Honeywell Enraf

Instruction manual
640 Securiterre

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April 2014
Part no. 4417571
Rev. 5

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Preface

This manual is intended for technicians involved in the commissioning and service of the Honeywell Enraf Series 640 Securiterre.

A description preceding the technical procedures provides the technical information necessary to understand its functioning. It is recommended to read this description prior to performing any procedures.

For installation of the 640 Securiterre, please refer to the Installation guide of the 640 Securiterre. This manual solely describes the commissioning and service of the basic Securiterre.

Legal aspects

Safe execution of the procedures described in this manual requires technical skill in the handling of tools and knowledge of safety regulations for working in hazardous areas.

The information in this manual is the copyright of Enraf B.V., Netherlands. Enraf B.V. disclaims any responsibility for personal injury or damage to equipment caused by:

- Deviation from any of the prescribed procedures
- Execution of activities that are not prescribed
- Neglect of the safety regulations for handling tools and use of electricity

EC declaration of conformity

Refer to the declaration of conformity shipped with the instrument

Additional information

Please do not hesitate to contact Honeywell Enraf or its representative if you require any additional information.

1 Introduction

Electrostatic charge can be generated and accumulated during product movement, filtering and loading of tank compartments with non-conducting liquids such as petroleum products and chemicals. As a result, the tank obtains a different potential than the loading equipment. This can lead to sparking when for example the loading arm is brought in, igniting the product vapors. This also applies for movement of powders (barrel version)

The model 640 Securiterre is a grounding system for loading gantries that offers improved safety during the transfer of flammable liquids or powders see above. It ensures that reliable grounding has been achieved before any product transfer takes place. It is an indispensable item for every loading facility of flammable non-conducting liquids and powders.

1.1 Principle of operation

The measuring circuit of the Securiterre consists of a low power, intrinsically safe digital signal processor that detects the presence of a specific load at the end of the ground clamp. The Securiterre as such can be used for the grounding of trucks, trains or barrels. The impedance of the load (its resistance and capacitance) is measured by the DSP circuit and does not require any tuning. Internal jumpers allow the specific configuration of the operating range to the specific intended application; either truck, train or barrel.

Note: Please note that the device can only be used in one predefined application. The device has been configured to your specific requirements in the Honeywell Enraf factory!

1.2 Configurations

Truck version
The Securiterre type: UAT*640CAA* or UAT*640DAA*, designed specifically for the grounding of trucks, provides a direct earth connection for the carrier. When not mounted the circuit is grounded via a large resistance to reduce the hazard of sparking. Only after connecting the earth clamp to the truck a double check is executed, based on the measured capacitance and resistance. After verification of both values a relay will connect the measuring circuit directly to ground. Another relay switches the signal LEDs to green and switches an extra contact to externally mounted equipment.

There are two versions:
- UAT*640**C**AA* this version has a coiled cable connected to the grounding clamp
- UAT*640**D**AA* this is an optional version with a reel (Securistore) connected to the grounding clamp
Refer to Figures 1.1 and 1.2
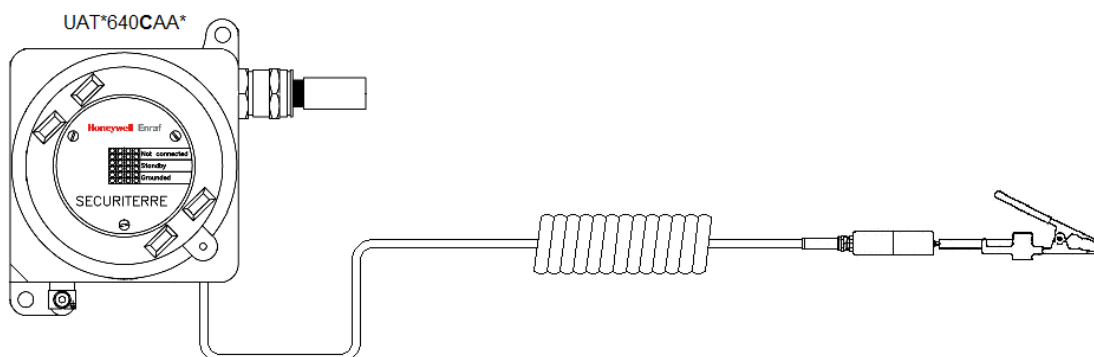

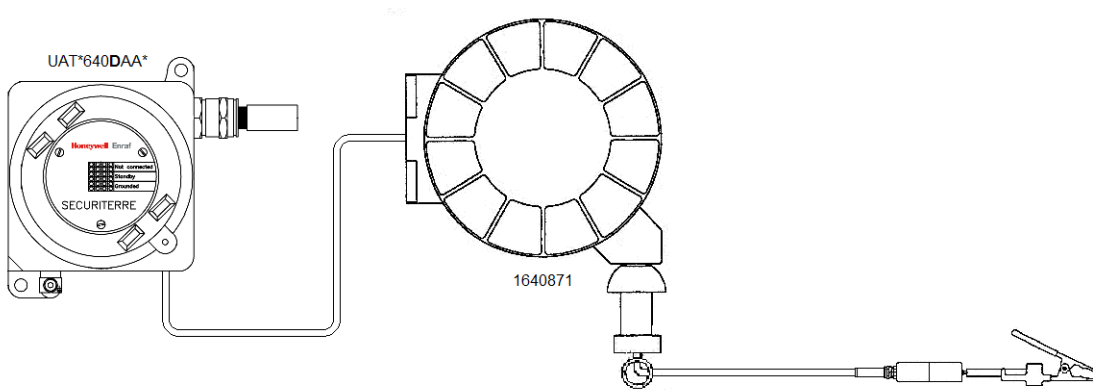Figure 1.1   Truck version with coiled cable

Figure 1.2   Truck version with Securistore (optional)

The Truck version of the Securiterre is provided with a so called: Quick Break Release. If the truck driver accidently forgets to disconnect the earth clamp and drives away, the clamp releases from the cable, which prevents damaging the cable. In this case, just plug in a spare clamp.

If the impedance cannot be measured, in case of a low resistance or a too small capacitance, a magnetically operated bypass can be activated to establish the initial grounding. Please see section 3.2 for proper operation procedures.

Train version
The Securiterre type: UAW*640CAA* or UAW*640DAA*, designed for the grounding of train wagons, provides a direct earth connection for the carrier. As such it assumes a loop resistance in the circuit loading rack-Securiterre-carrier-rail-earth. After verification of the maximum resistance to the ground a relay will connect the measuring circuit directly to ground. Another relay switches the signal LEDs to green and switches an extra contact to externally mounted equipment.

There are two versions:
- UAW*640**C**AA* this version has a coiled cable connected to the grounding clamp
- UAW*640**D**AA* this is an optional version with a reel (Securistore) connected to the grounding clamp
Refer to Figures 1.3 and 1.4
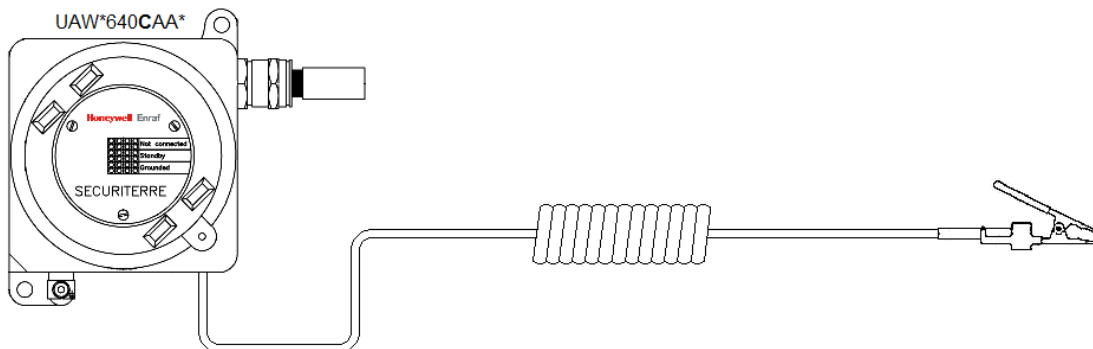

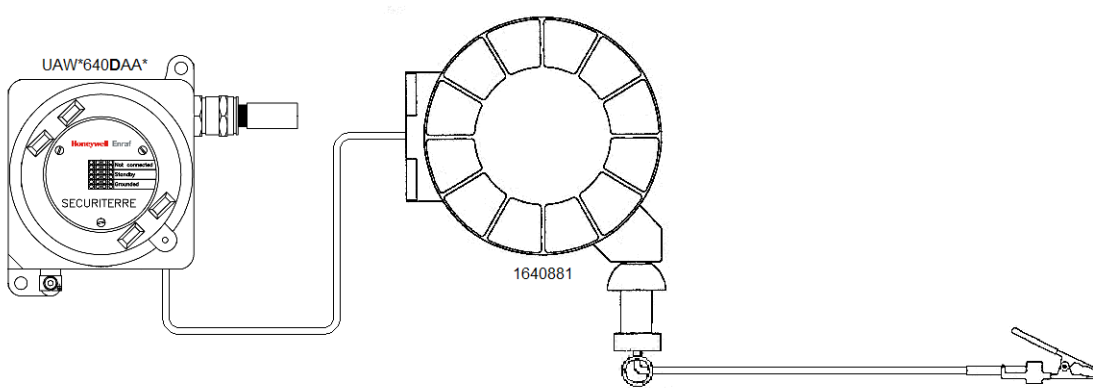Figure 1.3   Train wagon version with coiled cable

Figure 1.4   Train wagon version with Securistore (optional)

Barrel version

The Securiterre type: UAB*640CAA*, designed for the grounding of barrels and drums, provides a direct earth connection for the carrier. For this purpose a special clamp is used which has two poles connected to the barrel or drum. After verification of the maximum resistance between the two poles in the clamp, a relay will connect the measuring circuit to ground. Another relay switches the signal LEDs to green and switches an extra contact to externally mounted equipment. Refer to figure 1.5.
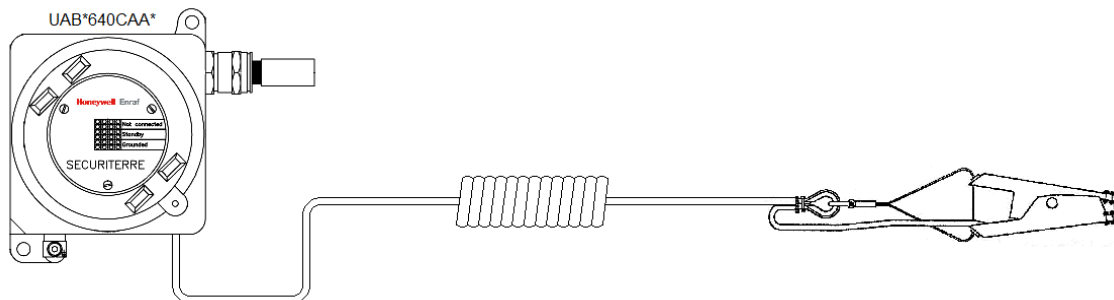

Figure 1.5   Barrel version

1.3 Approvals (ATEX)

The Honeywell Enraf 640 Securiterre is an explosion proof instrument, which is designed to meet requirements of ATEX.

2 Safety

2.1 Safety aspects of the 640 Securiterre

> **Warning**
>
> Do not use the instrument for anything else than its intended purpose.
>
> Do not deviate from described procedures

The housing of the 640 Securiterre is explosion proof and complies with European ATEX standards which include EN 50.014, EN 50.018, EN 50.020, EN13463 and EN50281-1-1 and is certified as:

$$\text{Ex}\ \text{II 2 (1)/1 G D}$$
Ex d [ia] ia IIC T6
Ex tD A21 T85°C IP6X
LCIE 05 ATEX 6001 X

The cover of the Securiterre is removable for installation and modification purposes. However please remind that the device has already been programmed to your specific application.

> **Caution**
>
> The Securiterre is an explosion proof instrument with an intrinsically safe circuit. Modifications to the instrument may only be carried out by trained personnel, who are authorized by Honeywell Enraf. Failure to adhere to this will invalidate the approval certificates.

2.2 Personal safety

The technician must have basic technical skills to be able to safely install the equipment. When the Securiterre is installed in a hazardous area, the technician must work in accordance with the (local) requirements for electrical equipment in hazardous areas.

> **Warning**
>
> In hazardous areas it is compulsory to use personal protection and safety gear such as: hard hat, fire-resistant overall, safety shoes, safety glasses and working gloves.
>
> Avoid possible generation of static electricity. Use non-sparking tools and explosion-proof testers
>
> Make sure no dangerous quantities of combustible gas mixtures are present in the working area.
>
> Never start working before all parties have signed the work permit.
>
> Pay attention to the kind of product in the area. If any danger for health exists, wear a gasmask and take all necessary precautions.

2.3 Safety conventions

"**Warnings**", "**Cautions**", and "**Notes**" are used throughout this manual to bring special matters to the immediate attention of the reader.

- A **Warning** concerns danger to the safety of the technician or user
- A **Caution** draws attention to an action which may damage the equipment
- A **Note** points out a statement deserving more emphasis than the general text, but not requiring a "Warning" or "Caution".

3 Commissioning

The specific settings of jumper S1 and S2 define the application, respectively truck, train or barrel, of your Securiterre 640. The Securiterre can as such be (re)configured to your specific needs (please adhere earlier warning and caution notes). These jumpers are located in the top of the main board between the three optocouplers (U8, U9 and U10) and the connector JP4, see figure 3.1.
The specific settings for jumper S1 and S2 associated with the Securiterre types
UAT*640CAA*/UAT*640DAA*(Truck), UAW*640CAA*/UAW*640DAA*(Train wagon) and UAB*640CAA* (Barrel) are represented in table 3.2.
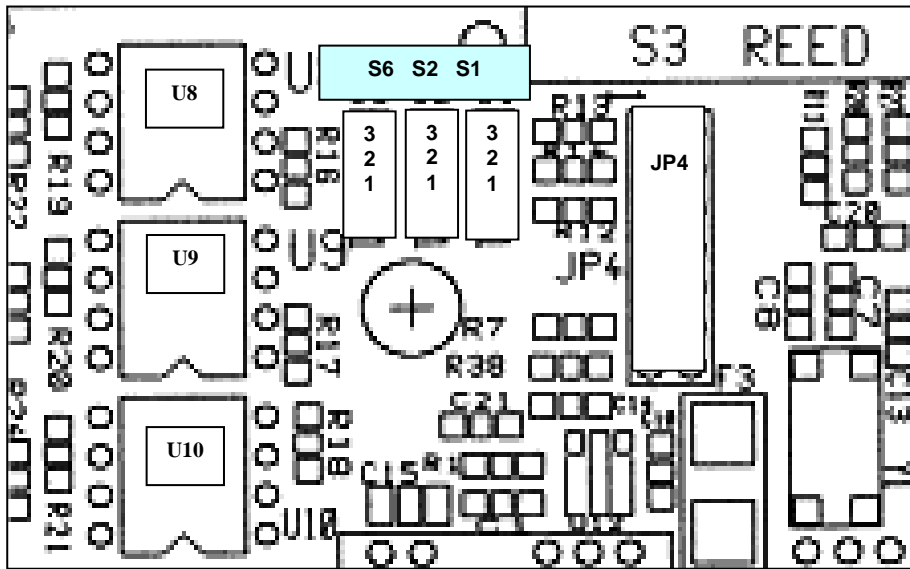

Figure 3.1

Function/Jumper	S1	S2
Truck	2-3	2-3
Train wagon	2-3	1-2
Barrel	1-2	2-3

Table 3.2

Note: S1 position 1-2 means that a jumper is inserted between positions 1 and 2 of S1.
Note: The jumper settings have already been adjusted to your specific application in the factory

<div style="border:1px solid black; text-align:center">

Caution
Each version, Truck, Train wagon and Barrel, has its own type of clamp.
Hence, when changing the S1 and S2 jumper setting, one must also change the type of clamp
on the cable and check/alter the wiring connection (refer to installation guide).

</div>

3.1 Checks before starting the application

Before any power is applied to the Securiterre 640 check the following:
- verify jumper settings for the intended application
- verify power fuse and check for label indicating the rated voltage
- check for clean wiring, especially between IS and non-IS wires
- check that all ground connections are made
- check that non-used cable inlets are sealed with appropriate blind plugs
- close all covers
- place clamp in rest position / rest plug
- apply power and check whether the red LEDs light as should be

Note: Yellow and Red LEDs lighting simultaneously indicates internal auto-test failure: The Securiterre may work but needs repair.

Note: Green and Red LEDs lighting simultaneously indicates poor internal relay contact grounding: The Securiterre is unusable and needs repair.

3.2 Proposed procedures

Trucks
- Place the earth clamp on the clamp holder to start calibration. The LEDs will light up yellow when the calibration process is finished.
- Connect the earth clamp to the earth point of the truck, the LED indication should instantly turn to yellow and then to green indicating a safe situation. If the red LEDs remain activated check the clamp for good connection.
- When the green LEDs indicate a safe situation other secondary connections, such as overfill alarms, filling attachments, etc., can be connected to the truck.
- After loading first disconnect the secondary connections such as overfill alarms, filling attachments, etc.
- Then remove the earth clamp and place this back on the clamp holder.
  Note: The Return point is a brass pin intended to calibrate the clamp. The user should place the clamp on this pin when the clamp is not connected to the truck.

Note: To achieve correct grounding conditions the cable clamp must be properly connected. If there is no release after few seconds (red LEDs are on), check the earth connection which should be clean and free from corrosion.

Magnetic override
Highly sensitive, the Securiterre device will detect even small changes in grounding properties as a result of weather conditions, loading equipment or any other grounding sources that do not impact safety and in rare cases prevent the system switching to green. If, after double checking the grounding, the release remains blocked, the magnetic override can be used to reset the alarm as following:
- Connect the earth clamp to the earth point of the truck, the LED indication in this case should remain red.
- Briefly place the brine magnet on the red dot located on the top side of the Securiterre, see figure 3.3 below. The instrument should now respond within a couple of seconds indicating successful grounding, do not remove the clamp during use of the brine magnet. Remove the magnet after successful grounding.
- Secondary connections, such as overfill alarms, filling attachments, etc., can now be connected to the truck.
- After filling first disconnect the secondary connections such as overfill alarms, filling attachments, etc.
- Then remove the earth clamp and place this back on the clamp holder.

> **Caution**
> Forced truck grounding requires a careful assessment of the situation. Please check the Securiterre and truck for anomalies; e.g. missing or broken clamp, cut cable, etc.
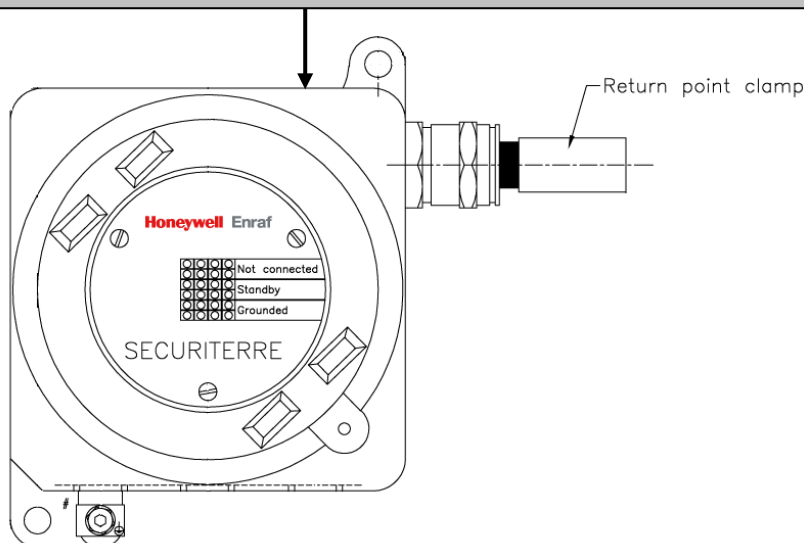
Figure 3.3

Trains

Connect the earth clamp to the earth point of the train, the LED indication should instantly turn to orange and then to green indicating a safe situation. If the red LEDs remain activated check the clamp for good connection.
- When the green LEDs indicate a safe situation other secondary connections, such as overfill alarms, filling attachments, etc., can be connected to the train.
- After filling first disconnect the secondary connections such as overfill alarms, filling attachments, etc.
- Then remove the earth clamp and place this back on the clamp holder.

Note: To achieve correct grounding conditions the cable clamp must be properly connected. If there is no release after a few seconds (red LEDs are on), check the earth connection which should be clean and free from corrosion. Use of brine-magnet is not possible.

Barrels

Connect the earth clamp to the earth point of the barrel, the LED indication should instantly turn to yellow and then to green indicating a safe situation. If the red LEDs remain activated check the clamp for good connection.
- When the green LEDs indicate a safe situation other secondary connections, such as filling attachments, etc., can be connected to the barrel.
- After filling first disconnect the secondary connections such as filling attachments, etc.
- Then remove the earth clamp and place this back on the clamp holder.

Note: To achieve correct grounding conditions the cable clamp must be properly connected. If there is no release after a few seconds (red LEDs are on), check the earth connection which should be clean and free from corrosion. Use of brine-magnet is not possible.

4 Service and Troubleshooting

The 640 Securiterre does not require preventive maintenance. The instrument has been adjusted in the factory and is carefully tested before shipping. Hence installation without any adjustments is possible after receipt of the instrument.

For mechanical and electrical installation details, please refer to the installation guide of the Securiterre 640.

Appendix A Dimensional drawings
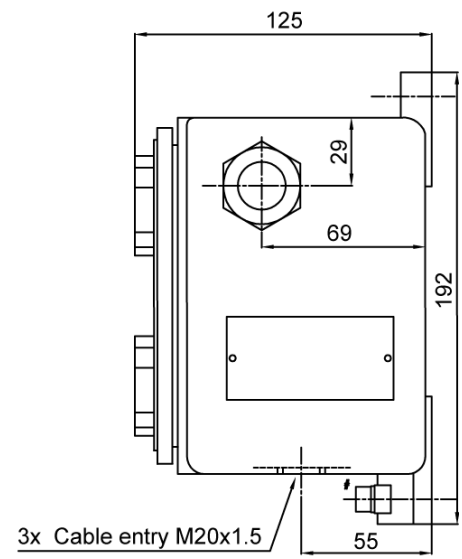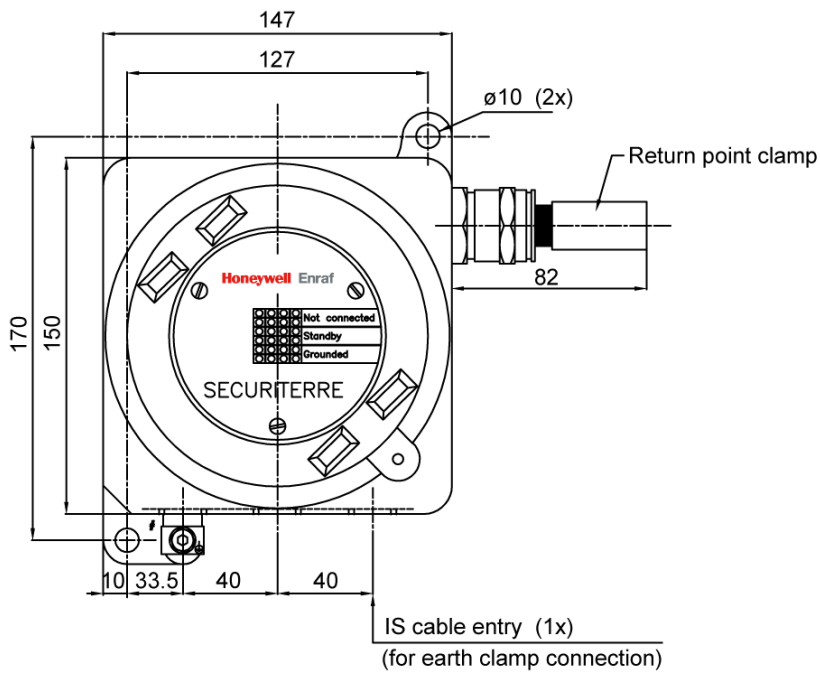
Appendix B Spare Parts

Part	Function	Part number
Main Board	CPU circuits	S0640601
Display Board	Led display	S0640602
Rest Position Plug	Metal part	S0640102
Coiled Cable + Clamp (Train wagon version)	Connection	S0640103
Coiled Cable + Clamp (Truck version)	Connection	S1640872
Coiled Cable + Clamp (Barrel version)	Connection	S1640892
Clamp (Truck version)	Connection	S0640104
Brine Magnet	Manual override	A0186236
Fuses Set	Control power surges	S0640901

Related publications

- Installation guide Securiterre 640
- Brochure Load automation systems, for safety and precision
- Safety instructions