TCL GROUP

Boost your control

LPG tank managing solution

SPIN·System®

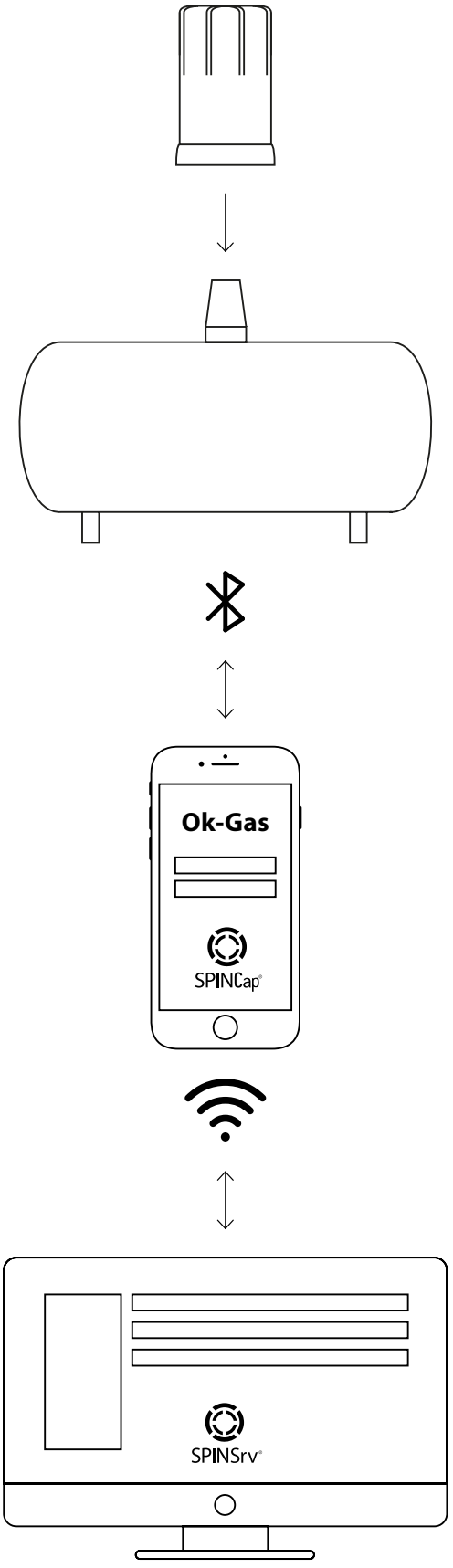
Total control of filling valve

SPINCap®

SpinCap® is an innovative closing and access control system for tanks, with data acquisition, recording, administration and surveillance functions.

The access "key" is provided through an **INTUITIVE MOBILE APPLICATION.** Only authorized operators will have the authorization to remove the cap and then access the tank valve. Completely self-powered with more than **8 YEARS autonomy**, the hardware is contained in a waterproof cell protected by a manganese steel shell, **cutting and drilling resistant.**

The SpinCap system is designed and full compliant with the most recent European Directives like ATEX (2014/34/EU), RED (2014/53/EU) and EMC (2014/30/EU).



functional characteristics

Hardware, based on ARM Cortex M4 MCU, interfaces with Android mobile devices (6.0 or higher) via Bluetooth 4.1. When the device is in "rest" condition, the rotation of the cap does not allow to unscrew it from the filling valve. Following the unlocking procedure via Android APP, the device exits from "rest" condition and it is therefore possible to unscrew it from the tank. **SpinCap** can be **unlocked only by enabled operators** (verification through login credentials) following the generation of unlocking keys called "**Token**".

These tokens have daily validity and are calculated using a **proprietary algorithm**, similar to tokens in use in the banking system. While the operator is rotating the device for closing the valve, the system also **identifies the tank** by an RFID tag placed on the tank itself.
In case of non-recognition or incorrect ID, the system will **generate an alarm**. At the actuation of the cap, the system uses a **GPS receiver** and a **MEMS** to detect latitude and longitude and any abnormal movement. Therefore, any access, attempt to access or non-regular closures will be **recorded** by the hardware device **and transferred** to the server via the mobile device, also **keeping track of each event** related to the tank valve.

Technical
features

- MCU ARM Cortex M4 with integrated Crypto Engine
- Bluetooth BLE 4.1 with OTA functionality for remote updates
- MIFARE 13.56 MHz RFID reader
- MEMS for motion detection on 3 axes
- Flash memory for local storage of events
- Real Time Clock with a maximum error of less than 5 minutes / year
- Thermoplastic polymer casing with full internal X120MN12 steel protection
- Autonomy > 8 years
  (depending on use and environmental conditions)
- Generation of daily tokens, unique for each hardware device
- Database for managing operations, customers, tanks, operators and more
- No additional external control device required

Other features

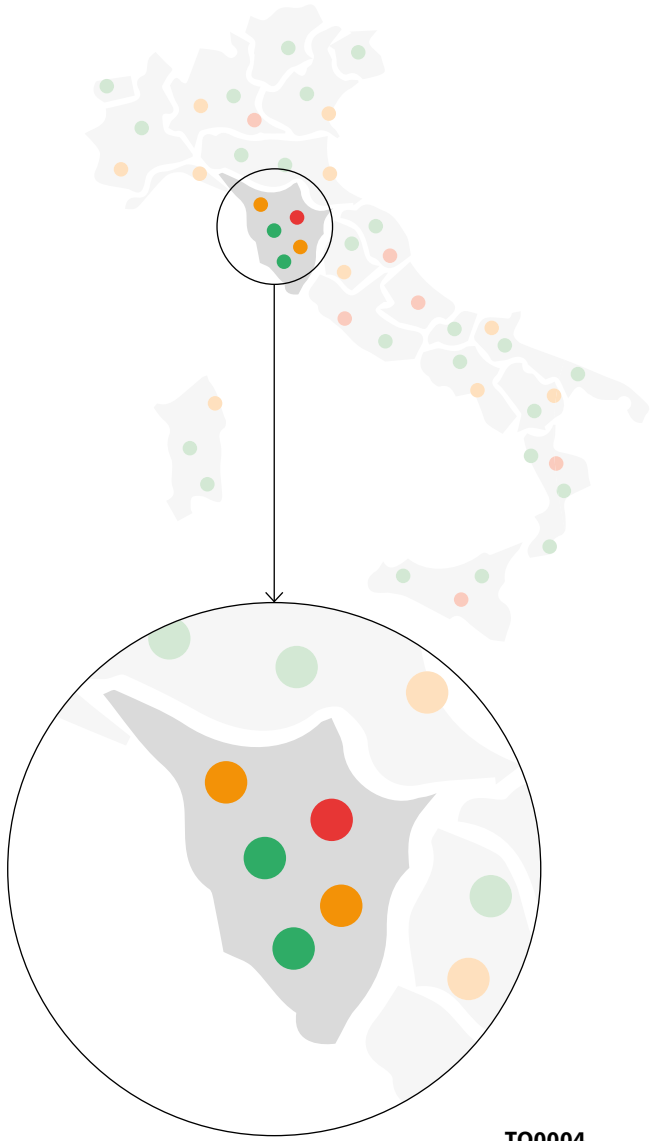
- ATEX Mark: II 1 G Ex ma IIA T6 Ga (up to Zone 0)
- Degree of protection: IP65/IP68
- Operating temperature: -20°C + 60°C
- Dimensions: 98(Ø) x 148(h) mm
- Weight: 1200 gr approx

Server
characteristics

The SpinCap web server allows to monitor the events from Android application that interacts with the cap. At regular intervals the application sends to the web server the operations that have been implemented on the SpinCap which are then **stored in an SQL database**.

The Spin Cap web server was built with **RoR** (Ruby on Rails) version 5.x.

At the current stage, the **recorded operations** concern: *the user's login; Bluetooth connection; time, date and number of opening/closing actions; time, date and tank ID of installation/uninstallation of the cap.*
It is also possible to monitor the position of the caps and tanks on which they have been installed. **Furthermore the system is set up to extend the type of events recorded** (i.e residual capacity of the tank and real time operations*) and to install plugins that allow you to **make statistics** on the data gathered.



TO0004
Customer 5689565
Last Refuelling 25/11/2017

TO0002
Customer 3256985
Last Refuelling 07/12/2015

TO0003
Customer 3256985
Last Refuelling 01/12/2016

(*) With previous installation of additional sensors / devices.

TCL Group, founded in 1966, is specialized in electronic construction from design to assembly, on its own behalf and on behalf of third parties. TCL operates in various sectors: Oil & Gas, petrochemical, nautical, medical, product's automation and industrial automation with the creation of full custom products, offering an extremely personalized service to the needs of its customer. **www.tcl.it**

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