

# ROUND WIRE COIL SPRINGS

—WR (60% DEFLECTION) · WF (45% DEFLECTION)—



Order

Catalog No.

WR13—60



Days to Ship

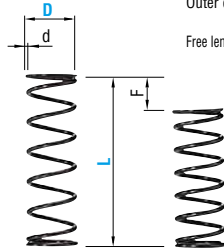
**Quotation**



Price

**Quotation**

WR  
WF



Spring constant  $\pm 10\%$   
Outer dia. D  $\phi 10$  or less  $-0.5mm$   
 $\phi 12$  or more  $-0.8mm$   
Free length L 50 or less  $\pm 1.5mm$   
55 or more  $\pm 2.5mm$



SWP-A

Spring constant

D	Type	WY	WR	WF	WL	WT	WM	WH	WB
2	3	N/mm 0.1 (kgf/mm) (0.01)	N/mm 0.3 (kgf/mm) (0.03)	N/mm 0.5 (kgf/mm) (0.05)	N/mm 1.0 (kgf/mm) (0.1)	1.5 (0.15)	2.0 (0.2)	2.9 (0.3)	3.9 (0.4) 4.9 (0.5)
4	4								
5	5								
6	6								
8	8								
10	10								
12	12								
13	13								
14	14								
16	16								
18	18	N/mm 0.2 (kgf/mm) (0.02)	N/mm 0.5 (kgf/mm) (0.05)	N/mm 1.0 (kgf/mm) (0.1)	N/mm 2.0 (kgf/mm) (0.2)	N/mm 2.9 (kgf/mm) (0.3)	N/mm 4.9 (kgf/mm) (0.5)	N/mm 9.8 (kgf/mm) (1.0)	N/mm 19.6 (kgf/mm) (2.0) 29.4 (3.0)
20	20								
22	22								
27	27								

WR : Fmax. (maximum allowable deflection) = L×60%

d	Solid height	F max.	Load N (kgf) max.	Catalog No. Type D—L	Base unit price
0.23	1.8	3	0.9 (0.09)	WR3—5	
0.25	2.3	6	1.8 (0.18)	10	
0.3	4.8	9	2.6 (0.27)	15	
0.3	4.8	12	3.5 (0.36)	20	
0.32	6.8	15	4.4 (0.45)	25	
0.32	6.8	18	5.3 (0.54)	30	
0.35	11.5	24	6.2 (0.63)	35	
0.35	11.5	24	7.1 (0.72)	40	
0.26	1.6	3	0.9 (0.09)	WR4—5	
0.29	2.2	6	1.8 (0.18)	10	
0.32	3.2	9	2.6 (0.27)	15	
0.38	6.5	12	3.5 (0.36)	20	
0.38	6.5	15	4.4 (0.45)	25	
0.4	8.4	18	5.3 (0.54)	30	
0.4	8.4	21	6.2 (0.63)	35	
0.45	15	24	7.1 (0.72)	40	
0.45	15	27	7.9 (0.81)	45	
0.45	15	30	8.8 (0.9)	50	
0.45	15	33	9.7 (0.99)	55	
0.5	23.5	36	10.6 (1.08)	60	
0.5	25	39	11.5 (1.17)	65	
0.5	25	42	12.4 (1.26)	70	
0.3	1.6	3	0.9 (0.09)	WR5—5	
0.35	1.6	6	1.8 (0.18)	10	
0.35	2.8	9	2.6 (0.27)	15	
0.4	4.8	12	3.5 (0.36)	20	
0.45	8	15	4.4 (0.45)	25	
0.45	8	18	5.3 (0.54)	30	
0.5	12.5	21	6.2 (0.63)	35	
0.5	12.5	24	7.1 (0.72)	40	
0.55	17.6	27	7.9 (0.81)	45	
0.55	18	30	8.8 (0.9)	50	
0.55	20	33	9.7 (0.99)	55	
0.55	20	36	10.6 (1.08)	60	
0.55	20.9	39	11.5 (1.2)	65	
0.55	20.9	42	12.4 (1.3)	70	
0.32	1.6	3	0.9 (0.09)	WR6—5	
0.4	3.2	6	1.8 (0.18)	10	
0.4	3.2	9	2.6 (0.27)	15	
0.5	7.5	12	3.5 (0.36)	20	
0.5	7.5	15	4.4 (0.45)	25	
0.5	7.5	18	5.3 (0.54)	30	
0.55	11.5	21	6.2 (0.63)	35	
0.55	11.5	24	7.1 (0.72)	40	
0.6	17.4	27	7.9 (0.81)	45	
0.6	17.4	30	8.8 (0.9)	50	
0.6	17.4	33	9.7 (0.99)	55	
0.6	17.4	36	10.6 (1.08)	60	
0.6	17.4	39	11.5 (1.17)	65	
0.6	17.4	42	12.4 (1.26)	70	
0.65	27.3	48	14.1 (1.4)	80	
0.45	2.7	6	1.8 (0.18)	WR8—10	
0.5	4	9	2.6 (0.27)	15	
0.5	4	12	3.5 (0.36)	20	
0.55	5.8	15	4.4 (0.45)	25	
0.6	8.4	18	5.3 (0.54)	30	
0.6	8.4	21	6.2 (0.63)	35	
0.6	8.4	24	7.1 (0.72)	40	
0.7	16	27	7.9 (0.81)	45	
0.7	16	30	8.8 (0.9)	50	
0.7	16	33	9.7 (0.99)	55	
0.7	16	36	10.6 (1.08)	60	
0.7	16	39	11.5 (1.17)	65	
0.7	16	42	12.4 (1.26)	70	
0.75	22.9	48	14.1 (1.4)	80	

d	Solid height	F max.	Load N (kgf) max.	Catalog No. Type D—L	Base unit price
0.55	3.6	6	1.8 (0.18)	WR10—10	
0.6	4.8	9	2.6 (0.27)	15	
0.65	6.5	12	3.5 (0.36)	20	
0.65	6.5	15	4.4 (0.45)	25	
0.7	8.8	18	5.3 (0.54)	30	
0.7	8.8	21	6.2 (0.63)	35	
0.7	8.8	24	7.1 (0.72)	40	
0.8	16	27	7.9 (0.81)	45	
0.8	16	30	8.8 (0.9)	50	
0.8	16	33	9.7 (0.99)	55	
0.85	21	36	10.6 (1.08)	60	
0.85	21	39	11.5 (1.17)	65	
0.85	21	42	12.4 (1.26)	70	
0.9	28.8	48	14.1 (1.4)	80	
0.6	3.6	6	1.8 (0.18)	WR12—10	
0.65	4.6	9	2.6 (0.27)	15	
0.65	4.6	12	3.5 (0.36)	20	
0.7	6	15	4.4 (0.45)	25	
0.7	6	18	5.3 (0.54)	30	
0.7	6	21	6.2 (0.63)	35	
0.8	10.4	24	7.1 (0.72)	40	
0.8	10.4	27	7.9 (0.81)	45	
0.9	17.1	30	8.8 (0.9)	50	
0.9	17.1	33	9.7 (0.99)	55	
0.9	17.1	36	10.6 (1.08)	60	
0.9	17.1	39	11.5 (1.17)	65	
0.9	17.1	42	12.4 (1.26)	70	
1.0	28	48	14.1 (1.4)	80	
0.6	3.2	6	1.8 (0.18)	WR13—10	
0.7	4.9	9	2.6 (0.27)	15	
0.7	4.9	12	3.5 (0.36)	20	
0.8	8.4	15	4.4 (0.45)	25	
0.8	8.4	18	5.3 (0.54)	30	
0.8	8.4	21	6.2 (0.63)	35	
0.9	13.5	24	7.1 (0.72)	40	
0.9	13.5	27	7.9 (0.81)	45	
0.9	13.5	30	8.8 (0.9)	50	
0.9	13.5	33	9.7 (0.99)	55	
1.0	22	36	10.6 (1.08)	60	
1.0	22	39	11.5 (1.17)	65	
1.0	22	42	12.4 (1.26)	70	
1.0	22	48	14.1 (1.4)	80	
1.0	22	54	15.9 (1.62)	90	
0.7	4.6	9	2.6 (0.27)	WR14—15	
0.75	5.6	12	3.5 (0.36)	20	
0.8	7.2	15	4.4 (0.45)	25	
0.8	7.2	18	5.3 (0.54)	30	
0.8	7.2	21	6.2 (0.63)	35	
0.9	11.3	24	7.1 (0.72)	40	
0.9	11.3	27	7.9 (0.81)	45	
0.9	11.3	30	8.8 (0.9)	50	
1.0	18	33	9.7 (0.99)	55	
1.0	18	36	10.6 (1.08)	60	
1.0	18	39	11.5 (1.17)	65	
1.0	18	42	12.4 (1.26)	70	
1.1	28.6	48	14.1 (1.4)	80	
1.1	28.6	54	15.9 (1.62)	90	

● Load calculation method: Load=Spring constant×Deflection  
(SI units) N=M/mm×Fmm  
kgf=kgf/mm×Fmm  
(kgf=N×0.101972)

- ⊕ Neither end is ground for all WR type springs.
- ⊕ The solid height values are for reference only. There may be some variation between lots.
- ⊕ Operation count: 1 million
- ⊕ Instructions and precautions for the use of coil springs P.1397

d	Solid height	F max.	Load N (kgf) max.	Catalog No. Type D—L	Base unit price
0.75	4.5	9	2.6 (0.27)	WR16—15	
0.8	5.6	12	3.5 (0.36)	20	
0.9	8	15	4.4 (0.45)	25	
0.9	8	18	5.3 (0.54)	30	
0.9	8	21	6.2 (0.63)	35	
1.0	13	24	7.1 (0.72)	40	
1.0	13	27	7.9 (0.81)	45	
1.0	13	30	8.8 (0.9)	50	
1.0	13	33	9.7 (0.99)	55	
1.1	20	36	10.6 (1.08)	60	
1.1	20	39	11.5 (1.17)	65	
1.1	20	42	12.4 (1.26)	70	
1.1	20	48	14.1 (1.4)	80	
1.2	28.8	54	15.9 (1.62)	90	
1.0	7	12	5.8 (0.6)	WR18—20	
1.0	7	15	7.4 (0.75)	25	
1.1	9.9	18	8.8 (0.9)	30	
1.1	9.9	21	10.3 (1.05)	35	
1.2	14.4	24	11.8 (1.2)	40	
1.2	14.4	27	13.2 (1.35)	45	
1.2	14.4	30	14.7 (1.5)	50	
1.3	19.5	33	16.2 (1.65)	55	
1.3	19.5	36	17.7 (1.8)	60	
1.3	19.5	39	19.1 (1.95)	65	
1.3	19.5	42	20.6 (2.1)	70	
1.4	27.3	48	23.5 (2.4)	80	
1.0	6	12	5.8 (0.6)	WR20—20	
1.1	8.3	15	7.4 (0.75)	25	
1.1	8.3	18	8.8 (0.9)	30	
1.2	10.8	21	10.3 (1.05)	35	
1.2	10.8	24	11.8 (1.2)	40	
1.2	10.8	27	13.2 (1.35)	45	
1.3	15	30	14.7 (1.5)	50	
1.3	15	33	16.2 (1.65)	55	
1.3	15	36	17.7 (1.8)	60	
1.3	15	39	19.1 (1.95)	65	
1.4	21	42	20.6 (2.1)	70	
1.4	21	48	23.5 (2.4)	80	
1.1	6.9	12	5.9 (0.6)	WR22—20	
1.2	9	15	7.4 (0.75)	25	
1.2	9	18	8.8 (0.9)	30	
1.3	12.4	21	10.3 (1.05)	35	
1.3	12.4	24	11.8 (1.2)	40	
1.3	12.4	27	13.2 (1.35)	45	
1.4	16.1	30	14.7 (1.5)	50	
1.4	16.1	33	16.2 (1.65)	55	
1.4	16.1	36	17.7 (1.8)	60	
1.5	22.5	39	19.1 (1.95)	65	
1.5	22.5	42	20.6 (2.1)	70	
1.5	22.5	48	23.5 (2.4)	80	
1.3	8.5	18	8.8 (0.9)	WR27—30	
1.4	10.5	21	10.3 (1.05)	35	
1.4	10.5	24	11.8 (1.2)	40	
1.4	10.5	27	13.2 (1.35)	45	
1.6	17.6	30	14.7 (1.5)	50	
1.6	17.6	33	16.2 (1.65)	55	
1.6	17.6	36	17.7 (1.8)	60	
1.7	22.1	39	19.1 (1.95)	65	
1.7	22.1	42	20.6 (2.1)	70	
1.7	22.1	48	23.5 (2.4)	80	

WF : Fmax. (maximum allowable deflection) = L×45%

d	Solid height	F max.	Load N (kgf) max.	Catalog No. Type D—L	Base unit price
0.26	2	2.25	1.1 (0.11)	WF3—5*	
0.32	5	4.5	2.2 (0.22)	10*	
0.32	5	6.7	3.2 (0.33)	15*	
0.35	7	9	4.4 (0.45)	20*	
0.35	7	11.2	5.5 (0.56)	25*	
0.4	13.2	13.5	6.6 (0.67)	30	
0.4	13.2	15.7	7.6 (0.78)		