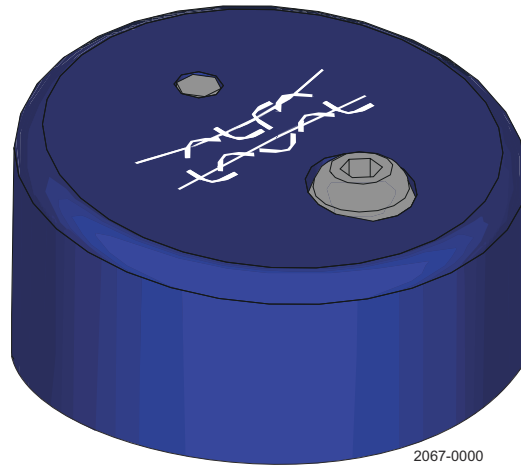


# Alfa Laval CM

Condition monitoring

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Lit. Code

200002050-3-EN-GB

Instruction manual

**Published by**  
Alfa Laval Kolding A/S  
Albuen 31  
DK-6000 Kolding, Denmark  
+45 79 32 22 00

**The original instructions are in English**

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# 1 Declarations of Conformity

## 1.1 EU Declaration of Conformity

The Designated Company

Alfa Laval Kolding A/S, Albuen 31, DK-6000 Kolding, Denmark, +45 79 32 22 00

Company name, address and phone number

Hereby declare that

CM

Designation

Condition Monitor

Type

is in conformity with the following directives with amendments:

- EMC - Directive 2014/30/EU
- RED 2014/53/EU
- RoHS Directive 2011/65/EU and amendments

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

Global Product Quality Manager

Title

Lars Kruse Andersen

Name

Kolding, Denmark

Place

2023-06-01

Date (YYYY-MM-DD)



Signature

This Declaration of Conformity replaces Declaration of Conformity dated 2018-10-01



## 1.2 UK Declaration of Conformity

The Designated Company

Alfa Laval Kolding A/S, Albuen 31, DK-6000 Kolding, Denmark, +45 79 32 22 00

Company name, address and phone number

Hereby declare that

CM

Designation

Condition Monitor

Type

is in conformity with the following directives with amendments:

- The Electromagnetic Compatibility Regulations 2016
- The Radio Equipment Regulations 2017
- The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

Signed on behalf of: Alfa Laval Kolding A/S

Global Product Quality Manager

Title

Lars Kruse Andersen

Name

Kolding, Denmark

Place

2023-06-01

Date (YYYY-MM-DD)

Signature

DoC Revison\_02\_062023

**UK  
CA**

## 1.3 ISED and FCC Statements

### ISED Statements:

This Device complies with Industry Canada License-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage ; (2) l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

### FCC Statements:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received,

including interference that may cause undesired operation.

Changes or modifications to the equipment not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This portable device with its antenna complies with FCC/IC RF exposure limits for general population / uncontrolled exposure. The antenna used for this device must not be co-located or operating in conjunction with any other antenna or transmitter.

#### NOTE

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

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## 2 Safety



### Read this first



#### **WARNING**

Failure to observe the instructions contained in this manual could result in personal injury and property damage, and may void the warranty. Read this manual carefully before installing and using the product.

### 2.1 Purpose of this manual

#### **NOTE**

Save this manual for future reference and keep it readily available. For detailed use of product guidance, consult the Alfa Laval Condition Monitor application. Requesting other information for instructions, situations, or events that are not considered in this manual or in the sales documents, please contact your local Alfa Laval representative. Always specify the exact product type and identification code when requesting technical information or spare parts.

The purpose of this manual is to provide necessary information for:

- **Installation**
- **Safety**
- **Recycling**
- **Troubleshooting**
- **Related documents**

### 2.2 Warning Signs in Text

Pay attention to the safety instructions in this manual.

Below are definitions of the four grades of warning signs used in the text where there is a risk for injury to personnel or product damage.

#### **DANGER**

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

#### **WARNING**

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

#### **CAUTION**

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate damage on the product.

#### **NOTE**


Indicates important information to simplify or clarify procedures.


## 2.3 Safety Instructions and Warnings




### 2.3.1 Safety Signs

	General warning.
	Hot surfaces.

### 2.3.2 General Safety Precautions

	<p><b>Installation</b></p> <p>This product should only be installed/commissioned by instructed or otherwise competent personnel.</p>
---	--

	<p><b>Hot surfaces</b></p> <p>When mounting the CM on external equipment, such as pump gearboxes, be aware of potential hot surfaces, always wear appropriate protective equipment.</p> <p>The CM can be mounted on surfaces up to 80° C (176° F).</p>
---	--

 	<p><b>Temperature</b></p> <p>Never heat the Condition Monitor to temperatures in excess of 90° C (194° F).</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;">  <b>WARNING</b> </div> <p>Heating above these temperatures could result in serious injury. Never dispose of the Condition Monitor in a fire, this could result in serious injury.</p> <p>This product contains a Lithium thionyl chloride battery, do not crush/cut open or disassemble the product to remove the battery in any way.</p>
--	--

### 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.

## 2.4 Recycling Information

### NOTE

Product contains lithium thionyl chloride.

This product contains a lithium thionyl chloride battery, recycle or dispose of the product properly. Local, state or federal laws may prohibit disposal of lithium thionyl chloride batteries in ordinary trash. Consult local waste management companies for assistance in the correct disposal of this product.

---

## 3 Introduction

Understanding the running condition of equipment and whether service or maintenance is required is paramount to keeping plant and processes running efficiently and cost effective.

The Alfa Laval CM condition monitor is a quick and easy battery operated device, to attach to rotating equipment and detect any change in the equipment behaviour. Providing users with easy, safe data via bluetooth to enable them to optimise process uptime, assist in maintenance scheduling and efficiency and reduce operating costs.

The Alfa Laval CM periodically measures the tri-axial vibration of the installed unit and the internal temperature storing 3 months of data for analysis.

In addition, unique identification can provide the user with service data of the equipment and contacts of service partners to ease the maintenance process, ensuring asset value, total cost of ownership and process continuity.

## 3.1 About Condition Monitor

The Condition Monitor (CM) is a compact, easy to use, vibration monitoring system which allows the user to monitor the condition of rotating equipment. The CM is battery powered, and communication is performed wirelessly by means of Bluetooth, thus no need for cabling.

During operation, the CM measures equipment vibration.

Advanced frequency analysis functions assist the user in detecting maintenance demanding equipment components in due time, so that maintenance can be carried out as a planned operation.

A minimum of 3 months of measurements can be stored directly on the CM.

### NOTE

The CM shall be used in conjunction with a handheld device (not included) running Android or iOS with the Alfa Laval Condition Monitor application installed.

The battery life of the CM is expected to be at least 2-3 years under normal operating conditions.

Since this depends on user behaviour, battery life time is excluded from warranty.



### NOTE

#### Countries approved for use

For updated information, go to :

<https://www.alfalaval.com/products/fluid-handling/automation/condition-monitoring/cm/>

## 4 Installation

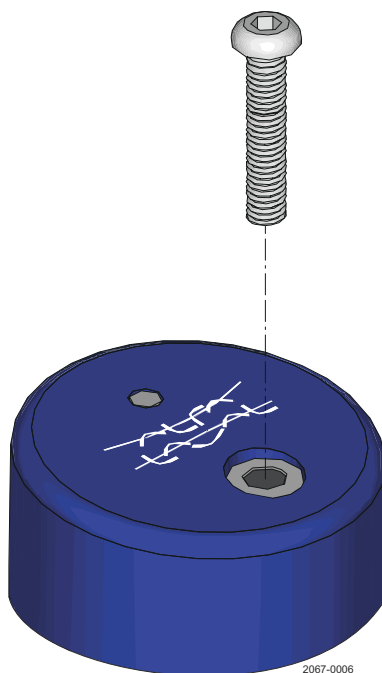
### NOTE

When mounting the CM, it is important to achieve a solid mechanical connection between the equipment and the CM in addition to any adapter if fitted, ideally mounted to a flat surface. The CM can be mounted on surfaces up to 80° C (176° F).

### 4.1 General Guidelines

The general guidelines for custom fitting of the CM to rotating equipment, we recommend the following.

CM screw	Clearance hole	Thread	Tool	Max torque
Button SHCS	[Drill Size / Depth]	[Tap Size / Depth]	Hex key	
M6 x 30mm	5mm / 10mm	M6 / 7mm	4mm	10 Nm / 7.5 ft-lb



## 4.2 Alfa Laval Equipment Guidelines

For Alfa Laval equipment which does not have the specific M6 tapping available for retro-fit, an adapter kit can be supplied.

Please find the relevant addendum for the specific Alfa Laval equipment.

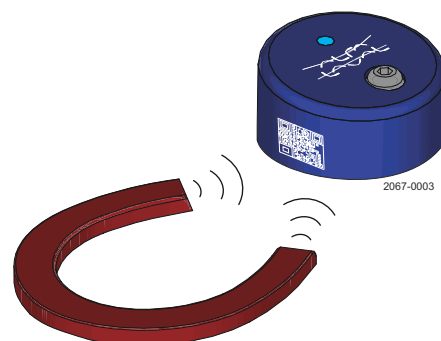
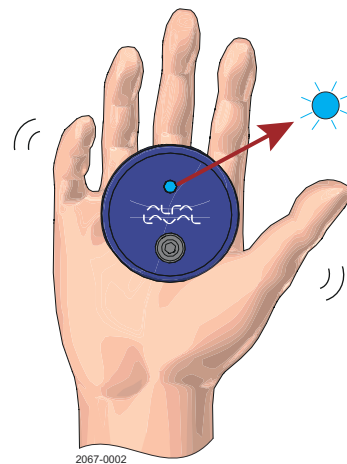
## 4.3 Setup

- 1 Install and open the Alfa Laval Condition Monitor application.

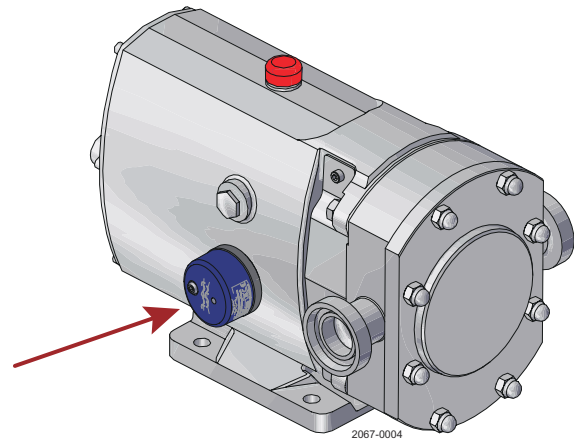
Scan the QR code see "[Section 3.4 Software](#)".



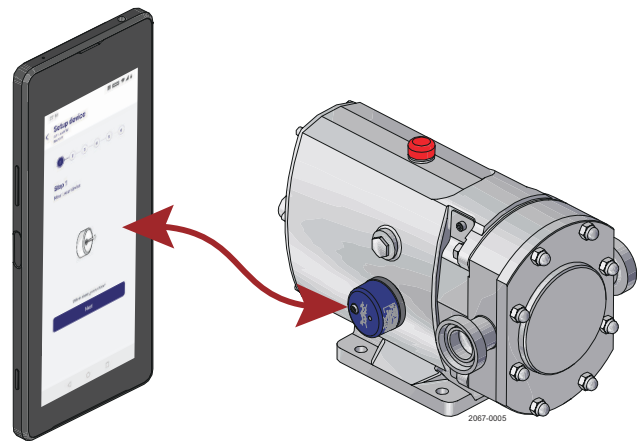
- 2 Wake up the CM by shaking it, until the LED flashes blue or hold a magnet to the QR-code until the LED flashes blue, then remove the magnet.



- 3 Mount the CM on the rotating pump.



- 4 Connect your handheld device with the CM, and follow the "First Time Setup" instructions in the Alfa Laval Condition Monitor application.



## 4.4 Software

To install the Alfa Laval Condition Monitor application, use a handheld device that operates with Android or iOS - Direct download via QR-code.



2067-0007

\* Application download in China with Android: Go to Condition Monitor product page, at [www.alfalaval.cn](http://www.alfalaval.cn) and download the application.

### NOTE Software Compatibilities

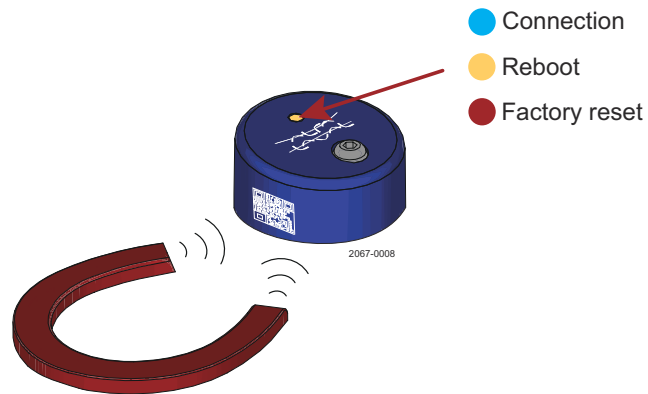
Requires iOS 9 or later or Android 4.4 or later. Requires Bluetooth® 4.0 or above.



## 5 Troubleshooting

Issue	Cause	Connection
The CM does not appear in the “My Devices” list.	The CM is in sleep mode.	Shake the CM and wait for the blue LED to blink or wake the CM by use of a magnet, see <a href="#">“Section 5.1 Magnet functionality”</a>
The CM does not wake up when performing the wake instructions.	The CM software may be suspended.	Perform a software reboot by use of the magnet, if the reboot does not correct the issue, perform a factory reset by use of a magnet, see <a href="#">“Section 5.1 Magnet functionality”</a>
The CM does not respond to a magnet, but is connectable via the application.	Make sure the magnet is placed correctly, at the QR code on the CM.	If the problem persists, try a different type of magnet.
During Setup, I successfully woke up the CM, but now it does not appear in the “My devices” list.	The CM returns to sleep mode after 15 minutes, if no application connection has been made.	Perform a wake instruction again.

## 5.1 Magnet Functionality



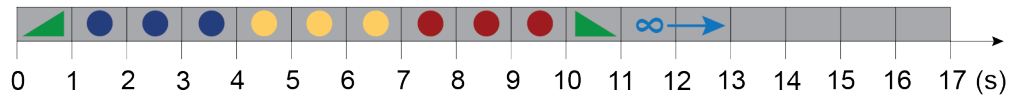
In case the CM becomes unconnectable via the Alfa Laval Condition Monitor application the CM firmware can be restarted by holding a magnet to the QR code located on the CM.

The magnet HMI describes how to operate the magnet, the magnet menu is divided into colors. Blue for connection, yellow for reboot and red for factory reset.

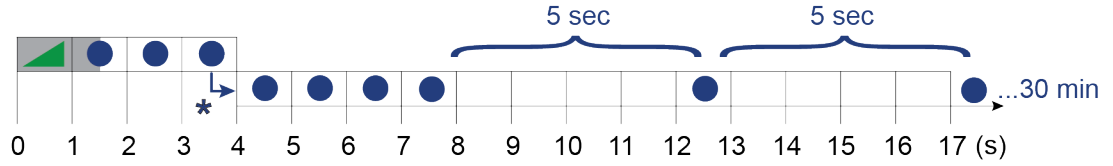
If a reboot is wanted, hold the magnet to the QR code on the CM. The CM will indicate the presence of the magnet by flashing the green LED and then proceed through the magnet menu. When the CM starts to flash yellow remove the magnet, if the reboot command has been confirmed the CM will respond with three yellow LED flashes.

In the event a firmware reboot does not alleviate the problem, the magnet can also be used to perform a factory reset of the CM, this will delete all stored data and completely reset the CM.

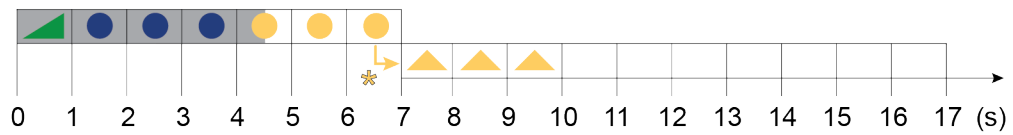
Mag Menu



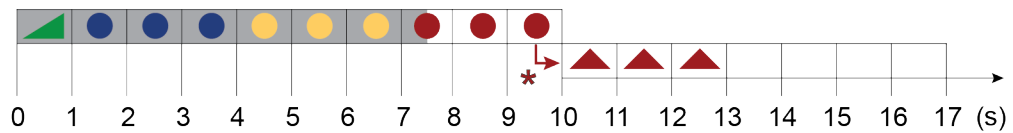
Magtiwake



Mag Reboot



Mag Reset



- Magnet ON
  LED Ramp Up (Green)
  LED Ramp Up (Yellow)
  LED Single Blink (Blue)
  LED Single Blink (Yellow)
  LED Single Blink (Red)
 \* Connectable
 \* Reboot
 \* Factory Reset
  No action
- Magnet OFF
  LED Ramp Down (Green)
  LED Ramp Down (Yellow)
  LED Ramp Down (Red)

## 5.2 Tips and Tricks

### Wink function: Locating a CM among other CM's

To easily identify a CM from others, use the Wink functionality. In the My Devices list tap and hold a CM card, until the Wink dialog pops up. Selecting Wink, will instruct the CM to flash purple with 1 second between flashes for a total of 1 minutes, giving the user time to visually locate the CM.

### Sleep mode for storage

When storing a CM, remember to put it in sleep mode, in sleep mode all data will be preserved, while all sub routines such as measuring, logging and comparison with baseline levels, are suspended. While in sleep mode, the CM life expectancy is greatly increased. To exit sleep mode, simply perform one of the two wake instructions. See [Section 3.3 Setup](#)

### Name your CM

For a quick and easy overview of your equipment, use the custom name function and name your CM with either type/name/P&ID or something unique to you.

For example, "SRU3 Intake ID 5.02".

### Event log

If the CM has observed vibrations that triggered a notification, use the Event log to see details of exactly when the notification occurred.

## 5.3 Parts Lists

Item name	Article number	Description
CM incl M6 screw	8010000561	Condition Monitor
Screw M6 alone	8010000565	Condition Monitor Mounting screw

## 6 General Installation Guidelines

### 6.1 Hygienic Recommendations

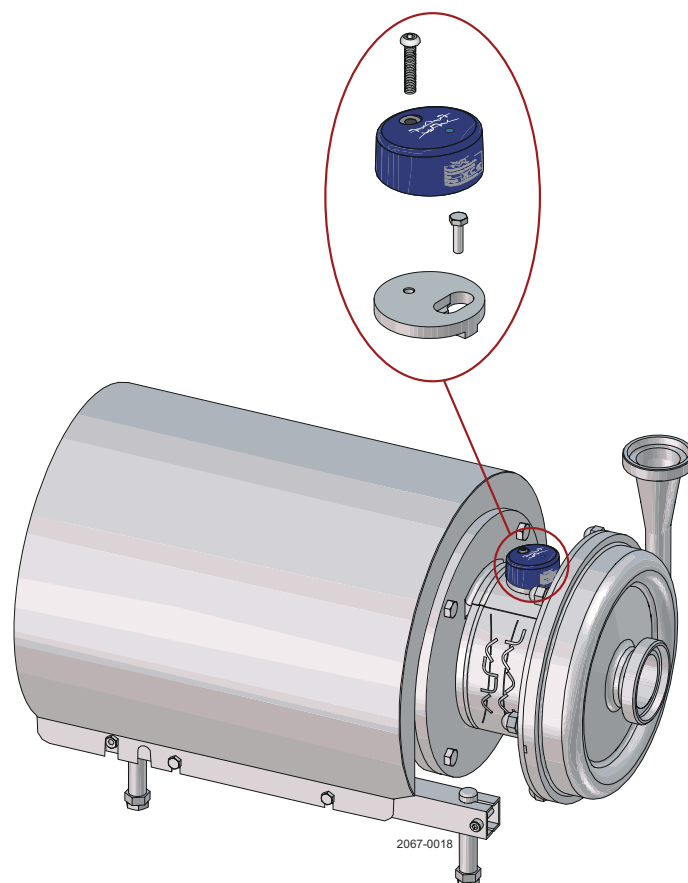
For a hygienic installation, use an FDA approved sealant between the equipment and the adapter plate, and between the CM and the adapter plate.

### 6.2 LKH Guidelines

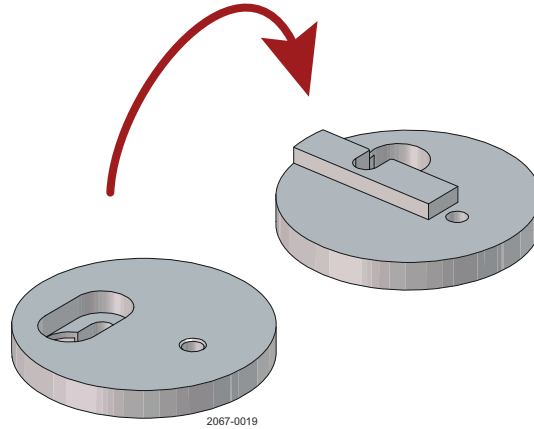
**NOTE** When mounting the CM, it is important to achieve a solid mechanical connection between the equipment and the CM adapter plate. The CM can be mounted on surfaces up to 80° C (176° F).

The CM is assembled on the top of the adapter.

Motor size	Tool Spanner Adapter screw	Tool Hex key CM screw	Max torque [Adapter screw/ CM screw]
IEC 80–280 NEMA 182–405	8 mm	4 mm	4.5 Nm / 8 Nm 3.3 ft-lb / 5.9 ft-lb



### 6.2.1 Adapter Details



Adapter Kit [Type / Article No.] <sup>1</sup>	Adapter Screw Hex screw	Adapter Dimensions [Ø/H]	Adapter Weight
<b>8010008558</b>	M5 x 16	58 mm / 11 mm 2.3 inch / 0.43 inch	0.13 kg 0.29 lbs

<sup>1</sup> All adapters are made of stainless steel EN 1.4301 (AISI 304). The CM is included.

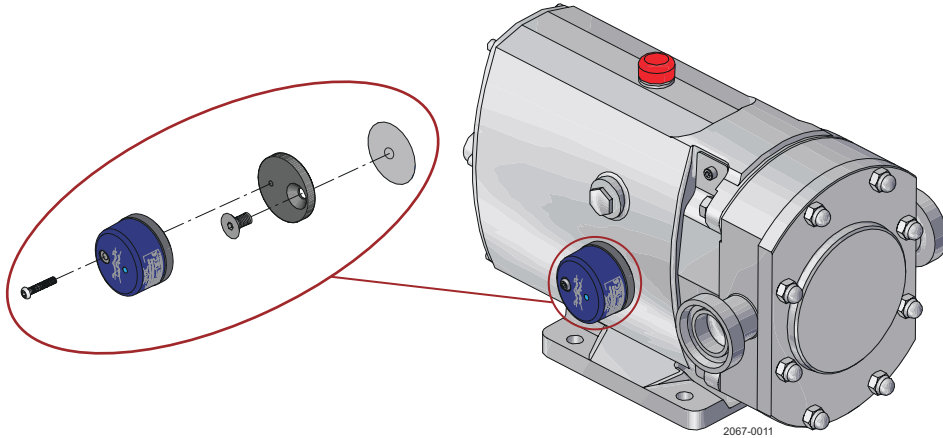
### 6.3 SRU / SX Guidelines

**NOTE** When mounting the CM, it is important to achieve a solid mechanical connection between the equipment and the CM adapter plate, ideally mounted to a flat surface. The CM can be mounted on surfaces up to 80° C (176° F).

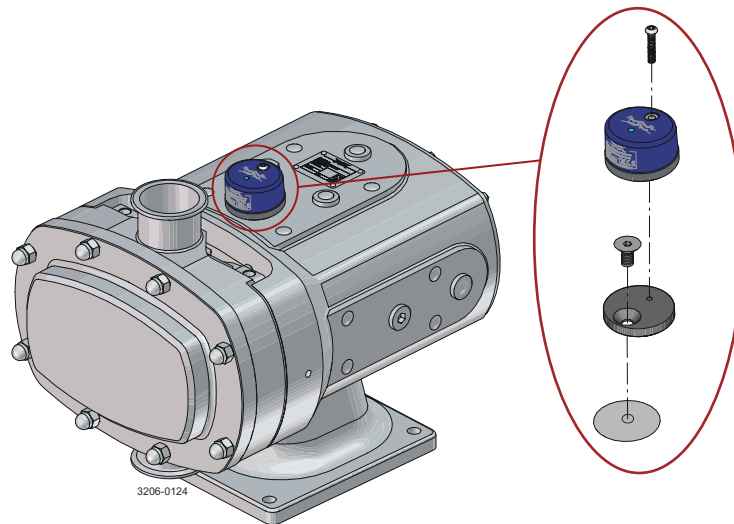
The SRU/SX range does not have a dedicated M6 tapping to mount the CM and as such an adapter kit is required to utilize existing available screw threads on the gearbox.

Pump type	Adapter type	Tool Hex key Adapter screw	Tool Hex key CM screw	Max torque [Adapter screw / CM screw]
SRU1 / SX1	1	5 mm	4 mm	20 Nm / 10 Nm 15 ft-lb / 7.5 ft-lb
SRU2 & 3 / SX2 & 3	2	6 mm		40 Nm / 10 Nm 30 ft-lb / 7.5 ft-lb
SRU4,5 & 6 / SX4, 5 & 6	3	8 mm		50 Nm / 10 Nm 37 ft-lb / 7.5 ft-lb
SX7	4	12 mm		60 Nm / 10 Nm 44.5 ft-lb / 7.5 ft-lb

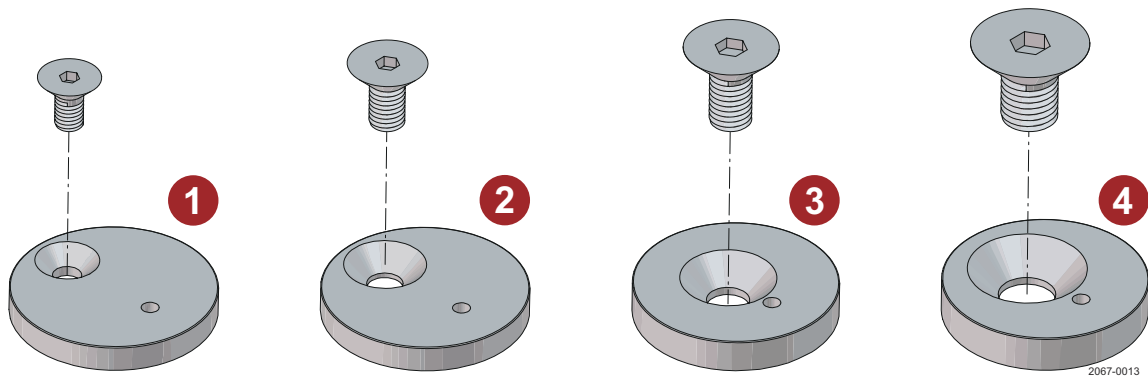
### 6.3.1 Horizontal Ported Pump Guidelines



### 6.3.2 Vertical Ported Pump Guidelines



### 6.3.3 Adapter Details



## 6.4 DuraCirc Guidelines

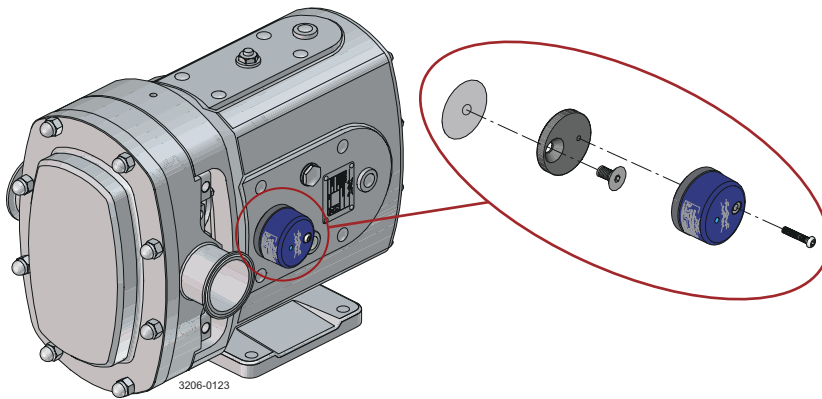
**NOTE** When mounting the CM, it is important to achieve a solid mechanical connection between the equipment and the CM adapter plate, ideally mounted to a flat surface. The CM can be mounted on surfaces up to 80° C (176° F).

The first production series of DuraCirc does not have a dedicated M6 tapping to mount the CM and as such an adapter kit is required to utilize existing available screw threads on the gearbox.

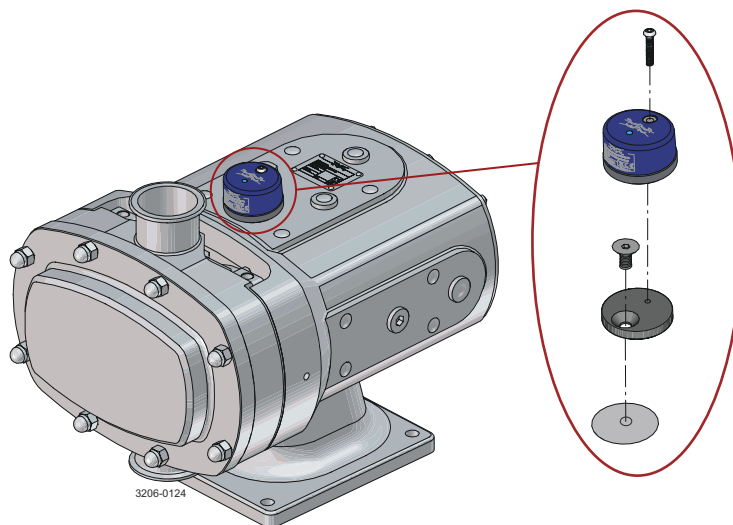
Newer DuraCirc pumps have a dedicated M6 thread hole for CM mount. Use the supplied M6 screw for direct mount.

Pump type	Adapter type	Tool Hex key Adapter screw	Tool Hex key CM screw	Max torque [Adapter screw / CM screw]
DuraCirc	1	5mm	4mm	20 Nm / 10 Nm 15 ft-lb / 7.5 ft-lb

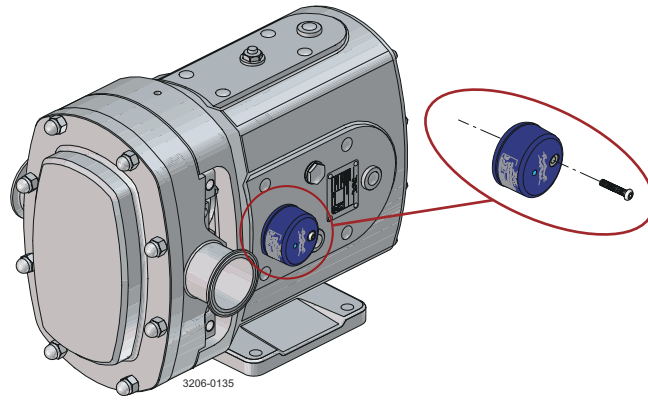
### 6.4.1 Horizontal Ported Pump Guidelines



### 6.4.2 Vertical Ported Pump Guidelines

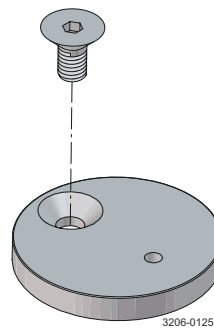






### 6.4.3 Adapter Details

**NOTE** Please be aware: The newer DuraCirc pumps might not need a bracket for CM.



Adapter Kit [Type / Article No.] <sup>1</sup>	Adapter Screw Flat SHCS	Adapter Dimensions [Ø/H]	Adapter Weight
Type 1) <b>8010005350</b>	M8 x 16	58 mm / 8 mm 2.3 in / 0.3 in	0.16 kg 0.35 lbs

<sup>1</sup> All adapters are made of stainless steel of type EN 1.4301 (AISI 304). The CM is included