



# Overfill Prevention and its components



## FAFNIR – Quality and Satisfaction

### Company:

FAFNIR GmbH, based in Hamburg, Germany, has over 45 years of experience in the development and production of filling safety devices, overfill prevention solutions, limit signal controllers and continuous level gauging solutions for all types of liquid.

The optimisation of process controls, improvements in cost efficiency and the protection of people and the environment are at the heart of our business.

Our close and trusting relationship with our customers is a key factor in the practice-oriented implementation of innovative ideas and the functionality of our products.



### Quality for your satisfaction:

To provide all customers with products of consistently high quality, FAFNIR has for many years operated an internationally recognised, comprehensive quality management system that meets the requirements of ISO 9001:2008 (EN 29001). Our expertise in the development and manufacture of explosion-proof equipment is certified by an independent body. All our products are subject to strict FAFNIR quality requirements. We are committed to meeting international standards and applicable EU directives.



# Overfill Prevention Type 83-UV

The Overfill Prevention Sensor GWG  
and QSS/ASS Plugs



The overfill prevention sensor GWG  
with tube plug type 907

## Application

The filling sensor is a safety mechanism to prevent overfilling of storage and bunker tanks when they are filled with gasoline, diesel, and fuel oil from road tankers. It consists of a level

sensor inside the tank and an amplifier with valve inside the road tanker.

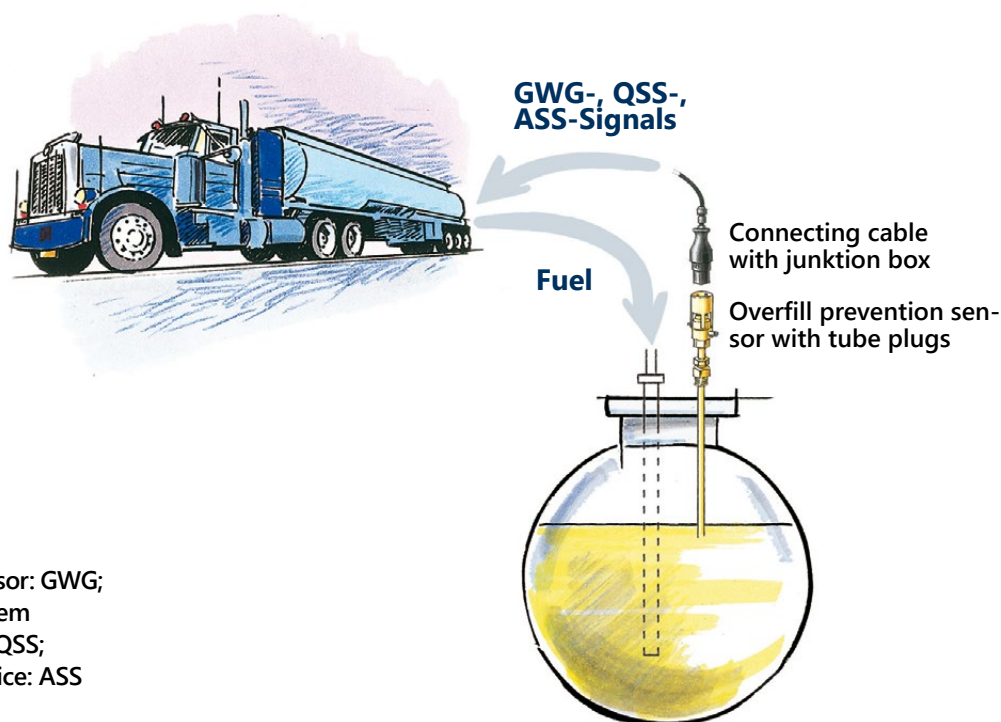
The QSS/ASS plugs are part of a safety system that prevents the blending of products due to a

faulty connection and that checks the hose connection to the road tanker during the filling process.

## Features of FAFNIR technology

- Space-saving, robust and corrosion-free design
- Easy adjustment for different tank sizes
- Sensor without moving parts
- Totally maintenance-free
- Measuring principle tested and tried a million times under the most difficult conditions
- More than 50 years of FAFNIR-experience using this technology
- Integrated QSS and ASS function
- Certified in accordance with the ATEX Directive
- Manufactured in accordance with DIN EN 13616
- Use as part of an overfill prevention in Belgium, Germany, Austria, Poland, Czech Republic, Sweden

# The Filling System



## Our Terminology

Overfill prevention sensor: GWG;  
Quality assurance system  
or product detection: QSS;  
Filling hose safety device: ASS

## Function

The electrical connection to the amplifier is made with the connection cable and coupling type 903 of the road tanker. This connection cable supplies the GWG with intrinsically safe electric current. In addition, it carries the signals for the QSS and ASS function. The threshold point of the GWG inside the tank includes a PTC-resistor. The PTC-resistor is a variable resistance in relation to the rising temperature.

As liquids are better thermal conductors than air or gas, the PTC-resistor heats up better in air or gas. When dipped into liquid, the PTC-resistor is cooled down, and the changing resistance value is interpreted by the amplifier. The amplifier controls a solenoid valve which is part of the control chain of the valve. If the threshold point of the GWG is dipped into liquid, the valve is closed automatically. The filling process is completed.

The QSS functions are carried out by the simple pairing of magnetic reed sensorcodings between plug and coupling. The ASS function is based on checking the closed circuit between amplifier, connection cable, GWG, filling nozzle, filling hose and hose connection in the road tanker.

## Installation Possibilities

Three different designs are available. With the GWG with pipe plugs type 907, the connection cable of the road tanker can be connected directly to the tank. There is a design with a fixed or a telescopic probe tube permitting a variable height adjustment of the tube plugs above the screw-in unit.

If the road tanker cannot be connected directly to the tank, the connection is made with the wall plugs, type 907, which are mounted in the area of the

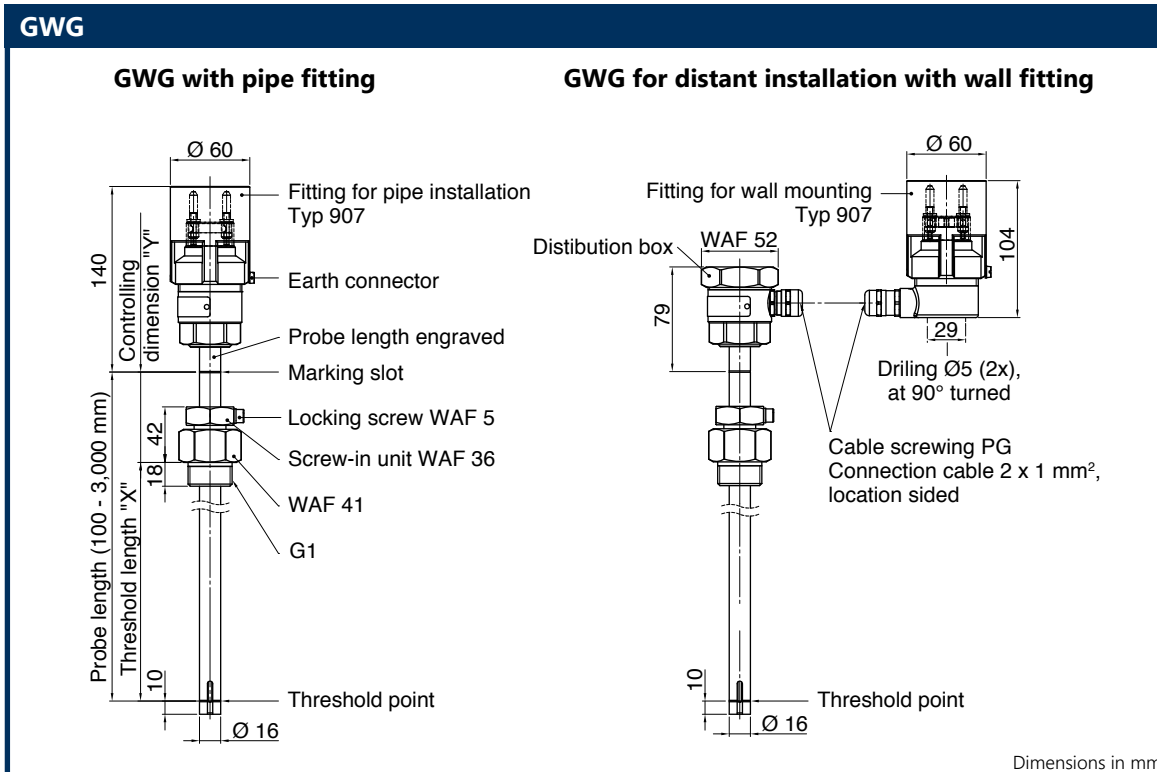
filling connection, and connected to the GWG via a two-wire cable. The threshold length to be maintained for each tank, can be easily adjusted by shifting the probe tube inside the screw-in unit.

## Design

- The GWG consists of
- » Sensor element
  - » Height adjustable probe tube (optional: telescopic tube for plugs)
  - » Screw-in unit
  - » Plugs optional:
    - Tube plugs with flanged plug-in unit and protective basket
    - Junction box for long distance connection
  - » Separate wall plugs with flanged plugin unit and protective basket

## Process Connection

The GWG is supplied with one screw-body G1".



### Technical Data

#### Operating data

- » Product temperature:
  - 25 °C to + 50 °C
- » Ambient temperature:
  - 25 °C bis + 70 °C
- » Operation pressure in tank: unpressurized
- » Test pressure: 0.67 (approx. 9 p.s.i.) to 2 bar (approx. 29 p.s.i.)
- » Applied substances: see List of Substances
- » Switching delay for threshold: < 2 seconds
- » Protection class: IP68

#### Materials

- » Parts in contact with product: brass, stainless steel, galvanised spring steel, solder, viton, ultradur
- » Plugs: brass and nickel-plated brass

#### Dimensions

- » Tube diameter: stainless steel Ø16 x 1.5

- » Lengths of probes: 100 mm to 3,000 mm, standard: 400 mm to 1,000 mm in steps of 100 mm
- » Other data: see illustration

#### List of Substances for Type 83 UV ...

- » Gasoline according to DIN 51600/51607 in tanks covered with more than 300 mm of earth
- » Diesel according to DIN 51601/51606
- » fuel oil according to DIN 51603

#### Extended List of Substances for Type 81 D-Ex

- » gasoline according to 51600/51607; aviation gasoline; aviation turbine kerosene
- » Special fuels: petrolic ether according to DIN 51630; boiling point benzines according to DIN 51631;

- test benzines according to DIN 51632; safety lamp fuels according to DIN 51634; FAM regular gasoline according to DIN 51635; lamp, petroleum for lighting, heating and solvents according to DIN 51636
- » aliphatic hydrocarbons: hexane, heptane, octane, nonane, decane
- » benzene, toluol, xylol, solvent naphtha according to DIN 51633; alcohol: propane, butane, ethane

#### Tank registrations

- » For type 83 UV: DIN 6608, 6616, 6617, 6619, 6623, 6624 and TGL 5315
- » For type 81 D-Ex: DIN 6608, 6616, 6617, 6618, 6619, 6623, 6624, 4119 and TGL 5315

#### Accessories

- » Overfill prevention sensor testing device type ME 6

Order Code	
<b>Overfill Prevention Sensor</b>	<b>1110</b> - - - - -
<b>Type / probe tube</b>	81 D-Ex <b>1</b> 83 UV <b>2</b>
<b>Lengths of probes</b>	Two-digit code: Length in mm/100 (e. g. 1,500 mm = 15) 84 UVT only available with length 600 mm and 900 mm (code: 06 or 09)
<b>Plugs</b>	Junction box for remote installation <b>1</b> Pipe plugs (basis) <b>2</b> Pipe plugs (basis) for ASS <b>3</b> Junction box and wall plugs (bottom part) for remote installation <b>4</b> Junction box and wall plugs (bottom part) for remote installation for ASS <b>5</b> Junction box and wall plugs (bottom part) for remote installation for ASS with additional earth connector <b>6</b>
<b>Flanged insert</b>	without <b>0</b> <b>Typ 901</b> <b>1</b> <b>Typ FP 901 ASS K</b> nickel-plated for ASS <b>3</b>
<b>Coding for QSS</b>	without <b>N</b> Code <b>1</b> Code <b>2</b> Code <b>3</b> Code <b>4</b> Code <b>5</b> Code <b>6</b>
<b>Protective basket nickel-plated</b>	without <b>0</b> with <b>1</b>

### Individual Parts and Retroplugs

Product	Function	Order Code
Pipe plugs complete type FP 907 / ASS 3 / K IP68 with adapter union	Code 1 till 6	11191 / 1-6
Flanged insert type 901	without coding	111901
Flanged insert type FP 901 ASS K nickel-plated for ASS	Code 1 till 6	11390 / 1-6
Wall plugs complete type 907		112910
Wall plugs complete type FPW 907 / ASS / K IP 68	Code 1 till 6	11293 / 1-6
Wall plugs complete type FPW 907 / ASS / K IP 68 with additional earth connector	Code 1 till 6	11294 / 1-6
Wall plugs bottom part		111902
Wall plugs bottom part nickel-plated for ASS		112920
Wall plugs bottom part nickel-plated for ASS with additional earth connector		112940
Protective basket nickel-plated		111903
Adapter union for ASS retroplug		111904
Seal white		111906
Screw-in cap for joint box Ms with seal		111909

# Type FP 903/907 ASS K

Coded Electrical Plug Connection  
Type FP 903/907 ASS K for QSS and ASS



Coupling Type 903 ASS K  
Wall plug Type 907 ASS K

## Application

The product recognition QSS is a device to prevent the mixing of fuels or other liquids during the filling of a storage or bunker tank from a road tanker.

The filling hose safety device ASS monitors the correct connection of the filling hose to

such tanks. The FAFNIR QSS/ASS solutions consist of a plug on the tank and a coupling on the road tanker.

The release signal for the filling process is performed by an amplifier in the road tanker that recognizes the correct pair-

ing and functioning of the coupling connection. By the way, the overfill prevention sensor for filling stations is integrated into the overfill protection system via this coupling connection.

## Features of FAFNIR technology

- Robust design for application in a rough environment
- Simple functional structure for high operational safety
- Totally maintenance-free
- Coding principle tested and tried a million times
- Introduced in Europe as the standard for filling station systems
- Integrated solution for contacting overfill prevention sensors, QSS and ASS function

### Our Terminology

Overfill prevention sensor: GWG;  
Quality assurance system or  
product recognition: QSS;  
Filling hose safety device: ASS

### Function

The QSS functions are carried out by the simple pairing of magnetic reed sensor coding between the plug (wall plugs) and the mobile coupling. The analysis is based on the principle "2 out of 4", thus corresponding to a high safety standard. Six different codes are available.

The ASS function is performed by checking the closed circuit between amplifier, connection cable, plugs, filling nozzle, filling hose, and the hose connection inside the road tanker. ASS monitors the correct connection of the filling hose as well as that of the gas displacement device for gasolines.

### Design

The coupling type 903 ASS K consists of

- » Connection cable
- » Protective hose
- » Coupling with:
  - GWG with contact sockets
  - Reed sensors
  - Push contacts

The wall plugs type 907 ASS K consist of

- » Wall plugs bottom part
- » Flanged plug-in unit
- » Magnets
- » Protective basket

### Coupling Connection

The coupling type 903 ASS K fits all wall and tube plugs. It connects all GWGs in accordance with DIN EN 13616.

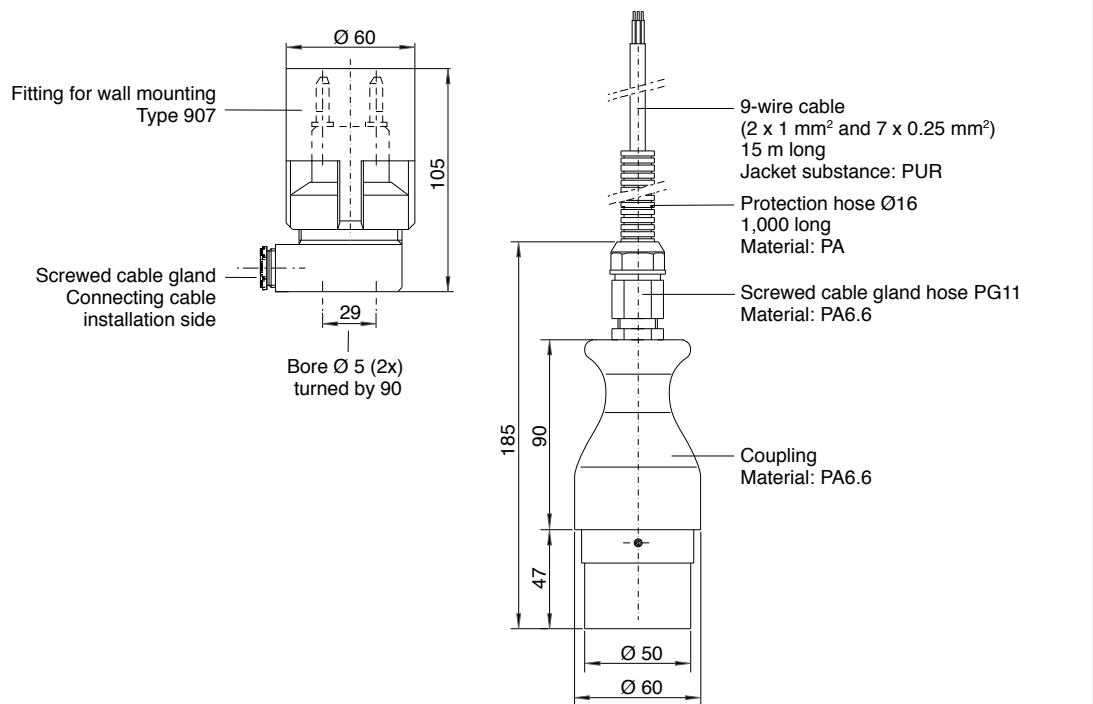
The QSS and ASS function is established only in conjunction with the plug type 907 ASS K.

### Electrical Connection

- » Clamped connection in the amplifier
- » 2 x 1 mm<sup>2</sup> for GWG circuit
- » 7 x 0.25 mm<sup>2</sup> for QSS coding and ASS



## Product Recognition Coupling



Dimensions in mm

### Technical Data

#### Operating data

- » Umgebungstemperatur:  
– 25 °C to + 50 °C
- » Resistant to all products according to the GWG list of substances

#### Materials

##### Coupling

- » Connection cable: PUR
- » Protective hose: PA
- » Housing: PA6.6
- » GWG contact sockets:  
CuZn39Pb2 / Pb3,  
surface galvanised Ni 5 µm
- » Push contacts: VA

##### Wall plugs

- » Brass nickel-plated
- » Protection class: IP68

#### Dimensionen

##### Coupling

- » Connection cable:  
Ø 7 mm x 15 m standard
- » Protective hose:  
Ø 16 mm x 1,000 mm
- » Housing: Ø 60 mm x 137 mm
- » Other data:  
see illustration

##### Wall plugs

- » Housing Ø 60 mm x 105 mm

## Type ME 6

The Overfill Prevention Sensor  
Testing Device ME 6



Overfill prevention sensor testing  
Type ME 6 with Helix cable and  
coupling type 903

### Application

Overfill prevention sensors must be checked on a regular basis. This is usually performed during

a tank inspection. An optimal and safe check of overfill prevention sensors is guaranteed

by the overfill prevention sensor testing device ME 6.

### Features of FAFNIR technology

- Genuine function check
- Easy menu-driven operation
- Handy design
- Suitable for all overfill prevention sensors with PTC technology
- Certified for overfill prevention sensors in explosive atmospheres
- Simultaneous check of the QSS coding
- Driven by storage batteries
- PC software

### Our Terminology

Overfill prevention sensor: GWG;  
Quality assurance system or  
product recognition: QSS

### Function

The GWG is heated up by the intrinsically safe current of the testing device. The heating time is measured, analysed and indicated in the touch display. A switching off event is treated in the same manner. The QSS coding is registered and also displayed.

### Connection to the GWG

The connection of the overfill prevention sensor testing device to the GWG is realised via a coupling type 903 with helix cable.

### Design

The overfill prevention sensor testing device consists of

- » Coupling
- » Helix cable
- » Housing with:
  - Test electronics
  - Touch display
  - USB connection

### Technical Data

#### Operating data

- » Ambient temperature: 0 °C to + 50 °C
- » Protection class: IP30
- » Supply voltage: 24 V<sub>DC</sub>, 7,2 V<sub>DC</sub>
- » Measuring circuit protection class: see approval

#### Materials

- » Coupling Type 903: PVC,
- » Coupling Type 903 QSS: PA6.6
- » Connection cable: PVC-covered copper line
- » Housing: ABS

#### Dimensions

- » Coupling: Ø 60 mm x 137 mm
- » Connection cable: Ø 2 x 0.75 mm<sup>2</sup>
- » Housing: 196 x 100 x 40

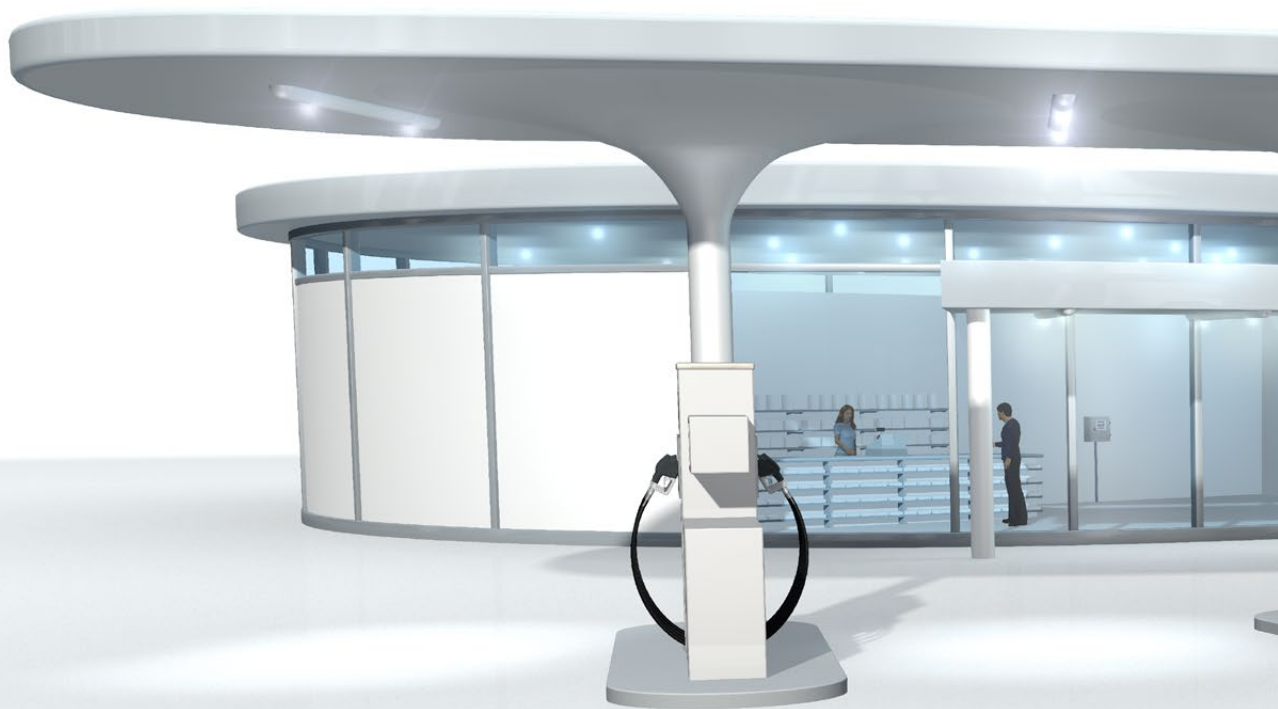
#### Accessories

- » Charging device for ME 6
- » Plastic suitcase with moulded tray
- » PC software

### Designs

#### Overfill Prevention Sensor Testing Device ME 6

- » ME 6  
Overfill prevention sensor testing device without product identification (with type 903 socket coupler)
- » ME 6 P  
Overfill prevention sensor testing device with product identification (with type AS 903 socket coupler)
- » ME 6 F  
Overfill prevention sensor testing device for LPG overfill prevention sensors (with CEE socket coupler)



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