

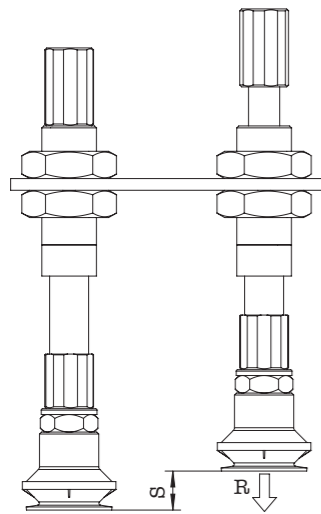
Telescopic rod features

- Spring shock absorption and height compensation ensure flexible contact when handling delicate workpieces, especially for the electronics industry and injection molded end pickers.
- The suspensions (or buffers, or level compensators) are used to keep the suction cups in position as the robot approaches.
- They are typically mounted on EOATs (End Of Arm Toolings) with OFI brackets.

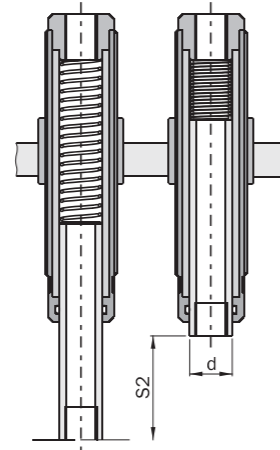
Reaction force

- The reaction force depends on the compression (S) of the internal spring. And also on the piston diameter (d) and operation pressure (p), in the case of telescopic suspensions.

$$R = R1 + K \cdot S + d^2 \cdot \frac{\pi}{40} \cdot p$$



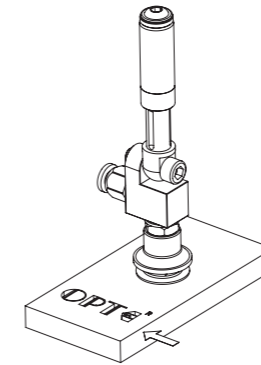
- R [N] Reaction force
- R1 [N] Spring force at the beginning
- K [N/mm] Spring rate
- S [mm] Compression stroke
- d [mm] Piston bore



- p [bar] Pressure
- R2 [N] Spring force at the end-stroke
- S2 [mm] Maximum stroke
- m [g] Weight

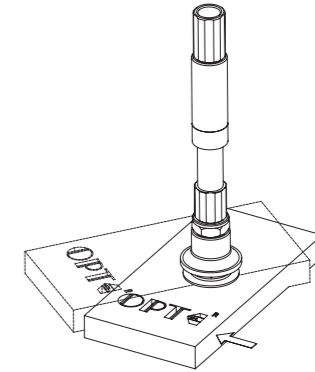
Suspensions series

Non-rotative suspensions



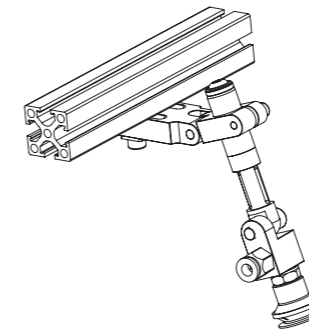
- OSE
- OSET
- OSN
- OSNT
- OSD
- OSDT

Rotative suspensions



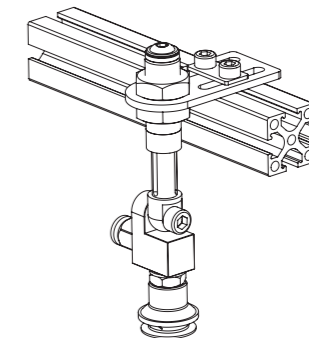
- OSR
- OSRT

Suspensions with smooth body



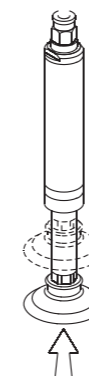
- OSR
- OSE
- OSN
- OSD

Suspensions with threaded body



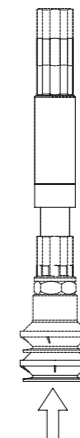
- OSRT
- OSET
- OSNT
- OSDT

Telescopic suspensions



- OSE
- OSN
- OSD

Through rod suspensions



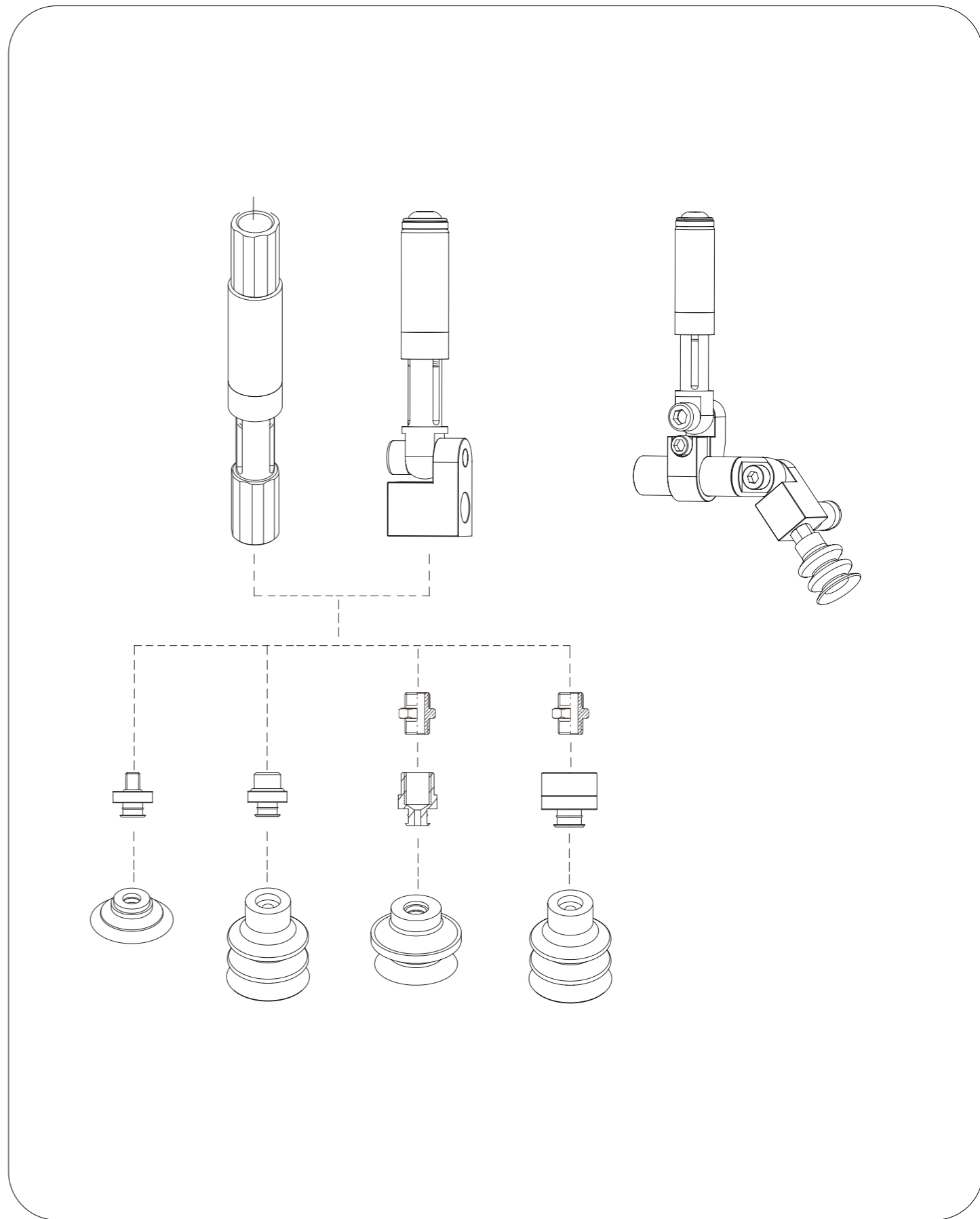
- OSR
- OSRT
- OSE
- OSET
- OSN
- OSNT
- OSD
- OSDT

Spring loaded suspension rod

Spring loaded suspension rod



Code	Diameter	Stroke	Thread
OSR	10 : Φ 10mm	10 : 10mm	
OSRT	14 : Φ 14mm	20 : 20mm	F05 : M5
OSN	20 : Φ 20mm	25 : 25mm	F14 : 1/4
OSNT		35 : 35mm	F18 : 1/8
OSRTG		50 : 50mm	
OSS			
OSD			
OSDT			
OSE			
OSET			

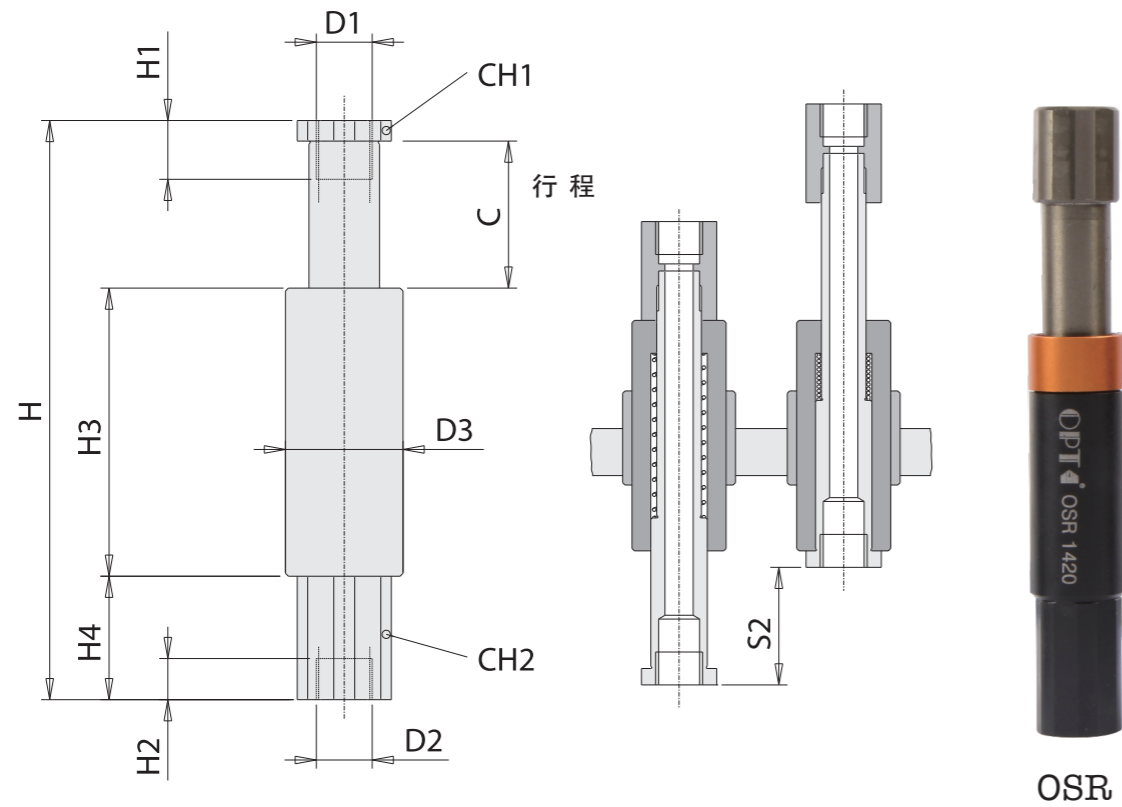


Spring loaded suspension rod

Spring loaded suspension rod

Smooth-body rotative suspensions

- Body and rod in anodized aluminum;
- Rotative rod;
- Pressure range:-1÷8bar;
- FDA-H1 food-grade grease.

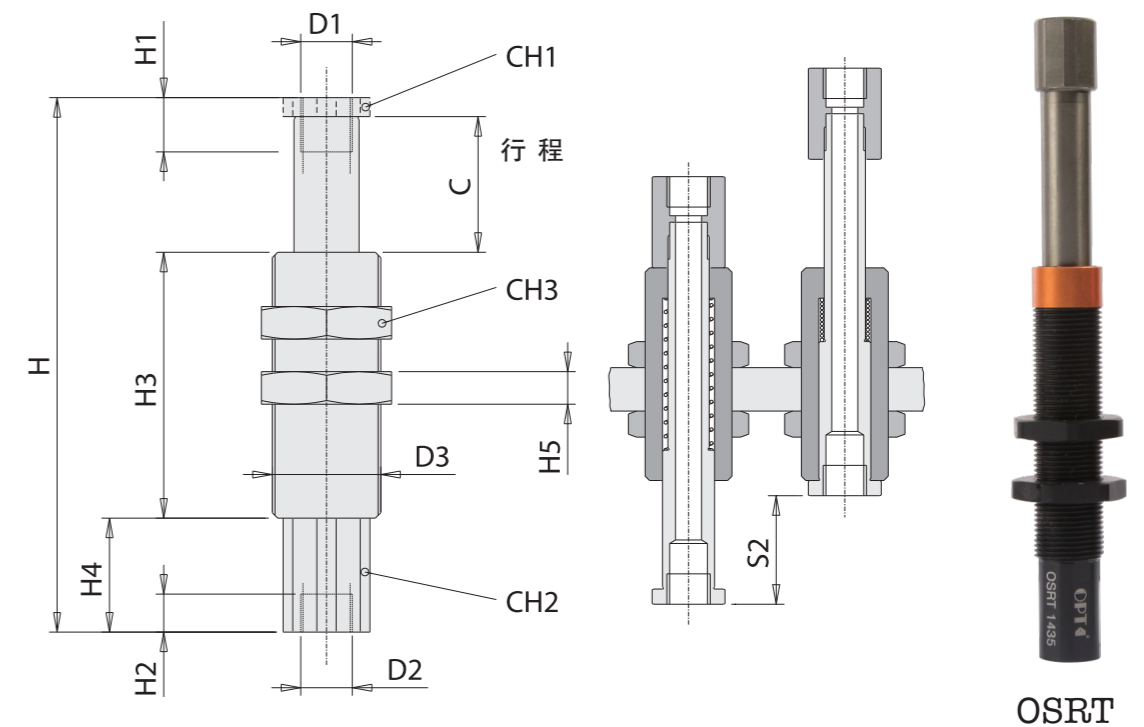


OSR

Model	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	D1	D2	D3	CH1 (mm)	CH2 (mm)	C (mm)	S2 (mm)	D (mm)	K (N/mm)	R1 (N)	R2 (N)	M (g)
OSR1010	51	6	5	21	17	M5	M5	Φ10	8	8	10	10	0	0.213	1.490	3.619	7
OSR1025	85.5	6	5	40.5	17	M5	M5	Φ10	8	8	25	25	0	0.085	1.575	3.704	11
OSR1420	92.5	10	7	38.5	20	G/8"	G/8"	Φ14	12	12	20	20	0	0.268	3.617	8.975	23
OSR1435	127.5	10	7	58.5	20	G/8"	G/8"	Φ14	12	12	35	35	0	0.150	4.267	9.507	32
OSR2025	98.5	10	7	49	21	G/8"	G/8"	Φ20	16	16	25	25	0	0.275	4.131	11.02	50
OSR2050	156	10	7	81.5	21	G/8"	G/8"	Φ20	16	16	50	50	0	0.141	4.308	11.37	77

Threaded-body rotative suspensions

- Body and rod in anodized aluminum;
- Rotative rod;
- Pressure range:-1÷8bar;
- FDA-H1 food-grade grease.



OSRT

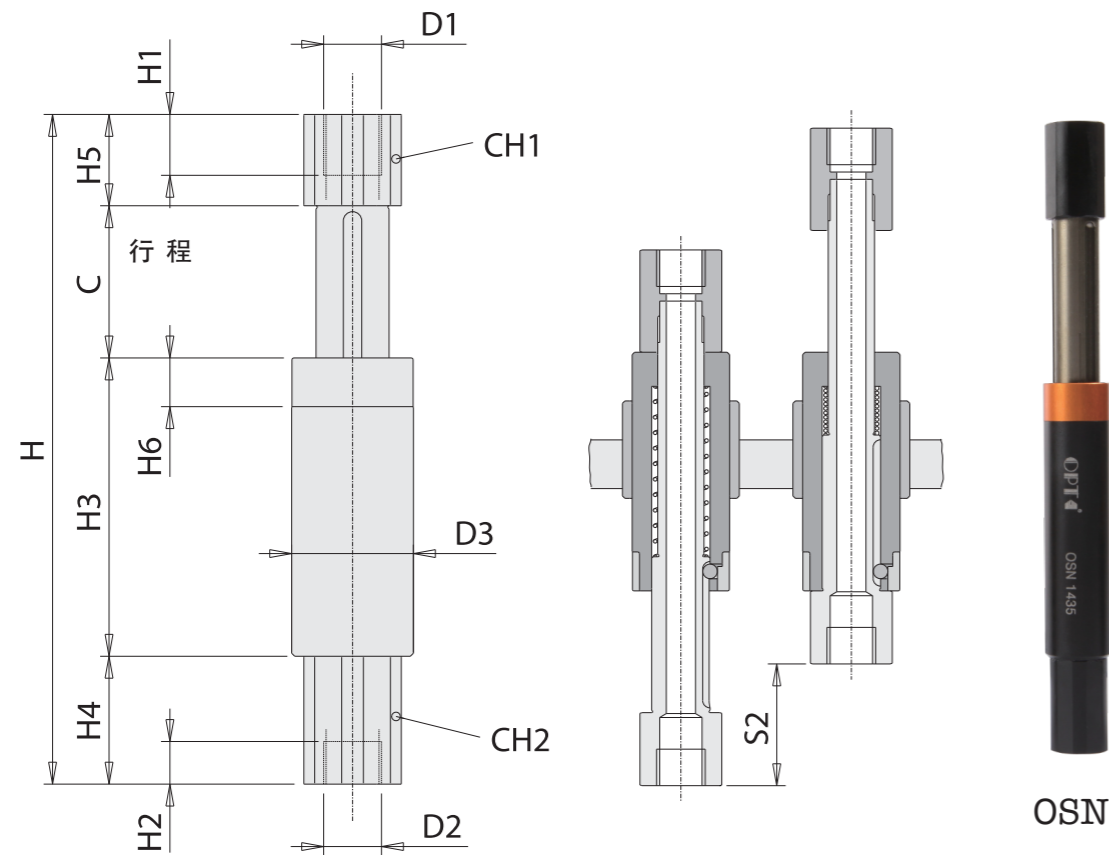
Model	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	D1	D2	D3	CH1 (mm)	CH2 (mm)	CH3 (mm)	C (mm)	S2 (mm)	D (mm)	K (N/mm)	R1 (N)	R2 (N)	M (g)
OSRT1010	51	6	5	21	17	3.5	M5	M5	M10X1	8	8	8	10	10	0	0.213	1.490	3.619	11
OSRT1025	85.5	6	5	40.5	17	3.5	M5	M5	M10X1	8	8	8	25	25	0	0.085	1.575	3.704	16
OSRT1420	92.5	10	7	38.5	20	4	G/8"	G/8"	M14X1.5	12	12	12	20	20	0	0.268	3.617	8.975	32
OSRT1435	127.5	10	7	58.5	20	4	G/8"	G/8"	M14X1.5	12	12	12	35	35	0	0.150	4.267	9.507	42
OSRT2025	98.5	10	7	49	21	6	G/8"	G/8"	M20X1.5	16	16	16	25	25	0	0.275	4.131	11.02	70
OSRT2050	156	41	7	81.5	21	6	G/8"	G/8"	M20X1.5	16	16	16	50	50	0	0.141	4.308	11.37	104

Spring loaded suspension rod

Spring loaded suspension rod

Smooth-body non-rotative telescopic suspensions

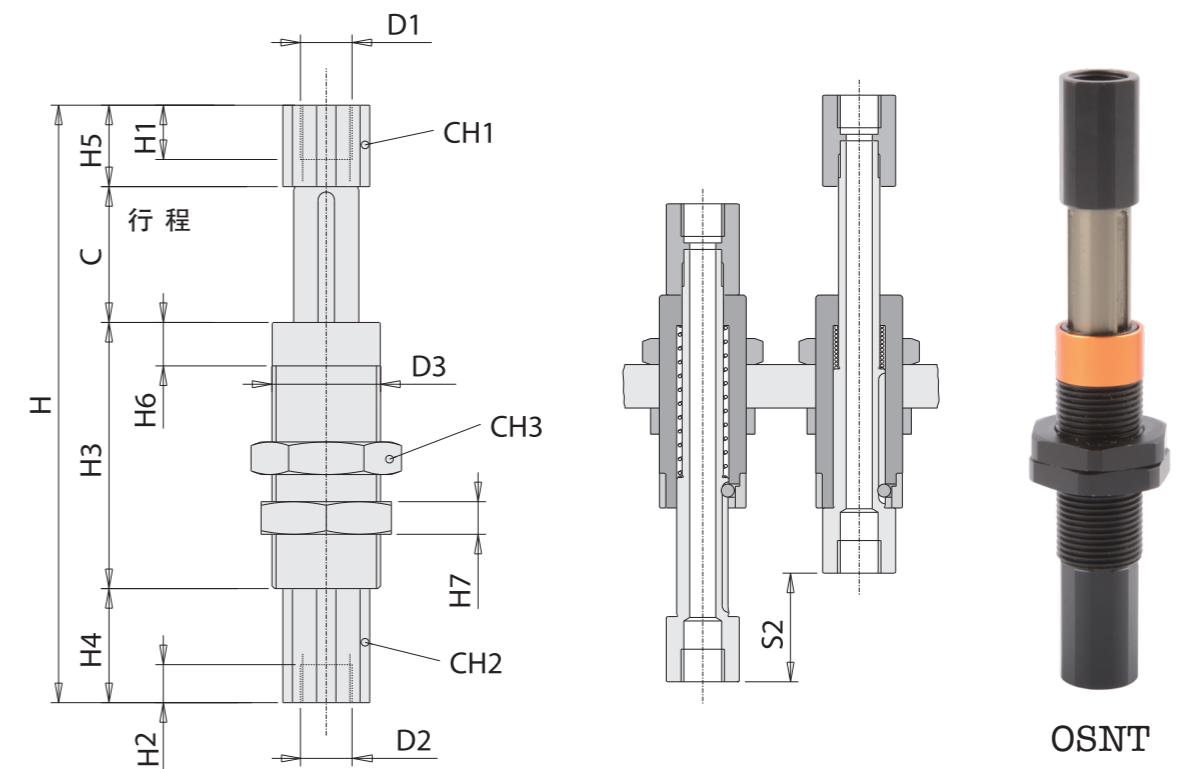
- Body and rod in anodized aluminum;
- Non-rotative rod with high load capability;
- Pressure range: -1÷8 bar;
- FDA-H1 food-grade grease.



Model	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	H6 (mm)	D1	D2	D3	CH1 (mm)	CH2 (mm)	C (mm)	S2 (mm)	D (mm)	K (N/mm)	R1 (N)	R2 (N)	M (g)
OSN1010	56	6	5	21	17	8	5	M5	M5	Φ10	8	8	10	10	0	0.213	1.490	3.619	7
OSN1025	90.5	6	5	40.5	17	8	5	M5	M5	Φ10	8	8	25	25	0	0.085	1.575	3.704	11
OSN1420	98.5	10	7	38.5	20	20	7	G/8"	G/8"	Φ12	12	12	20	20	0	0.268	3.617	8.975	24
OSN1435	133.5	10	7	58.5	20	20	7	G/8"	G/8"	Φ12	12	12	35	35	0	0.150	4.267	9.507	33
OSN2025	114	10	7	49	21	15	8	G/8"	G/8"	Φ14	16	16	25	25	0	0.275	4.131	11.02	54
OSN2050	171.5	10	7	81.5	21	15	8	G/8"	G/8"	Φ14	16	16	50	50	0	0.141	4.308	11.37	80

Threaded-body non-rotative telescopic suspensions

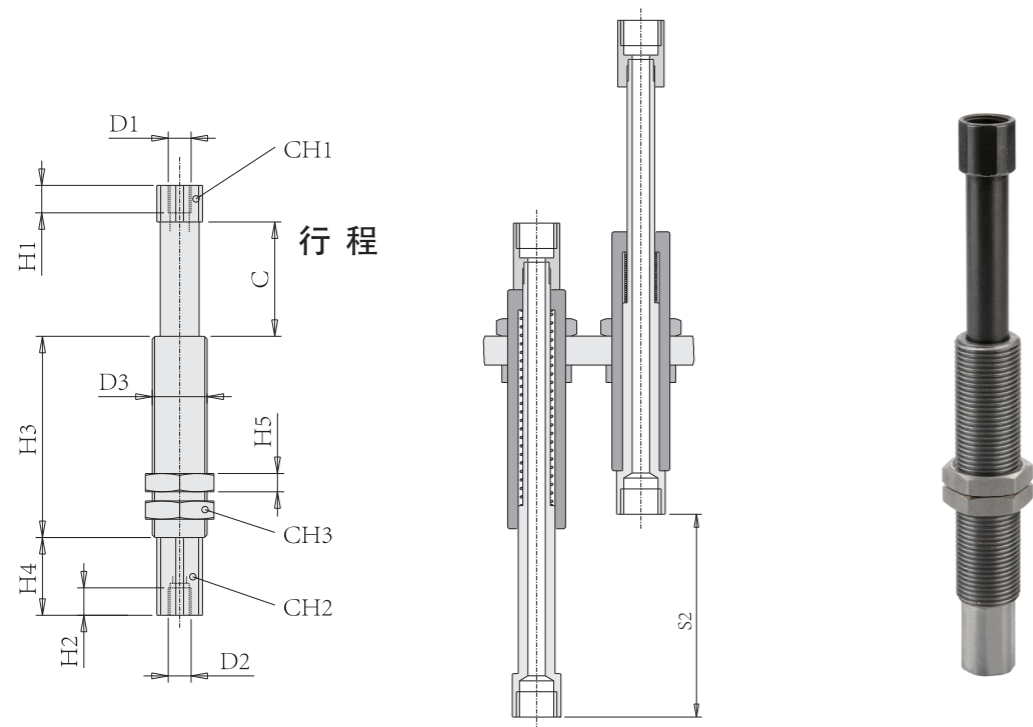
- Body and rod in anodized aluminum;
- Non-rotative rod with high load capability;
- Pressure range: -1÷8 bar;
- FDA-H1 food-grade grease.



Model	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	H6 (mm)	H7 (mm)	D1	D2	D3	CH1 (mm)	CH2 (mm)	CH3 (mm)	C (mm)	S2 (mm)	D (mm)	K (N/mm)	R1 (N)	R2 (N)	M (g)
OSNT1010	56	6	5	21	17	8	5	3.5	M5	M5	M10x1	8	8	13	10	10	0	0.213	1.490	3.619	7
OSNT1025	90.5	6	5	40.5	17	8	5	3.5	M5	M5	M10x1	8	8	13	25	25	0	0.085	1.575	3.704	11
OSNT1420	98.5	10	7	38.5	20	20	7	3.5	G/8"	G/8"	Φ12	12	12	13	20	20	0	0.268	3.617	8.975	24
OSNT1435	133.5	10	7	58.5	20	20	7	3.5	G/8"	G/8"	Φ12	12	12	13	35	35	0	0.150	4.267	9.507	33
OSNT2025	110	10	7	49	21	15	8	3.5	G/8"	G/8"	Φ14	16	16	13	25	25	0	0.275	4.131	11.02	54
OSNT2050	167.5	10	7	81.5	21	15	8	3.5	G/8"	G/8"	Φ14	16	16	13	50	50	0	0.141	4.308	11.37	80

Rotative stainless suspensions with threaded body

- Body, rod and spring in stainless steel;
- Rotative rod;
- FDA-H1 food-grade grease;
- Pressure range: -1÷8 bar.

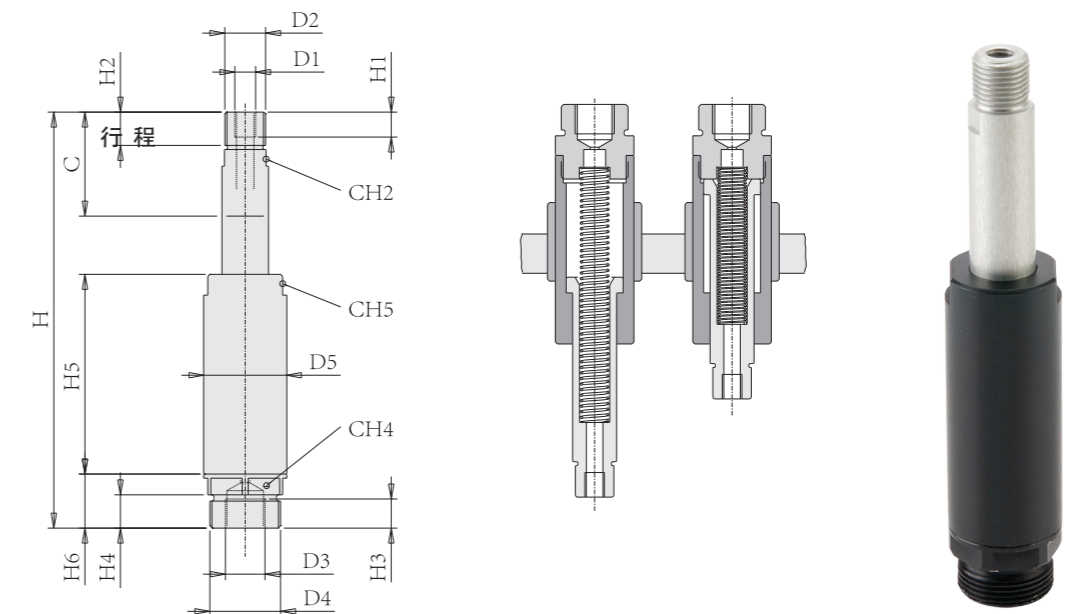


OSRTG

Model	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	D1	D2	D3	CH1 (mm)	CH2 (mm)	CH3 (mm)	C (mm)	S2	D (mm)	K (N/mm)	R1 (N)	R2 (N)	M (g)
OSRTG1025	90	6	5	40.5	17	8	M5	M5	M10x1	8	8	8	25	25	0	0.085	1.58	3.71	50
OSRTG1435	133.5	10	7	58.5	20	20	G1/8" G1/8"	M14x1	M14x1	12	12	12	35	35	0	0.15	3.62	9.51	110
OSRTG2050	167.5	10	7	81	21	15	G1/8" G1/8"	M20x1.5	M20x1.5	16	16	13	50	50	0	0.141	4.31	11.37	220

Telescopic self-retracting suspensions

- Body and rod in anodized aluminum;
- Sealing with no seals;
- Only for vacuum applications;
- When the cup takes a part, the vacuum on the internal piston overtakes the spring force and moves the rod up;
- The speed of the retraction movement can be adjusted by a standard throttle valve;
- When the vacuum is removed the part is released and the internal spring resets the rod;
- Pressure range: -1÷0 bar;
- FDA-H1 food-grade grease.



OSS

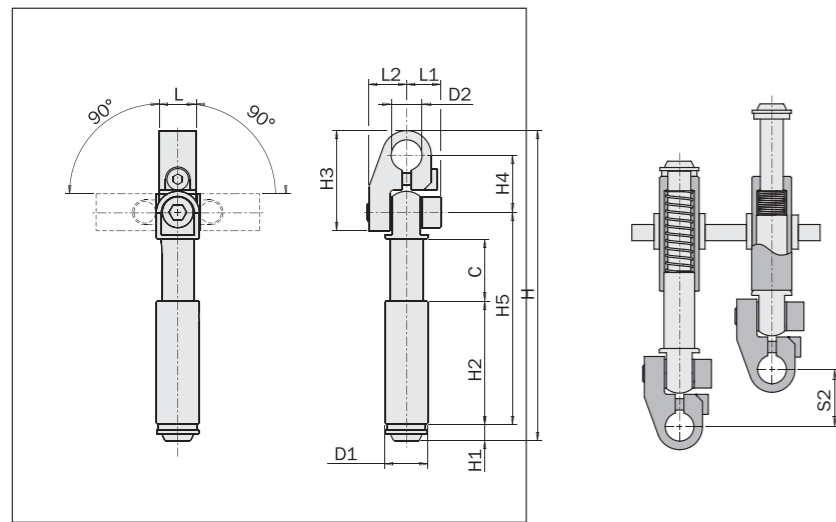
Model	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	H6 (mm)	D1	D2	D3	D4	D5	CH2 (mm)	CH4 (mm)	CH5 (mm)	C (mm)	S2	D (mm)	K (N/mm)	R1 (N)	R2 (N)	M (g)
OSS2025	100	6	8	8	8	48	13	M5	G1/8"	G1/8"	M17x1	Φ20	10	18	18	25	25	14.5	0.085	1.525	3.642	40
OSS2050	150	6	8	8	8	73	13	M5	G1/8"	G1/8"	M17x1	Φ20	10	18	18	50	50	14.5	0.052	1.606	4.197	55

Spring loaded suspension rod

Spring loaded suspension rod

Non-rotative suspensions with smooth-body and adjustable clamp

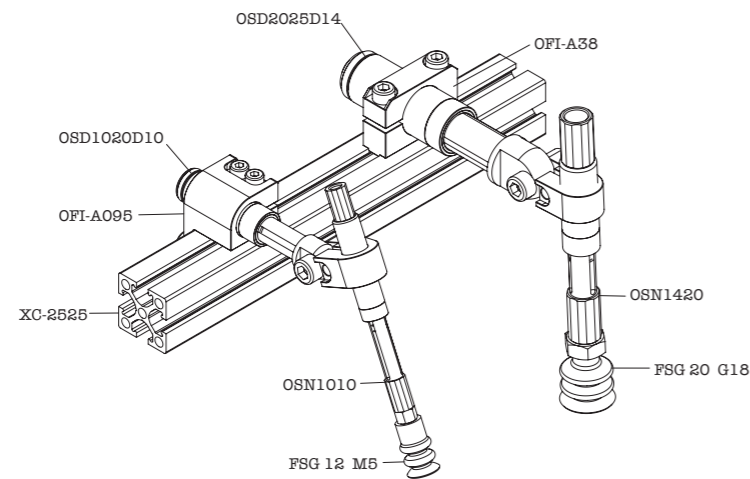
- It is possible to set continuously the angle between 0° and +/-90° ;
- External air feeding ;
- Body and rod in anodized aluminum ;
- Non-rotative rod ;
- FDA-H1 food-grade grease.



OSD

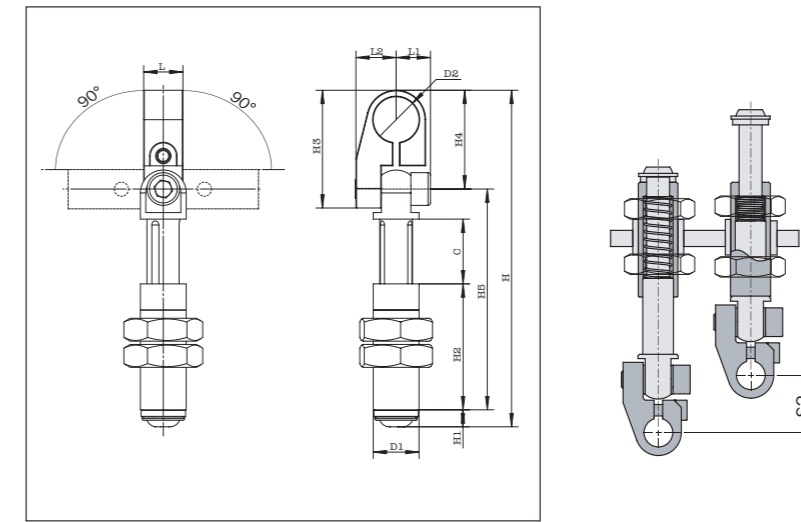
Model	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	D1	D2	L (mm)	L1 (mm)	L2 (mm)	C (mm)	S2	D (mm)	K (N/mm)	R1 (N)	R2 (N)	M (g)
OSD1420D10	100.6	5.3	40	32.5	18.5	67.3	Φ14	Φ10	12	11.3	12.3	20	20	0	0.268	3.617	8.975	43
OSD2025D10	119.8	6.3	50	32.5	18.5	86	Φ20	Φ10	12	11.3	12.3	25	25	0	0.275	4.131	11.02	69
OSD2025D20	131.8	6.3	50	46.5	25	86	Φ20	Φ10	16	13.5	13.5	25	25	0	0.275	4.131	11.02	85

Application example



Non-rotative suspensions with Threaded-body and adjustable clamp

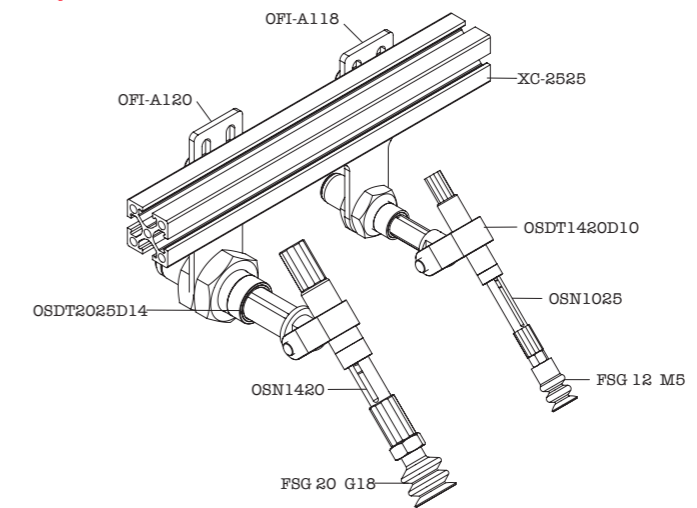
- It is possible to set continuously the angle between 0° and +/-90° ;
- External air feeding ;
- Body and rod in anodized aluminum ;
- Non-rotative rod ;
- FDA-H1 food-grade grease.



OSDT

Model	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	D1	D2	L (mm)	L1 (mm)	L2 (mm)	C (mm)	S2	D (mm)	K (N/mm)	R1 (N)	R2 (N)	M (g)
OSDT1420D10	100.6	5.3	40	32.5	18.5	67.3	Φ14	Φ10	12	11.3	12.3	20	20	0	0.268	3.617	8.975	43
OSDT2025D10	119.8	6.3	50	32.5	18.5	86	Φ20	Φ10	12	11.3	12.3	25	25	0	0.275	4.131	11.02	69
OSDT2025D20	131.8	6.3	50	46.5	25	86	Φ20	Φ10	16	13.5	13.5	25	25	0	0.275	4.131	11.02	85

Application example

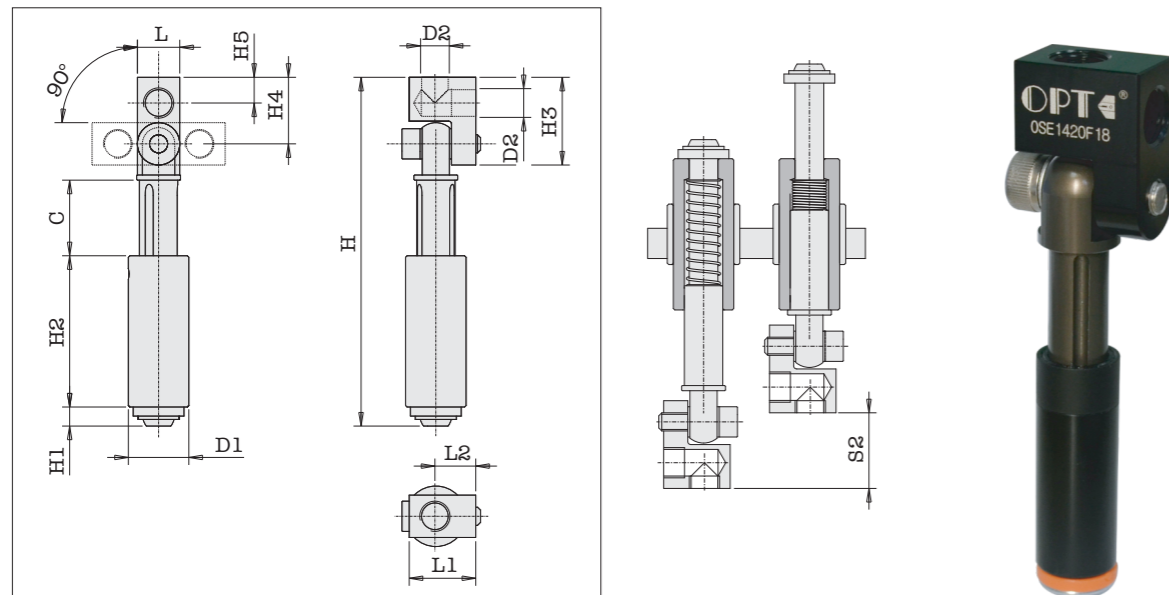


Spring loaded suspension rod

Spring loaded suspension rod

Smooth-body non-rotative suspensions with integral elbow arms

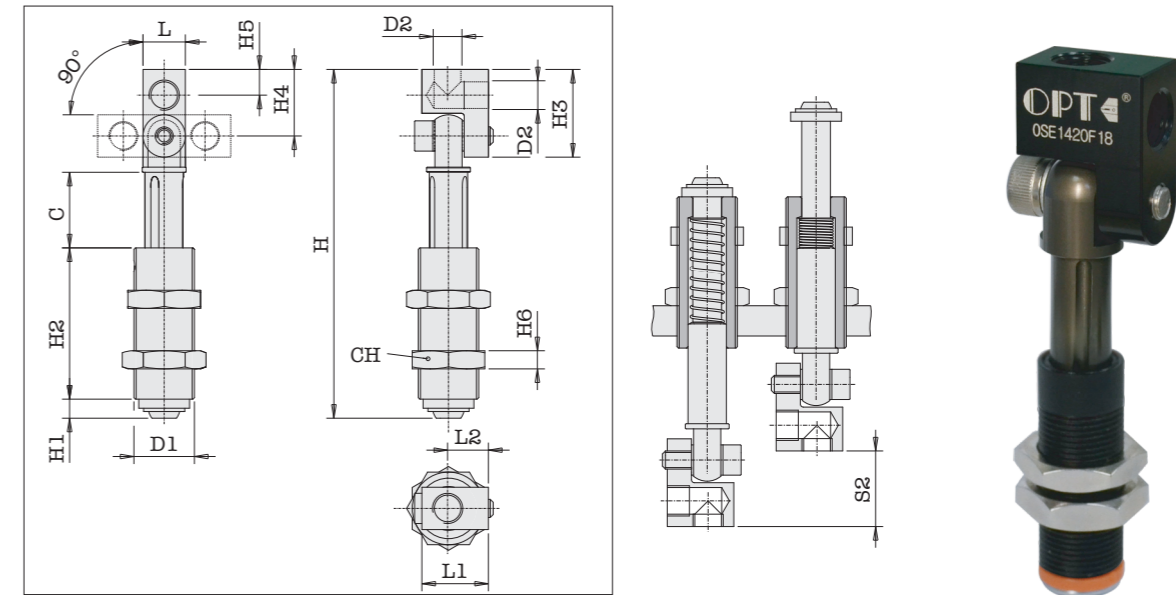
- It is possible to set continuously the angle between 0° and +/-90°
- External air feeding ;
- Body and rod in anodized aluminum ;
- Non-rotative rod with high load capability ;
- Pressure range: -1 ÷ 8 bar ;
- FDA-H1 food-grade grease.



OSE

Threaded-body non-rotative suspensions with integral elbow arms

- It is possible to set continuously the angle between 0° and +/-90°
- External air feeding.
- Body and rod in anodized aluminum.
- Non-rotative rod with high load capability.
- Pressure range: -1 ÷ 8 bar.
- FDA-H1 food-grade grease.



OSET

Model	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	D1 (mm)	D2 (mm)	L (mm)	L1 (mm)	L2 (mm)	C (mm)	S2 (mm)	d (mm)	K (mm)	R1 (mm)	R2 (mm)	Weight
OSE1010F05	56.7	3.3	22.5	19	14	5.5	Ø10	M5	10	16.5	11	10	10	0	0.106	0.957	2.020	15g
OSE1025F05	91	3.3	42	19	14	5.5	Ø10	M5	10	16.5	11	25	25	0	0.138	3.100	6.545	20g
OSE1420F18	96.1	5.3	40	29	22	8.5	Ø14	G1/8"	14	22	13.5	20	20	0	0.268	3.617	8.975	45g
OSE1435F18	131.1	5.3	60	29	22	8.5	Ø14	G1/8"	14	22	13.5	35	35	0	0.150	4.267	9.507	55g
OSE2025F18	13.2	6.3	50	29	22	8.5	Ø20	G1/8"	14	22	13.5	25	25	0	0.275	4.131	11.02	70g
OSE2025F14	126.4	6.3	50	38	28	12	Ø20	G1/4"	20	27	15	25	25	0	0.275	4.131	11.02	90g
OSE2050F18	170.7	6.3	82.5	29	22	8.5	Ø20	G1/8"	14	22	13.5	50	50	0	0.141	4.308	11.37	105g
OSE2050F14	183.7	6.3	82.5	38	28	12	Ø20	G1/4"	20	27	15	50	50	0	0.141	4.308	11.37	120g

Model	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	H6 (mm)	D1 (mm)	D2 (mm)	L (mm)	L1 (mm)	L2 (mm)	C (mm)	CH (mm)	S2 (mm)	d (mm)	K (mm)	R1 (mm)	R2 (mm)	Weight
OSET1010F05	56.3	3.3	22.5	19	14	5.5	3.5	M10x1	M5	10	16.5	11	10	13	10	0	0.213	1.490	3.619	18g
OSET1025F05	90.8	3.3	42	19	14	5.5	3.5	M10x1	M5	10	16.5	11	25	13	25	0	0.085	1.575	3.704	23g
OSET1620F18	96.1	5.3	40	29	22	8.5	5	M16x1	G1/8"	14	22	13.5	20	19	20	0	0.268	3.617	8.975	57g
OSET1635F18	131.1	5.3	60	29	22	8.5	5	M16x1	G1/8"	14	22	13.5	35	19	35	0	0.150	4.267	9.507	70g
OSET2025F18	115.3	6.3	50	29	22	8.5	6	M20x1.5	G1/8"	14	22	13.5	25	24	25	0	0.275	4.131	11.02	88g
OSET2025F14	121.3	6.3	50	38	28	12	6	M20x1.5	G1/4"	20	27	15	25	24	25	0	0.275	4.131	11.02	109g
OSET2050F18	172.8	6.3	82.5	29	22	8.5	6	M20x1.5	G1/8"	14	22	13.5	50	24	50	0	0.141	4.308	11.37	125g
OSET2050F14	178.8	6.3	82.5	38	28	12	6	M20x1.5	G1/4"	20	27	15	50	24	50	0	0.142	4.308	11.37	142g