

# Hydraulic locking unit HLU LE25

Size	LE25
Type G	Blocking against retraction with pressure relief valve (belt tensioner)
Stroke	80 mm



## Product characteristics

The hydraulic locking units HLU LE (25/32) as well as HLU LE-X (M/E) are specially developed for amusement rides and flying constructions and can be configured to meet individual customer requirements. They ensure maximum safety in shoulder restraints, lap restraints, and abdominal restraints of passenger restraint systems. A check valve in the locking system blocks the cylinder movement and thus reliably locks the restraint bar.

### Features and advantages

- delivery Plug & Play - simple installation and immediately ready for use
- closed and low-maintenance hydraulic system
- electric unlocking and manual emergency operation
- high passenger comfort through stepless and silent bar adjustment
- comfort locking: restraint bars can be used as an aid for getting in and out (depending on model)
- easier bar opening: energy applied during closing is used to open the bar (depending on model)

### Intended applications

- amusement rides and flying constructions (e. g. roller coasters, VR rides, robot simulations)

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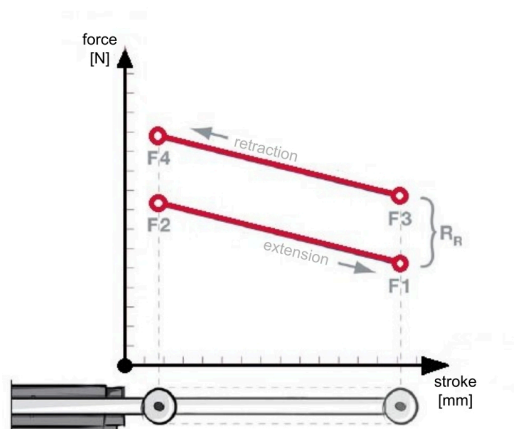
## Technical data

### General

blocking direction	against retraction			
comfort lock	no			
weight (incl. hydraulic fluid), size, RoHs		<b>size</b>	<b>weight</b>	<b>RoHs</b>
	850-8009-2	LE25	3.2 kg	-
	850-8017-1	LE25	3.2 kg	-
material	steel, aluminium, acrylonitrile-butadiene (NBR), polytetrafluorethylene (PTFE), polyurethane			
operating temperature	-10 to + 60 °C			
ambient and storage temperature	-10 to + 60 °C			
outside dimensions cartonage (LxWxH)	630 mm x 250 mm x 200 mm			
mounting position	arbitrary			
behavior in case of power failure	closed/locked			
corrosive category	C2 up to 7 Jahre (M) DIN EN ISO 12944-2			
	<p><b>!</b> <b>NOTICE</b></p> <p>The specified corrosion protection classes were tested by means of a salt spray test according to DIN EN ISO 9227 under laboratory conditions. This neutral salt spray test only serves as quality control for the coatings / materials used and does not reflect the behavior in natural environments. An earlier occurrence of corrosion - than assumed according to the corrosion protection class - can therefore not be ruled out.</p>			
dimensions		<b>nominal stroke</b>	<b>piston diameter</b>	<b>rod diameter</b>
	850-8009-2	80 mm	25 mm	16 mm
	850-8017-1	80 mm	25 mm	16 mm
		<b>installation length when piston rod is retracted</b>	<b>installation length when piston rod is extended</b>	<b>nominal bore diameter of rod end bearing</b>
	850-8009-2	355.75±0.75 mm	435±2 mm	15-0.008 mm
850-8017-1	355.75±0.75 mm	435±2 mm	15-0.008 mm	
speed at 20 °C		<b>max. extending speed</b>	<b>max. retracting speed</b>	
	850-8009-2	60 mm/s	-	
	850-8017-1	60 mm/s	-	

retraction and extension forces at 20 °C

	F1	F2	F3	F4
850-8009-2	200 N	245 N	270 N	340 N
850-8017-1	200 N	245 N	270 N	340 N



load cases\*

\*calculation base DIN EN 13814:2019 / ISO 17842-01:2015 / compatible to ASTM F 2291-15

	static load (max.)	blow-off-case
850-8009-2	8,100 N	6,100 N + 1,000 N
850-8017-1	8,100 N	6,100 N + 1,000 N

**Primary function:**  
**Locking**

The piston rod of the hydraulic cylinder extends when the restraint system is closed. The check valve prevents the cylinder from retracting during operation, thereby locking the restraint system. If the restraint system is operated above the working point of the integrated pressure relief valve, the piston rod retracts. This functionality is usually used for the automatic retensioning of restraining belts.

**Secondary function:**

The locking system functions as a drive and can, for example, be used to tension a belt. In the case of overload, the system retreats, but then immediately tensions again as soon as the load decreases. The system is not intended to be used as a safety-related module and therefore does not have TÜV approval according to DIN EN 13814.

## Hydraulic parameters

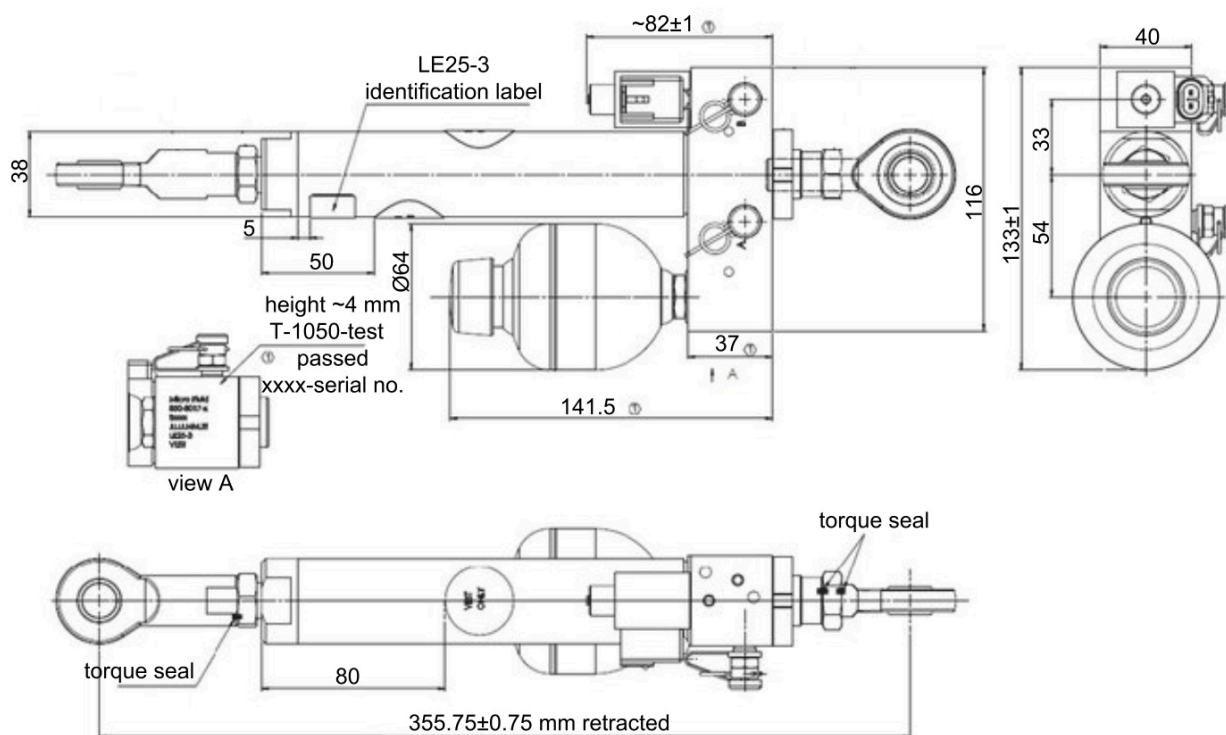
filling gas	nitrogen			
hydraulic fluid	hydraulic fluid DIN 51524 - RSL 22			
fill volume (hydraulic fluid)	850-8009-2	0.06 l		
	850-8017-1	0.06 l		
pressure at 20 °C		<b>P0</b> pneumatic preload pressure	<b>P1</b> filling pressure (hydraulic fluid) with piston rod extended (piston side)	<b>P2</b> filling pressure (hydraulic fluid) with piston rod retract- ed (piston side)
	850-8009-2	8 bar	10.8 bar	15 bar
	850-8017-1	8 bar	10.8 bar	15 bar
pressure-limiting valve	120 +20 bar			

## Electrical parameters

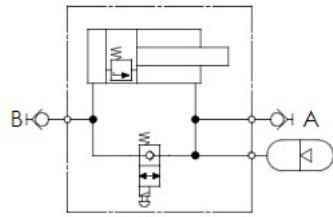
rated voltage seated valve	24 VDC +/- 10 %		
coil power consumption	850-8009-2	22 W	
	850-8017-1	10 W	
power supply	socket AMP-Superseal 1.5 2 poles		
protection class (with appropriate connector)	IP 65		
duty cycle	depending on the environment up to 100 % of duty cycle		

## Dimensions and connections

Dimensions are given in mm.



## Circuit diagram



## Order information

order number	lot size "spare parts Fastlane" (delivery time 5 days)	lot sizes (delivery time 12 weeks)					
		1-36	37-72	73-108	109-144	145-180	>180
850-8009-2	1-5*						
850-8017-1							

\*monthly max. 5 spare parts per order number possible

## Accessories, spare & tear parts

designation	details	order number
packaging set HLU	Standard LE 25 / 32	063-6003-0*
Hydraulic locking unit set	<b>HLU remote unlocking set 1 m</b>	390-6001-0*
	1 m push-pull cable	390-2045-0*
	clamping	390-2048-0*
	<b>HLU remote unlocking set 2 m</b>	390-6002-0*
	2 m push-pull cable	390-2046-0*
	clamping	390-2048-0*
	<b>HLU remote unlocking set 3 m</b>	390-6003-0*
	3 m push-pull cable	390-2047-0*
	clamping	390-2048-0*
plug AMP Superseals & wire 1.5 m without jacket, up to IP 65, UL/CSA-certified	<b>2-way cable</b> <ul style="list-style-type: none"> <li>resistant to hydraulic fluid</li> </ul>	325.6001*
plug AMP Superseals & wire 2 m with jacket, with protective sleeve, up to IP 67, UL/CSA-certified	<b>control wire</b> <ul style="list-style-type: none"> <li>cross section 2x0.75 mm<sup>2</sup></li> <li>wire end 2 mm stripped</li> <li>black/red</li> </ul>	014-3017-1*
plug AMP Superseals & wire 5 m with jacket, with protective sleeve, up to IP 67, UL/CSA-certified	<b>max. bending radius</b> <ul style="list-style-type: none"> <li>once 5x outside diameter</li> <li>several times 15 x outside diameter</li> </ul>	014-3011-2*
coil of 2/2-way directional valve <i>see page 4</i>	24 VDC 10 W	350.2017*
coil of 2/2-way directional valve <i>see page 4</i>	24 VDC 22 W	390-2007-0*
coil casing		330-2012-0*
protective cap		390-1000-0*
rod end (LE25) bore diameter 15-0.008 mm <i>see page "dimensions"</i>	rod side	085-1025-0*
	foot side	085-1026-0*
lock nut M14 (LE25) <i>see page ""</i>	both sides	850-2114-0*
minimesse hose line with plug-in coupling	800 mm	002-1044-0*
auxiliary tool for manual operation	type A/E	850-7046-0*

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