



Dyna Shock System SAS

VISCOELASTIC DEVICES WITH HYDROSTATIC COMPRESSION OF ELASTOMER

VISCOELASTIC SHOCK ABSORBERS / AUTOMATIC STROKE RETURN

BXLR range from 6 to 150 kJ



Technology

The shock absorbers are designed on the principal of compression of hydrostatic viscoelastic fluids. The viscosity and the compressibility of our fluids allow in one device to obtain both functions: a shock absorber and a spring, without the need of any additional rearming mechanism (gas or mechanical spring). The two functions can be used separately or in combination, in the same product.

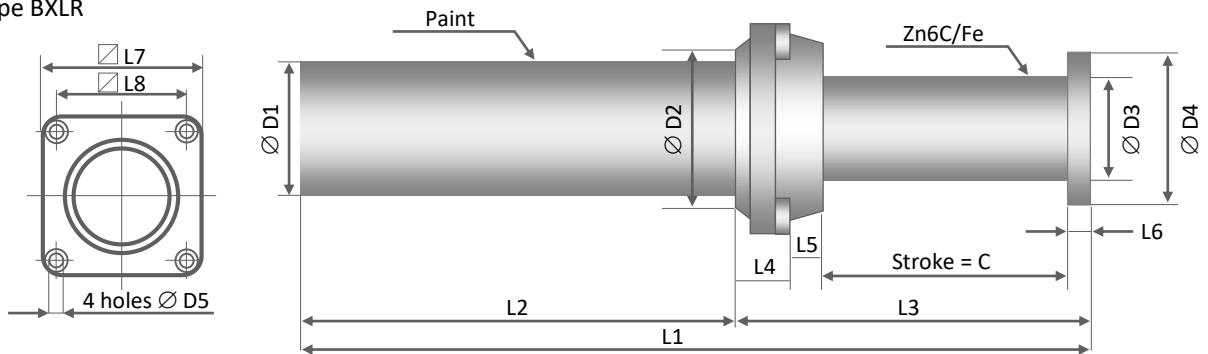
Advantages

- Simple design – High reliability – Simple integration
- High damping coefficient
- Low sensitivity to temperature variances
- Security by integrated static preload

Applications

Protection against shocks in Industry, Material Handling, Rolling Mill, Railway, Defence, Waterways, Paper industry, ...

Type BXLR



DIMENSIONAL CHARACTERISTICS

	L1	L2	L3	L4	L5	L6	L7	L8	D1	D2	D3	D4	D5	Mass
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kg
BXLR6-150	410	231	179	19	0	10	∅ 90	∅ 70	50	∅ 90	38	50	9	4,2
BXLR12-150	480	285	195	18	15	12	110	85	75	90	57	80	11	11
*BXLR12-200	530	285	245	18	15	12	110	85	75	90	57	80	11	11
BXLR25-200	620	370	250	20	18	12	135	105	90	110	72	100	14	20
*BXLR25-270	690	370	320	20	18	12	135	105	90	110	72	100	14	25
BXLR50-275	855	520	335	25	20	15	175	140	110	150	87	120	18	40
*BXLR50-400	980	520	460	25	20	15	175	140	110	150	87	120	18	40
BXLR100-400	1370	910	460	25	20	15	175	140	110	150	87	120	18	65
*BXLR100-600	1570	910	660	25	20	15	175	140	110	150	87	120	18	65
*BXLR150-800	2640	1780	860	25	20	15	175	140	110	150	87	120	18	115

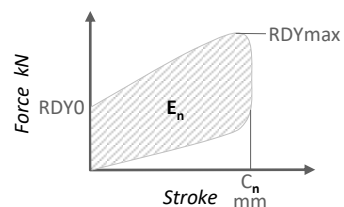
- Mounting type on request
- Outside protection: paint and reservoir Zn6CFe
- * Devices not available on stock (delivery from 12 to 16 weeks according to model and/or quantity)

MECHANICAL CHARACTERISTICS ⁽¹⁾

	En	Stroke	RDY0	RDYmax
	kJ	mm	kN	kN
BXLR6-150	6	150	25	50
BXLR12-150	12	150	66	100
*BXLR12-200	12	200	42	78
BXLR25-200	25	200	95	150
*BXLR25-270	25	270	66	112
BXLR50-275	50	275	118	230
*BXLR50-400	50	400	75	150
BXLR100-400	100	400	175	320
*BXLR100-600	100	600	85	230
*BXLR150-800	150	800	80	250

⁽¹⁾ Based on the following data:

- Impact speed: 2 m/s
- Operating temperature: -20°C to +40°C



Symbols:

- En = nominal energy capacity
- Cn = maximum stroke
- RDY = dynamic reaction

- Impact speed: BXLR range shock absorbers are designed for impact velocities of 2 m/s. Higher velocities require custom modification.



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VISCOELASTIC DEVICES WITH HYDROSTATIC COMPRESSION OF ELASTOMER

VISCOELASTIC SHOCK ABSORBERS / AUTOMATIC STROKE RETURN

BALR range from 100 to 1000 kJ



Technology

The shock absorbers are designed on the principal of compression of hydrostatic viscoelastic fluids. The viscosity and the compressibility of our fluids allow in one device to obtain both functions: a shock absorber and a spring, without the need of any additional rearming mechanism (gas or mechanical spring). The two functions can be used separately or in combination, in the same product.

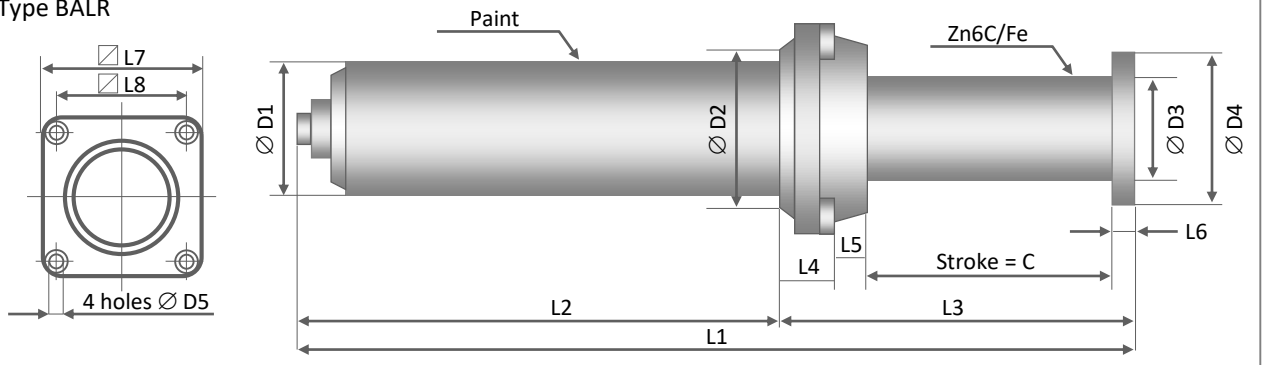
Advantages

- Simple design – High reliability – Simple integration
- High damping coefficient
- Low sensitivity to temperature variances
- Security by integrated static preload

Applications

Protection against shocks in Industry, Material Handling, Rolling Mill, Railway, Defence, Waterways, Paper industry, ...

Type BALR



DIMENSIONAL CHARACTERISTICS

	L1	L2	L3	L4	L5	L6	L7	L8	D1	D2	D3	D4	D5	Mass
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kg
*BALR-100	1120	660	460	25	20	15	175	140	130	150	110	140	18	63
BALR-150	1350	775	575	30	25	20	215	170	140	185	120	150	22	90
BALR-220S	1258	783	475	30	25	20	215	170	140	185	120	150	22	100
BALR-250	1750	1025	725	30	25	20	215	170	155	185	135	170	22	135
*BALR-400	2185	1250	935	35	25	25	265	210	175	235	150	190	27	218
*BALR-600	2555	1420	1135	35	25	25	265	210	200	235	175	215	27	295
*BALR-800	2935	1630	1305	40	35	30	300	240	220	270	190	235	30	420
*BALR-1000	3225	1820	1405	40	35	30	300	240	230	270	205	248	30	470

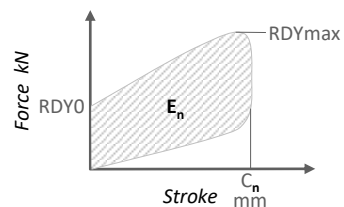
- Mounting type on request
- Outside protection: paint and reservoir Zn6CFe
- * Devices not available on stock (delivery from 12 to 16 weeks according to model and/or quantity)

MECHANICAL CHARACTERISTICS ⁽¹⁾

	En	Stroke	RDY0	RDYmax
	kJ	mm	kN	kN
*BALR-100	100	400	190	310
BALR-150	150	500	200	380
BALR-220S	220	400	380	685
BALR-250	250	650	270	490
*BALR-400	400	850	330	600
*BALR-600	600	1050	370	740
*BALR-800	800	1200	430	860
*BALR-1000	1000	1300	500	1000

⁽¹⁾ Based on following data:

- Impact speed: 2 m/s
- Operating temperature: -20°C to +40°C



Symbols:

- E_n = nominal energy capacity
- C_n = maximum stroke
- RDY = dynamic reaction

- Impact speed: BALR range shock absorbers are designed for impact velocities of 2 m/s. Higher velocities require custom modification.

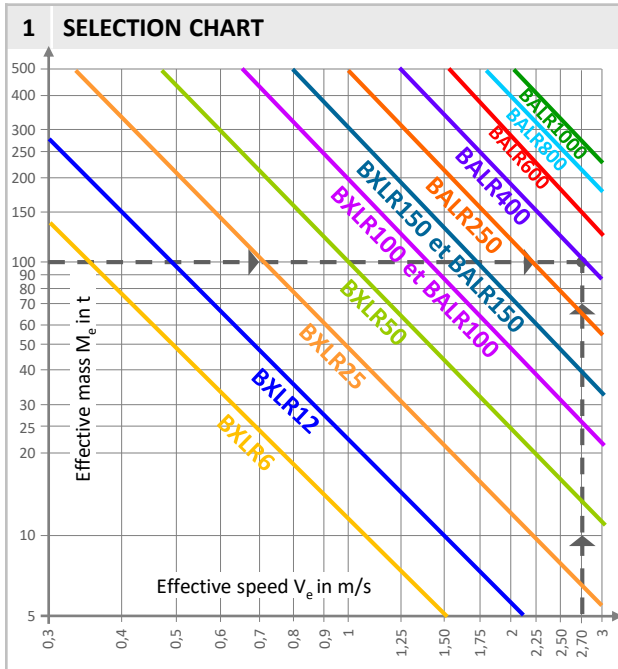


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VISCOELASTIC DEVICES WITH HYDROSTATIC COMPRESSION OF ELASTOMER

SELECTION OF A STANDARD SHOCK ABSORBER

BXLR and BALR ranges



2 EFFECTIVE ENERGY CALCULATION

$$E_e = \frac{1}{2} M_e V_e^2$$

3 ALLOWABLE IMPACT FREQUENCY

$$F < 8 \times \frac{E_n}{E_e} \text{ impacts/hour}$$

4 EFFECTIVE STROKE CALCULATION

$$C_e = C_n \left(\sqrt{\frac{E_e}{E_n(0.027V_e + 0.22)}} + 1.83 - 1.35 \right)$$

5 EFFECTIVE REACTION R_{dy_e} CALCULATION

$$R_{dy_e} = \left[\left(\frac{R_{dymax} - R_{dy0}}{C_n} \right) x C_e + R_{dy0} \right] (0.1V_e + 0.8)$$

6 APPLICATION EXAMPLE

Given data:

Shock to absorb with 1 horizontal shock absorber

- Effective mass = 100 t
- Effective speed = 2.7 m/s
- Impact frequency = 5 impacts/hour
- Maximum allowable structural load = 650 kN

① Selection chart gives BALR400.

The mechanical characteristics are:

- E_n = 400 kJ
- C_n = 850 mm
- R_{dymax} = 600 kN
- R_{dy0} = 330 kN

② The energy to dissipate E_e per shock is 365 kJ.

③ Allowable impact frequency F is $< 8 \times 400 / 365$

$\Rightarrow 5 < 8.8$ is convenient

④ The effective stroke C_e will be 743 mm.

$$850 \left(\sqrt{\frac{365}{400(0.027 \times 2.7 + 0.22)}} + 1.83 - 1.35 \right)$$

⑤ The effective dynamic reaction R_{dy_e} will be 605 kN.

$$\left[(600 - 330) \times \frac{743}{850} + 330 \right] (0.1 \times 2.7 + 0.8)$$

$R_{dy_e} < 650$ kN (resistance of the structure)

All performance characteristics can be modified.

Please advise us of your specific requirements.

Dyna Shock System SAS

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