Fittings for accurate measurements

Versatile real time and wireless systems for measurements in all kinds of food containers

Table of contents

Fittings for accurate measurements

There are many factors that can impact on the efficacy of a thermal process but one of the main considerations in the development of processes for heat preserved foods is the acquisition of accurate time/temperature profiles. The main reasons for this are:

- Safety – ensuring that microbial stability has been achieved and there is no risk of food poisoning or food spoilage
- Optimisation – reducing process times to increase production throughput and minimise energy costs
- Improvement of quality – optimisation of vitamin and protein retention, and product sensorial qualities
- Process validation – providing documentation to demonstrate compliance with regulations for authorities, FDA/USDA, EC, customers, ISO9000, HACCP, etc.

The validation procedure encompasses many aspects with the process vessel and product both needing detailed study. In both cases it is important to find the cold zone at which the slowest heat transfer will be applied. Three phases of tests should be considered:

- Temperature distribution – temperature mapping within a fully loaded process vessel to investigate performance against a control programme and identify the cold zone.
- Cold point determination – multiple measurements within a product container to find the slowest heating point within the product. This will be product and packaging dependent.
- Heat penetration – replicate measurements with temperature measurement devices located at the position identified within the cold point tests.

All of the above phases are focused on identifying the worst case conditions to which a product would be exposed, with the lowest temperatures and slowest heat transfer leading to the lowest microbial reduction. It is therefore crucial that the temperature measurement devices are of high accuracy and reliability. A systematic or experimental error of 1°C in a temperature measurement system at the sterilisation reference temperature of 121.1°C would lead to a corresponding error of 26% in the calculated Fo sterility value.

It is therefore important that the correct equipment is applied for a given validation. We have developed a large selection of probes, sensors, packing glands, and tools which are available for correct mounting in many styles and designs of container. The range of fittings available is being continually expanded and improved with the following parameters taken into consideration:

• Correct positioning of the measuring point

It is very important that the packing gland and probe are correctly positioned in the “cold spot”. If this is not obtained it can result in “false” measurements, risking high Fo/Po-Values.

• Elimination of steam and water ingression

It is very important that the packing gland and the probe are mounted so as to maintain the integrity of the container and ensure that water/steam ingression to the measuring point cannot occur leading to false data and high Fo/Po values.

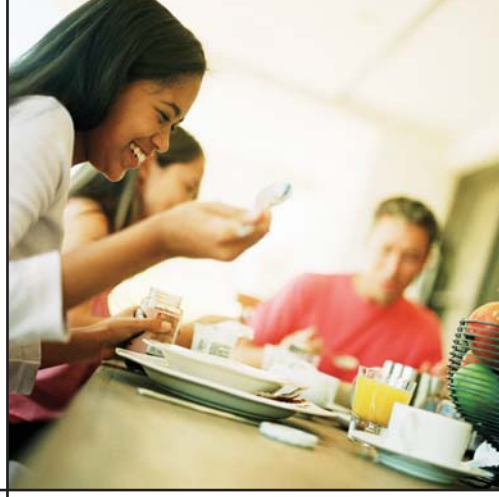
• Minimizing risks of heat conduction

It is recommended that the probe and gland are mounted from the side of the container with the longest distance to the “cold spot” so that heat conduction from the water/steam is avoided. Even if the probe/gland is as small as possible and made of materials with the lowest conductivity there will always be a risk for heat conduction.

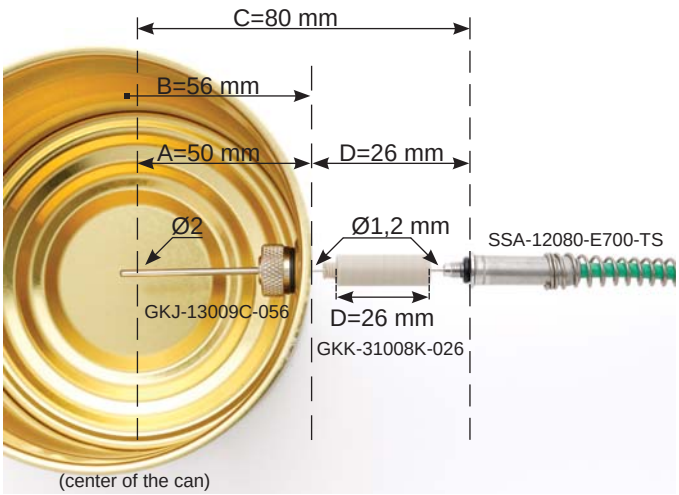
• Minimizing the probe assembly inside the container

It is very important that the probe and gland are as small as possible so that the impact on the internal environment (product) of the container, including the headspace, is minimised. This is especially important for products that receive a rotary process where the movement of the headspace will be a critical factor in the rate of heat transfer.

If it is a mixed product in liquid it is important the biggest piece of solid is positioned at the measuring point, and that the probe assembly is mounted so it is not preventing the other solid pieces to move freely. The reference container must be as close to the “normal” containers as possible, otherwise the heat transfer profile will no longer be representative for the entire batch.



Calculation of probe and gland specifications



The picture shows an example of how to calculate the measuring depth for all kinds of containers.

A

The measuring depth in which the measuring point - “cold spot” has to be situated.

B

The packing gland has to be 6 mm longer than the measuring depth, corresponding to the size of the sealings of the gland and the probe. The length of the gland is specified in the last three characters of the type designation - GKJ-13009C-056.

C

In this case the probe electrode length is 80 mm, specified in the last three characters of the type designation - SSA-12080-G700-TS. Because of the size of the thermojunction and the sealing of same, the measuring point is situated 4 mm from tip.

D

As the probe electrode is longer than the GKJ-C gland, a space bar of 26 mm is screwed in between the probe bushing and gland. The three last characters of the type designation specifies the length - GKK-31008K-026. A probe with 54 mm electrode can be used directly without using a space bar.

The GKJ Packing Gland is developed for mounting with the o-ring positioned inside the container, so it is flush with the outside wall of the container. This ensures that the container can be filled and sealed in industrial machinery.

If this is not a critical parameter the o-ring can also be positioned outside the container still taking the position of the measuring point in the cold spot into consideration.

Normal and vacuum sealed cans

Packing gland type GKJ

Make a hole in the can with the can punch TC89 or TC40S/TC41 (see instructions for perforating and embossing the containers).

Disassemble the GKJ packing gland (1).

Introduce the bushing (2) into the can and ensure that the measuring point is correctly positioned in the “cold spot”.

Place the o-ring (3) on the bushing (2) from the inside of the can.

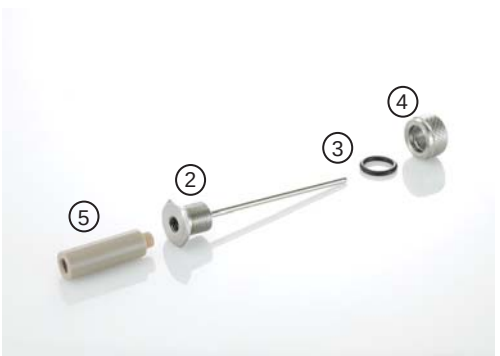
Screw on and fasten the fingernut (4) from the inside of the can.

The can can now be filled and sealed in the sealing machine.

The logger is started up in the reader station.

The sensor is introduced and if necessary a GKK-K space bar (5) can be used.

If a double sensor is used both product and ambient temperature can be measured in the same position at the same time.



Configuration

	SSA12xxxE700TS Sensor	TSP 2 mm	TSP Mini 2.5 mm	TSP 3 mm
①	GKJ13009Cxxx Packing gland	GKJ21009Cxxx Packing gland	GKJ26009Cxxx Packing gland	GKJ31009Cxxx Packing gland
⑤	GKK31008Kxxx Space bar (optional)	GKK31008Kxxx Space bar (optional)	GKK31008Kxxx Space bar (optional)	GKK31008Kxxx Space bar (optional)

Spare part list

③	GKJ-U O-ring	GKJ-U O-ring	GKJ-U O-ring	GKJ-U O-ring
④	GKJ-J Stainless steel finger nut	GKJ-J Stainless steel finger nut	GKJ-J Stainless steel finger nut	GKJ-J Stainless steel finger nut

When ordering sensors, packing glands and space bars please replace xxx with the length(s) needed.

Aluminium and plastic containers

Packing gland type GKJ

Make a hole in the container with the can punch TC89 or TC40S/TC41 (see instructions for perforating and embossing the containers).

Disassemble the GKJ packing gland (1).

With parallel sides

Introduce the bushing (2) into the can and ensure that the measuring point is correctly positioned in the “cold spot”.

Place the O-ring (3) on the bushing (2) from the inside.

Screw on and fasten the fingernut (4) from the inside of the can.

With unparallel sides

Introduce the bushing (2) with a wedge washer (6) into the container and ensure that the measuring point is correctly positioned in the cold spot.

Place the other wedge washer (6) on the bushing from the inside of the container. Screw on and fasten the fingernut (4) from the inside of the container. The container can now be filled and sealed in the sealing machine.

The logger is started up in the reader station. The sensor is introduced and if necessary a GKK-K space bar (5) can be used. If a double sensor is used both product and ambient temperature can be measured in the same position at the same time.

Configuration

	SSA12xxxE700TS Sensor	**TSP 2 mm**	**TSP Mini 2.5 mm**	**TSP 3 mm**
①	GKJ13009Cxxx Packing gland	GKJ21009Cxxx Packing gland	GKJ26009Cxxx Packing gland	GKJ31009Cxxx Packing gland
⑤	GKK31008Kxxx Space bar (optional)	GKK31008Kxxx Space bar (optional)	GKK31008Kxxx Space bar (optional)	GKK31008Kxxx Space bar (optional)
⑥	GFJ-K Wedge washers	GFJ-K Wedge washers	GFJ-K Wedge washers	GFJ-K Wedge washers

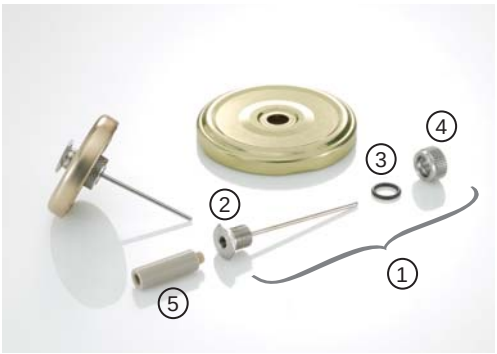
Spare part list

③	GKJ-U O-ring	GKJ-U O-ring	GKJ-U O-ring	GKJ-U O-ring
④	GKJ-J Stainless steel finger nut	GKJ-J Stainless steel finger nut	GKJ-J Stainless steel finger nut	GKJ-J Stainless steel finger nut

When ordering sensors, packing glands and space bars please replace xxx with the length(s) needed.

Glass jars with metal lids

Packing gland type GKJ



Make a hole in the lid with the can punch TC89 or TC40S/TC41 (see instructions for perforating and embossing the containers).

Disassemble the GKJ packing gland (1).

Introduce the bushing (2) into the lid and ensure that the measuring point is correctly positioned in the “cold spot”.

Place the o-ring (3) on the bushing (2) from the inside of the lid.

Screw on and fasten the fingernut (4) from the inside of the lid. The jar can now be filled and sealed.

The logger is started up in the reader station.

The sensor is introduced and if necessary a GKK-K space bar (5) can be used.

If a double sensor is used both product and ambient temperature can be measured in the same position at the same time.

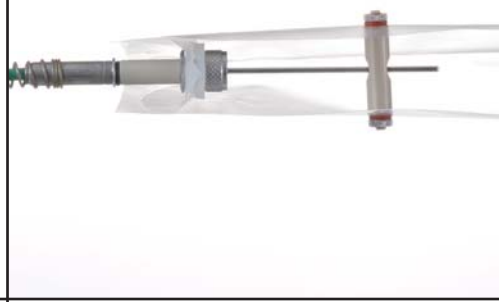
Configuration

	SSA12xxxE700TS Sensor	TSP 2 mm	TSP Mini 2.5 mm	TSP 3 mm
①	GKJ13009Cxxx Packing gland	GKJ21009Cxxx Packing gland	GKJ26009Cxxx Packing gland	GKJ31009Cxxx Packing gland
⑤	GKK31008Kxxx Space bar (optional)	GKK31008Kxxx Space bar (optional)	GKK31008Kxxx Space bar (optional)	GKK31008Kxxx Space bar (optional)

Spare part list

③	GKJ-U O-ring	GKJ-U O-ring	GKJ-U O-ring	GKJ-U O-ring
④	GKJ-J Stainless steel finger nut	GKJ-J Stainless steel finger nut	GKJ-J Stainless steel finger nut	GKJ-J Stainless steel finger nut

When ordering sensors, packing glands and space bars please replace xxx with the length(s) needed.



Plastic and aluminium pouches

Packing gland type GKJ

Make a 8mmØ hole in the pouch with the cutting tool type TC42 (see instructions for perforating and embossing the containers).

Disassemble the GKJ packing gland (1).

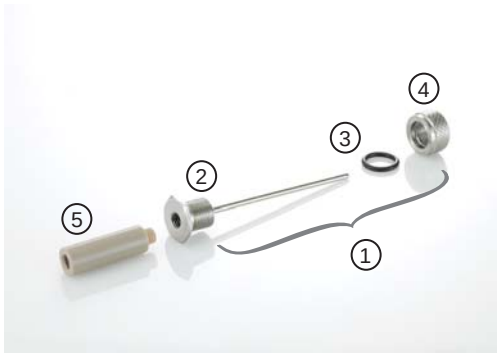
Make two holes on each side of the pouch of approximately 2mmØ. The height/ thickness of the filled pouch is measured and a fitting GEM-K distance piece (6) is mounted as shown on photo.

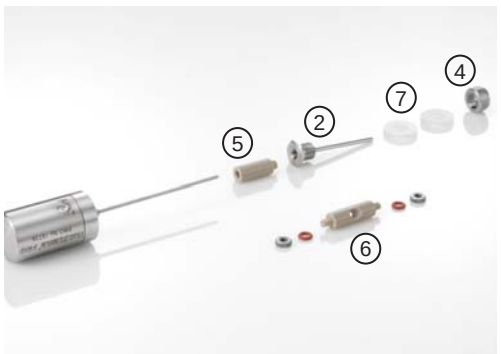
Introduce the bushing (2) with one silicone washer (7) into the container, and then place the other silicone washer (7) and the finger nut (4) on the gland from the inside.

The end of the gland is via the centerhole of the GEM-K (6) placed in the “cold spot” of pouch, and the fingernut (4) is fastened by hand so it is tight. The two nuts of the GEM-K are also fastened by hand until they are tight.

The container can now be filled and sealed in the sealing machine. The logger is started up in the reader station.

The sensor is introduced and if necessary a GKK-K space bar (5) can be used. If a double sensor is used both product and ambient temperature can be measured in the same position at the same time.





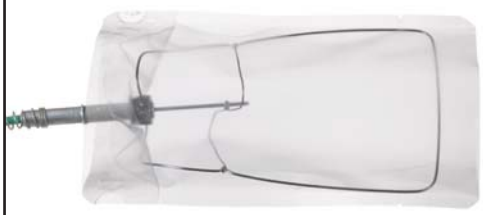
Configuration

	SSA12xxxE700TS Sensor	TSP 2 mm	TSP Mini 2.5 mm	TSP 3 mm
①	GKJ13009Cxxx Packing gland	GKJ21009Cxxx Packing gland	GKJ26009Cxxx Packing gland	GKJ31009Cxxx Packing gland
⑤	GKK31008Kxxx Space bar (optional)	GKK31008Kxxx Space bar (optional)	GKK31008Kxxx Space bar (optional)	GKK31008Kxxx Space bar (optional)
⑦	GFJ-S Silicone rubber washer	GFJ-S Silicone rubber washer	GFJ-S Silicone rubber washer	GFJ-S Silicone rubber washer
⑥	GEM26008Kxxx Distance piece	GEM26008Kxxx Distance piece	GEM26008Kxxx Distance piece	GEM26008Kxxx Distance piece

Spare part list

③	GKJ-U O-ring	GKJ-U O-ring	GKJ-U O-ring	GKJ-U O-ring
④	GKJ-J Stainless steel finger nut	GKJ-J Stainless steel finger nut	GKJ-J Stainless steel finger nut	GKJ-J Stainless steel finger nut

When ordering sensors, packing glands and space bars please replace xxx with the length(s) needed.

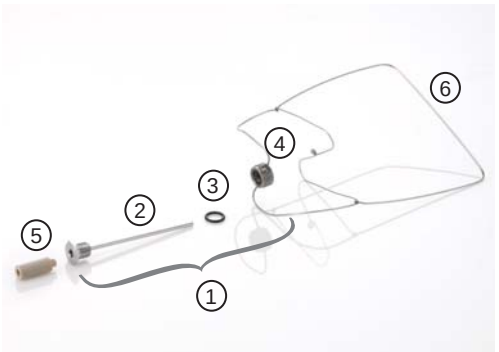


Plastic and aluminium doypacks and flat pouches

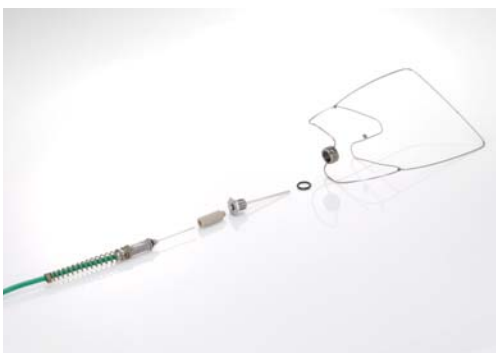
TPJ stainless steel frame

A frame which is manufactured exactly for the dimensions of the pouch is inserted into the pouch. The pouch has to be sent to Ellab. The frame is in the middle furnished with a “crossing wire” fitting the thickness of the pouch for fixating the sensor, and thus avoiding movement of the sensor touching the wall of the pouch.

An 8mm Ø hole is punched either from bottom or side (what is most convenient) in which a packing gland is mounted, also fixating the frame inside the pouch. Disassemble the GKJ packing gland (1). The bushing (2) is introduced into the container, the o-ring (3) is positioned on the thread from the inside and the gland is screwed into the thread (4) of the frame.



The “crossing wire” has a hole through in which the needle of the packing gland is inserted, securing fixation of the sensor in the “cold spot”. The pouch can now be filled, and if a mixed product the part with the slowest heat transfer can be positioned at the measuring points (meat balls, fish etc.). Then the pouch can be sealed. The logger and temperature sensor(s) are started up in the reader station.



The sensor is introduced and if necessary a GKK-K space bar (5) can be used.

If a double sensor is used both product and ambient temperature can be measured in the same position at the same time.

The advantage with this method is that there is a minimum of probe assembly inside the pouch, minimizing risks of heat conduction and securing the reference container is as close to the “normal” containers as possible, because otherwise the heat transfer profile will no longer be representative for the entire batch.

Configuration

SSA12xxxE700TS Sensor	**TSP 2 mm**	**TSP Mini 2.5 mm**	**TSP 3 mm**
⑥ TPJ Stainless steel frame	TPJ Stainless steel frame	TPJ Stainless steel frame	TPJ Stainless steel frame
① GKJ13009Cxxx Packing gland	GKJ21009Cxxx Packing gland	GKJ26009Cxxx Packing gland	GKJ31009Cxxx Packing gland
⑤ GKK31008Kxxx Space bar (optional)	GKK31008Kxxx Space bar (optional)	GKK31008Kxxx Space bar (optional)	GKK31008Kxxx Space bar (optional)

Spare part list

③ GKJ-U O-ring	GKJ-U O-ring	GKJ-U O-ring	GKJ-U O-ring
④ GKJ-J Stainless steel finger nut	GKJ-J Stainless steel finger nut	GKJ-J Stainless steel finger nut	GKJ-J Stainless steel finger nut

When ordering sensors, packing glands and space bars please replace xxx with the length(s) needed.

Small plastic and aluminium containers

Packing gland type GEJ

Make a 4mmØ hole in the container.

Disassemble the GEJ packing gland (1).

Mount one o-ring (3) on the bushing (2) and introduce the bushing into the container.

Place the other o-ring (3) on the bushing (2) from the inside.

Screw on and fasten the fingernut (4) from the inside of the container. The container can now be filled and sealed, and a piece of tape covering the hole can prevent the product dripping out.

The logger is started up in the reader station.

The sensor can now be introduced, and if necessary a GKK-K space bar (5) can be used. Ensure that the measuring point is correctly positioned in the “cold spot”.

If a double sensor is used both product and ambient temperature can be measured in the same position at the same time.

Configuration

	SSA12xxxE700TS Sensor	**TSP Mini 2.5 mm**	**TSP 3 mm**
①	GEJ13040C Packing gland	GEJ26040C Packing gland	GEJ31040C Packing gland
⑤	GKK31008Kxxx Space bar (optional)	GKK31008Kxxx Space bar (optional)	KK31008Kxxx Space bar (optional)

Spare part list

④	GEJ-J Finger nuts	GEJ-J Finger nut	GEJ-J Finger nut
③	GEJ37007U O-rings	GEJ37007U O-rings	GEJ37007U O-rings

When ordering sensors, packing glands and space bars please replace xxx with the length(s) needed.

Filled metal containers

Packing gland type HUJ

Mark the container where you want the HUJ-C gland to be fitted.

Make a hole in the container with the TC25 perforation tool (6) and a hammer.

Place the HUJ-C (1) mounted with silicone rubber washer (3) in the TC26 spanner (7) and screw it into the hole.

Screw until it is tight, but be careful not to screw too tight.

The logger is started up in the reader station.

The sensor is introduced and if necessary a GKK-K space bar (5) can be used.

If a double sensor is used both product and ambient temperature can be measured in the same position at the same time.

Configuration

	SSA12xxxE700TS Sensor	**TSP 2-3 mm**
①	HUJ13035C005 Packing gland	HUJ31035C005 Packing gland
⑤	GKK31008Kxxx Space bar (optional)	GKK31008Kxxx Space bar (optional)

Spare part list

⑥	TC25 Perforation tool	TC25 Perforation tool
⑦	TC26 Spanner	TC26 Spanner
③	HUJ-S Silicone rubber washer	HUJ-S Silicone rubber washer

When ordering sensors, packing glands and space bars please replace xxx with the length(s) needed.

Glass and plastic bottles

Packing gland type GVK

The xxx in the type designation has to replaced with the neck diameter and a sample of the bottle has to be sent to Ellab.

Disassemble the GVK packing gland (1).

After filling the bottle the lower part of the gland (4) (with an outer thread) is pressed around the bottle neck.

The upper part (2) of the gland, with inner thread and silicone washer (3) inside is screwed on the lower part (4) until it is tight.

The logger is started up in the reader station.

The sensor is introduced and if necessary a GKK-K space bar (5) can be used.

If a double sensor is used both product and ambient temperature can be measured in the same position at the same time.

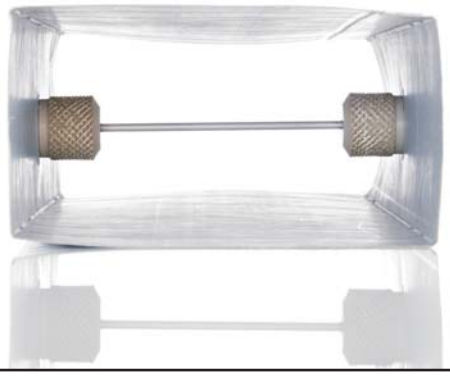
Configuration

	SSA12xxxE700TS Sensor	**TSP 2-3 mm**
①	GVK42xxxC000 Packing gland	GVK42xxxC000 Packing gland
⑤	GKK31008Kxxx Space bar (optional)	GKK31008Kxxx Space bar (optional)

Spare part list

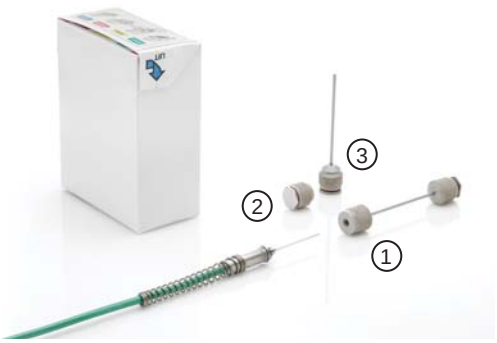
③	GVK-S Silicone rubber washer	GVK-S Silicone rubber washer

When ordering sensors, packing glands and space bars please replace xxx with the length(s) needed.



Retortable cartons

Packing gland type RECART



A special packing gland (1) is fitted from wall to wall of the carton, securing that the measuring point will not move during processing.

Disassemble the RECART packing gland (1).

Make two 8mmØ holes with the TC42 cutting tool on each side of the carton.

The bushing (2) is screwed into the hole of one side of the carton.

The other bushing (3) with a stainless steel tube is screwed into the hole of the other side and the stainless steel tube is fitted into the first bushing (2).

The o-rings must be positioned inside the carton and the two nuts on bushings (2)(3) are fastened by hand until they are tight.

The container can now be filled and sealed in the sealing machine.

The logger is started up in the reader station.

The sensor is introduced and if necessary a GKK-K space bar (5) can be used.

If a double sensor is used both product and ambient temperature can be measured in the same position at the same time.

Configuration

	SSA12xxxE700TS Sensor	**TSP 2 mm**	**TSP Mini 2.5 mm**	**TSP 3 mm**
①	RECART Pack. gl. for 1.2mmØ probe	RECART Pack. gl. for 2mmØ sensors	RECART Pack. gl. for 2.5mmØ sensors	RECART Pack. gl. for 3mmØ sensors
⑤	GKK31008Kxxx Space bar (optional)	GKK31008Kxxx Space bar (optional)	GKK31008Kxxx Space bar (optional)	GKK31008Kxxx Space bar (optional)

When ordering sensors, packing glands and space bars please replace xxx with the length(s) needed.

Direct measurements in food particulates

Sausages (Hot dogs)

Fixture type HBJ-120

This packing gland is developed for all kind of sausages in sterilization, pasteurisation, cooling and freezing. The sausage is positioned in the fixture and afterwards the sensor is positioned so the measuring point is in the “cold spot”. It can be used for both batch and continuous processing.

Pasta (Ravioli)

Fixture type HBJ-Q

This packing gland is developed for all kind of ravioli pieces and can also be used for other kinds of meat balls, chunks, fish etc., in sterilization, pasteurisation, cooling and freezing. The pasta is positioned in the fixture and afterwards the sensor is positioned so the measuring point is in the “cold spot”. It can be used for both batch and continuous processing.

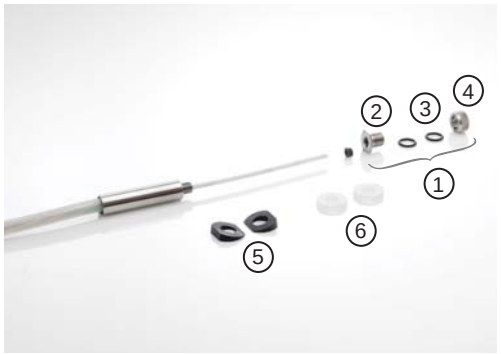
Shrimp pre-cooking

Fixture type HBK70000Q

This packing gland is developed for all kind of shrimps in sterilization, pasteurisation, cooling and freezing. The shrimp is positioned in the fixture and afterwards the sensor is positioned so the measuring point is in the “cold spot”. It can be used for both batch and continuous processing.

Heat penetration multipoint probe

Type SD4-30110-G700-ST multipoint probe
Packing gland type GFJ-36009C-000



The above are designed for measurements in all kinds of containers. On demand the SD4 probes can be delivered with other specifications corresponding to the size of the container and the product.

Make a hole in the container. Non-flexible with TC89 or TC40S/41, flexible with TC42.

Disassemble the GFJ packing gland (1).

Introduce the bushing (2) mounted with an o-ring or a washer (please see below) into the hole, and place the other o-ring or washer on the bushing from the inside of the container.

Non-flexible containers: 2 pieces GFJ-U (3) o-rings are used.

Thin flexible containers: 2 pieces GFJ-S (6) o-rings are used.

Containers with unparallel sides: 2 pieces GFJ-K wedge washers (5) are used.

Introduce the multipoint probe into the packing gland.

When the measuring points are placed as wanted the finger nut (4) is fastened, so that the system is tight.

The container can now be filled, sealed and placed in a suitable position in the heating media. The probe is inserted into the container and tightened with the protection tube (7). The SD4-probe is connected to 4 input sockets on the Ellab instruments used.

Configuration

SSA12xxxE700TS Probe

① GFJ-36009C-000 Packing gland

⑦ GFK-95012M-050 Protection tube

Spare part list

④ GKJ-J Finger nut

③ GFJ-U O-rings

Optional parts for very thin flexible containers:

⑥ GFK-S Silicone rubber washer

Optional parts for containers with unparallel sides:

⑤ GFJ-K Wedge washer

Other parts:

TC89 Can punch

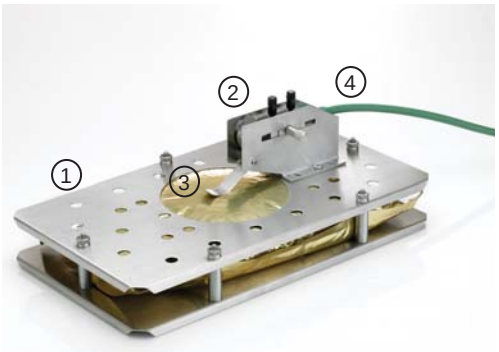
TC40/41 Perforation tool

TC42 Cutting tool

When ordering sensors, packing glands and space bars please replace xxx with the length(s) needed.

Real time container deflection with E-Val Flex

Deflection measurement



The deflection measurement system is able to measure the plus/minus deflections of the container during the thermal process.

With the deflection measurements it is now possible to establish the process parameters so that flexible and semi-rigid containers can be processed with minimal mechanical stress and deformation.

A container holding device (1) is manufactured according to the type and size of the container, and for this purpose a sample of the container(s) has to be sent to Ellab.

The container is fixed with a stainless steel plate, and the holding device is fastened with four screws, so it will not move around during processing.

The SHD stainless steel support (2) is positioned on top of the holding device, so the clamp (3) is positioned at the spot wanted, and then fastened with four screws.

For plastic trays, holding devices are available with up to three measuring points – top, bottom and side – for establishing the most optimal process parameters.

The LVDT deflection transducer (4) is then introduced into the autoclave chamber and position in the SHD stainless steel support, and the complete device is positioned at the spot wanted.

The LVDT deflection transducer cable is then connected to a D-Flex module (5) which again is connected to the RS485 port at the E-Val Flex master module.

By using a multibox it is possible to monitor deflection, autoclave pressure and container pressure using the RS485 port on the E-Val Flex master module. These parameters will then be presented together with the temperatures in the same data sessions.

Configuration

E-Val Flex master module (please require documentation)

⑤ D-FLEX Module

④ LVDT Deflection transducer

② SHD Stainless steel support

① THD TRAY HOLDING Device (sample of container necessary)

GQJ16G12C001 Packing gland ½" or

GRJ19G34C001 Packing gland ¾" or

GSJ25G10C001 Packing gland 1"

Real time pressure with E-Val Flex

Container pressure

For pressure measurements in different containers the PRS digital pressure sensor and the PAJ connection system are needed.

Make a hole in the container with the can punch TC89 or TC40S/TC41 (see instructions for perforating and embossing the containers).

Introduce the pressure bushing (2) into the container and place the o-ring (3) on the bushing from the inside.

Screw on and fasten the fingernut (4) from the inside of the container.

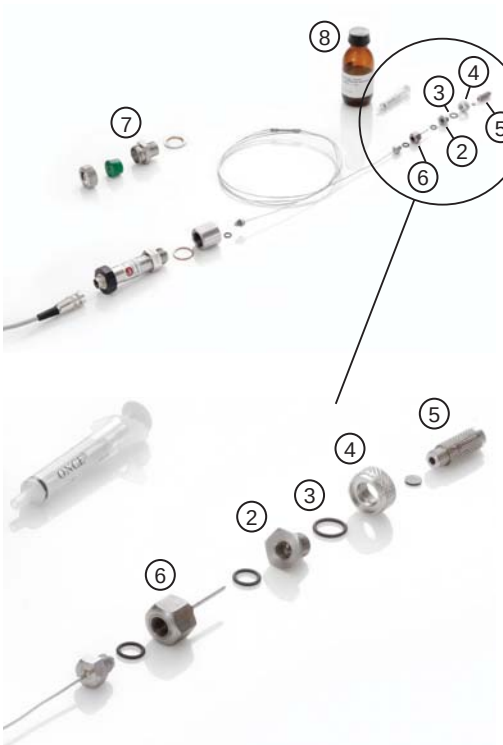
The container can now be filled and sealed in the sealing machine also using vacuum.

The PAJ piercing needle (6) on the capillary tube is then inserted into the pressure bushing through a rubber seal so keeping an eventual vacuum.

The capillary tube is lead through the autoclave wall using an autoclave packing gland (7).

Using a syringe silicone oil (8) is injected into the capillary system in order to avoid air pockets.

On the outside of the autoclave the PRS digital pressure sensor is connected to the capillary tube, and the PRS is then connected to the RS485 of the E-Flex system.



Autoclave pressure

For measurements of the autoclave pressure the PRS digital pressure sensor is needed. Range 0-4 bar. The PRS sensor can be mounted in a pocket of the autoclave, or by using a feed-trough which is available with ½", ¾" or 1" which is screwed into the wall of the autoclave.

Configuration for container pressure

E-Val Flex Master module (please require documentation)
DIGITAL PRS SENSOR Digital pressure sensor
PRS O-RING O-ring for Digital pressure sensor
PAJDIGITALC030 Pressure connection kit for containers
⑦ GQJ16G12C001 Packing gland ½" or
⑦ GRJ19G34C001 Packing gland ¾" or
⑦ GSJ25G10C001 Packing gland 1"

Configuration for autoclave pressure

DIGITAL PRS SENSOR Digital pressure sensor
PRS O-RING O-ring for Digital pressure sensor
FEED THROUGH 1", ¾" or ½"
TRI CLAMP FLANGE 1", ¾" or ½"

Real time rotation measurements with E-Val Flex

DCS-EL slipring contacts for measurements in rotating autoclaves

For measurements in rotating autoclaves we have developed a selection of slipring contacts which makes it possible to have real time data for temperature, pressure, deflection and rotation per minute during processing.

The slipring contact consists of a rotating part which is furnished with probe sockets and a 8mmØ locking screw for mounting, and the stationary part furnished with extension cables and a nylon bar to prevent rotation.

A suitable connection piece is mounted on the drive shaft of the autoclave in which the rotating part of the DCS slipring contact is fixed by using the locking screw.

The nylon bar on the stationary part is fixed so it is preventing rotation of the stationary part during processing.

The temperature probes are positioned in the probe sockets on the rotating part and led through the drive shaft via an autoclave packing gland.

The temperature extension cables are connected to the probe input sockets of the E-Val Flex module.

Rotation per minute cable (if applicable) is connected to the R-FLEX module which is connected to the RS485 port of the E-Val Flex module.

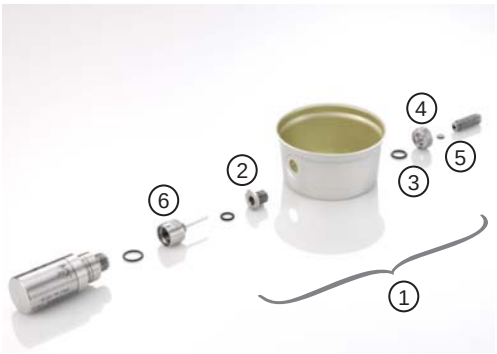
Deflection can be measured by mounting the DA26 kit with connection to a LVDT transducer on the rotating part. Two temperature input sockets are used to transmit data from one deflection channel, and the LVDT deflection cable are led through an autoclave packing gland positioned in the drive shaft. The deflection extension cable is then connected to a D-Flex module which is connected to the RS485 port at the E-Val Flex module.

Configuration

Temperature	Deflection	Rotation
DCS-4EL Slipring contact, 4 channels & RpM	DA26 Kit	R-FLEX Module
DCS-8EL Slipring concact, 8 channels & RpM	D-FLEX Module	
DCS-16EL Slipring contact, 16 channels & RpM	SHD Support	
GQJ16G12C001 Packing gland ½" or	THD Device	
GRJ19G34C001 Packing gland ¾" or		
GSJ25G10C001 Packing gland 1"		

Container pressure with TrackSense® Pro

External mounting



Packing gland type PAJ Pro Pressure

Pressure connection system for TrackSense® Pro Pressure

Make a hole (1) in the container with the can punch TC89 or TC40S/TC41 (see instructions for perforating and embossing the containers).

Disassemble the PAJ Pro pressure connection system.

Introduce the bushing (2) with the filter mesh (5) into the container.

Place the o-ring (3) on the bushing (2) from the inside.

Screw and fasten the fingernut (4) from the inside of the container.

The container can now be filled and sealed in the sealing machine.

The top nut of the pressure sensor is unscrewed and replaced with the following:

The top nut with piercing needle (6) is filled with silicone oil and screwed on top of the logger unit.

The logger and pressure sensor is started up in the reader station.

The piercing needle (6) is introduced into the PAJ packing gland and tighten by hand.

Configuration

TSPRO PRS Pressure sensors

① PAJ Pro pressure kit

Spare parts list

② PAJ Bushing with 9mmØ thread

③ GKJ-U O-ring

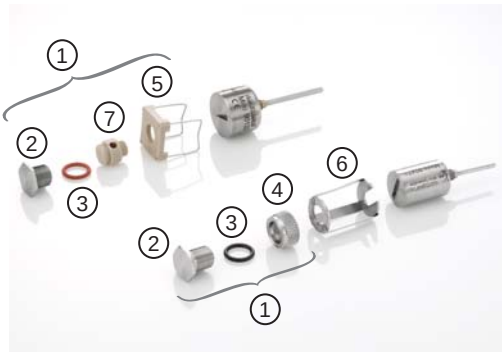
④ GKJ-J Stainless steel finger nut

⑤ PAJ Filter mesh

When ordering sensors, packing glands and space bars please replace xxx with the length(s) needed.

Internal fittings

TSK/TSJ



The mini and micro loggers are designed for applications where size is an issue. The low volume displacement makes these small loggers ideal for monitoring inside of packaging.

Temperature in all kinds of containers

Cans, jars, trays, bottles, pouches, doy-packs, retortable cartons etc.

Internal fittings for wireless dataloggers

Make a hole in the container with the can punch TC89 or TC40S/TC41 or TC42 (see instructions for perforating and embossing the containers).

Disassemble the TSK/TSJ Fixture (1).

Introduce the screw (2) into the hole and place the o-ring (3) on the screw from the inside of the container.

Screw on and fasten the fixture (5 or 6) from the inside of the container – or if the measuring depth has to be adjusted the screw (2) and o-ring (3) is tightened with the fingernut (4) and TKK distance piece (7) is screwed into the inner thread of the screw securing measurements in the “cold spot”. The fixture (5 or 6) is screwed on the distance piece.

The logger is started up in the reader station and then placed in the fixture inside the container.

The container can now be filled and sealed, and if a mixed product the part with the slowest heat transfer can be positioned at the measuring points (meat balls, fish etc.).

Configuration

	Mini logger	Micro logger	TSPro logger
①	TSK MINI Fixture	TSJ MICRO TMP Fixture	TSJ08000Q054 Fixture
⑦	TKK10PROL0xx Distance piece (opt)	TKK10PROL0xx Distance piece (opt)	TKK10PROL0xx Distance piece (opt)

Spare parts list

②	TSK Screw 9mmØ	TSJ Screw 9mmØ	TSJ Screw 9mmØ
③	GKJ-U O-ring	GKJ-U O-ring	GKJ-U O-ring
④	GKJ-J Finger nut	GKJ-K Finger nut	GKJ-J Finger nut

When ordering sensors, packing glands and space bars please replace xxx with the length(s) needed.

Internal temperature fittings for cans, jars, trays, bottles, retortable cartons

TBJ stainless steel frame for bottles, cans, jars, trays
RECART stainless steel frame for retortable cartons

A stainless steel frame (1) is manufactured exactly for the dimensions of the container. The frame is furnished with a nut (2) with internal thread.

The logger is started up in the reader station and then placed in the fixture (3, 4 or 5).

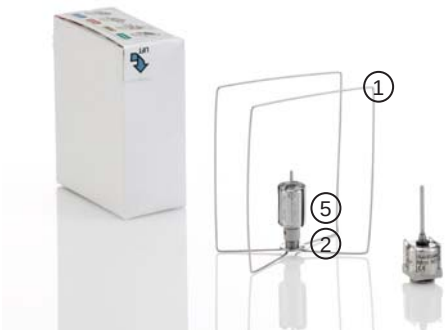
The fixture with the logger is then screwed into the nut (2) of the frame (1).

If the measuring depth has to be adjusted a TKK distance piece (6) is screwed in between the frame and the fixture securing measurements in the “cold spot”.

The whole assembly is then immersed into the container.

The container can now be filled and sealed, and if a mixed product the part with the slowest heat transfer can be positioned at the measuring points (meat balls, fish etc.).

This application has the advantage that it is not necessary to make any holes in the container, maintaining the container integrity during processing.



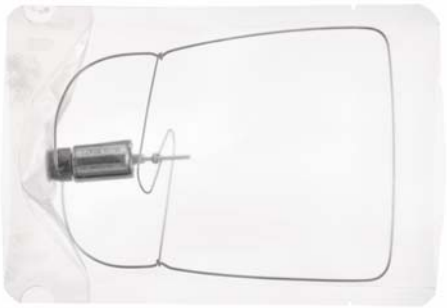
Configuration

	Mini logger	Micro logger	TSPro logger
①	TBJ Frame/ RECART Frame	TBJ Frame/ RECART Frame	TBJ Frame/ RECART Frame
④	TSK MINI Fixture	TSJ MICRO TMP Fixture	TSJ08000Q054 Fixture
⑥	TKK10PROL0xx Distance piece (opt)	TKK10PROL0xx Distance piece (opt)	TKK10PROL0xx Distance piece (opt)

Spare parts list

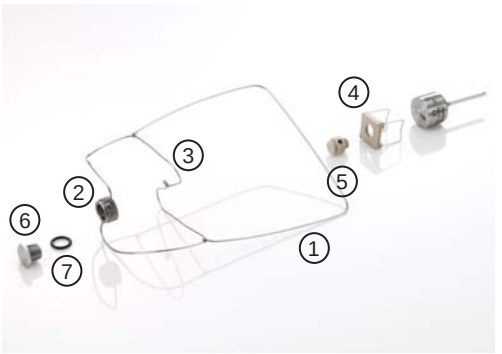
	TSK Screw 9mmØ	TSJ Screw 9mmØ	TSJ Screw 9mmØ
	GKJ-U O-ring	GKJ-U O-ring	GKJ-U O-ring
②	GKJ-J Finger nut	GKJ-K Finger nut	GKJ-J Finger nut

When ordering sensors, packing glands and space bars please replace xxx with the length(s) needed.



Internal temperature fittings for flat pouches and doypacks

TPJ stainless steel frame for flat pouches
TDJ stainless steel frame for stand-up pouches



A stainless steel frame (1) is manufactured exactly for the dimensions of the pouch. The frame is furnished with a nut (2) with internal thread.

The wire is bended so it is fitting the bottom of the pouch.

The frame is in the middle furnished with a “crossing wire” (3) fitting the thickness of the pouch for fixating the sensor, and thus avoiding movement of the sensor touching the wall of the pouch.

The logger is started up in the reader station and then placed in the fixture (4).

The fixture with the logger is then screwed into the nut (2) of the frame (1) using the TSK screw (6) and O-ring (7) and the sensor fixated in the hole of the crossing wire (3). If the measuring depth has to be adjusted a TKK distance piece (5) is screwed in between the frame and the fixture securing measurements in the “cold spot”.

The whole assembly is then immersed into the pouch.

The container can now be filled and sealed, and if a mixed product the part with the slowest heat transfer can be positioned at the measuring points (meat balls, fish etc.).

This application has the advantage that it is not necessary to make any holes in the container, maintaining the container integrity during processing.

Configuration

	Mini logger	Micro logger	TSPro logger
①	TPJ Pouch frame/ TDJ Doypack frame	TPJ Pouch frame/ TDJ Doypack frame	TPJ Pouch frame/ TDJ Doypack frame
④	TSK MINI Fixture	TSJ MICRO TMP Fixture	TSJ08000Q054 Fixture
⑤	TKK10PROL0xx Distance piece (opt)	TKK10PROL0xx Distance piece (opt)	TKK10PROL0xx Distance piece (opt)

Spare parts list

⑥	TSK Screw 9mmØ	TSJ Screw 9mmØ	TSJ Screw 9mmØ
⑦	GKJ-U O-ring	GKJ-U O-ring	GKJ-U O-ring

When ordering sensors, packing glands and space bars please replace xxx with the length(s) needed.

Internal pressure fittings for all kinds of containers, cans, jars, trays, bottles, retortable cartons, doypacks and pouches

Internal fittings for pressure dataloggers

Make a hole in the container with the can punch TC89 or TC40S/TC41 or TC42 (see instructions for perforating and embossing the containers).

Introduce the screw into the hole and place the o-ring on the screw from the inside of the container.

Screw on and fasten the fixture (3) from the inside of the container.

The logger is started up in the reader station and then placed in the fixture (4) inside the container.

The container can now be filled and sealed.

Configuration

Micro PRS Logger	**Micro PRS/TMP Logger**	**TSPro Pressure sensors**
TSJ MICRO PRS/TMP Fixture	TSJ MICRO PRS/TMP Fixture	TSK08000Q001 Fixture

Spare parts list

②	TSJ Screw 9mmØ	TSJ Screw 9mmØ	TSJ Screw 9mmØ
③	GKJ-U O-ring	GKJ-U O-ring	GKJ-U O-ring
④	GKJ-J Finger nut	GKJ-K Finger nut	GKJ-J Finger nut

Internal fitting for micro pressure and micro pressure/temperature loggers

Both loggers are started up in the reader station.

A hole is punched in the top or bottom of the can and the external pressure sensor is fixed with a special nut and the logger is positioned in the plastic holder (3).

The internal pressure/(temperature) logger is also positioned in the plastic holder (3).

If used in continuous cooker/coolers secure that the can is balanced and freely rolling. The can can now be filled and sealed and ready for process.

Configuration

Micro pressure logger, 2 pieces

③ PRS-INT-EXT Internal/external fixture

Can rotation speed in continuous cooker-coolers and hydrostats

The number of rotations is a very important parameter for the effect of the heat penetration during the process.

It is therefore recommended frequently to check the number of rotations of the containers to secure that the product is achieving the proper heat treatment.

Internal fittings for micro rotation loggers

Make a hole in the container with the can punch TC89 or TC40S/TC41 or TC42 (see instructions for perforating and embossing the containers).

Disassemble the TSJ Fixture (1).

Introduce the screw (2) into the hole and place the o-ring (3) on the screw from the inside of the container.

Screw on and fasten the fixture (5) from the inside of the container using finger nut (4).

The logger is started up in the reader station and no programming is needed. The process results will be presented as rotation per sample, axial rotation direction and total rotations.

The logger is then placed in the fixture (5) inside the container.

The fixture has to be mounted axial to secure that the container is balanced and freely rolling.

The container can now be filled and sealed.

Configuration

TSP MICRO ROT Logger
TSJ MICRO ROT Fixture

Spare parts list

② TSJ Screw 9mmØ
③ GKJ-U O-ring
④ GKJ-J Finger nut

Instructions for perforating and embossing the containers

TC89 - Can punch

The TC89 is designed for perforation and embossing of all metal containers such as cans, alu-containers etc., and for perforation of plastic containers.

The profiled hole is fitting the GKJ-C and GTJ-C packing glands and other special glands with diameter of 9 mm.

Place a mark on the container where you want the packing gland to be fitted.

Place the container in the can punch so that the piston punch (2) will perforate exactly where you want it to.

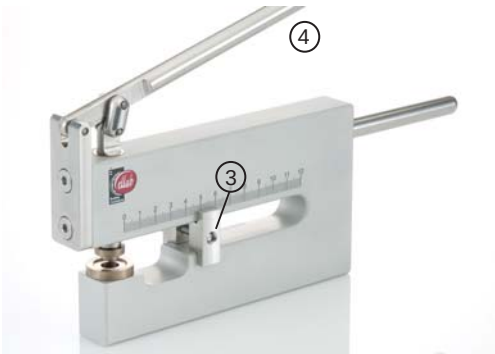
The height/depth restrictor (3) can be locked at the distance wanted.

When the containers are correctly positioned press down the hand lever (4), and the piston punch will make a perfect hole (1).

Metal containers: continue to press until the profile is made. This is important for the thightness and for getting the container in the sealing machine with the gland fitted.

The container is now ready to be fitted with a packing gland. Please see instructions for same.

When you have finished please remember to remove the cut-outs (5) from the TC89.



Instructions for perforating and embossing the containers

TC41 and TC40S - Perforation and pre-perforation tool

The TC40S is designed for perforation and embossing of alu- and plastcontainers.

The profiled hole is fitting the GKJ-C and GTJ-C packing glands with a diameter of 9 mm.

Make a mark on the container where you want the packing gland to be fitted and pre-perforate a hole (1) with the TC41 (2).

Disassemble the TC40S.

Introduce the allen screw (3) with the female bush (4) through the hole from the inside of the container.

Place the male bush (5) on the allen screw (3).

Screw on grip (7) and continue until a clean hole is made. Use allen tool (6) to counterbalance.

Alu-containers: keep on screwing until the profile is made. This is important for the thightness and for getting the container in the sealing machine, with the gland fitted.

The container is now ready to be fitted with a packing gland. Please see instructions for same.

When you have finished please remember to remove the cut-outs from the TC40S.

Instructions for perforating the containers

TC42 - Cutting tool

The TC42 is used for perforation of flexible plastic pouches.

The 8 mm diameter hole is fitting the GKJ-C and GTK-C packing glands. On request we can deliver tools with other diameters.

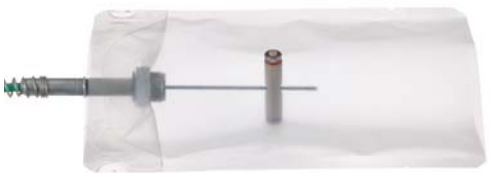
Place a mark on the container where you want the gland to be fitted.

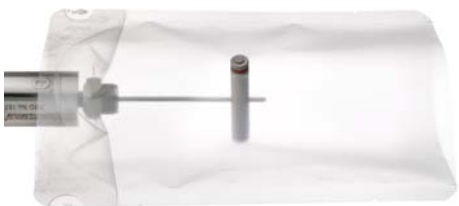
Press the cutting tool either by hand or with a hammer until a hole is cut out.

When cutting the hole it is recommended to use a piece of wood as underlay.

The container can now be fitted with the glands needed.

On the right please find examples of flexible containers where these cutting tools have been used.





TC25 Cutting tool
TC26 Spanner

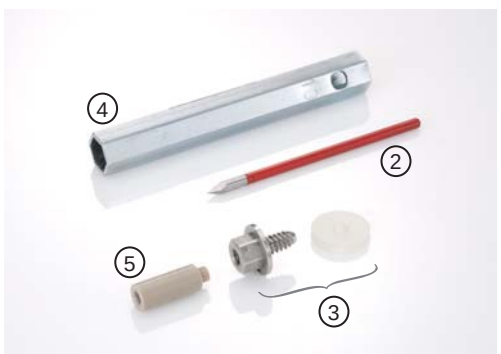
These tools are used with the HUJ packing gland and in already filled metal containers. It can be used in some plast containers if the thickness of the container is thick enough for fastening.

Make a hole in the container with the TC25 perforation tool (2) and a hammer.

Place the HUJ-C (3) in the TC26 spanner (4) and screw it into the hole.

Screw until it is tight, but be careful not to screw too tight.

Use the TKK distance piece (5) if necessary.



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