

## Product Information

ZwickRoell single testing actuators: LH 10 / LH 25 / LH 50

CTA: 203094 23041



LH actuator, overhead installation in a test frame



LH actuator with foot flange option

### Range of application

The testing actuators in the LH range feature servo-hydraulic linear drives, designed for maximum dynamic range and durability. As double-rod actuators they are suitable for dynamic and static tensile/compression alternating stress. They are used as single testing actuators, e.g. on a fixture platen for component testing, or as machine actuators in a test frame for materials testing.

### Function description

LH actuators are equipped with a servo valve and convert hydraulic energy into a mechanical linear motion. The servo valve and accumulator are flange-mounted directly on the actuator, giving a high dynamic range. Nominal operating pressure options are 280 or 210 bar. The chromed piston rod runs in zero-backlash hydrostatic bearings, the only type of bearing capable of absorbing significant transverse forces. As no friction-generating seals are used, sliding friction is absent from this bearing system under normal operating conditions and the system is therefore wear-free. This eliminates the need for maintenance operations such as bearing

replacement or re-chroming the piston rod. A further advantage is the absence of slip-stick effects or hysteresis in both quasi-static and cyclic tests.

In addition, a polymer coating is applied to both bearings and the piston skirt.

Due to the sealless bearing design, the small amounts of bearing oil which escape must be suctioned by with a bearing-oil pump.

Cushioning at both ends ensures safe, reliable hydraulic braking of the piston from speeds up to a maximum of 2 m/s. The maximum permissible additional weight, for example for specimen grips, is approximately 15 kg for the LH 10 and LH 25 actuators and approx. 40 kg for the LH 50.

LH actuators can be used in any desired orientation; in testing machines they are usually upright or suspended; in test benches they may also be horizontal. The standard version of the actuators is as machine actuator. With the foot flange option they can be used as single testing actuators.

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To simplify fixture mounting, the piston rod is provided with a connecting flange,

An inductive displacement transducer (LVDT) is integrated centrally for precise measurement of the piston position; linearity is 0.25%.

#### Advantages and features

- actuator with hydrostatic bearings for virtually frictionless and maintenance-free operation
- hydraulic end-cushioning for safe, reliable braking of the piston
- valve blocks for 1 or 2 servo valves for optimum matching of hydraulic output to requirements
- integrated piston displacement measurement system, LVDT
- actuators can be used in any desired orientation: upright, overhead or horizontal
- flange adapter with centering spigot for simple, reliable attachment of load cell and fixture

#### Operation of hydrostatic bearing

Each bearing has four bearing pockets distributed around its circumference and fed at system pressure. The piston rod floats on an oil cushion and is automatically centered. Friction and wear are thus eliminated.

If a transverse force arises, the pressure in the corresponding bearing pocket falls, while that in the opposing pocket rises, re-centering the piston rod. In the event of higher transverse forces, the bearing

passes from a state of purely fluid friction into one of mixed friction, a hydrostatically unloaded sliding bearing. During this phase the actuator can be operated without any restriction. Bearing and piston skirt also have a polymer coating, giving the actuator emergency dry-running properties.

#### Transverse force loading

The permissible transverse force absorption depends on the size of the actuator, the piston position and any accessories etc. which may have been installed. The maximum permitted transverse force  $F_{Qmax}$  during continuous operation in a state of hydrostatically unloaded sliding friction is approximately  $F_{Qmax} \approx 0.3 \times F_n$ , with retracted piston rod and force application at the end of the piston rod. Top mounting is preferable in the event of high transverse forces.

#### Accessories

- Accumulator set for pressure and return oil for smoothing pulsation
- Servo valve in accordance with the demands on the dynamic performance of the actuator
- Bearing-oil pump for suctioning excess bearing oil
- Hose set for connection to hydraulic supply (various lengths)
- Load cell
- Version with foot flange

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### Technical data

Nominal force [kN]	Stroke [mm]	Valve block [l/min]	Quantity Servo valves	Piston rods Ø	Connection dimension <sup>1)</sup>	Item number 280 bar	Item number 210 bar	
±10	50	65	1	45	Ø 70.6 x M8 and 6x Ø 9 Centering Ø 30 H7	<b>935396</b>	<b>1011634</b>	
±10	50	130	2 <sup>2)</sup>	45		<b>064697</b>	<b>1011635</b>	
±10	100	65	1	45		<b>924945</b>	<b>000152</b>	
±10	100	65	1	45 <sup>3)</sup>		<b>3008417</b>	<b>3008416</b>	
±10	100	130	2 <sup>2)</sup>	45		<b>935503</b>	<b>006112</b>	
±10	150	65	1	45		<b>1010638</b>	<b>1011662</b>	
±10	150	130	2 <sup>2)</sup>	45		<b>1010639</b>	<b>1011664</b>	
±10	250	65	1	45		<b>936255</b>	<b>935415</b>	
±10	250	130	2 <sup>2)</sup>	45		<b>101640</b>	<b>926803</b>	
±25	50	65	1	45		<b>026234</b>	<b>925057</b>	
±25	50	130	2 <sup>2)</sup>	45		<b>1010643</b>	<b>1011666</b>	
±25	100	65	1	45		<b>924793</b>	<b>924829</b>	
±25	100	65	1	45 <sup>3)</sup>		<b>1073380</b>	<b>1036928</b>	
±25	100	130	2 <sup>2)</sup>	45		<b>089112</b>	<b>019513</b>	
±25	150	65	1	45		<b>037787</b>	<b>1011668</b>	
±25	150	130	2 <sup>2)</sup>	45		<b>1010644</b>	<b>1011671</b>	
±25	250	65	1	45		<b>003954</b>	<b>935414</b>	
±25	250	130	2 <sup>2)</sup>	45		<b>073844</b>	<b>1011672</b>	
±50	50	65	1	45		Ø 105.12 x M10 and 12 x Ø 11 Centering Ø 70 H7	<b>1010646</b>	<b>033770</b>
±50	50	130	2 <sup>2)</sup>	45			<b>1010658</b>	<b>1011673</b>
±50	100	65	1	45	<b>925059</b>		<b>936146</b>	
±50	100	130	2 <sup>2)</sup>	45	<b>063085</b>		<b>1011675</b>	
±50	150	65	1	45	<b>1010659</b>		<b>1011677</b>	
±50	150	130	2 <sup>2)</sup>	45	<b>1010661</b>		<b>1011678</b>	
±50	250	65	1	45	<b>077594</b>		<b>935380</b>	
±50	250	130	2 <sup>2)</sup>	45	<b>077595</b>		<b>936174</b>	

1) The piston rod includes a connection flange

2) Valve block for 2 valves required, Item No.: **924802**

3) Version only for HC/HC compact models

### For the single testing actuator version:

Description	Item number
Version LH with flange 10 to 63 kN	<b>1052792</b>