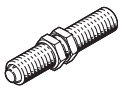
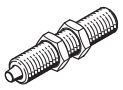
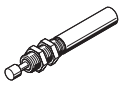
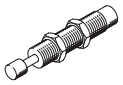
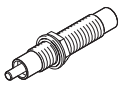
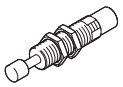
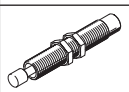
Cushioning components

FESTO

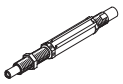
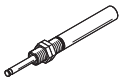
Product range overview

Function	Type	Design	Description	Can be used with
Shock absorber	**Elastomer shock absorbers**			
	DYEF-Y1		• Mechanical shock absorber with elastic rubber buffer • Cushioning stroke cannot be adjusted • No fixed stop • Continuous mounting thread with internal hex	• Mini slide DGSL
	DYEF-Y1F		• Mechanical shock absorber with elastic rubber buffer • Cushioning stroke can be adjusted • With fixed stop • Continuous mounting thread with internal hex	• Mini slide DGSL • Semi-rotary drive DSM-B
	Adjustable			
	DYSR		• Hydraulic shock absorber with spring return • Adjustable cushioning hardness	–
	Self-adjusting			
	YSR-C		• Hydraulic shock absorber with path-controlled flow control function • Rapidly increasing cushioning force curve • Short cushioning stroke • Suitable for rotary drives • Maintenance-free • Continuous mounting thread	• Linear drive DGPL • Linear drive DGC • Linear drive unit SLE
	DYSC		• Hydraulic shock absorber with path-controlled flow control function • Rapidly increasing cushioning force curve • Short cushioning stroke • Suitable for rotary drives • Maintenance-free • Metal end position on the housing • Continuous mounting thread with internal hex	• Semi-rotary drive DSM-B • Swivel/linear drive unit DSL-B • Semi-rotary drive DRRD
	DYSD		• Hydraulic shock absorber with path-controlled flow control function • Rapidly increasing cushioning force curve • Short cushioning stroke • Suitable for rotary drives • Maintenance-free • Continuous mounting thread • With fixed stop on housing and internal hex for stroke adjustment • Suitable for pressure chamber • With additional return spring to compensate pressure chamber	• Semi-rotary drive DRRD
	YSRW		• Hydraulic shock absorber with path-controlled flow control function • Slowly increasing cushioning force curve • Long cushioning stroke • Suitable for low-vibration operation • Short cycle times possible • Maintenance-free • Continuous mounting thread with spanner flat	• Linear drive DGC • Handling module HSP, HSW
	DYSS		• Hydraulic shock absorber with path-controlled flow control function • Rapidly increasing cushioning force curve • Short cushioning stroke • Suitable for low-vibration operation • Not suitable for rotary drives • Maintenance-free • Metal end position on the housing • Continuous mounting thread with internal hex	• Linear drive DLGF • Mini slides DGST
	DYSW		• Hydraulic shock absorber with path-controlled flow control function • Slowly increasing cushioning force curve • Long cushioning stroke • Suitable for low-vibration operation • Short cycle times possible • Maintenance-free • Metal end position on the housing • Continuous mounting thread with internal hex	• Mini slide DGSL • Handling module HSW

Product range overview

Size	Stroke [mm]	Energy absorption per stroke [J]	Position sensing	→ Page/Internet
Elastomer shock absorbers				
M4, M5, M6, M8, M10, M12, M14, M16	0.9; 1.0; 1.2; 1.3; 1.5	0.015 ... 0.55	–	6
M4, M5, M6, M8, M10, M12, M14, M16, M22	1.7; 2.8; 3.1; 3.4; 3.7; 4.2; 5; 4.8; 7	0.005 ... 1.2	–	10
Adjustable				
8, 12, 16, 20, 25, 32	8, 12, 20, 25, 40, 60	4 ... 384	–	14
Self-adjusting				
4, 5, 7, 8, 10, 12, 16, 20, 25, 32	4, 5, 8, 10, 12, 20, 25, 40, 60	0.6 ... 380	–	18
4, 5, 7, 8, 12, 16, 20, 25	4, 5, 8, 12, 18, 25	0.6 ... 100	–	22
5, 7, 8, 12, 16, 20 ,25, 32	5, 8, 12, 15, 16, 24, 25	2 ... 8	–	26
5, 7, 8, 10, 12, 16, 20	8, 10, 14, 17, 20, 26, 34	1.3 ... 70	–	30
2, 3, 4, 5, 7, 8, 10, 12	4, 5, 8, 10, 12	0.1 ... 10	–	34
4, 5, 7, 8, 10, 12	6, 8, 10, 14, 17, 20	0.8 ... 12	–	38

Product range overview

Function	Type	Design	Description	Can be used with
Stop element	**Self-adjusting**			
	YSRWJ		• Cushioning with self-adjusting, progressive hydraulic shock absorbers (YSRW) • Slowly increasing cushioning force curve • Adjustable cushioning stroke • End-position sensing with proximity switch SME/SMT-8 • Precision end-position adjustment • Stop elements YSRWJ can be used for a wide variety of applications in handling and assembly technology.	–
Hydraulic cushioning cylinder	**Adjustable**			
	DYHR		• Hydraulic cushioning cylinder for constant, slow braking speeds across the entire stroke • Braking speed can be precisely adjusted • A built-in compression spring returns the piston rod to the initial position • Suitable for slow feed speeds in the range up to 0.1 m/s	–

Product range overview

Size	Stroke [mm]	Energy absorption per stroke [J]	Position sensing	→ Page/Internet
Self-adjusting				
5, 7, 8	8, 10, 14	1 ... 3	■	42
Adjustable				
16, 20, 25, 32	20, 25, 40, 50, 60	32 ... 384	–	46

Type codes

001	Series	
DYEF	Shock absorber	

002	Design type	
	Standard	
S	Short	

003	Size	
M4	M4x0.5	
M5	M5x0.5	
M6	M6x0.5	
M8	M8x1	
M10	M10x1	
M12	M12x1	
M14	M14x1	
M16	M16x1	

004	Geometric characteristics	
Y1	Internal hex	

Data sheet

- Ø - Size
  M4 ... M16
- | - Stroke length
  0.9 ... 1.5 mm

General technical data

Size			M4	M5	M6	M8	M10	M12	M14	M16
Stroke		[mm]	0.9	1.5	1.5	1.3	1	1.2	1.2	1.3
Mode of operation			Elastomer cushioning without metal fixed stop							
Cushioning			Non-adjustable							
Cushioning length		[mm]	0.9	1.5	1.5	1.3	1	1.2	1.2	1.3
Type of mounting			With lock nut							
Max. impact velocity		[m/s]	0.8							
Mounting position			Any							
Product weight		[g]	2.1	3.6	6	14	23	45.5	82.5	106
	S	[g]	1.1	2	3	8.6	12	15	31	40
Ambient temperature		[°C]	0 ... +60							
Corrosion resistance class CRC[1)]			2							

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

Energies [J]

Size	M4	M5	M6	M8	M10	M12	M14	M16
Max. energy absorption per stroke	0.015	0.05	0.08	0.12	0.25	0.35	0.45	0.55

Mass range [kg]

Size	M4	M5	M6	M8	M10	M12	M14	M16
Mass range up to	0.15	0.35	0.7	1	2	3	5	7

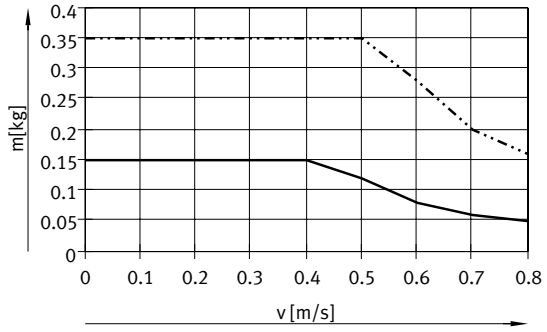
Data sheet

Materials

Shock absorber	
Buffer	Nitrile rubber
Housing	High-alloy steel
Seals	Nitrile rubber
Note on materials	RoHS-compliant

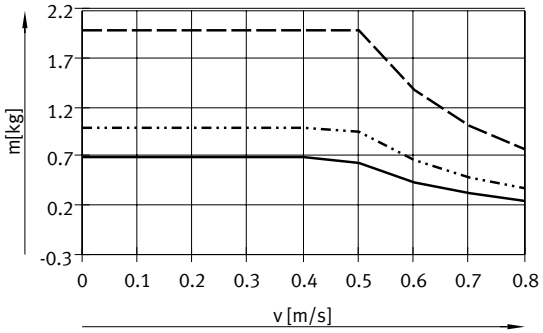
Impact velocity v as a function of mass m

DYEF-(S)-M4/M5-Y1



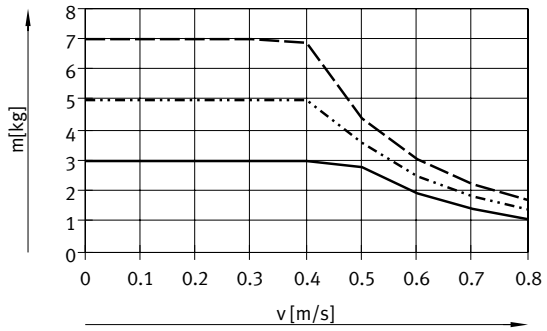
DYEF-(S)-M4-Y1
DYEF-(S)-M5-Y1

DYEF-(S)-M6/M8/M10-Y1



DYEF-(S)-M6-Y1
DYEF-(S)-M8-Y1
DYEF-(S)-M10-Y1

DYEF-(S)-M12/M14/M16-Y1

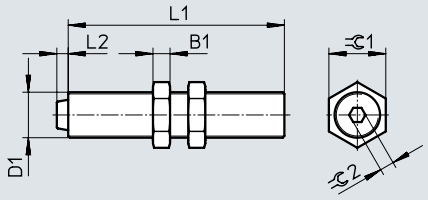


DYEF-(S)-M12-Y1
DYEF-(S)-M14-Y1
DYEF-(S)-M16-Y1

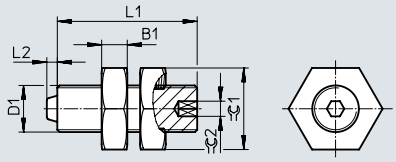
Data sheet

Dimensions Download CAD data ➔ www.festo.com

DYEF-M-... – long design



DYEF-S-M-... – short design



Size	B1	D1	L1		L2	⌀C1	⌀C2	Max. tightening torque ⌀C1
			DYEF-M	DYEF-S-M	+0.3			[Nm]
M4	2.2	M4x0.5	22	12	0.9	7	1.5	0.5
M5	2.7	M5x0.5	26	14.5	1.8	8	1.5	0.8
M6	2.5	M6x0.5	30	15	1.8	8	2	1
M8	3	M8x1	38	23.5	2	10	2.5	2
M10	3.5	M10x1	41	21	1.8	13	3	3
M12	4	M12x1	54	20	2	15	4	5
M14	5	M14x1	72	28	2	17	4	8
M16	5	M16x1	75	31.5	2	19	5	20

Ordering data

Size	Part no.	Type
DYEF-M-... – long design		
M4	**1179810**	**DYEF-M4-Y1**
M5	**1179818**	**DYEF-M5-Y1**
M6	**1179831**	**DYEF-M6-Y1**
M8	**1179834**	**DYEF-M8-Y1**
M10	**1179837**	**DYEF-M10-Y1**
M12	**1179840**	**DYEF-M12-Y1**
M14	**1179863**	**DYEF-M14-Y1**
M16	**1179879**	**DYEF-M16-Y1**
DYEF-S-M-... – short design		
M4	**1152500**	**DYEF-S-M4-Y1**
M5	**1152507**	**DYEF-S-M5-Y1**
M6	**1152524**	**DYEF-S-M6-Y1**
M8	**1152536**	**DYEF-S-M8-Y1**
M10	**1152959**	**DYEF-S-M10-Y1**
M12	**1153004**	**DYEF-S-M12-Y1**
M14	**1153017**	**DYEF-S-M14-Y1**
M16	**1153023**	**DYEF-S-M16-Y1**

Type codes

001	Series	
DYEF	Shock absorber	

003	Size	
M4	M4x0.5	
M5	M5x0.5	
M6	M6x0.5	
M8	M8x1	
M10	M10x1	
M12	M12x1	
M14	M14x1	
M16	M16x1	
M22	M22x1.5	

004	Geometric characteristics	
Y1	Internal hex	

005	Stop	
	None	
F	With fixed stop	

Data sheet

- Ø - Size
  M4 ... M22
- l - Stroke length
  1.7 ... 7 mm

General technical data										
Size		M4	M5	M6	M8	M10	M12	M14	M16	M22
Stroke	[mm]	1.7	2.8	3.1	3.4	3.7	4.2	5	4.8	7
Mode of operation		Elastomer cushioning with metallic fixed stop								
Cushioning		Adjustable								
Cushioning length	[mm]	1.7	2.8	3.1	3.4	3.7	4.2	5	4.8	7
Type of mounting		With lock nut								
Max. impact velocity	[m/s]	0.8								
Mounting position		Any								
Product weight	[g]	1.6	2.9	5.1	11.9	19.7	39.6	77.3	104	200
Ambient temperature	[°C]	0 ... +60								
Corrosion resistance class CRC[1)]		2								

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

Forces [N]										
Size		M4	M5	M6	M8	M10	M12	M14	M16	M22
Min. insertion force[1)]		15	30	40	60	70	100	150	180	500

1) This is the minimum force that must be applied so that the shock absorber is pushed precisely into the retracted end position. This value is reduced accordingly in the event of an extended external end position or a reduction in the cushioning stroke.

Energies [J]										
Size		M4	M5	M6	M8	M10	M12	M14	M16	M22
Max. energy absorption per stroke		0.005	0.02	0.03	0.04	0.06	0.12	0.2	0.25	1.2

Mass range [kg]										
Size		M4	M5	M6	M8	M10	M12	M14	M16	M22
Mass range up to		0.15	0.25	0.4	0.6	1.2	1.8	3	5	15

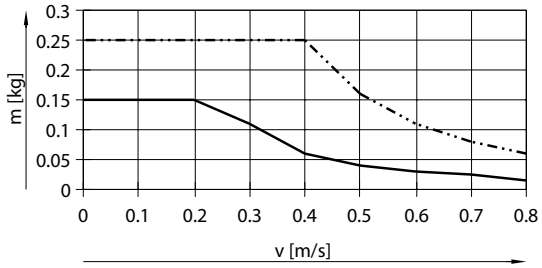
Data sheet

Materials

Shock absorber	
Buffer	Nitrile rubber
Adjustable sleeve	High-alloy steel
Setting piece	High-alloy steel
Seals	Nitrile rubber
Note on materials	RoHS-compliant

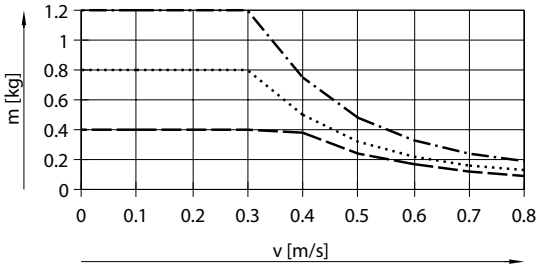
Impact velocity v as a function of mass m

DYEF-M4/M5-Y1F



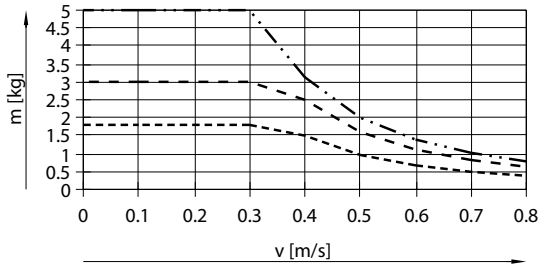
DYEF-M4-Y1F
DYEF-M5-Y1F

DYEF-M6/M8/M10-Y1F



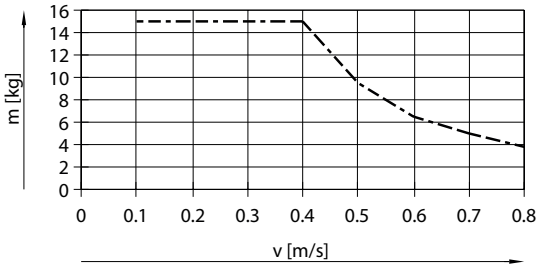
DYEF-M6-Y1F
DYEF-M8-Y1F
DYEF-M10-Y1F

DYEF-M12/M14/M16-Y1F



DYEF-M12-Y1F
DYEF-M14-Y1F
DYEF-M16-Y1F

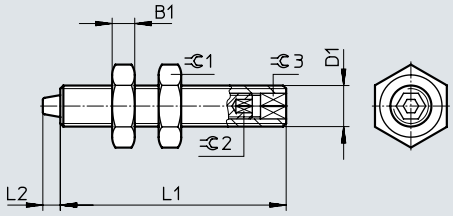
DYEF-M22-Y1F



DYEF-M22-Y1F

Data sheet

Dimensions Download CAD data ➔ www.festo.com



Size	B1	D1	L1	L2 +0.3	⊂1	⊂2	⊂3	Max. tightening torque ⊂1 [Nm]
M4	2.2	M4x0.5	22	1.7	7	1.3	2.5	0.5
M5	2.7	M5x0.5	26	2.8	8	1.5	3	0.8
M6	2.5	M6x0.5	30	3.1	8	2	4	1
M8	3	M8x1	38	3.4	10	2.5	5	2
M10	3.5	M10x1	41	3.7	13	3	6	3
M12	4	M12x1	54	4.2	15	4	8	5
M14	5	M14x1	72	5	17	4	8	8
M16	5	M16x1	75	4.8	19	5	10	20
M22	5	M22x1.5	78	7	27	5	10	35

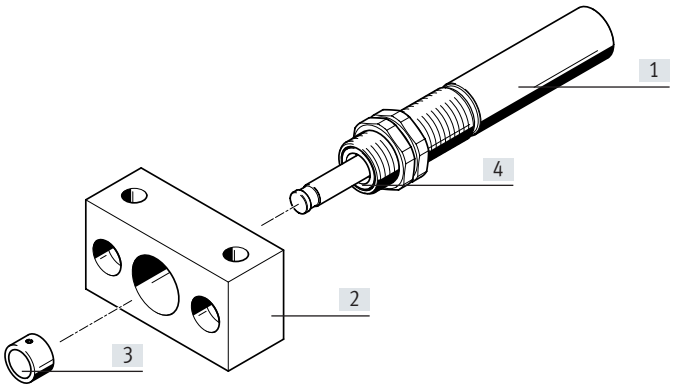
Ordering data

Size	Part no.	Type
M4	**548370**	**DYEF-M4-Y1F**[1)]
M5	**548371**	**DYEF-M5-Y1F**
M6	**548372**	**DYEF-M6-Y1F**
M8	**548373**	**DYEF-M8-Y1F**
M10	**548374**	**DYEF-M10-Y1F**
M12	**548375**	**DYEF-M12-Y1F**
M14	**548376**	**DYEF-M14-Y1F**
M16	**548377**	**DYEF-M16-Y1F**
M22	**1113706**	**DYEF-M22-Y1F**

1) With this size, the scope of delivery of the drive includes an Allen key.

Peripherals overview and type codes

Peripherals overview



Accessories and special feature

	Type	Brief description	→ Page/Internet
[1]	Shock absorber DYSR	Hydraulic shock absorber with adjustable cushioning characteristic	14
[2]	Mounting flange YSRF	Mounting option for shock absorber	50
[3]	Buffer YSRP	For protecting the piston rod	52
[4]	Wiper seal[1]; hardened piston rod[2]	The wiper seal (prevents the ingress of dirt) and the hardened piston rod (protects against scratches) greatly increase the service life	–

1) Size 12 and up
2) Size 16 and up

Type codes

001	Series	
DYSR	Shock absorber	

002	Size	
8	8	
12	12	
16	16	
20	20	
25	25	
32	32	

003	Stroke	
8	8	
12	12	
20	20	
25	25	
40	40	
60	60	

004	Geometric characteristics	
Y5	Internal hex for adjusting cushioning	

005	Product features	
	Standard	
T	Custom thread	

Data sheet

- Ø - Size
  8 ... 32
- | - Stroke length
  8 ... 60 mm

General technical data							
Size		8	12	16	20	25	32
Stroke	[mm]	8	12	20	25	40	60
Mode of operation		Hydraulic shock absorber with spring return					
		Single-acting, pushing					
Cushioning		Adjustable, force-dependent, hard characteristic curve					
Cushioning length	[mm]	8	12	20	25	40	60
Type of mounting		With lock nut					
Impact velocity	[m/s]	0.1 ... 3					
Mounting position		Any					
Product weight	[g]	60	105/120[1]	200/250[1]	355/425[1]	715	1355
Ambient temperature	[°C]	–10 ... +80					
Corrosion resistance class CRC[2]		2					

1) Applies to shock absorbers with special thread T
2) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

Reset time [s]						
Size	8	12	16	20	25	32
Reset time[1]	≤ 0.2		≤ 0.3		≤ 0.4	≤ 0.6

1) The specified technical data refers to room temperature. At –10°C, the reset time can be up to 1 s for sizes 12 and 16, and up to 3 s for sizes 8, 20, 25 and 32.

Forces [N]						
Size	8	12	16	20	25	32
Min. insertion force[1]	18	38	66	110	155	175
Max. stop force[2] in the end positions	400	900	1600	2500	4000	6400
Min. resetting force[3]	1.8	4.5	5.4	9	12.5	18

1) This is the minimum force that must be applied so that the shock absorber is pushed precisely into the retracted end position. This value is reduced accordingly with an extended external end position.
2) If the maximum stop force is exceeded, a fixed stop (e.g. YSRA) must be fitted 0.5 mm before the end of stroke.
3) This is the maximum force that can act on the piston rod, allowing the shock absorber to fully extend (e.g. extended stud).

Energies [J]						
Size	8	12	16	20	25	32
Max. energy absorption per stroke	4	10.8	32	62.5	160	384
Max. energy consumption per hour	24000	60000	100000	135000	220000	330000
Max. residual energy	0.01	0.05	0.16	0.32	0.8	2

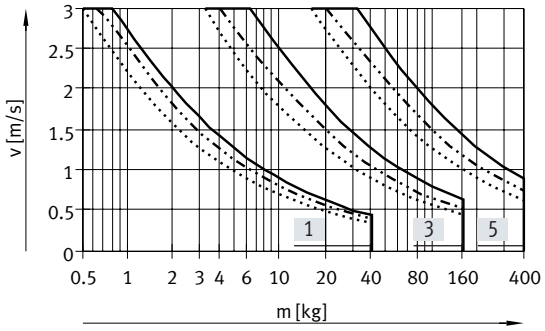
Data sheet

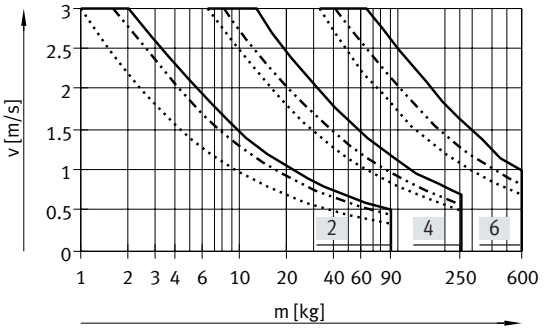
Materials

Size		8	12	16	20	25	32
[1]	Piston rod	High-alloy steel		Hardened high-alloy steel			
[2]	Housing	High-alloy steel	Galvanised steel				
–	Buffer	Polyacetal	—				
–	Seals	Nitrile rubber					
	Note on materials	RoHS-compliant					

Selection graph for shock absorbers with infinitely adjustable cushioning DYSR

Impact velocity v as a function of mass m



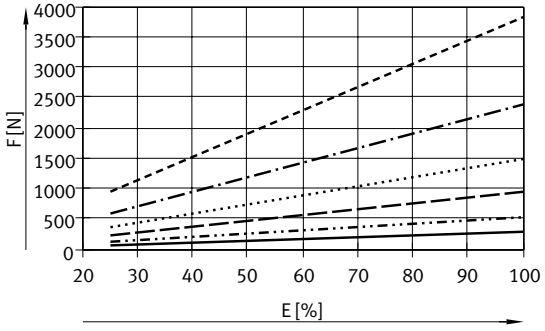


Three force curves are shown for each shock absorber. An average must be taken for intermediate values.

[1] DYSR-8-8
[2] DYSR-12-12
[3] DYSR-16-20
[4] DYSR-20-25
[5] DYSR-25-40
[6] DYSR-32-60

Shock absorber	Force _____	Force ----------	Force _ _ _ _ _
DYSR-8-8	0 N	100 N	200 N
DYSR-12-12	0 N	200 N	500 N
DYSR-16-20	0 N	500 N	800 N
DYSR-20-25	0 N	800 N	1200 N
DYSR-25-40	0 N	1200 N	2000 N
DYSR-32-60	0 N	2000 N	3000 N

Recommended max. drive force as a function of energy utilisation

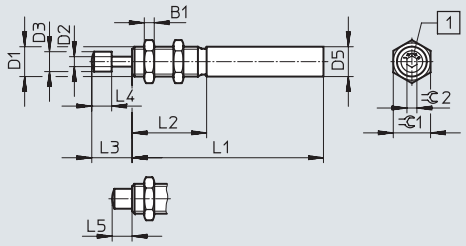


DYSR-8-8-Y5
DYSR-12-12-Y5
DYSR-16-20-Y5
DYSR-20-25-Y5
DYSR-25-40-Y5
DYSR-32-60-Y5

Data sheet

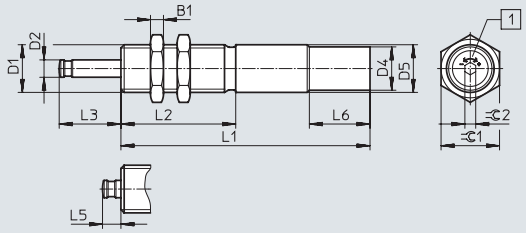
Dimensions Download CAD data ➔ www.festo.com

DYSR-8-8



[1] Cushioning adjustment buffer (included in the scope of delivery)

DYSR-...



[1] Cushioning adjustment buffer YSRP (not included in the scope of delivery)

Type	B1	D1	D2 ø	D3 ø ±0.2	D4 ø +0.15	D5 ø +0.15/–0.1	L1	L2 ±0.1
DYSR-8-8-Y5	4	M12x1	4	8	–	12	77±0.1	30
DYSR-12-12-Y5	5	M15x1	6	–	–	15	97±0.1	36
DYSR-12-12-Y5-T		M16x1				16		
DYSR-16-20-Y5	6	M20x1.25	8	–	–	20	115±0.1	53
DYSR-16-20-Y5-T		M22x1.5			20	22		
DYSR-20-25-Y5	8	M24x1.25	10	–	–	24	138±0.1	60
DYSR-20-25-Y5-T		M26x1.5			24	26		
DYSR-25-40-Y5	10	M30x1.5	12	–	28.8	30	178±0.1	80
DYSR-32-60-Y5	12	M37x1.5	15	–	34.8	37	230±0.15	108

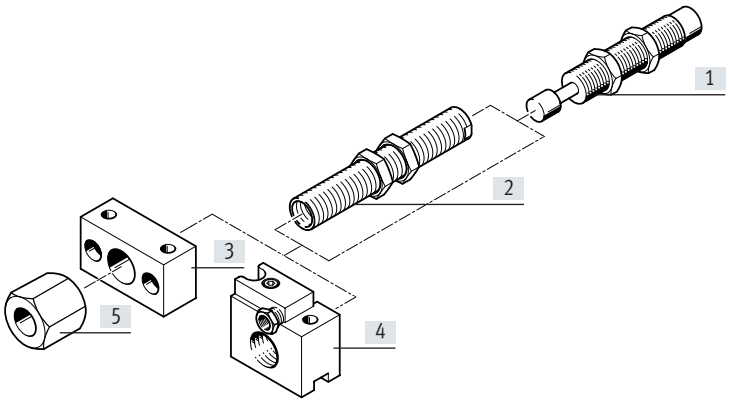
Type	L3	L4 ±0.2	L5	L6 ±0.2	⌀C1	⌀C2	Max. tightening torque ⌀C1 [Nm]
DYSR-8-8-Y5	16.2+0.6/–0.45	8	8+0.5/–0.35	–	15	4	5
DYSR-12-12-Y5	18.4+0.35/–0.2	–	6.4+0.45/–0.4	–	19	5	20
DYSR-12-12-Y5-T							
DYSR-16-20-Y5	28.5+0.4/–0.3	–	8.5+0.45/–0.4	–	24	5	35
DYSR-16-20-Y5-T				28	27		
DYSR-20-25-Y5	35.6+0.4/–0.3	–	10.6+0.45/–0.4	–	30	5	60
DYSR-20-25-Y5-T				28	32		
DYSR-25-40-Y5	52.8+0.4/–0.3	–	12.8+0.45/–0.4	28	36	6	80
DYSR-32-60-Y5	76+0.5/–0.4	–	16+0.5/–0.4	28	46	6	100

Ordering data

Size	Part no.	Type
8	**1138641**	**DYSR-8-8-Y5**
12	**1138642**	**DYSR-12-12-Y5**
	1138643	**DYSR-12-12-Y5-T**
16	**1138644**	**DYSR-16-20-Y5**
	1138645	**DYSR-16-20-Y5-T**
20	**1138646**	**DYSR-20-25-Y5**
	1138647	**DYSR-20-25-Y5-T**
25	**1138648**	**DYSR-25-40-Y5**
32	**1138649**	**DYSR-32-60-Y5**

Peripherals overview and type codes

Peripherals overview



Accessories

	Type	Brief description	→ Page/Internet
[1]	Shock absorber YSR-C	Hydraulic shock absorber with rapidly increasing cushioning force curve	18
[2]	Reducing sleeve DAYH	To improve cushioning characteristics at low load, the installed shock absorber can be replaced with the next size down shock absorber using the reducing sleeve.	53
[3]	Mounting flange YSRF	Mounting option for shock absorber	50
[4]	Mounting flange YSRF-S	Mounting option for shock absorber with integrated, attached stop sleeve and position sensing	51
[5]	End stop limiter YSRA	Stroke limiter for shock absorber	52
–	Inductive proximity switches SIEN	For mounting flange YSRF-S	54

Type codes

001	Series	
YSR	Shock absorber	

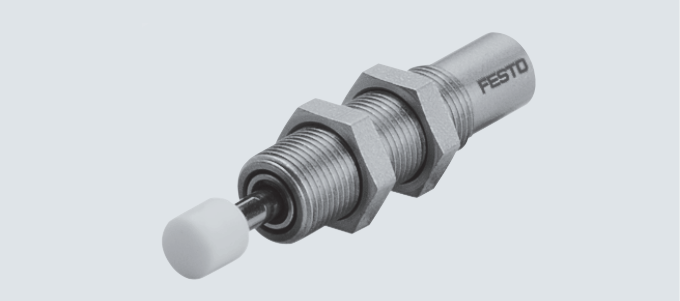
002	Size	
4	4	
5	5	
7	7	
8	8	
10	10	
12	12	
16	16	
20	20	
25	25	
32	32	

003	Stroke	
4	4	
5	5	
8	8	
10	10	
12	12	
20	20	
25	25	
40	40	
60	60	

004	Cushioning	
C	Self-regulating	

Data sheet

- Ø - Size
  4 ... 32
- | - Stroke length
  4 ... 60 mm



General technical data											
Size		4	5	7	8	10	12	16	20	25	32
Stroke	[mm]	4	5	5	8	10	12	20	25	40	60
Mode of operation		Hydraulic shock absorber with spring return									
		Single-acting, pushing									
Cushioning		Self-adjusting, hard characteristic curve									
Cushioning length	[mm]	4	5	5	8	10	12	20	25	40	60
Type of mounting		With lock nut									
Impact velocity	[m/s]	0.05 ... 2		0.05 ... 3							
Mounting position		Any									
Product weight	[g]	5	8	16	32	51	74	185	318	600	1220
Ambient temperature	[°C]	–10 ... +80									
Corrosion resistance class CRC[1]		2									

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

Reset time [s]											
Size		4	5	7	8	10	12	16	20	25	32
Reset time[1]		≤ 0.2						≤ 0.3		≤ 0.4	≤ 0.5

1) The specified technical data refers to room temperature. At higher temperatures in the region of 80°C, the maximum mass and the cushioning energy must be reduced by approximately 50%. At –10°C, the reset time may be up to 1 second.

Forces [N]										
Size	4	5	7	8	10	12	16	20	25	32
Min. insertion force[1]	6.5	7.5	10	18	25	35	60	100	140	160
Max. stop force[2] in the end positions	100	200	300	500	700	1000	2000	3000	4000	6000
Min. resetting force[3]	0.7	0.9	1.2	2.5	3.5	5	6	10	14	20

1) This is the minimum force that must be applied so that the shock absorber is pushed precisely into the retracted end position. This value is reduced accordingly with an extended external end position.
2) If the maximum stop force is exceeded, a fixed stop (e.g. YSRA) must be fitted 0.5 mm before the end of stroke.
3) This is the maximum force that can act on the piston rod, allowing the shock absorber to fully extend (e.g. extended stud).

Energies [J]										
Size	4	5	7	8	10	12	16	20	25	32
Max. energy absorption per stroke	0.6	1	2	3	6	10	30	60	160	380
Max. energy consumption per hour	5600	8000	12000	18000	26000	36000	64000	92000	150000	220000
Max. residual energy	0.006	0.01		0.02	0.03	0.05	0.16	0.32	0.8	2

Mass range [kg]										
Size	4	5	7	8	10	12	16	20	25	32
Mass range up to	1.2	1.5	5	15	25	45	90	120	200	400

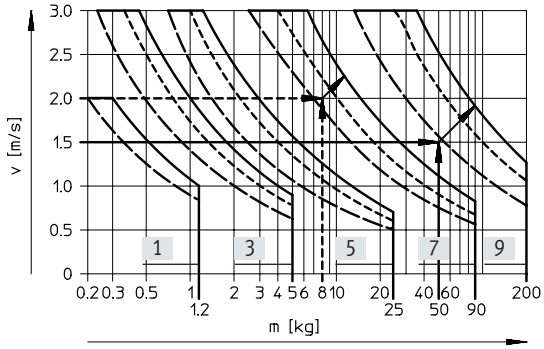
Data sheet

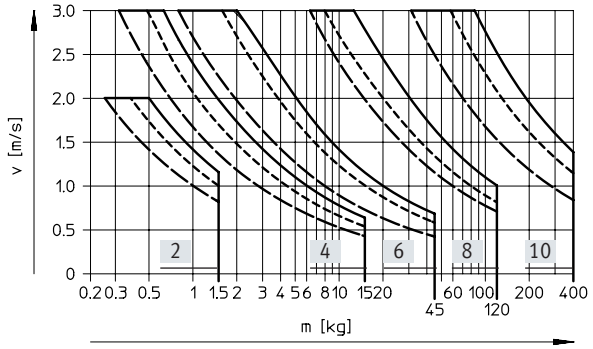
Materials

Size		4	5	7	8	10	12	16	20	25	32
[1]	Housing	High-alloy steel				Galvanised steel					
[2]	Piston rod	High-alloy steel									
[3]	Buffer	Polyamide								Steel with polyurethane	
–	Seals	Nitrile rubber, polyurethane									
–	Note on materials	RoHS-compliant									

Selection graph for self-adjusting shock absorbers YSR-C

Impact velocity v as a function of mass m





Three force curves are shown for each shock absorber. An average must be taken for intermediate values.

[1] YSR-4-4-C
[2] YSR-5-5-C
[3] YSR-7-5-C
[4] YSR-8-8-C
[5] YSR-10-10-C
[6] YSR-12-12-C
[7] YSR-16-20-C
[8] YSR-20-25-C
[9] YSR-25-40-C
[10] YSR-32-60-C

Shock absorber	Force _____	Force ----------	Force _ _ _ _ _
YSR-4-4-C	0 N	–	50 N
YSR-5-5-C	0 N	50 N	100 N
YSR-7-5-C	0 N	100 N	200 N
YSR-8-8-C	0 N	100 N	200 N
YSR-10-10-C	0 N	150 N	300 N
YSR-12-12-C	0 N	200 N	500 N
YSR-16-20-C	0 N	500 N	800 N
YSR-20-25-C	0 N	800 N	1200 N
YSR-25-40-C	0 N	1200 N	2500 N
YSR-32-60-C	0 N	2000 N	4000 N

Data sheet

Dimensions

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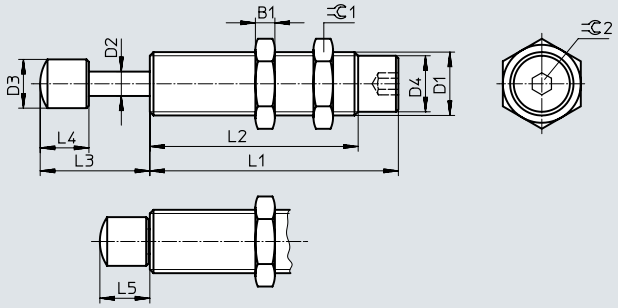


Note

To increase the service life:
Prevent dirt or liquids getting into the inner chamber of the piston via the piston rod (e.g. by using a cover).

Size	B1	D1	D2 Ø	D3 Ø	D4 Ø	L1 ±0.1
4	2.5	M6x0.5	2	3.5 ±0.05	5.3 ±0.05	28.5
5	3	M8x1	2.5	4.7 ±0.05	6.7 ±0.05	29
7	3.5	M10x1	3	6 ±0.1	8.6 ±0.05	34
8	4	M12x1	4	8 ±0.2	10.4 ±0.1	46
10	5	M14x1	5	10 ±0.2	12.4 ±0.1	55
12	5	M16x1	6	12 ±0.2	14.5 ±0.1	64
16	6	M22x1.5	8	16 ±0.2	19.6 ±0.1	86
20	8	M26x1.5	10	20 ±0.2	23.8 ±0.1	104
25	10	M30x1.5	12	25 ±0.2	27.8 ±0.1	152
32	12	M37x1.5	15	32 ±0.2	34.8 ±0.1	205

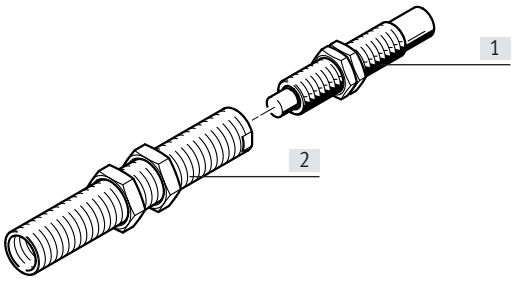
Size	L2 ±0.3	L3	L4	L5	⌀C1	⌀C2	Max. tightening torque ⌀C1 [Nm]
4	18.5	8.3 +0.6/–0.3	4 ±0.1	4.3 +0.35/–0.25	8	2	1
5	19	10.8 +0.6/–0.3	5.5 ±0.1	5.8 +0.55/–0.25	10	–	2
7	23	12.3 +0.7/–0.35	7 ±0.2	7.3 +0.55/–0.25	13		3
8	33	16.3 +0.7/–0.35	8 ±0.2	8.3 +0.55/–0.25	15		5
10	42	20.5 +0.7/–0.35	10 ±0.2	10.5 +0.55/–0.25	17		8
12	51	24.5 +0.7/–0.35	12 ±0.2	12.5 +0.55/–0.25	19		20
16	69	36.5 +0.7/–0.35	16 ±0.2	16.5 +0.55/–0.25	27		35
20	87	45.5 +0.7/–0.35	20 ±0.2	20.5 +0.55/–0.25	32		60
25	125	61.5 +1.25/–0.75	20.5 ±0.4	21.5 +0.95/–0.55	36		80
32	179	87 +1.25/–0.75	26 ±0.4	27 +0.95/–0.55	46		100

Ordering data

Size	Part no.	Type
4	**540060**	**YSR-4-4-C**
5	**158981**	**YSR-5-5-C**
7	**160272**	**YSR-7-5-C**
8	**34571**	**YSR-8-8-C**
10	**191199**	**YSR-10-10-C**
12	**34572**	**YSR-12-12-C**
16	**34573**	**YSR-16-20-C**
20	**34574**	**YSR-20-25-C**
25	**160273**	**YSR-25-40-C**
32	**160274**	**YSR-32-60-C**

Peripherals overview and type codes

Peripherals overview



Accessories

	Type	Brief description	→ Page/Internet
[1]	Shock absorber DYSC	Hydraulic shock absorber with rapidly increasing cushioning force curve	22
[2]	Reducing sleeve DAYH	To improve cushioning characteristics at low load, the installed shock absorber can be replaced with the next size down shock absorber using the reducing sleeve.	53

Type codes

001	Series	
DYSC	Shock absorber	

002	Size	
4	4	
5	5	
7	7	
8	8	
12	12	
16	16	
20	20	
25	25	

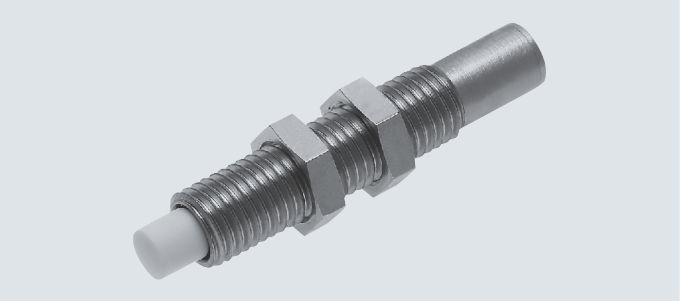
003	Stroke	
4	4	
5	5	
8	8	
12	12	
18	18	
25	25	

004	Geometric characteristics	
Y1	Internal hex	

005	Stop	
F	With fixed stop	

Data sheet

- Ø - Size
  4 ... 25
- | - Stroke length
  4 ... 25 mm



General technical data									
Size		4	5	7	8	12	16	20	25
Stroke	[mm]	4	5	5	8	12	18	18	25
Mode of operation		Hydraulic shock absorber with spring return							
		Single-acting, pushing							
Cushioning		Self-adjusting, hard characteristic curve							
Cushioning length	[mm]	4	5	5	8	12	18	16	25
Type of mounting		With lock nut							
Impact velocity	[m/s]	0.05 ... 2		0.05 ... 3					
Mounting position		Any							
Product weight	[g]	5	9	17	36	81	210	370	575
Ambient temperature	[°C]	–10 ... +80							
Corrosion resistance class CRC[1]		2							

1) Corrosion resistance class 2 to Festo standard 940 070
Components subject to moderate corrosion stress. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.

Reset time [s]									
Size		4	5	7	8	12	16	20	25
Reset time[1]		≤ 0.2					≤ 0.3		

1) The specified technical data refers to room temperature. At higher temperatures in the region of 80°C, the maximum mass and the cushioning energy must be reduced by approximately 50%. At –10°C, the reset time may be up to 1 second.

Forces [N]								
Size	4	5	7	8	12	16	20	25
Min. insertion force[1]	6.5	7.5	10	18	35	60	100	140
Max. stop force[2] in the end positions	100	200	300	500	1000	2000	3000	4000
Min. resetting force[3]	0.7	0.9	1.2	2.5	5	6	10	14

1) This is the minimum force that must be applied so that the shock absorber is pushed precisely into the retracted end position. This value is reduced accordingly with an extended external end position.
2) If the maximum stop force is exceeded, a fixed stop (e.g. YSRA) must be fitted 0.5 mm before the end of stroke.
3) This is the maximum force that can act on the piston rod, allowing the shock absorber to fully extend (e.g. extended stud).

Energies [J]								
Size	4	5	7	8	12	16	20	25
Max. energy absorption per stroke	0.6	1	2	3	10	25	38	100
Max. energy consumption per hour	5600	8000	12000	18000	36000	50000	80000	140000
Max. residual energy	0.006	0.01		0.02	0.05	0.16	0.32	0.8

Mass range [kg]								
Size	4	5	7	8	12	16	20	25
Mass range up to	1.2	1.5	5	15	45	70	100	160

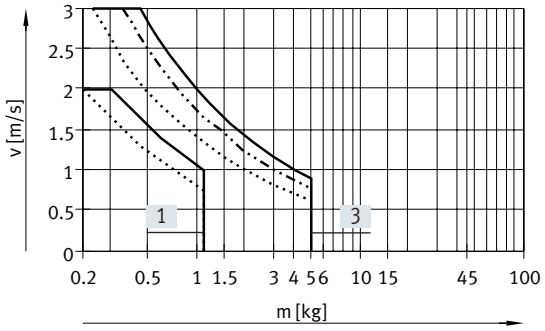
Data sheet

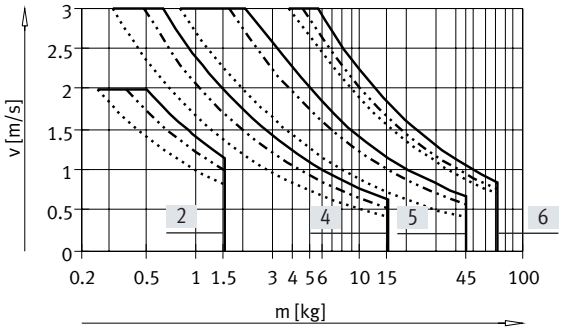
Materials

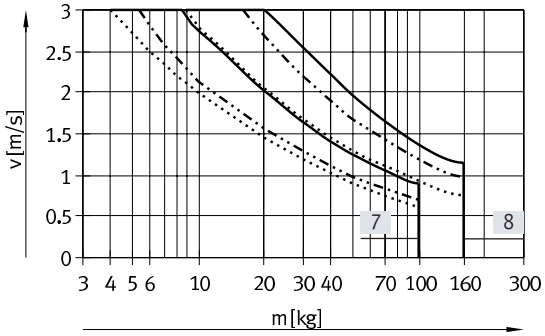
Size		4	5	7	8	12	16	20	25
[1]	Buffer	POM							
[2]	Piston rod	High-alloy steel							
[3]	Housing	High-alloy steel				Galvanised steel			
–	Seals	NBR							
	Note on materials	RoHS-compliant							

Selection graph for self-adjusting shock absorbers DYSC

Impact velocity v as a function of mass m







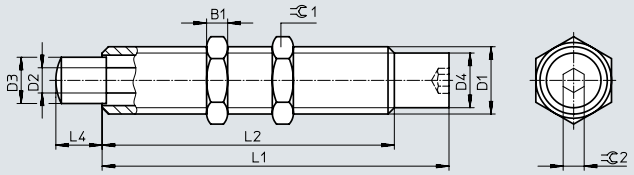
Three force curves are shown for each shock absorber. An average must be taken for intermediate values.

[1] DYSC-4-4-Y1F
[2] DYSC-5-5-Y1F
[3] DYSC-7-5-Y1F
[4] DYSC-8-8-Y1F
[5] DYSC-12-12-Y1F
[6] DYSC-16-18-Y1F
[7] DYSC-20-18-Y1F
[8] DYSC-25-25-Y1F

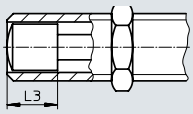
Shock absorber	Force _____	Force _ ¨ _ ¨ _ ¨ _	Force .....
DYSC-4-4-Y1F	0 N	–	50 N
DYSC-5-5-Y1F	0 N	50 N	100 N
DYSC-7-5-Y1F	0 N	100 N	200 N
DYSC-8-8-Y1F	0 N	100 N	200 N
DYSC-12-12-Y1F	0 N	200 N	500 N
DYSC-16-18-Y1F	0 N	500 N	800 N
DYSC-20-18-Y1F	0 N	800 N	1200 N
DYSC-25-25-Y1F	0 N	1200 N	2500 N

Data sheet

Dimensions Download CAD data ➔ www.festo.com



Shock absorber in end position



Note

To increase the service life:
Prevent dirt or liquids getting into the inner chamber of the piston via the piston rod (e.g. by using a cover).

Size	B1	D1	D2 ø	D3 ø	D4 ø	L1 +0.1	L2 +0.3/–0.2
4	2.5	M6x0.5	2	3.5 ±0.05	5.35 ±0.05	35.5	25.5
5	3	M8x1	2.5	4.7 ±0.05	6.7 ±0.05	38.6	28.6
7	3.5	M10x1	3	6 ±0.1	8.6 ±0.05	45.15	34.15
8	4	M12x1	4	7 ±0.1	10.4 ±0.1	59.05	46.05
12	5	M16x1	6	11 ±0.1	14.5 ±0.1	82.5	69.5
16	6	M22x1.5	8	15 ±0.1	19.6 ±0.1	110	93
20	8	M26x1.5	10	18.8 ±0.1	23.8 ±0.1	122	105
25	10	M30x1.5	12	22.8 ±0.1	27.8 ±0.1	165	137

Size	L3[1)]	L4	⊂1	⊂2	Max. tightening torque ⊂1 [Nm]
4	4	4 +0.30/–0.24	8	2	1
5	5.5	5 +0.32/–0.28	10	2.5	2
7	7	5 +0.37/–0.28	13	3	3
8	8	8 +0.42/–0.33	15	4	5
12	12	12 +0.50/–0.35	19	5	20
16	18	18 +0.50/–0.35	27	5	35
20	20	18 +0.50/–0.35	32	6	60
25	22	25 +0.50/–0.35	36	8	80

1) Buffer length

Ordering data

Size	Part no.	Type
4	**570506**	**DYSC-4-4-Y1F**
5	**548011**	**DYSC-5-5-Y1F**
7	**548012**	**DYSC-7-5-Y1F**
8	**548013**	**DYSC-8-8-Y1F**
12	**548014**	**DYSC-12-12-Y1F**
16	**553593**	**DYSC-16-18-Y1F**
20	**2479149**	**DYSC-20-18-Y1F**
25	**2480234**	**DYSC-25-25-Y1F**

Type codes

001	Series	
DYSD	Shock absorber	

002	Allocation	
Q11	Version Q11	

003	Size [mm]	
5	5	
7	7	
8	8	
12	12	
16	16	
20	20	
25	25	
32	32	

004	Stroke [mm]	
5	5	
8	8	
12	12	
15	15	
16	16	
24	24	
25	25	

005	Geometric characteristics	
Y1	Internal hex	

006	Stop	
F	With fixed stop	

007	Energy absorption	
	Standard	
L	Large	
S	Light	

008	Cushioning characteristic	
Y9	Standard	
Y10	Hard	
Y14	Soft	

Data sheet

- Ø - Size
  5 ... 32
- | - Stroke length
  5 ... 25 mm

Specially for applications in pressure chamber

General technical data									
Size		5	7	8	12	16	20	25	32
Stroke	[mm]	5	5	8	12	15	16	24	25
Mode of operation		Single acting							
		Pushing							
Cushioning		Self-adjusting							
Cushioning length	[mm]	5	5	8	12	15	16	24	25
Type of mounting		With lock nut[1)]							
Position sensing		Without							
Impact velocity	[m/s]	1							
Mounting position		Any							
Product weight	[g]	10	20	40	95	220	385	635	1050
Ambient temperature	[°C]	0 ... +60							
Corrosion resistance class CRC[2)]		2							

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.
2) With sealing washer and washer to seal the pressure chamber.

Reset time [s]									
Size		5	7	8	12	16	20	25	32
Reset time[1)]		0.2				0.3			

1) The specified technical data refers to room temperature. At higher temperatures in the region of 80°C, the maximum mass and the cushioning energy must be reduced by approximately 50%. At –10°C, the reset time can be up to 1 s.

Forces [N]								
Size	5	7	8	12	16	20	25	32
Min. insertion force[1)]	27	40	60	100	160	260	430	480
Max. stop force[2)] in the end positions	200	300	500	1000	2000	3000	4000	6000
Min. resetting force[3)]	7	12	18	28	46	75	120	150

1) This is the minimum force that must be applied so that the shock absorber is pushed precisely into the retracted end position. This value is reduced accordingly with an extended external end position.
2) If the maximum stop force is exceeded, a fixed stop (e.g. YSRA) must be fitted 0.5 mm before the end of stroke.
3) This is the maximum force that can act on the piston rod, allowing the shock absorber to fully extend (e.g. extended stud).

Energies [J]								
Size	5	7		8		12		
	[Y9]	[Y9]	[Y14]	[Y9]	[Y14]	[Y9]	[Y10]	[Y14]
Max. energy absorption per stroke	2	3	4	6	4	10	12	8
Max. energy consumption per hour	8000	12000		18000		36000		
Max. residual energy	0.01	0.01		0.02		0.05		

Energies [J]									
Size	16		20			25		32	
	[Y9]	[Y14]	[Y9]	[Y10]	[Y14]	[Y9]	[Y10]	[Y9]	[Y10]
Max. energy absorption per stroke	40	30	70	90	50	140	180	220	270
Max. energy consumption per hour	64000		92000			150000		180000	
Max. residual energy	0.16		0.32			0.8		2	

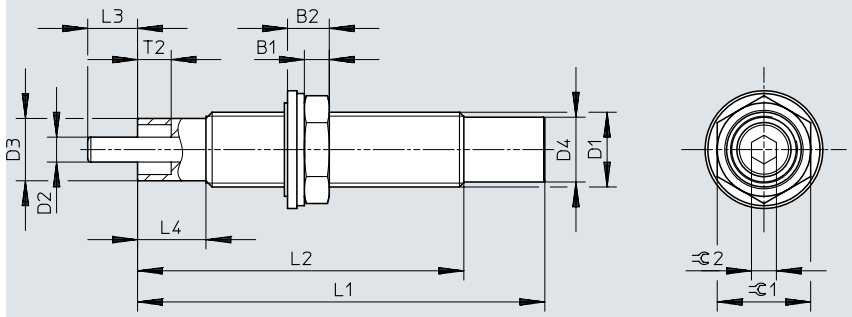
Data sheet

Materials

Size	5	7	8	12	16	20	25	32
Piston rod	High-alloy steel							
Nut	Galvanised steel							
Housing	High-alloy steel			Galvanised steel				
Seals	NBR							
PWIS conformity	VDMA24364-B2-L							
Note on materials	RoHS-compliant							

Dimensions

Download CAD data ➔ www.festo.com



Size	B1	B2	D1	D2 ⌀	D3 ⌀ −0.1	D4 ⌀	L1 +0.1	L2 +0.3/−0.2
5	3	5.5	M8x1	2.5	–	6.7±0.05	43	34
7	3.5	5.8	M10x1	3	–	8.6±0.05	49.1	38.1
8	4	6.7	M12x1	4	10	10.4±0.1	65.4	52.4
12	5	9	M16x1	6	14.2	14.5±0.1	89	76
16	6	11	M22x1.5	8	19.4	19.6±0.1	111.8	94.8
20	8	13.5	M26x1.5	10	23.6	23.8±0.1	137.5	116.5
25	10	14.9	M30x1.5	12	27.5	27.8±0.1	174.5	146.5
32	12	17.5	M37x1.5	15	34.4	34.8±0.1	177	149

Size	L3	L4 ±0.2	T2	⌀C1	⌀C2	Max. tightening torque ⌀C1 [Nm]
5	5+0.32/−0.23	–	3	10	2.5	2
7	5+0.32/−0.23	–	4.5	13	3	3
8	8+0.35/−0.25	11	5.4	15	4	5
12	12+0.35/−0.3	14	6.5	19	5	20
16	15+0.45/−0.4	18	5	27	5	35
20	15.5+0.45/−0.4	23	5	32	6	60
25	24+0.5/−0.4	25	5	36	8	80
32	25+0.5/−0.4	25	5	46	8	100

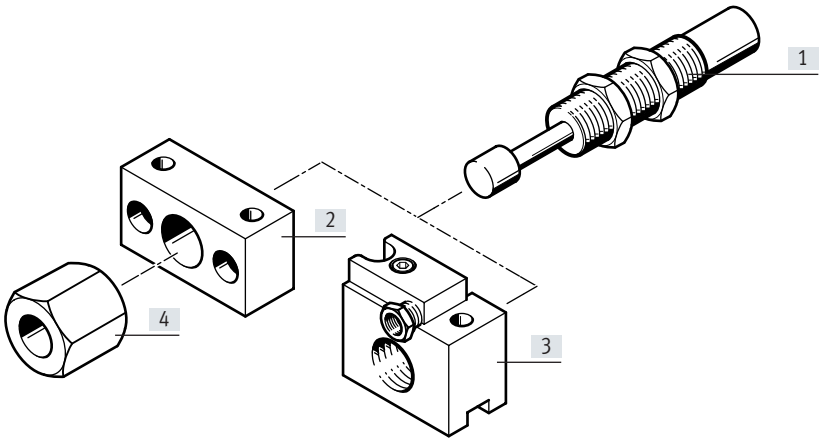
Data sheet

Ordering data

Size	Part no.	Type
DYSD-...-Y9		
5	**8161520**	**DYSD-Q11-5-5-Y1F-L-Y9**
7	**8161521**	**DYSD-Q11-7-5-Y1F-L-Y9**
8	**8161523**	**DYSD-Q11-8-8-Y1F-L-Y9**
12	**8161525**	**DYSD-Q11-12-12-Y1F-Y9**
16	**8161528**	**DYSD-Q11-16-15-Y1F-Y9**
20	**8161530**	**DYSD-Q11-20-16-Y1F-Y9**
25	**8161533**	**DYSD-Q11-25-24-Y1F-Y9**
32	**8161535**	**DYSD-Q11-32-25-Y1F-S-Y9**
DYSD-...-Y10 – Hard		
12	**8161526**	**DYSD-Q11-12-12-Y1F-L-Y10**
20	**8161531**	**DYSD-Q11-20-16-Y1F-L-Y10**
25	**8161534**	**DYSD-Q11-25-24-Y1F-L-Y10**
32	**8161536**	**DYSD-Q11-32-25-Y1F-L-Y10**
DYSD-...-Y14 – Soft		
7	**8161522**	**DYSD-Q11-7-5-Y1F-Y14**
8	**8161524**	**DYSD-Q11-8-8-Y1F-S-Y14**
12	**8161527**	**DYSD-Q11-12-12-Y1F-S-Y14**
16	**8161529**	**DYSD-Q11-16-15-Y1F-S-Y14**
20	**8161532**	**DYSD-Q11-20-16-Y1F-S-Y14**

Peripherals overview and type codes

Peripherals overview



Accessories

	Type	Brief description	→ Page/Internet
[1]	Shock absorber YSRW	Hydraulic shock absorber with progressive cushioning characteristic	30
[2]	Mounting flange YSRF	Mounting option for shock absorber	50
[3]	Mounting flange YSRF-S	Mounting option for shock absorber with integrated, attached stop sleeve and position sensing	51
[4]	End stop limiter YSRA	Stroke limiter for shock absorber	52
–	Inductive proximity switches SIEN	For mounting flange YSRF-S	54

Type codes

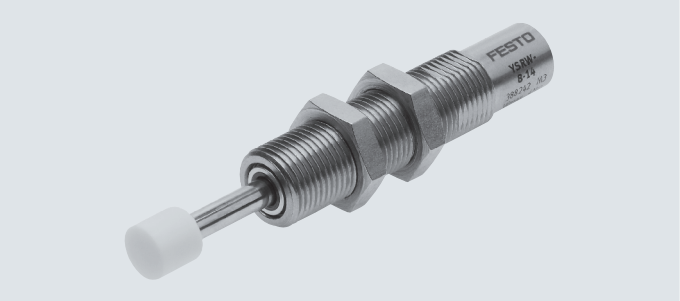
001	Series	
YSRW	Shock absorber	

002	Size	
5	5	
7	7	
8	8	
10	10	
12	12	
16	16	
20	20	

003	Stroke	
8	8	
10	10	
14	14	
17	17	
20	20	
26	26	
34	34	

Data sheet

- Ø - Size
  5 ... 20
- | - Stroke length
  8 ... 34 mm



General technical data								
Size		5	7	8	10	12	16	20
Stroke	[mm]	8	10	14	17	20	26	34
Mode of operation		Hydraulic shock absorber with spring return						
		Single-acting, pushing						
Cushioning		Self-adjusting, soft characteristic curve						
Cushioning length	[mm]	8	10	14	17	20	26	34
Type of mounting		With lock nut						
Impact velocity	[m/s]	0.1 ... 2	0.1 ... 3					
Mounting position		Any						
Product weight	[g]	8	18	34	54	78	190	330
Ambient temperature	[°C]	–10 ... +80						
Corrosion resistance class CRC[1]		2						

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

Reset time [s]								
Size		5	7	8	10	12	16	20
Reset time[1]		≤ 0.2				≤ 0.3		

1) The specified technical data refers to room temperature. At higher temperatures in the region of 80°C, the maximum mass and the cushioning energy must be reduced by approximately 50%. At –10°C, the reset time may be up to 1 second.

Forces [N]							
Size	5	7	8	10	12	16	20
Min. insertion force[1]	7.5	10	18	25	35	60	100
Max. stop force[2] in the end positions	200	300	500	700	1000	2000	3000
Min. resetting force[3]	0.9	1.2	2.5	3.5	5	6	10

1) This is the minimum force that must be applied so that the shock absorber is pushed precisely into the retracted end position. This value is reduced accordingly with an extended external end position.
2) If the maximum stop force is exceeded, a fixed stop (e.g. YSRA) must be fitted 0.5 mm before the end of stroke.
3) This is the maximum force that can act on the piston rod, allowing the shock absorber to fully extend (e.g. extended stud).

Energies [J]							
Size	5	7	8	10	12	16	20
Max. energy absorption per stroke	1.3	2.5	4	8	12	35	70
Max. energy consumption per hour	10000	15000	21000	30000	41000	68000	100000
Max. residual energy	0.01		0.02	0.03	0.05	0.16	0.32

Mass range [kg]							
Size	5	7	8	10	12	16	20
Mass range up to	2	5	10	20	30	50	80

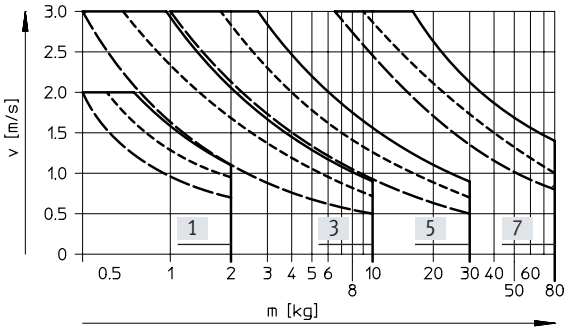
Data sheet

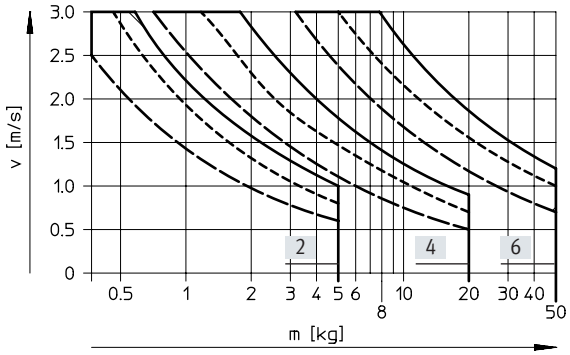
Materials

Size		5	7	8	10	12	16	20
[1]	Buffer	Polyamide						
[2]	Piston rod	High-alloy steel						
[3]	Housing	High-alloy steel			Galvanised steel			
–	Seals	Nitrile rubber						
	Note on materials	RoHS-compliant						

Selection graph for self-adjusting shock absorbers with progressive characteristics YSRW

Impact velocity v as a function of mass m





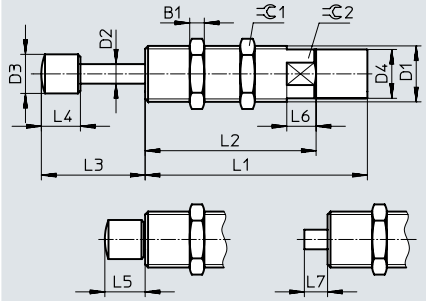
Three force curves are shown for each shock absorber. An average must be taken for intermediate values.

[1] YSRW-5-8
[2] YSRW-7-10
[3] YSRW-8-14
[4] YSRW-10-17
[5] YSRW-12-20
[6] YSRW-16-26
[7] YSRW-20-34

Shock absorber	Force _____	Force -----	Force _ _ _ _ _
YSRW-5-8	0 N	50 N	100 N
YSRW-7-10	0 N	75 N	150 N
YSRW-8-14	0 N	100 N	200 N
YSRW-10-17	0 N	150 N	300 N
YSRW-12-20	0 N	200 N	400 N
YSRW-16-26	0 N	500 N	800 N
YSRW-20-34	0 N	800 N	1200 N

Data sheet

Dimensions Download CAD data ➔ www.festo.com



Note

To increase the service life:
Prevent dirt or liquids getting into the inner chamber of the piston via the piston rod (e.g. by using a cover).

Size	B1	D1	D2 ø	D3 ø	D4 ø	L1 ±0.1	L2 ±0.3	L3
5	3	M8x1	2.5	4.7 ±0.05	6.7 ±0.05	33.5	22.5	13.8 +0.6/–0.25
7	3.5	M10x1	3	6 ±0.1	8.6 ±0.05	41	30	17.3 +0.7/–0.25
8	4	M12x1	4	8 ±0.2	10.4 ±0.1	53	40	22.3 +0.7/–0.25
10	5	M14x1	5	10 ±0.2	12.4 ±0.1	62	49	27.5 +0.7/–0.25
12	5	M16x1	6	12 ±0.2	14.5 ±0.1	72.5	59.5	32.5 +0.7/–0.25
16	6	M22x1.5	8	16 ±0.2	20 ±0.1	91	70	42.5 +0.7/–0.35
20	8	M26x1.5	10	18.8 ±0.2	24 ±0.1	112	91	54.5 +0.7/–0.35

Size	L4	L5	L6 +0.5	L7	⌀C1	⌀C2	Max. tightening torque ⌀C1 [Nm]
5	5.5 ±0.1	5.8 +0.35/–0.25	5	3.5 ±0.25	10	7	2
7	7 ±0.2	7.3 +0.35/–0.25	6	4.3 ±0.25	13	9	3
8	8 ±0.2	8.3 +0.4/–0.25	8	5.3 +0.3/–0.25	15	11	5
10	10 ±0.2	10.5 +0.4/–0.25	10	6.5 +0.3/–0.25	17	13	8
12	12 ±0.2	12.5 +0.4/–0.25	12	7.5 +0.3/–0.25	19	15	20
16	16 ±0.2	16.5 +0.4/–0.25	12	9.5 +0.3/–0.25	27	20	35
20	20 ±0.2	20.5 +0.4/–0.25	12	11.5 +0.3/–0.25	32	24	60

Ordering data

Size	Part no.	Type
5	**191192**	**YSRW-5-8**
7	**191193**	**YSRW-7-10**
8	**191194**	**YSRW-8-14**
10	**191195**	**YSRW-10-17**
12	**191196**	**YSRW-12-20**
16	**191197**	**YSRW-16-26**
20	**191198**	**YSRW-20-34**

NEW

Type codes

001	Series	
DYSS	Shock absorber	

002	Size	
2	2	
3	3	
4	4	
5	5	
7	7	
8	8	
10	10	
12	12	

003	Stroke	
4	4	
5	5	
8	8	
10	10	
12	12	

004	Geometric characteristics	
Y1	Internal hex	

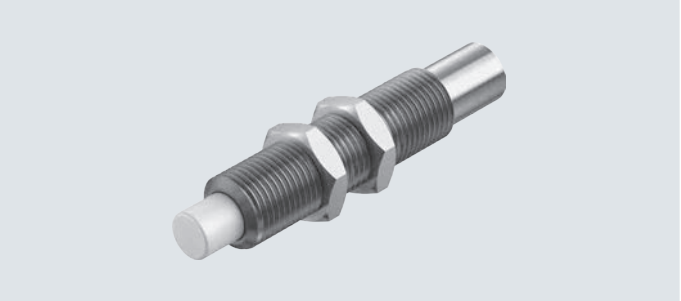
005	Stop	
F	With fixed stop	

Note

The following technical data also apply to the shock absorber DYSS-G8-... .

Data sheet

- Ø - Size
  2 ... 12
- | - Stroke length
  4 ... 12 mm



General technical data

Size		2	3	4	5	7	8	10	12
Stroke	[mm]	4	4	4	5	5	8	10	12
Mode of operation		Hydraulic shock absorber with spring return							
		Single-acting, pushing							
Cushioning		Self-adjusting, soft characteristic curve							
Cushioning length	[mm]	4	4	4	5	5	8	10	12
Type of mounting		With lock nut							
Impact velocity	[m/s]	0.1 ... 0.5	0.1 ... 1			0.1 ... 1.5			
Mounting position		Any							
Product weight[1]	[g]	1	3	4.5	7	15	30	51	82
Ambient temperature	[°C]	–10 ... +70	–10 ... +80						–5 ... +80
Corrosion resistance class CRC[2]		2							

1) Weight without nut.
2) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

Reset time [s]

Size	2	3	4	5	7	8	10	12
Reset time[1]	≤ 0.5	≤ 0.2						

1) The specified technical data refers to room temperature. At higher temperatures in the region of 80°C, the maximum mass and the cushioning energy must be reduced by approximately 50%. At –10°C, the reset time may be up to 1 second.
Increased reset times must be expected with longer dwell time in the end position.

Forces [N]

Size	2	3	4	5	7	8	10	12
Min. insertion force[1]	2.5	3.5	4.5	10	10	18	24	35
Max. stop force[2] in end positions (housing)	60	80	100	200	300	500	700	1000
Min. resetting force[3]	0.8	0.5	0.8	0.9	1.2	2.5	4	4

1) This is the minimum force that must be applied so that the shock absorber is pushed precisely into the retracted end position. This value is reduced accordingly with an extended external end position.
2) If the maximum stop force is exceeded, a fixed stop (e.g. YSRA) must be fitted 0.5 mm before the end of stroke.
3) This is the maximum force that can act on the piston rod, allowing the shock absorber to fully extend (e.g. extended stud).

Energies

Size		2	3	4	5	7	8	10	12
Max. energy absorption per stroke at +20°C	[J]	0.1	0.4	0.8	1.4	2	3	6	10
Max. energy absorption per hour at +20°C	[kJ]	0.27	4.5	5.5	8	12	18	25	36
Max. operating frequency[1]	[Cycles/min]	50	80	80	80	70	50	50	50
Max. residual energy		0.003	0.004	0.006	0.01	0.01	0.02	0.03	0.05

1) For energy utilisation of 70% or above per stroke.

Data sheet

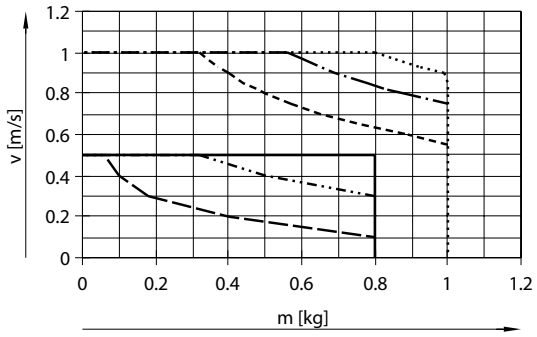
Mass range [kg]								
Size	2	3	4	5	7	8	10	12
Mass range up to	0.8	1	1.7	2.5	5.5	15	20	45

Materials

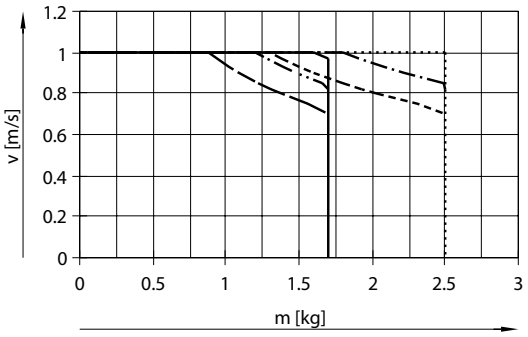
Shock absorber	
Buffer	POM
Piston rod	High-alloy steel
Housing	High-alloy steel
Seals	NBR
Note on materials	RoHS-compliant

Selection graph for self-adjusting shock absorbers with progressive characteristics DYSS

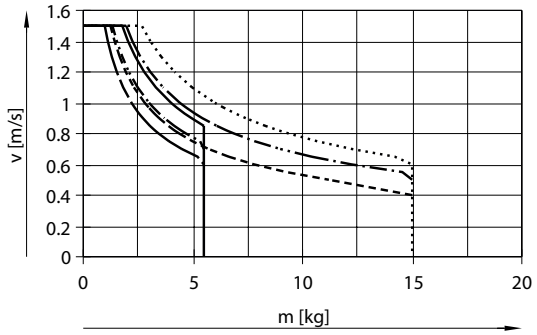
Impact velocity v as a function of mass m



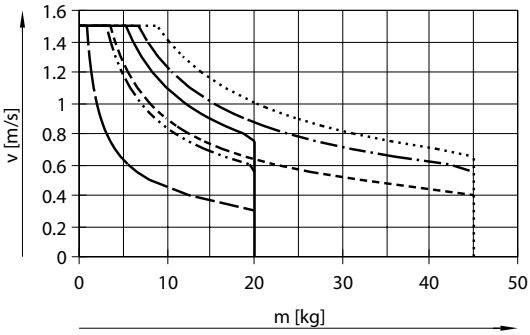
- DYSS-2-4 (0 N)
- DYSS-2-4 (15 N)
- DYSS-2-4 (23 N)
- DYSS-3-4 (0 N)
- DYSS-3-4 (30 N)
- DYSS-3-4 (60 N)



- DYSS-4-4 (0 N)
- DYSS-4-4 (50 N)
- DYSS-4-4 (90 N)
- DYSS-5-5 (0 N)
- DYSS-5-5 (100 N)
- DYSS-5-5 (150 N)



- DYSS-7-5 (0 N)
- DYSS-7-5 (100 N)
- DYSS-7-5 (180 N)
- DYSS-8-8 (0 N)
- DYSS-8-8 (100 N)
- DYSS-8-8 (200 N)

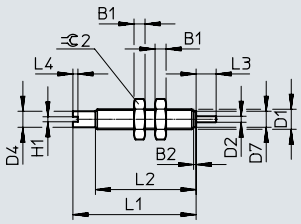


- DYSS-10-10 (0 N)
- DYSS-10-10 (250 N)
- DYSS-10-10 (500 N)
- DYSS-12-12 (0 N)
- DYSS-12-12 (200 N)
- DYSS-12-12 (500 N)

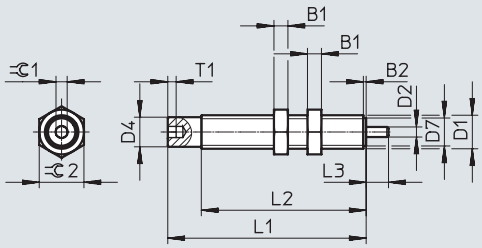
Data sheet

Dimensions Download CAD data ➔ www.festo.com

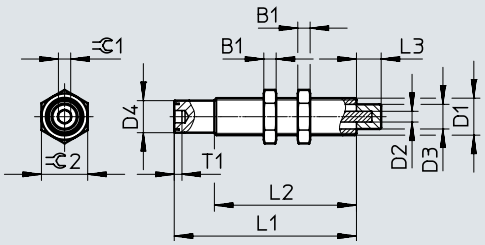
DYSS-2-4



DYSS-3-4/DYSS-4-4



DYSS-...



Note

- To increase the service life: Prevent dirt or liquids getting into the inner chamber of the piston via the piston rod (e.g. by using a cover).
- The piston rod must not be pushed beyond the stop surface
- The piston rod must not be pulled
- The screws in the internal hexagon socket must not be removed

Size	B1	D1	D2 ø	D3 ø	D4 ø	H1	L1 ±0.2	L2 ±0.3
2	2.2	M4x0.5	1.2	–	3.2+0.1/–0.05	1	24.6	20.1
3	2.7	M5x0.5	1.5	–	4.3+0.1/–0.05	–	33.5	27.5
4	2.5	M6x0.5	1.8	–	5.3+0.1/–0.05	–	35.5	29.5
5	3	M8x1	2.5	5±0.1	6.7+0.1/–0.05	–	38.6	32.6
7	3.5	M10x1	3	6±0.1	8.6+0.1/–0.05	–	45.2	35.2
8	4	M12x1	3.5	8±0.2	10.4+0.15/–0.1	–	59	49
10	5	M14x1	4	10±0.2	12.5+0.15/–0.1	–	70	57
12	5	M16x1	5	12±0.2	14.5+0.15/–0.1	–	82.5	69.5

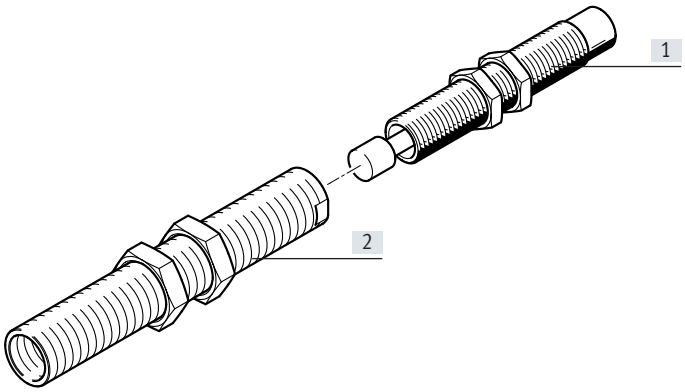
Size	L3	L4	T1	⌀1	Max. tightening torque ⌀1 [Nm]	⌀2	Max. tightening torque ⌀2 for nut [Nm]
2	$4^{+0.5}$	1	–	–	0.1	7	0.5
3	$4^{+0.6}$	–	1.5	2	0.5	8	1
4	$4^{+0.6}$	–	1.5	2	0.6	8	1
5	$5^{+0.6}$	–	2	2.5	1	10	2
7	$5^{+0.6}$	–	2.2	3	3	13	3
8	$8^{+0.6}$	–	2.5	4	5	15	5
10	$10^{+0.8}$	–	3.5	5	10	17	8
12	$12^{+0.8}$	–	3.5	5	16	19	20

Ordering data

Size	Part no.	Type
2	**8081767**	**DYSS-2-4-Y1F**
3	**8111390**	**DYSS-3-4-Y1F-G2**
4	**8111391**	**DYSS-4-4-Y1F-G2**
5	**8081770**	**DYSS-5-5-Y1F**
7	**8069001**	**DYSS-7-5-Y1F**
8	**8069002**	**DYSS-8-8-Y1F**
10	**8069003**	**DYSS-10-10-Y1F**
12	**8069004**	**DYSS-12-12-Y1F**

Peripherals overview and type codes

Peripherals overview



Accessories

	Type	Brief description	→ Page/Internet
[1]	Shock absorber DYSW	Hydraulic shock absorber with slowly increasing cushioning force curve	38
[2]	Reducing sleeve DAYH	To improve cushioning characteristics at low load, the installed shock absorber can be replaced with the next size down shock absorber using the reducing sleeve.	53

Type codes

001	Series	
DYSW	Shock absorber	

002	Size	
4	4	
5	5	
7	7	
8	8	
10	10	
12	12	

003	Stroke	
6	6	
8	8	
10	10	
14	14	
17	17	
20	20	

004	Geometric characteristics	
Y1	Internal hex	

005	Stop	
F	With fixed stop	

Data sheet

- Ø - Size
  4 ... 12
- | - Stroke length
  6 ... 20 mm

General technical data							
Size		4	5	7	8	10	12
Stroke	[mm]	6	8	10	14	17	20
Mode of operation		Hydraulic shock absorber with spring return					
		Single-acting, pushing					
Cushioning		Self-adjusting, soft characteristic curve					
Cushioning length	[mm]	6	8	10	14	17	20
Type of mounting		With lock nut					
Impact velocity	[m/s]	0.1 ... 2		0.1 ... 3			
Mounting position		Any					
Product weight	[g]	6	11	21	42	67	91
Ambient temperature	[°C]	–10 ... +80					
Corrosion resistance class CRC[1]		2					

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

Reset time [s]							
Size		4	5	7	8	10	12
Reset time[1]		≤ 0.2					≤ 0.3

1) The specified technical data refers to room temperature. At higher temperatures in the region of 80°C, the maximum mass and the cushioning energy must be reduced by approximately 50%. At –10°C, the reset time may be up to 1 second.

Forces [N]						
Size	4	5	7	8	10	12
Min. insertion force[1]	6.5	7.5	10	18	25	35
Max. stop force[2] in end positions (housing)	100	200	300	500	700	1000
Min. resetting force[3]	0.7	0.9	1.2	2.5	3.5	5

1) This is the minimum force that must be applied so that the shock absorber is pushed precisely into the retracted end position. This value is reduced accordingly with an extended external end position.
2) If the maximum stop force is exceeded, a fixed stop (e.g. YSRA) must be fitted 0.5 mm before the end of stroke.
3) This is the maximum force that can act on the piston rod, allowing the shock absorber to fully extend (e.g. extended stud).

Energies [J]						
Size	4	5	7	8	10	12
Max. energy absorption per stroke	0.8	1.3	2.5	4	8	12
Max. energy consumption per hour	7000	10000	15000	21000	30000	41000
Max. residual energy	0.006	0.01	0.01	0.02	0.03	0.05

Mass range [kg]						
Size	4	5	7	8	10	12
Mass range up to	1.2	2	5	10	20	30

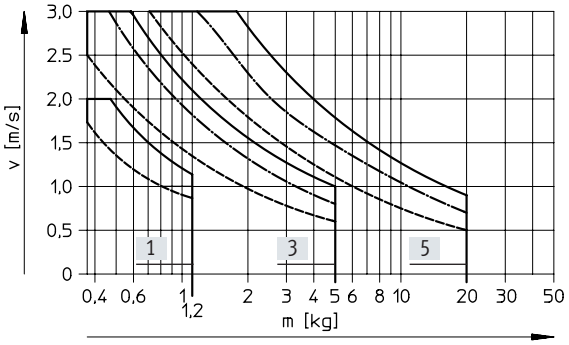
Data sheet

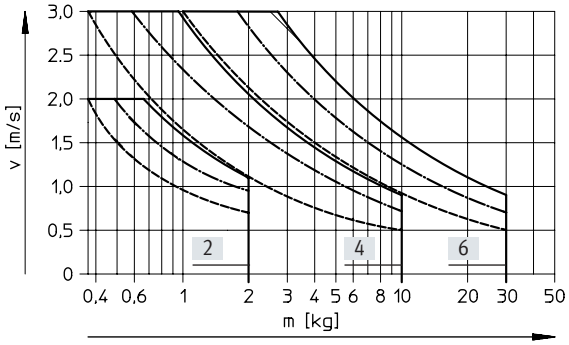
Materials

Size	4	5	7	8	10	12
Buffer	Polyacetal					
Piston rod	High-alloy steel					
Housing	High-alloy steel				Galvanised steel	
Seals	Nitrile rubber					
Note on materials	RoHS-compliant					

Selection graph for self-adjusting shock absorbers with progressive characteristics DYSW

Impact velocity v as a function of mass m





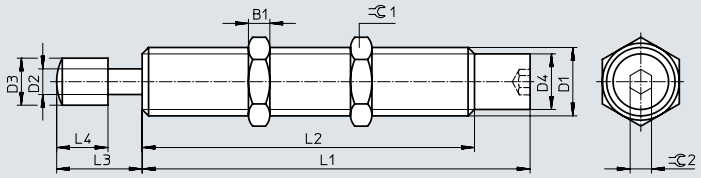
Three force curves are shown for each shock absorber. An average must be taken for intermediate values.

[1] DYSW-4-6-Y1F
[2] DYSW-5-8-Y1F
[3] DYSW-7-10-Y1F
[4] DYSW-8-14-Y1F
[5] DYSW-10-17-Y1F
[6] DYSW-12-20-Y1F

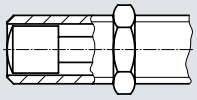
Shock absorber	Force _____	Force – ¨ – ¨ – ¨ –	Force ----------
DYSW-4-6-Y1F	0 N	–	50 N
DYSW-5-8-Y1F	0 N	50 N	100 N
DYSW-7-10-Y1F	0 N	75 N	150 N
DYSW-8-14-Y1F	0 N	100 N	200 N
DYSW-10-17-Y1F	0 N	150 N	300 N
DYSW-12-20-Y1F	0 N	200 N	400 N

Data sheet

Dimensions Download CAD data ➔ www.festo.com



Shock absorber in end position



Note

To increase the service life:
Prevent dirt or liquids getting into the inner chamber of the piston via the piston rod (e.g. by using a cover).

Size	B1	D1	D2 Ø	D3 Ø	D4 Ø	L1 +0.1
4	2.5	M6x0.5	2	3.5±0.05	5.35±0.05	35.5
5	3	M8x1	2.5	4.7±0.05	6.7±0.05	43.1
7	3.5	M10x1	3	6±0.1	8.6±0.05	52.05
8	4	M12x1	4	7±0.1	10.4±0.1	66.05
10	5	M14x1	5	9±0.1	12.4±0.1	77.55
12	5	M16x1	6	11±0.1	14.4±0.1	90.75

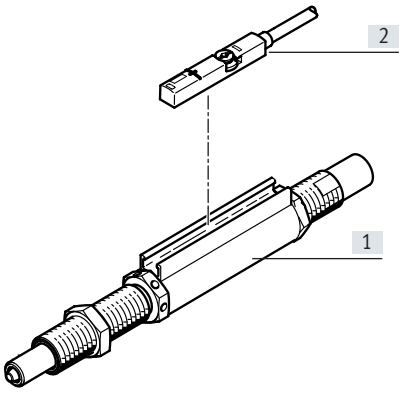
Size	L2 +0.3 –0.2	L3	L4	⌀C1	⌀C2	Max. tightening torque ⌀C1 [Nm]
4	25.5	6+0.30/–0.24	4±0.05	8	2	1
5	33.1	8+0.32/–0.28	5.5±0.1	10	2.5	2
7	41.05	10+0.37/–0.28	7±0.2	13	3	3
8	53.05	14+0.37/–0.28	8±0.2	15	4	5
10	64.55	17+0.37/–0.28	10±0.2	17	4	8
12	77.75	20+0.45/–0.30	12±0.2	19	5	20

Ordering data

Size	Part no.	Type
4	**548070**	**DYSW-4-6-Y1F**
5	**548071**	**DYSW-5-8-Y1F**
7	**548072**	**DYSW-7-10-Y1F**
8	**548073**	**DYSW-8-14-Y1F**
10	**548074**	**DYSW-10-17-Y1F**
12	**548075**	**DYSW-12-20-Y1F**

Peripherals overview and type codes

Peripherals overview



Accessories

	Type	Brief description	→ Page/Internet
[1]	Stop element YSRWJ	Hydraulic shock absorber with progressive cushioning characteristic. The cushioning length is adjustable	42
[2]	Proximity switch SME-/SMT-8	Sensing option for end positions	53

Type codes

001	Series	
YSRWJ	Shock absorber	

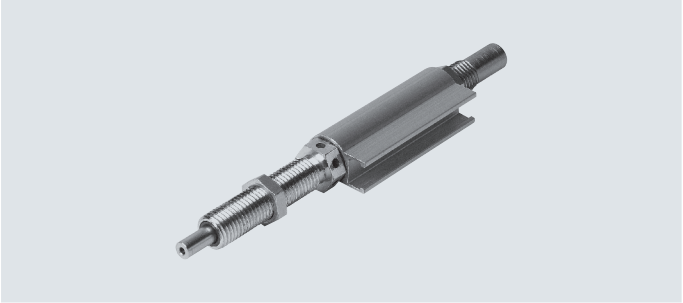
002	Size	
5	5	
7	7	
8	8	

003	Stroke	
8	8	
10	10	
14	14	

004	Position sensing	
A	For proximity sensor	

Data sheet

- Ø - Size
  5 ... 8
- | - Stroke length
  7.5 ... 13.5 mm



General technical data				
Size		5	7	8
Stroke	[mm]	8	10	14
Mode of operation		A piston rod in front of the shock absorber transfers the force to the shock absorber. The piston rod acts as an end stop and actuates the proximity switch via a magnet mounted on it		
		Single-acting, pushing		
Cushioning		Self-adjusting, soft characteristic curve		
Cushioning length	[mm]	8	10	14
Type of mounting		With lock nut		
Position sensing		Via proximity switch		
Impact velocity	[m/s]	0.05 ... 2	0.05 ... 3	
Repetition accuracy	[mm]	0.02		
Mounting position		Any		
Product weight	[g]	45	75	110
Ambient temperature	[°C]	0 ... +60		
Corrosion resistance class CRC[1]		2		

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

Reset time [s]			
Size	5	7	8
Reset time[1]	≤ 0.2		

1) The specified technical data refers to room temperature. At higher temperatures in the region of 80°C, the maximum mass and the cushioning energy must be reduced by approximately 50%. At 0°C, the reset time may be up to 1 second.

Forces [N]			
Size	5	7	8
Min. insertion force[1]	5	18	80
Max. stop force[2] in the end positions	200	300	500
Min. resetting force[3]	1.5	2	3.5

1) This is the minimum force that must be applied so that the shock absorber is pushed precisely into the retracted end position.
2) The max. stop force must not be exceeded.
3) This is the maximum force that can act on the piston rod, allowing the shock absorber to fully extend.

Energies [J]			
Size	5	7	8
Max. energy absorption per stroke	1	2	3
Max. energy consumption per hour	10000	15000	21000
Max. residual energy	0.01		0.02

Mass range [kg]			
Size	5	7	8
Mass range up to	2	5	10

Data sheet

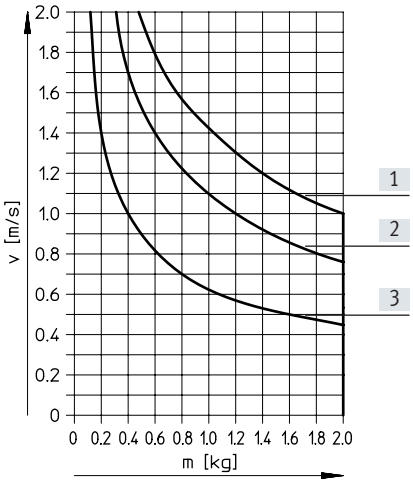
Materials

Stop element	
Limit plunger	Reinforced stainless steel
Stop sleeve	Galvanised steel
Threaded barrel	Nickel-plated brass
Note on materials	RoHS-compliant

Selection graphs for stop elements with shock absorber YSRWJ

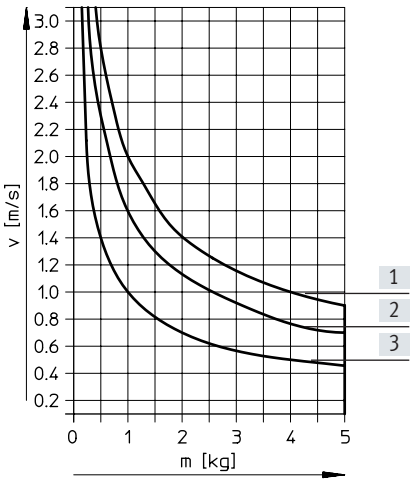
Impact velocity v as a function of mass m

YSRWJ-5-8-A



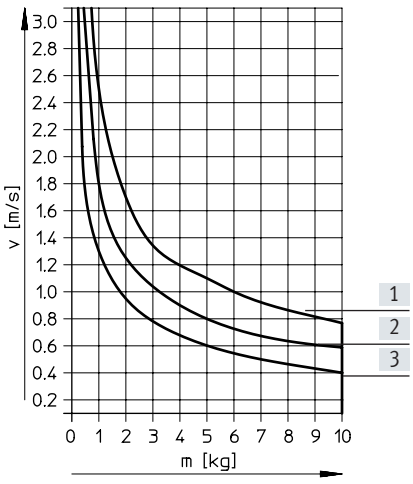
[1] Without additional force
[2] With additional force A = 50 N
[3] With additional force A = 100 N

YSRWJ-7-10-A



[1] Without additional force
[2] With additional force A = 75 N
[3] With additional force A = 150 N

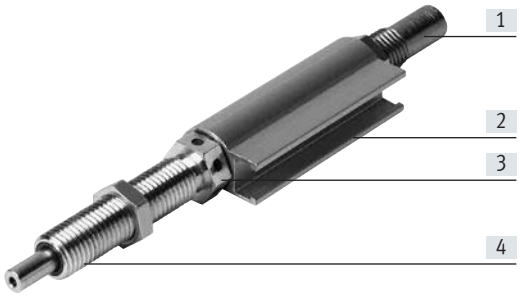
YSRWJ-8-14-A



[1] Without additional force
[2] With additional force A = 100 N
[3] With additional force A = 150 N

Data sheet

Mode of operation



[1] Soft cushioning characteristics. Cushioning stroke is adjustable
[2] End-position sensing via proximity switch SME-/SMT-8 that can be integrated
[3] Precision end-position adjustment
[4] Precise end position using internal metallic end position

Dimensions

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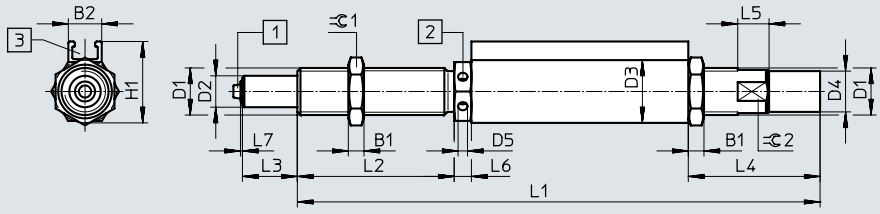


[1] Rubber buffer, only for sizes: YSRWJ-7-10-A and YSRWJ-8-14-A
[2] Precision end-position adjustment
[3] Slot for proximity switch SME/SMT-8

Size	B1	B2 +0.4	D1	D2	D3 +0.1	D4	D5 +0.1	H1 +0.3	L1 +0.3/–0.1	L2 +0.4
5	3	8.1	M8x1	4	12	6.7 ±0.05	2	16.5	97.4	32.5
7	3.5	8.5	M10x1	6	14	8.6 ±0.05	2.4	18.3	144.8	40
8	4	8.5	M12x1	8	16	10.4 ±0.1	2.4	20.75	133.3	40

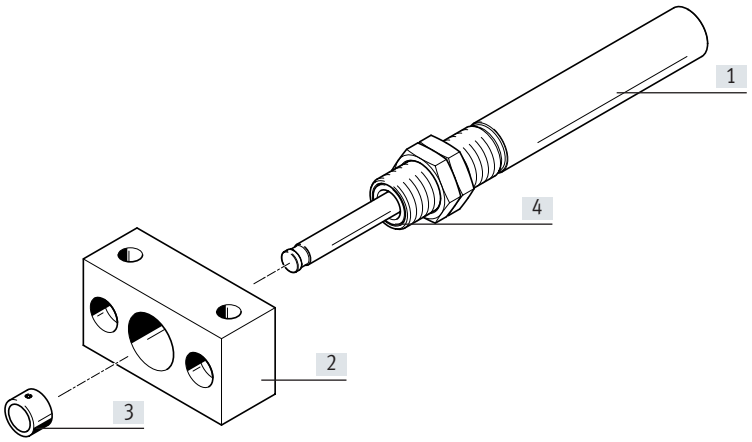
Size	L3	L4 +0.45/–0.1	L5 +0.5	L6 +0.1/–0.55	L7 +0.3	⌀G1	⌀G2	Max. tightening torque ⌀G1 [Nm]
5	8 +0.7/–0.55	21.6	5	4.4	0.5	10	7	7
7	10 +0.8/–0.55	21.1	6	4	0.5	13	9	9
8	14 +0.8/–0.55	33.6	8	4.4	0.5	15	11	11

Ordering data

Size	Part no.	Type
5	**192968**	**YSRWJ-5-8-A**
7	**192967**	**YSRWJ-7-10-A**
8	**192966**	**YSRWJ-8-14-A**

Peripherals overview and type codes

Peripherals overview



Accessories and special feature

	Type	Brief description	→ Page/Internet
[1]	Hydraulic cushioning cylinder DYHR	Hydraulic cushioning cylinder with spring return for slow feed speeds	46
[2]	Mounting flange YSRF	Mounting option for hydraulic cushioning cylinder	50
[3]	Buffer YSRP	For protecting the piston rod	52
[4]	Wiper seal; hardened piston rod	The wiper seal (prevents the ingress of dirt) and the hardened piston rod (protects against scratches) greatly increase the service life	–

Type codes

001	Series	
DYHR	Hydraulic cushioning cylinder	

002	Size	
16	16	
20	20	
25	25	
32	32	

003	Stroke	
20	20	
25	25	
40	40	
50	50	
60	60	

004	Geometric characteristics	
Y5	Internal hex for adjusting cushioning	

Data sheet

- Ø - Size
  16 ... 32
- | - Stroke length
  20 ... 60 mm

General technical data							
Size		16		20		25	32
Stroke	[mm]	20	40	25	50	40	60
Mode of operation		Hydraulic cushioning cylinder with spring return					
		Single-acting, pushing					
Braking speed		Adjustable					
Type of mounting		With lock nut					
Max. impact velocity	[m/s]	0.3					
Mounting position		Any					
Feed speed	[mm/s]	0.2 ... 100					
Product weight	[g]	190	255	360	440	720	1380
Ambient temperature	[°C]	0 ... +80					
Corrosion resistance class CRC[1)]		1					

1) Corrosion resistance class CRC 1 to Festo standard FN 940070
Low corrosion stress. Dry indoor application or transport and storage protection. Also applies to parts behind covers, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

Reset times [s]				
Size	16	20	25	32
Short stroke[1)]	≤ 0.4	≤ 0.5	≤ 0.8	≤ 1.2
Long stroke[1)]	≤ 0.8	≤ 1	–	–

1) Increased reset times must be expected at low temperatures (0°C). Up to 5 s for sizes 12 and 16, and up to 12 s for sizes 25 and 32.

Forces [N]				
Size	16	20	25	32
Min. feed force[1)]	160	250	400	640
Max. feed force[2)]	1600	2500	4000	6400
Resetting force[3)]	5.4	9	12.5	18

1) Minimum force required for constant and accurately reproducible braking speed
2) Corresponds to max. force in the end position
3) With piston rod extended

Energies [J]							
Size		16		20		25	32
Stroke	[mm]	20	40	25	50	40	60
Max. energy absorption per stroke		32	64	62.5	125	160	384
Max. energy consumption per hour		100000	150000	135000	200000	220000	330000
Max. residual energy in the end position		0.16		0.32		0.8	2

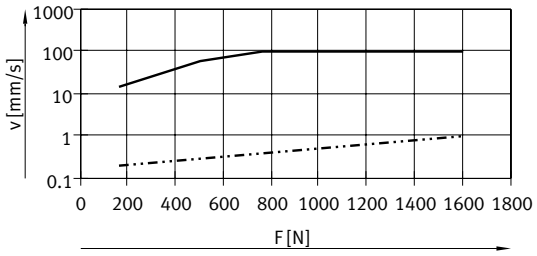
Data sheet

Materials

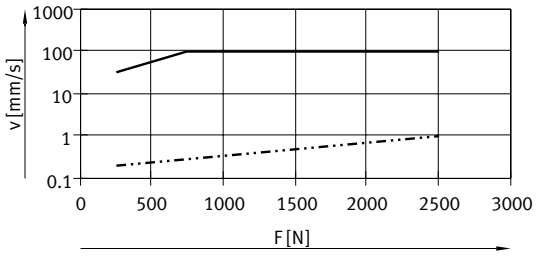
Hydraulic cushioning cylinder		
[1]	Piston rod	Hardened high-alloy steel
[2]	Housing	Galvanised steel
–	Seals	Nitrile rubber
	Note on materials	RoHS-compliant

Braking speed v as a function of drive force F and flow control valve setting

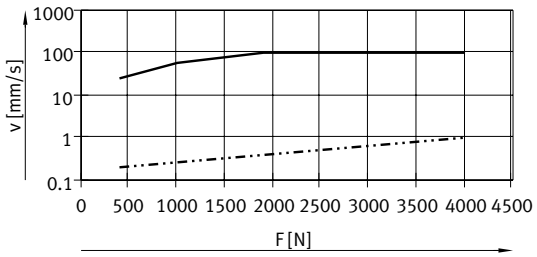
DYHR-16



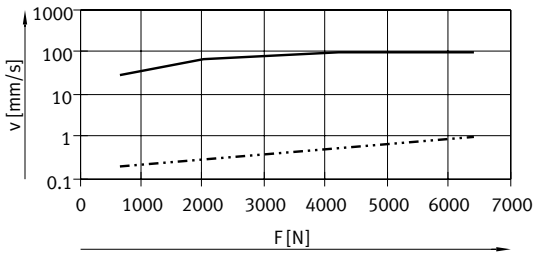
DYHR-20



DYHR-25



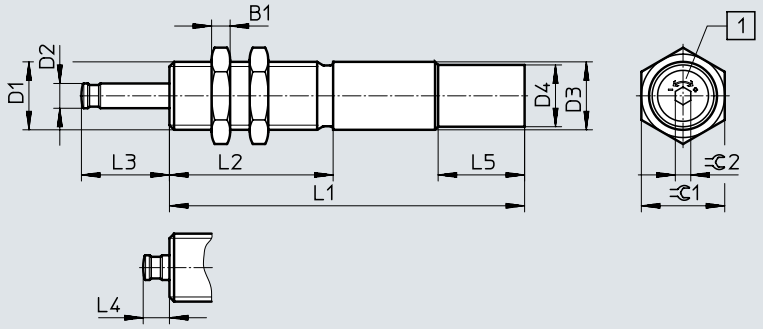
DYHR-32



Flow control valve open
Flow control valve closed

Data sheet

Dimensions Download CAD data ➔ www.festo.com



[1] Speed control

Size	Stroke [mm]	B1	D1	D2 ⌀	D3 ⌀ +0.15/–0.1	D4 ⌀ +0.15	L1
16	20	6	M20x1.25	8	20	–	115±0.1
	40						150±0.1
20	25	8	M24x1.25	10	24	–	138±0.1
	50						181±0.1
25	40	10	M30x1.5	12	30	28.8	178±0.1
32	60	12	M37x1.5	15	37	34.8	230±0.15

Size	Stroke [mm]	L2 ±0.1	L3	L4	L5 ±0.2	⊂1	⊂2
16	20	53	28.5+0.4/–0.3	8.5+0.45/–0.4	–	24	5
	40		48.5+0.4/–0.3				
20	25	60	35.6+0.4/–0.3	10.6+0.45/–0.4	–	30	5
	50		60.6+0.4/–0.3				
25	40	80	52.8+0.4/–0.3	12.8+0.45/–0.4	28	36	6
32	60	108	76+0.5/–0.4	16+0.5/–0.4	28	46	6

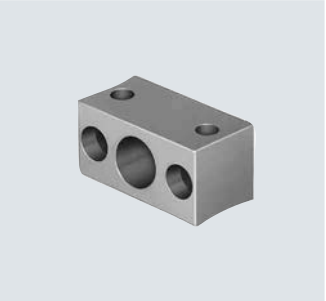
Ordering data

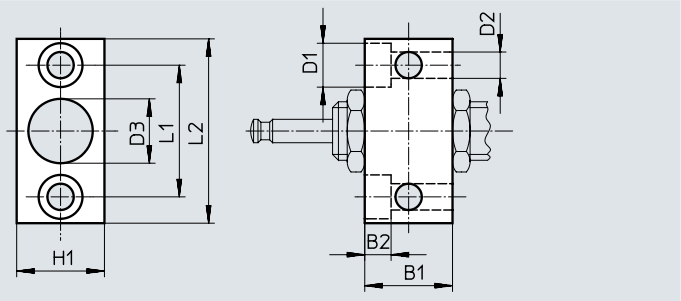
Size	Stroke [mm]	Part no.	Type
16	20	**1155690**	**DYHR-16-20-Y5**
	40	**1155691**	**DYHR-16-40-Y5**
20	25	**1155692**	**DYHR-20-25-Y5**
	50	**1155693**	**DYHR-20-50-Y5**
25	40	**1155694**	**DYHR-25-40-Y5**
32	60	**1155696**	**DYHR-32-60-Y5**

Data sheet

Mounting flange
YSRF/YSRF-C

Material:
Steel





Combination options

Cushioning components / Mounting flange	DYSR-...- Y5	Y5-T	YSR-C	YSRW	DYHR
YSRF					
YSRF-8	–	–	■[1]	■[1]	–
YSRF-12	■	–	–	–	–
YSRF-16	■	–	–	–	■
YSRF-20	■	–	–	–	■
YSRF-25	■	–	■	–	■
YSRF-32	■	–	■	–	■
YSRF-C					
YSRF-8-C	■	–	■	■	–
YSRF-12-C	–	■	■	■	–
YSRF-16-C	–	■	■	■	–
YSRF-20-C	–	■	■	■	–

1) For shock absorber size Ø 7

Dimensions and ordering data

YSRF

For size [mm]	B1	B2	D1	D2	D3	H1	L1	L2	CRC[1]	Weight [g]	Part no.	Type
8	16	5.5	10	5.5	10.2	16	25	38	2	50	**11681**	**YSRF-8**
12	25	6.8	11	6.6	15.2	25	36	50	2	175	**11682**	**YSRF-12**
16	30	9	15	9	20.2	30	45	63	2	300	**11683**	**YSRF-16**
20	36	11	18	11	24.2	36	56	78	2	535	**11684**	**YSRF-20**
25	45	13	20	13.5	30.2	45	63	86	2	895	**11685**	**YSRF-25**
32	55	15	24	15.5	37.2	55	80	108	2	1730	**11686**	**YSRF-32**

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

YSRF-C

For size [mm]	B1	B2	D1	D2	D3	H1	L1	L2	CRC[1]	Weight [g]	Part no.	Type
8	20	5.5	10	5.5	12.2	20	28	41	2	90	**34575**	**YSRF-8-C**
12	25	6.8	11	6.6	16.2	25	36	50	2	180	**34576**	**YSRF-12-C**
16	32	9	15	9	22.2	32	45	63	2	330	**34577**	**YSRF-16-C**
20	40	11	18	11	26.2	40	56	78	2	700	**34578**	**YSRF-20-C**

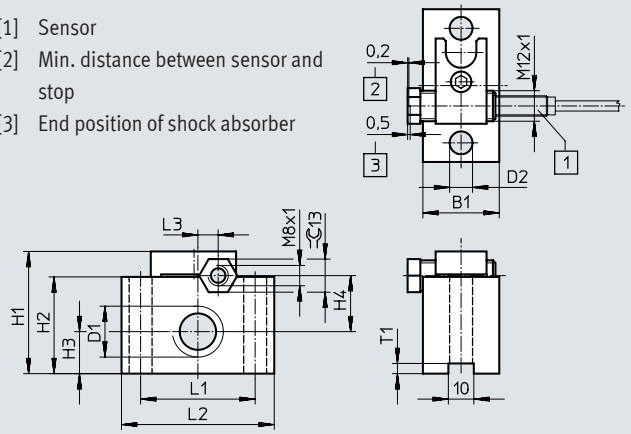
1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

Data sheet

Mounting flange YSRF-S-C

Material:
Aluminium, steel

[1] Sensor
[2] Min. distance between sensor and stop
[3] End position of shock absorber



Combination options

Cushioning components Mounting flange	YSR-C	YSRW
YSRF-S-8-C	■	■
YSRF-S-12-C	■	■
YSRF-S-16-C	■	■
YSRF-S-20-C	■	■

Dimensions and ordering data

For size [mm]	B1	D1	D2 Ø	H1	H2	H3	H4	L1	L2	L3	T1	Weight [g]	Part no.	Type
8	20	M12x1	5.5	35	25	9.5	16	32	45	4	2	12	**34579**	**YSRF-S-8-C**
12	25	M16x1	6.6	42	32	12.5	20	36	50	3	4	130	**34580**	**YSRF-S-12-C**
16	30	M22x1.5	9	48	38	16.5	22	45	60	8	4	180	**34581**	**YSRF-S-16-C**
20	30	M26x1.5	11	52	42	19	23.5	56	80	11.5	4	250	**34582**	**YSRF-S-20-C**

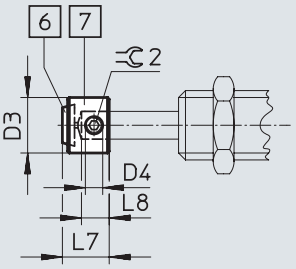
Note

Inductive sensors for position sensing ➔ page 54

Data sheet

Buffer YSRP

Material:
Steel, polyurethane



[6] Polyurethane insert
[7] Buffer

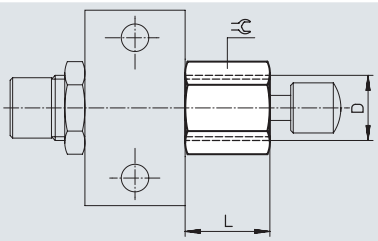
Dimensions and ordering data

For size [mm]	D3	D4	L7	L8	⊂ 2	CRC[1)]	Weight [g]	Part no.	Type
8	8	M2	6.7	4	0.9	2	4	**539638**	**YSRP-8**
12	12	M4	10	6	2	2	7	**11133**	**YSRP-12**
16	16	M5	13.5	8	2.5	2	15	**11134**	**YSRP-16**
20	20	M6	17	10	3	2	27	**11135**	**YSRP-20**
25	25	M8	20.5	12	4	2	52	**11136**	**YSRP-25**
32	32	M8	26	15	4	2	110	**11137**	**YSRP-32**

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

End stop limiter YSRA-C

Material:
Steel



Dimensions and ordering data

For size [mm]	D	L	⊂	Weight [g]	Part no.	Type
7	M10x1	14.5	13	12	**150932**	**YSRA-7-C**
8	M12x1	18	15	28	**150933**	**YSRA-8-C**
12	M16x1	24.5	19	48	**150934**	**YSRA-12-C**

Data sheet

Reducing sleeve DAYH

Material:
Niro steel

To improve cushioning characteristics at low load, the installed shock absorber can be replaced with the next size down shock absorber using the reducing sleeve.

Installed shock absorber	Part no.	Reducing sleeve	Part no.	Next size down shock absorber
YSR...-C				
YSR-5-5-C	**1165476**	**DAYH-4**	**540060**	**YSR-4-4-C**
DYSC...				
DYSC-8-8-Y1F	**1165484**	**DAYH-7**	**548012**	**DYSC-7-5-Y1F**
DYSC-7-5-Y1F	**1165480**	**DAYH-5**	**548011**	**DYSC-5-5-Y1F**
DYSW-...				
DYSW-12-20-Y1F	**1165491**	**DAYH-10**	**548074**	**DYSW-10-17-Y1F**
DYSW-10-17-Y1F	**1165488**	**DAYH-8**	**548073**	**DYSW-8-14-Y1F**
DYSW-8-14-Y1F	**1165484**	**DAYH-7**	**548072**	**DYSW-7-10-Y1F**
DYSW-7-10-Y1F	**1165480**	**DAYH-5**	**548071**	**DYSW-5-8-Y1F**
DYSW-5-8-Y1F	**1165476**	**DAYH-4**	**548070**	**DYSW-4-6-Y1F**

Ordering data – Proximity switch for T-slot, magneto-resistive

Data sheets → Internet: smt

	Type of mounting	Switching output	Electrical connection	Cable length [m]	Part no.	Type
N/O contact						
	Inserted in the slot from above, flush with the cylinder profile, short design	PNP	Cable, 3-wire	2.5	**574335**	**SMT-8M-A-PS-24V-E-2.5-OE**
			Plug M8x1, 3-pin	0.3	**574334**	**SMT-8M-A-PS-24V-E-0.3-M8D**
			Plug M12x1, 3-pin	0.3	**574337**	**SMT-8M-A-PS-24V-E-0.3-M12**
		NPN	Cable, 3-wire	2.5	**574338**	**SMT-8M-A-NS-24V-E-2.5-OE**
			Plug M8x1, 3-pin	0.3	**574339**	**SMT-8M-A-NS-24V-E-0.3-M8D**
N/C contact						
	Inserted in the slot from above, flush with the cylinder profile, short design	PNP	Cable, 3-wire	7.5	**574340**	**SMT-8M-A-PO-24V-E-7.5-OE**

Ordering data – Proximity switch for T-slot, magnetic reed

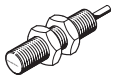
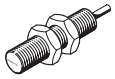
Data sheets → Internet: sme

	Type of mounting	Switching output	Electrical connection	Cable length [m]	Part no.	Type
N/O contact						
	Inserted in the slot from above, flush with the cylinder profile	Contacting	Cable, 3-wire	2.5	**543862**	**SME-8M-DS-24V-K-2.5-OE**
			Plug M8x1, 3-pin	0.3	**543861**	**SME-8M-DS-24V-K-0.3-M8D**
	Inserted in the slot lengthwise, flush with the cylinder profile	Contacting	Cable, 3-wire	2.5	**150855**	**SME-8-K-LED-24**
			Plug M8x1, 3-pin	0.3	**150857**	**SME-8-S-LED-24**
N/C contact						
	Inserted in the slot lengthwise, flush with the cylinder profile	Contacting	Cable, 3-wire	7.5	**160251**	**SME-8-O-K-LED-24**

Data sheet

Ordering data – Inductive sensors M8, for mounting flange YSRF-S-C

Data sheets ➔ Internet: sien

	Electrical connection		Switching output	LED	Cable length [m]	Part no.	Type
	Cable	Plug M8					
N/O contact							
	3-wire	–	PNP	■	2.5	**150386**	**SIEN-M8B-PS-K-L**
	–	3-pin	PNP	■	–	**150387**	**SIEN-M8B-PS-S-L**
N/C contact							
	3-wire	–	PNP	■	2.5	**150390**	**SIEN-M8B-PO-K-L**
	–	3-pin	PNP	■	–	**150391**	**SIEN-M8B-PO-S-L**

Ordering data – Connecting cables

Data sheets ➔ Internet: nebu

	Electrical connection, left	Electrical connection, right	Cable length [m]	Part no.	Type
	Straight socket, M8x1, 3-pin	Cable, open end, 3-wire	2.5	**541333**	**NEBU-M8G3-K-2.5-LE3**
			5	**541334**	**NEBU-M8G3-K-5-LE3**
	Angled socket, M8x1, 3-pin	Cable, open end, 3-wire	2.5	**541338**	**NEBU-M8W3-K-2.5-LE3**
			5	**541341**	**NEBU-M8W3-K-5-LE3**

Data sheet

This selection aid helps you determine the right shock absorber for every application.
When choosing the correct shock absorber, we recommend that you proceed as follows:

1. Determine the following at the moment of impact:
– Force (A)
– Equivalent mass m_{equiv}
– Impact velocity (v)
2. Select the shock absorber from the graphs on the following pages.
3. Check the selected shock absorber using the max. cushioning energy ($W_{max.}$)

When selecting a shock absorber for your application, you must ensure that the following values are not exceeded:

– Permissible energy utilisation per stroke:
$W_{min.}$ = 25%
$W_{max.}$ = 100%
– Recommended energy utilisation per stroke:
$W_{opt.}$ = 50% ... 100%
– Max. energy absorption per hour
– Max. residual energy
– Max. stop force in the end position

The (angular) speed used in the formulas is the speed on impact with the shock absorber. This depends on the dynamic performance of the drive component and can thus only be determined with difficulty.

It is better to determine the average speed ($v_m = s/t$ or $\omega_m = \varphi/t$).

To prevent damage to the drive, for safety reasons the following values should be used for calculation:
$v = 1.25 \ldots 2\ v_m$
$\omega = 1.25 \ldots 2\ \omega_m$
Typical values for linear movements:
Factor of 2 for strokes ‹ 50 mm,
Factor of 1.5 for strokes › 50 mm and ‹ 100 mm,
Factor of 1.25 for strokes › 100 mm.

As the (angular) speed is squared in the calculation, the expected error increases considerably. The calculation can therefore only be taken into consideration as an approximate figure. However, the safety factor ensures that it is not possible to select a shock absorber that is too small.

The following formulas are required for the calculation:

$A = F + G$
$A = F + m \times g \times \sin \alpha$
$W_{total} = 1/2 \times m \times v^2 + A \times s \leq W_{max.}$
$W_h = W_{total} \times \text{strokes / hour} \leq W_{hmax.}$

The following applies in addition for rotary motion:

$m_{equiv.} = 1/R^2$
$v = w \times R$
$A = M/R + m \times g \times \sin \alpha \times a/R$

The following abbreviations are used:

A = Additional force = F + G [N]
F = Cylinder force minus frictional force [N]
G = Weight force
= m x g x sin α

Special cases:
α = 0°: Horizontal movement
G = 0
α = 90°: Downward movement
G = m x g
α = 90°: Upward movement
G = –m x g

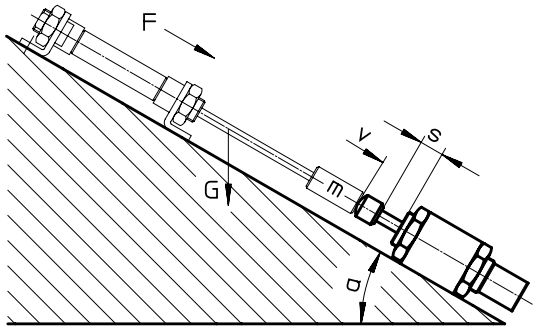
v = Impact velocity [m/s]
$m_{equiv.}$ = Equivalent mass [kg]
g = Acceleration due to gravity 9.81 [m/s²]
s = Shock absorber stroke [m]
α = Impact angle [°]
W_{total} = Cushioning work/stroke [J]
W_h = Cushioning work/hour [J]

J = Mass moment of inertia [kg x m²]
R = Distance between the pivot point of mass and shock absorber [m]
ω = Angular speed [rad/s]
M = Drive torque [Nm]
a = Distance between the centre of gravity of mass and the pivot point

Data sheet

Sizing example for linear motion

The procedure for selecting a shock absorber is illustrated using the adjacent diagram an example:



m = 50 kg
v = 1.5 m/s
α = 45°
F = 190 N

(Ø 20 mm for p = 6 bar, 1800 strokes per hour)

A = F + m x g x sin α
= 190 N + 50 x 9.81 x sin α
= 537 N

$m_{equiv.}$ = m = 50 kg

When selecting the shock absorbers from the graphs (see data sheets), the curve immediately to the right of the point of intersection of the equivalent mass ($m_{equiv.}$) and the impact velocity (v) determines the force (A). The curves move to the left as the additional force increases.
Three force curves are shown for each shock absorber. An average must be taken for intermediate values. As the graphs show (solid line), shock absorbers DYSR-25-40 and YSR-25-40-C can be considered here.
It is yet to be determined whether the permissible cushioning work ($W_{max.}$) and the cushioning work per hour ($W_{hmax.}$) have been exceeded. The max. permissible values and the stroke length (s) can be found in the tables (below the graphs).

Test:

W_{total} = 1/2 x m x v^2 + A x s
= (1/2 x 50 x 1.5^2 + 537 x 0.04) Nm = 78 J

W_h = W_{total} x strokes/h
= 78 Nm x 1 800
= 140 000 J

Both shock absorbers are suitable for the above application.
Additional selection criteria include possibility of adjustment, and size.

Result

	DYSR-25-40	YSR-25-40-C
W_{total}	78 J	78 J
W_h	140000 J	140000 J
$W_{max.}$ [1)]	160 J > W_{total}	160 J > W_{total}
$W_{hmax.}$	220000 > $W_{max.}$	150000 > $W_{max.}$

1) In both cases, utilisation is 49%.

Data sheet

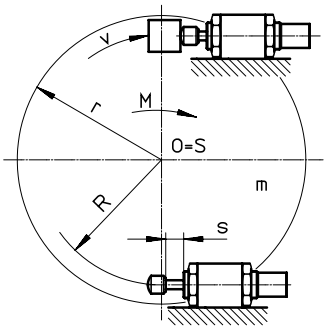
Sizing example for rotary motion

Example for rotary motion:

$m_{equiv.}$ = J/R^2 = 8 kg

v = ω x R

A = M/R = 40 N



J = 2 kg m^2

ω = 4 rad/s

R = 0.5 m

M = 20 Nm

900 strokes per hour

When selecting the shock absorbers from the graphs (see data sheets), the curve immediately to the right of the point of intersection of the equivalent mass ($m_{equiv.}$) and the impact velocity (v) determines the force (A). The curves move to the left as the additional force increases. Three force curves are shown for each shock absorber. An average must be taken for intermediate values. As the graphs show (dashed line), shock absorbers DYSR-16-20 and YSR-16-20-C are can be considered.

It is yet to be determined whether the permissible cushioning work ($W_{max.}$) and the cushioning work per hour ($W_{hmax.}$) have been exceeded. The max. permissible values and the stroke length (s) can be found in the tables (below the graphs).

Comment: For rotary applications, the impact angle must be taken into account.

Test:

W_{total} = 1/2 x m x v^2 + A x s

= (1/2 x 8 x 2^2 +

40 x 0.02) J = 17 J

W_h = W_{total} x strokes/h

= 17 J x 900

= 15 300 J

Both shock absorbers are suitable for the above application.

Additional selection criteria include possibility of adjustment, and size.

Result

	DYSR-16-20[3]	YSR-16-20-C
W_{total}	17 J	17 J
W_h	15 300 J	15 300 J
$W_{max.}$	32 J > W_{total}[1]	30 J > W_{total}[2]
$W_{hmax.}$	100000 > $W_{max.}$	64000 > $W_{max.}$

1) Utilisation is 53%.

2) Utilisation is 57%.

3) Operated without buffer.

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