



35º
CONGRESO
DE LA AIGLP

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RIO DE JANEIRO • BRASIL



AUTOMATION IN LPG INDUSTRY

ABOUT HTPC



Established in 1998, HTPC is the leading manufacturer of Electronic LPG Filling Machines, Cylinder inspection systems, Robotic Loading and Unloading Systems and Bitumen Filling Plants.



HTPC is a well known brand within the OMCs of India (IOCL, BPCL, HPCL, IPPL) and neighboring countries with over 140 installations of Carousels and in-line filling machines that are capable of filling cylinders of various capacities such as 5kg, 14.2kg, 19kg & 21kg.



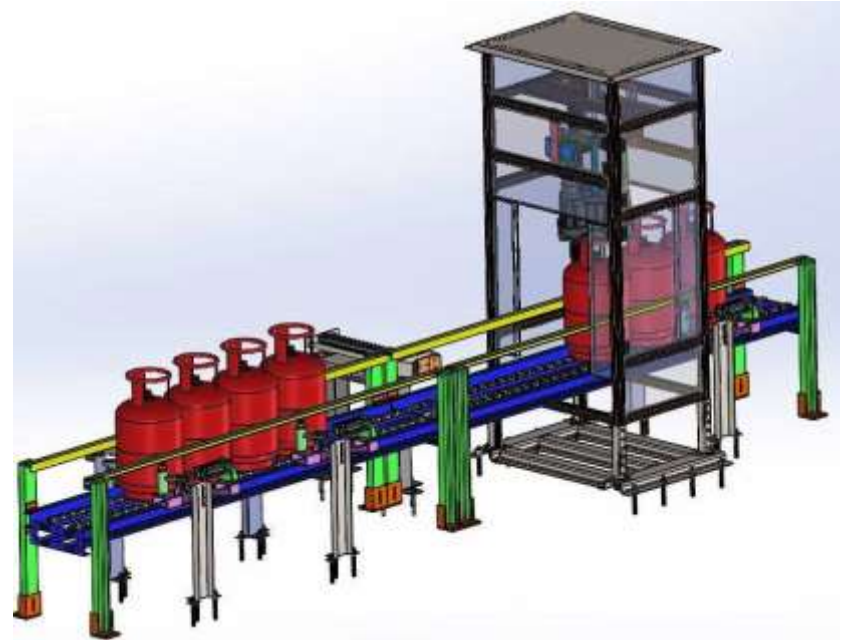
Our talented team of over 100 specialists strive to provide custom solutions to our clients diversified needs and try to go beyond expectations.

OUR RANGE OF PRODUCTS:

- AUTOMATIC TARE WEIGHT READER.
- 10 POST TO 36 POST ELECTRONIC FILLING CAROUSELS WITH ALLIED EQUIPMENT.
- ROBOTIC LOADING/UNLOADING SYSTEM WITHOUT PALLETIZATION.
- AUTOMATIC HOT REPAIR CYLINDER DETECTION.
- AUTOMATIC RQC MACHINE WITH VISION UNIT.
- BITUMEN DRUM FILLING AND POLYBAG FILLING SYSTEMS.



AUTOMATIC TARE WEIGHT READER



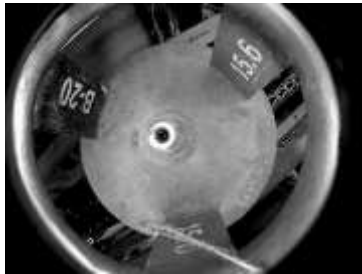
FEATURES:

- Tare Weight Inspection System reads the Tare Weights present on cylinder's shroud and stay plates as well as detects safety cap and read 5 year Test Due Date cylinder.
- OCR technology (Optical Character Recognition) with Artificial Intelligence is used for detecting the tare weight of cylinder.

FEATURES:

- High speed, high resolution motion camera is used for capturing the cylinder image in motion.
- Tare Weight Inspection System can process up to 3500 Cylinders per hour with minimum accuracy of 95%.

Tare Weight Read on Shroud/Stay Plates



Read Tare Weight-15.6



Read Tare Weight-15.7



Read Tare Weight-15.7

10/ 12/ 24/ 36 POST CAROUSELS



TECHNICAL SPECIFICATIONS

DESCRIPTION	10 POST	12 POST	18 POST	24 POST	36 POST
CAROUSEL CAPACITY	600 CYLS/HOUR	800 CYLS/HOUR	1200 CYLS/HOUR	1600 CYLS/HOUR	2400 CYLS/HOUR
DUAL CUT-OFF FILLING	YES	YES	YES	YES	YES
EXACT WEIGHT	80%	80%	80%	80%	80%
ACCURACY (± 50 GRAMS)	95%	95%	95%	95%	95%
ACCURACY (± 100 GRAMS)	98%	98%	98%	98%	98%
CHECK SCALE	1 STATION	1 STATION	1 STATION	2 STATION	4 STATION
CHECK SCALE CAPACITY	1440 CYLS/HOUR	1440 CYLS/HOUR	1440 CYLS/HOUR	1800 CYLS/HOUR	2400 CYLS/HOUR
IWCU CAPACITY	45 CYLS/HOUR	45 CYLS/HOUR	45 CYLS/HOUR	45 CYLS/HOUR	45 CYLS/HOUR
ELECTRONIC LEAK DETECTOR	1 STATION	1 STATION	2 STATION	2 STATION	4 STATION
ELECTRONIC LEAK DETECTOR CAPACITY	1200 CYLS/HOUR	1200 CYLS/HOUR	1800 CYLS/HOUR	1800 CYLS/HOUR	2400 CYLS/HOUR
O-RING LEAK DETECTOR	1 STATION	1 STATION	2 STATION	2 STATION	4 STATION
O-RING LEAK DETECTOR CAPACITY	1200 CYLS/HOUR	1200 CYLS/HOUR	1800 CYLS/HOUR	1800 CYLS/HOUR	2400 CYLS/HOUR
REMOTE DIAGNOSTICS	YES	YES	YES	YES	YES
INSTALLATION TYPE	RADIAL/ TANGENTIAL	RADIAL/ TANGENTIAL	RADIAL/ TANGENTIAL	RADIAL/ TANGENTIAL	RADIAL
MIS	YES	YES	YES	YES	YES

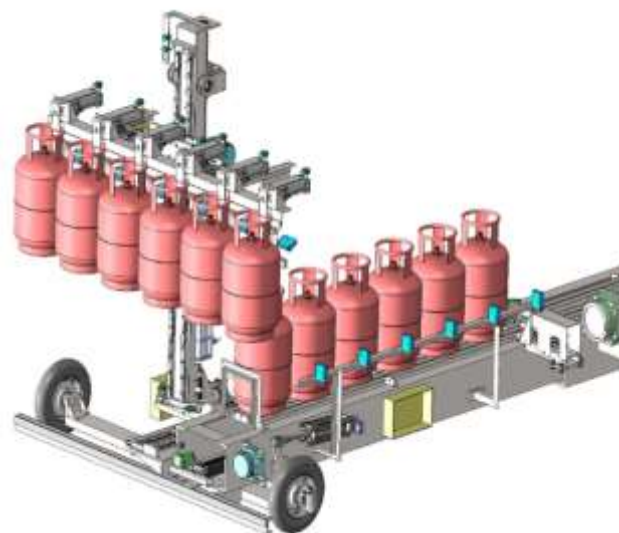
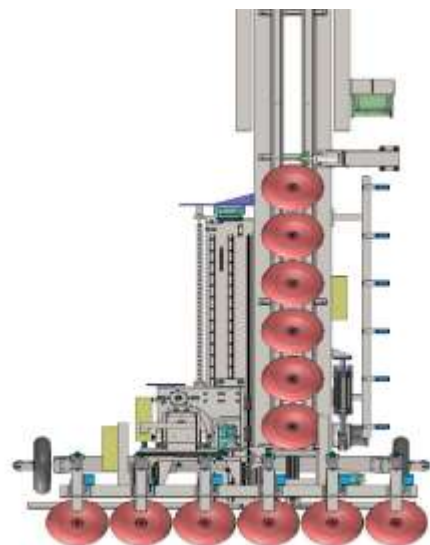
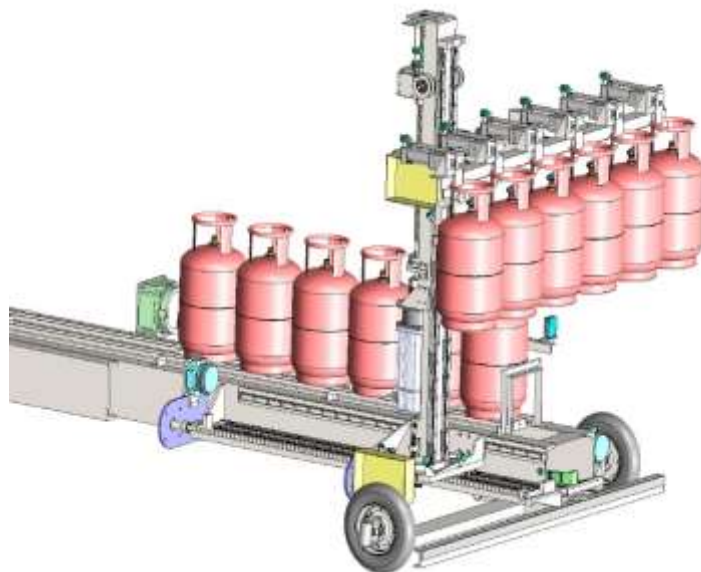
ADVANTAGES

- **Higher filling accuracy** because of coarse and fine filling technology. This minimizes LPG loss which is a major cost savings to the clients.
- **Remote Assistance** – reduces the dependency on engineers' visit and hence minimizes the down time of the carousel and allied equipment.
- Use of OFC cable for communication of data, which results in almost zero data loss instead of copper cable.
- Robust system which needs very low maintenance cost resulting in higher output.

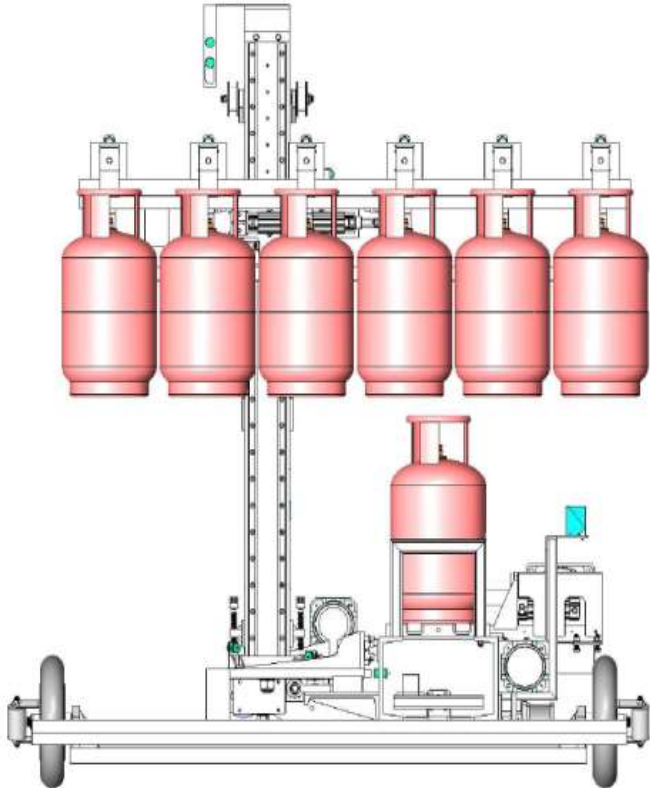
ADVANTAGES

- Higher in house spares inventory for immediate dispatch and support.
- **Higher readability** of vision unit even with single camera.
- Customizable data presentation as per client's requirements.
- 24x7 technical support team.
- Dedicated local bigger colored screen displays with real time information of equipment and the terminology used is easily understandable with visual alarms, visible from longer distance also.

ROBOTIC LOADING/UNLOADING SYSTEM WITHOUT PALLETIZATION.



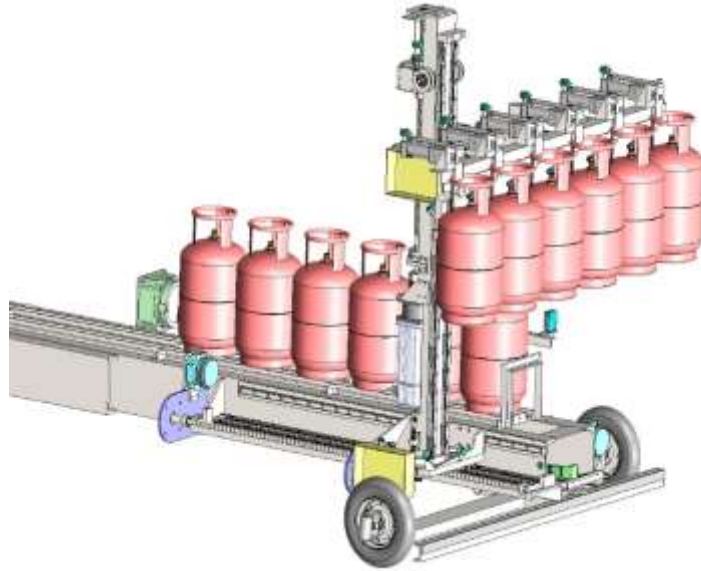
TELESCOPIC ROBOT FOR LOADING/UNLOADING OF LPG CYLINDERS



Equipment Details:

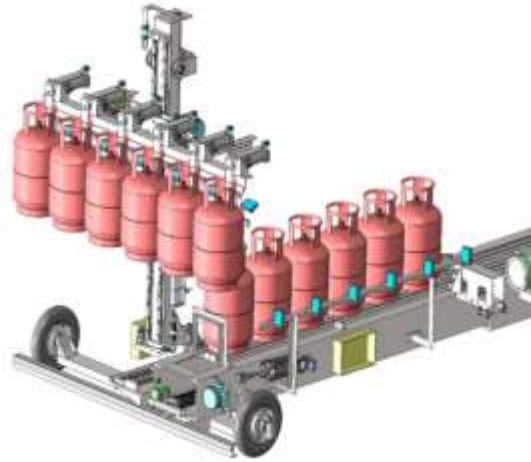
The Telescopic Robot consists of following parts:

- Telescopic Boom.
- Landing gear with Damper.
- Slider (X-Axis).
- Shifter (Y-Axis).
- Gripper.
- Vertical Ball Screw (Z-Axis).
- Rotary Axis.



Working Principle:

- The operation of Telescopic Robot is based on movement along multiple axis to Load/Unload LPG Cylinders from telescopic boom to Vehicle or Vehicle to telescopic boom with the help of Gripper.
- Sensors for interlocking & positioning are provided with the all the axis.



- Vertical movement is controlled by Servo Motor with inbuilt encoder for precise accuracy & position feedback.
- All Axis can detect & give the feedback of their position. On behalf of its position feedback, Robot can correct its position itself without any manual intervention.
- The whole system works independently in Auto mode to Load/Unload the LPG cylinders.

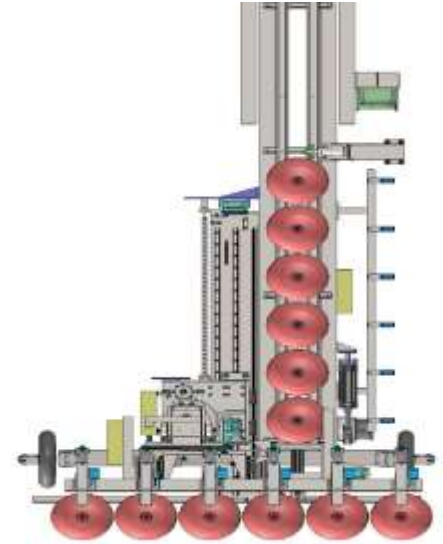
Safety Feature:

Telescopic Robot is equipped with the following safety features:

- Air Fail Safe.
- Power Fail Safe.
- Motion detection.

ADVANTAGES:

- No modification or special construction required at the plant level.
- No/minimal modifications required in the trucks.
- Loads/unloads 324 domestic cylinders in less than 15 minutes.
- Minimal human intervention required.
- Remote assistance.
- Atex approved for Zone I gas group IIA & IIB.
- Selectable Loading/Unloading Recipes through Intrinsically Safe keyboard.



GANTRY TYPE ROBOTIC LOADING/UNLOADING SYSTEM



Gantry type Robotic Loading/unloading System



Equipment Details:

The Gantry type Robot consists of:

- Stacker.
- Gantry.
- Gripper.



Working Principle:

- The operation of Gantry Robot is based on movement along three Axis (X, Y & Z Axis) to Load/Unload LPG Cylinders from Stacker to Vehicle or Vehicle to Stacker with help of Gripper/Grabber.
- There is a stacker unit attached with the line conveyor, from where LPG Cylinders has to be picked & placed on the defined position by the Robot.
- Sensors for interlocking & positioning are provided with the all the axis.



- Movement along all the axis is controlled by Servo Motor with inbuilt encoder for precise accuracy & position feedback.
- All Axis can detect & give the feedback of their position. On behalf of its position feedback Robot can correct its position itself without any manual intervention.
- The whole system works independently in Auto mode to Load/Unload the LPG cylinders.

Highlights:

- Capacity 1 Ton.
- Load/Unload 12 Cylinders of 14.2 Kg each cycle or 6 cylinders of 19 Kg.
- Total estimated time of loading for 306 cylinders of 14.2 kg- less than 15 Minutes.
- No physical damage to foot ring of cylinders.
- No risk to human injury.
- Increased efficiency and productivity.
- Atex Certified for Zone-1 (for Gas Group II A & II B).
- Self Diagnostics Feature.
- Remote Data Monitoring Feature.
- Selectable Loading/Unloading Recipes through Intrinsically Safe keyboard.

AUTOMATIC HOT REPAIR CYLINDERS IDENTIFICATION & SEGREGATION



**Cabin of HR Cylinder
Inspection Vision Unit**

**HMI Display
Unit**
**Certified Flameproof
Enclosure**

**Operation Control
Box**

Automatic Hot Repair Cylinders Identification and Segregation

- This is a Vision and PLC based machine which is able to detect the deformation in VP Ring / foot-ring of Cylinders automatically and segregates these cylinders into dedicated rejection loops.
- This machine is able to count the Safety Caps on empty cylinders received from distributors for refilling, which enables the Bottling Plant to maintain the exact data of Safety Caps consumption.

Why it is required?

- To automate the manual process of HR segregation.
- It maintains the exact data of Safety Caps present on the empty cylinders returned from Distributors/Transporters for refilling.
- Quality and safe cylinders to the Market can be ensured with this system.

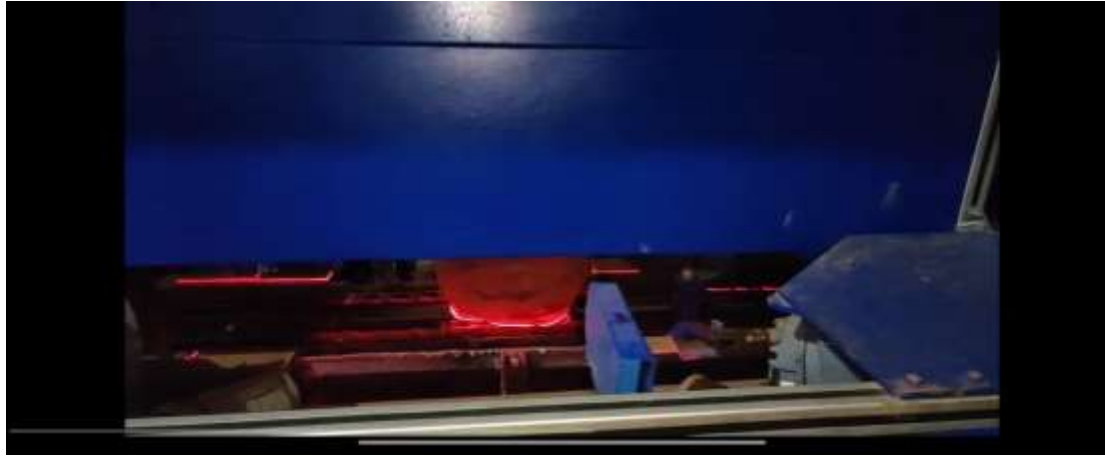
Advantages:

- It eliminates the human error and increases the efficiency.
- Cylinders ideal for filling operation are allowed only to enter Carousel System for filling, therefore eliminating the chances of LPG leakages at the filling stations of the Carousel.
- Damaged cylinders are prone to accident which gets eliminated during the process automatically.

This machine includes:

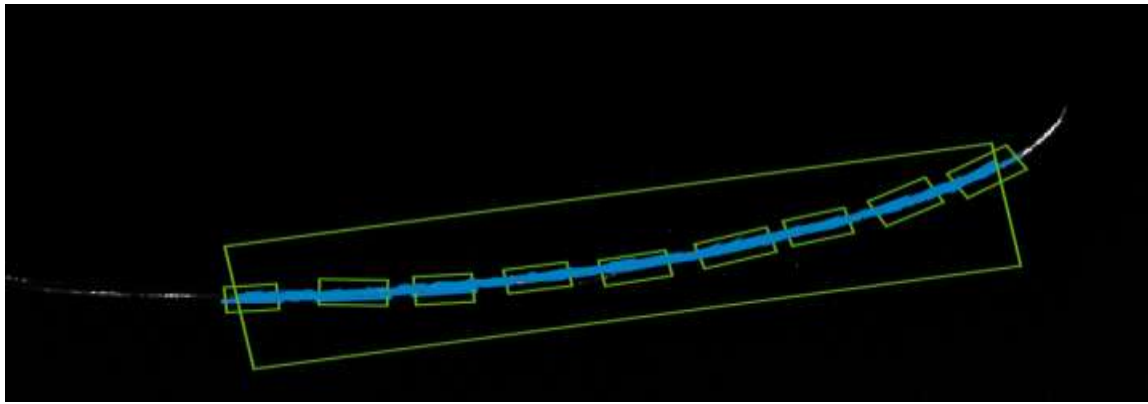
- 4 programmable smart cameras with Laser lights for detection of deformity in the Foot-ring of the cylinder.
- 1 programmable 3D camera for detection of deformity in the VP ring/collar of the cylinder and detection of safety cap on the SC valve of the cylinder.





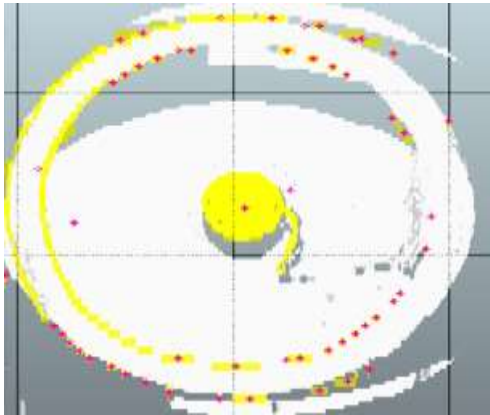
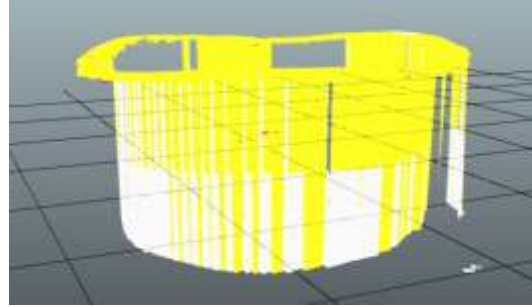
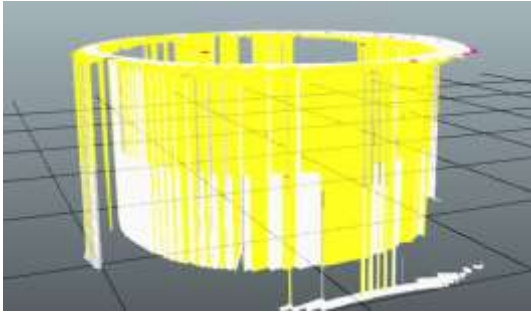
Working Principle:

- The Laser lights are projected on the foot-ring of the cylinders and the 4 programmable cameras capture the deformation of Laser light based on triangulation method.



- The image captured by each camera is divided into multiple blocks and the rejection/acceptance of the cylinder is configurable as per client's requirements (images attached in green blocks are for good quality foot-ring cylinder and in red blocks are for deformed foot-ring cylinders).





- The Laser light is projected at the VP ring/collar of the Cylinder and the 3D camera captures multiple images of a single cylinder while it travels on the chain conveyor and then forms a complete image.
- There are various reference points on the VP ring/collar and the acceptance/rejection of the cylinder depends upon the client's requirements.

THANK YOU