Capacitive level limit switch TS-KGS

Level limit monitoring for liquids in non-conductive plastic- and glass vessels
Suitable as overfill or dry run protection

Description

- Level limit monitoring for liquids in non-conductive plastic and glass vessels
- Flexible polyurethane-housing, IP 67
- Simple mounting and fast sensor configuration
- Suitable for bent vessel surfaces above 200 mm diameter
- LED status indicator
- Ambient temperature -10 ... +60 °C
- Configurable as NO or NC contact
- Intelligent µC electronic compensates contamination on the internal side of the vessel

The capacitive level limit switch **TS-KGS** is designed to monitor level limits of liquids in non-conductive plastic or glass vessels. The flexible polyurethane-housing is mounted with self adhesive layer directly on the vessel. The sensor has to be mounted on the height of the level limit which is to be monitored. The maximum possible thickness of the vessel wall is depending on the permittivity ε_r (dielectric conductivity) of the filling medium.

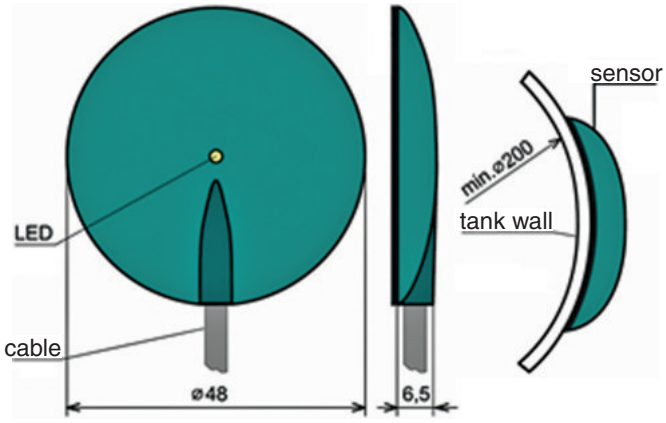
The configuration of the **TS-KGS** sensor as overfill or dry run protection is performed simple and fast by attaching the programming wire on the positive or negative potential of the supply voltage. The **TS-KGS** can be attached directly to a relay or a control with binary inlet. A seperate sensor control for wall mounting with sensor supply and relay outputs and LED status indicators is available optionally.

Technical data	Type: TS-KGS
Operating Voltage U_B	6 … 30 V DC
Current supply (static state)	Max. 0,6 mA
Switching current (min. / max.)	3,3 / 40 mA
Remanent voltage in switched on state	Max. 6 V
Maximum switching frequency	2 Hz
Ambient temperature range	-10 ... +60 °C
Vessel diameter for attaching the sensor	Min. 200 mm
Max. thickness of the vessel wall Dielectric conductive liquids ($\varepsilon_r > 10$) Dielectric non-conductive liquids ($\varepsilon_r < 10$)	 8 mm 3 mm
Protection class	IP 67
Housing material	Polyurethane
Connection cable type	PUR 3 x 0,14 mm²
Available lengths of connection cable	2 m, 5 m (please specify when ordering)
Weight (including 2 m cable)	~ 45 g
Electrical safety and electromagnetic compatibility: The capacitive level switch TS-KGS is protected against reverse polarity, overvoltage and overload. Electromagnetic compatibility according to directive: EN55022 / B, EN 61326-1, EN61000-4-2, -3, -4, -6.	

Capacitive level limit switch TS-KGS

Level limit monitoring for liquids in non-conductive plastic- and glass vessels
Suitable as overfill or dry run protection

Dimensional drawing

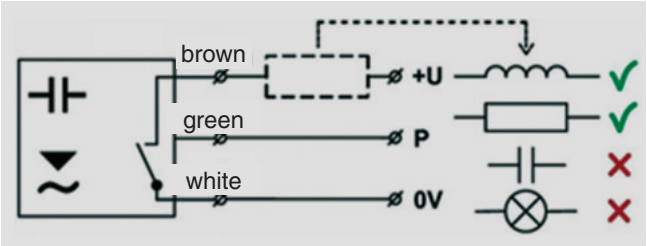


Sensor installation

The capacitive level limit switch **TS-KGS** is mounted by self adhesive removable layer directly on the vessel. The surface of the vessel has to be dry and free of oil and grease. The temperature of the sensor must correspond with the ambient temperature. Prior to the installation remove the self adhesive layer protection foil and mildly press the sensor on to the vessel wall. The complete flexible sensor housing must fit flat on the vessel surface. Therefore damaged self adhesive layer needs to be replaced before installation.

The capacitive level limit switch **TS-KGS** might be installed and dismantled multiple times. Dismantling of the **TS-KGS** must take place carefully and with the necessary diligence to prevent damages on housing or electronics of the sensor.

Electrical connection



Sensor supply: **+U** connected on brown conductor, an electrical load (e. g. relay) gets interposed. **0V** connected on white conductor. **Programming wire "P"** (green) is used for configuration. The sensor output is equipped with short circuit protection. Capacitive loads or low resistance (e. g. bulb) is evaluated by the sensor as short circuit.
In case of strong ambient electromagnetic interference or connecting cable lengths of more than 30 meters, we recommend to use shielded cable.

Sensor configuration

The configuration of the **TS-KGS** is performed by using the green **Programming wire "P"**.

Normally Open (NO) configuration

Attach the programming wire "P" to the 0V terminal for approx. 2 seconds if the tank is empty or partially filled (level is under the sensor bottom end, sensor is mounted on the height of the level limit which is to be monitored).

When the level reaches the upper end of the sensor, potentially the tank is completely filled, attach the programming wire "P" to the +U terminal for approx. 2 seconds (level is above the sensor middle, sensor is mounted on the height of the level limit which is to be monitored).

Note: The programming wire "P" is only necessary for the sensor configuration. To prevent an unintentional other configuration of the sensor programming wire "P" needs to be isolated.

Normally Closed (NC) configuration

Attach the **programming wire "P"** to the **+U terminal** for approx. 2 seconds if the tank is empty or partially filled (**level is under the sensor bottom end**, sensor is mounted on the height of the level limit which is to be monitored).

When the level reaches the upper end of the sensor, potentially the tank is completely filled, attach the **programming wire "P"** to the **0V terminal** for approx. 2 seconds (**level is above the sensor middle**, sensor is mounted on the height of the level limit which is to be monitored).

Reset on default settings:
Disconnect the sensor from power supply. Attach the **programming wire "P"** to the **+U terminal** and connect sensor to power supply again. Remove **programming wire "P"** from **+U terminal** after approx. 5 seconds. The default settings are restored now, **TS-KGS** is in **normally open (NO) configuration.**

Failure alarm

Incorrect setting: If **TS-KGS** sensor is not able to distinguish between the level under and above the level limit, the LED status indicator will announce the failure by flashing in short intervals (approx. 0,2 seconds). In this case repeat the sensor configuration.

Failure at sensor output: In case of a short-circuit or the overrun of max. allowed switched current, the LED status indicator will announce the failure by flashing in long intervals (approx. 0,8 seconds). In this case verify the sensor connection

Capacitive level limit switch TS-KGS-25

Level limit monitoring for liquids in non-conductive sight tubes or plastic or glass vessels
Available as open collector PNP transistor output with or two wire electronic switch

Description

- Level limit monitoring for liquids in non-conductive sight tubes and plastic or glass vessels
- Polypropylen-housing, IP67
- Simple mounting and fast sensor configuration
- LED status indicator
- Ambient temperature -20 ... +80 °C
- Configurable as NO or NC contact

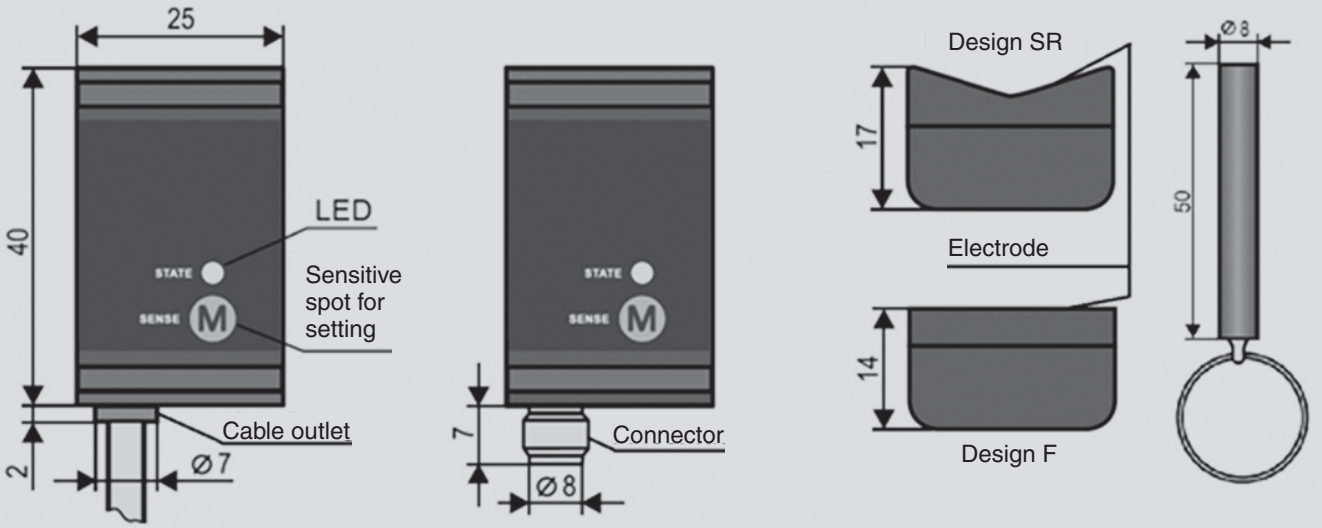
The capacitive limit switch **TS-KGS** is designed to monitor level limits of liquids in non-conductive sight tubes and plastic or glass vessels. Depending on the selected design, the sensor will be installed directly on the sight tube by plastic straps or on the vessel wall with a self adhesive layer. The installation position on the sight tube or on the vessel wall is the height of the level limit which is to be monitored. The maximum possible thickness of the vessel wall is depending on the permittivity (dielectric conductivity) of the filling medium.
The Configuration of the capacitive level limit switch **TS-KGS** takes place fast and simple by using the magnetic pen MP8, which is included in the delivery.
The **TS-KGS-25** is available with a PNP transistor output with open collector or a two wire electronic switch. The two wire electronic switch design can be attached directly to a relay or a control with binary inlet.

Technical data	Type: TS-KGS-25	
Operating Voltage U_B	6 … 30 V DC	
Current supply (static state)	PNP transistor output two-wire electronic switch	max. 0,6 / 7 mA (ON / OFF state) max. 0,6 mA (OFF state)
Switching current (min. / max.)	PNP transistor output two-wire electronic switch	100 mA 3,3 mA / 40 mA
Remanent voltage in switched on state	PNP transistor output two-wire electronic switch	1,8 V 6,0 V
Maximum switching frequency	1 Hz	
Ambient temperature range	-20 ... +80 °C	
Temperature range at the tube or vessel surface Temperature range when installed with self adhesive layer	-20 ... +90 °C -20 ... +60 °C	
Max. thickness of the vessel wall Dielectric conductive liquids [ε_r< 10] Dielectric non-conductive liquids [ε_r< 10]	 8 mm 3 mm	
Protection class	IP 67	
Housing material	Polypropylen (PP)	
Connection cable type	PVC 2 x 0,34 mm² bzw. 3 x 0,34 mm² (PNP output)	
Weight (including 2 m cable)	~ 60 g	
Electrical safety and electromagnetic compatibility: The capacitive level switch TS-KGS-25 is protected against reverse polarity, overvoltage and overload. Electromagnetic compatibility according to directive: EN55022 / B, EN 61326-1, EN61000-4-2, -3, -4, -6.		

Capacitive level limit switch TS-KGS-25

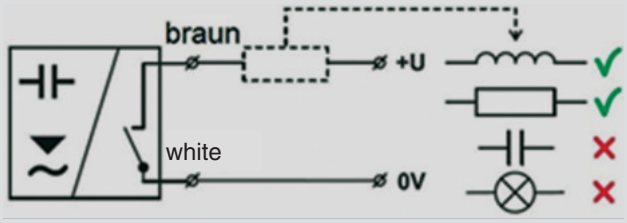
Level limit monitoring for liquids in non-conductive sight tubes or plastic or glass vessels
Available as open collector PNP transistor output with or two wire electronic switch

Dimensional drawing

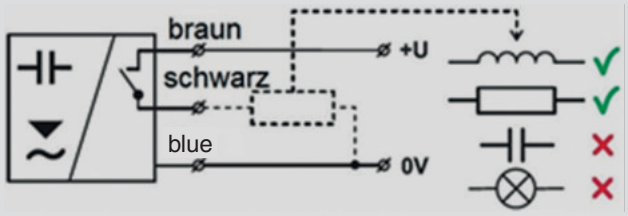


Design SR is fixed on the non-conductive sight tube (Ø 15 up to 50 mm) by plastic straps
Design F is installed with a self adhesive layer directly on the flat vessel surface.

Electrical connection



TS-KGS-25 with two wire electronic switch (SLT)
Sensor supply: **+U** connected on brown conductor,
A electrical load (e. g. relay) gets interposed.
0V connected on white conductor.



TS-KGS-25 with open collector PNP transistor output (PNP)
Sensor supply: **+U** connected on brown conductor,
0V connected on blue conductor.
Electrical load (e. g. relay) on black conductor.

The sensor output is equipped with short circuit protection. Capacitive loads or low resistance (e. g. bulb) is evaluated by the sensor as short circuit.
In case of strong ambient electromagnetic interference or connecting cable lengths of more than 30 meters, we recommend to use shielded cable.

Type designation codes

	1		2		3
Type **TS-KGS-25** -	**SLT**	-	**SR**	-	**AS**

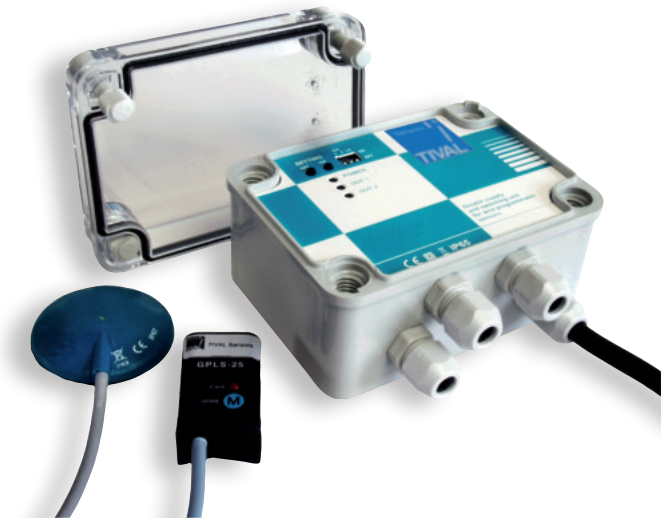
1 **Output signal** (e.g. **TS-KGS-25-PNP-**… = open collector PNP transistor output)
SLT = Two wire electronic switch
PNP = PNP transistor output (open collector)

2 **Sensor design** (e.g.**TS-KGS-25-SLT-SR-…** = electric switch, sight tube installation)
SR = Design SR to be installed on non-conductive sight tubes (Ø 15 up to 50 mm) with plastic straps
F = Design F to be installed with a self adhesive layer directly on the flat vessel surface

3 **Electrical connection** (e.g. **TS-KGS-25-SLT-SR-K3m** = SLT, design SR, cable outlet with 3 m cable length)
AS = Connecting plug (Type: ELKA KV 3308 – not included, available with surcharge)
K…m = Cable outlet + cable length in meters (e. g. K5m = 5 meters, K2m = 2 meters, etc.)

Level limit controller TS-KGS-W1222

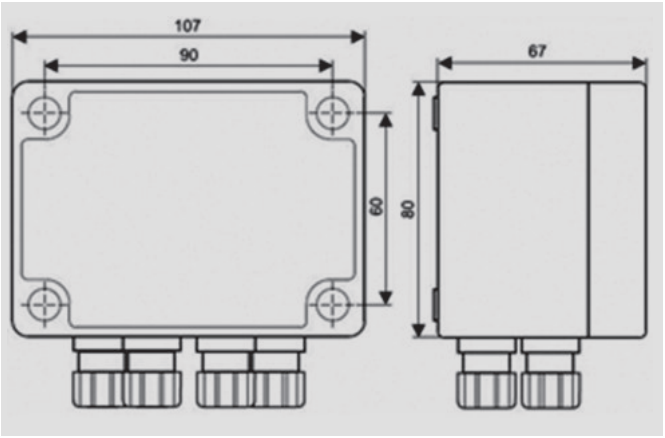
Evaluation and supply for 2-wire or 3-wire level limit switches
Two relay outputs with optical status indication



Description

- Available for 2-wire or 3-wire level limit switches such as TS-KGS-25
- Special design for 2-wire level limit switches with additional programming wire such as TS-KGS
- Two independent relay outputs
- Preconfigured program for pump control
- Integrated power supply unit to supply the connected sensors with 12 V DC
- Optical status indication
- Simple handling and installation
- IP 65 housing, designed for wall mounting

Dimensional drawing



The level limit controller **TS-KGS-W1222** is designed for the evaluation of 2-wire or 3-wire level limit switches. For 2-wire level limit switches with additional programming wire, such as TS-KGS, a special design for simplified sensor configuration is available.
The level limit controller provides a supply voltage of 12 V DC for the sensors and controls two independent relay outputs. **The TS-KGS-W1222** is standard equipped with a preconfigured program for pump control (monitoring of a liquid level between minimum and maximum), which can be enabled by a DIP switch.

Technical data	Type: TS-KGS-W1222
Operating Voltage U_B	230 V (50 Hz) ±10 %
Nominal power demand	4 VA
Sensor supply voltage	12 V DC ±10 %
Maximum output current (including inputs IN1, IN2)	max. 50 mA
No. of level limit sensors	1 or 2
No. of relay outputs	2
Relay output type	250 V AC, 2 A, 500 VA
Max. switching frequency at maximum load	360 / h
Ambient temperature range	-20 … +50 °C
Max. / recommended conductor size	Max. 2,5 mm² / 0,14 … 0,5 mm²
Housing material	ABS + fiberglass
Protection class	IP 65
Weight	~ 350 g
Electrical safety and electromagnetic compatibility: The level limit controller **TS-KGS-W1222** is equipped with an overload protection. The control is protected by a fuse type T 50 mA. Certified electrical safety and CE conformity according to directive: EN 61010-1. Electromagnetic compatibility according to directive: EN55022, EN61000-4-2, -3, -4,-5, -6 und EN 6100-6-2.	