1.6° at 8 bar
[5] If, at the end of the swivelling motion, the kinetic energy is absorbed by the cushioning, the drive shaft will swivel back by a corresponding proportion of the angle.
[6] The stops must not be removed, as the vane itself is not suitable for setting the end position.An angle scale is provided on the cover cap to help set the swivel angles.
[7] The maximum permissible tightening torque of the bolt at D4 must not be exceeded when attaching additional components to the spigot shaft.

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Dimensions

	B1	B2	B3	D1 ø g7	D2 ø	D3 ø h9	D4	E1	E2	H1	H2	H3	L1	L2
DSR-10	22	32	53	6	12	20	M2,5	M3	M3	19,4	15,5	38,8	57	22,4
DSR-12	26	40	65	8	16	22	M3	M5	M3	23,5	18,5	48	65,6	25,5
DSR-16	30	46	78	10	17	24	M3	M5	M3	27	20,5	56,5	75,8	29
DSR-25	42	60	98	12	18	28	M4	M5	M4	30	23	68,1	94,5	35,4
DSR-32	54	80	130	16	27	42	M5	G1/8	M4	43	34	92	125,5	50
DSR-40	70	100	160	20	36	52	M6	G1/4	M4	53	40	121	162	60

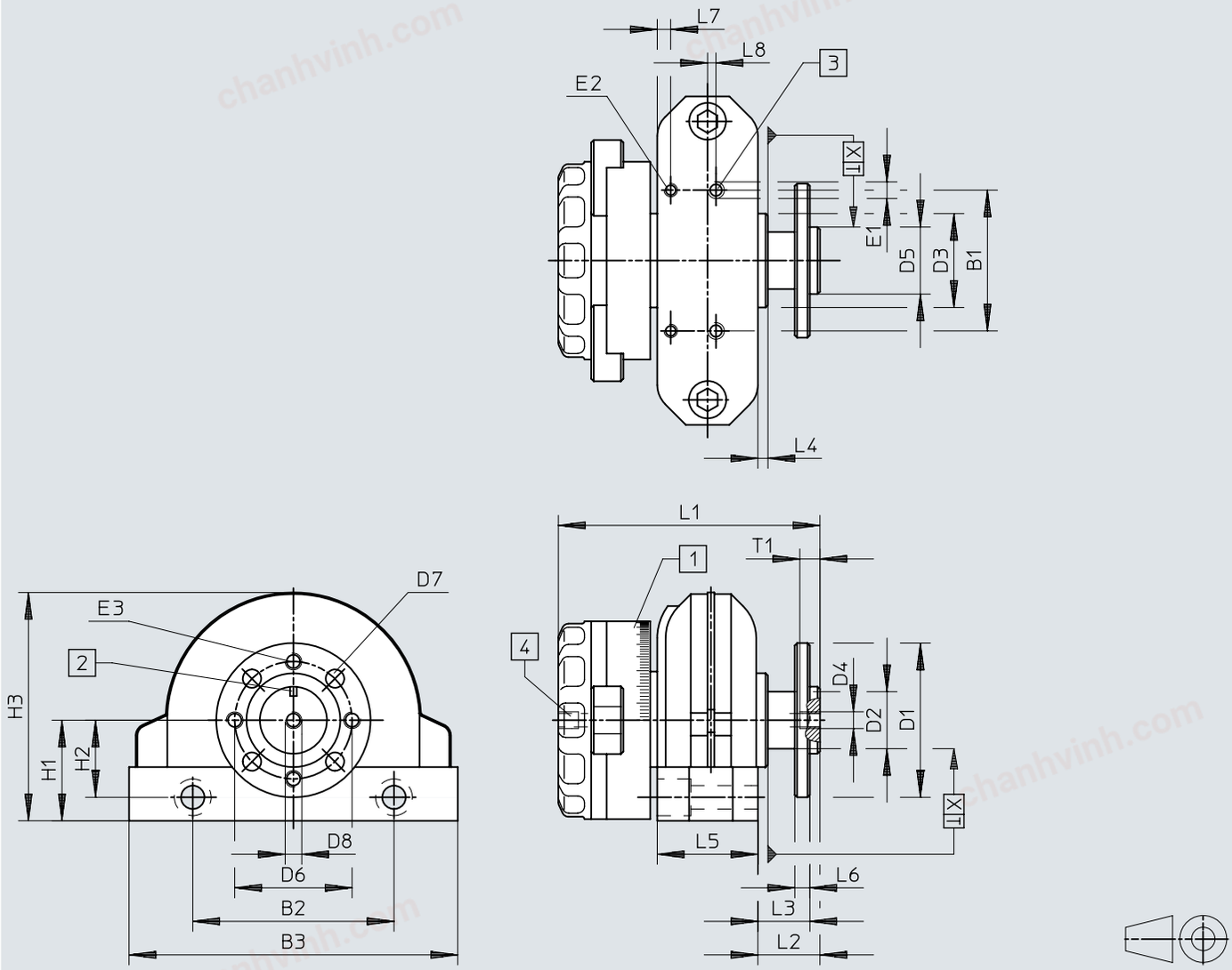
	L3	L4	L5	L6	L7	S1	S2	T2	X	1)	2)
DSR-10	6,5	4,5	15,1	2,2	2	3,4	6	7	0,35	A2 x 2 x 12	0,7
DSR-12	5,5	3,5	18	2,1	2,5	4,4	8	9	0,35	A2 x 2 x 16	1,2
DSR-16	6	3,5	22,5	2,1	–	5,5	10	9	0,35	A3 x 3 x 18	1,2
DSR-25	5,4	3	30	4	–	7	11	10	0,4	A4 x 4 x 25	5,5
DSR-32	10	7	36	4	–	8,5	15	12,5	0,45	A5 x 5 x 36	5,5
DSR-40	10	6	50	4	–	8,5	15	16	0,5	A6 x 6 x 45	5,5

1) Feather key according to DIN 6885 included in the scope of delivery
2) Tightening torque at D4 [Nm]

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Dimensions

Dimensions – Semi-rotary drives DSRL Download CAD data www.festo.com



[1] Angle scale for reading the swivelling angle
[2] Featherkey position at 0°
[3] Compressed air supply port
[4] Through-hole
[5] The swivel angle is 180° and is pressure-dependent.The maximum cushioning angle per side is approx. 1.6° at 8 bar
[6] If, at the end of the swivelling motion, the kinetic energy is absorbed by the cushioning, the drive shaft will swivel back by a corresponding proportion of the angle.
[7] The stops must not be removed, as the vane itself is not suitable for setting the end position.An angle scale is provided on the cover cap to help set the swivel angles.
[8] The maximum permissible tightening torque of the bolt at D4 must not be exceeded when attaching additional components to the spigot shaft.

Dimensions

	B1	B2	B3	D1 ø g7	D2 ø	D3 ø h8	D4	D5 ø f8	D6 ø	D7 ø H13	D8 ø min.	E1	E2	E3	H1
DSRL-10	22	32	53	30	10	20	M3	11	21	3,4	1,5	M3	M3	M3	19,4
DSRL-12	26	40	65	33	13	22	M3	14	25	3,4	1,5	M5	M3	M3	23,5
DSRL-16	30	46	78	38	14	24	M5	16	28	4,5	3,5	M5	M3	M4	27
DSRL-25	42	60	98	46	17	28	M5	20	35	5,5	3,5	M5	M4	M5	30
DSRL-32	54	80	130	60	24	42	G1/8	28	45	6,5	7	G1/8	M4	M6	43
DSRL-40	70	100	160	70	30	52	G1/8	36	54	9	7	G1/4	M4	M8	53

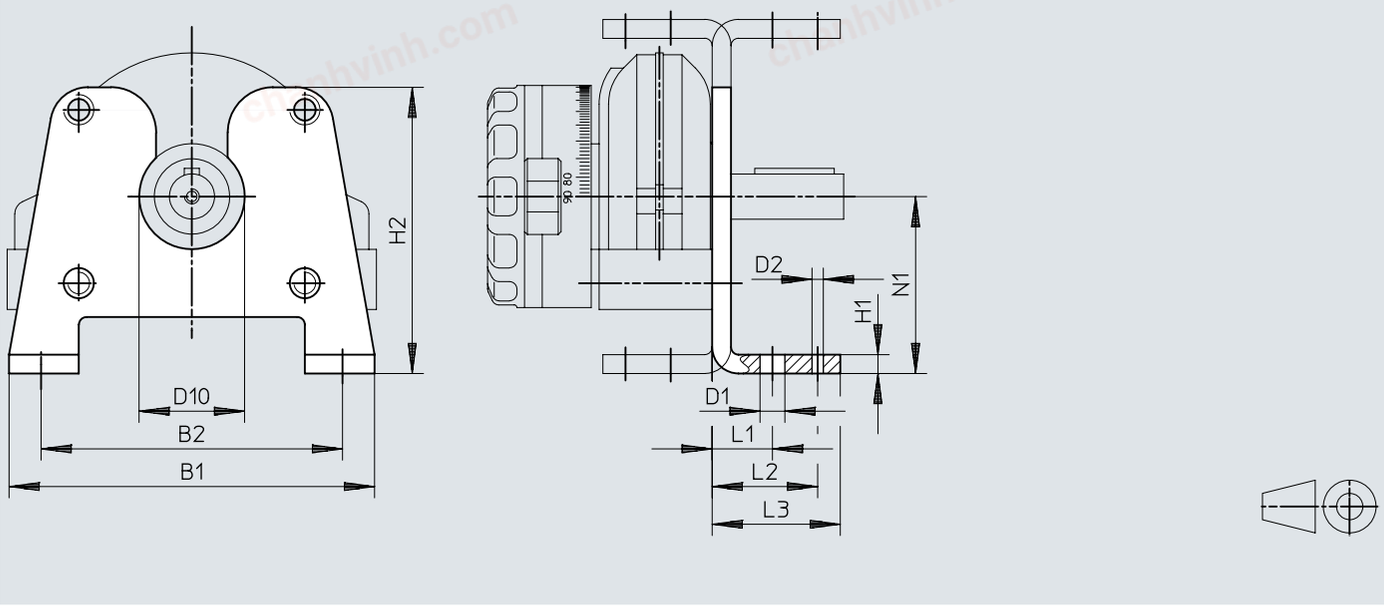
	H2	H3	L1	L2	L3	L4	L5	L6	L7	L8	S1	S2	T1	X	1)
DSRL-10	15,5	38,8	49	14	12,3	4,5	15,1	3	2,2	2	3,4	6	5	0,35	0,7
DSRL-12	18,5	48	54,2	13,5	11,5	3,5	18	3	2,1	2,5	4,4	8	5	0,35	1,2
DSRL-16	20,5	56,5	64,7	16	14	3,5	22,5	4	2,1	–	5,5	10	6	0,35	1,2
DSRL-25	23	68,1	78	18,5	15,5	3	30	4,5	4	–	7	11	6	0,4	5,5
DSRL-32	34	92	102,8	26	22	7	36	6	4	–	8,5	15	8	0,45	5,5
DSRL-40	40	121	134,5	31	26	6	50	7,5	4	–	8,5	15	8	0,5	5,5

1) Tightening torque at D4 [Nm]

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Dimensions

Dimensions – Foot mounting HSR-...-FW Download CAD data www.festo.com

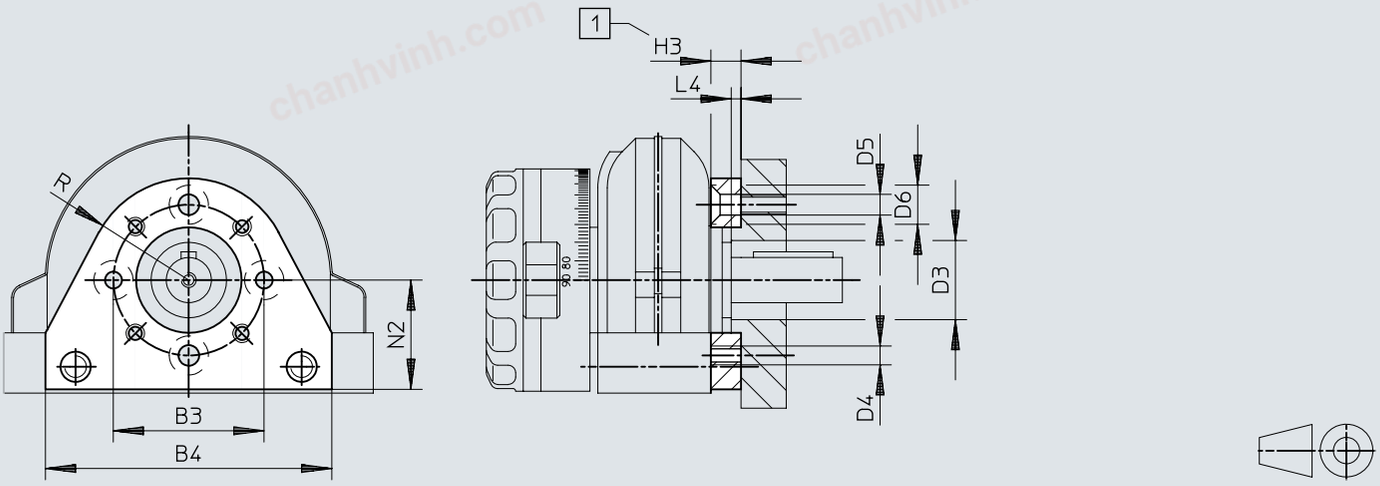


	B1	B2	D1 ø H13	D2	D10	H1	H2	L1	L2	L3	N1
HSR-10-FW	53,5	43	3,5	2	20	4	53	11	17	21	34
HSR-12-FW	64	52	3,5	2	22	4	63	11	17	21	40
HSR-16-FW	77	63	5,7	2	24	5	71	14	22	26,5	44
HSR-25-FW	97	80	6,8	3	28	5	76	16	28	34	47
HSR-32-FW	129	105	8,8	4	42	8	108	20	34	43	66
HSR-40-FW	159	130	8,8	5	52	8	134	25	42	52	81

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Dimensions

Dimensions – Flange mounting FSR Download CAD data www.festo.com



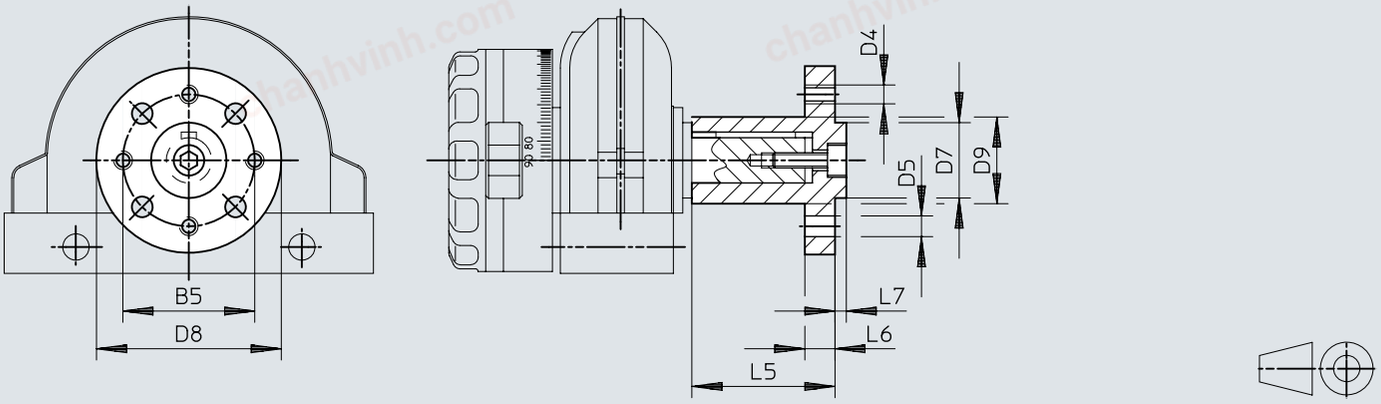
[1] Max. length for centring collar

	B3	B4	D3 ø min.	D4	D5 ø H13	D6 ø H13	H3	L4 max.	N2	R
FSR-10	28	46	13	M3	3,4	6,5	7	2	20	18
FSR-12	31	54	17	M3	3,4	6,5	7	2	22	20,5
FSR-16	35	62	19	M4	4,5	8,5	8	2	26,5	23,5
FSR-25	40	76	21	M5	5,5	10,4	8	2,5	29	27
FSR-32	56	100	32	M6	6,6	12,4	12	2,5	42	36
FSR-40	72	120	37	M8	9	16,4	14	4	52	46

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Dimensions

Dimensions – Push-on flange FWSR Download CAD data www.festo.com

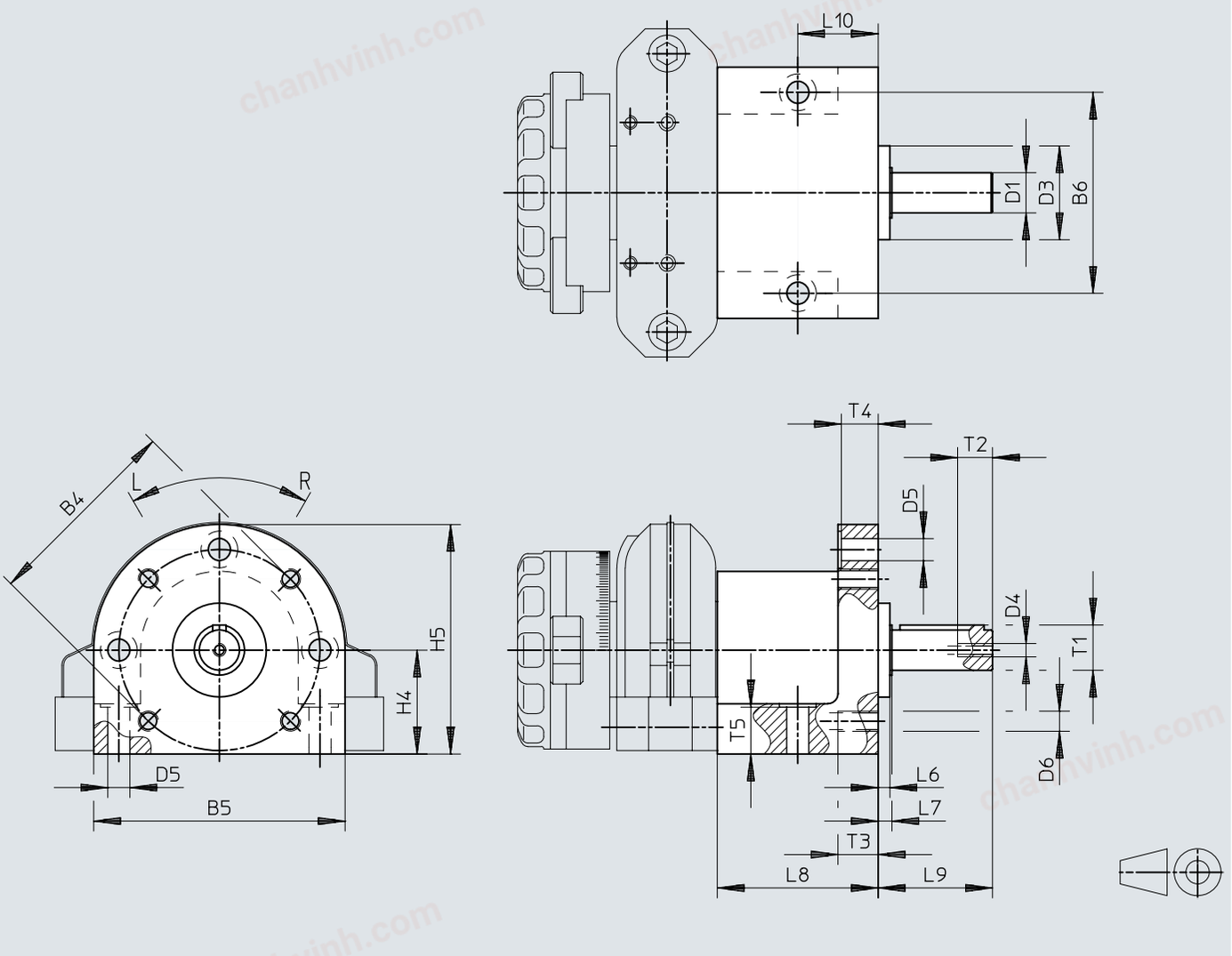


	B5	D4	D5 ø H13	D7 ø f8	D8 –0,5	D9 +0,4	L5	L6	L7
FWSR-10	21	M3	3,4	11	30	12	22	3	1,6
FWSR-12	25	M3	3,4	14	35	15	25	3	3
FWSR-16	28	M4	4,5	16	40	17	28	5	3
FWSR-25	35	M5	5,5	20	50	23	38	8	3
FWSR-32	45	M6	6,5	28	60	28	48	10	4
FWSR-40	54	M8	9	36	70	38	60	11	5

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Dimensions

Dimensions – Free wheel unit FLSR Download CAD data www.festo.com



	B4	B5	B6	D1 ø g7	D3 ø h8	D4	D5 ø H13	D6	H4	H5
FLSR-10	38	45	38,5	6	20	–	3,3	M3	20	42,5
FLSR-12	42	49	41,5	8	25	M3	3,3	M3	24	48,5
FLSR-16	50	60	50	10	24	M3	4,5	M4	28	58
FLSR-25	60	75	60	12	28	M4	6,6	M6	31	68,5
FLSR-32	83	98	83	16	42	M5	6,6	M6	44	93
FLSR-40	96	114	96	20	52	M6	8,6	M8	54	111

	L6	L7	L8	L9	L10	T1	T2	T3	T4	T5	1)
FLSR-10	3,5	4,2	41,5	20,2	23	6,8	8	8	5	8	A2 x 2 x 12
FLSR-12	3,5	4,5	47,3	24,5	25	8,8	9	8	5	9	A2 x 2 x 16
FLSR-16	3,5	4,4	47	27,4	23,5	11,2	11	10	8	11	A3 x 3 x 18
FLSR-25	3,5	4,1	48	34	24	13,5	14	12	11	14	A4 x 4 x 25
FLSR-32	7,2	8,5	60	48,5	30	18	16	12	11	16	A5 x 5 x 36
FLSR-40	6	8	75	58	38	22,5	21	15	11	21	A6 x 6 x 45

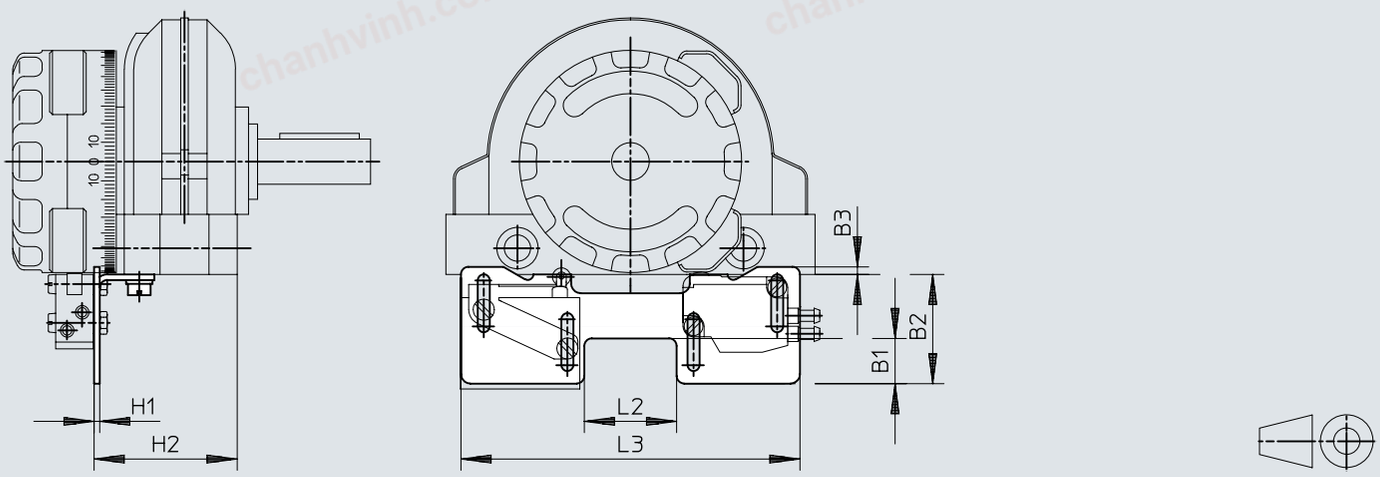
1) Feather key according to DIN 6885 included in the scope of delivery

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Dimensions

Dimensions – Mounting kit WSR-12 ... 40 for micro stem actuated valve S-3-PK-3-B, SO-3-PK-3-B

Download CAD data www.festo.com

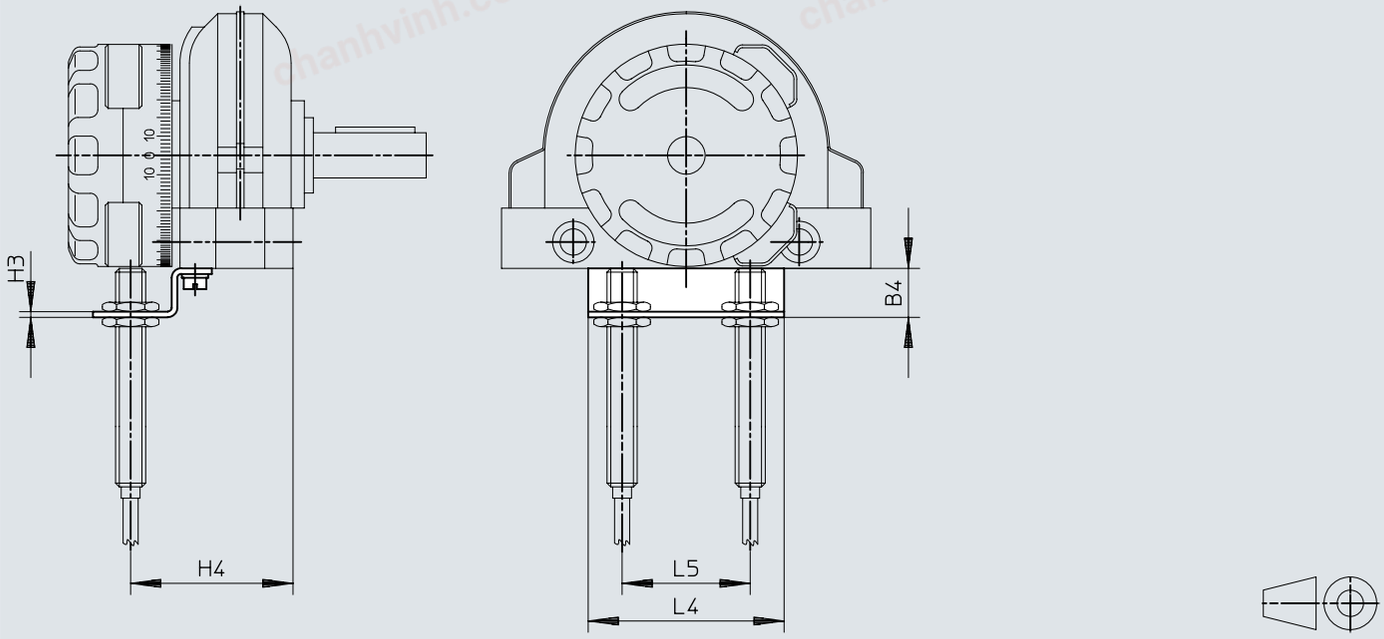


	B1	B2	B3	H1	H2	L2	L3
WSR-12	5,8	23,4	4	1,5	23	14	79
WSR-16	10	26,5	4,5	1,5	29,8	19	84,5
WSR-25	12	29	2	1,5	38	24,5	90
WSR-32	12	29	2	1,5	49,2	40,5	107
WSR-40	12	29	2	1,5	68,7	52	118,5

Dimensions

Dimensions – Mounting kit WSR-...-J for proximity switch SIEN-M8; mounting kit WSR-...-J-M5 for proximity switch SIEN-M5

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	B4	H3	H4	L4	L5
WSR-16-J	13	1,5	35	52	27
WSR-25-J	13	1,5	43,1	52	34
WSR-32-J	13	1,5	54,3	64	48
WSR-40-J	13	1,5	76,3	80	60

	B4	H3	H4	L4	L5
WSR-10-J-M5	8	1	25,4	30	20
WSR-12 J-M5	8	1	28,3	34	24,5
WSR-16 J-M5	8	1	34,9	38	27
WSR-25 J-M5	13	1,5	43	52	34
WSR-32 J-M5	13	1,5	54,3	64	48
WSR-40 J-M5	13	1,5	76,3	80	60

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Ordering data

With spigot shaft

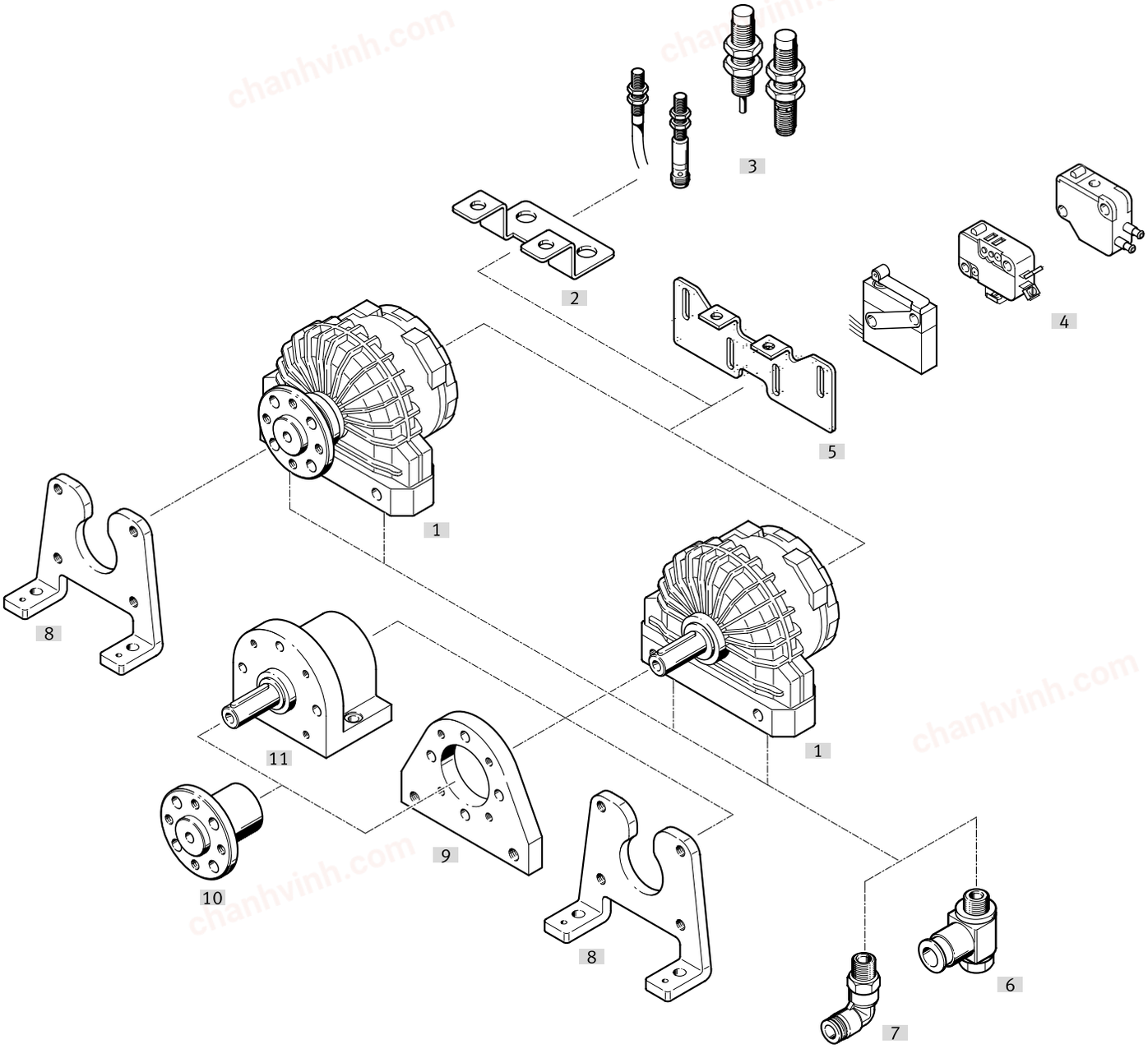
	Size	Part no.	Type
	10	**33297**	**DSR-10-180-P**
	12	**11909**	**DSR-12-180-P**
	16	**11910**	**DSR-16-180-P**
	25	**11911**	**DSR-25-180-P**
	32	**11912**	**DSR-32-180-P**
	40	**13467**	**DSR-40-180-P**

With flanged shaft

	Size	Part no.	Type
	10	**33296**	**DSRL-10-180-P-FW**
	12	**30654**	**DSRL-12-180-P-FW**
	16	**30655**	**DSRL-16-180-P-FW**
	25	**30656**	**DSRL-25-180-P-FW**
	32	**30657**	**DSRL-32-180-P-FW**
	40	**30658**	**DSRL-40-180-P-FW**

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Peripherals

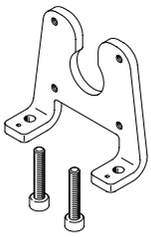


Accessories			→ Link
	Type/order code	Description	
[1]	Semi-rotary drive DSR	Pneumatic drive	dsr
[2]	Mounting kit WSR-...	For proximity switch SIEN	20
[3]	Proximity switch SIEN	Inductive proximity sensor, round design	21
[4]	Micro stem actuated valve SO-3-PK-3-B, S-3-PK-3-B	Pneumatic, either normally open or normally closed	21
[5]	Mounting kit	For micro stem actuated valve SO-3-PK-3-B, S-3-PK-3-B	20
[6]	One-way flow control valve GRLA	For controlling speed	21
[7]	Push-in fitting QSL	For connecting compressed air tubing with standard O.D.	qs
[8]	Foot mounting HSR-...-FW	On the output side	19
[9]	Flange mounting FSR	On the output side	19
[10]	Push-on flange FWSR	For spigot shaft	19
[11]	Freewheel FLSR-...-L/R	For spigot shaft, optional left/right swivel	20

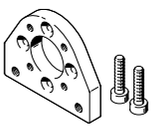
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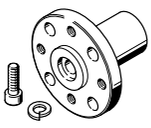
Foot mounting HSR

	Description	Material bracket	Product weight	Part no.	Type
	For Ø 10	Steel	61 g	**33317**	**HSR-10-FW**
	For Ø 12		87 g	**30923**	**HSR-12-FW**
	For Ø 16		170 g	**30924**	**HSR-16-FW**
	For Ø 25		235 g	**30925**	**HSR-25-FW**
	For Ø 32		660 g	**30926**	**HSR-32-FW**
	For Ø 40		1,040 g	**30927**	**HSR-40-FW**

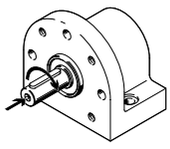
Flange mounting FSR

	Description	Material plate	Product weight	Part no.	Type
	For Ø 10	Cast aluminium	22 g	**34480**	**FSR-10**
	For Ø 12		32 g	**14658**	**FSR-12**
	For Ø 16		50 g	**13236**	**FSR-16**
	For Ø 25		70 g	**13237**	**FSR-25**
	For Ø 32		180 g	**13238**	**FSR-32**
	For Ø 40		300 g	**14655**	**FSR-40**

Push-on flange FWSR

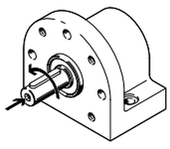
	Description	Material housing	Product weight	Part no.	Type
	For Ø 10	Wrought aluminium alloy	10 g	**32798**	**FWSR-10**
	For Ø 12		19 g	**14659**	**FWSR-12**
	For Ø 16		30 g	**13239**	**FWSR-16**
	For Ø 25		70 g	**13240**	**FWSR-25**
	For Ø 32		120 g	**13241**	**FWSR-32**
	For Ø 40		240 g	**14656**	**FWSR-40**

FLSM-...-R right-hand rotation (clockwise)



The free wheel unit only allows movement in one of the two possible swivel directions of the semi-rotary drive DSR.The reverse direction is blocked.
This turns the oscillating swivel motion of the semi-rotary drive into a smooth, synchronous movement.
The minimum switchable swivel angle is 0.4°. The switching accuracy also depends on the switching speed and the load.
The load must be stopped externally

FLSM-...-L left-hand rotation (anti-clockwise)

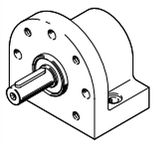


The free wheel unit only allows movement in one of the two possible swivel directions of the semi-rotary drive DSR.The reverse direction is blocked.
This turns the oscillating swivel motion of the semi-rotary drive into a smooth, synchronous movement.
The minimum switchable swivel angle is 0.4°. The switching accuracy also depends on the switching speed and the load.
The load must be stopped externally

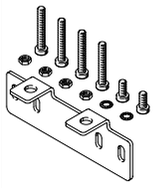
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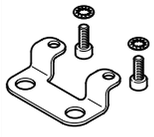
Free wheel unit FLSR

	Description	Direction of rotation	Theoretical torque at 0.6 MPa (6 bar, 87 psi)	Material housing	Product weight	Part no.	Type
	For Ø 10	Clockwise rotation	0.53 Nm	Die-cast aluminium	100 g	**33299**	**FLSR-10-R**
		Anticlockwise rotation				**33298**	**FLSR-10-L**
	For Ø 12	Clockwise rotation	1 Nm		220 g	**30929**	**FLSR-12-R**
		Anticlockwise rotation				**30930**	**FLSR-12-L**
	For Ø 16	Clockwise rotation	2.03 Nm		350 g	**15280**	**FLSR-16-R**
		Anticlockwise rotation				**15281**	**FLSR-16-L**
	For Ø 25	Clockwise rotation	4.95 Nm		500 g	**13730**	**FLSR-25-R**
		Anticlockwise rotation				**13778**	**FLSR-25-L**
	For Ø 32	Clockwise rotation	9.98 Nm		1,120 g	**15687**	**FLSR-32-R**
		Anticlockwise rotation				**15688**	**FLSR-32-L**
	For Ø 40	Clockwise rotation	20.03 Nm		1,820 g	**19036**	**FLSR-40-R**
		Anticlockwise rotation				**19037**	**FLSR-40-L**

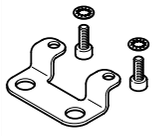
Mounting kit WSR for micro stem actuated valve

	Description	Part no.	Type
	For Ø 12	**15684**	**WSR-12**
	For Ø 16	**14874**	**WSR-16**
	For Ø 25	**14796**	**WSR-25**
	For Ø 32	**14960**	**WSR-32**
	For Ø 40	**14961**	**WSR-40**

Mounting kit WSR-...-J-M5 for proximity switch SIEN-M5

	Description	Part no.	Type
	For Ø 10	**33413**	**WSR-10-J-M5**
	For Ø 12	**15685**	**WSR-12-J-M5**
	For Ø 16	**15931**	**WSR-16-J-M5**
	For Ø 25	**15932**	**WSR-25-J-M5**
	For Ø 32	**15933**	**WSR-32-J-M5**
	For Ø 40	**15934**	**WSR-40-J-M5**

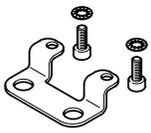
Mounting kit WSR-...-J for proximity switch SIEN-M8

	Description	Part no.	Type
	For Ø 16	**14873**	**WSR-16-J**

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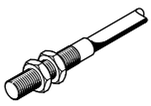
Mounting kit WSR-...-J for proximity switch SIEN-M8

	Description	Part no.	Type
	For Ø 25	14799	WSR-25-J
	For Ø 32	14962	WSR-32-J
	For Ø 40	14963	WSR-40-J

Micro stem actuated valve S-3-PK for DSR-16 ... 40

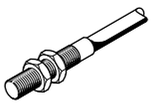
	Valve function	Operating pressure	Product weight	Part no.	Type
	3/2-way, closed, monostable	-0.95 ... 8 bar	7 g	7843	S-3-PK-3-B
	3/2 open, single solenoid			10403	SO-3-PK-3-B

Proximity switch SIEN, inductive - for DSR-10 ... 40 Link sien

	Type of mounting [1]	Switching output	Electrical connection	Cable length	Part no.	Type
	Via lock nut	PNP	Open end	2.5 m	150370	SIEN-M5B-PS-K-L
			Plug M8, A-coded		150371	SIEN-M5B-PS-S-L

1) With sensor bracket SL-DSM-S

Proximity switch SIEN, inductive – for DSR-16 ... 40 Link sien

	Type of mounting [1]	Switching output	Electrical connection	Cable length	Part no.	Type
	Via lock nut	PNP	Open end	2.5 m	150386	SIEN-M8B-PS-K-L
			Plug M8, A-coded		150387	SIEN-M8B-PS-S-L

1) With sensor bracket SL-DSM-S

One-way flow control valves GRLA

	Pneumatic connection 1	Pneumatic connection, port 2	Product weight	Part no.	Type
	Push-in connector 3 mm	M3	7 g	175041	GRLA-M3-QS-3
		M5	13 g	193137	GRLA-M5-QS-3-D
		G1/8	22 g	193142	GRLA-1/8-QS-3-D
	Push-in connector 4 mm	M5	13 g	★ 193138	GRLA-M5-QS-4-D
		G1/8	22 g	193143	GRLA-1/8-QS-4-D
	Push-in connector 6 mm			★ 193144	GRLA-1/8-QS-6-D
		G1/4	42 g	★ 193146	GRLA-1/4-QS-6-D
	Push-in connector 8 mm	G1/8	22 g	★ 193145	GRLA-1/8-QS-8-D
		G1/4	42 g	★ 193147	GRLA-1/4-QS-8-D
	Push-in connector 10 mm			193148	GRLA-1/4-QS-10-D