Instruction Manual

Kuhnke Motor Lock HS7722

M853 EN/ 26-11-2018

Contents

1 What is a motor lock?

Since automation is entering more and more areas of our lives, new locking and interlocking systems are needed. The new motor lock combines a mechanical interlock, motor drive unit, limit sensors and electronic circuitry.

One of the many tasks of a motor lock is to not only lock a machine door but to apply a monitored and controlled force to gently pull it into the door seal. Benefits of this locking device include an automatic readjustment of the door when the seal has worn down.

When opening a door, the motor lock's up to 40 mm of travel distance provide further positioning options, e.g. to let superheated steam escape from furnaces.

Safety aspects to be considered by users

Improper operation at initial use, protection of operators when the door closes automatically, protection of door mechanism against damage, protective EMC measures, fuses to protect cables against overload.

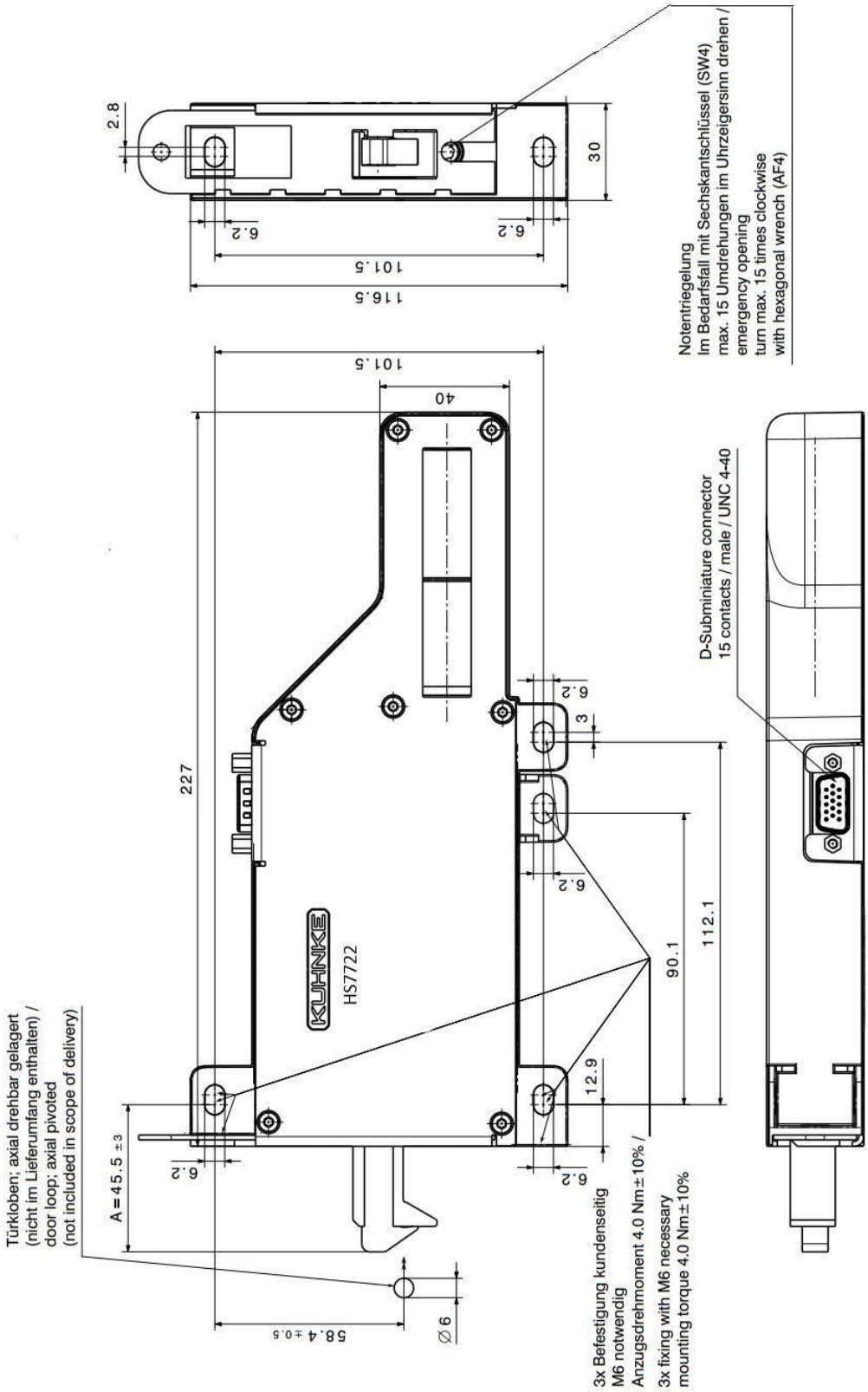
Properties

- ♣ up to 40 mm travel distance
- ♣ uses controlled force for closing
- ♣ up to 400 N closing force
- ♣ multiple target positions
- ♣ emergency unlock supported

2 Design, dimensions, installation

The figure below shows a motor lock as delivered. It is at its home position for receiving a door. Sensor 1 is covered.

Three mounting holes are provided on either side. Another mounting option is to use two screws on the front and one screw on the side face.



3 Electrical connection

All electric signals are transferred trough the male 15-pin D-subminiature connector on top of the motor lock.

- Note: You will need a mating connector (female 15-pin D-subminiature connector) and the appropriate cable to connect the lock to your higher-level control unit. None of the two elements are included in the package.
  We recommend using a shielded D-sub cable.

3.1 Pin wiring

Bridge pins Motor+ and Motor- in order to distribute the load generated by the motor and to be carried by the connectors among three plugs each (pins 6, 12, 14 and pins 11, 13, 15).

Pin	Connects to	Bridges in mating connector
1	Sensor #5	
2	Sensor #4	
3	Sensor #3	
4	Sensor #2	
5	Sensor #1	
6	Motor +	
7	Gnd	
8	24 VDC in	
9	Gnd	
10	Sensor #6	
11	Motor -	
12	Motor +	
13	Motor -	
14	Motor +	
15	Motor -	

Note: The sensor functions inside the motor lock are provided by light barriers.

3.2 Motor actuation

The polarity defines the direction in which the motor turns:

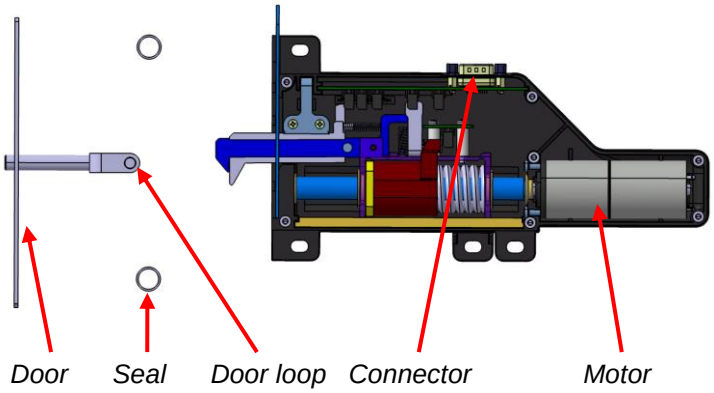
- Forward (open) +24 V on pins 6, 12, 14 / 0 V on pins 11, 13, 15
- Backward (close): 0 V on pins 6, 12, 14 / + 24 V on pins 11, 13, 15

	Short-circuit the connectors after stop!
	Turn off the motor voltage at the target position (sensor x). Ensure that the motor connectors short-circuit immediately afterwards. This means immediately stops the drive and prevents the motor from moving across the sensor.

	Never go across the motor end positions!
	The motor must turn off at one of the end positions. Otherwise (if the lock goes across the end positions), you run a risk of mechanical damage because the motor lock has no mechanical limit stops.

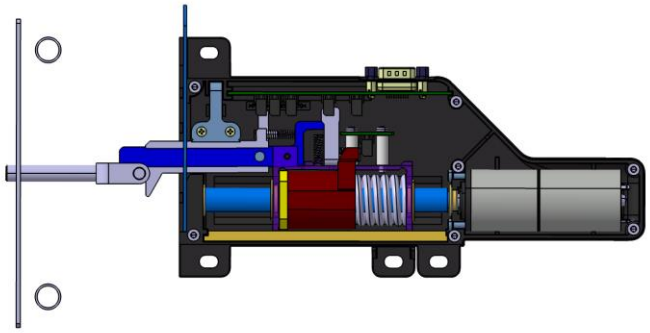
4 Functional process

4.1 Home position (sensor #1)



The door is open and can be closed without operators having to exert much force.

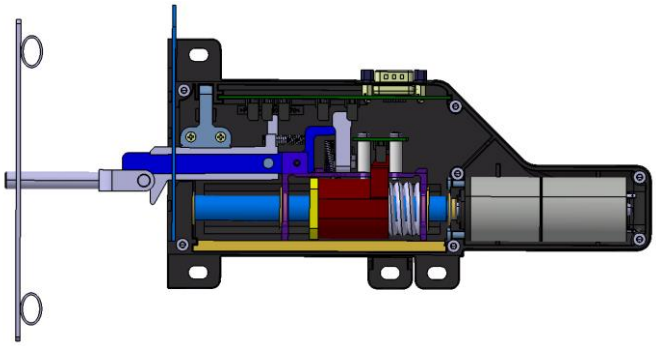
4.2 Door is latched (sensor #2, sensor #1 remains active)



The door latches onto the door loop but need not be closed completely. The door locks preliminarily and prevents the door from opening.

A command of the machine control unit could still unlock the door. To do so, run the motor **forward** (→3.2 Motor actuation) to sensor #6. Then go to → section 4.6.

4.3 Door moves into the seal (sensor #3)



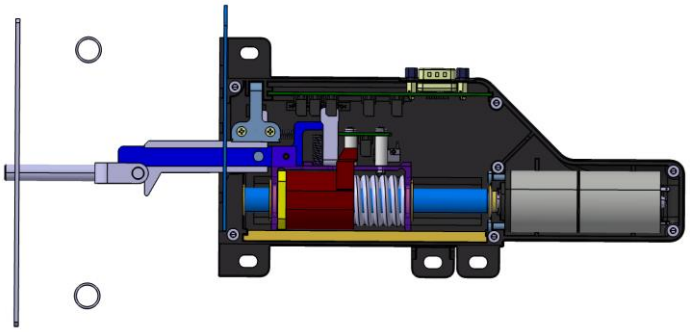
Output "close door" command.

The motor drives the door **backward** into the seal (400 N) up to sensor #3.

A spring actuator compensates for any wear on the door seal (retaining a constant sealing pressure).

	Seal or door loop defective (sensor #4)
	When you close the door and the motor fails to stop at sensor #3 but runs on to sensor #4, there is a defect either in the seal (e.g. wear) or in the door loop. If so, the drive must stop and the fault has to be removed immediately.

4.4 Move to venting position (sensor #5)

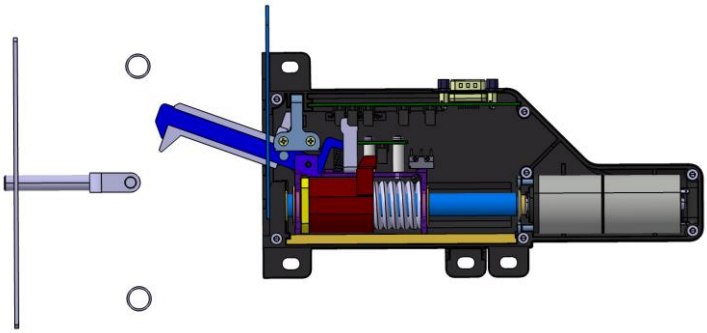


The process (e.g. baking) is finished.

The motor drive runs **forward** to open the door to an about 30 mm gap at sensor #5.

The heat can escape and the baking process terminates. To prevent operators from being burnt, the door may stay locked for a customisable time.

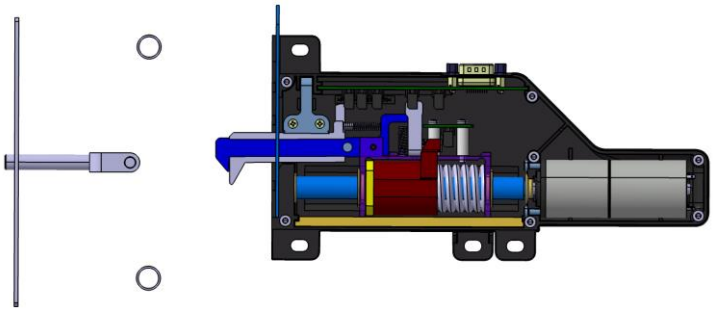
4.5 Unlock door (sensor #6)



After the set time, the latch is moved **forward** by the motor running up to sensor #6 and unlocking the door.

You can now open the door by hand to remove the finished products.

4.6 Return to home position (sensor #1)



To return the lock to its home position, the motor drive now has to move **backward** to sensor #1.

5 Technical data

Model	**Kuhnke Motor Lock HS7722**
Travel distance	40 mm
Velocity	6.5 mm/s
Position sensors	6 x light barrier (open collector, 30 mA)
Maximum closing force	400 N
Power supply	24 V DC
Power	19 W (@ 24 VDC)
Operating temperature	0 °C … 80 °C
Housing	Plastic
Dimensions (W x L x D)	117 x 227 x 30 [mm]