

Fittings for accurate measurements



Versatile real time and wireless systems
for measurements in various types of
pharmaceutical applications

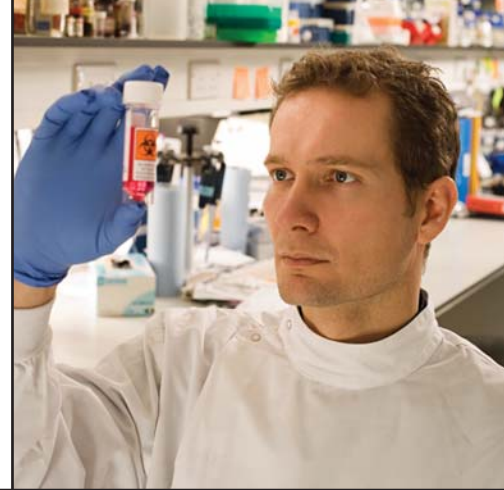


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Fittings for accurate measurements

There are many factors that can impact on the efficiency of a thermal process. In the development of processes for sterilization of pharmaceuticals, one of the main considerations is the acquisition of accurate time/temperature profiles.

- Safety – ensuring that microbial stability has been achieved
- Optimization – reducing process times to increase production throughout and minimize energy costs
- Process validation – providing documentation to demonstrate compliance with regulations for authorities, FDA/USDA, EC, customers, ISO9000, 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 spot 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 program and identify the cold spot.
- 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 phases above are focused on identifying the worst case conditions to which the product would be exposed. The lowest temperatures and slowest heat transfer would lead to the lowest microbial reduction. It is crucial that the temperature measurement devices have high accuracy and reliability. A systematic or experimental error of 1°C in a temperature measurement system at the sterilization reference temperature of 121.1°C would lead to a corresponding error of 26% in the calculated F_0 sterility value.

It is 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 various styles and designs of containers. The range of fittings available is being continually expanded and improved with the following parameters taken into consideration:



- **Correct positioning of the measuring device**

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-values.

- **Elimination of steam and water ingress**

It is pertinent that the packing gland and the probe are mounted so that the integrity of the container is maintained. Properly mounting the gland will also ensure that water/steam ingress cannot occur, which would lead to false data and high Fo-values.

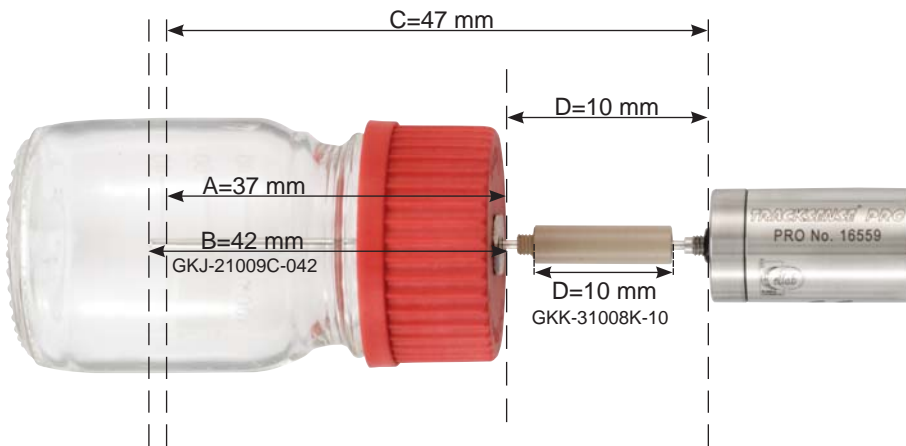
- **Minimizing risks of heat conduction**

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 of heat conduction.

- **Minimizing the probe assembly inside the container**

It is very important that the probe and fixture are as small as possible so that the impact on the internal environment (product) of the container, including the head-space, is minimized.

Calculation of sensor, gland and space bar specifications



The picture shows an example of how to calculate the measuring depth for various types of containers.

A

The measuring depth in which the measuring point - "cold spot" has to be determined. In this case the cold spot is 37 mm from the lid.

B

The packing gland has to be 5 mm longer than the measuring depth, corresponding to the size of the sealings of the gland and the sensor. The length of the gland is specified in the last three characters of the type designation - GKJ-21009C-042.

C

In this case the sensor electrode length is 50 mm, specified in the last three characters of the type designation - TPA20050TS. Because of the size of the thermojunction and the sealing of the sensor, the measuring point is situated 3 mm from tip.

D

As the sensor electrode is longer than the GKJ-C gland, a space bar of 10 mm is screwed in between the sensor bushing and gland. The three last characters of the type designation specifies the length - GKK-31008K-010.

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.

Feed-through support for pressure and temperature sensors



The ELLAB feed-through support is made from AISI 316 medical grade stainless steel material and can be easily utilized in an autoclave or retort access port using either the ½", ¾" or 1" thread directly or the optional NW40 flange connection.

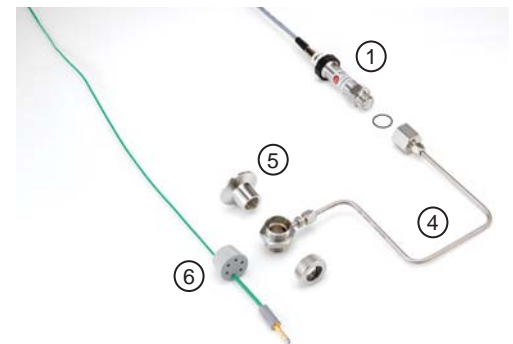
The design secures trouble free use of the Ellab Digital Pressure sensor (1) in the vertical position with the membrane protected by the condensed water in the U-shape according to the water lock principle.

At the same time, it is possible to feed multiple SSA and STC Thermocouple sensors easily and tight through the rubber packings and standard sizes are available with holes from 4 to 16.

Main Advantages

- Easy and you save time mounting
- Protects pressure membrane during operation
- Safe, tight and fast handling of thermocouple probes
- Perfect tool for repetition in validation jobs

For further information please see the chapter "Real time pressure with E-Val Flex".



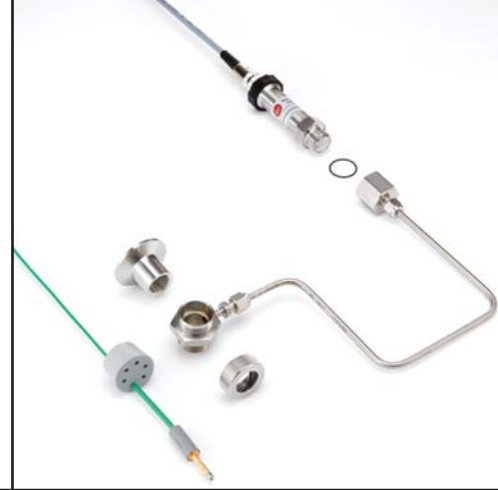
Configuration for container pressure

- | | | | |
|---|---|---|----------------------------------|
| | E-Val Flex Master module (please require documentation) | ② | GQJ16G12C001 Packing gland ½" or |
| ① | DIGITAL PRS SENSOR Digital pressure sensor | ③ | GRJ19G34C001 Packing gland ¾" or |
| | PRS O-RING O-ring for Digital pressure sensor | | GSJ25G10C001 Packing gland 1" |
| | PAJDIGITALC030 Pressure connection kit for containers | | |

Configuration for autoclave pressure

- | | |
|---|---|
| ① | DIGITAL PRS SENSOR Digital pressure sensor |
| | PRS O-RING O-ring for Digital pressure sensor |
| ④ | FEED THROUGH 1", ¾" or ½" |
| ⑤ | TRI CLAMP FLANGE 1", ¾" or ½" |
| ⑥ | Rubber packing 1", ¾" or ½" |

Real time pressure with E-Val Flex



Autoclave pressure

For measurements of the autoclave pressure the PRS digital pressure sensor is needed. It's range is from 0-4 bar. The PRS sensor can be mounted in a pocket on the autoclave or by using a feed-through which is available in 1/2", 3/4" and 1" diameter. Please see the previous page.

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.

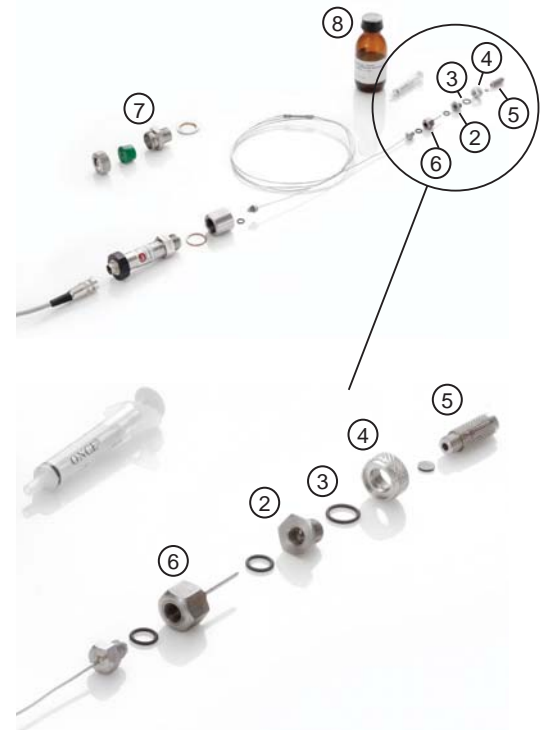
The container can now be filled and sealed in the sealing machine also using vacuum.

The PAJ piercing needle (6) on the capillary tube is then inserted into the pressure bushing through a rubber seal which allows a vacuum to be created.

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.



Configuration for autoclave pressure

DIGITAL PRS SENSOR Digital pressure sensor
PRS O-RING O-ring for Digital pressure sensor
FEED THROUGH 1", 3/4" or 1/2"
TRI CLAMP FLANGE 1", 3/4" or 1/2"
Rubber packaging 1", 3/4" or 1/2"

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

GQJ16G12C001 Packing gland 1/2" or
GRJ19G34C001 Packing gland 3/4" or
GSJ25G10C001 Packing gland 1"

Container pressure with TrackSense® Pro



External mounting in vials and bottles

Packing gland type PAJ Pro Pressure Pressure connection system for TrackSense® Pro Pressure

Make a hole in the container with the TC42 or a 8mmØ drilling tool.

Disassemble the PAJ Pro pressure connection system.

Introduce the bushing (6) with the filter mesh (2) into the container.

Place the o-ring (3) on the bushing (6) 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:

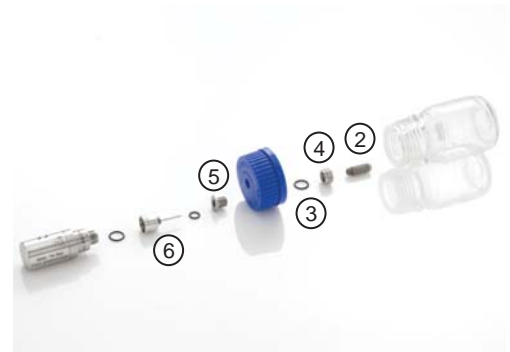
The top nut with piercing needle (6) is filled with silicone oil and screwed on top of the logger unit.

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

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

External mounting in syringes

The PAJLUER0512M pressure kit (8) is positioned on the top of the logger unit and the luer lock piece (7) is positioned in the syringe.



Configuration

TSPRO PRS Pressure sensors

- ① PAJ Pro pressure kit
- ⑧ PAJLUER0512M 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.

IV Bags - external mounting



The container is filled and sealed.

The point of the neck (1) of the bag is snapped or cut off.

The GLJ gland (2) is then pressed into the neck until it is tight.

The logger is started up in the reader station.

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

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



Configuration

	SSA12xxxE700TS Sensor	TSP 2 mm	TSP Mini 2.5 mm	TSP 3 mm
②	GLJ31055C014 Packing gland	GLJ31055C014	GLJ31055C014	GLJ31055C014
	GLK13008C000 Packing gland	GLK13008C000	GLK13008C000	GLK13008C000
	GKK31008Kxxx space bar (optional)	GKK31008Kxxx	GKK31008Kxxx	GKK31008Kxxx

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



Glass ampoules with breakable necks

Packing Gland type GNK

After filling break off the neck (2) of the ampoule.

The fingerscrew (3) in the holder (4) is unscrewed and the filled ampoule is placed in the holder.

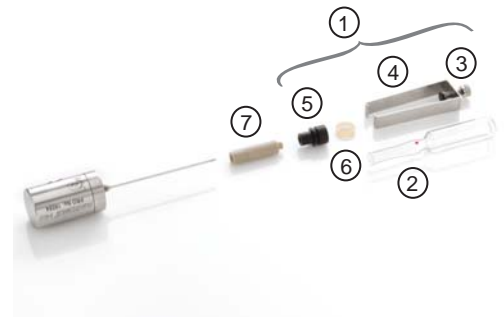
The bushing (5) with the rubber washer inside is placed on top of the ampoule and in the holder.

The fingerscrew (3) is screwed in until the ampoule fits tightly in the silicone rubber washer (6).

The logger is started up in the reader station.

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

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 2.5mm	TSP 3 mm
①	GNK13011C001 gland for 1ml	GNK31011C001	GNK31011C001	GNK31011C001
	GNK13011C002 gland for 2ml	GNK31011C002	GNK31011C002	GNK31011C002
	GNK13015C003 gland for 3ml	GNK31015C003	GNK31015C003	GNK31015C003
	GNK13015C005 gland for 5ml	GNK31015C005	GNK31015C005	GNK31015C005
	GNK13022C010 gland for 10ml	GNK31022C010	GNK31022C010	GNK31022C010
	GNK13022C020 gland for 20ml	GNK31022C020	GNK31022C020	GNK31022C020
	GNK13022C025 gland for 25ml	GNK31022C025	GNK31022C025	GNK31022C025
	GNK13022C030 gland for 30ml	GNK31022C030	GNK31022C030	GNK31022C030
⑦	GKK31008Kxxx space bar (optional)	GKK31008Kxxx	GKK31008Kxxx	GKK31008Kxxx

Spare part list

	GNJ Holder	GNK Bushing	GNM70011S washer for 1, 2ml	GNM95015S washer for 3, 5ml	GNM14022S washer for 10 to 30ml
④	GNJ Holder	GNK Bushing	GNM70011S	GNM95015S	GNM14022S
⑤	GNJ Holder	GNK Bushing	GNM70011S	GNM95015S	GNM14022S
⑥	GNJ Holder	GNK Bushing	GNM70011S	GNM95015S	GNM14022S
	GNJ Holder	GNK Bushing	GNM70011S	GNM95015S	GNM14022S
	GNJ Holder	GNK Bushing	GNM70011S	GNM95015S	GNM14022S
	GNJ Holder	GNK Bushing	GNM70011S	GNM95015S	GNM14022S

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



Glass ampoules with pointed ends

Packing Gland type GNQ

After filling break off one of the ends (2) of the ampoule.

The finger screw (3) in the holder (4) is unscrewed and the filled ampoule is placed in the holder (4) with the point in the hole of the finger screw (3).

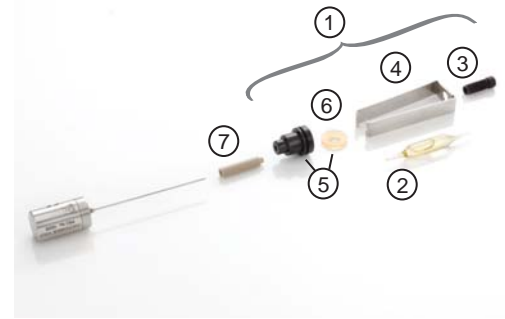
The bushing (5) with the rubber washer inside is placed on top of the ampoule and in the holder (4).

The fingerscrew (3) is screwed in until the ampoule fits tightly in the silicone rubber washer (6).

The logger is started up in the reader station.

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

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 2.5mm	TSP 3 mm
①	GNQ13011C001 gland for 1ml	GNQ31011C001	GNQ31011C001	GNQ31011C001
	GNQ13011C002 gland for 2ml	GNQ31011C002	GNQ31011C002	GNQ31011C002
	GNQ13015C003 gland for 3ml	GNQ31015C003	GNQ31015C003	GNQ31015C003
	GNQ13015C005 gland for 5ml	GNQ31015C005	GNQ31015C005	GNQ31015C005
	GNQ13022C010 gland for 10ml	GNQ31022C010	GNQ31022C010	GNQ31022C010
	GNQ13022C020 gland for 20ml	GNQ31022C020	GNQ31022C020	GNQ31022C020
⑦	GKK31008Kxxx space bar (optional)	GKK31008Kxxx	GKK31008Kxxx	GKK31008Kxxx

Spare part list

	GNQ Holder	GNQ Holder	GNQ Holder	GNJ Holder
④	GNQ Holder	GNQ Holder	GNQ Holder	GNJ Holder
⑤	GNQ Bushing	GNQ Bushing	GNQ Bushing	GNQ Bushing
⑥	GNQ70011S washer for 1, 2ml	GNQ70011S	GNQ70011S	GNQ70011S
	GNQ95015S washer for 3, 5ml	GNQ95015S	GNQ95015S	GNQ95015S
	GNQ14022S washer for 10 to 30ml	GNQ14022S	GNQ14022S	GNQ14022S

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

Plastic ampoules and syringe barrels with cone



Packing Gland type GLK20050C005 / GLJ25050C005

The ampoule is filled and sealed.

After filling break off or cut the neck (2) of the ampoule.

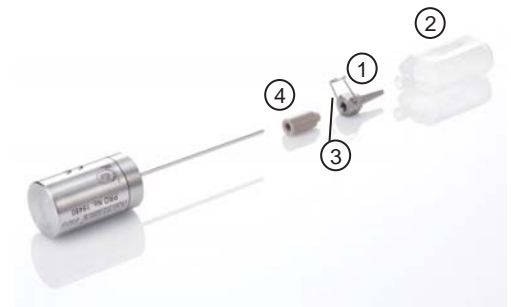
The gland (1) is then placed on top of the ampoule with the luer cone positioned inside the neck.

Secure the gland (1) with the metal spring (3).

The logger is started up in the reader station.

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

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 2.5mm	TSP 3 mm
①	GLK20050C005 2.1mmØ GLJ25050C005 2.1mmØ	GLK20050C005 2.6mmØ GLJ25050C005 2.6mmØ	GLK20050C005 2.6mmØ GLJ25050C005 2.6mmØ	GLK20050C005 3.1mmØ GLJ25050C005 3.1mmØ
④	GKK31008Kxxx space bar (optional)	GKK31008Kxxx	GKK31008Kxxx	GKK31008Kxxx

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

Glass and plastic vials



Packing Gland type GPK

The vial is filled and sealed.

Remove the tear off piece (2) in the middle of the rubber stopper.

The gland (1) is placed on top of the vial.

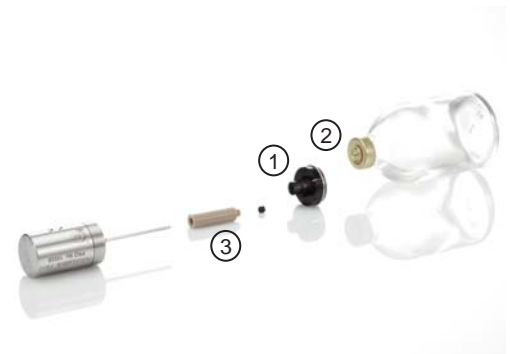
The logger is started up in the reader station.

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

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

CAUTION!

When pressing the sensor through the rubber stopper please be careful not to bend the sensor.



Configuration

	SSA12xxxE700TS Sensor	TSP 2 mm	TSP Mini 2.5mm	TSP 3 mm
①	GPK13020C00, neckØ 20mm GPK13032C00, neckØ 32mm	GPK31020C000 GPK31032C000	GPK31020C000 GPK31032C000	GPK31020C000 GPK31032C000
③	GKK31008Kxxx space bar (optional)	GKK31008Kxxx	GKK31008Kxxx	GKK31008Kxxx

Spare part list

GPK090004R000 Rubber washer	GPK090004R000	GPK090004R000	GPK090004R000
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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 be 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 a GKK-K space bar can be used if necessary.

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)

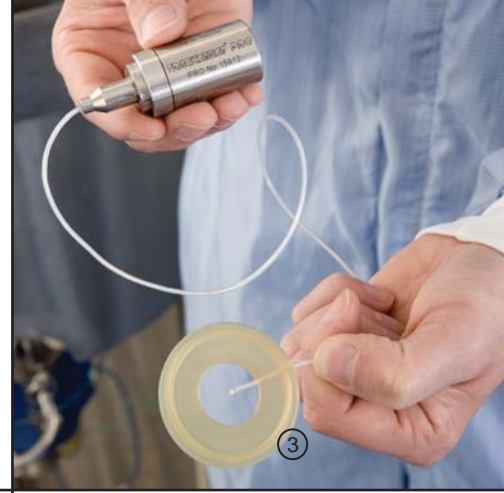
Spare part list

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.

Fermentors/Bioreactors Steam in place (SIP) with TrackSense® Pro



During sterilizing with steam (SIP) the temperature will typically be around or even above 121°C and the inside of all inlets and outlets have to be validated.

TriClamp for measuring inside of pipes

The TriClamp (4) is positioned between the flange connection of two pipes and the sensors can be introduced via the Smart Gasket (3).

TS Pro rigid and Teflon sensors can be used and if using the E-Val Flex system, also the SSA thermocouples can also be used.



Contact Clamp for measuring on the outside of pipes

To avoid opening of pipe system a standard logger can be positioned on the outside of the pipe wall using the Contact Clamp. Good contact is assured by design including slot for sensor positioning. The Contact Clamp is easily connected to - or taken off the pipe without use of tools. Material is POM (polyacetal).

The TS Pro Logger with a double sensor with a 180°C angled sensor is positioned in the Contact Clamp (1).

The fixture with the logger is connected to the tube so that the angled sensor has direct contact to the surface of the tube (2).



Configuration

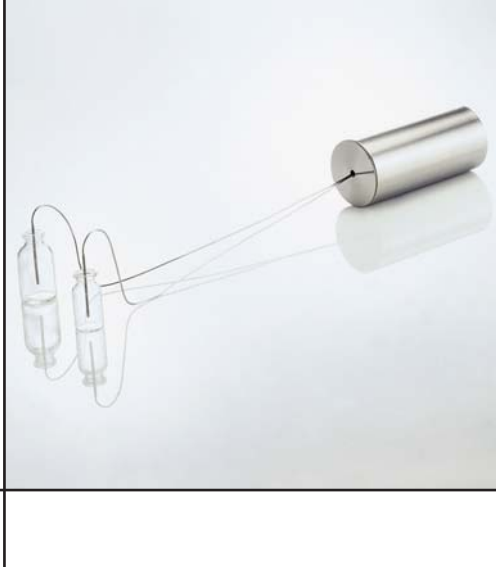
TSPro Logger

- ① Contact Clamp
- ② TriClamp
- ③ Smart Gasket

Mini Logger

- ① Contact Clamp
- ② TriClamp
- ③ Smart Gasket

Depyrogenation - High temperature with TrackSense® Pro and E-Val Flex



TrackSense® Pro

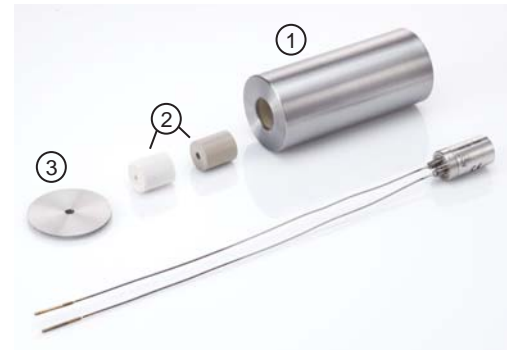
The system is designed for use at temperatures between +150°C and +400°C (302°F to 750°F). The characteristics of the system allow limited process duration. The datalogger can withstand 150°C (302°F) whereas the high temperature sensors can go up to 400°C (750°F). Inserting the logger into the thermal barrier (Insulation Pack) keeps it protected from the high temperature.

The thermal barrier consists of a stainless steel base cylinder (1) in which the thermal barrier and the two inserts (2) are placed on top of each other. The cylinder has a stainless steel lid (3).

The thermal barrier is filled with demineralized water. The logger with a high temperature sensor is inserted into the thermal barrier. The inserts are placed on top of the datalogger. The sensor electrode passes through holes in both the inserts and the lid when closing the thermal barrier.

The system utilizes the effect of evaporating water. As long as there is water left in the thermal barrier, the temperature of the logger is approximately 100°C (212°F). When all water has evaporated the temperature inside the thermal barrier will rise quickly to ambient temperature, why the instructions for preparation of the thermal barrier must be followed carefully.

The TrackSense® Pro system can be used both in batch ovens and continuous flow tunnels.



Configuration

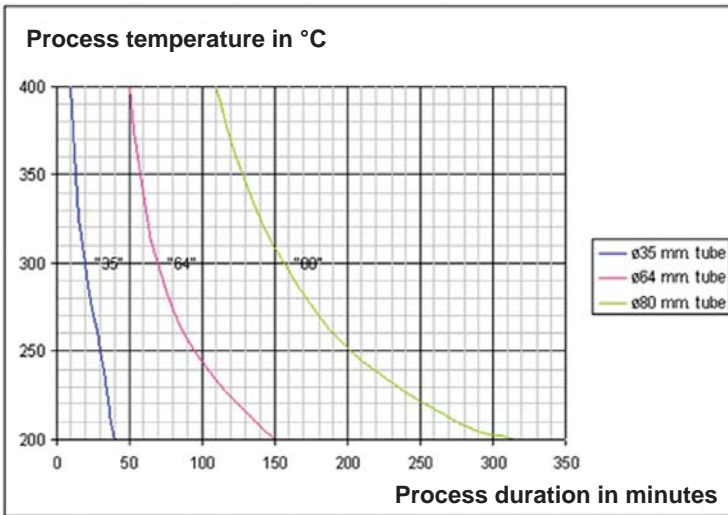
① Thermal Barriers	TSP Single Rigid Sensor	TSP Single Flex Sensor	TSP Double Flex Sensor
TTB 35 – 147mm x 35mmØ	TTB 35	TTB 35	TTB 35-2
TTB 64 – 147mm x 64mmØ	TTB 64	TTB 64	TTB 64-2
TTB 80 – 147mm x 80mmØ	TTB 80	TTB 80	TTB 80-2

Spare parts list

② Ceramic Insert for Barrier	Single	Single	Double
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Depyrogenation - High temperature with TrackSense® Pro and E-Val Flex



The diagram shows that at 300°C a 35mm thermal barrier protects the datalogger for 20 minutes, a 64mm thermal barrier protects it for 70 minutes and an 80mm thermal barrier protects it for approx. 150 minutes. At 400°C the 35mm will protect the datalogger for 10 minutes, the 64mm for 50 minutes and the 80mm for 110 minutes. It is important not to exceed the limits shown in the diagram as battery might explode.

High Temperature Loggers and Sensors

The standard TS Pro/TS Pro X Loggers can be used with the thermal barriers and we have developed a selection of rigid and semi-flexible sensors with stainless steel mineral insulated cables for measuring in the range of 0 to +400°C. Single and double sensors are available.

E-Val Flex and Kapton sensors

The measuring range for the E-Val Flex and Kapton probe is from -200°C to +400°C which means they can also be used for depyrogenation. The high temperature probe can be used from 0°C to 350°C and primarily in batch ovens and other dry air applications.



Configuration

E-Val Flex Master Module (please require documentation)

STC25012E700KT High temperature Kapton probe

Freezing, Lyophilization and Liquid Nitrogen - Low temperature with TrackSense® Pro X



TrackSense® Pro X Logger

The TrackSense® Pro X logger is designed for difficult low temperature applications. The logger can run studies in excess of 250 hours at -80 °C.

It can monitor all ranges of validation applications from -80 °C to 150 °C without using a thermal barrier. The thermal barrier allows you to use the TS Pro X logger for depyrogenation applications up to 400 °C.

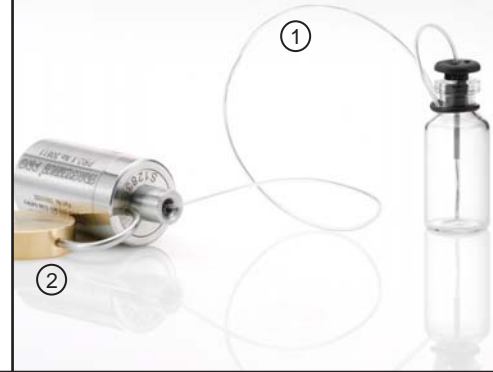
The TS Pro X logger is run with the current multiple or single reader stations where it is possible to program and read up to 16 loggers simultaneously.

Furthermore, the TS Pro X logger features interchangeable sensors enabling utilizing different sensors for various low and high temperature applications on the same logger.

Low Temperature Sensors

New sensors with flexible $\varnothing 1.2$ mm Teflon cables are available that can be used in applications that range from -196 °C to +100 °C. These are available with 1, 2 and 4 channels. They are available with a combination of 1 rigid and 1 flexible sensor. The sensors are suitable for measurements in the product and on the shelf simultaneously during the freeze drying cycle.





The main applications are:

Lyophilizers

The combination of 1 rigid and 1 flexible sensor (1) is appropriate for measurements in the product and on the shelf simultaneously. The contact puck allows close contact to the shelf securing accurate measurements. Teflon sensors with four measuring points are making the validation of the chamber extremely convenient.

Freezers

Mapping freezers are greatly simplified by eliminating long thermocouples.

Cryo-Shipments

Distribution studies down to -196°C can be validated by inserting a Teflon flexible sensor into the thermal bottle, and the TS Pro X logger is placed outside the vessel.

Packing Gland type FLEXFIXTUREØ1.2 for vials

The flexible Teflon sensor is introduced into the vial through a hole and a stainless steel tube.

The measuring point is positioned just above the product (cake) for accurate measurements during the freeze drying process.

Configuration

TSP Loggers

TSPRO X, -80 to $+150^{\circ}\text{C}$

Temperature Sensors

TPT12L01TFYY single Teflon
 TPT12L02TFYY double Teflon
 TPT12L04TFYY quad Teflon
 TPT12L02TFYYYU030 double rigid/teflon
 TPT18L02TF030 double teflon
 TPT18L02TF050 double teflon

Spare parts list

TSP Battery

② Contact Puck

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 mounting inside of packaging.

Temperature in various types of containers

IV bags, parenteral bags, vials, glass, etc.

Internal fittings for wireless dataloggers

Make a hole in the container with the TC42 or a 8mmØ drilling tool.

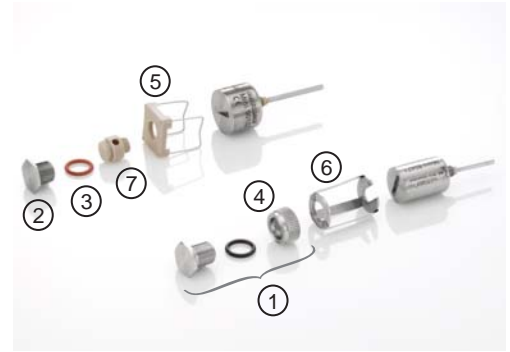
Disassemble the TSK/TSJ Fixture (1).

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) are tightened with the fingernut (4) and TTK 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 placed in the fixture inside the container.

The container can now be filled and sealed.



Configuration

Mini logger

- ① TSK MINI Fixture
- ⑦ TTK10PROL0xx
Distance piece (opt)

Micro logger

- TSJ MICRO TMP Fixture
- TKK10PROL0xx
Distance piece (opt)

TSPPro logger

- TSJ08000Q054 Fixture
- 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 IV-bags

TIK Internal fixture

Before filling, the TSP Mini or Micro Logger is started up in the reader station.

The logger is placed in the TIK internal fixture.

The fixture with logger is positioned in the necks of the IV bag securing the measuring point in the “cold spot”.

The IV bag is filled and sealed.

Configuration

Micro Logger
TIK Internal Fixture

Mini Logger
TIK Internal Fixture

Internal temperature fittings for bottles and vials



TBJ stainless steel fixture for bottles and vials

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

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

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

If the measuring depth has to be adjusted, a TKK distance piece (6) is screwed in between the fixture holder 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.

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



Configuration

Mini logger

- ① TBJ Frame
- ④ TSK MINI Fixture
- ⑥ TKK10PROL0xx Distance piece (opt)

Micro logger

- TBJ Frame
- TSJ MICRO TMP Fixture
- TKK10PROL0xx Distance piece (opt)

TSPro logger

- TBJ Frame
- TSJ08000Q054 Fixture
- TKK10PROL0xx Distance piece (opt)

Spare parts list

TSK Screw 9mmØ
GKJ-U O-ring

TSJ Screw 9mmØ
GKJ-U O-ring

TSJ Screw 9mmØ
GKJ-U O-ring

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

Internal pressure fittings for containers, bottles and vials



Internal fittings for pressure data loggers

A stainless steel fixture (2) is manufactured for the dimensions of the container. The fixture is furnished with a unit with internal thread (4).

The logger is started up in the reader station and placed in the holder fixture (3) inside the container.

The container can now be filled and sealed.



Configuration

Micro PRS Logger

③ TSJ MICRO PRS/TMP Fixture

Micro PRS/TMP Logger

TSJ MICRO PRS/TMP Fixture

TSPro Pressure sensors

TSK08000Q001 Fixture

Spare parts list

TSJ Screw 9mmØ

GKJ-U O-ring

GKJ-J Finger nut

TSJ Screw 9mmØ

GKJ-U O-ring

GKJ-K Finger nut

TSJ Screw 9mmØ

GKJ-U O-ring

GKJ-J Finger nut

Protective sleeves for the TrackSense® Pro Loggers



If needed the loggers can be protected by a rubber protective sleeve in which the loggers can be easily inserted.

The rubber sleeves are also useful for different applications where the loggers are to be hung up in different positions e.g. for validation of empty autoclaves, warehouses, bulk products, etc.



Configuration

TSP 2 mm
TSS25044S

TSP Mini
TSS20016S

TSP Micro
TSS16022S

ID labels for Ellab thermocouples and TrackSense® Pro sensors

For easy and fast identification of thermocouples and logger sensors, the color coded ID labels are very convenient.

The ID labels are made from shrink tube polyolefin and can easily be placed on Ellab type STC thermocouples and TrackSense® Pro flexible teflon sensors with diameter of 1.6 to 3.2 mm using a hot air blower ($\sim 90^{\circ}\text{C}$). The operating temperature range is from -55°C to $+200^{\circ}\text{C}$.



Configuration

ID-Labels 25105998 – set of 1-16 orange with black text

ID-Labels 25105999 – set of 1-16 yellow with black text

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