K-CALEMATIC®

LOGISTIC SOLUTIONS

KOPRON®

ASSEMBLY, USE AND MAINTENANCE MANUAL

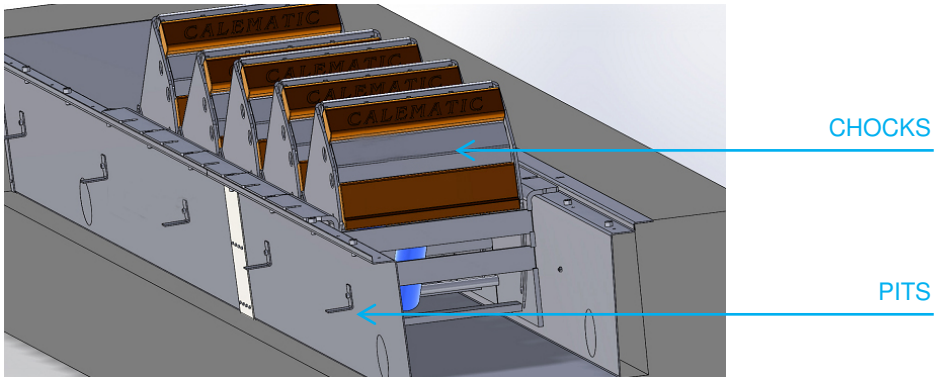
INDEX

1. GENERAL DESCRIPTION	1
2. WARNING	1
3. CONTRAINDICATION	3
4. DEFINITION OF THE NAME OF THE PARTS	3
5. NORMAL USE OF THE SYSTEM	4
6. TROUBLESHOOTING	4
7. MAINTENANCE	6
8. TECHNICAL DATA	15
9. DECOSTRUCTION OF THE SYSTEM	15
10. WORK EXCLUDED	15
11. INSTALLATION	17
12. ELETRICAL CONTROL UNIT	25

1. GENERAL DESCRIPTION

K-CALEMATIC® is an automatic chocking system designed to:

- Limit the progressive forward movement of the truck;
- Prevent the accidental starting of the trucks in the bay during transhipment operations;
- Avoid the risk of handling devices falling from the bay.



The system can comprises:

- Pits: 1 or 2
- Chocks: 5, 6, 8, 10, 12
- Control system: by manual button box or automatic servo

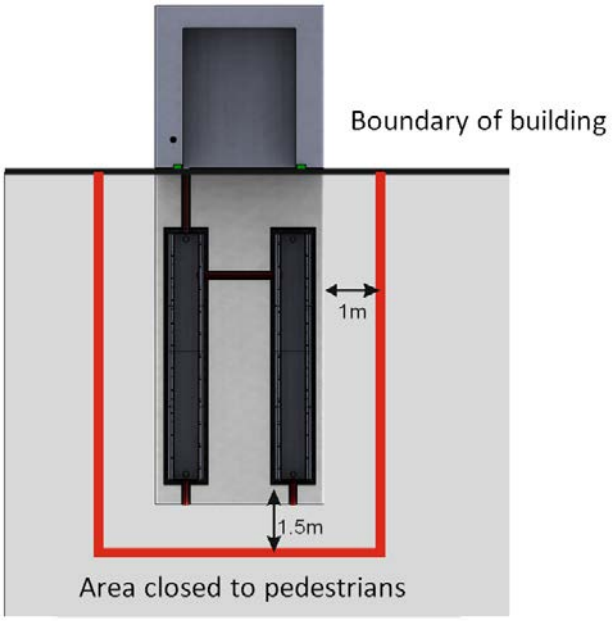
2. WARNING

2.1. GENERAL WARNING

- The system can comprises the follow elements:
  - 1 pit of 5 or 6 double chocks / K2-CALEMATIC® system
  - 2 pit of 5 of 6 single chocks / K1-CALEMATIC® system

  (For developments please contact us)

- K-CALEMATIC® system is automatic and enables any unauthorised human intervention to be excluded from the chocking area (see below) (we recommend that the manager of the establishment create and keep up to date a list of the names of the personnel authorised to intervene in the chocking area).
- The chocking area and surrounding area must be area closed to pedestrians. The user must delimit this area and warn personnel of this restriction (see diagram below).



- Any work on the chocks must be carried out with a purged air circuit by authorised, trained personnel (maintenance service, installer, etc.).
- The shutoff valve must be permanently accessible.
- The K-CALEMATIC® system must be activated in two different ways:
  - Servo control;
  - Direct manual control by button.
- In the present case the control can be:
  - by manual control knob;
  - automiatic servo at the door;
  - automatic servo at the niveller.
- If the chocks are raised in the absence of a truck, make sure that there is no one in the chocking area closed to pedestrians.

2.2. WARNING BEFORE STARTING

- Check the compressed air supply;
- Make sure that the system control elements are powered.

2.3. WARNING DURING USE

- Check that the truck is in the correct position:
  - centred in relation to the leveller;
  - at least 5 cm from the bumpers;
  - perpendicular to the bay.

3. CONTRAINDICATION

- K-CALEMATIC® system must never be raised in the presence of a lightweight vehicle as there is a risk of damage.
- The trucks must never reverse onto raised chocks unless provisions have been made for this; contact the manufacturer if necessary.

4. DEFINITION OF THE NAME OF THE PARTS

4.1. CHOCKS:

4.2. HALF PLUGS:

4.3. CONCRETE PITS:

In concrete

5. NORMAL USE OF THE SYSTEM

5.1. RAISING THE CHOCKS

- The chocks can be raised by:
  - operator action via a command button
  - subservience to the door
  - enslavement to the leveller
  - subservience to the barrier
- Check that the truck is in position:
  - Centred in relation to the leveller;
  - At least 5 cm from the bumpers;
  - Perpendicular to the bay.
- The chocks will automatically be placed in the high position when the door is opened within a lapse of time of 10 to 20s (for any developments contact the manufacturer).
- The authorisation for use of the leveller is dependent on the high position of the wedges.

5.2. LOWERING THE CHOCKS

- The chocks are lowered by:
  - operator action via a command button
  - enslavement to the door
  - enslavement to the leveller

(for any developments contact the manufacturer).

-

6. TROUBLESHOOTING

Repair operations must be carried out by trained personnel authorised by the company.

6.1. CHOCKS LOKED AT THE TOP

Case 1: Check that the compressed air supply has not been cut off. Restore the compressed air and use the system normally.

Case 2: One chock remains locked; it will have to be released manually. Follow the procedure described below.

If the chock remains locked by a tyre, ask the driver to reverse the truck a short distance to release the chock.

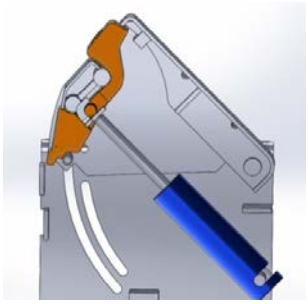
6.2. REASING A CHOCKS

Releasing a chock involves risks. Once the chock has been released it drops very quickly and may catch fingers.

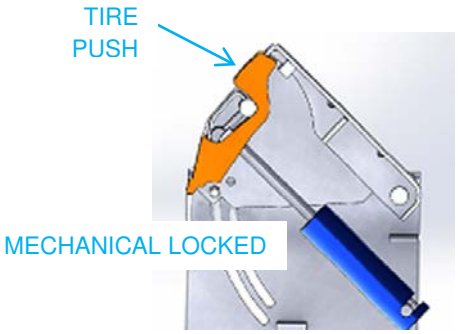
A tool of the crowbar type must necessarily be used to release the chocks and **never by parts of the human body.**

For this reason access to the chock must be provided only for authorised, trained personnel belonging to the company.

6.2.1. HOW A CHOCK LOCKS WHEN A TYRE CONTACTS IT



Raised, but not locked chock

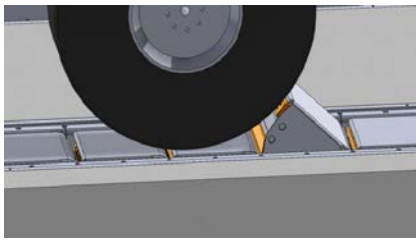
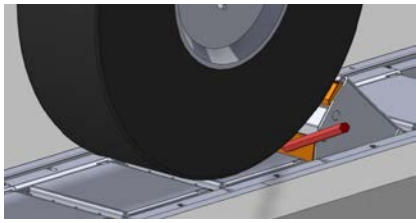
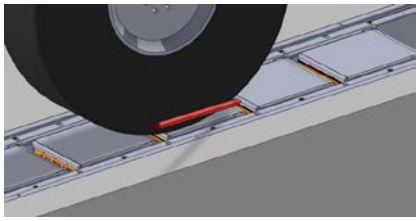


Raised, locked chock

Mechanical locking of the chock is normal and enables perfect handling of the chock under the pressure of the wheel. In the normal situation the traction of the jack lowers the chock.

6.2.2 HOW TO RELEASE A CHOCKS

In rare cases it may not be possible to loser one of the chocks.
Simply reversing the truck may be sufficient to release the chock automatically.
Otherwise manual unlocking will be necessary:

	Locked wheel
	Use of a crowbar or presser foot to unlock the chock. With this tool the operator applies a lever arm to the tyre and presses the yellow base of the chock.
	The chock drops quickly

6.2.3. CHOCK LOCKED AT THE BOTTOM

Case 1: Check the compressed air supply. Restore this supply when required.

Case 2: Inspect the servo system.

Case 3: Check that there is no air leakage (leakage noise from the chocks), if this is the case:

- Shut off the air supply and place the system in the open air;
- Remove the chocks from the pit and replace the leaking pipes in their quick-release connections as appropriate.

7. MAINTENANCE

7.1. GENERAL

Close and purge the compressed air system before working on the K-CALEMATIC® system. Maneuver **three times up** / **down** to ensure that the system is empty of air.

As other machines and particularly those incorporated in safety systems, the K-CALEMATIC® system requires maintenance operations. We recommend arranging two inspections per year. One simple inspection visit and one visual inspection of the inside of the pit (see maintenance instructions). For any additional information refer to the maintenance guide.

- Only the jack has a more limited service life depending on its use
- Have the system inspected by an approved installer at least every ten years

7.2. INSPECTIONS

Check:

- That there is no air leakage.
- That there are no foreign objects present that may interfere with the raising and lowering of the chocks, a piece of pallet, etc.)
- Raise the chocks at no load to check that they are all operational: a single visual inspection will suffice.
- The distributors and jacks are designed for several thousands of operation: they do not therefore require any lubrication until several years of use.

7.3. REMOVING THE CHOCK FROM THE PIT

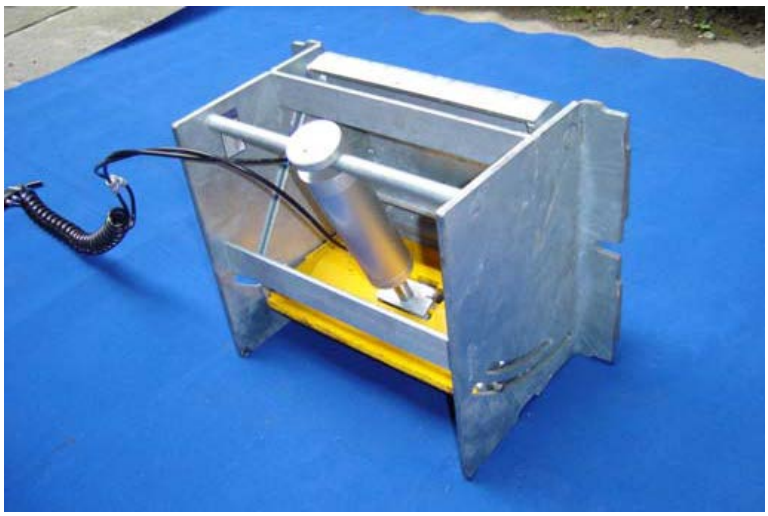
Close and drain the compressed air circuit before any work on the K-CALEMATIC® system. Maneuver three times up / down to ensure that the system is empty of air.

7.4. REMOVING THE CHOCKS

The chock is heavy and has moving parts. It is essential to wear gloves and safety shoes for its removal.

- Remove the chock from the pit (See paragraph on removing the chock):

- Turn over the chock a ¼ of a revolution by lifting it on the joint pin side:

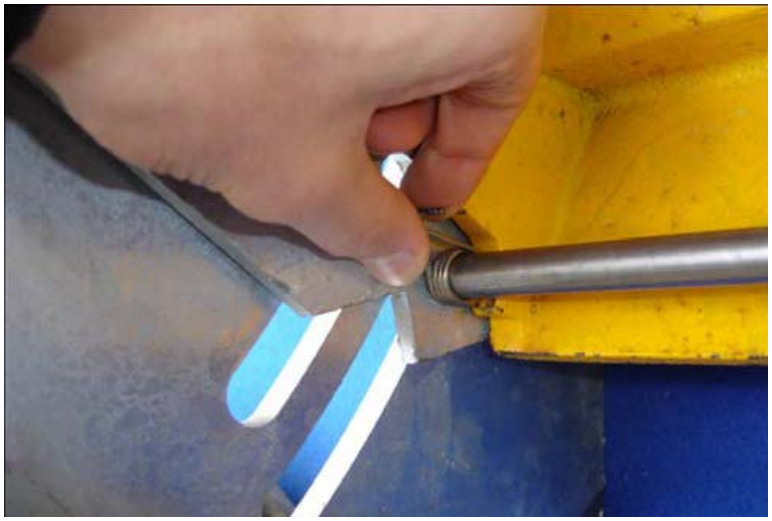


- Release the back plate from the jack:

- Slide the jack into the bottom of the chock:

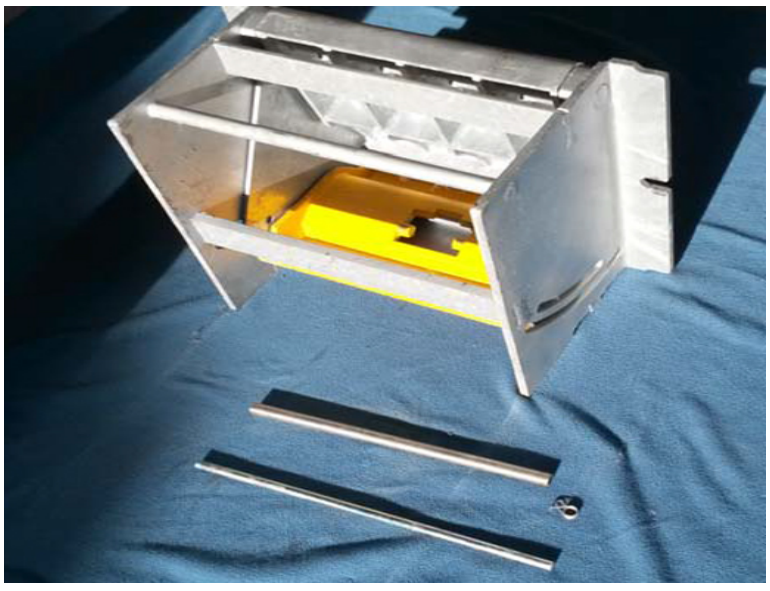
- Disconnect the front plate from the jack and remove the jack (when refitting the pneumatic pies must necessarily pass through the bottom of the chock, as shown in this photo):

- Squeeze the springs so that they can be slid and moved towards the inside of the chock:

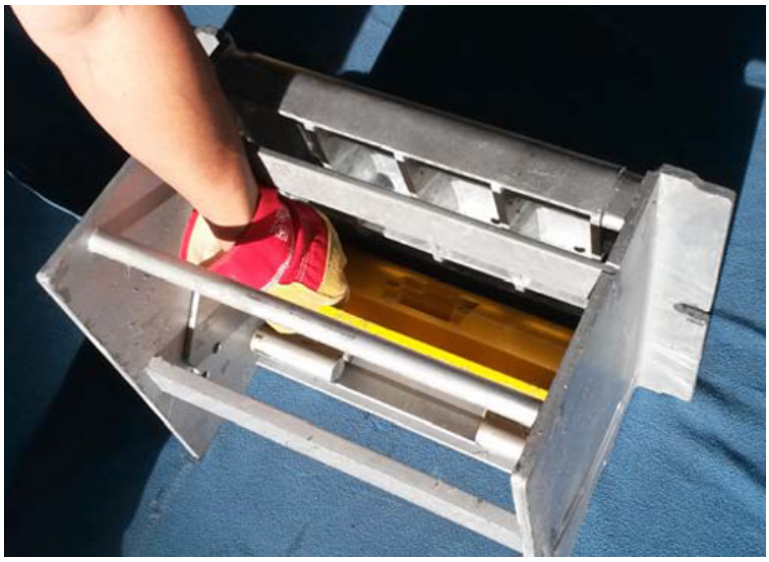


- Slide the rod to the right; remove the rod from the inside of the pipe:

- Rod removed:



- Raise the cast iron treadle:



- Remove the cast iron pedal:

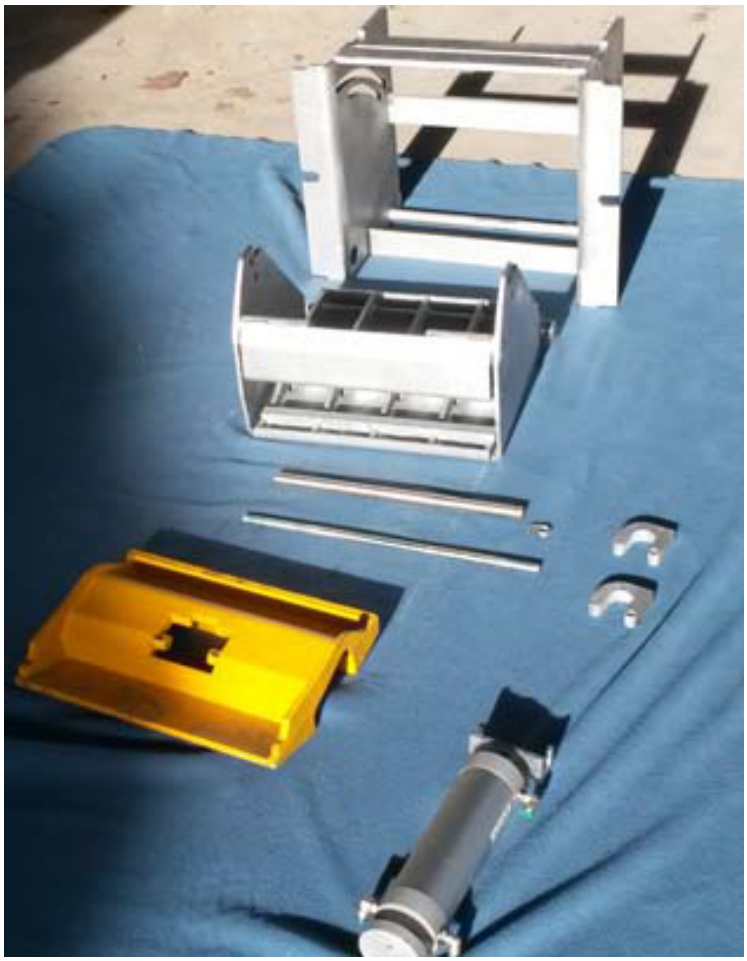
- Remove the C-shaped parts:

- Overturn the chock:

- Continue rotating by only supporting the frame. The “chock” section remains on the floor:

- By a “right – left” movement of the chock remove the rotating shaft from the chock frame:

- The chock has been removed:

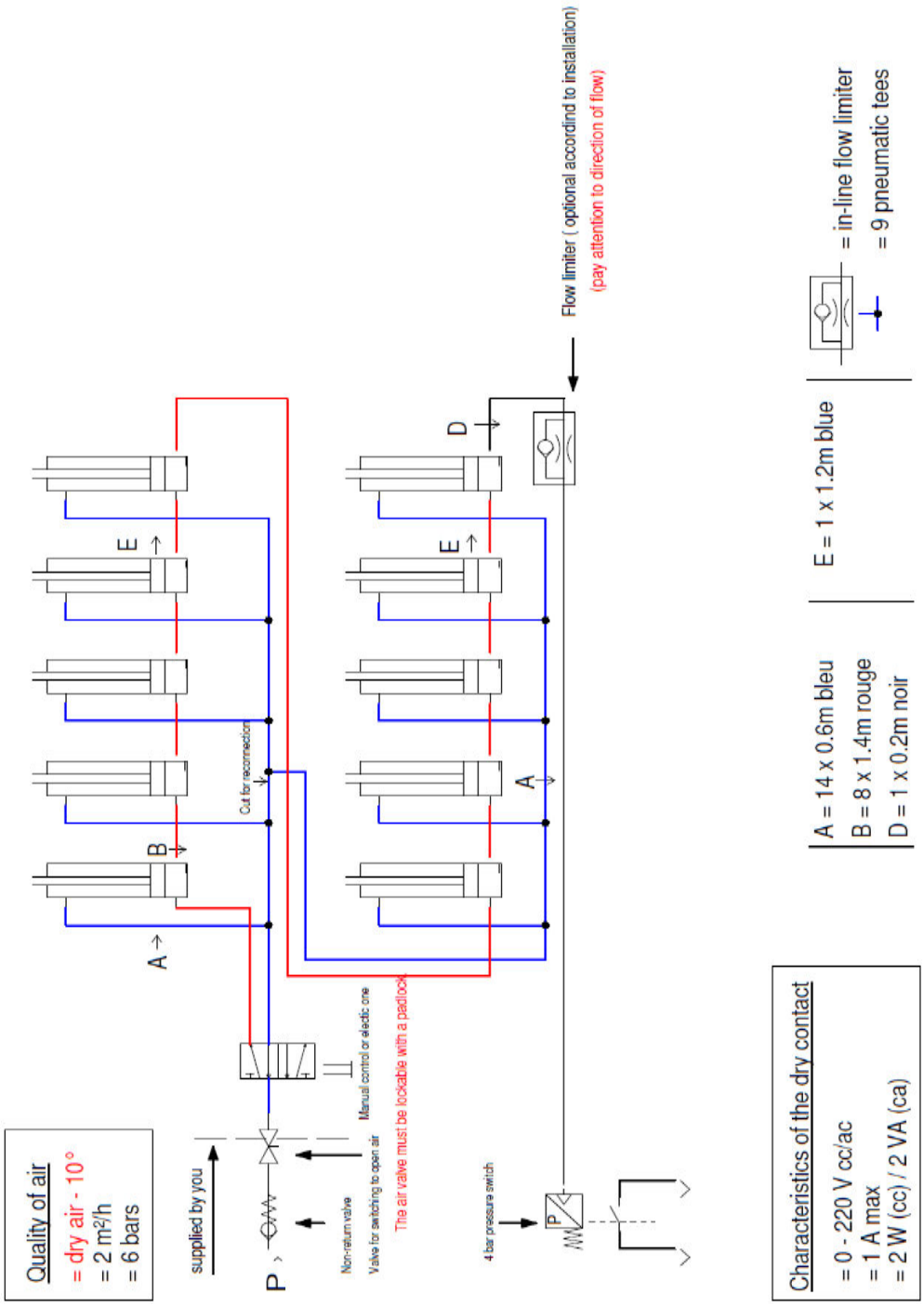


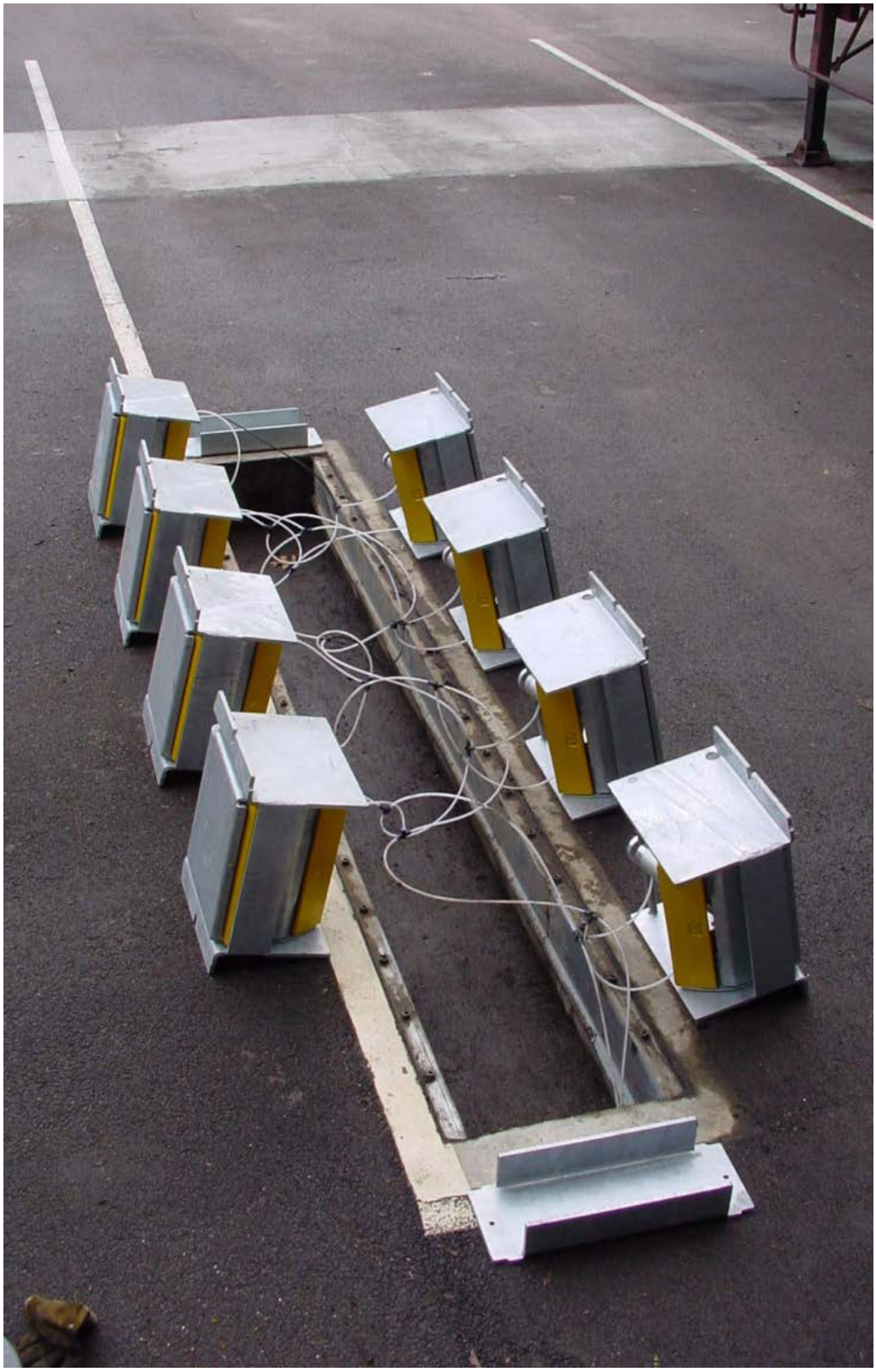
7.5. REASSEMBLING THE CHOCK

Follow the instructions for removing the chock but in the reverse order.

- The replace the chock in the pit in its initial location.
- Switch the air pressure to the system back on once all the chocks have been reinstalled.
- Check that there is no noise from leaking air.

7.6. PNEUMATIC DIAGRAM





8. TECHNICAL DATA

8.1. NOISE

When in operation the system generates less than 70 dB.

8.2. WEIGHT

ELEMENTS	WEIGHT
Chock	70Kg
Half-plug	14Kg
Concrete pit	1 250Kg
Steel pit	80Kg

9. DECOSTRUCTION OF THE SYSTEM

The chocks, the half-plugs as well as the distributor must be placed in the waste bins for meals. The pipes must be placed in the waste bin for plastics. The underground concrete pits must be closed with concrete or dug out, transported strapped in a suitable vehicle and deposited at a tip. The electrical panel, if present, must be placed in the waste bin for electrical appliances.

10. WORK EXCLUDED

Work to be carried out by the customer when installing K-CALEMATIC®

RECEIVING THE PITS:

- Each PIT weighs 1.25 tons.
- Unload the pit under the responsibility of the company designated by the site manager, the project owner or the customer. In most cases the unloading is carried out by the civil works company.
- The date of delivery of the pit must be confirmed to us by the customer at least 3 weeks in advance.

INSTALLATION OF THE PITS:

- Construction of the trenches capable of receiving the pits.
- Pouring of the binding concrete at the bottom of the pit. The foundation must allow load lowering rates of 2 tons/m^2.
- Placing the pit on the binding concrete: the upper part of the pit must be aligned with the finished floor level. The bottom of the pit must remain a distance of 330 mm from the finished floor.
- Connection of the pits to the rain evacuation system at the low point of each pit.
- Incoming technical duct (minimum diameter of 80 mm) running from the pit to the inside of the building on the side where the leveller control box is located and a connecting duct between two pits in the same loading bay.
- Sealing of the pit on 4 sides (support the inside of the pit during sealing).

IF THERE A SIGNALING LIGHT OR TRUCK PRESENCE DETECTOR OPTION:
electricity in feed into the loading bay: 220 V - 10 A.

COMPRESSED AIR AND ELECTRICITY DEMAND

- Each arrival of compressed air in the loading bay inside of the building has to follow forward recommendations:
  - Height approx. 1,50 m. Side of leveller control box for renovation, left hand side for new buildings.
  - Non-return valve upstream of the block valve.
  - Block valve with venting air from the downstream.
  - The output of the block valve has to be an instant connection diameter 6 mm.
  - Air quality:
    - DRY air (-10°C) / 6 to 10 bars
    - 40l/h to 6 bars
    - Section of the tube for the air distribution suitable according to the numbers of equipments installed.
- Dew point lower than or equal to -10°C.

REQUIREMENTS FOR THE PRODUCTION OF COMPRESSED AIR:

Needed a signal of loos of pressure from compressor via low pressure switch alarm.

Recommendations:

- Take advice from a specialist of compressors and air distribution manufacturer.
- The compressor room must be protected from negative temperatures.
- The air production must be redundant to ensure availability of the equipments.
- Provide grids (high and low) ventilation in the compressor room, dimensions to be defined by supplier.

11. INSTALLATION

11.1. DELIVERY OF THE CHOCKS, HALF COVER PLATES AND PITS

11.2. INSTALLATION OF THE PIT(S)

11.2.1. PREPARATION OF THE BOTTOM OF THE PITS:

The bedding must enable the lowered loads due to the pit to be received: 2 tonnes/m^2.

11.2.2. HANDLING OF THE PITS:

- Each pit must necessary be handled by straps of sufficient length passing under the part in the recesses provided for this purpose.
- A fork lift truck may be used provided that a distance between the forks of 1.8 meters is maintained.
- Each pit must always rest on 2 pieces of wood placed on the side of the recesses.

- Each pit will be installed on two wood pieces, placed beside pit reservations

11.2.3. INSTALLATION OF THE PITS

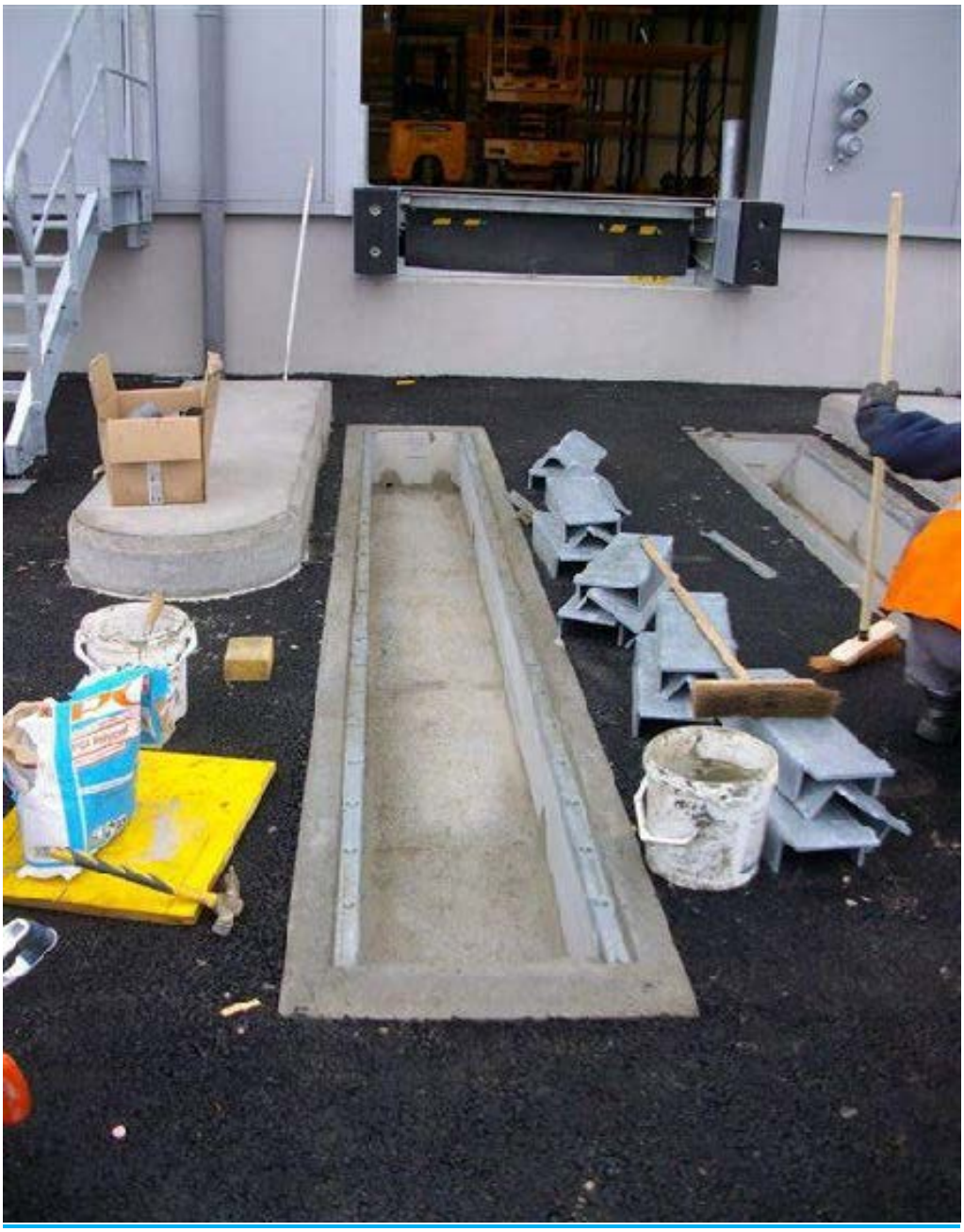
(According to implantation drawing dimensions)

11.2.4. POSITIONING OF FLEXIBLE DUCT AND WATER DRAIN:

- Connection of the lower point of the pit to the water drainage.
- Place a flexible duct between the pit and the control box in the building diameter 80 mm. (According to implantation drawing dimensions)

11.2.5. SEALING OF THE PITS:

Sealing of the pit on the 4 sides (underpin inside the pit during sealing operation).



11.3. INSTALLATION OF THE CHOCKS

11.3.1. POSITIONING OF THE CHOCKS ALONGSIDE THE PITS

11.3.2. POSITIONING OF THE CHOCKS ALONGSIDE THE PITS

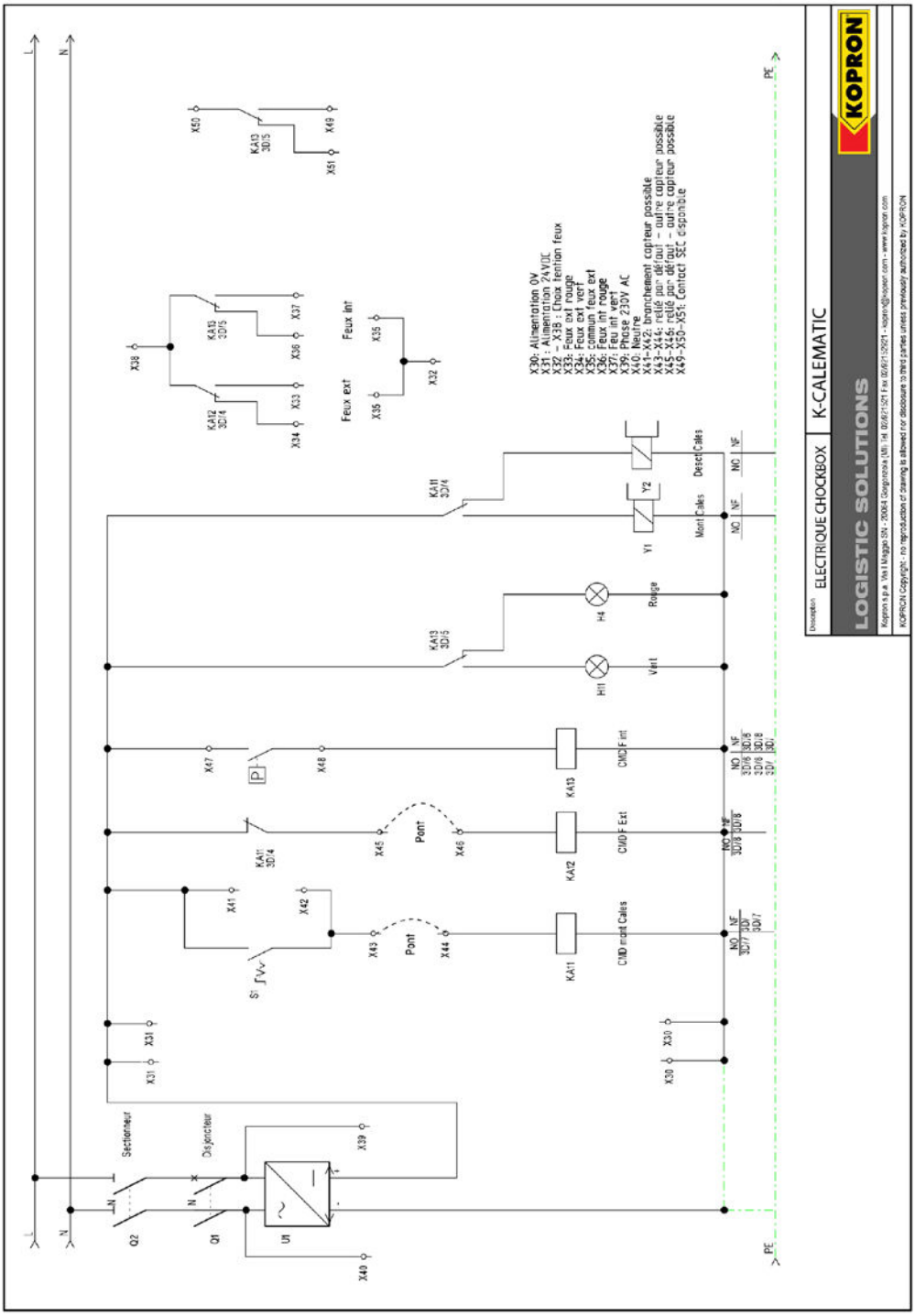
11.3.3. FINAL INSTALLATION OF THE CHOCKS AND HALF COVERS IN THE PITS

The chocks are installed one behind the other in the pits.

During assembly the chocks are centered automatically by means of the locating pins arranged on the pit.

12. ELETRICAL CONTROL UNIT

12.1. CIRCUIT DIAGRAM



TERMINAL	FUNCTION
X30	0V AC Power supply
X31	24V DC Power supply
X32-x38	Voltage selection for traffic lights
X33	Red exterior signal light
X34	Green exterior signal light
X35	Exterior signal light shared
X36	Red interior signal light
X37	Green interior signal light
X39	230V AC Live
X40	230V AC Neutral
X41-X42	Door contact or rotary switch connection
X43-X44	Bridged by default - may be used for another sensor
X45-X46	Bridged by default - may be used for another sensor
X49-X50	DRY NO Contact - Chocks raised
X50-X51	DRY NO Contact - Chocks raised

12.2. OPERATION

This unit controls:

- the K-CALEMATIC® system via a regulator installed either on the door or a rotary button
- the bay's interior and exterior traffic lights
- the authorisation of the bay-levelling, or other, system when the chocks are activated.

The lamps on the front of the control box repeat the interior traffic light signals.

- Basic operation of the traffic lights with the factory wiring:

	(Door raised or rotary switch "on")	**No contact between X41 and X42 (Door lowered or rotary switch 'off')**
Chocking not operational	Interior traffic lights / Exterior traffic lights Bay levelling system blocked	Interior traffic lights / Exterior traffic lights Bay levelling system blocked
Chocking operational	Interior traffic lights / Exterior traffic lights Bay levelling system authorised	Interior traffic lights / Exterior traffic lights Bay levelling system authorised

12.3. CONNECTIONS

12.3.1. COMPRESSED AIR

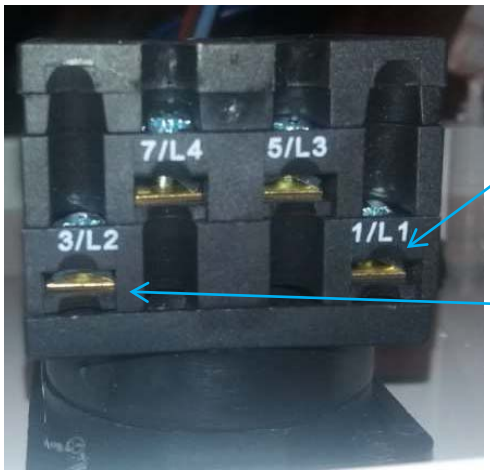
The pressure switch (on the right of the control box) is electrically pre-wired. A NO contact closes when the chock system's hydraulic pressure is above 4 bars, meaning that the chocks are raised.

The black hose from the chocks must be connected to the pressure switch.

12.3.2. ELECTRICAL

CONTROL UNIT POWER SUPPLY

The control box is powered by a direct 230VAC connection to the isolating switch.



Overhead view of the isolating switch.

OPERATION

The control unit is supplied with bridges fitted across terminals X41 and X42, and across terminals X45 and X46.

Terminals X43 - X44 can be used to add a further condition for chock raising.

Terminals X45 - X46 can be used to add a further condition for exterior traffic light control.

Contact switches X50-X51 and X52 can be used to signal another independent system, such as a bay leveller, that the chocks are raised.

12.3.3. TRAFFIC LIGHT POWER SUPPLY

The control box is pre-wired to provide 24VDC power the traffic lights. This is why terminal X38 is connected to 24 VDC and terminal X32 is connected to 0VDC.
The control box may be configured to provide 230VAC power to the traffic lights. To do this,remove the wires connecting X38 to 24VDC and X32 to 0VDC, then connect X38 to X39 and X32 to X40.

12.4. SPECIFIC INSTRUCTIONS REGARDING THE USE OF NORSUD GROUP TRAFFIC LIGHTS AND SENSORS

If a PA18CAD04PAWS bay-door sensor is present, it should be installed at a height of 2.5m on the bay-door guide to ensure the best possible operational life.

If the aim is to detect when the door is only just open it should be fitted above the lintel and connected as follows:

Brown wire to X41, blue wire to X30 and black wire to X42.

If the aim is to detect when the door is fully open it should be fitted just

below the lintel and connected as follows:

Brown wire to X41, blue wire to X30 and white wire to X42.

Two-colour LED traffic lights

	Interieur / interior	Exterieur / exterior
Blanc / white	X35	X35
Vert / Green	X37	X34
Marron / brown	X36	X33

12.5. TECHNICAL SPECIFICATION: DIMENSIONS

The control unit has a 230V AC power supply connected to the isolating switch as indicated in paragraph 12.3.2.

- Electrical protection: fuse
- Nominal voltage: 250 VAC
- Nominal current: 0.16A
- Breaking capacity: 35 A
- Specification: Time-lag T
- Operating temperature: -55 ° C to 125 ° C

- Environmental classification: 55/125/21 acc. IEC
- Unit weight: 1 g
- Storage conditions: 0 ° C to 60 ° C, max. 70% r.h.
- Product labelling: assigned current, nominal voltage, specification, breaking capacity, authorisations
- Dimensions: height 290 mm, width 240 mm, depth 130 mm
- Protection rating: IP 65 according to DIN EN 60529
- Material: box and cover in ABS (UV protected)
- Colour: grey, RAL 7035
- Installation temperature: -5°C to +60°C according to DIN EN 60670
- Heat resistance: up to 70°C max. according to DIN EN 60695-10-2
- Flame resistance: 650°C according to DIN EN 60695-2-11.

12.6. SYSTEM DISPOSAL

The electrical junction box must be disposed of along with other electrical devices.

12.7. EC COMPLIANCE DECLARATION

In compliance with the 2006/42/CE Machine Directive.

Declares that this **"Electric control unit for chock system"** complies with the following legislation and European Directives:

Directive 2006/95/CE Low Voltage

Directive 2014/30/UE Electromagnetic compatibility (EMC)

NF EN 60204-1 Machine safety - Electrical machine equipment.

COMPLIANCE STATEMENT WITH MACHINE DIRECTIVE 2006/42/CE

K-CALEMATIC® is compliant with the requirements of the European Directive 2006/42/CE

The Reference Standards consulted during its conception are the following:

- EN 60 204-1 (2009): Electrical equipment for machinery
- EN 282 (1996): Safety requirements concerning hydraulic equipment
- EN 13 849-1 (2008): Safety-related portions of control systems.

As a result, to the constant evolution of the products, we reserve the right to modify or amend the commercial and technical characteristics of this product, without prior warning. The characteristics are published on an indicative basis and do not represent a compromise from our company or for our distributors.

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RELEASE SUMMARY

VER 1.0 - 28/03/2018

OVER 35 YEARS OF SUCCESS WITH:

FINCANTIERI | Lamborghini | FEDERAZIONE ITALIANA GIUOCO CALCIO | F.C. Internazionale | aprilia | Eni

Magnetti Building | Bologna Fiere | CATERPILLAR® | L'ERBOLARIO LODI | EXPO MILANO 2015 | ceramica SANT'AGOSTINO

PEPSICO | IVECO | AnsaldoEnergia | General Motors | DHL | Waitrose

AND OTHER 115.000 CUSTOMERS SATISFIED

Quality Management System UNI EN ISO 9001 Certified
Factory Production Control UNI EN 1090-1 Certified
Welding of Metallic Materials UNI EN ISO 3834-2 Certified
Steel Processing Center N° 2533/13
Applicable Standard: UNI EN 13241-1

CE

Member of CISQ Federation
RINA
CERTIFIED MANAGEMENT SYSTEM
ISO 9001

CERTIFICAZIONI
CERTIFICATIONS

Kopron attraverso le certificazioni di qualità offre un'ulteriore garanzia sull'efficacia e l'efficienza dei propri prodotti.

Through certifications Kopron offers a further guarantee on efficiency and quality of their products.

KOPRON

LOGISTIC SOLUTIONS

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