

# Hydraulic locking unit HLU LE25

Size	LE25
Type RL	Blocking against retraction with reverse lock & comfort lock
Stroke	110 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
- easier acceptance process through TÜV-Süd component certificate according to current standards
- 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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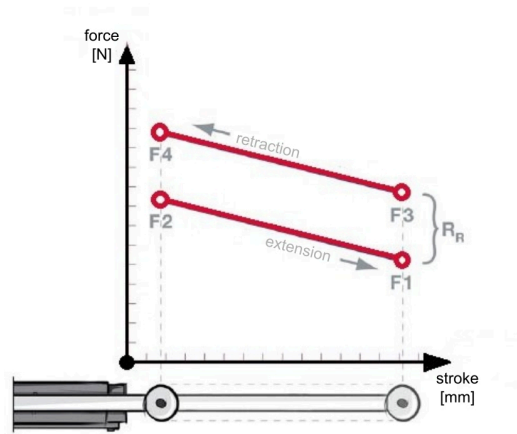
## Technical data

### General

blocking direction	against retraction			
comfort lock	yes			
facilitated restraint bracket	no Note: An actuator (e.g. gas spring) is required to open the bracket to the end position.			
weight (incl. hydraulic fluid), size, RoHs		size	weight	RoHs
	850-7053-0	LE25	3.4 kg	√
material	steel, aluminium, acrylonitrile-butadiene (NBR), polytetrafluorethylene (PTFE), polyurethane			
operating temperature	-10 to + 60 °C			
Umgebungs- und Lagertemperatur	-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>! 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		nominal stroke	piston diameter	rod diameter
	850-7053-0	110 mm	25 mm	16 mm
		installation length when piston rod is retracted	installation length when piston rod is extended	nominal bore diameter of rod end bearing
	850-7053-0	393.5±1 mm	503.5±2 mm	15-0.008 mm
speed at 20 °C		max. extending speed	max. retracting speed	
	850-7053-0	60 mm/s	-	

retraction and extension forces at  
20 °C

	F1	F2	F3	F4
850-7053-0	not relevant	not relevant	155 N	215 N



load cases\*

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

	static load	fatigue load swelling	fatigue load changing	panic load	fatigue load comfort function
850-7053-0	17,000 N	10,500 N	7,900 N	17,000 N	3,700 N

NOTE: No load is permitted for the comfort function "Blocking against Extension" during driving operation. The fatigue load is reduced with alternating dynamic loads. If alternating dynamic loads are possible, only the "fatigue load changing" is permitted for the primary function.

**Primary function:  
Lap bar locking**

The piston rod of the hydraulic cylinder extends when the restraint system is closed. The check valve prevents the cylinder from retracing during operation, thereby locking the restraint system.

**Secondary function:  
Lap bar drive**

As an inherent feature of the design, type "RL" locking units always generate only very low piston extension forces. It is not possible to drive the opening motion of the restraint system with the locking unit. The low extension forces bring about a force that closes the restraint system. This makes an additional system (e. g. gas spring, torsion spring) necessary to drive the opening motion and maintain the restraint system in the open position.

**Secondary function:  
Lap bar fixation  
(comfort function)**

In the open state of the restraint system, the lock of valve V2 prevents the cylinder from extending under load. Passengers can use the restraint system as a handhold when entering and leaving the vehicle.

**Function logic**

You find information on valve switching in your HAWE assembly instructions for the product HLU.

## Hydraulic parameters

filling gas	nitrogen			
hydraulic fluid	hydraulic fluid DIN 51524 - RSL 22			
fill volume (hydraulic fluid)	850-7053-0 ~0.09 l			
pressure at 20 °C		<b>P0 pneumatic preload pressure</b>	<b>P1 filling pressure (hydraulic fluid) with piston rod extended (piston side)</b>	<b>P2 filling pressure (hydraulic fluid) with piston rod retracted (piston side)</b>
	850-7053-0	2.7 bar	3.5 bar	6.9 bar

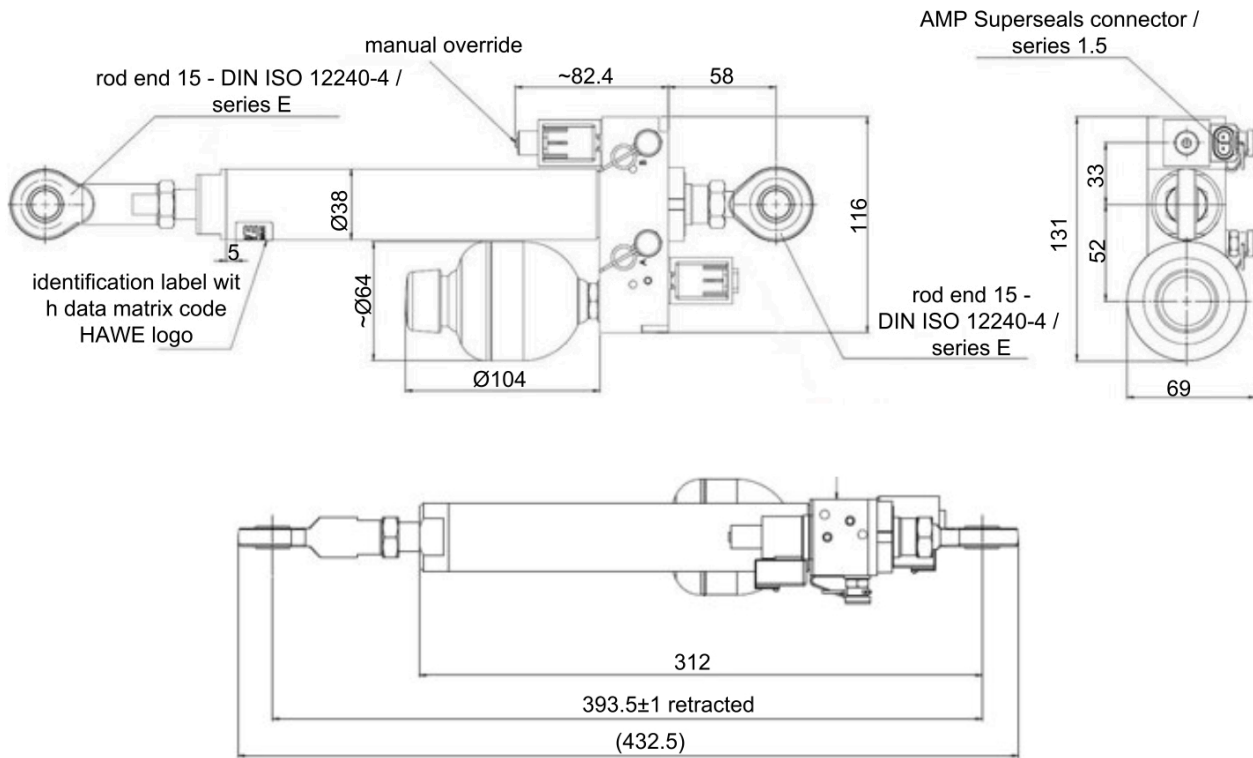
## Electrical parameters

rated voltage seated valve	24 VDC +/- 10 %
coil power consumption	44 W (2x 22 W)
coil power supply	switch-on point: > 0.55 A switch-off point: < 0.05 A*  *Prevent leakage currents and slow current decay.
power supply	socket AMP-Supseal 1.5 2 poles
protection class (with appropriate connector)	IP 65
duty cycle	depending on the environment up to 100 % of duty cycle

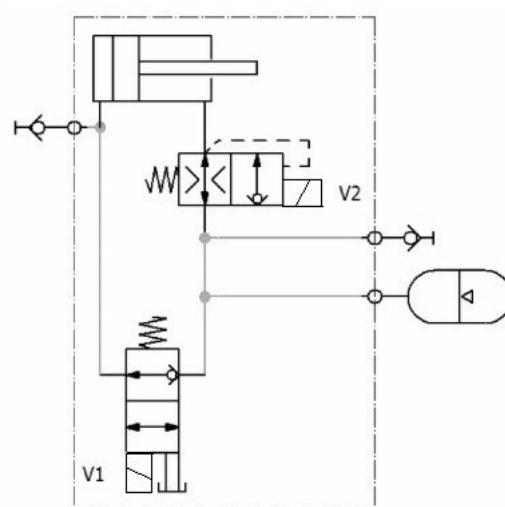
## Dimensions and connections

Dimensions are given in mm.

850-7053-0



## Circuit diagram



## Order information

order number	lot size "spare parts Fastlane" (delivery time 5 days)	lot sizes (delivery time 12 weeks)					
850-7053-0	1-5*	1-36	37-72	73-108	109-144	145-180	>180

\*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>▪ mehrmals 15 x outside diameter</li> </ul>	014-3011-2*
coil of 2/2-way directional valve see page 5	24 VDC 22 W (is needed twice)	390-2007-0*
coil casing		330-2012-0*
protective cap		390-1000-0*
rod end (LE25) bore diameter 15-0.008 mm see page 3	rod side	085-1025-0*
	foot side	085-1026-0*
lock nut M14 (LE25) see page 3	both sides	850-2114-0*
minimess 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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