BS EN 15207:2014

BSI Standards Publication

# Tanks for the transport of dangerous goods — Plug/socket connection and supply characteristics for service equipment in hazardous areas with 24 V nominal supply voltage

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**National foreword**

This British Standard is the UK implementation of EN 15207:2014. It supersedes BS EN 15207:2006 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee AUE/18, Tanks for the transport of dangerous goods.

A list of organizations represented on this committee can be obtained on request to its secretary.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

# EN 15207

December 2014

ICS 23.020.20

Supersedes EN 15207:2006

English Version

# Tanks for the transport of dangerous goods - Plug/socket connection and supply characteristics for service equipment in hazardous areas with 24 V nominal supply voltage

Citernes destinées au transport des matières dangereuses - Prises et embases de raccordement, caractéristiques de l'alimentation électrique des équipements de service en atmosphères explosibles, à tension nominale de 24 V

Tanks für die Beförderung gefährlicher Güter - Steckvorrichtung und elektrische Kennwerte der Versorgung von Bedienungsausrüstungen in explosionsgefährdeten Bereichen mit 24 V Nennspannung

This European Standard was approved by CEN on 2 November 2014.

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EUROPÄISCHES KOMITEE FÜR NORMUNG

**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

## Contents Page

# Foreword

This document (EN 15207:2014) has been prepared by Technical Committee CEN/TC 296 “Tanks for the transport of dangerous goods”, the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2015 and conflicting national standards shall be withdrawn at the latest by June 2015.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 15207:2006.

According to edition EN 15207:2006 the following fundamental changes are given:

— the pin- assignment in Table 1 revised;

— Subclause 4.1 “Service equipment energy consumption” deleted.

This European Standard forms part of a coherent standards programme comprising the following standards:

- EN 13616, *Overfill prevention devices for static tanks for liquid petroleum fuels*
- EN 13922, *Tanks for transport of dangerous goods — Service equipment for tanks — Overfill prevention systems for liquid fuels*
- EN 14116, *Tanks for transport of dangerous goods — Digital interface for the product recognition device for liquid fuels*
- EN 15208, *Tanks for transport of dangerous goods — Sealed parcel delivery systems — Working principles and interface specifications*
- EN 15969-1, *Tanks for transport of dangerous goods — Digital interface for the data transfer between tank vehicle and with stationary facilities — Part 1: Protocol specification — Control, measurement and event data*
- EN 15969-2, *Tanks for transport of dangerous goods — Digital interface for the data transfer between tank vehicle and with stationary facilities — Part 2: Commercial and logistic data*

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## 1 Scope

This European Standard specifies the interoperability requirements for the tractor/trailer and/or transport tank/trailer plug/socket for the use in hazardous areas, being:

— the connection used for the supply Type A and supply Type S electrical power to service equipment; and

— the supply characteristics for each operating mode.

This plug/socket combination includes provisions for future connections including data transfer.

The plug/socket connection is not used for purposes which are specified in other standards for truck – trailer connections e.g. ISO 12098 and ISO 7638-1.

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 60079-0, *Electrical apparatus for explosive gas atmospheres — Part 0: General requirements (IEC 60079-0)*

EN 60079-7, *Explosive atmospheres - Part 7: Equipment protection by increased safety "e" (IEC 60079-7)*

EN ISO 8092-2, *Road vehicles - Connections for on-board electrical wiring harnesses - Part 2: Definitions, test methods and general performance requirements (ISO 8092-2)*

ISO 4091, *Road vehicles — Connectors for the electrical connection of towing and towed vehicles — Definitions, tests and requirements*

ISO 12098, *Road vehicles — Connectors for the electrical connection of towing and towed vehicles — 15-pole connector for vehicles with 24 V nominal supply voltage*

ISO 16750-3, *Road vehicles — Environmental conditions and testing for electrical and electronic equipment — Part 3: Mechanical loads*

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

**3.1**
**supply Type A**
one that is designed to remain safely active in hazardous areas (e.g. while the switch for operation in hazardous areas is open)

**3.2**
**supply Type S**
one that is designed to be switched off in hazardous areas

# 4 Power supply characteristics

## 4.1 Current ratings of supplies

The supply Type A and the supply Type S shall be fused for explosion protection requirements with adequate fuses of 5 A.

## 4.2 Voltages rating

The voltages rating shall be the nominal 24 V DC.

# 5 Design characteristics

## 5.1 Plug/socket connection

### 5.1.1 General

Plug/socket connection according to ISO 12098, ISO 8092-2 and ISO 16750-3.

To avoid mismatching of this plug/socket connection with other plug/socket connections according to ISO 12098 or similar plug/socket connections, any insertion force ≤ 1 000 N shall not result in an electrical contact.

Additional or exceptional requirements according to 5.1.2 to 5.1.5.

### 5.1.2 Requirements for operation in hazardous areas

Tractor/trailer connection shall fulfil the requirements of equipment category 2, gas group IIC and temperature class T6 under consideration that no connection/disconnection happens in a hazardous area.

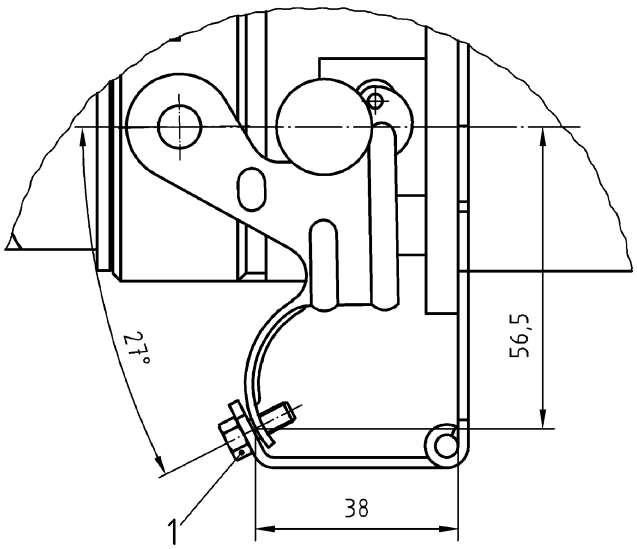
Equipment shall be in accordance with EN 60079-0 and EN 60079-7.

Isolation requirements shall be according to EN 60079-7, DC-voltages ≤ 60 V.

The plug/socket connection shall be designed according to Figure 1 to Figure 3 to prevent accidental disconnection. It shall only be possible to unscrew the screw with a tool. The screw shall be captive and self-locking with a thread dimension M 4 × 16.

All connections except those used by the power supply shall be limited to a current $I_{OC}$ < 4 A per pin.

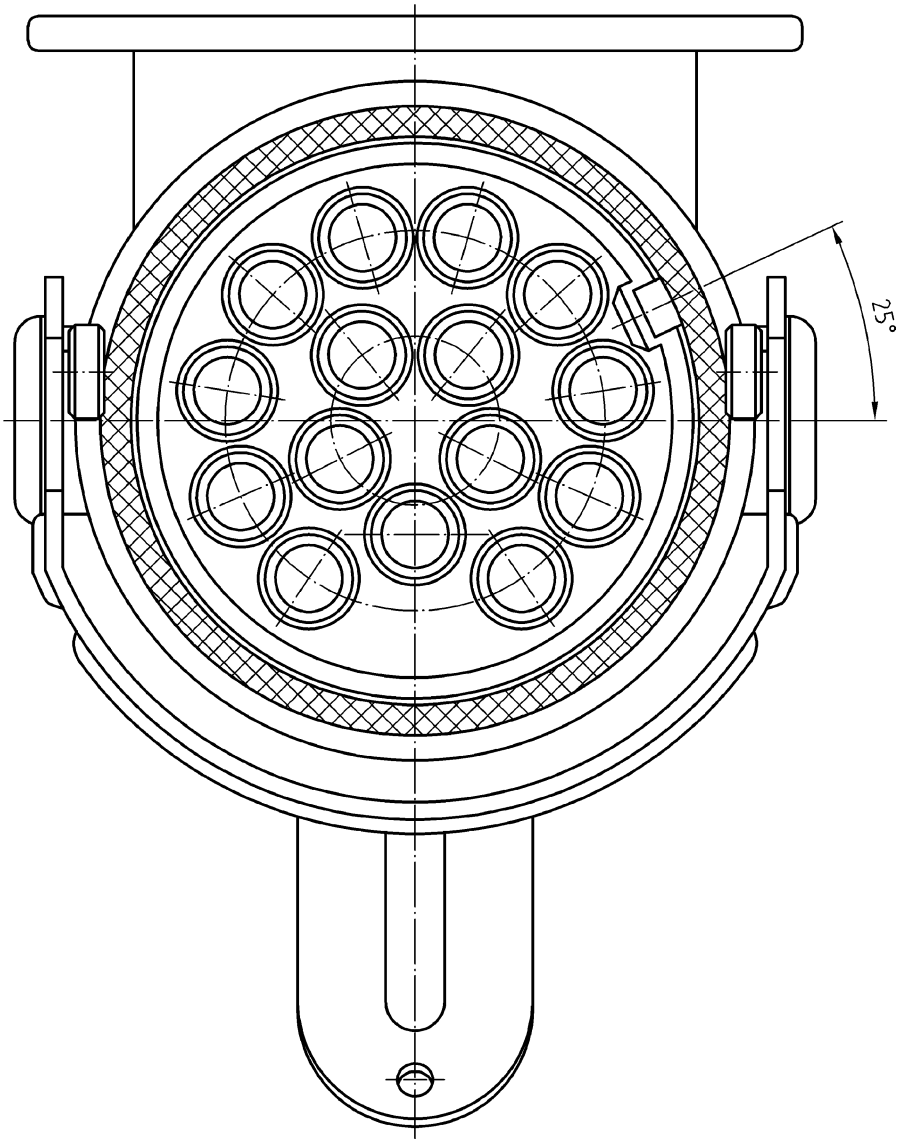
Dimensions in millimetres




**Key**

1 screw

**Figure 1 — Locking mechanism for plug/socket**




NOTE Socket without cover.

**Figure 2 — Plug**

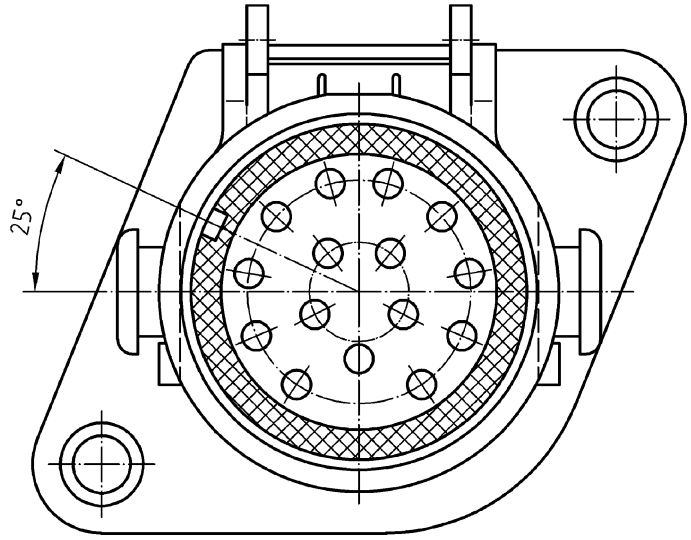



**Figure 3 — Socket, fixed installed**

### 5.1.3 Pin use restriction

Any pin, except those dedicated to supply Type S, may be energized at any time.

Certified and non-certified equipment connected to any pin, except those assigned to supply Type A or supply Type S, shall be designed to prevent the current exceeding 4 A (fuse rating) per pin.

The compatibility of the equipment using the data transfer pins defined in this European Standard is the responsibility of the operator.

### 5.1.4 Keying

Keying of plug/socket shall be according to Figure 2 and Figure 3.

The colour of the plug and socket shall not be blue.

### 5.1.5 Pin assignment

The number of pins shall be 15.

All plug/socket connections according to Table 1 shall have the same pin assignment.

**Table 1 — Pin assignment**

| Pin number | Function | Example 1 | Example 2 |
|---|---|---|---|
| 1 | Primary data line: data transfer: a | RS 485 (A) | RS 485 (A) |
| 2 | Primary data line: data transfer: b | RS 485 (B) | RS 485 (B) |
| 3 | Primary data line: data transfer ground | RS 485 (S) | RS 485 (S) |
| 4 | Supply Type S, ground | - | - |
| 5[a] | Secondary data line: data transfer: a | RS 232 (TxD) (tractor) | CAN-bus (H) |
| 6 | Supply Type S, DC +24 V | - | - |
| 7[a] | Secondary data line: data transfer: b | RS 232 (RxD) (tractor) | CAN-bus (L) |
| 8[a] | Secondary data line: data transfer ground | RS 232 (GND) | CAN-bus (GND) |
| 9 | Supply Type A, DC +24 V | - | - |
| 10[a] | available for application specific use | free for application specific use | free for application specific use |
| 11[a] | available for application specific use | free for application specific use | free for application specific use |
| 12[a] | available for application specific use | free for application specific use | free for application specific use |
| 13 | Supply Type A, ground | - | - |
| 14[a] | available for application specific use | free for application specific use | free for application specific use |
| 15[a] | available for application specific use | free for application specific use | free for application specific use |

[a] The tank vehicle manufacturer shall provide measures to ensure that tractors/trailers with different pin assignments will either not be connected to each other or that the connection of different pin assignments will not cause damage to the equipment.

## 5.2 Optional additional connections

### 5.2.1 General

Optional additional connections shall fulfil the requirements according to 5.1.

### 5.2.2 Cab socket

A cab socket may be fixed mounted or flying lead, see Annex A.

## 5.3 Ambient operational temperature range

The plug/socket connection may be used in an ambient operational temperature range from –40 °C to +60 °C.

# 6 Test

The plug/socket connection shall be tested according to ISO 12098, EN ISO 8092-2, ISO 16750-3 and EN 60079-7.

The test for mismatching according to 5.1.1 shall be carried out according to ISO 4091.

# 7 Marking

## 7.1 Type plate

— Information according to EN 60079-0;

— EN 15207.

## 7.2 Warning sign

A warning sign according to EN 60079-7 regarding connection/disconnection in hazardous area shall be provided.

# Annex A
(informative)
# Example for wiring

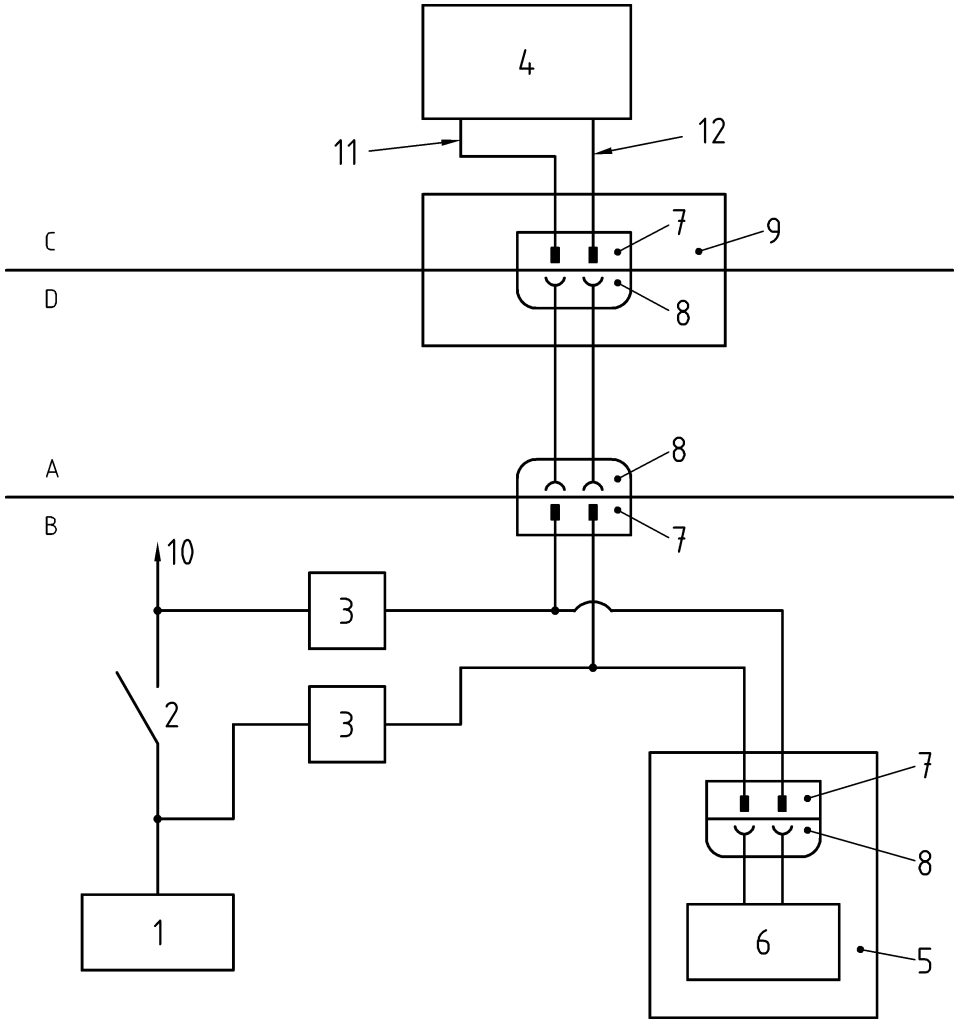
Figure A.1 shows the schematic wiring to achieve the non-interruptible and interruptible power supply to the service equipment via plug/socket connections.

Key 9 shows connection to trailer by extension cable.

Key 5 shows connection to service equipment installed in the cabin.

The keys 5 and 9 are not required, but if they are used, then it shall be according to the standard.

The wiring of all plug/socket connections (7 - 8) shall be the same.




**Key**

A-D interconnecting cable

B tractor/tank truck side

C trailer side

1 battery

2 switch, to be broken in hazardous areas

3 current limiting device, sized to protect plug socket connection and battery

4 service equipment on the trailer

5 optional plug/socket connection in the driver cabin

6 service equipment in the driver cabin to be compatible with 4

7 male side of 15 pins plug/socket connection

8 female side of 15 pins plug/socket connection

9 optional plug/socket connection on the trailer

10 to existing 15-pole connector

11 supply Type S

12 supply Type A

**Figure A.1 — Wiring schematic with single line representation**

# Bibliography

[1] EN 13616, *Overfill prevention devices for static tanks for liquid petroleum fuels*

[2] EN 13922, *Tanks for transport of dangerous goods - Service equipment for tanks - Overfill prevention systems for liquid fuels*

[3] EN 14116, *Tanks for transport of dangerous goods - Digital interface for product recognition devices for liquid fuels*

[4] EN 13237, *Potentially explosive atmospheres - Terms and definitions for equipment and protective systems intended for use in potentially explosive atmospheres*

[5] EN 15208, *Tanks for transport of dangerous goods - Sealed parcel delivery systems - Working principles and interface specifications*

[6] EN 15969-1, *Tanks for transport of dangerous goods - Digital interface for the data transfer between tank vehicle and with stationary facilities - Part 1: Protocol specification - Control, measurement and event data*

[7] EN 15969-2, *Tanks for transport of dangerous goods - Digital interface for the data transfer between tank vehicle and with stationary facilities - Part 2: Commercial and logistic data*

[8] ISO 7638-1, *Road vehicles — Connectors for the electrical connection of towing and towed vehicles — Part 1: Connectors for braking systems and running gear of vehicles with 24 V nominal supply voltage*

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