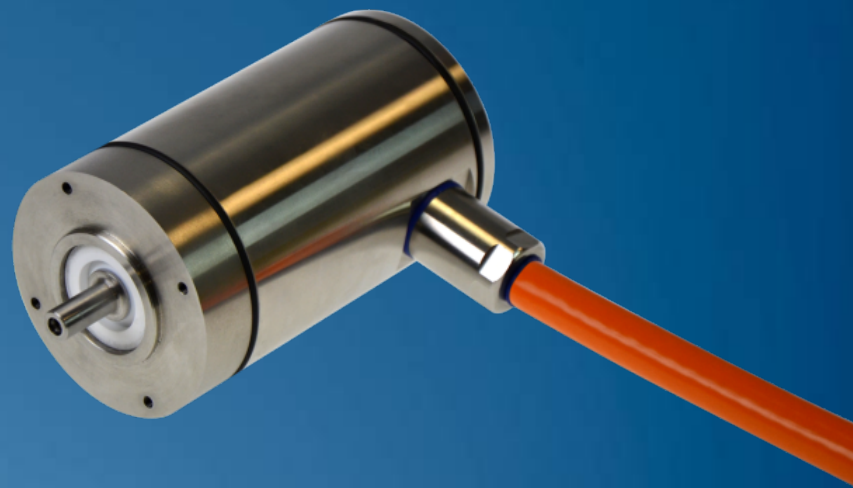




# AKMH AKM Hygienic



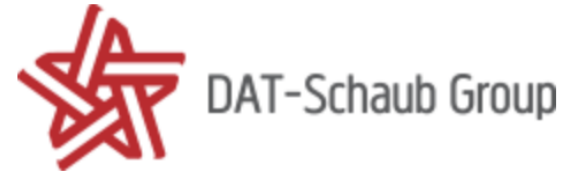
**KOLLMORGEN**<sup>®</sup>

*Because Motion Matters™*

# Hygienic servo motor AKMH

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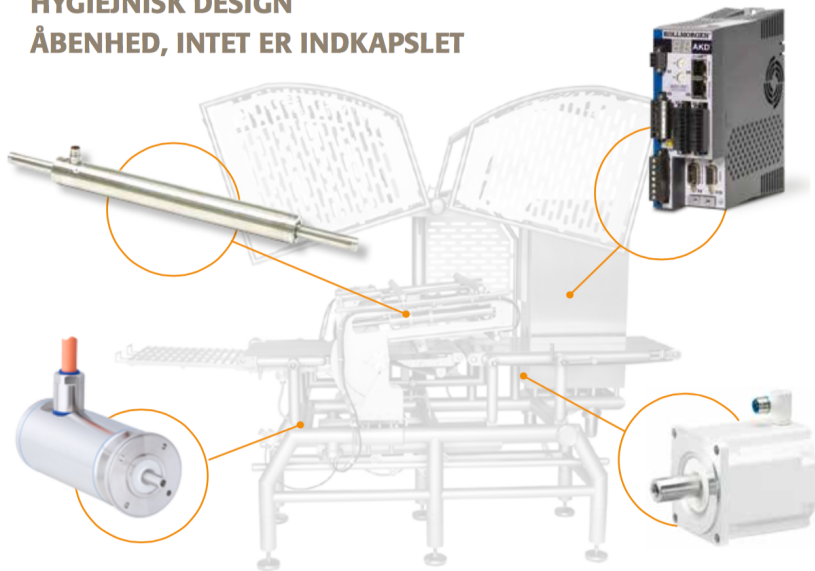
# Hygienic servo motor AKMH

**KOLLMORGEN**

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**RENGØRINGSVENLIGHED  
HYGIEJNISK DESIGN  
ÅBENHED, INTET ER INDKAPSLET**





# Hygienic servo motor AKMH



## Product specifications:

### P3-topactive DES

Acid disinfectant based on peracetic acid/hydrogen peroxide for the food and beverage industry

### P3-topactive LA:

Mild alkaline, chlorine-free foam cleaner for the food and beverage industry

### P3-topax 56:

Acid foam cleaning substance for the food and beverage industry

### P3-topax 66:

Alkaline cleaner and disinfectant based on chlorine for the food and beverage industries

### P3-topax 91:

Neutral disinfectant based on Quaternary Ammonium Compounds (QAC) for the food and beverage industries



## Rinsing with water 40 – 50°C

Rinsing with low pressure. Rinsing from top to bottom in the direction of the drains. Cleaning of the drains.

## Foaming from bottom to top

alkaline: P3-topactive LA or P3-topax 66 2 – 5 % daily  
acid: P3-topax 56 2 % on demand  
temperature: cold up to 40°C  
contact time: 15 min. recommended

## Rinsing with water 40 – 50°C

Rinsing from top to bottom with low pressure

**Spray disinfection:** P3-topax 91 1-2 %, 30-60 min

**Foam disinfection :** P3-topactive DES 1-3 %, 10-30 min

## Analysis:

- Visual judgement like swelling, brittleness, discoloring
- compared to zero-reference factor (demineralized water)
- Photo documentation

\* corresponding 2.500 washing cycles with 1 cleaning step each and 1500 cycles with cleaning plus additional disinfecting step.



# Conformity to European law

## Hygienic machine design according to Directive 2006/42/EC

### 2.1. FOODSTUFFS MACHINERY AND MACHINERY FOR COSMETICS OR PHARMACEUTICAL PRODUCTS

(a) The **machinery must be designed** so that materials can be **cleaned** before

Briefly said

Meet  
EHEDG

(c) It must be possible for **liquids, gas** cosmetics or pharmaceutical products

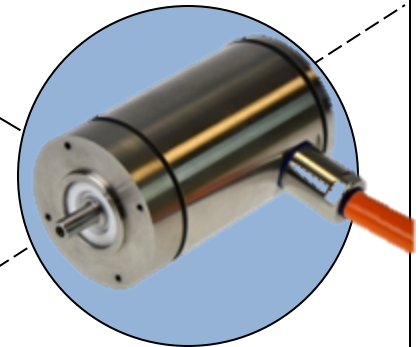
rinsing fluids **to be completely discharged from the machinery** (if possible, in a 'cleaning' position);

(d) machinery must be designed and constructed in such a way as to **prevent any substances or living creatures**, in particular insects, from entering, or any organic matter **from accumulating in, areas that cannot be cleaned**

# Our motors: fit for any environment

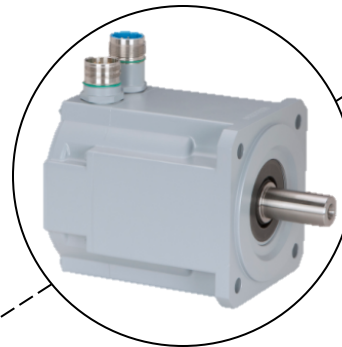
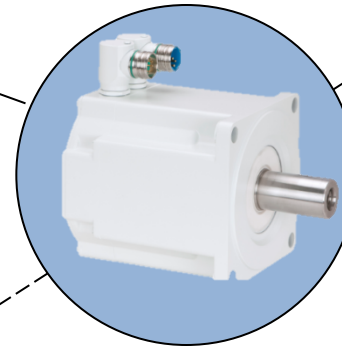
## AKMH:

- IP69K
- Hygienic environment



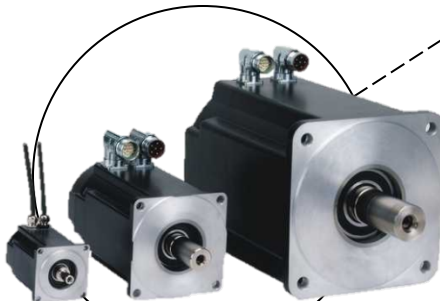
## AKM Washdown Food:

- IP67
- Food environment



## AKM Washdown:

- IP67
- Rough environment



## Standard AKM:

- IP65
- Standard requirements

# Right solution for different requirements

## Rough environment

- Food packaging / process without direct contact
- Outdoor applications
- Offshore, Wind, Radar....
- simplified cleaning
- resistance to salt, cleaning...
- No rust at screws, shaft, flange

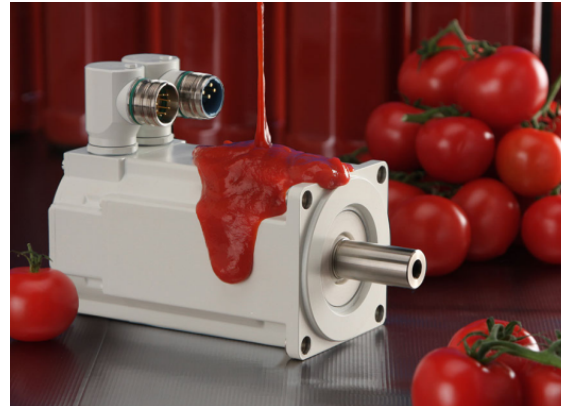
## AKM Washdown



## Food environment

- Food packaging / process with possible or rare direct contact
- below / beside food
- easy removable substances
- Filling of drinks, juices...

## AKM Washdown Food



## Hygienic environment

- Food / Pharma process / packaging with direct contact
- Above food
- Delta Picker
- hardly removable substances
- Sirup, sausages

## AKMH stainless steel

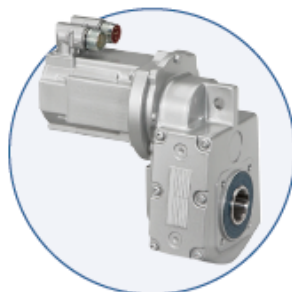




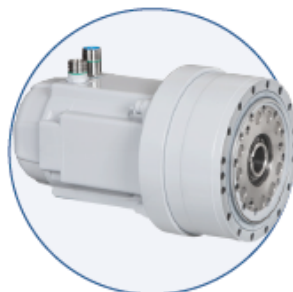
# Our motors: fit for any environment

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AKM41E-BF06



AKM62L-F2CS-A35-59



AKM62K-BK17



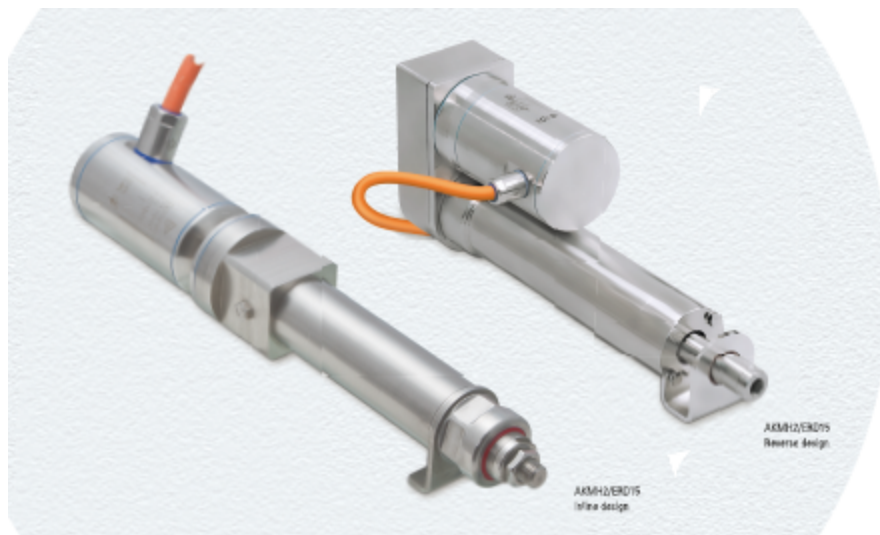
AKMH65M-AQT-160-004

Type		AKM41E-BF06	AKM62L-F2CS-A35-59	AKM62K-BK17	AKMH65M-AQT160-004
Version		Washdown, coated	Washdown, coated	Washdown-Food, coated	Hygienic, stainless steel
Rated output torque	Nm	51	668	175	64
Endurable acceleration torque	Nm	76	1390	400	876
Average output speed	rpm	75	28	181	675
Maximum output speed	rpm	95	67	200	1000
Gear ratio		31.5	59	19.39	4
Transmitter		Resolver	Resolver	Resolver	Digital resolver SFD3, Hiperface DSL
Special features			Circumferential backlash of less than 1 arcmin, holding brake	FDA-compliant coating, lubrication, and bearing grease	Circumferential backlash of 13 arcmin, single cable solution
Benefits		<ul style="list-style-type: none"> <li>Developed for regular cleaning with common cleaning products with pH2 of up to 12</li> <li>Space-saving motor/gearhead technology</li> <li>Increased service life in rough environmental conditions</li> </ul>	<ul style="list-style-type: none"> <li>High peak performance and minimal circumferential backlash</li> <li>Extremely compact design including highest torque efficiency</li> <li>Long service life thanks to washdown coating</li> </ul>	<ul style="list-style-type: none"> <li>Lower energy cost thanks to high efficiency of the servomotor and gearhead</li> <li>Suitable for indirect contact with food products</li> <li>Simple to clean thanks to rounded housing design</li> </ul>	<ul style="list-style-type: none"> <li>Fast to clean thanks to hygienic design and single cable solution</li> <li>Simple startup by means of electronic rating plate and single cable connection technology</li> <li>Reduced risk of food products having to be recalled thanks to</li> </ul>

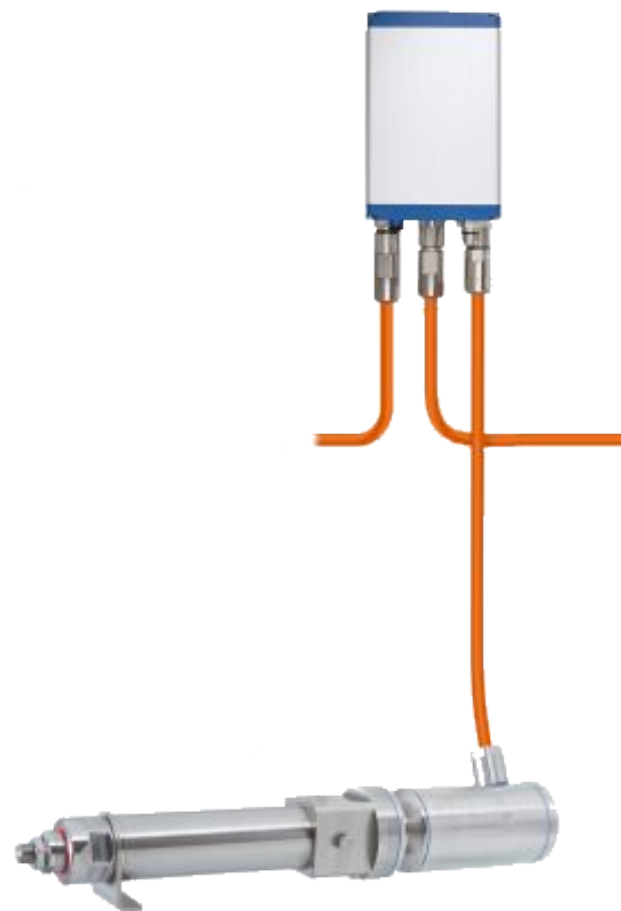
# Our motors: fit for any environment

**KOLLMORGEN**

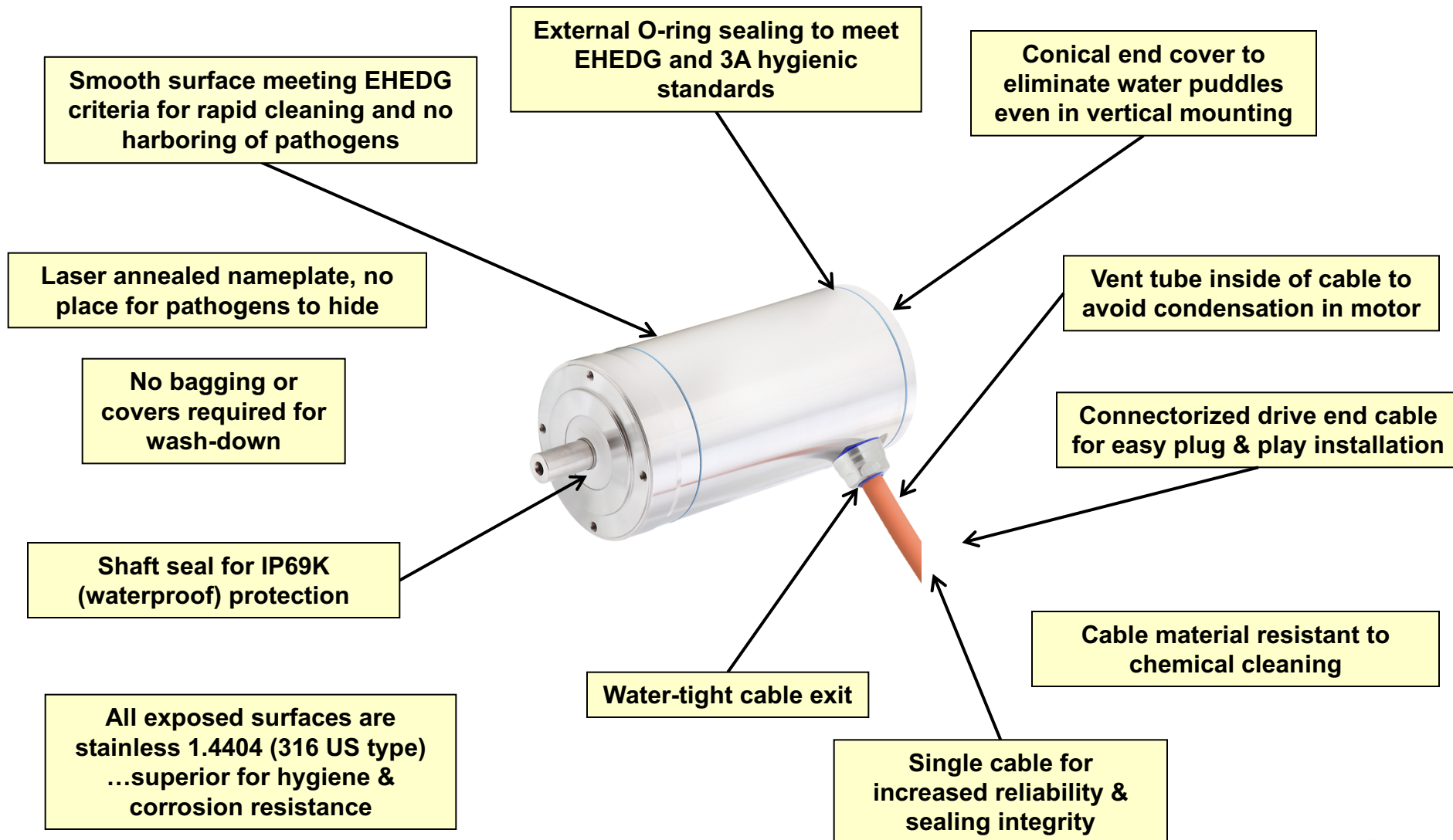
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Stainless steel linear actuators		AKMH2/ ERD15	AKMH3/ EDR20	AKMH4/ ERD25	AKMH5/ ERD30
Protection class / hygiene standard		IP69k / USDA, 3A, NSF			
Connection technology / servo amplifier		Single-cable technology, centralized with AKD or decentralized with AKD-N			
Encoder options		Digital Resolver SFD3, Hiperface DSL			
Motor diameter	mm	72.5	85	114	132
Actuator diameter	mm	42	52	89	89
Feed (max)	mm	610	610	1000	1000
Feed speed (max)	mm/s	1016	495	1448	813
Feeding force	kN	0.89	2.224	14.679	20.017



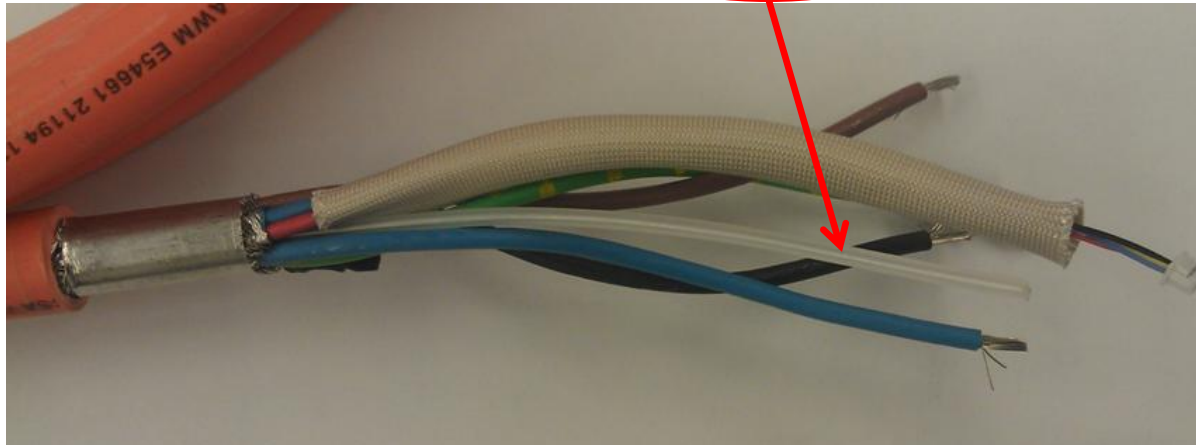
# AKMH Clean Design Features





# AKMH details. Passive venting

- Pressure equalization: our motors stays always dry and get no rusting!
- Standard cable has unique **venting tube** inside



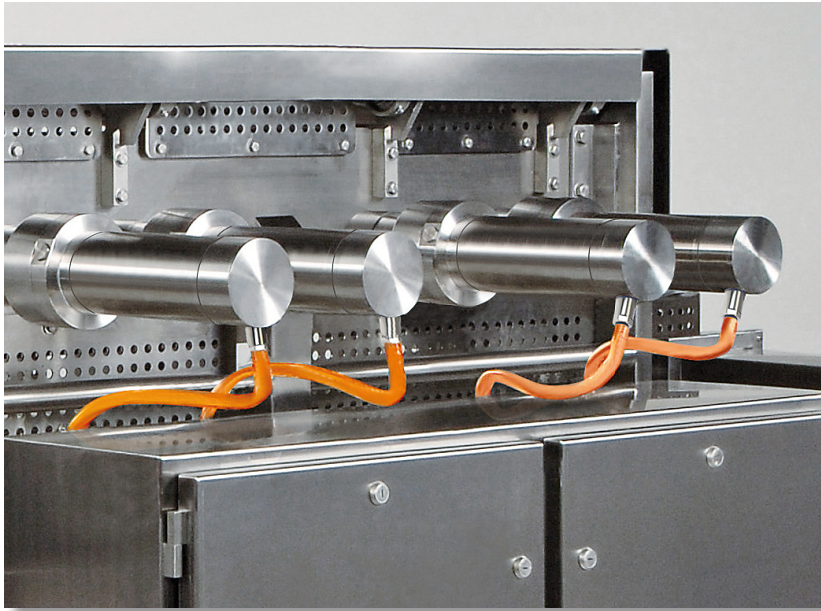
- Test results on AKMH6: full pressure equalization within 180 seconds:

Temperature, ° C	Pressure without vent tube, bar	Pressure with vent tube, bar
- 15	- 0,138	0
+ 125	0,483	0

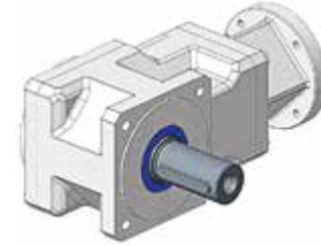
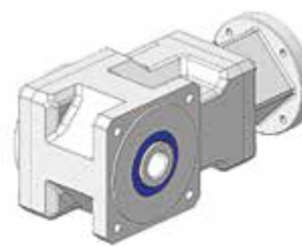
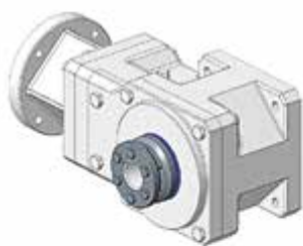
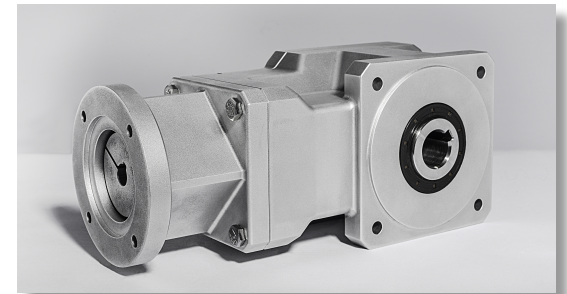
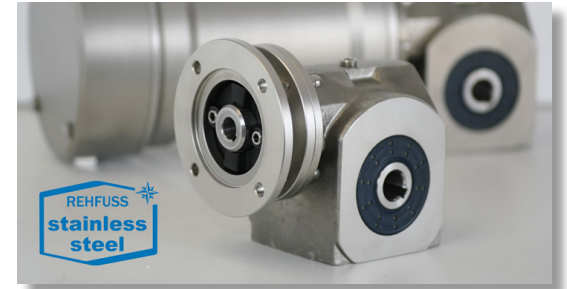
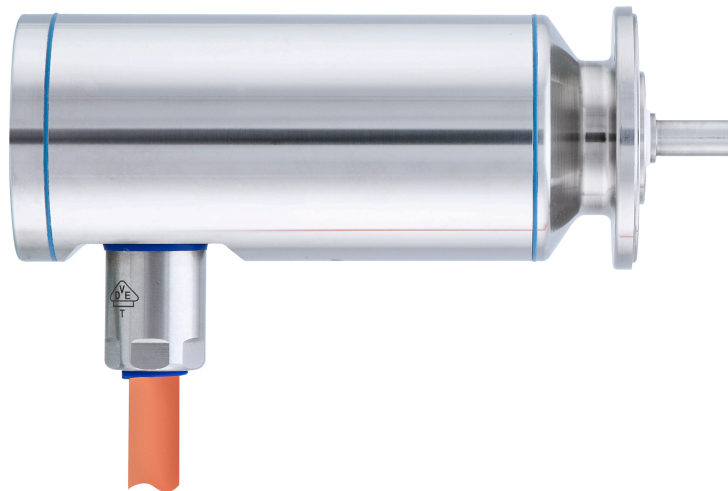
# AKMH details. Passive venting

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# AKMH - Gearbox

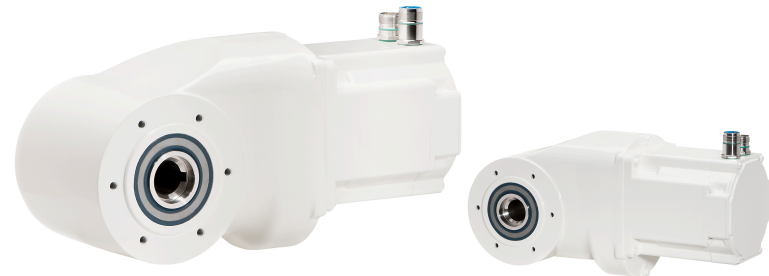
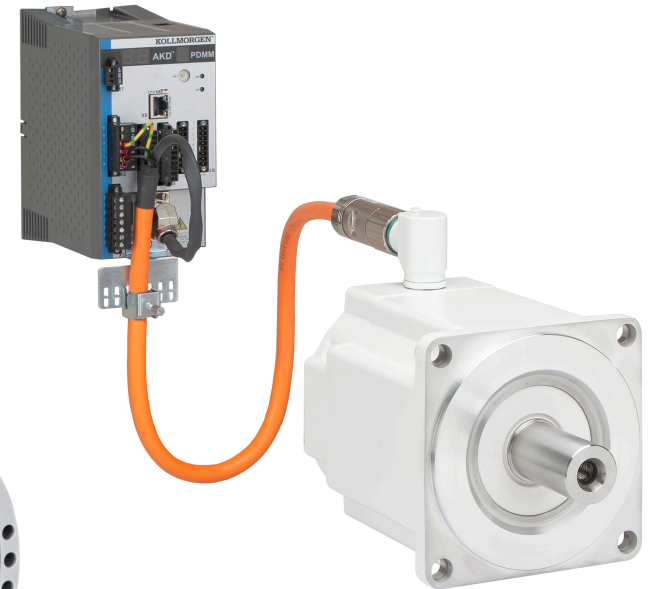




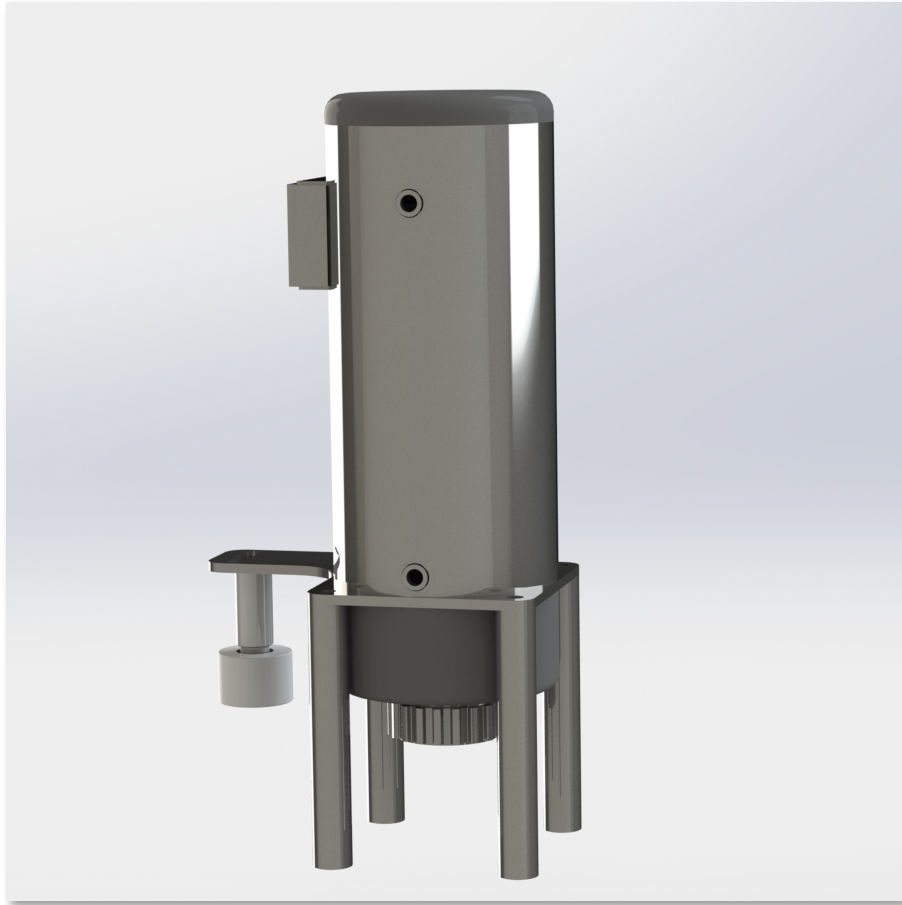
# AKMH - Gearbox

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# AKMH Hygienic motor design



- Plads: ø150 x 450 mm – 4
- Laser parts – 3D tegning - bearbejdning
- Down grade motor performance
- Trykluft for hold vand ude - køling
- Savings up to 2 timer svejsetid –  
bearbejdning og montage ca. 5000,-



# Hygienic servo motor AKMH

## Customer

Uni-Food A/S.

Industry: Food Processing

## Application

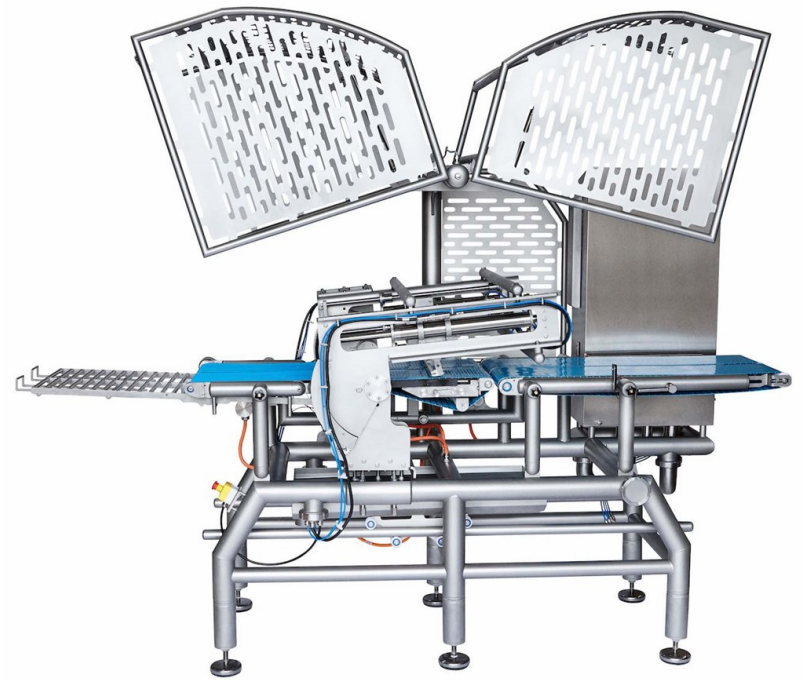
Fish slicer/cutting machine

Portion cutting

Salmon

Working width up to 120 cuts/min

Minimal cut thickness 2mm

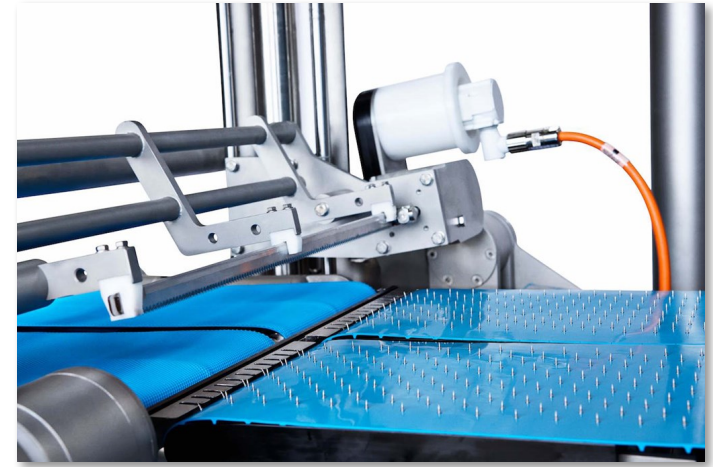




# Grasselli s.p.a. Hygienic servo motor AKMH

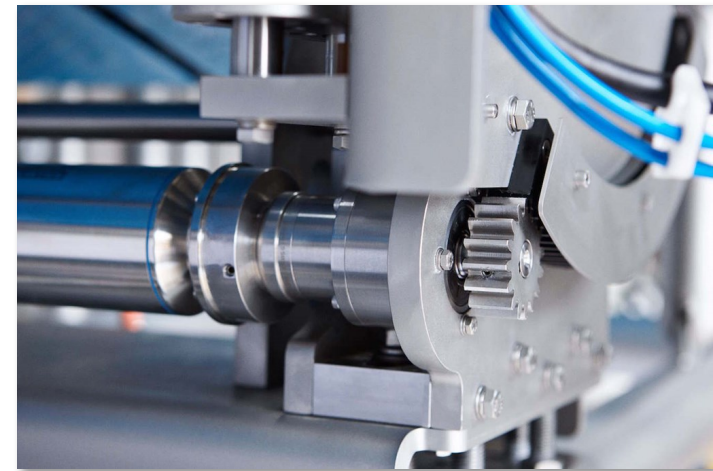
## Products

AKMH 22 with SFD 3  
AKM 22 Food Grade  
AKD 3 amp  
Potential ca. 40 axis p.a.



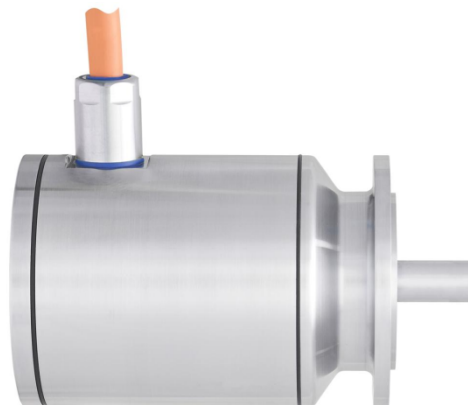
## Benefits

Application program  
LinMot – linear SSC motors  
Hygienic design in IP69K  
Complete solution from Kollmorgen  
Competition: Siemens



# AKMH benefits

- Hard-line hygienic design -> reducing risk of product recall
- Developed for open machine design  
-> clean machine design for hygienic processes
- Reduced cleaning time and frequency -> higher productivity
- High reliability in washdown -> higher productivity
- Complete servo axis AKMH + AKD (-N) -> saves time and money  
at installation,  
setup, maintenance



# Rehfuss – AC-motor IP69K

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## EFFICIENT, POWERFUL AND SMOOTH SURFACE

Smooth body motor SB71  
4-pole asynchronous 3-phase motor



THE SMOOTH ONE  
FROM REHFUSS

### OPTIONS (excerpt)



Cable gland  
Stainless steel



Cable gland  
Stainless steel hygienic  
EHEDG certified



Combination with gearboxes of the  
REHFUSS gearbox modular system

### VERSIONS



SBA  
Smooth body motor  
Aluminium with coating



SBE  
Smooth body motor  
Stainless steel



SBH  
Smooth body motor  
Stainless steel in hygienic-design

# AKMH details. Mechanics

- Delivery **only** with mounted cable with 1 to 15m length (increments 1m)
- Stainless steel 1.4404 (316L US type)
- Vent option for air pressure balance
- No shaft seal in case of gear assembly

Compatible to Micron Aqua True  
Compatible to Wittenstein, Neugart, Eisele  
and other EU stainless gears

- IP69K with shaft sealing  
No slinger ring needed



Source: [www.thomsonlinear.com](http://www.thomsonlinear.com)



Source: [www.wittenstein.de](http://www.wittenstein.de)



# Hygienic Drive Axis AKMH + AKD (-N)

- Best fit motor + cable + drive motion package
- Plug & Play with electronic nameplate
- Easy to clean due to one cable
- Less installation time due to one cable
- Savings up to 50 % HW cable costs
- Scalable solution with Hiperface DSL and SFD
- Higher machine uprate time due to less EMC issues -  
pure digital interfaces DSL and SFD
- Less stock inventory - one cable for both feedbacks



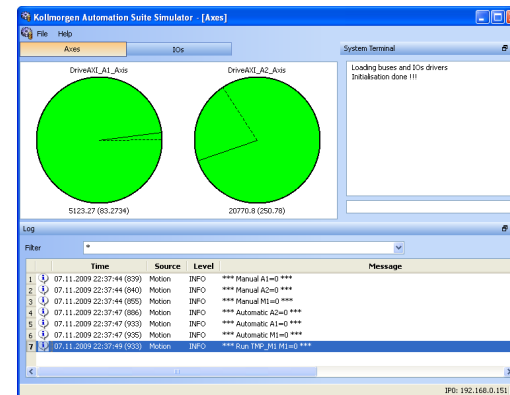
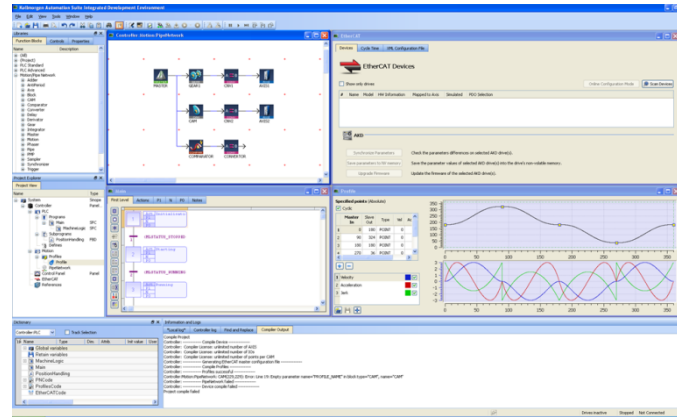
...AKMH + AKD (-N) saves time and money at installation, setup, maintenance

# AKMH + AKD + PDMM

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Because Motion Matters™

- Complete machine automation
  - System solution from one source
  - Fast commissioning with KAS IDE
  - Higher performance and throughput
  - Application library for easy setup
  - Perfect hygienic solution with AKMH
  - HW costs savings:  
motion control for more than 8 axis without IPC
- ...AKMH + AKD + PDMM increases machine productivity  
and saves time and money at commissioning

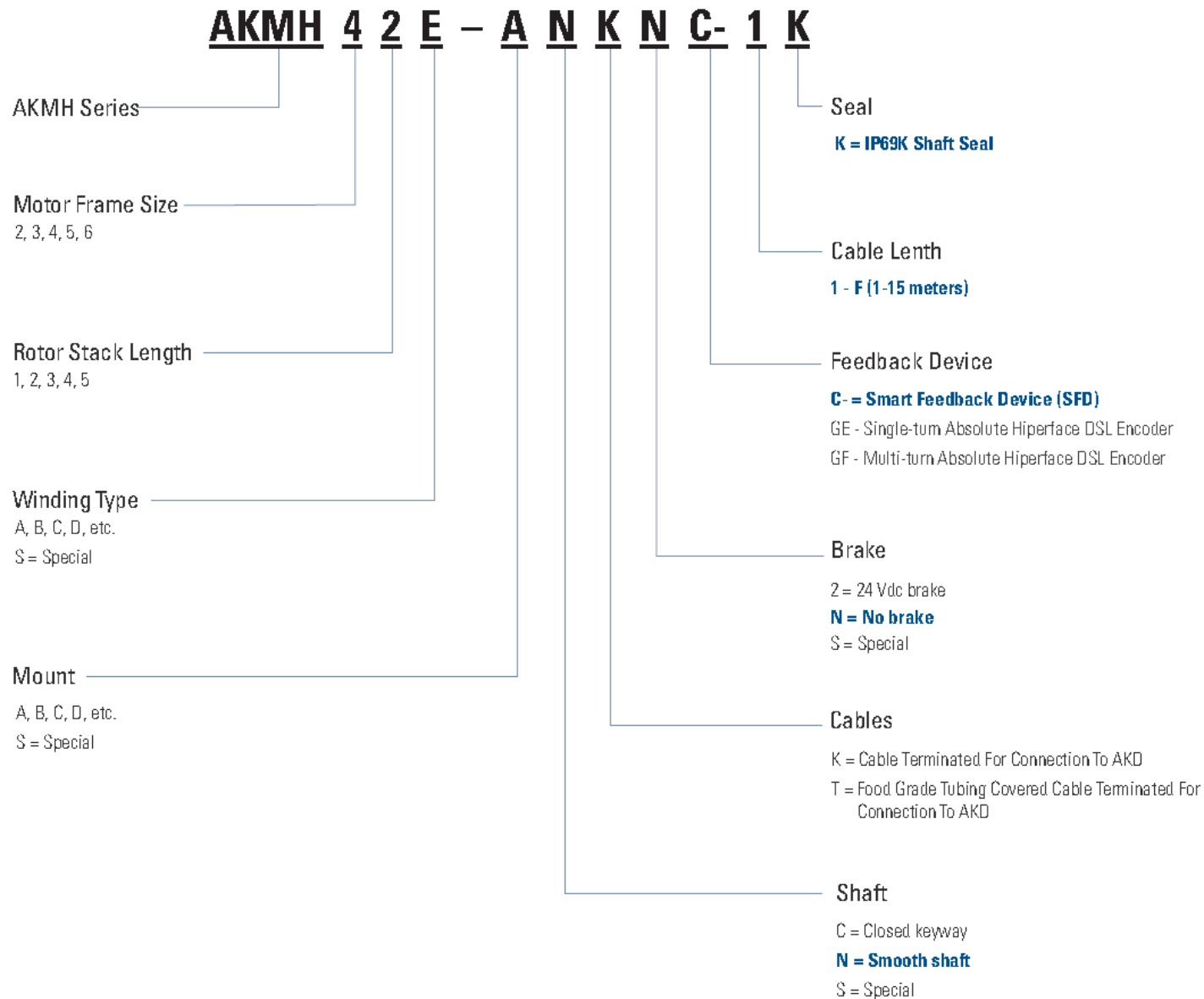


# AKMH Hygienic motor design

- Design according EHEDG requirements
- Stainless steel used for housing, cover, shaft
- Very smooth surface
- No sharp edges
- Food grade material used for
  - O-rings
  - rubber in bushing area
- Screw able cover to avoid screws
- No direct metal to metal contact
- Motor identification: laser marking
- Protection up to IP69K
- Option silicon food grade tube for cable



# AKMH item key





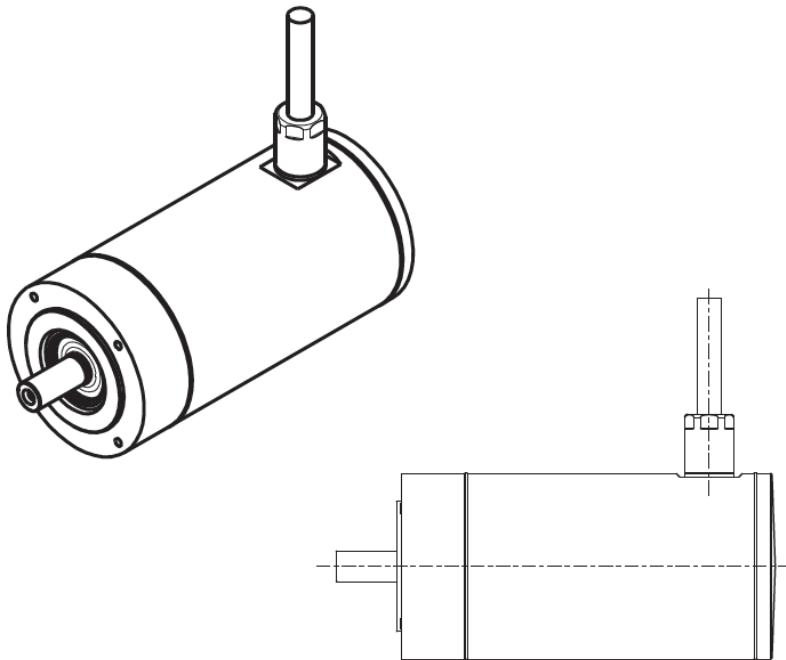
# AKMH overview

- 5 frame sizes with 4 rotor lengths for each frame (exception AKMH3)
- Standstill torque up to 22 Nm
- Peak torque up to 92 Nm
- Max speed up to 8000 rpm

Motor size	Rated Power Range (kW)	Continuous Torque Range (Nm)	Peak Torque Range (Nm)	Max Speed (rpm)	Motor Diameter (mm)
AKMH2	0,21 - 0,93	0,3 - 1,1	1,6 - 5,5	8000	72,5
AKMH3	0,25 - 1,15	1,0 - 2,4	4,4 - 11,9	8000	85
AKMH4	0,22 - 1,64	1,8 - 5,8	6,8 - 23,5	6000	114
AKMH5	0,39 - 1,44	3,3 - 10,6	15,0 - 55,1	6000	132
AKMH6	1,1 - 5,69	10,6 - 22,2	39,8 - 92,0	6000	186

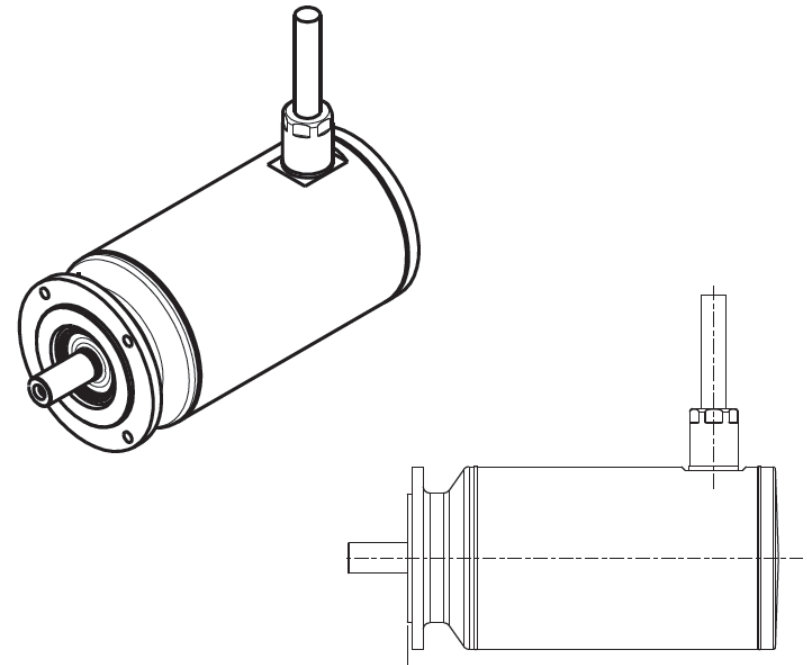
# AKMH details. Mechanics

## Face mountings B14



and

## Front mountings B5



# AKMH details. Electrics.

- One cable solution with SFD and Hiperface DSL
- Derating less than 20% with special design.
- High speed windings up to 6000 rpm
- Low speed winding best fit for AKD,  
if it makes sense from AKD
- KTY83-110 as standard
- Option brake
- Option internal  
feedback connection\*

*\* in development*



# AKMH details. Certificates.

## AKMH Certificates \*:

- CE, UL
- EHEDG
- NSF / ANSI169
- FDA
- 3A Sanitary Certificate
- USDA

*\* partially in progress*





# AKMH highlights

- Low derating due to special motor design
- High flexibility with 19 motor types (Rockwell 3 types, Beckhoff 12 types)
- AKMH2 the most compact stainless steel servo motor on the market
- Internal connection for easy installation (Q3 2013)
- One cable solution is best fit for hygienic design  
(easy washdown, high reliability)
- One cable option with SFD -> high performance cost effective feedback
- One cable option with SFD Gen3 and brake (Q3 2013)
- Face and front mountings available.  
Face mounting is optimal from hygienic POV
- Venting tube for air pressure equalization: no humidity and rust inside

# KOLLMORGEN<sup>®</sup>

*Because Motion Matters.<sup>™</sup>*

