



# Instruction Manual

## HLSD-2 Circular Access Tank Cover



TE91K041  
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Original manual



The information herein is correct at the time of issue but may be subject to change without prior notice

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# 1 EC Declaration of Conformity

The Designated Company

Alfa Laval Kolding A/S  
Company Name

Albuen 31, DK-6000 Kolding, Denmark  
Address

+45 79 32 22 00  
Phone No.

hereby declare that

Cover  
Designation

HLSD-2 Circular Access Tank Cover  
Type  
From serial number 2015-00001 to 2030-99999

was manufactured in conformity with DIRECTIVE 97/23/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 29 May 1997 on the approximation of the laws of the Member States concerning pressure equipment.

HLSD is constructed according to Merkblätter AD 2000 and approved by TÜV Nord e. V. app. No. 0124P042320 intended for pressure vessels in Category IV and Fluids Group 1 and 2.

The Manhole Cover is not pressure tested. It must be tested as a part of the pressure vessel.

The person authorised to compile the technical file is the signer of this document.

Global Product Quality Manager  
Pumps, Valves, Fittings and Tank Equipment  
Title

Lars Kruse Andersen  
Name

  
Signature

Kolding  
Place

2018-02-01  
Date

*This Declaration of Conformity replaces Declaration of Conformity dated 2015-05-26*

*Unsafe practices and other important information are emphasized in this manual.  
Warnings are emphasized by means of special signs.  
Always read the manual before using the cover!*

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### 2.1 Important information

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#### **WARNING**

Indicates that special procedures must be followed to avoid serious personal injury.

#### **CAUTION**

Indicates that special procedures must be followed to avoid damage to the cover.

#### **NOTE**

Indicates important information to simplify or clarify procedures.

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### 2.2 Warning signs

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General warning:



## 3 Introduction

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*Study the instructions carefully and pay special attention to the warnings!*

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### 3.1 Introduction and general description

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This instruction manual has been prepared as a guide for the persons who will be operating/handling the HLSD-2 Circular Access Tank Covers.

**Warning:**



The service personnel must be acquainted with the content of these instructions in order to avoid operating errors. Incorrect use can be of danger to the user or a third party and can cause damage to objects and/or people.

You will find the information contained in this manual simple to follow, but should you require further assistance, our Technical Sales Support Department and worldwide net of sales offices are pleased to help you.

**NOTE**

The illustrations and specifications contained in this manual were effective at the date of printing. However, as continuous improvements are our policy, we reserve the right to alter or modify any unit specification on any product without prior notice or any obligation.

The English version of the instruction manual is the original manual. We make reservations in regard to possible mistranslations in language versions of the instruction manual. In case of doubt, the English version of the instruction manual applies.

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### 3.2 Intended use

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The end-user should verify:

- that the tank cover is in conformity with respect to tank, vessel or container size in which it is used.
- that the construction materials (both metallic and nonmetallic) are compatibility with product, flushing media, cleaning media, temperatures and pressure under the intended use.

Alfa Laval covers are suitable for different applications (e.g.: filling, emptying, access for cleaning or inspection, general access opening etc.).

Clients must specify the detailed version of each cover required. The client must determine the intended purpose of the cover from the technical data of the whole container/vessel (including details such as working/design pressures and temperatures etc.).

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*Study the instructions carefully and pay special attention to the warnings!*

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### 4.1 Application

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Outward opening manhole cover type HLSD-2 is used on top of pressurized tanks and containers where closeable means of access to the interior of the vessel is required. HLSD-2 is approved and can be used on pressure vessels according to PED 97/23/EC.

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### 4.2 Working principle

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HLSD-2 is secured in the closed position by swingbolts, which, together with the seal in the cover, ensure complete tightness. The cover is attached to the frame by a rigid hinge, giving exact location of the cover in the closed position and designed to stop the cover at an angle of 20-30° beyond the vertical position when opening.



## 5 Operation

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*Study the instructions carefully and pay special attention to the warnings!*

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### 5.1 Safety regulations

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**Warning:**



All operators must be trained / certified to work in the area of the container operation and must abide by the site safety regulations.  
All work on the cover must be carried out by competent staff with knowledge of the relevant rules of operation of container and pressure container.  
When the removal of protection equipment is necessary for cleaning or maintenance purpose, assembly and examination of protection equipment has to follow immediately!  
Before opening the cover, check the pressure of the container. Only open the cover when the container is not under pressure.  
Conditions are not allowed to exceed pressure and temperature specified. The Pressure (PS) and Temperature (TS) are written on each cover.  
When filling and emptying the container, the regulations regarding contact of the liquid or content (e.g. foodstuff) must be kept.  
National rules regarding use and test frequency must be followed.

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### 5.2 Components

---

Depending of the detailed version of the cover, specified by the customer, components are attached accordingly.

Typical components according to drawing:

- Screws complete (number according to description)
  - Hinge / swivelling feature
  - Screwed sight glass / circular sight glass
  - Spring assist
  - Limit switch
  - Locking bolt
  - Safety grill
  - Safety valve
  - Etc. for other special items agreed
- 

### 5.3 Weld into position

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To tack in, frame and vessel wall have to be adjusted carefully.

By applying the tack weld, the weld crack has to be small. Short distances between the tack welds prevent deformation.

During the welding of the neck to the container, it is preferable to have the cover lid closed and the operational seal removed (to be replaced by a temporary seal / spacer). This will give added rigidity to the neck when welding in and avoid heat transfer damage to the seal.

After welding, gasket seating has to be checked against circular and plane. If there is a difference of more than 1 mm, gasket seating has to be put in right form.

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*Study the instructions carefully and pay special attention to the warnings!*

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### 5.4 Assembly

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When surface treatment is completed (ground, pickled, polished, shot-blasted etc), all components have to be assembled carefully.

Screws / Swing-pins must be assembled completely (i.e. securing the bolts with the safety cir-clips, clamp sleeve, washer and nut / handle to be correctly assembled to the screws / swing-pins).

Before starting a process or putting the container under pressure / temperature, all equipment must be checked to ensure correct functionality; (hinge, gasket seating, screws/swing-pins including all safety cir-clips assembled, locking bolt, nuts/handles etc.)

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### 5.5 Material lifetime

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As the customer selects the material by order, no warranty in relation to material lifetime is offered by Alfa Laval Kolding A/S. It is the responsibility of the operator to make sure, that product coming in contact with the cover or seal, are suitable and the materials and seal are sufficiently resistant to the product / conditions.

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### 5.6 Closure of cover

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The operator is responsible for the safe closure of the cover. Ensure before closing that the container is not occupied by persons, animals or inadmissible objects.

Ensure before closing the cover that the sealing surface is free from any obstructions (i.e. body parts or equipment) as injury or damage can occur.

All parts relevant to security and pressure has to be checked visually before closing the cover. (e.g. gasket, gasket seating, screws).

Cover has to be closed carefully without force. Look after good centralisation. Ensure seal is positioned correctly and that contact area is clean.

Lid and neck should have a little lateral clearance, so that the gasket seating does not have metal contact.

Centre of lid flange has to enclose the gasket seating of the neck perfectly.

Screws/swing-pins are to be put in the correct position, so that the machined face of sleeves clings to the outside groove of the lid flange.

The bolting arrangement must be tightened evenly and to a set torque when using a max allowable torque procedure in several steps as follows:

- A. 50% torque
- B. 80% torque
- C. Max. torque

Cross tightening of the bolting arrangement should be used when applying torque to the nut / handle (e.g. North, South, East, West where appropriate).

The maximum torque for the screws is 40 Nm for M12 Screws and 60 Nm for M16 Screws.

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## 5 Operation

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*Study the instructions carefully and pay special attention to the warnings!*

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### 5.7 Opening of cover

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The operator is responsible for the safe opening of the cover. Before opening the cover, ensure the container is checked to be free from pressure, heat and chemical vapours.

If necessary, protective clothing and protective eyewear have to be used especially for high temperatures, for caustic or toxic liquid applications etc.

Like with closing, all nuts / handles should be opened symmetrically. Cross opening of the bolting arrangement should be used when opening the cover (e.g. North, South, East, West where appropriate).

Opened lid to be set down securely / carefully, to avoid damage to lid / seal (if possible use a spring loaded locking pin) and to prevent lid falling downwards accidentally causing injury.

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### 5.8 Cleaning

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The complete cover has to be cleaned as per the recommendations of the manufacturer of the container.

It is the responsible of the operator to ensure that all cleaning agents used do not have an adverse affect on the cover materials and the seal. Cleaning agents should be thoroughly removed after use.

During C.I.P., it is imperative that the temperature does not rise above the recommended temperature of the cover/seal causing damage.

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*Study the instructions carefully and pay special attention to the warnings!*

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### **6.1 Maintenance**

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Cover has to be checked regularly for damage (e.g. gasket, gasket seating, nut / screw and complete swing assembly, hinge, spring, etc. - Only Alfa Laval recommended spare parts to be used).

We recommend inspection of each cover at least annually against mechanical damage, corrosion and tightness.

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## 7 Technical and physical data

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*Study the instructions carefully and pay special attention to the warnings!*

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### 7.1 Standard

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The HLSD-2 pressure cover is designed according to Merkblätter AD 2000 newest edition and designed for installation in pressure vessels until hazard category IV. The cover is not pressure tested and must be tested as a part of the pressure vessel.

- HLSD-2 is designed for fluid group 1 and 2.

#### TECHNICAL DATA

**Sizes** 200 mm, 300 mm, 400 mm, 450 mm, 500 mm and 600 mm.

#### Pressure

Max. allowable pressure: According to selection table, see page 13

Min. allowable negative pressure: Full vacuum

Max. test pressure P<sub>test</sub>: According to selection table, see page 13

#### PHYSICAL DATA

##### Materials

Product wetted steel parts: 1.4404 (AISI 316L)

Other steel parts: 1.1401 (AISI 304)

Seal: EPDM, FPM, Silicone, FEP covered silicone, FEP covered FPM, PFA covered silicone

Standard surface finish: 1.6µm, inside Ra 0.8µm

#### Temperature

Temperature range: -10°C to +250°C

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### 7.2 Options

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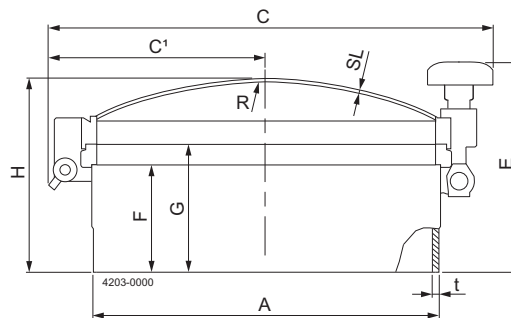
- A. Spring to assist opening.
  - B. Arrangement for securing cover in open and closed position.
  - C. Bracket for indication unit.
  - D. Handle in stainless steel.
  - E. Guide for cover for vertical installation. Please define positioning of the hinge (right or left hand side).
  - F. Sight glass DIN 28120.
  - G. Sight glass DIN 11851.
  - H. Safety grid.
  - I. Special surface finish.
  - J. Frame height G = 300mm.
  - K. Seal of Q (silicone), FPM, FEP covered silicone, PFA covered silicone, FEP covered FPM.
  - L. Conical frame, different frame thickness and frame height available on request.
-

## 7 Technical and physical data

Study the instructions carefully and pay special attention to the warnings!

### 7.3 Selection table

Size	A	Number of bolts	Max. allowable pressure PS (bar) at design					Max. test pressure P <sub>test</sub>	Cover thickness (SL)	Cover radius
			temperature T <sub>d</sub> (°C)							
			50°C	100°C	150°C	200°C	250°C			
mm	mm		bar	bar	bar	bar	bar	bar	mm	mm
200	208	4	14.7	13.0	11.8	10.8	10.0	21.1	8	500
300	308	4	7.6	6.7	6.4	6.1	6.0	13.5	5	500
		6	9.4	8.4	7.5	6.9	6.4	13.5	6	500
400	408	4	4.4	3.8	3.7	3.5	3.4	10.1	4	500
		6	6.6	5.8	5.5	5.3	5.2	14.3	5	500
		8	8.7	7.7	7.4	7.1	6.8	14.3	6	500
450	458	6	5.2	4.6	4.4	4.2	4.1	12.0	4	500
		8	7.0	6.1	5.9	5.7	5.5	12.5	5	500
		10	8.7	7.7	7.1	7.0	6.8	14.5	6	500
500	508	6	4.2	3.7	3.6	3.4	3.3	9.8	4	500
		8	5.7	5.0	4.8	4.6	4.5	10.7	4	500
		10	7.5	6.9	6.6	6.3	6.2	12.0	5	500
600	608	6	3.0	2.6	2.5	2.4	2.3	6.9	4	500
		8	4.0	3.5	3.3	3.2	3.1	7.7	4	500
		10	5.0	4.4	4.2	4.0	3.9	7.7	4	500
		12	6.0	5.3	5.0	4.9	4.7	8.8	5	500
		14	7.0	6.1	5.9	5.7	5.4	10.0	5	500



Size	200	300	400	450	500	600
mm	mm	mm	mm	mm	mm	mm
A	208	308	408	458	508	608
C <sub>1</sub>	154	204	254	279	309	359
C	320	420	520	570	625	725
E	237	237	247	247	247	247
F	125	125	125	125	125	125
G	150	150	150	150	150	150
H	185	198	226	240	251	285
R	500	500	500	500	500	500
SL see selection table						
t	4	4	4	4	4	4

### 7.4 Certificates

- 3.1 Certificate (EN10204)
- EC unit verification module G according to PED 97/23/EC
- FDA declaration §177.2600 for seal material (except FPM seal)
- ASME BPE Certificate (option)

## 8 General information

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*Study the instructions carefully and pay special attention to the warnings!*

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### 8.1 Service & Repair

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Upon every return of a product, no matter if for modifications or repair, it is necessary to contact your local Alfa Laval office to guarantee a quick execution of your request.

You will receive instructions regarding the return procedure from your local Alfa Laval office. Be sure to follow the instructions closely.

When ordering replacement parts, we require the order number and the Alfa Laval serial number stated on the cover/lid.

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### 8.2 Warranty - definition

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**Warning:**



The rules of Intended Purpose are absolute. Use of the cover is allowed only when in compliance with the technical data supplied with the Intended Purpose.

Differing utilisation, other than agreed with Alfa Laval Kolding A/S, exclude any liability and warranty.

No modification or alteration of the cover is allowed, unless explicit permission is granted by Alfa Laval Kolding A/S.

**Liability and warranty are excluded:**

- If advice and instruction of operating instructions are ignored.
- For incorrect operation or for insufficient maintenance of the cover.
- For any kind of change of function of cover without prior written agreement by Alfa Laval Kolding A/S.
- If covers are modified by non-authorized persons.
- If using the covers without attention of appropriate safety regulations. (See respective section of this instruction manual, page 8).
- If protection equipment is not used and vessel process / ancillary equipment is not brought to a standstill.
- If the cover and ancillary parts are not properly maintained (to be executed in intervals and including fitting of prescribed replacement parts).

When exchanging parts, only original replacement parts, released from the manufacturer, must be used.

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### 8.3 Warranty

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The warranty conditions are subject to the legal warranty period of 12 months from the date of delivery. In case of improper use, modifications of or damages to the device, we do not accept warranty claims. Damaged devices will also not be accepted. Furthermore, defects due to normal wear are not subject to warranty services.

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*Study the instructions carefully and pay special attention to the warnings!*

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### 8.4 How to contact Alfa Laval Kolding A/S

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For further information please feel free to contact:

**Alfa Laval Kolding A/S**

31, Albuen - DK 6000 Kolding - Denmark

Registration number: 30938011

Tel switchboard: +45 79 32 22 00 - Fax switchboard: +45 79 32 25 80

[www.toftejorg.com](http://www.toftejorg.com), [www.alfalaval.dk](http://www.alfalaval.dk) - [info.dk@alfalaval.com](mailto:info.dk@alfalaval.com)

Contact details for all countries are continually updated on our websites

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**How to contact Alfa Laval**

Contact details for all countries are continually updated on our website.

Please visit [www.alfalaval.com](http://www.alfalaval.com) to access the information directly.

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