

JL

Guided compact cylinders

Ø 12 ÷ 63 mm



JL Guided compact cylinders

The JL series guided compact cylinders are studied for applications requiring reduced dimensions and in case anti-rotation has to be guaranteed.

Typical applications: thrust transport and lifting of pieces (LIFTER), stop function (STOPPER)

Bores: 12 - 16 - 20 - 25 - 32 - 40 - 50 - 63

Strokes: until 400 mm

Versions: guide on bearings (JLS) ideal for high side loads, guide on ball bushing (JLV) suitable for high precision applications and uniform speed

Fixing: 3 fixing type (pierced hole bolt, back tapped hole, bottom tapped hole)

Connexions: on two sides

Sensors: recessed on two sides



TECHNICAL CHARACTERISTICS

Ambient temperature	-5 ÷ +60 °C		
Fluid	compressed air with or without lubrication		
Working pressure	1 ÷ 10 bar		
Operation	double-acting		
Cushioning	elastic buffers		
Connections	M5	G1/8	G1/4
Bores	12 - 16	20 - 25 - 32 - 40	50 - 63

CONSTRUCTIVE CHARACTERISTICS

Body	aluminium alloy		
Shafts	chromium-plated steel (JLS) hardened and chromium-plated steel (JLV)		
Piston	aluminium alloy		
Piston rod	chromium-plated stainless steel AISI 303 (Ø12-16-20) chromium-plated steel C45 (Ø25-32-40-50-63)		
Guide bearing	bearings (JLS) ball bushing (JLV)		
Piston seals	NBR		
Cushion seals	NBR		
Magnet	standard supplied		
Flange	steel		

CODIFICATION KEY

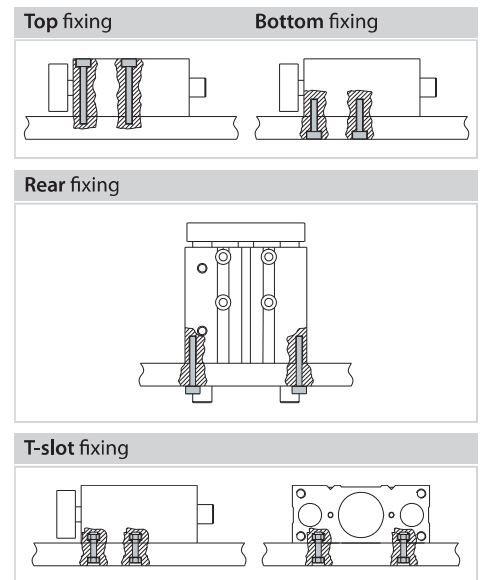
J	L	S	0	1	2	0	0	3	0
1	2	3					4		

1 Series	2 Guide bearing	3 Bore (mm)	4 Stroke (mm)
JL = Guided compact cylinders	S = Bearings V = Ball bushing	012 = Ø12 032 = Ø32 016 = Ø16 040 = Ø40 020 = Ø20 050 = Ø50 025 = Ø25 063 = Ø63	0010 = 10 0075 = 75 0250 = 250 0020 = 20 0100 = 100 0300 = 300 0025 = 25 0125 = 125 0350 = 350 0030 = 30 0150 = 150 0400 = 400 0040 = 40 0175 = 175 0050 = 50 0200 = 200



Version with metallic piston rod scraper upon request

Fixing schemes



Ø	Strokes (mm)															
	10	20	25	30	40	50	75	100	125	150	175	200	250	300	350	400
12	[Bar chart showing stroke availability for bore 12]															
16	[Bar chart showing stroke availability for bore 16]															
20	[Bar chart showing stroke availability for bore 20]															
25	[Bar chart showing stroke availability for bore 25]															
32	[Bar chart showing stroke availability for bore 32]															
40	[Bar chart showing stroke availability for bore 40]															
50	[Bar chart showing stroke availability for bore 50]															
63	[Bar chart showing stroke availability for bore 63]															

THEORETICAL FORCES

(N)

Ø	Working surface area (mm ²)		Working pressure (bar)									
	Thrust	Traction	Thrust					Traction				
			2	4	6	8	10	2	4	6	8	10
12	113	85	23	45	68	90	113	17	34	51	68	85
16	201	173	40	80	121	161	201	35	69	104	138	173
20	314	264	63	126	189	251	314	53	106	158	211	264
25	491	412	98	196	294	393	491	82	165	247	330	412
32	804	691	161	322	482	643	804	138	276	415	553	691
40	1257	1056	251	503	754	1006	1257	211	422	634	845	1056
50	1963	1649	393	785	1178	1570	1963	330	660	989	1319	1649
63	3117	2803	623	1247	1870	2494	3117	561	1121	1682	2242	2803

WEIGHT

Guide with bearings - JLS

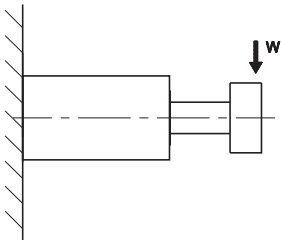
Ø	Cylinder Stroke 0	Increase per 5 mm stroke
	g	g
12	191	21
16	283	28
20	450	45
25	670	63
32	1210	90
40	1474	88
50	2540	140
63	3345	157

Guide with ball bushings - JLV

Ø	Cylinder Stroke 0	Increase per 5 mm stroke
	g	g
12	211	18
16	260	30
20	470	45
25	740	60
32	1170	85
40	1300	98
50	2360	150
63	3060	174

OPERATING CONDITIONS

Allowable lateral load



Guide with bearings - JLS

(N)

Ø	Strokes (mm)															
	10	20	25	30	40	50	75	100	125	150	175	200	250	300	350	400
12	31	24	-	19	16	13	37	31	-	-	-	-	9	-	-	-
16	50	39	-	32	27	24	54	45	-	-	-	-	16	-	-	-
20	-	51	-	44	39	35	54	46	74	66	59	54	28	24	21	19
25	-	68	-	59	52	46	72	61	98	88	79	72	53	46	41	37
32	-	-	165	-	-	129	106	90	138	123	111	101	88	77	68	61
40	-	-	203	-	-	164	182	159	142	127	-	-	-	-	-	-
50	-	-	296	-	-	245	273	241	216	195	-	-	-	-	-	-
63	-	-	296	-	-	245	273	241	216	195	-	-	-	-	-	-

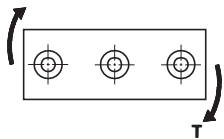
Guide with ball bushings - JLV

(N)

Ø	Strokes (mm)															
	10	20	25	30	40	50	75	100	125	150	175	200	250	300	350	400
12	23	17	-	14	34	30	23	19	-	-	-	-	6	-	-	-
16	36	29	-	24	59	52	40	33	-	-	-	-	10	-	-	-
20	-	43	-	36	98	87	69	57	46	40	36	32	32	27	23	20
25	-	67	-	56	148	132	105	87	70	62	55	50	42	36	30	27
32	-	-	104	-	-	74	165	138	114	100	90	81	66	56	48	42
40	-	-	113	-	-	78	129	106	130	114	-	-	-	-	-	-
50	-	-	120	-	-	83	178	148	148	129	-	-	-	-	-	-
63	-	-	117	-	-	81	176	145	145	126	-	-	-	-	-	-

It shows the dynamic allowable value when the cylinder is working with lateral load **W** at the top of the guide rods (vertical load against the guide rods).

Allowable moment



Guide with bearings - JLS

(Nm)

Ø	Strokes (mm)															
	10	20	25	30	40	50	75	100	125	150	175	200	250	300	350	400
12	0,64	0,48	-	0,39	0,32	0,28	0,75	0,63	0,15	0,13	0,12	0,11	0,09	-	-	-
16	1,14	0,9	-	0,74	0,63	0,55	1,23	1,04	0,31	0,27	0,24	0,22	0,18	-	-	-
20	-	1,14	-	1,21	1,07	0,95	1,49	1,25	2,03	1,81	1,63	1,48	0,37	0,32	0,29	0,26
25	-	2,19	-	1,88	1,65	1,47	2,31	1,94	3,15	2,8	2,52	2,3	0,85	0,74	0,66	0,59
32	-	-	6,61	-	-	5,16	4,23	3,59	5,52	4,93	4,45	4,06	1,72	1,50	1,33	1,20
40	-	-	7	-	-	5,66	6,27	5,48	4,87	4,38	-	-	-	-	-	-
50	-	-	13	-	-	10,8	12	10,6	9,50	8,60	-	-	-	-	-	-
63	-	-	14,7	-	-	12,1	13,5	12	10,7	9,69	-	-	-	-	-	-

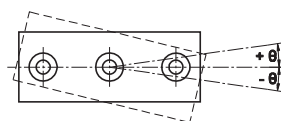
Guide with ball bushings - JLV

(Nm)

Ø	Strokes (mm)															
	10	20	25	30	40	50	75	100	125	150	175	200	250	300	350	400
12	0,47	0,35	-	0,29	0,71	0,62	0,4	0,38	0,13	0,11	0,09	0,08	0,07	-	-	-
16	0,84	0,66	-	0,54	1,35	1,19	0,93	1,76	0,23	0,19	0,17	0,15	0,12	-	-	-
20	-	1,19	-	0,99	2,69	2,4	1,89	1,56	1,26	1,1	0,98	0,88	0,43	0,36	0,31	0,27
25	-	2,14	-	1,79	4,74	4,22	3,36	2,78	2,25	1,98	1,76	1,59	0,68	0,57	0,49	0,42
32	-	-	4,17	-	-	2,95	6,6	5,52	4,56	4,02	3,59	3,24	1,29	1,09	0,94	0,82
40	-	-	5,24	-	-	4,25	7,19	6,33	7,81	7,11	-	-	-	-	-	-
50	-	-	7,02	-	-	5,76	12,3	10,9	11,2	10,2	-	-	-	-	-	-
63	-	-	7,77	-	-	6,35	13,7	12,2	12,5	11,4	-	-	-	-	-	-

It shows the dynamic allowable value when the cylinder is working with a rotating torque **T** at the top of the guide rods.

Precision



Guide with bearings - JLS

Ø	Precision θ
12	$\pm 0,09^\circ$
16	$\pm 0,08^\circ$
20	$\pm 0,08^\circ$
25	$\pm 0,07^\circ$
32	$\pm 0,07^\circ$
40	$\pm 0,06^\circ$
50	$\pm 0,05^\circ$
63	$\pm 0,05^\circ$

Guide with ball bushing - JLV

Ø	Precision θ
12	$\pm 0,06^\circ$
16	$\pm 0,06^\circ$
20	$\pm 0,03^\circ$
25	$\pm 0,05^\circ$
32	$\pm 0,03^\circ$
40	$\pm 0,08^\circ$
50	$\pm 0,06^\circ$
63	$\pm 0,06^\circ$

- The values show the deflection angle against the piston rod.
 - Guide rods deflection not considered.

OPERATING CONDITIONS Ø 12 ÷ 32 mm

Use of the cylinder as stopping system STOPPER

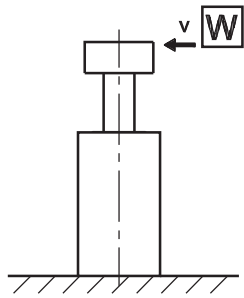


Fig. 1

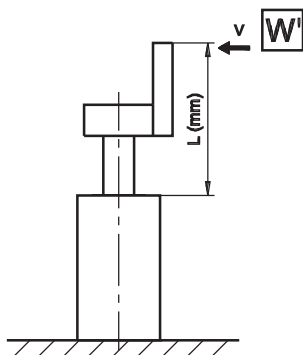


Fig. 2

Use of the cylinder as lifting system LIFTER

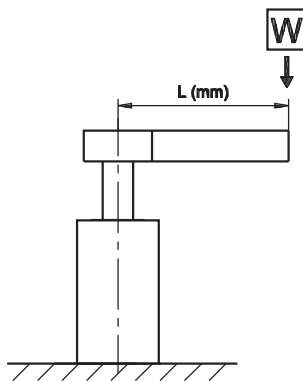
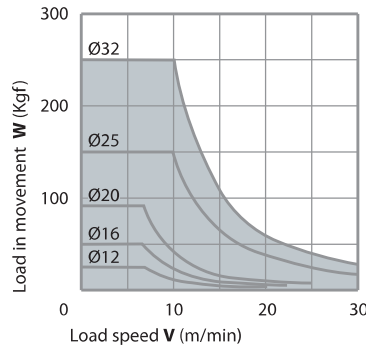
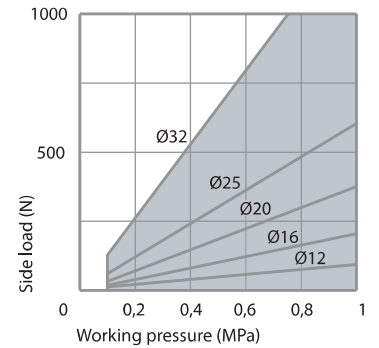


Fig. 3

Stopping capacity
JLS (stroke 30 mm)



Applied side load
JLS (stroke 30 mm)



Conversion coefficient

$$W = W' \times \frac{L}{\ell}$$

Ø	JLS				
	12	16	20	25	32
ℓ	40	42	42	42	44

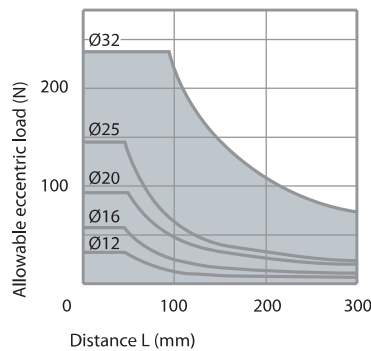
W = Maximum weight of the load in movement

In case of use with a load applied as per figure, the load W is the result of the formula indicated above. Choose the suitable bore according to the load.

The model JLV with ball bushing is not suitable as STOPPER system.

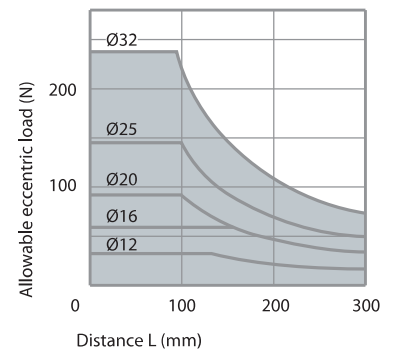
Bearings

JLS (stroke 10 ÷ 50 mm)



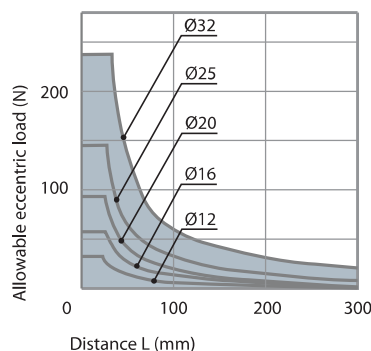
Bearings

JLS (stroke >50 mm)



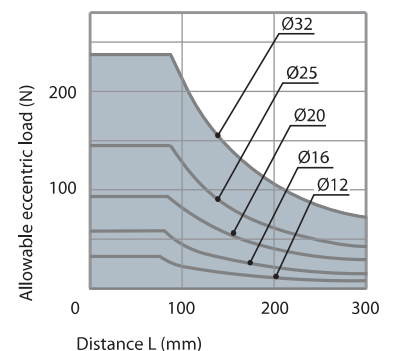
Ball bushing

JLV (stroke 10 ÷ 50 mm)



Ball bushing

JLV (stroke >51 mm)



W = Maximum allowable eccentric load (pressure 5 bar) with length L

OPERATING CONDITIONS Ø40 ÷ Ø63 mm

Use of the cylinder as stopping system STOPPER

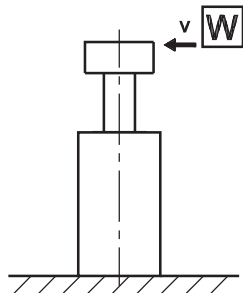


Fig. 1

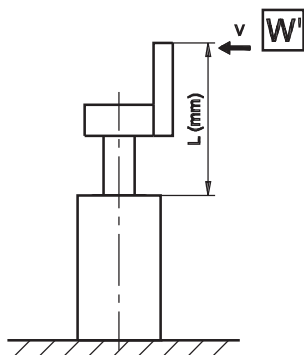
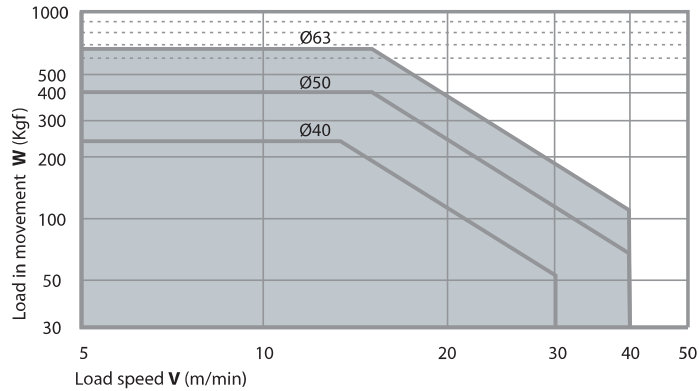


Fig. 2

Stopping capacity
JLS (stroke 25 mm)



Conversion coefficient

$$W = W' \times \frac{L}{\ell}$$

Ø	JLS		
	40	50	63
ℓ	72	78	78

W = Maximum weight of the load in movement

In case of use with load applied as per figure, the load W is the result of the formula the formula indicated above. Choose the suitable bore according to the load.

The model JLV with ball bushing is not suitable as STOPPER

Use of the cylinder as lifting system LIFTER

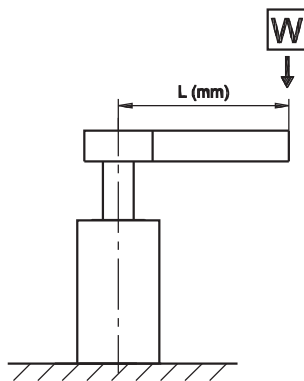
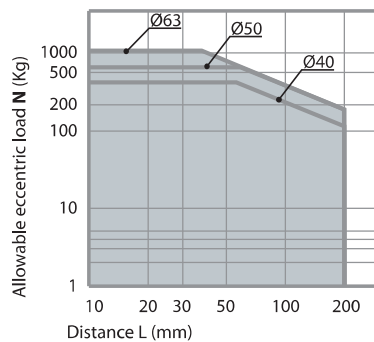
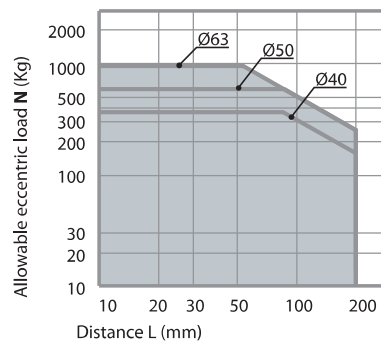


Fig. 3

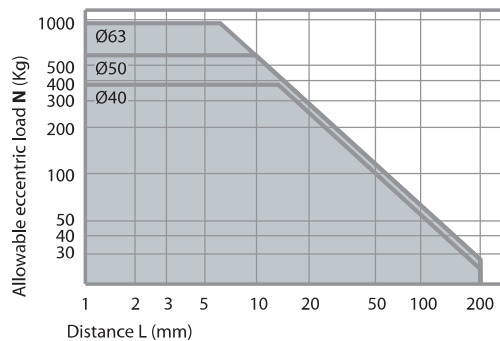
Bearings
JLS (stroke 25 ÷ 50 mm)



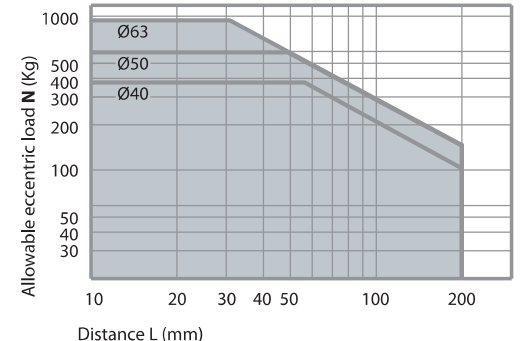
Bearings
JLS (stroke > 51 mm)



Ball bushing
JLV (stroke 25 ÷ 50 mm)



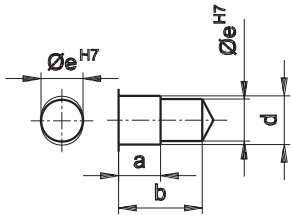
Ball bushing
JLV (stroke > 51 mm)



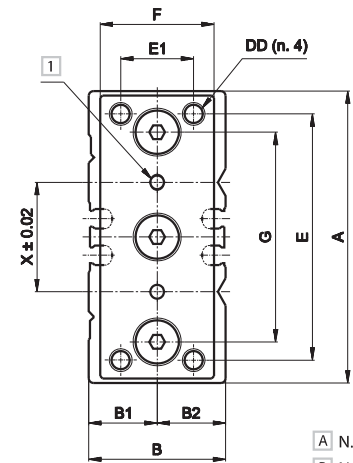
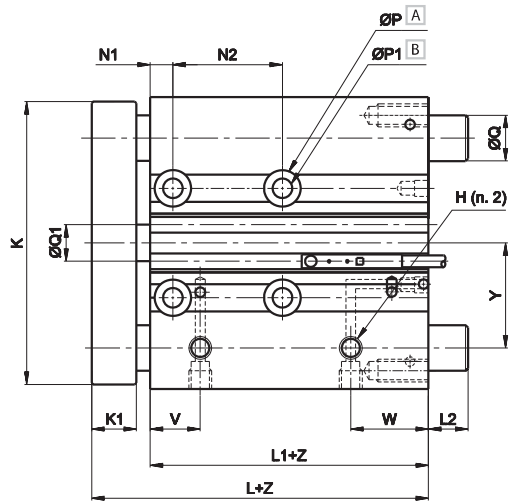
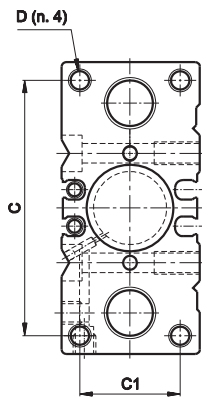
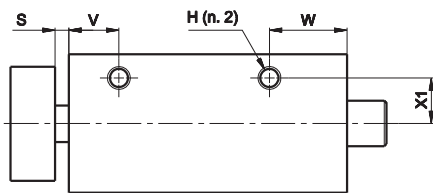
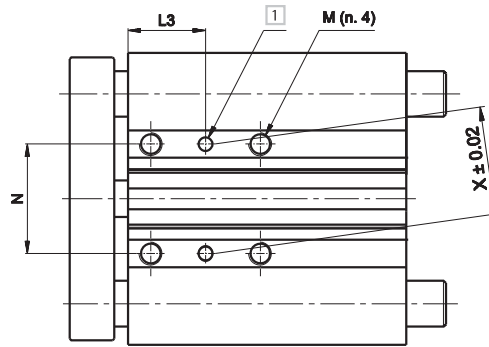
W = Maximum allowable eccentric load (pressure 5 bar) with length L

JLS/JLV Ø 12 ÷ 32 mm

1 Detail



Ø	a	b	d	e
12	3	6	3,5	3
16	3	6	3,5	3
20	3	6	3,5	3
25	3	6	4,5	4
32	3	6	4,5	4



A N. 4 Spot-facings
B N. 4 Through holes

Ø	A	B	B1	B2	C	C1	D	DD	E	E1	F	G	H	K	K1
12	58	26	13	13	50	18	M4 x 0,7 x 10	M4 x 0,7	48	14	22	41,5	M5 x 0,8	56	8
16	64	30	15	15	56	22	M5 x 0,8 x 12	M5 x 0,8	54	16	25	46	M5 x 0,8	62	8
20	85	36	17	19	72	24	M5 x 0,8 x 13	M5 x 0,8	70	18	30	55	G1/8	81	10
25	96	42	21	21	82	30	M6 x 1 x 15	M6 x 1,0	78	26	38	65	G1/8	91	10
32	116	51	26	25	98	34	M8 x 1,25 x 20	M8 x 1,25	96	30	44	80	G1/8	110	12

Ø	L	L1	M	N	N1	P	P1	Q1	S	V	W	X	X1	Y	Q (JLS)	Q (JLV)
12	42	29	M5 x 0,8 x 10	23	5	8 x 4,5	4,3	6	5	11	15*	23	8,5	18	8	6
16	46	33	M5 x 0,8 x 10	24	5	8 x 4,5	4,3	8	3	11	18**	24	10	19	10	8
20	53	37	M6 x 1,0 x 12	28	17	9,5 x 5,5	5,2	10	6	10,5	8,5	28	11,5	25	12	10
25	53,5	37,5	M6 x 1,0 x 12	34	17	9,5 x 5,5	5,2	12	6	11,5	9	34	13,5	28,5	16	13
32	59,5	37,5	M8 x 1,25 x 16	42	21	11 x 7,5	6,6	16	10	12,5	9	42	16	34	20	16

* = Stroke ≤ 19 mm W = 7,5 mm

** = Stroke ≤ 19 mm W = 9 mm

Ø	JLS		
	L2		
	10<Z<50	51<Z<100	Z>101
12	-	18,5	43
16	-	18,5	49
Ø	JLV		
	L2		
	10<Z<30	31<Z<100	Z<101
12	1	13	43
16	3	19	49
Ø	JLS		
	L3		
	10<Z<50	51<Z<200	Z>201
20	-	31,5	69
25	-	31,5	68,5
32	37,5	42,5	80,5

Ø	JLV		
	L2		
	10<Z<30	31<Z<100	Z<101
12	1	13	43
16	3	19	49
Ø	JLV		
	L3		
	20<Z<30	31<Z<100	101<Z<200
20	10	27	51
25	16	32	51
32	21,5	38,5	58,5

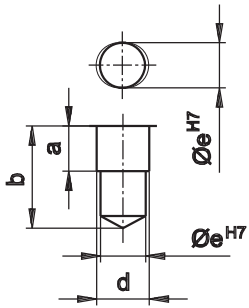
Ø	JLS/JLV				
	L3				
	20<Z<39	40<Z<100	125<Z<200	201<Z<300	Z>301
12	15	25	60	105	-
16	17	27	60	105	-
20	29	39	77	117	167
25	29	39	77	117	167
32	33	45	83	121	171

Ø	JLS/JLV				
	N2				
	Z>39	40<Z<100	125<Z<200	201<Z<300	Z>301
12	20	40	110	200	-
16	24	44	110	200	-
20	24	44	120	200	300
25	24	44	120	200	300
32	24	48	124	200	300

Z = Stroke

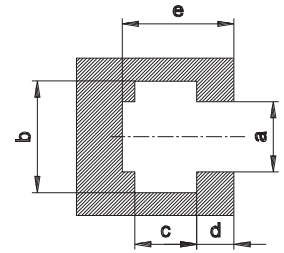
JLS/JLV Ø 40 ÷ 63 mm

1 Detail

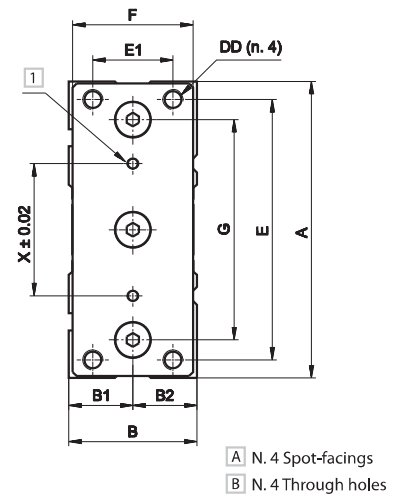
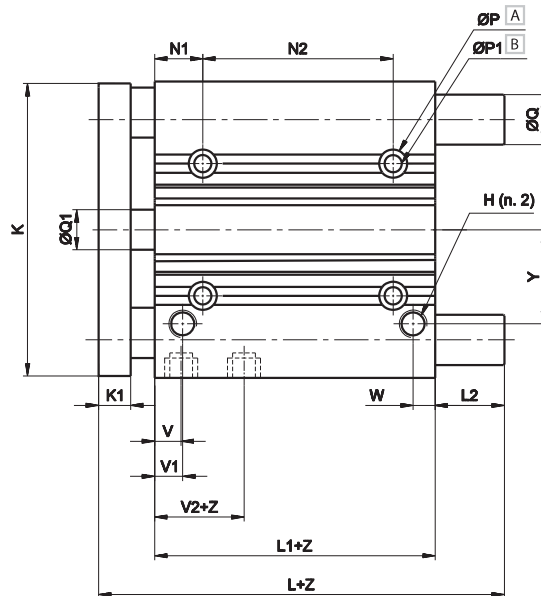
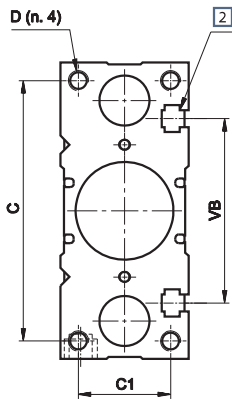


Ø	a	b	d	e
40	3	6	4,5	4
50	4	8	6	5
63	4	8	6	5

2 Detail



Ø	a	b	c	d	e
40	6,5	10,5	5,5	4	11
50	8,5	13,5	7,5	4,5	13,5
63	11	17,8	10	7	18,5



A N. 4 Spot-facings
B N. 4 Through holes

Ø	A	B	B1	B2	C	C1	D	DD	E	E1	F	G	H	K	K1	L1
40	120	54	27	27	106	40	M8 x 1,25 x 20	M8 x 1,25	104	30	44	86	G1/8	118	12	44
50	148	64	32	32	130	46	M10 x 1,5 x 22	M10 x 1,5	130	40	60	110	G1/4	146	16	44
63	162	78	39	39	142	58	M10 x 1,5 x 22	M10 x 1,5	130	50	70	124	G1/4	158	16	49

Ø	M	N	N1	P	P1	Q1	S	V	V1	V2	VB	Y	W	X	X1	Q (JLS)	Q (JLV)
40	M8 x 1,25	50	22	11 x 7,5	6,6	16	10	14	14	13	72	38	10	50	18	20	16
50	M10 x 1,5	66	24	14 x 9	8,6	20	12	12	14	9	92	47	11	66	21,5	25	20
63	M10 x 1,5	80	24	14 x 9	8,6	20	12	16,5	16,5	14	110	55	13,5	80	28	25	20

Ø	JLS		JLV		
	L		L		
	25 ≤ Z ≤ 50	Z > 50	25 ≤ Z ≤ 50	75 ≤ Z ≤ 100	Z > 100
40	97	102	81	98	118
50	106,5	118	93	114	134
63	106,5	118	93	114	134

Ø	JLS		JLV		
	L2		L2		
	25 ≤ Z ≤ 50	Z > 50	25 ≤ Z ≤ 50	75 ≤ Z ≤ 100	Z > 100
40	31	36	15	32	52
50	34,5	46	21	42	62
63	29,5	41	16	37	57

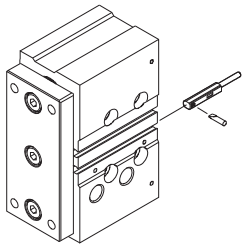
Ø	JLS/JLV			JLS/JLV		
	L3			N2		
	Z = 25	Z = 50-75-100	Z > 100	Z = 25	Z = 50-75-100	Z > 100
40	34	46	84	24	48	124
50	36	48	86	24	48	124
63	38	50	88	28	52	128

Z = Stroke

DF-R MAGNETIC SENSOR



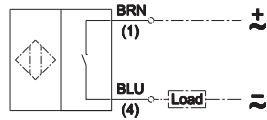
■ Mounting scheme



Type	ELECTROMECHANICAL		ELECTRONIC PNP	
	DF-R200L02	DF-R200M08	DF-R700L02	DF-R700M08
Part No.				
Working voltage (V AC/DC)	5÷120 V AC/DC	5÷120 V AC/DC	5÷30 V DC	5÷30 V DC
Max switching current (mA)	100	100	50	50
Max switching power (W/V)	10	10	1,5	1,5
Shock resistance (G)	30	30	50	50
Max voltage drop (V AC/DC)	2,5	2,5	1,5	1,5
Cables number and section (mmq)	2 x 2,8 (PUR)	2 x 2,8 (PUR)	3x3 (PUR)	3x3 (PUR)
Cable length (mm)	2000	150	2000	150
Contact	NO	NO	NO	NO
Max response time (ms)	1	1	1	1
State indicator (LED)	red	red	green	green
Electric circuit	A	A	C	C
Protection degree (NEMA 6)	IP67			
Working temperature (°C)	-10 ÷ +70			

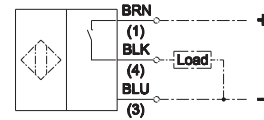
■ Electric circuits

A AC/DC 2 wires NO

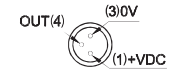


BRN = Brown BLK = Black BLU = Blue

C DC 3 wires PNP NO



■ M8



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