

Hydraulic locking unit HLU LE25

Size	LE25
Type E	Blocking against retraction
Stroke	140 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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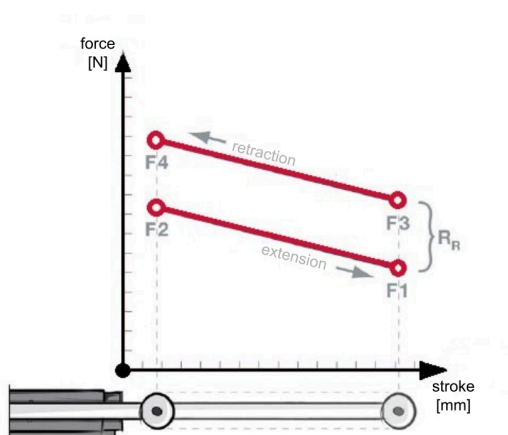
Technical data

General

blocking direction	against retraction			
comfort lock	no			
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
	850-8044-1	LE25	3.3 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 years (M) DIN EN ISO 12944-2			
	<p>! NOTICE</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
	850-8044-1	140 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
	850-8044-1	413.5±1 mm	553.5±2 mm	15-0.008 mm
rod end angle foot side		angle		
	850-8044-1	90°		
speed at 20 °C		max. extending speed	max. retracting speed	
	850-8044-1	60 mm/s	-	

retraction and extension forces at 20 °C

	F1	F2	F3	F4
850-8044-1	not relevant	not relevant	200 N	250 N



load cases*

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

	static load	fatigue load	panic load
850-8044-1	15,150 N	10,500 N	15,150 N

CAUTION

Load bearing capacity:

The maximum operational loads stated in this datasheet are calculated based on safety factors related to ISO 17842 / EN 13814 and must not be exceeded to meet the requirements of those standards.

- Load tests performed with 7 specimen at stroke 135 mm resulted in real breaking loads of 39.7kN.
- Load tests performed with 3 specimen at stroke 105 mm resulted in real breaking loads of 48.5kN.
- Stroke 135 mm indicates a real safety factor 2.6 for buckling related to the normative static / panic loads.
- Stroke 105 mm indicates a real safety factor 3.2 for buckling related to the normative static / panic loads.

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 retracting during operation, thereby locking the restraint system.

Secondary function:
lap bar drive

As an inherent feature of the design, type E locking systems generate only very low piston extension forces. It is not possible to drive the opening motion of the restraint system with the locking system. 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.

Hydraulic parameters

filling gas	nitrogen			
hydraulic fluid	hydraulic fluid DIN 51524 - RSL 22			
fill volume (hydraulic fluid)	850-8044-1	~0.09 l		
pressure at 20 °C		P0 pneumatic preload pressure	P1 filling pressure (hydraulic fluid) with piston rod extended (piston side)	P2 filling pressure (hydraulic fluid) with piston rod retract- ed (piston side)
	850-8044-1	2.7 bar	3.5 bar	6.5 bar

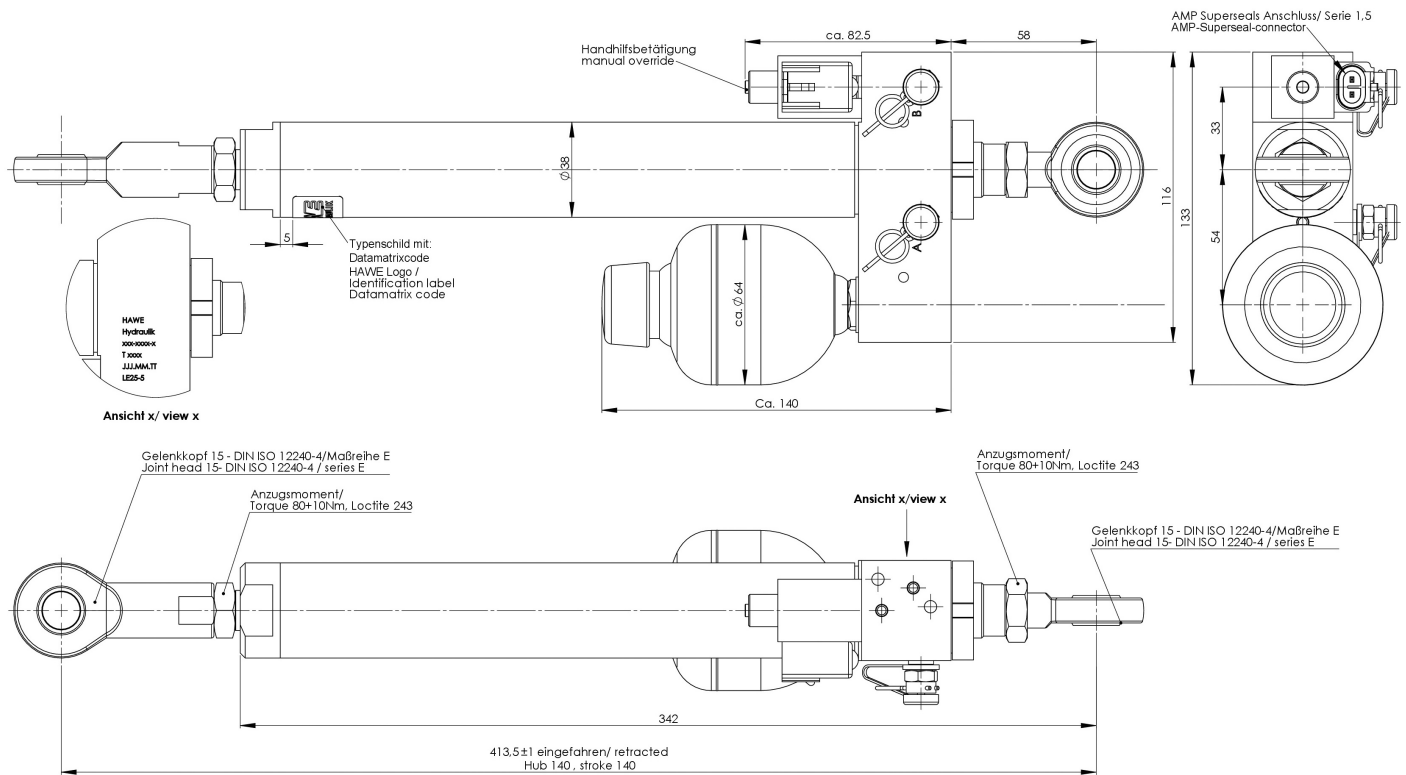
Electrical parameters

rated voltage seated valve	24 VDC +/- 10 %
coil V1 power consumption	22 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

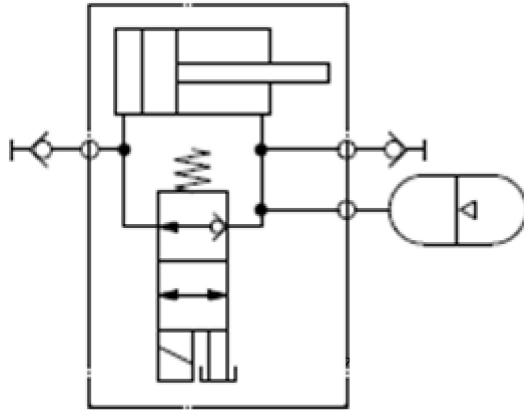
Dimensions and connections

Dimensions are given in mm.

850-8044-1



Circuit diagram



Order information

order number	lot size "spare parts Fastlane" (delivery time 5 days)	lot size "standard" (delivery time 6 weeks)					
		1-36	37-72	73-108	109-144	145-180	>180
850-8044-1	1-5*						

*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	HLU remote unlocking set 1 m	390-6001-0*
	1 m push-pull cable	390-2045-0*
	clamping	390-2048-0*
	HLU remote unlocking set 2 m	390-6002-0*
	2 m push-pull cable	390-2046-0*
	clamping	390-2048-0*
	HLU remote unlocking set 3 m	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	2-way cable <ul style="list-style-type: none"> resistant to hydraulic fluid 	325.6001*
plug AMP Superseals & wire 2 m with jacket, with protective sleeve, up to IP 67, UL/CSA-certified	control wire <ul style="list-style-type: none"> cross section 2x0.75 mm² wire end 2 mm stripped black/red 	014-3017-1*
plug AMP Superseals & wire 5 m with jacket, with protective sleeve, up to IP 67, UL/CSA-certified	max. bending radius <ul style="list-style-type: none"> once 5x outside diameter several times 15 x outside diameter 	014-3011-2*
coil of 2/2-way valve see "Electrical parameters"	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 see "Technical data"	rod side	085-1025-0*
	foot side	085-1026-0*
lock nut M14 (LE25) see "Technical data"	on 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*

*HAWE Micro Fluid GmbH

HAWE Micro Fluid GmbH

Borsigstraße 11 | 93092 Barbing | Germany

Phone +49 89 379100-6000 | info@hawe-microfluid.com | www.hawe.com

