



LPG filling centre and Cylinders Management
Solutions
液化气站管理系统

01

行业背景
Industry background

02

信息化基础
Information foundation

03

跟踪软件
Tracking system

04

公司简介
Company profile

目 录

CONTENT



Chinese State policies and regulations



source can be
inquired

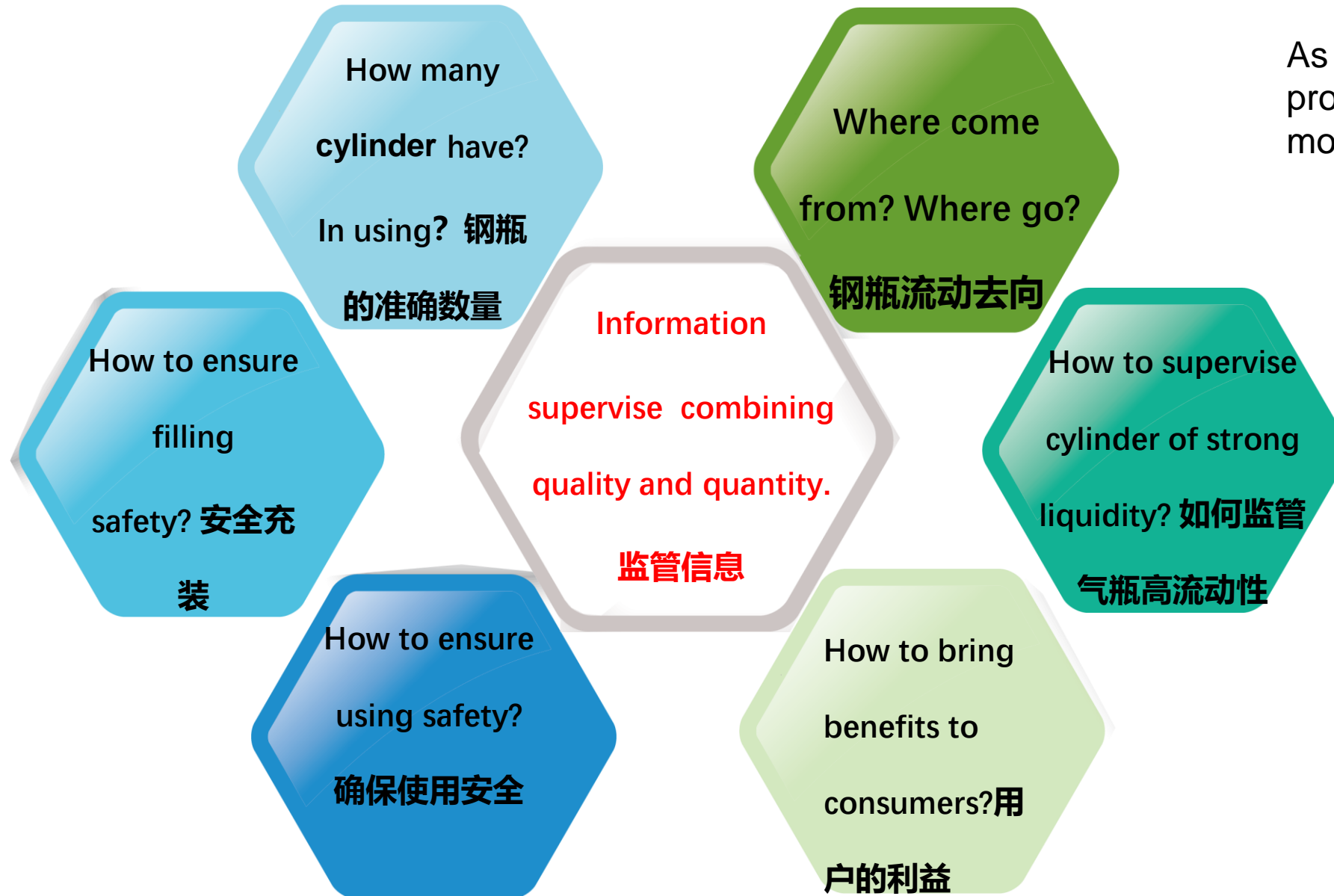
destination can be
inquired

responsibility can
be checked



企业的主要问题; LPG company Current Problems

As for the above problems, you can modify : add or decrease.



Objectives of Cylinders tracking and management system

软件目标

信息化 Informatization

- 建立信息管理系统,对气瓶数量、充装、检验以及流转进行动态管理
- Dynamic management to collect information for cylinder

充装 Filling

- 充装可追溯
- Trace the filling records of each cylinder

去向 Direction

- 去向可追踪
- Trace the direction of each cylinder where has gone

公示 Publicity

- 信息公示
- Cylinder open information of the quality safety and use safety

Information System 信息化系统

建立一个基于互联网和云服务的动态数据库来满足气瓶的大型数据管理概念。

Establish a dynamic database based on the Internet of things and cloud service to meet the large data management concept of the cylinder.

对于气瓶原始文件、检验、充装、存储、转移、配送、追溯管理的各个环节进行数据的动态收集和更新。

Dynamic collect and update data for gas cylinder original document , inspection, filling, storage, transfer, distribution, the whole process of each link of traceability management.



01

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Industry background

02

信息化基础
Information foundation

03

跟踪软件
Tracking system

04

公司简介
Company profile

目 录

CONTENT



How to choose a suitable unique ID ?

Permanent metal-ceramic barcode

One Cylinder , One ID Code , One Document Once Installation , 20 years usage



Barcode tag best choice suited for cylinder tracking

- Outstanding high temperature 800°C resistance.
- Low temperature resistance - 40°C degrees
- Scraping 10 times with an art knife without damage to the surface
- Resistance to chemical reagent corrosion, penetration of acetone reagent for half an hour. Wipe with wire ball for removal without damage
- White base, black bar code, easy to read.
- Excellent image resistance to damaging UV exposure, 20 years practice proof .
- Ceramic layer protects the image from chemicals abrasion.
- Unbreakable ceramic technology, little bit bend is available.



How to choose a suitable unique ID ?



Permanent barcode tags



RFID

Item	Permanent Barcode tag	RFID
Life time	30 years	2-5 years
High&low temperature resistance	-40~800 °C	-20~220°C
Reading speed	One by one	Batch read, but not stable
Cost	low	high
Reader	PDA or mobile phone	Special reader
Cylinder Renewal Process	No need take barcode away	Must take down and Packing in sequence
Successful case	Xiangkang, Trackabout BOC ,Linde, Praxair,Airliquide	None

钢瓶维护

Cylinder repair and renew

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祥康电子



To clean inside
remaining by fire



To protect the tags
surface by a rubber
cover



Comparison before
and after shot
blasting and baking



Use sticker to protect the
barcode from the repaint





Barcode introduce

XIANGKANG 祥康电子

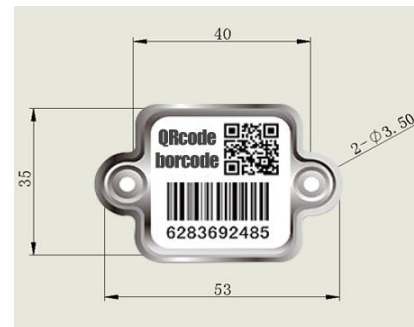


One-dimensional code

Adopt international 128 code

Main function:

- Cylinder ID , register cylinder file
- Internal Filling data Management
- Cylinder Tracking
- External Distribution Management



We adopted international code standard , Any reader and smart phone can use it

QR code

Quick Response Code , The most common code in the world

Include 1. digital number 2. web link

Main function:

- Link to website
- Scan QR code to place order
- Enterprise publicity



条码开始 QR CODE : EGYC6A00000001---	QTY:	20000 PCS
The URL will be:	https://cylinders.paygoenergy.io/c/	
Examples of the IDs are as follows:	https://cylinders.paygoenergy.io/c/ALF0001 https://cylinders.paygoenergy.io/c/ALF0002 https://cylinders.paygoenergy.io/c/ALF0003 https://cylinders.paygoenergy.io/c/ALF0004	

尺寸Dimension size



包装情况Package:

100pcs/bag 一袋

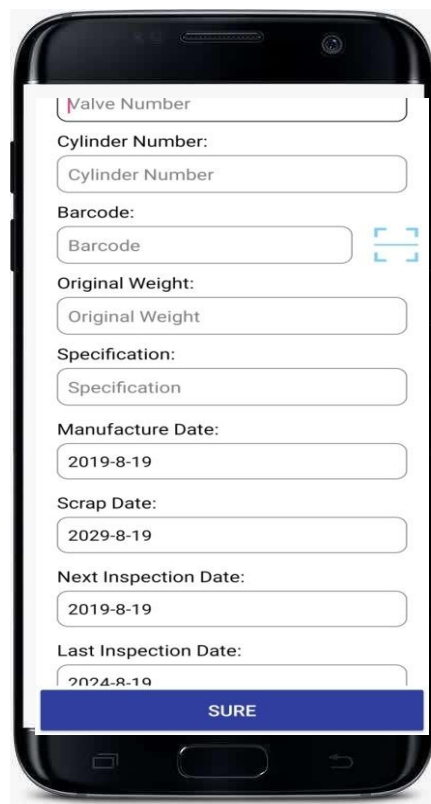
20 bags/cnt

外箱毛重 GW/CNT:

21.50 KGS/CNT

标识安装

Registration Cylinder



> Filling Station > Document Entry

Cylinder Document Entry

(Red words must be filled, time format is 2000-01)

Cylinder Registration Information	Manufacturer	Please Select	Factory Number	
	Cylinder Category	LPG Cylinder	Filling Medium	LPG
	Last Inspection Time		Manufacturing Time	
	Nominal Working Pressure	MPa	Next Inspection Time	
	Change the Use Status	Normal	Scrap Time	
	Volume	L	Design Wall Thickness	mm
Cylinder Other Information	Barcode		RFID	
	Latest Registration Number		Remarks	
	Cylinder Specification	Please Select	Own Number	
	Hydraulic Test Pressure	MPa	Enterprise Segmentation Medium	
	Registration Time		Initial Weight	Kg
	Enter Station Time		Entry Person	

Buttons: Save, Reset

Manufacturer Name	Cylinder Category	Serial No.	Barcode No.	Cylinder Batch No.	Tare Weight	Net Weight	Cylinder Testing Date	Cylinder Expiry Date	Entry Person
CPIL	LPG	4343	1600000258	-	15.2	12	3/95	A22	GOPAL
CPIL	LPG	434056J	1600000475	G07	14.6	12	01-Jan	C22	GOPAL
CPIL	LPG	433847J	1600000733	G07	14.4	12	08-Jan	C22	GOPAL
CPIL	LPG	4337S	1600003265	G05	12.5	12	15-Jan	A26	GOPAL
CPIL	LPG	4338S	1600004267	G07	14.5	12	01-Aug	C22	GOPAL
CPIL	LPG	432083J	1600002430	G04	14.6	12	01-Aug	C22	GOPAL
CPIL	LPG	313521	1600000461	-	14.7	12	8/98	A22	GOPAL
CPIL	LPG	03396J	1600003387	-	15	12	3/96	A22	GOPAL
CPIL	LPG	0953S	1600001373	A	13.7	12	15-Aug	C22	GOPAL
CPIL	LPG	432073J	1600000976	G04	14.6	12	01-Aug	C22	GOPAL
CPIL	LPG	002089L	1600004212	GP8	14.1	12	15-Jan	A26	GOPAL

Registration cylinder document including:
Valve number ,
cylinder number ,
original weight , specification,
manufacturer date,
scrap date,
next inspection date,
last inspection date

标识安装

Identification installed

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Method for new cylinder installation:

Welding



Method for old cylinder installation:



① Drill holes

② Riveting



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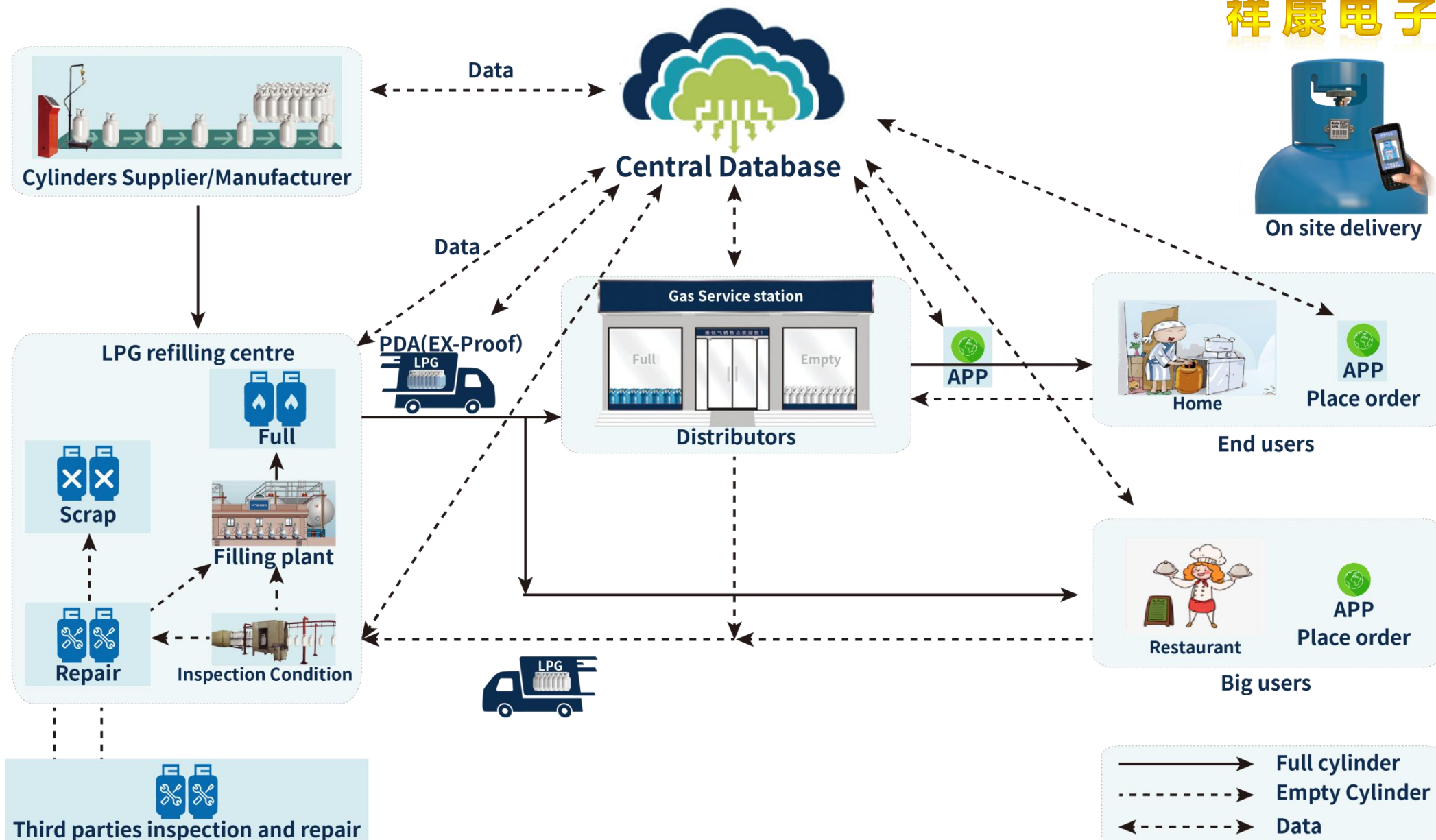
04

公司简介
Company profile

目 录

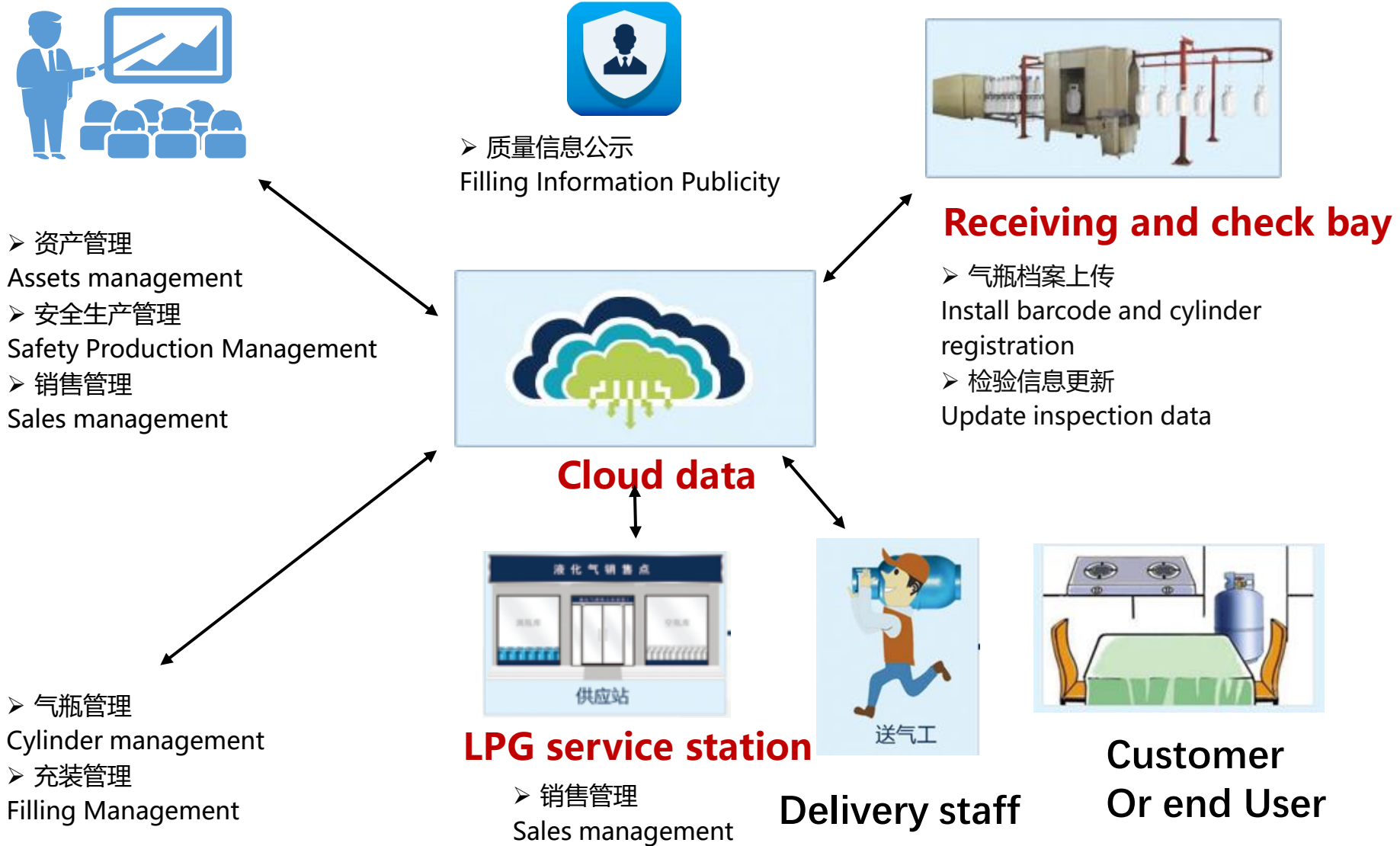
CONTENT

Cylinder flow and data flow

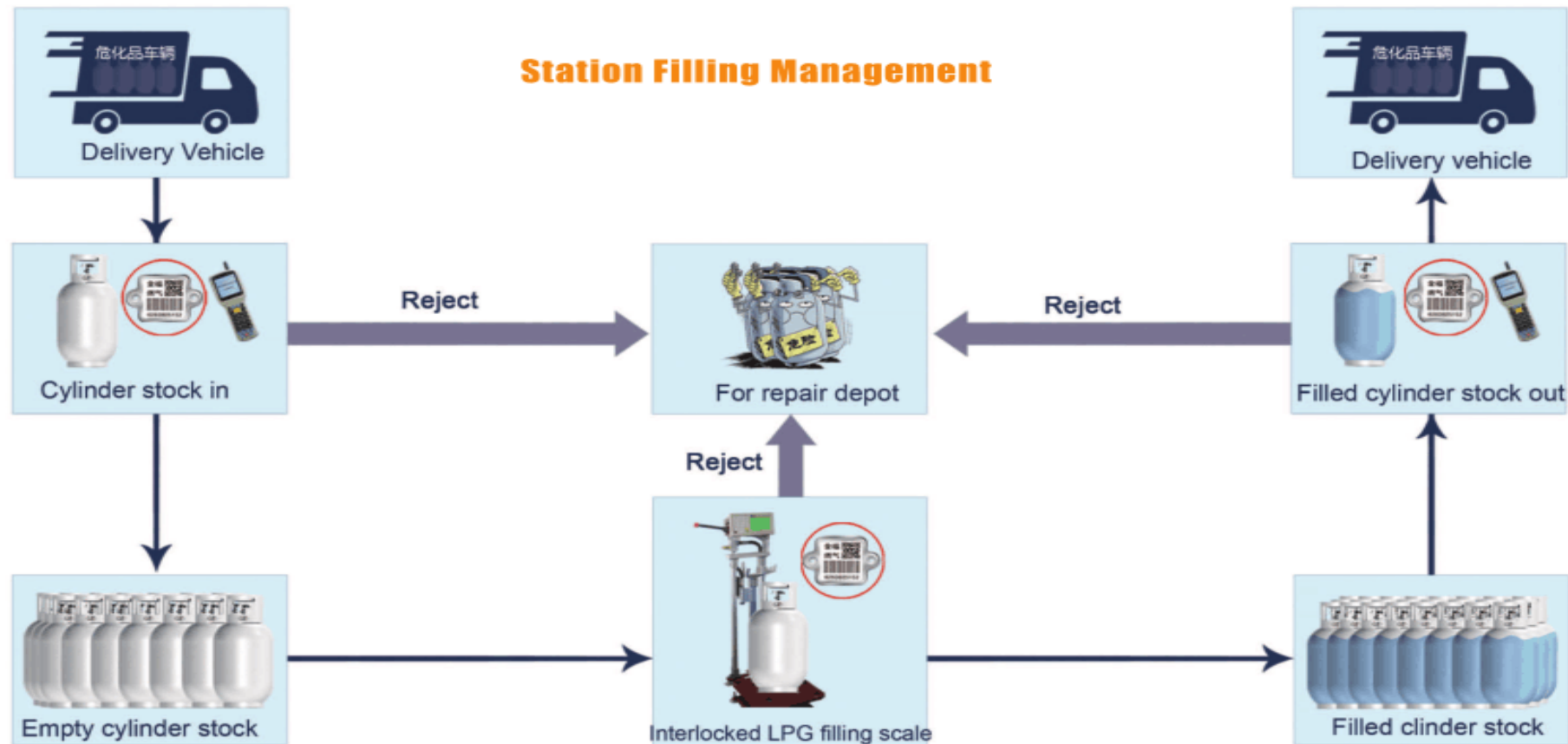




打破信息孤岛! Break the information isolated island!



The filling station uses intrinsic safety explosion-proof PAD and interlocked LPG filling scale to form standard filling process in the station .(empty bottle recycling - > interlocking filling record - > full bottle sending) 灌装站采用本安型防爆数据采集器和灌装电子秤，在站内形成标准灌装流程（空瓶回收->连锁灌装记录->满瓶发送）。



Scan the code before filling to judge the state of the cylinder. Tare weight and filling data will be automatically recorded to barcode cylinders in real time . The remaining gas data and filling data will be transferred into cloud sever.



Cylinder Information



Filling Information

- Filling man: Wang Feng
- Total gas weight: 30.5kg
- Empty bottle weight: 16kg
- Filling medium: liquefied petroleum gas
- Last filling date: 2016-10-31



Technical support: China Changzhou Xiangkang Electronics Co.Ltd.



URL: www.czxcdz.com



Service hotline: + 862160712938



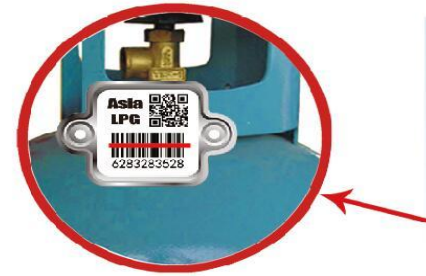
Service tenet: strives for the survival by the quality
strives for the honor



充装系统

Filling system

1. Place the empty cylinder on the scale platform and scan the barcode on the cylinder.
 2. Non-conforming cylinder refuse filling.
 3. Open the valve and start filling.
 4. After filling ,it will automatic cut-off .
- Filling record will automatic transmit into the software system through wireless mode.



Interlocking scanning

1. Cylinders without files cannot be filled
2. Blacklist cylinders cannot be filled
3. Cylinders without bar code cannot be filled
4. Overdue cylinders cannot be filled
5. Cylinders with non-owned property rights cannot be filled.



Qualified



Expired filling permits



no barcode



Scrappedders



no file



Blacklist



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充装系统

Filling system

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1x Computer with lpg filling software(Internet or not)
1X Communication server
1X Wireles data receptor
nX LPG filling scale



1. Communication base station is intrinsically safe and explosion-proof. It can be installed in filling site and communicate with electronic scales and data acquisition devices by wireless communication.

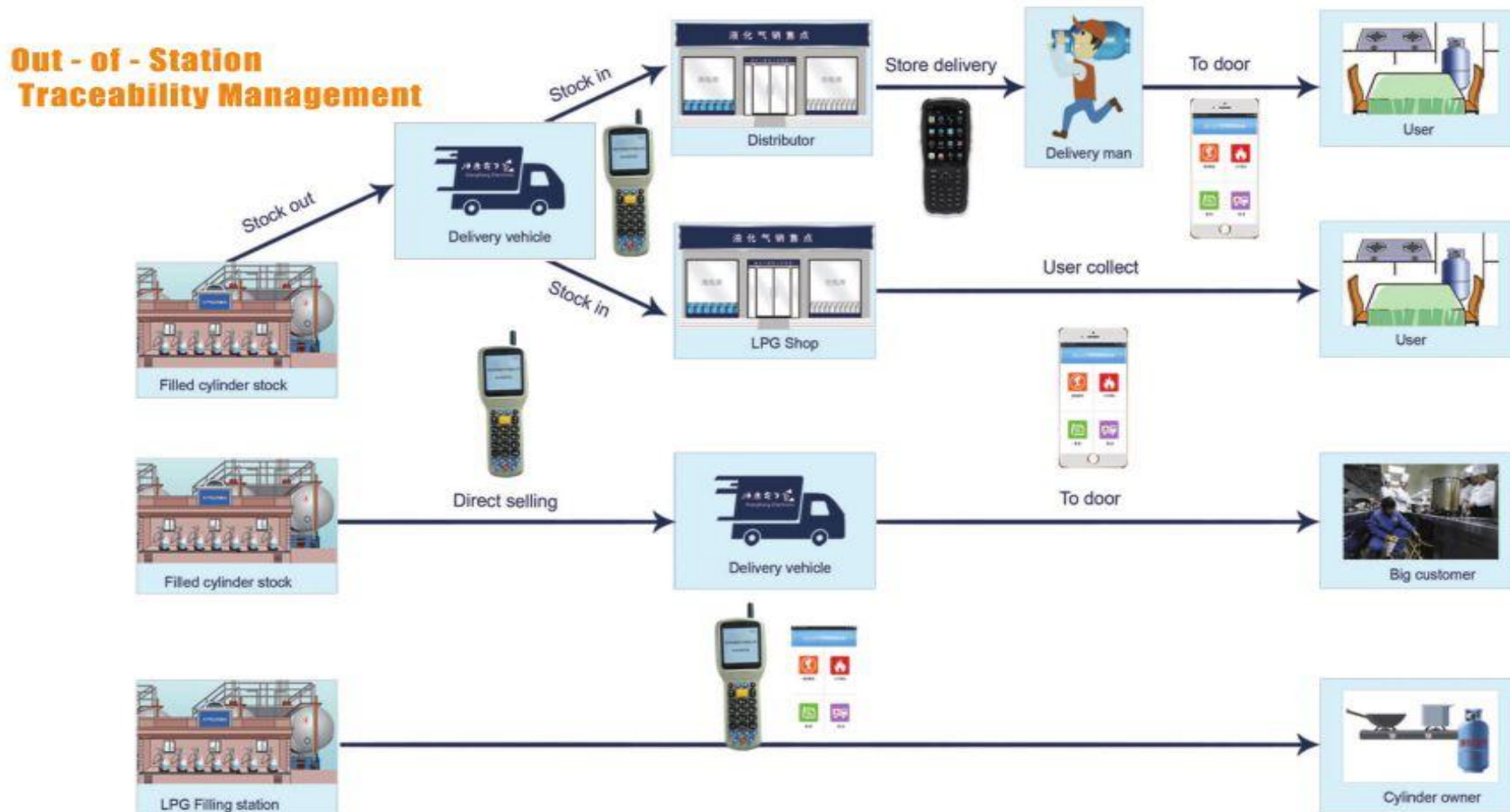
- Wired length:1000m
- Radius of wireless coverage:50m

- Module: S-TCS-YG-SV
- Performance parameters
- Accuracy: III
- Minimum weighing: 2KG
- Maximal weighing:120KG &180 KG
- Division value: 50g
- Operating pressure:0~1.6Mpa
- Suitable gas filled: LPG
- Liquefied gases with explosion protection
- requirements no higher than EXib IICT
- ATEX approval
- Power supply 220V 50/60Hz
- OLED digital display

2. Wifi 4G 3G
transfer data



In the process of cylinder flow, the data of each node (vehicle, supply station, gas supplier, customer) are collected by explosion-proof data collector and mobile phone APP, forming a complete traceability chain.



Cylinders in and out of the warehouse:

The gas station warehouse sends full bottles to the transporter / recovers empty bottles from the transporter, and warehouse staff scans and registers the loaded full bottles / empty bottles and enters the system.

Purpose: The company can register and control the gas cylinders entering and leaving the warehouse.



At LPG service station: Operators use PDA(or mobile phone APP) to scan and collect full and empty cylinders in stores.

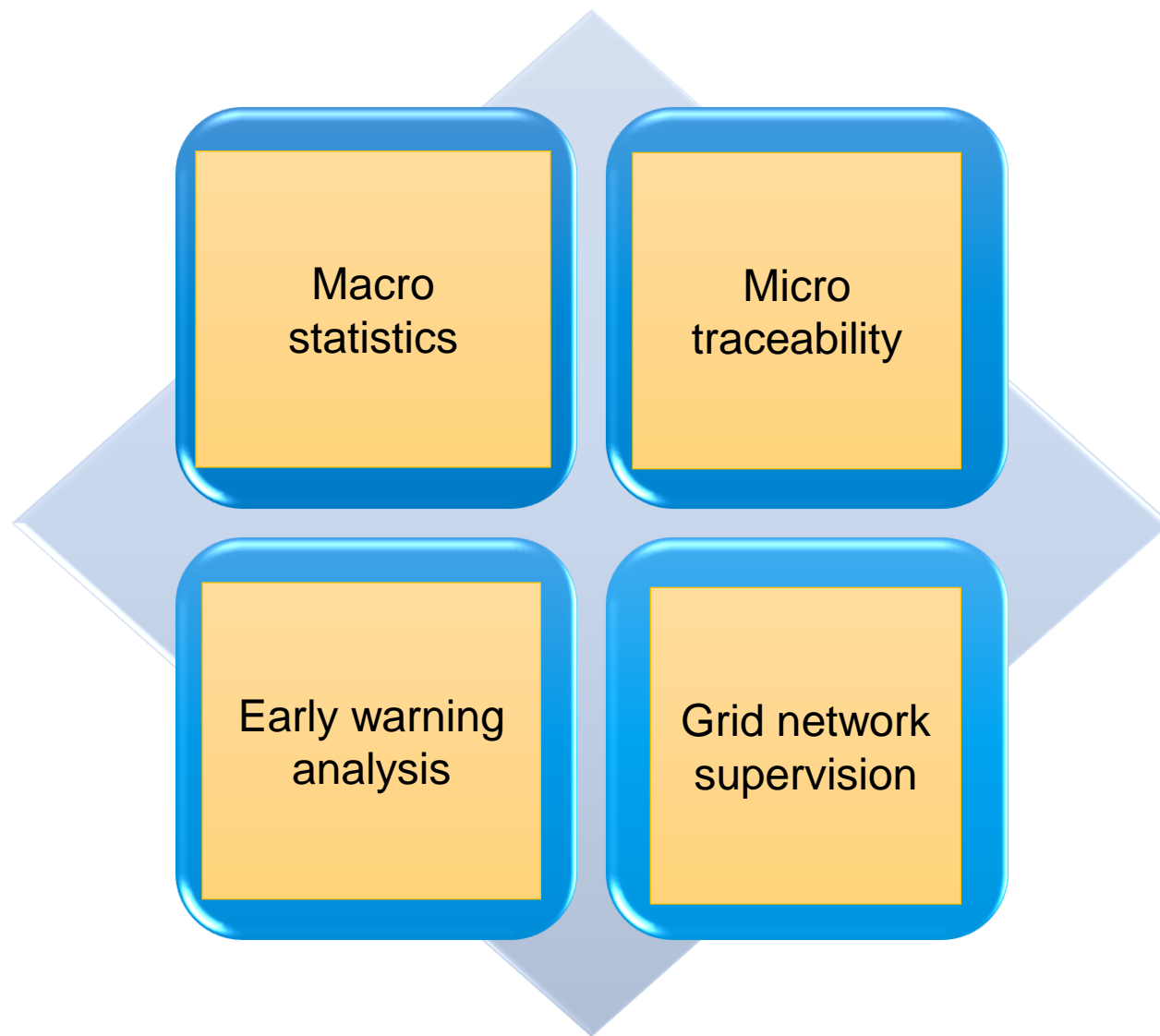
Full/empty cylinders record is collected into the cloud database.

Purpose: The company can supervise the gas cylinders in each service station, and monitor the gas cylinder circulation and purchase and sale in real time.

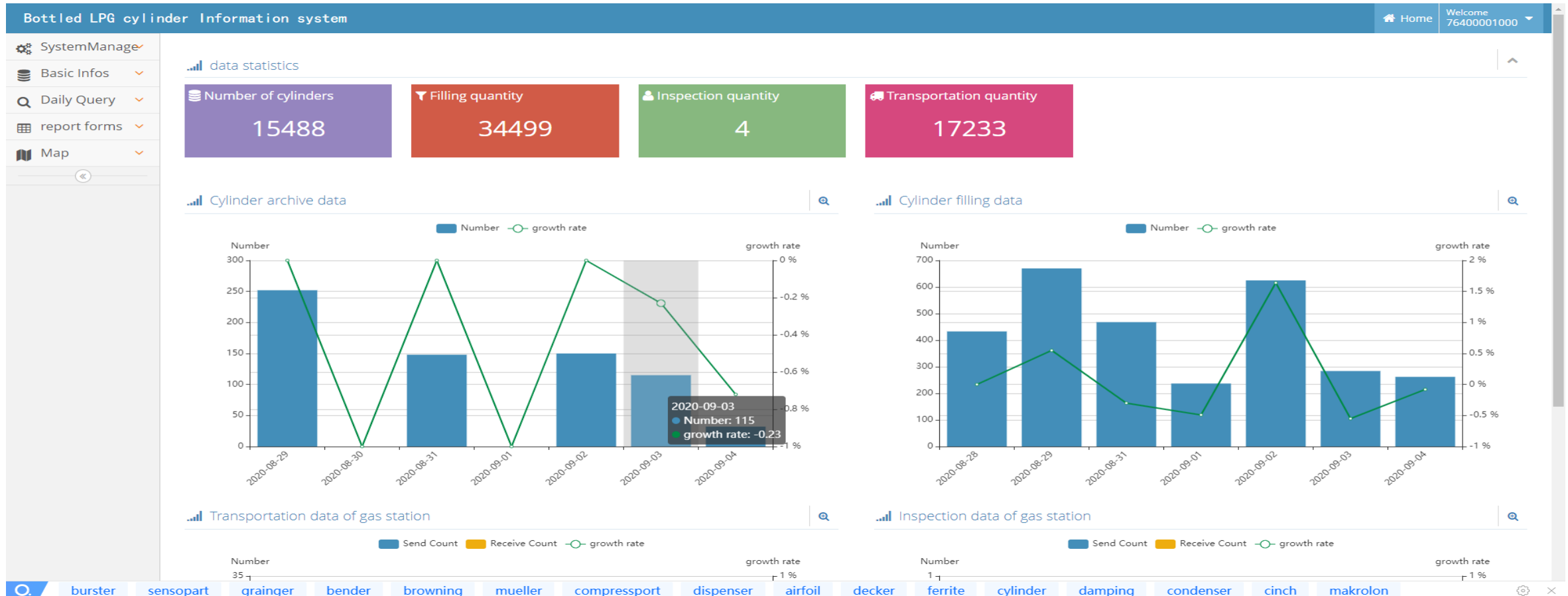


Deliver man bring cylinder to user home, use mobile phone APP to obtain user ID and location information:
When, who, where and which cylinder to deliver to which customer. Ensure that the cylinders are "traceable" and carry out strict control of "the last kilometer".





Establish a unified dispatching management platform for the supervision department to manage the filling stations, stores, gas users, cylinder circulation, inventory and distribution, including map display, large data analysis, abnormal early warning.



Establish a unified dispatching management platform for the supervision department to manage the filling stations, stores, gas users, cylinder circulation, inventory and distribution, including map display, large data analysis, abnormal early warning.

Bottled LPG cylinder Information system

Home

Basic Infos

Index > report forms > cylinder statistics

Daily Query

Export Excel

--Please enter the name

Start of operation time 至 End of operation time

SerialNum	FillingStation	Filling quantity of gas cylinder	4KG	7KG	15KG	15KG forklift	48KG	48KG LW	
1	Suksawat	999	0	0	600	0	200	199	
Summary of this page		999	0	0	600	0	200	199	
Summarize all		999	0	0	600	0	200	199	

1 rows, Display per page 20 rows, Showing 1 page, Altogether 1 page

report forms

- cylinder statistics
- filling summary
- Inspection statistics
- Transportation statistics
- Station Stock

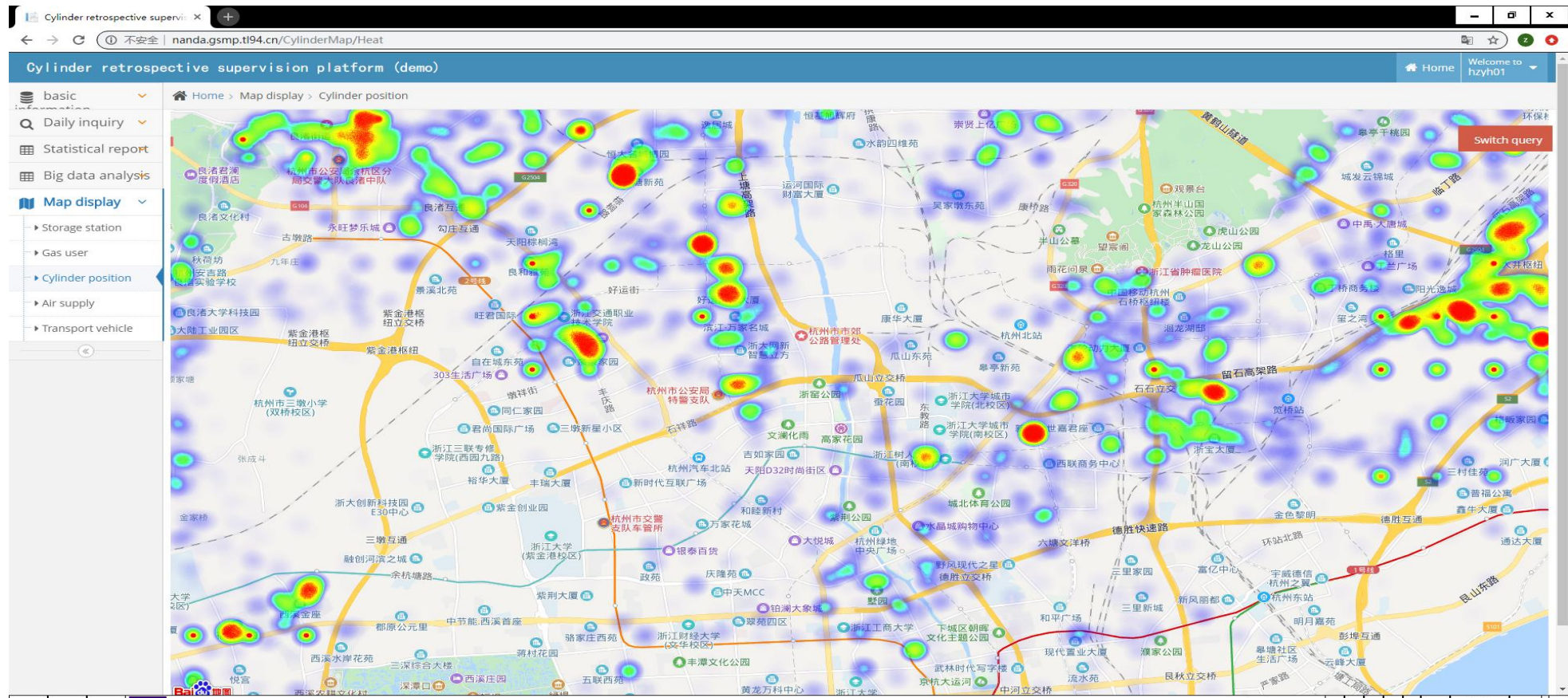
Map

Establish a unified dispatching management platform for the supervision department to manage the filling stations, stores, gas users, cylinder circulation, inventory and distribution, including map display, large data analysis, abnormal early warning.

The screenshot shows a web browser window with the URL 'nanda.gsmp.tl94.cn/Cylinder/'. The page title is 'Cylinder retrospective supervision platform (demo)'. The breadcrumb navigation is 'Home > basic information > Gas cylinder file management'. There is an 'Export Excel' button and search filters for storage station name, gas cylinder specification, creation time range, and cylinder status. An 'Inquire' button is also present.

<input type="checkbox"/>	Serial number	region	Storage station name	Gas cylinder barcode	Manufacturing unit	Year of manufacture	Serial number	Gas cylinder specification	Cylinder status	Creation time	Last delivery customer code	Last filling time	current position	operating
<input type="checkbox"/>	1	Lihang District, Hangzhou City, Liquefied Petroleum Gas Management Office	Hangzhou Gaode Chemical Fiber Co., Ltd.	1163068240	Hangzhou Yuhang Yushan Steel Bottle Co., Ltd.	2017-08	0050739	15KG	normal	2017/12/29		2019/4/10 11:48:30	Storage and Distribution Station: Hangzhou Gaode Chemical Fiber Co., Ltd.	View
<input type="checkbox"/>	2	Lihang District, Hangzhou City, Liquefied Petroleum Gas Management Office	Hangzhou Gaode Chemical Fiber Co., Ltd.	1163068127	Hangzhou Yuhang Yushan Steel Bottle Co., Ltd.	2014-02	014977	15KG	normal	2018/6/2				View
<input type="checkbox"/>	3	Lihang District, Hangzhou City, Liquefied Petroleum Gas Management Office	Hangzhou Gaode Chemical Fiber Co., Ltd.	1163038278	Hangzhou Yuhang Yushan Steel Bottle Co., Ltd.	2013-06	1440310	15KG	normal	2018/6/2		2018/11/17 12:03:59	Storage and Distribution Station: Hangzhou Gaode Chemical Fiber Co., Ltd.	View
<input type="checkbox"/>	4	Lihang District, Hangzhou City, Liquefied Petroleum Gas Management Office	Hangzhou Gaode Chemical Fiber Co., Ltd.	1163058881	Hangzhou Yuhang Yushan Steel Bottle Co., Ltd.	2016-05	040784	15KG	normal	2018/6/2		2019/4/27 7:58:32	Storage and Distribution Station: Hangzhou Gaode Chemical Fiber Co., Ltd.	View
<input type="checkbox"/>		Lihang District, Hangzhou City, Liquefied Petroleum Gas Management Office	Hangzhou Gaode Chemical Fiber Co., Ltd.		Hangzhou Yuhang Yushan Steel Bottle Co., Ltd.									

Map display: Realizes strict control of people, cars and bottles. In the deployment process, through the mobile phone APP positioning function, the real-time trajectory positioning of vehicles, people (distributors and customers) and bottles is realized, and displayed by "a map".



1. Applying digital technology to realize the networking and transparency of cylinder safety management and improve the efficiency of enterprise cylinder information management.应用数字技术实现气瓶安全管理的网络化和透明化,提高企业气瓶信息管理的效率。

2. Enhance the effectiveness of safety supervision on cylinder use and realize flattening and verticalization of safety supervision in line with the development trend of science and technology.提高气瓶使用安全和监督的有效性,实现安全监督的扁平化和垂直化,符合科学技术的发展趋势。



3. Effectively reduce cylinder accidents, ensure the safety of life and property of enterprises and personnel, enhance the level of social identity, and promote social harmony.有效降低气瓶事故发生率,保障企业和人员生命财产安全,提高社会认同水平,促进社会和谐。

管理效益

Information management benefits

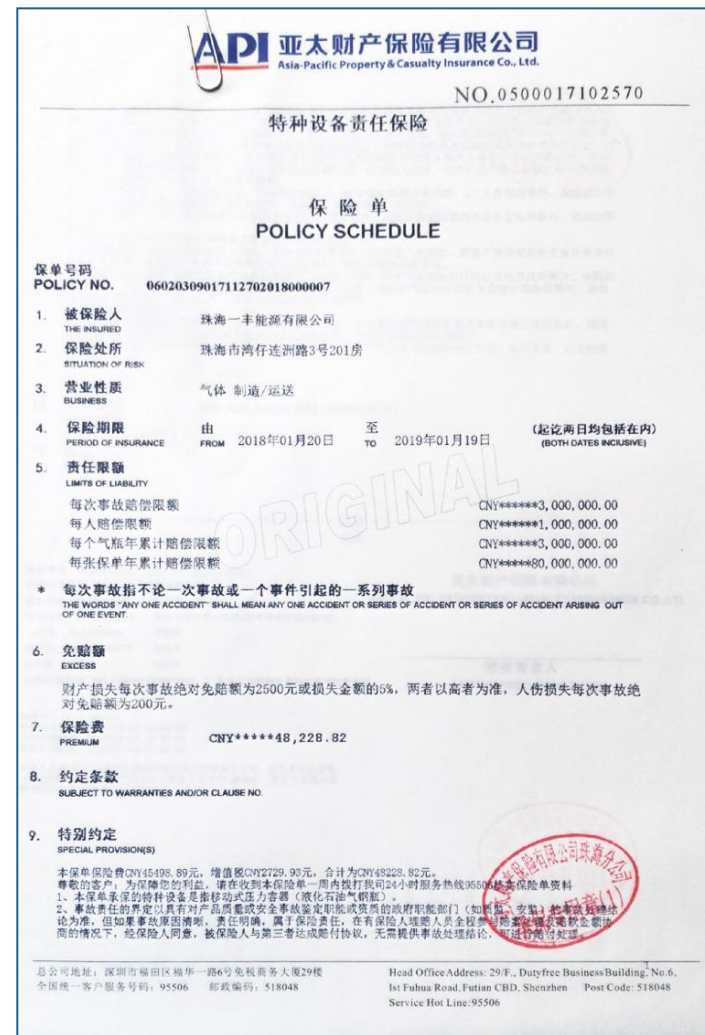
One cylinder One insurance

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祥康电子

Through the insurance of registered cylinders, one bottle, one insurance, one charge, and one insurance can be achieved. Regular cylinder insurance (protection insurance, safety exemption insurance) is provided to protect consumer rights.



Gas users can scan the QR code to query the insurance information handled by gas cylinders: third-party insurance companies and insurance periods.



01

行业背景
Industry background

02

信息化基础
Information foundation

03

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Tracking system

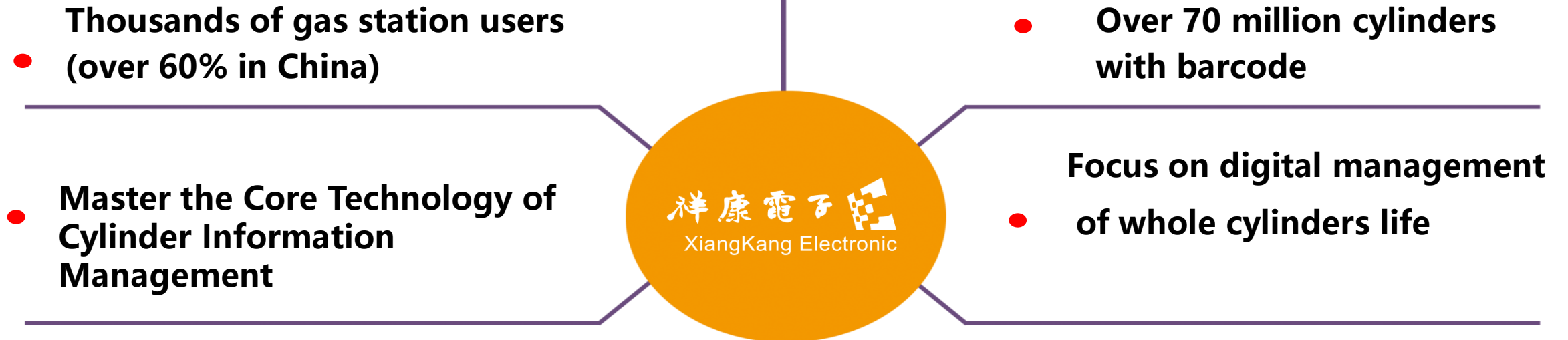
04

公司简介
Company profile

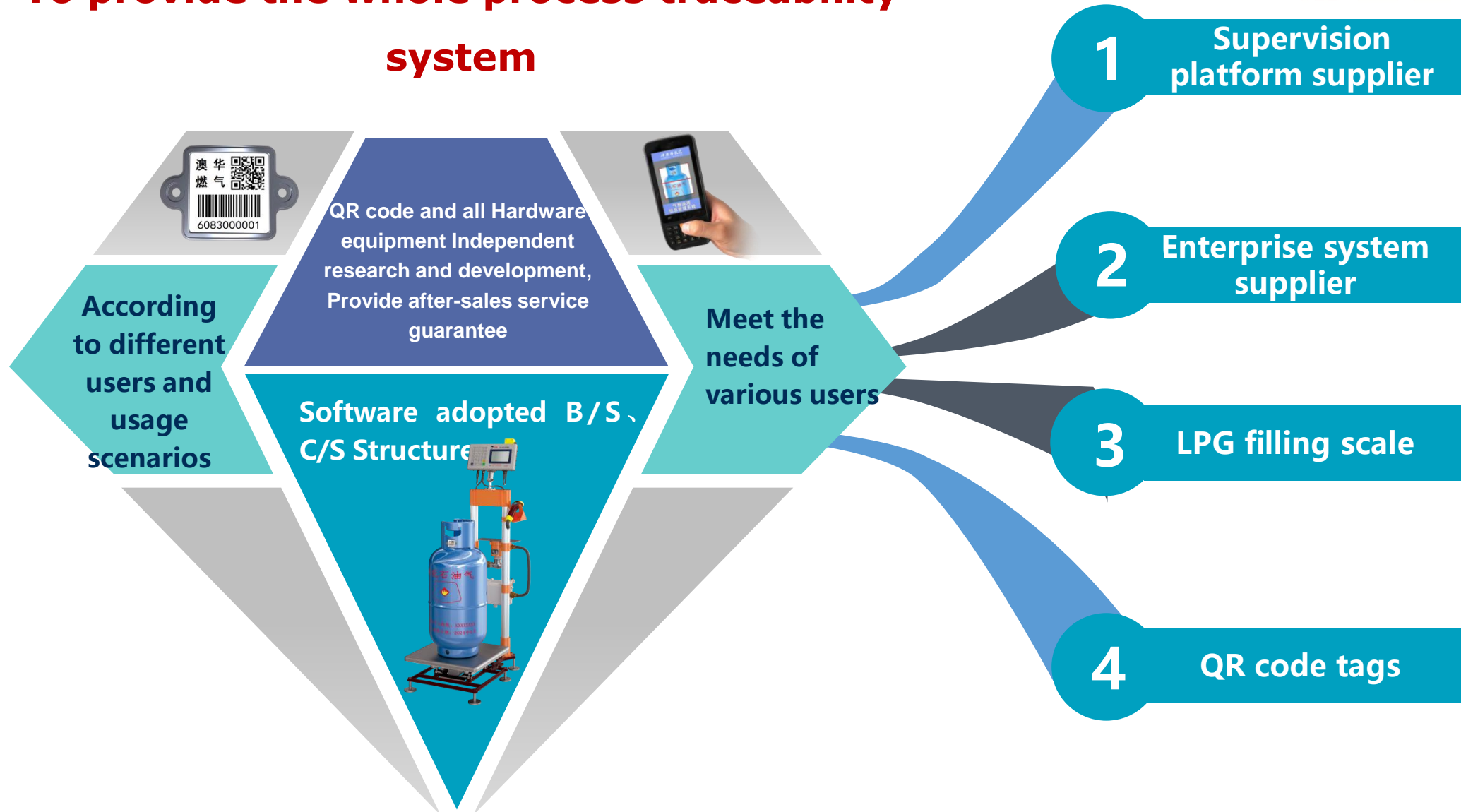
目 录

CONTENT

Xiangkang is the first leader solution supplier for Chinese Bureaus of Quality and Technical Supervision about LPG cylinder tracking and management, interlocking automatic filling scale and government supervision network platform.



To provide the whole process traceability system



公司介绍

Company profile

XIANGKANG
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R&D team

30+ people. Design and development of hardware and software platform.



Workshop

50+ people. Systematic product workshop.



Services

30+ people. Provide professional pre-sale, after-sale and implementation support.

在用祥康气瓶信息化监管系统地区分布图 (统一地区)



液化气企业

工业气企业



National QR code tracking Regulation draftsman

《Implementation requirements of gas cylinder traceability information system based on two-dimensional bar code》 First drafting unit

标准状态	现行
标准编号	T/CATSI 02003—2019
中文标题	基于二维码的气瓶追溯信息系统实施要求
英文标题	Implementation requirements of gas cylinder traceability information system based on two-dimensional bar code
国际标准分类号	23.020.30 压力容器、气瓶
中国标准分类号	J74
国民经济分类	I653 信息系统集成和物联网技术服务
发布日期	2019年09月16日
实施日期	2019年10月08日
起草人	史志锋、张希旺、陈红卫、徐迪青、余宏宇
起草单位	江苏祥康科技有限公司、中国...委员会、山东特检鲁安工程技术服务有限公司、多立恒（北京）能源技术股份公司、杭州瓶安智享科技有限公司、气通达（湖北）网络科技有限公司、北京天海工业有限公司、河北百工实业有限公司、杭州余杭弹山钢瓶有限公司、宁波金佳佳阀门有限公司、深圳市燃气集团股份有限公司
范围	本标准规定了基于二维码的气瓶信息化追溯管理的总体要求、气瓶二维码标识、气瓶扫描设备、追溯系统和实施的基本要求。本标准适用于气瓶制造、充装和定期检验，以及瓶装氢气的经销和使用环节追溯信息系统的构建与实施。

Mr. Shi Zhifeng
first draftsman
Xiangkang Electronic
Company



Thank You

Xiangkang Electronics CO., Ltd

2021.9.20