ERMATIC® MODULAR RANGE

VARIOUS NETWORKS- INDUSTRIAL APPLICATIONS

NORINCO

les solutions en fonte à graphite sphéroïdal

Norinco, your partner every day

Our culture of forging long-term partnerships is our key strength. With this catalogue containing Norincos complete modular range of products, we aim to support our customers by responding to their needs and specifications. We offer our partners a global service and technical expertise based on our development capacity.

NORINCO develops, produces, and markets the most extensive ranges of solutions in ductile cast iron, galvanised steel and aluminium for:

- Municipal castings & accessories
- Telecommunications and cable networks
- Major projects such as tunnels, exhibition halls, ports and airports
- Watertight networks: MODULAR Ermatic® range

A few figures on NORINCO:

- 4 industrial sites producing more than 120 000 tons
- 8 commercial subsidiaries
- Customers in more than 140 countries across 5 continents
- More than 1000 employees

Norinco has been a member of EJ GROUP since 2004. Headquartered in East Jordan, Michigan, USA, the EJ GROUP with manufacturing facilities in North America, Europe and Asia, multiple research and development centers, and a global network of subsidiaries, distributors and agents, offers global resources to local markets throughout the world.

NORINCO
www.norinco.fr

Some of our references throughout the world

Telecommunications and cable:
France Telecom, Telecom Italia, Infratelitalia, Fastweb, Metroweb, Wind, Colt, AEM Telecomunicazioni, Telefónica, ONO, Deutsche Telekom, SingTel, PLDT, Portugal Telecom, TELKOM, INDOSAT, TELKOMEL, Kingston Communications, PACIFICTEL Ecuador, CTC Telefónica Chile..

Airports:
Heathrow (UK), Madrid Barajas (Spain), Roissy CDG (France) Dublin (Ireland), Frankfurt, Stuttgart, Munich (Germany), Athens (Greece), Dubaï International (UAE), Linate Milan Milan Malpensa, Ezeiza (Argentina), Miami International Airport (USA), Johannesburg International Airport (South Africa), Sangster International Airport...

Ports and other major projects: Dubaï Dock (UAE), Portsmouth (UK), Dunkerque, Rouen (France), Trieste (Italy), Valencia (Spain), Channel tunnel, Disneyland Paris, TGV train stations, Bilbao Exhibition Centre, etc.. .

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NORINCO will not be responsible under any circumstances for having suggested a place of installation by use of this brochure.

ERMATIC® ACCESS COVERS AND FRAMES FEATURES

Ermatic® is a comprehensive and highly specified range of access covers for diverse underground services

Sewerage: inspection pits for sludge chambers, access shafts for large plants.
Telecommunications: cable jointing chambers.
Electricity: lighting, signals, transformer pits, cable joint boxes.
Potable water, gas, district heating, valve chambers, manifold chambers and meter chambers

In the following environments:

Airports and ports,
Railways,
Power stations,
Water treatment and purification plants,
Manufacturing plants,
Industries,
Exhibition centres, leisure parks, tunnels, Stadiums...

Ermatic® assures protection against damage, debris or aggressive chemicals, and allows designers to conceal underground services, maximising productive use of the unobstructed surface.

Modular construction

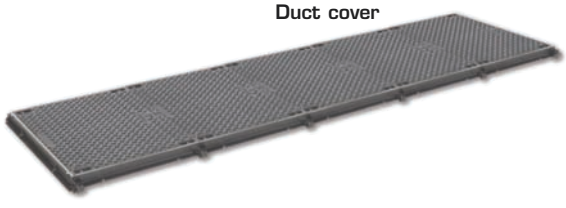
The use of modular elements gives a vast range of sizes

rame elements (side frames and end plates) are assembled using bolts and aluminium joints to provide linear openings for even the longest ducts.

Above clear opening spans of 1200 mm, Ermatic® units employ removable beams supported in boxes which are fixed to the frames. This permits the construction of units to suit the largest openings.

1/2/3 – part unit

Duct cover



Multiple unit with removable beams

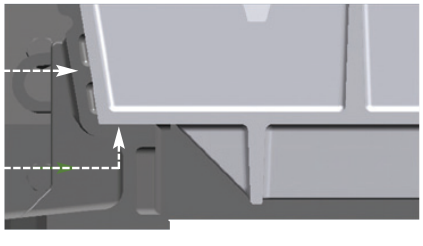
Stability and sealing

The horizontal and vertical faces of the cover and frame are machined to give metal-to-metal contact between the seating faces, within a tolerance of 0.2 mm.

Stability: when correctly installed, Ermatic® products are non-rocking, silent under traffic and prevent the ingress of dust and debris.

Sealing: the addition of a film of grease to the machined contact faces of the cover and frame renders the Ermatic® cover watertight under normal rainwater conditions.

Machined contact faces



Environment, security, ergonomics, the Ermatic® range benefits from the advanced technology of the Norinco Group:

aesthetics of the project is enhanced: the covers can be recessed to receive a similar material to the surround,
rapid and easy access for maintenance and development of the network,
security reinforced by the strength and stability of the covers.

Types of surface finish available

Designed for a wide range of applications, The Ermatic® range offers a choice of covers to suit every specification of performance and/or appearance.

Solid top cover with uniform anti-slip surface

This cover offers unequaled performance whilst being lighter than recessed covers of a comparable size when filled with concrete. Installation costs are reduced and the performance is not influenced by the quality of the concrete infill.

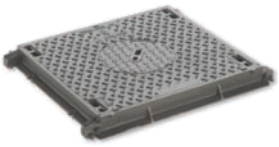
Cover recessed for concrete infill

In classes B 125 and C 250, the ribs are positioned below the surface of the cover to permit the installation of thin paving.This type of cover is particularly suited to large openings where aesthetic considerations are a priority.
The concrete infill is undertaken in accordance with the requirements of EN124 and with Norinco's specifications detailed in this brochure (see page 85)

Other types:

Covers recessed for small element paving for pedestrian areas (see pages 20 - 42 - 64)

Cover with central removable plug (see pages 22 and 34)



Painting

Covers and frames: painted with water soluble black paint except for machined surfaces and surfaces in contact with concrete. Where products are delivered in a dismantled condition, all machined surfaces are coated with a protective film.

Handling with ease

Covers slide in and out of the frame along greased, machined seatings, requiring no vertical lift.
Ermatic® key: ergonomically assists with safety. Further reduces the effort required to remove and replace covers.

Universal keyways

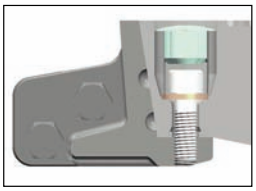
For use with many different types of common lifting keys.
Fitted with polyethylene blanking plugs to prevent the entry of debris or concrete.

Ribs extend below the underside of the cover

To protect the machined seatings, the reinforcing webs are deeper than the cover. This also prevents any greased surfaces coming into contact with the floor (except for some B 125 recessed covers). (see handling page 86)

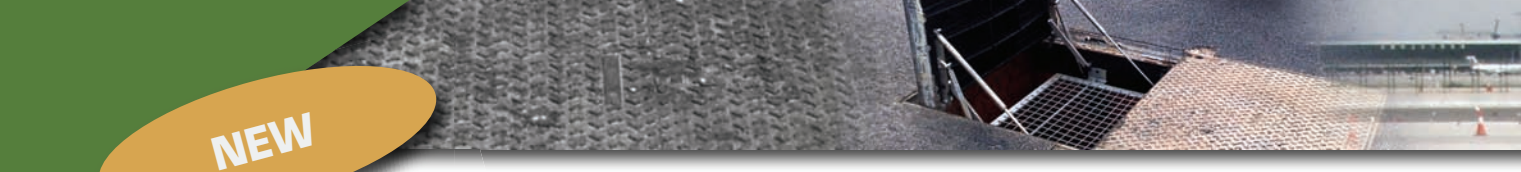
Locking of the covers

In order to ensure an easier and more optimised installation of our Ermatic® systems, it has been decided to supply all the products in D400 systematically locked. For E600 and F900 productslocking is recommended for the same reasons.



Adjusting bolts

In order to facilitate the levelling of Ermatic® systems, adjusting bolts are supplied with the products. These bolts will allow, if necessary, to adjust the height of the system to the final level and correct any possible defects of the civil work.

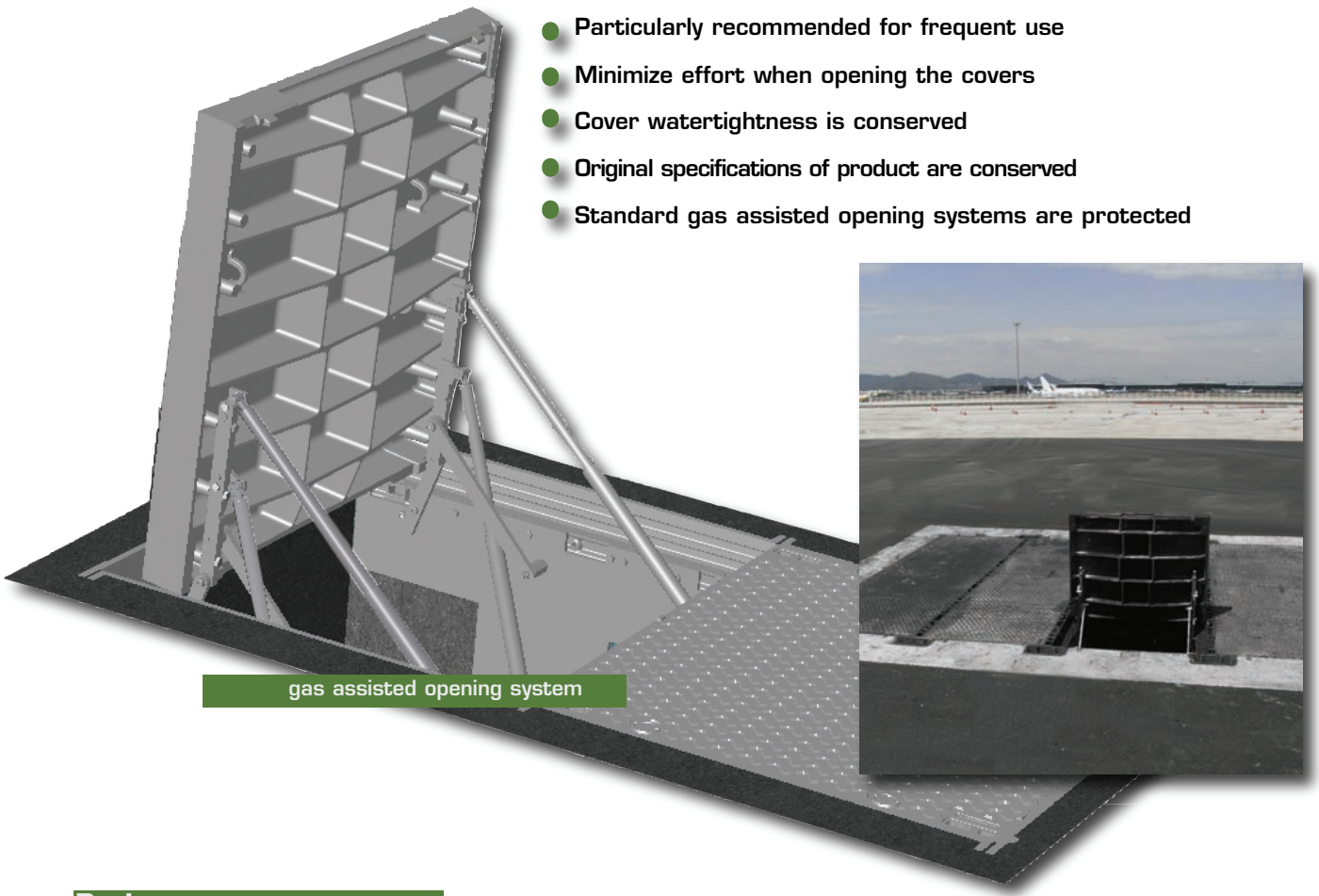


NEW

HINGES & GAS ASSISTED OPENING SYSTEM ON THE COVERS TO EASE HANDLING

Advantages

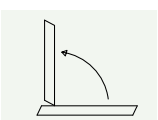
- Particularly recommended for frequent use
- Minimize effort when opening the covers
- Cover watertightness is conserved
- Original specifications of product are conserved
- Standard gas assisted opening systems are protected

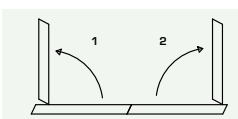


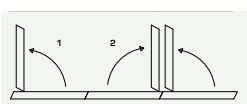
gas assisted opening system

Projects: contact us

Hinge of Ermatic® covers:
principle and opening order of covers

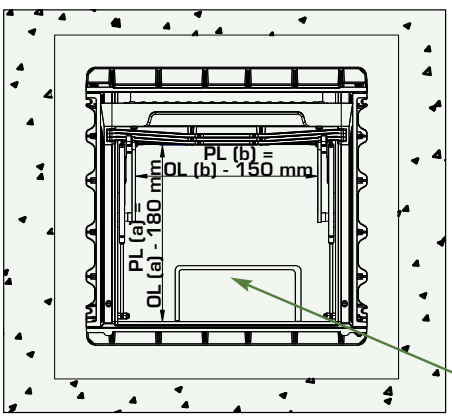




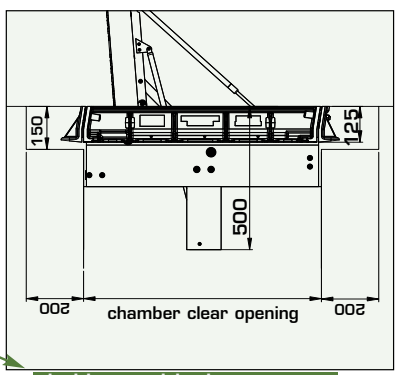


changing of standard dimensions

clear opening



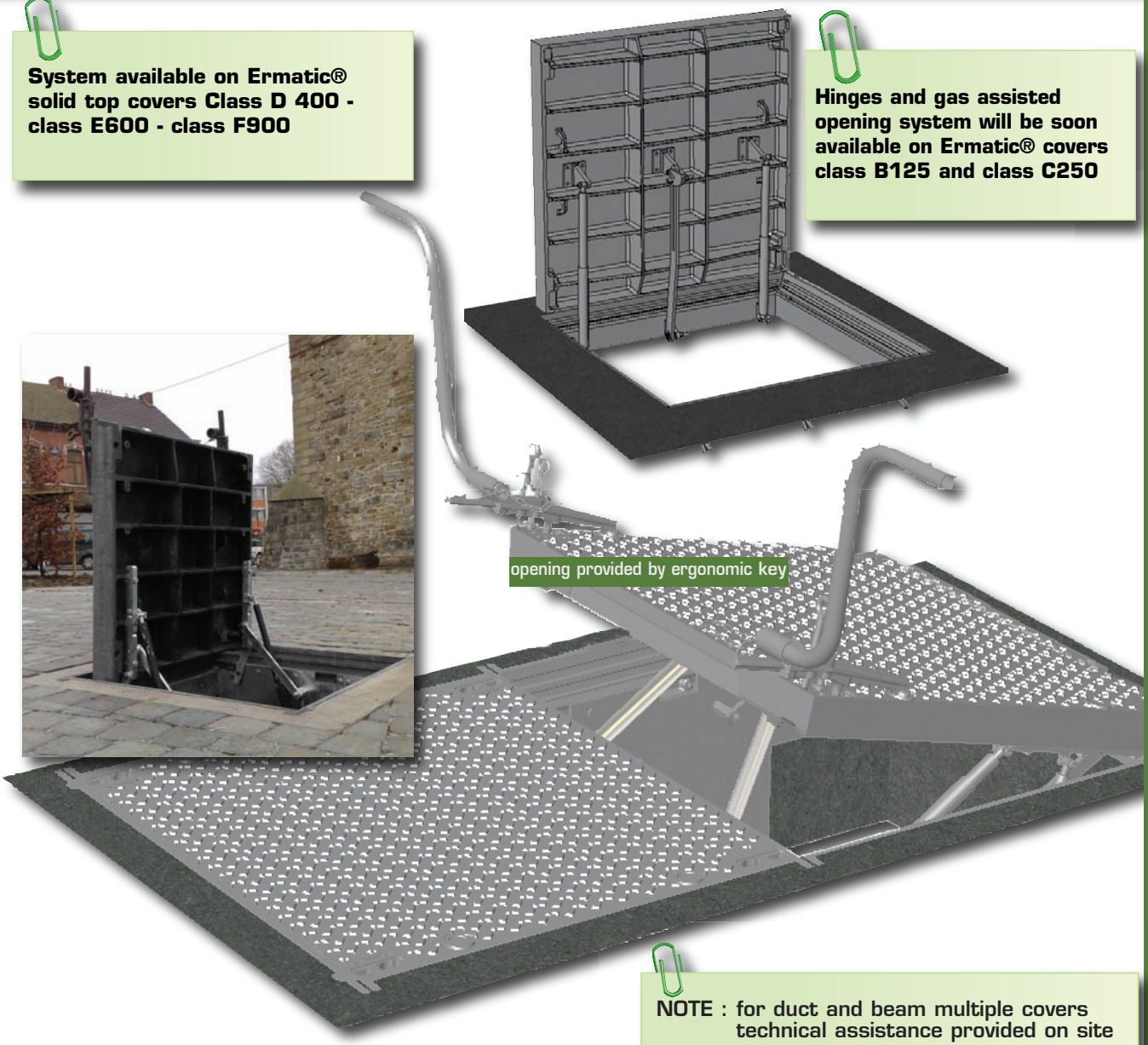
height overall dimension



ladder positioning

System available on Ermatic® solid top covers Class D 400 - class E600 - class F900

Hinges and gas assisted opening system will be soon available on Ermatic® covers class B125 and class C250



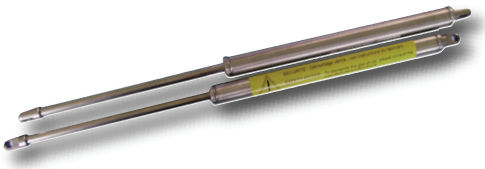
NOTE : for duct and beam multiple covers technical assistance provided on site

Operation

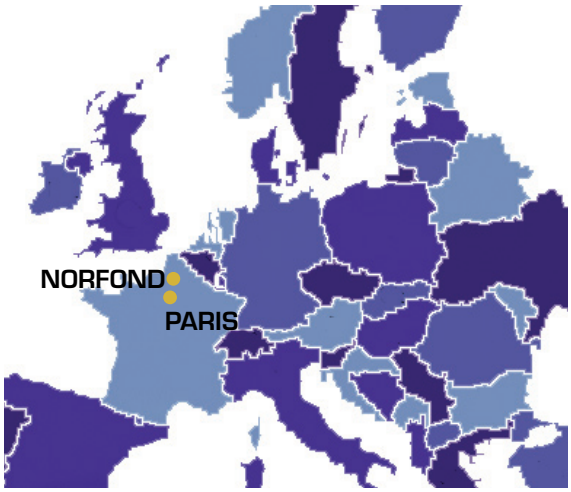
opening order of hinged covers

Options

- Stainless steel gas strut or spring loaded struts
- Deployable safety barrier
- Fall protection safety grid
- Integral skirt supporting the struts and acting as shuttering
- Motorised opening of covers



A fully European production



ISO 9001

Ermatic® products are fully conceived and produced in a European foundry .

Norfond is certified by third parties for conformity to ISO 9001. This quality management is recognised as a reference for design, development, production, installation and after-sales service.

ISO 14001

Environmental responsibility, conformity with standards, compliance with laws and a resolutely eco-friendly approach are all factors strengthening NORINCO's reputation, its image and its growth potential. **Protecting the environment is at the heart of our strategy.**
NORFOND is ISO 14001 certified since 2008.

Expertise in design

As per ISO 9001: 2000

As per the exact requirements of clients.

Following EN124: 1994 standard and others standards.

Expertise in production

Material: Ductile (or SG) cast iron.
Products are 100% ductile iron, recyclables

Total integration of every manufacturing process.

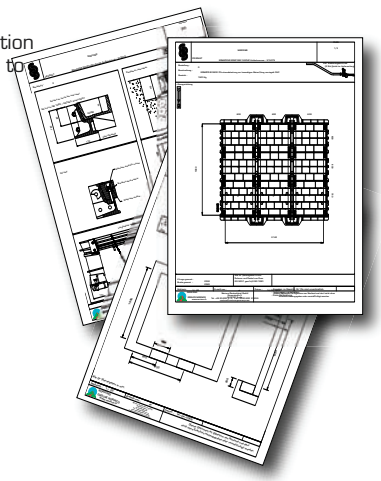
Control manufacturing process and final assessment.

Expertise in customer network

Comprehensive commercial service.

Rapid supply of documentation.

Technical assistance:
At the design stage: from conception to installation, experts are available to assist with the selection of suitable products, including the provision of drawings of covers and rebates for ducts and beamed multiple covers.
During Installation: for the correct installation of large or complex covers, the production centre can provide,upon request, skilled technicians to assist with the installation process.
After-sales service.



Products are made from 100% ductile iron:
Ductile iron provides reliability and strength. Ductile iron is produced by converting the inherently brittle grey cast iron, by the addition of magnesium before pouring. This gives a material with high flexibility, particularly resistant to forces and shock. (See p. 87)

COVER AND FRAME CONFORMITY

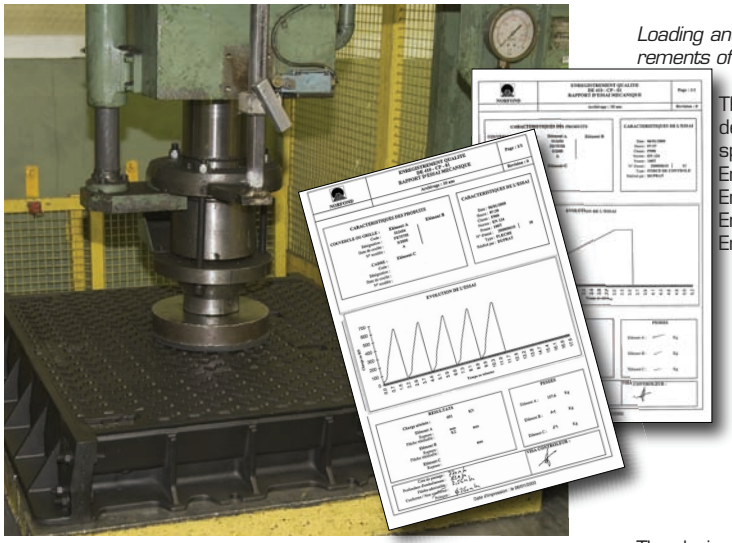
EN124 Standard

Determines the following characteristics of covers and frames:

Principles of construction: frame depth, depth of insertion, seatings, surface condition etc.

Material used for the manufacture of covers.

Testing regime: test loads and permanent set limits



Requires a quality system equivalent to ISO 9002.

Requires that products are clearly marked with the mark of a certification body.

Ermatic® Range

All Ermatic® covers are designed to meet all the requirements of the EN124 standard.

All Ermatic® covers are manufactured from ductile iron according to ISO 1083 and EN 1563.

All solid top covers and recessed B125/C250/D400/E600 covers are tested in the as-cast condition and meet all the test criteria of the EN124 standard. F900 recessed covers and ER6R ...120 attain resistance characteristics after filling with concrete, complying with EN124 standards and the recommendations on page 85.

Loading and conformity certificates in accordance with the requirements of EN124

The dimensions of removable beams in multiple units are derived from the following French specifications

Ermatic® B 125: .....Loading 500 daN/m²
Ermatic® C 250: .....CCTG volume 61 - clause 2
Ermatic® D 400: .....CCTG volume 61 - clause 2
Ermatic® E 600/F 900: .....ADP and STBA

The design and manufacture of Ermatic® covers is undertaken within one facility operating a quality system certified by third party to ISO 9001.

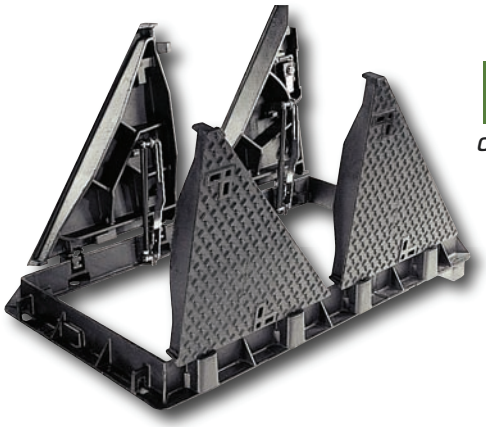
The EN124 standard is limited to covers with a clear opening dimension "1000 mm. Consequently, units above this dimension, particularly those that utilise removable beams, are outside the scope of EN124. However, some 1,2 and 3 part solid top units, from which multiples are constructed, carry third party certification to conform with the requirements of EN124 (please consult us for further information).

Product characteristics are dependent upon correct installation in accordance with the recommendations on p. 79. Drawings, photos, dimensions and weights are given as an indication without any contractual value. Our policy is one of continuous product improvement, we reserve the right to modify product specifications without prior notice.

OTHER TECHNICAL SOLUTIONS

Norinco also has other ranges of innovative products for all applications.
Norinco's commercial and technical departments work together to consider specific product development studies in close collaboration with clients. If you have any such project where the ideal Ermatic® cover is not depicted in this catalogue, please contact us:

Telecom and cable networks



SG cast iron triangular covers and frames
SG cast iron triangular covers and galvanised steel frames

Class B125 - C250- D400 - E600 - F900

Municipal castings

SG cast iron covers and frames

Class B125 - C250- D400 - E600 - F900

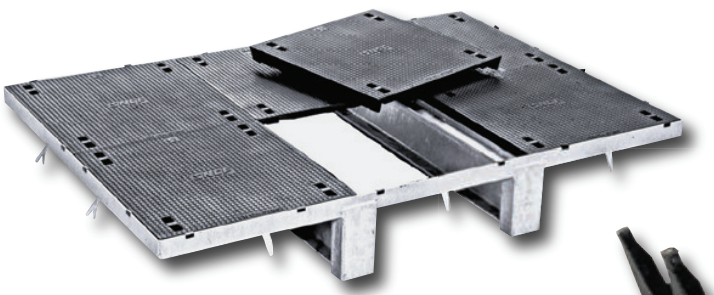
SG cast iron gratings, duct gratings and kerb gully gratings

Class F900 - E600 - D 400 - C250 - B125

Other solutions

Multiple access covers
and frame with removable beams

SG cast iron cover
Galvanised steel frame



Multiple access covers and frame with removable beams

SG triangular cast iron standard or hinged cover / Galvanised steel frame

Class B125- C250

LOADING CLASSES AND THEIR APPLICATIONS

The EN124 standard introduced the idea of groups and minimum class, depending on the place of installation of access covers and frames.

Recommended Ermatic®

GROUP 1 (class A 15 minimum)

Design load: 15 kN
Place of installation:
Areas which can only be used by pedestrians and pedal cyclists.

GROUP 2 (class B125 minimum)

Design load: 125 kN
Place of installation:
Footways, pedestrian areas and comparable areas, car parks or car parking decks

Ermatic® B125

Place of installation:
Group 2 and lower.

GROUP 3 (class C250 minimum)

Design load: 250 kN
Place of installation:
For gully tops installed in the area of kerbside channels of roads which when measured from the kerb edge, extend a maximum of 0.5 m into the carriageway and a maximum of 0.2 m into the footway.

Ermatic® C250

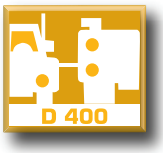
Place of installation:
Group 3 and lower including parking areas for all types of road vehicles, forecourts and service areas.

GROUP 4 (class D400 minimum)

Design load: 400 kN
Place of installation:
Carriageways of roads (including pedestrian streets), hard shoulders and parking areas for all types of road vehicles

Ermatic® D400

Place of installation:
Group 4 and lower.



GROUP 5 (class E600 minimum)

Design load: 600 kN
Place of installation:
Areas imposing high wheel loads e.g. docks, aircraft pavements.

Ermatic® E600

Place of installation:
Group 5 and lower.

GROUP 6 (class F900 minimum)

Design load: 900 kN
Place of installation:
Areas imposing particularly high wheel loads e.g. docks, aircraft pavements.

Ermatic® F900

Place of installation:
Group 6 and lower.

The selection of the appropriate class is the responsibility of the designer. Where there is any doubt, the stronger class should be selected.

To cover chambers with clear openings (a x b)
up to 3040 mm in lenght x 1 200 mm in width

1/2/3 part covers

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Ermatic® F 900
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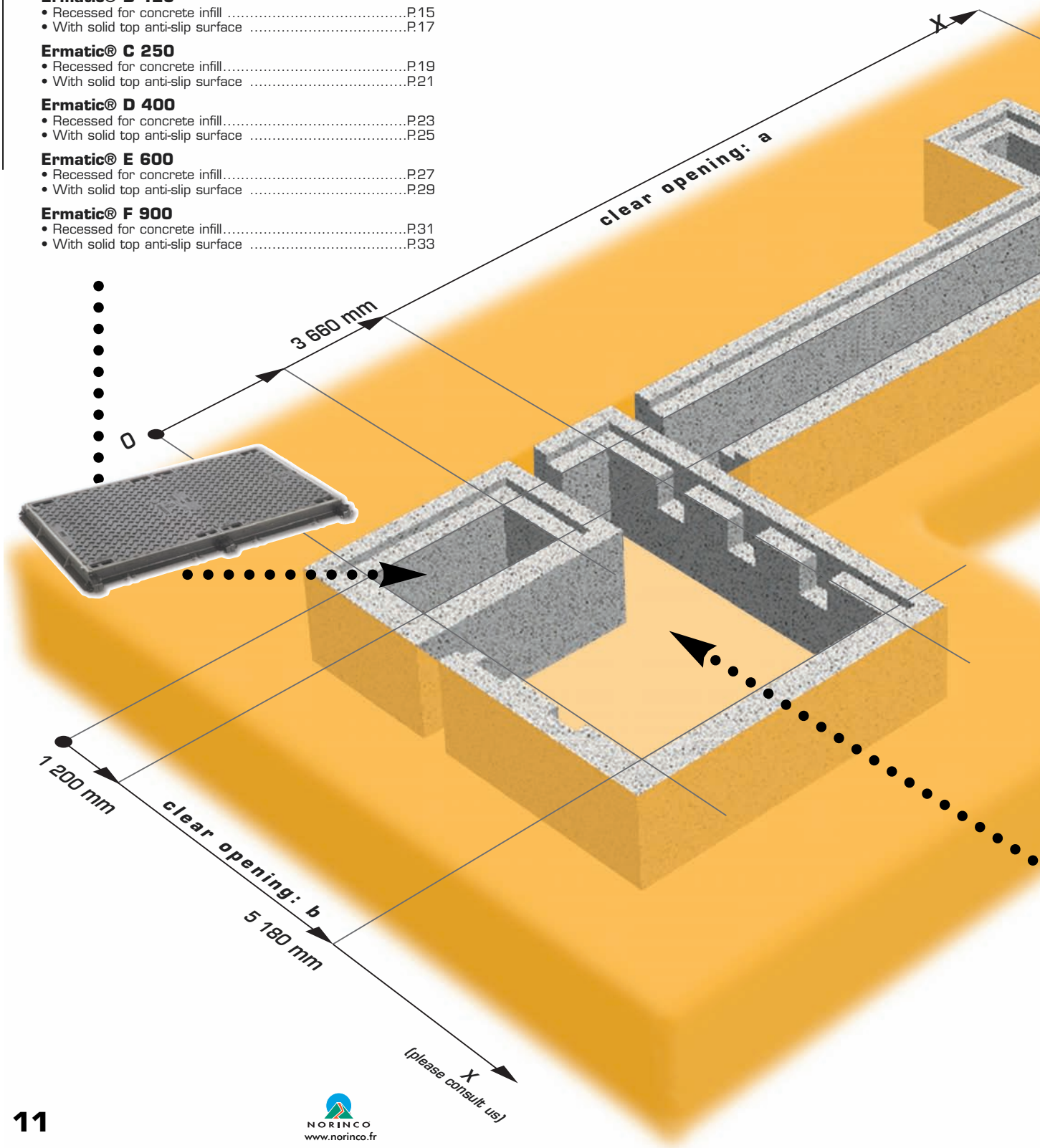
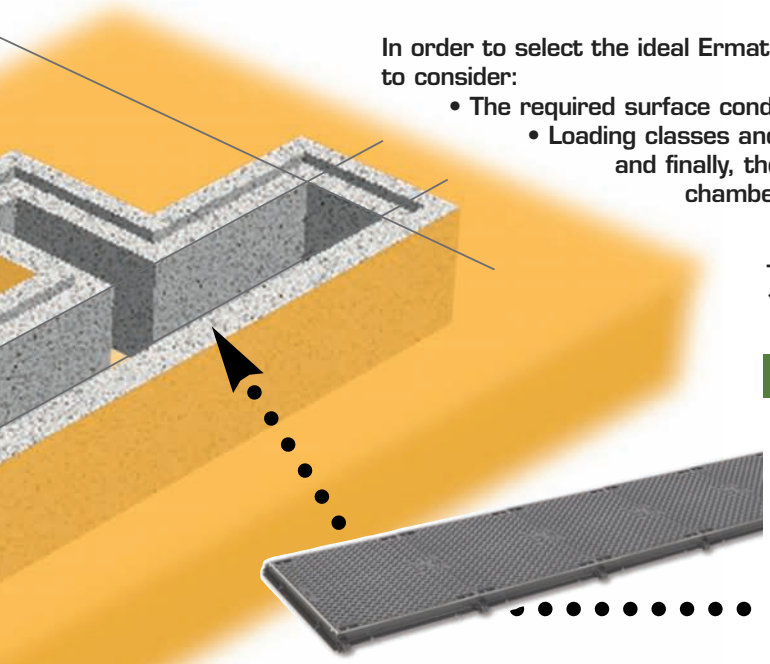


In order to select the ideal Ermatic® cover it is necessary to consider:

- The required surface condition of the covers (P4)
- Loading classes and their application (P.10)
- and finally, the characteristics of the chamber or duct to be covered.



To cover ducts with clear openings (b) lower than 1 200 mm

Duct covers

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Ermatic® F 900
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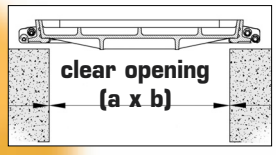

To cover large chambers with clear openings (a x b) greater than 1 200 x 1 200 mm up to 3 660 x 5180 mm.
For sizes in excess of this, please consult us.

Multiple covers with removable beams

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Access covers and frames

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- With solid top anti-slip surface..**P.77**

ACCESS COVERS WITH REMOVABLE BEAMS

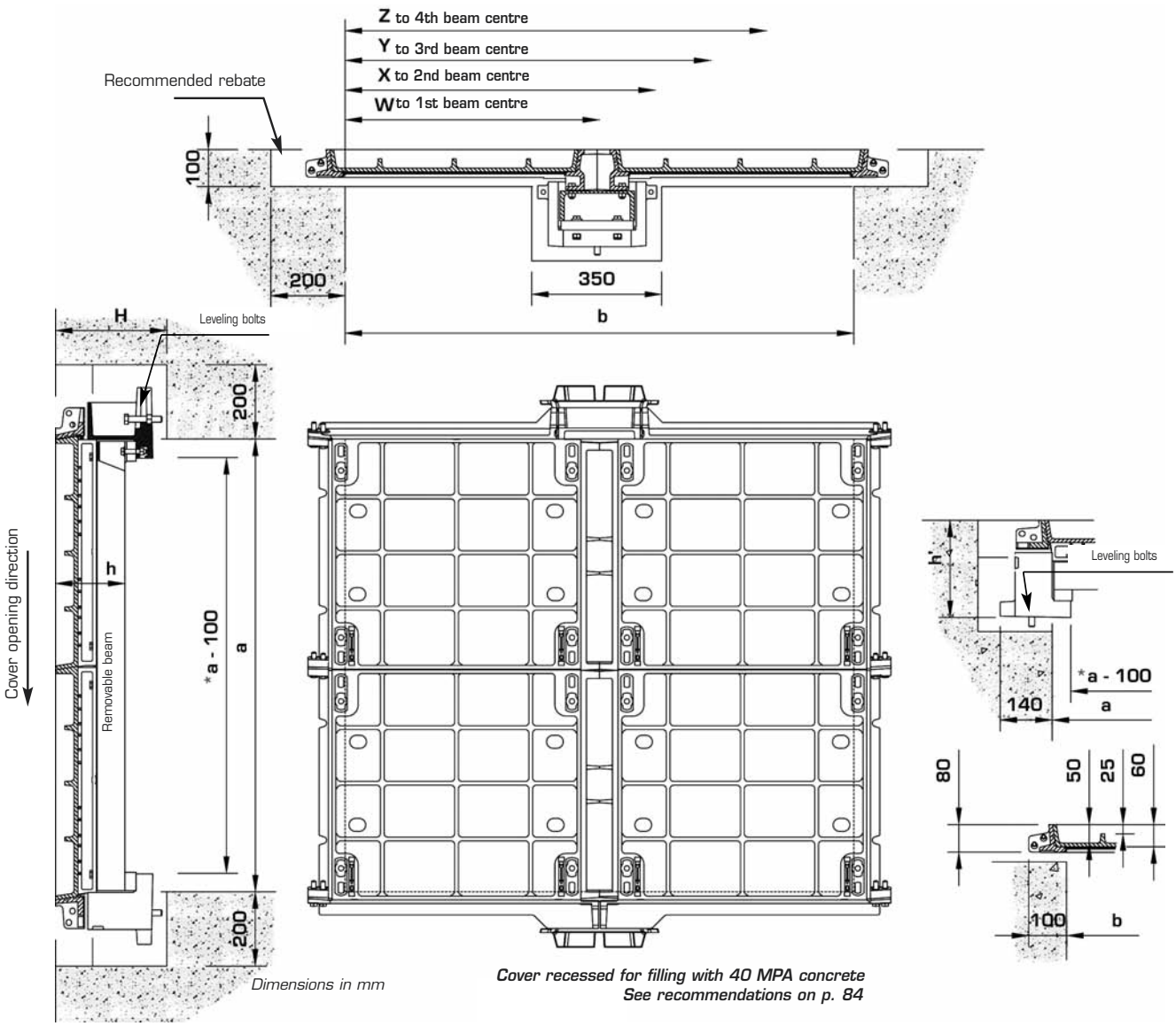
Large chambers are neccessary for cable drawpits manifold chambers, and for the servicing of large items of machinery. Beamed multiple Ermatic® covers ensure complete, unobstructed access to chambers from 1220mm span and above. They are constructed from standard covers, seating and sealing on intermediate removable support beams.
These covers are available in different loading classes, in a wide variety of sizes from 1220mm long x 1370mm span.

NEW !

HINGED COVERS WITH ASSISTED OPENING

see pages 70-74-78

ERMATIC®
B 125



Dimensions in mm

Cover recessed for filling with 40 MPA concrete
See recommendations on p. 84

Multiple covers with removable beams
Covers recessed for concrete infill

Specification

- ERMATIC® B 125 multiple access covers with removable beams
- Covers recessed for concrete infill
- Clear opening (a x b) in mm
  Reference ER2R (a x b) in cm
- Machined horizontal and vertical contact faces
- In order to facilitate the levelling of ERMATIC systems, **adjusting bolts** are supplied with the products.
- Ductile cast iron to ISO 1083 and EN 1563
- Galvanised mild steel beams
- Quality assurance by third party certification to ISO 9001

Place of installation

B 125

Footways, pedestrian areas and comparable areas, car parks or car parking decks.

Group 2 and lower
As per EN124

Standard clear opening dimensions: a x b (in cm)
For other clear opening dimensions, please consult us
**Clear opening is reduced of 10 cm between boxes*

Norinco's reference: ER2R (a x b) in cm

a \ b	clear opening (cm)	2 covers 1 beam					3 covers 2 beams							4 covers 3 beams									5 covers 4 beams											Removable beam used (mm)
		137	152	167	182	197	214	229	244	259	274	289	304	291	306	321	336	351	366	381	396	411	368	383	398	413	428	443	458	473	488	503	518	
2 covers	122																																	UPE200 h = 195 h' = 260 H = 300
	137																																	
	152																																	
	167																																	
	182																																	
3 covers	184																																	1990
	199																																	
	214																																	HEA180 h = 290 h' = 355 H = 400
	229																																	
	244																																	
	259																																	
	274																																	
4 covers	246																																	
	261																																	
	276																																	
	291																																	
	306																																	
	321																																	
	336																																	
	351																																	
	366																																	3660

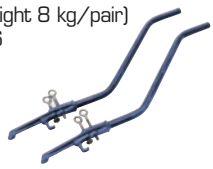
Overall dimensions of cover (a+280mm) x (b+200mm) x (beam box height : h'

Beam centres (see section opposite)

Clear opening in cm		137	152	167	182	197	214	229	244	259	274	289	304	291	306	321	336	351	366	381	396	411	368	383	398	413	428	443	458	473	488	503	518
Beam centres (mm)	W	685	685	835	835	985	685	685	835	835	835	985	985	685	685	685	835	835	835	835	985	985	685	685	685	835	835	835	835	835	985	985	985
	X	To 2nd beam centre					1455	1605	1605	1755	1905	1905	2055	1455	1455	1605	1605	1755	1755	1905	1905	2055	1455	1455	1605	1605	1755	1755	1755	1905	1905	2055	2055
	Y	To 3rd beam centre												2225	2375	2525	2525	2675	2825	2975	2975	3125	2225	2375	2375	2525	2525	2675	2825	2825	2975	2975	3125
	Z	To 4th beam centre																					2995	3145	3295	3295	3445	3595	3745	3895	3895	4045	4195

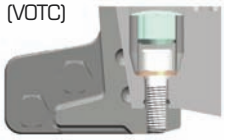
Lifting

Pair of EM keys (weight 8 kg/pair)
see details on p. 86



Option: Locking (composed of 4 stainless steel bolts)

Standard locking (VCHC)
or security locking (VOTC)
Add suffix to reference.



For example :
ER2R (a)(b) VCHC
(see detail on p. 3)

Drawings

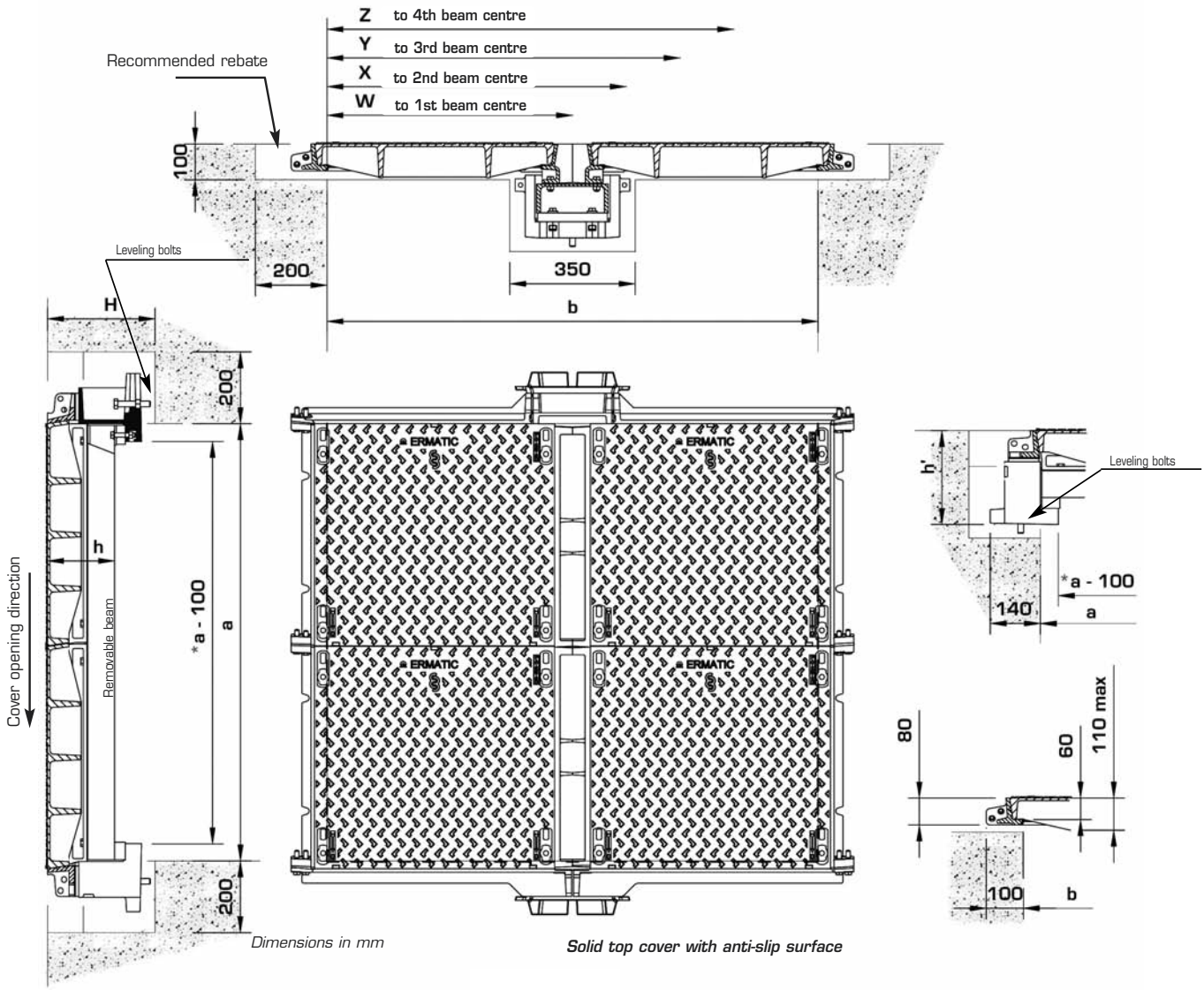
Layout drawings are available showing the cover/frame and the concrete rebate dimensions. Please consult us.

Installation:
see recommendations on p. 79

Infilling of recessed covers:
see recommendations on p. 85

How to specify:
see detail on P. 89

ERMATIC®
B 125



Dimensions in mm

Solid top cover with anti-slip surface

Multiple covers with removable beams
Solid top cover with anti-slip surface

Specification

- ERMATIC® B 125 multiple access covers with removable beams
- Solid top cover with anti-slip surface
- Clear opening (a x b) in mm Reference ER2S (a x b) in cm
- Machined horizontal and vertical contact faces
- In order to facilitate the levelling of ERMATIC systems, **adjusting bolts**
- Ductile cast iron according to ISO 1083 and EN 1563
- Galvanised mild steel beams
- Quality assurance by third party certification to ISO 9001

Place of installation

Footways, pedestrian areas and comparable areas, car parks or car parking decks.

Group 2 areas and lower
As per EN124

Standard clear opening dimensions: a x b (in cm)

For other clear opening dimensions, please consult us

***Clear opening is reduced of 10 cm between boxes**

Norinco's reference: ER2S (a x b) in cm

a \ b	clear opening (cm)	2 covers 1 beam					3 covers 2 beams							4 covers 3 beams									5 covers 4 beams										
		137	152	167	182	197	214	229	244	259	274	289	304	291	306	321	336	351	366	381	396	411	368	383	398	413	428	443	458	473	488	503	518
2 covers	122		X						X		X					X		X		X					X		X		X		X		
	137																																
	152																																
	167																																
	182																																
3 covers	184		X						X		X					X		X		X					X		X		X		X		
	199																																
	214																																
	229																																
	244																																
	259																																
	274																																
4 covers	246		X						X		X					X		X		X					X		X		X		X		
	261																																
	276																																
	291																																
	306																																
	321																																
	336																																
	351																																
	366																																

Removable beam used (mm)

UPE200
h = 195
h' = 260
H = 300

1990

HEA180
h = 290
h' = 355
H = 400

3660

X Please note for these solutions do not refer to the table below: please contact us

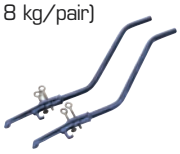
Beam centres (see section opposite)

Overall dimensions of cover (a+280mm) x (b+200mm) x (beam box height = h')

Clear opening in cm		137	152	167	182	197	214	229	244	259	274	289	304	291	306	321	336	351	366	381	396	411	368	383	398	413	428	443	458	473	488	503	518
Beam centres (mm)	W	685	685	835	835	985	685	685	835	835	835	985	985	685	685	685	835	835	835	835	985	985	685	685	685	835	835	835	835	835	985	985	985
	X	To 2nd beam centre					1455	1605	1605	1755	1905	1905	2055	1455	1455	1605	1605	1755	1755	1905	1905	2055	1455	1455	1605	1605	1755	1755	1755	1905	1905	2055	2055
	Y	To 3rd beam centre												2225	2375	2525	2525	2675	2825	2975	2975	3125	2225	2375	2375	2525	2675	2675	2825	2825	2975	2975	3125
	Z	To 4th beam centre																					2995	3145	3295	3295	3445	3595	3745	3895	3895	4045	4195

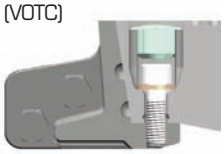
Lifting

Pair of EM keys (weight 8 kg/pair)
see details on p. 86



Option: Locking (composed of 4 stainless steel bolts)

Standard locking (VCHC)
or security locking (VOTC)
Add suffix to reference.



For example:
ER2S (a)(b) VCHC
(see detail on p. 3)

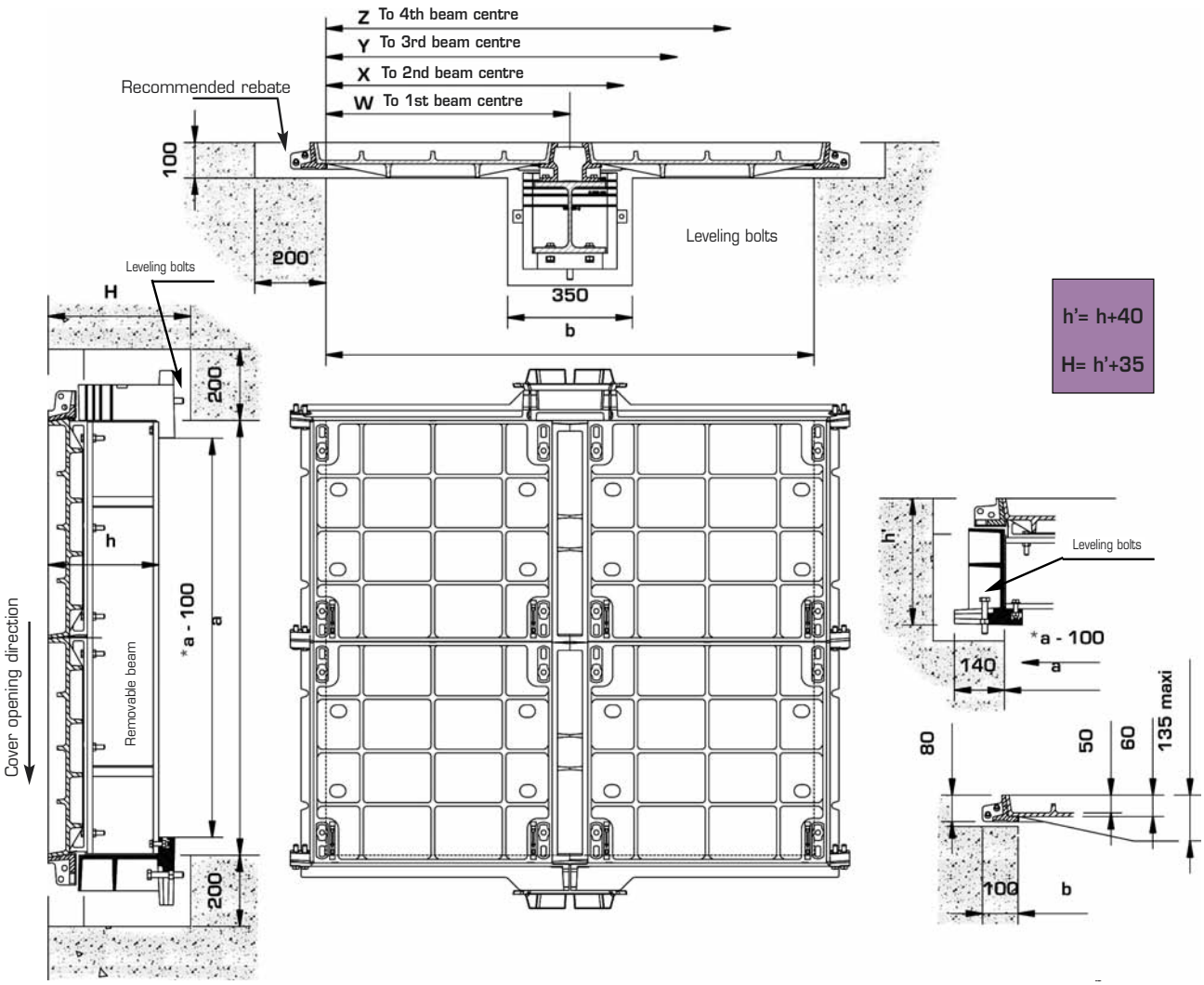
Drawings

Layout drawings are available showing the cover/frame and the concrete rebate dimensions. Please consult us.

Installation
see recommendations on p. 79

How to specify
see detail on p. 89

ERMATIC®
C 250



Dimensions in mm

Cover recessed for filling with 40 MPA concrete
See recommendations on P84

Multiple covers with removable beams
Covers recessed for concrete infill

Specification

- ERMATIC® C 250 multiple access covers with removable beams
- Covers recessed for concrete infill
- Clear opening (a x b) in mm
  Reference ER3R (a x b) in cm
- Machined horizontal and vertical contact faces
- In order to facilitate the levelling of ERMATIC systems, **adjusting bolts**
- Ductile cast iron according to ISO 1083 and EN 1563
- Galvanised mild steel beams
- Quality assurance by third party certification to ISO 9001

Place of installation

Parking and yard areas for all types of road vehicles, fore-courts and service areas.

Group 3 and lower
As per EN124

Standard clear opening dimensions : a x b (in cm)
For other clear opening dimensions, please consult us
**Clear opening is reduced of 10 cm between boxes*

x *Pavior infill covers available on these dimensions Ref.* **ER3P** *(a) (b)*

Norinco's reference : **ER3R (a x b) in cm**

a \ b	clear opening (cm)	2 covers 1 beam					3 covers 2 beams							4 covers 3 beams									5 covers 4 beams											Removable beam used (mm)
		137	152	167	182	197	214	229	244	259	274	289	304	291	306	321	336	351	366	381	396	411	368	383	398	413	428	443	458	473	488	503	518	
2 covers	122	x					x							x									x											HEB200 h = 315
	137																																	
	152																																	
	167																																	
	182																																	
3 covers	184	x					x							x									x											1990
	199																																	
	214																																	HEB220 h = 335
	229																																	
	244																																	
	259																																	HEB240 h = 335
	274																																	
4 covers	246	x					x							x									x											HEB220
	261																																	HEB240 h = 355
	276																																	
	291																																	3660
	306																																	
	321																																	
	336																																	HEB260 h = 375
	351																																	
	366																																	3660

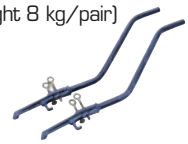
Overall dimensions of cover (a+280mm) x (b+200mm) x (beam box height 400mm)

Beam centres (see section opposite)

Beam centres (mm)	137	152	167	182	197	214	229	244	259	274	289	304	291	306	321	336	351	366	381	396	411	368	383	398	413	428	443	458	473	488	503	518
W	685	685	835	835	985	685	685	835	835	835	985	985	685	685	685	835	835	835	835	985	985	685	685	685	835	835	835	835	835	985	985	985
X	To 2nd beam centre					1455	1605	1605	1755	1905	1905	2055	1455	1455	1605	1605	1755	1755	1905	1905	2055	1455	1455	1605	1605	1755	1755	1755	1905	1905	2055	2055
Y	To 3rd beam centre												2225	2375	2525	2525	2675	2825	2975	2975	3125	2225	2375	2375	2525	2525	2675	2825	2825	2975	2975	3125	3125
Z	To 4th beam centre																					2995	3145	3295	3295	3445	3595	3745	3895	3895	4045	4195

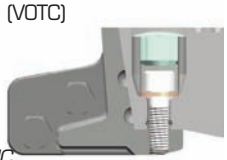
Lifting

Pair of EM keys (weight 8 kg/pair)
see details on p. 86



Option: Locking
(composed of 4 stainless steel bolts)

Standard locking (VCHC)
or security locking (VOTC)
Add suffix to reference.



For example :
ER3R (a x b) VCHC
(see detail on p. 3)

Drawings

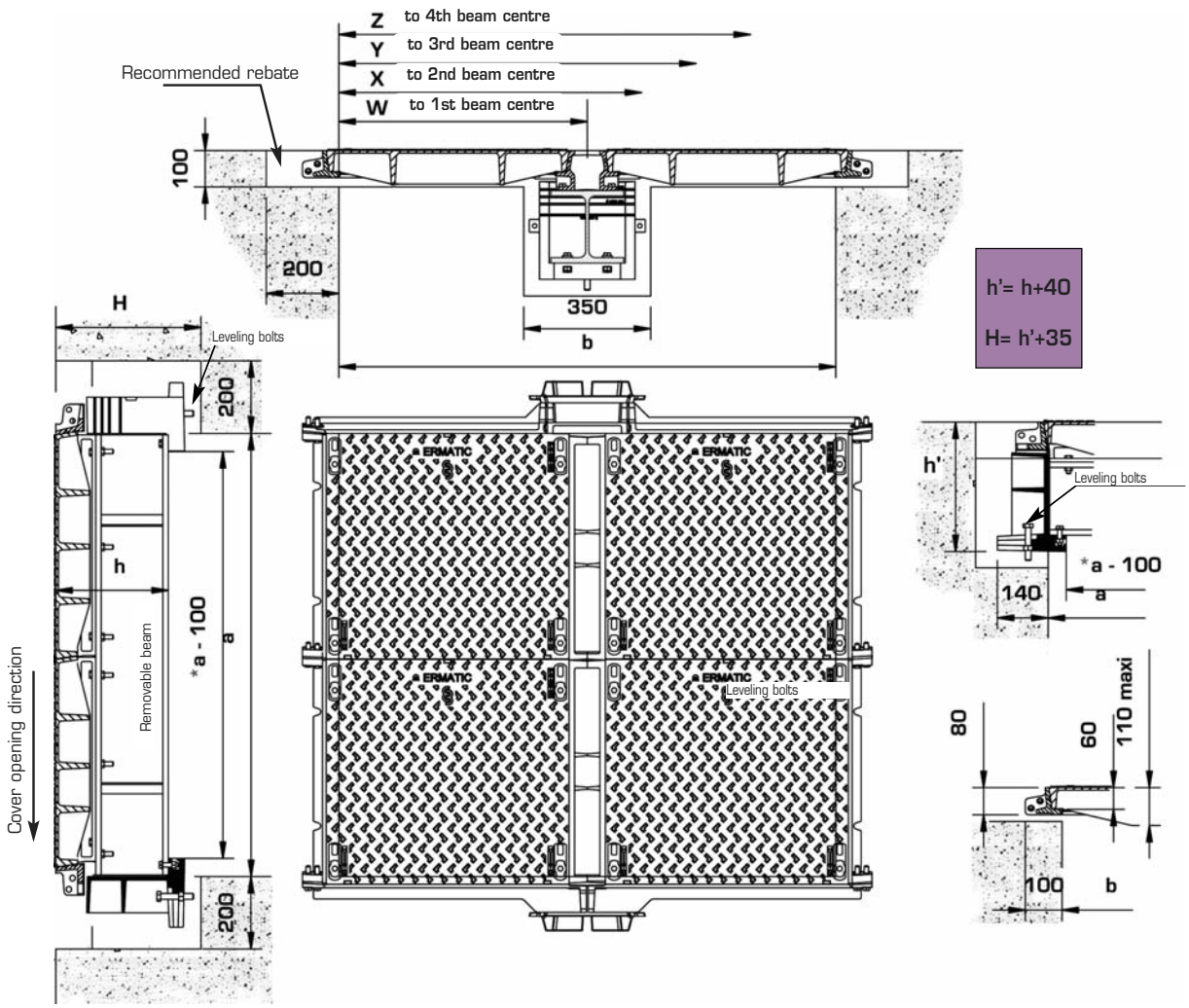
Layout drawings are available showing the cover/frame and the concrete rebate dimensions. Please consult us.

Installation
see recommendations on p. 79

Infilling of recessed covers
see recommendations on p. 85

How to specify
see detail on p. 89

ERMATIC®
C 250



Solid top cover with anti-slip surface

Dimensions in mm

Multiple covers with removable beams
Solid top cover with anti-slip surface

Specification

- ERMATIC® C 250 multiple access covers with removable beams
- Solid top covers with anti-slip surface
- Clear opening (a x b) in mm Reference ER3S (a x b) in cm
- Machined horizontal and vertical contact faces
- In order to facilitate the levelling of ERMATIC systems, **adjusting bolts**
- Ductile cast iron according to ISO 1083 and EN 1563
- Galvanised mild steel beams
- Quality assurance by third party certification to ISO 9001

Place of installation

Parking and yard areas for all types of road vehicles, fore-courts and service areas.

Group 3 and lower
As per EN124

Standard clear opening dimensions : a x b (in cm)

for other clear opening dimensions, please consult us

**Clear opening is reduced of 10 cm between boxes*

Norinco's reference : ER3S (a x b) in cm

a \ b	clear opening (cm)	2 covers 1 beam					3 covers 2 beams							4 covers 3 beams									5 covers 4 beams										
		137	152	167	182	197	214	229	244	259	274	289	304	291	306	321	336	351	366	381	396	411	368	383	398	413	428	443	458	473	488	503	518
2 covers	122		X						X		X					X		X		X					X		X		X		X		
	137																																
	152																																
	167																																
	182																																
3 covers	184		X						X		X					X		X		X					X		X		X		X		
	199																																
	214																																
	229																																
	244																																
	259																																
	274																																
4 covers	246		X						X		X					X		X		X					X		X		X		X		
	261																																
	276																																
	291																																
	306																																
	321																																
	336																																
	351																																
	366																																

Removable beam used (mm)

- HEB200 h = 315 — *1990*
- HEB220 *h = 335*
- HEB240 / HEB220 / HEB240 h = 355 — *3660*
- HEB260 h = 375 — *3660*

X Please note for these solutions do not refer to the table below: please contact us

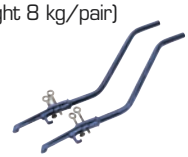
Overall dimensions of cover (a+280mm) x (b+200mm) x (beam box height : h')

Beam centres (see section opposite)

Clear opening in cm		137	152	167	182	197	214	229	244	259	274	289	304	291	306	321	336	351	366	381	396	411	368	383	398	413	428	443	458	473	488	503	518
Beam centres (mm)	W	685	685	835	835	985	685	685	835	835	835	985	985	685	685	685	835	835	835	835	985	985	685	685	685	835	835	835	835	835	985	985	985
	X	To 2nd beam centre					1455	1605	1605	1755	1905	1905	2055	1455	1455	1605	1605	1755	1755	1905	1905	2055	1455	1455	1605	1605	1755	1755	1755	1905	1905	2055	2055
	Y	To 3rd beam centre												2225	2375	2525	2525	2675	2825	2975	2975	3125	2225	2375	2375	2525	2525	2675	2825	2825	2975	2975	3125
	Z	To 4th beam centre																					2995	3145	3295	3295	3445	3595	3745	3895	3895	4045	4195

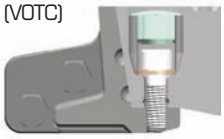
Lifting

Pair of EM keys (weight 8 kg/pair)
see details on p. 86



Option: Locking (composed of 4 stainless steel bolts)

Standard locking (VCHC)
or security locking (VOTC)
Add suffix to reference.



For example :
ER3S (a x b) VCHC
(see detail p. 3)

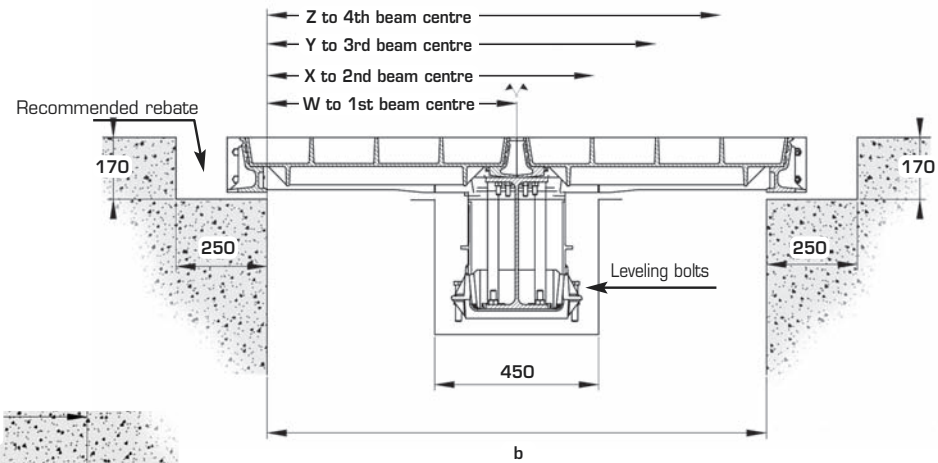
Drawings

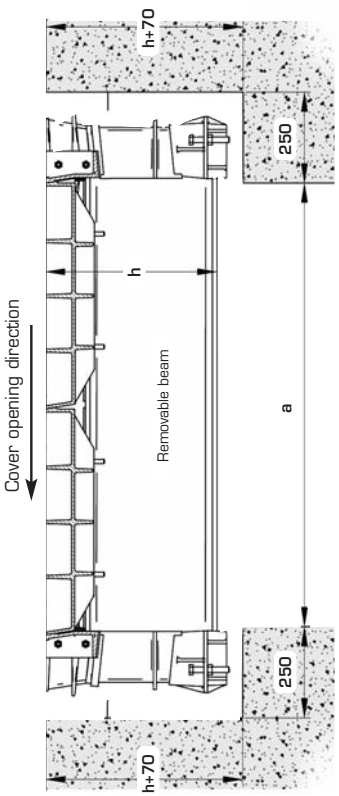
Layout drawings are available showing the cover/frame and the concrete rebate dimensions. Please consult us.

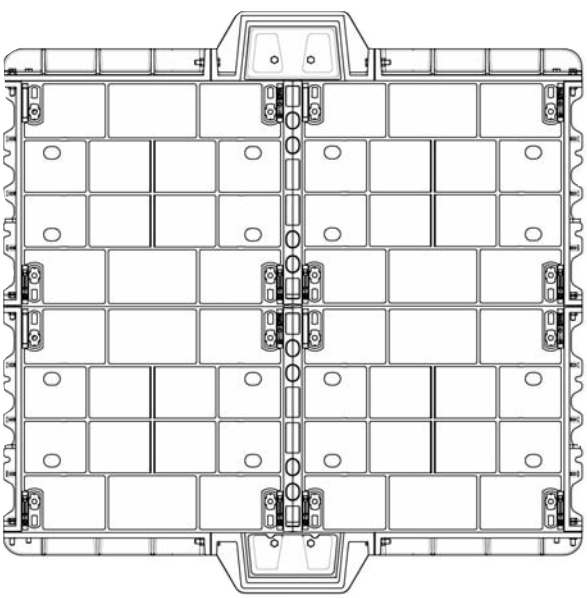
Installation
see recommendations on p. 79

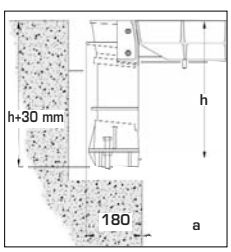
How to specify
see detail on p. 89

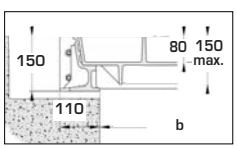
ERMATIC®
D 400











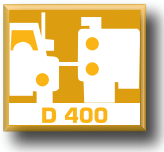
Dimensions in mm

Cover recessed for filling with 40 MPA concrete
See recommendations on p. 84

Multiple covers with removable beams
Covers recessed for concrete infill

Specification

- ERMATIC® D 400 multiple access covers with removable beams
- Covers recessed for concrete infill
- Clear opening (a x b) in mm
  Reference ER5R (a x b) in cm
- Machined horizontal and vertical contact faces
- In order to facilitate the levelling of ERMATIC systems, **adjusting bolts**
- Ductile cast iron according to ISO 1083 and EN 1563
- Galvanised mild steel beams
- Quality assurance by third party certification to ISO 9001



Place of installation

Carriageways of roads (including pedestrian steets),
hard shoulders and parking areas for all types of road vehicles.

Group 4 and lower
As per EN124

Standard clear opening dimensions : a x b (in cm)
for other clear opening dimensions, please consult us

Norinco's reference : **ER5R (a x b) in cm**

a \ b	clear opening (cm)	2 covers 1 beam					3 covers 2 beams							4 covers 3 beams									5 covers 4 beams											Removable beam used (mm)
		137	152	167	182	197	214	229	244	259	274	289	304	291	306	321	336	351	366	381	396	411	368	383	398	413	428	443	458	473	488	503	518	
2 covers	122																																	IPE360 (h = 470)
	137																																	
	152																																	
	167																																	
	182																																	
3 covers	184																																	
	199																																	
	214																																	
	229																																	
	244																																	
	259																																	
	274																																	
4 covers	246																																	2910
	261																																	
	276																																	
	291																																	
	306																																	
	321																																	IPE400 (h = 510)
	336																																	
	351																																	
	366																																	3660

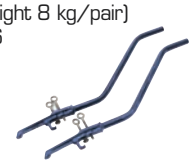
Overall dimensions of cover (a+360mm) x (b+220mm) x (beam box height = h +30mm)

Beam centres (see section opposite)

Clear opening in cm		137	152	167	182	197	214	229	244	259	274	289	304	291	306	321	336	351	366	381	396	411	368	383	398	413	428	443	458	473	488	503	518
Beam centres (mm)	W	685	685	835	835	985	685	685	835	835	835	985	985	685	685	685	835	835	835	835	985	985	685	685	685	835	835	835	835	835	985	985	985
	X	To 2nd beam centre					1455	1605	1605	1755	1905	1905	2055	1455	1455	1605	1605	1755	1755	1905	1905	2055	1455	1455	1605	1605	1755	1755	1755	1905	1905	2055	2055
	Y	To 3rd beam centre												2225	2375	2525	2525	2675	2825	2975	2975	3125	2225	2375	2375	2525	2525	2675	2825	2825	2975	2975	3125
	Z	To 4th beam centre																					2995	3145	3295	3295	3445	3595	3745	3895	3895	4045	4195

Lifting

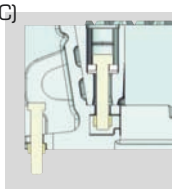
Pair of EM keys (weight 8 kg/pair)
see details on p. 86



Locking
(composed of 4 stainless steel bolts)

Standard locking (VCHC)
or security locking (VOTC)
Add suffix to reference

For example :
ER5R (a)(b) VOTC
(see detail on p. 3)



Drawings

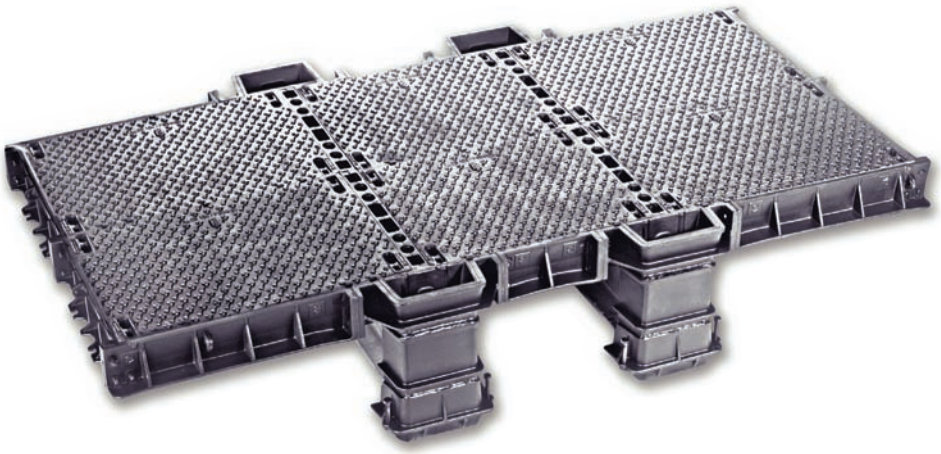
Layout drawings are available showing the cover/frame and the concrete rebate dimensions. Please consult us.

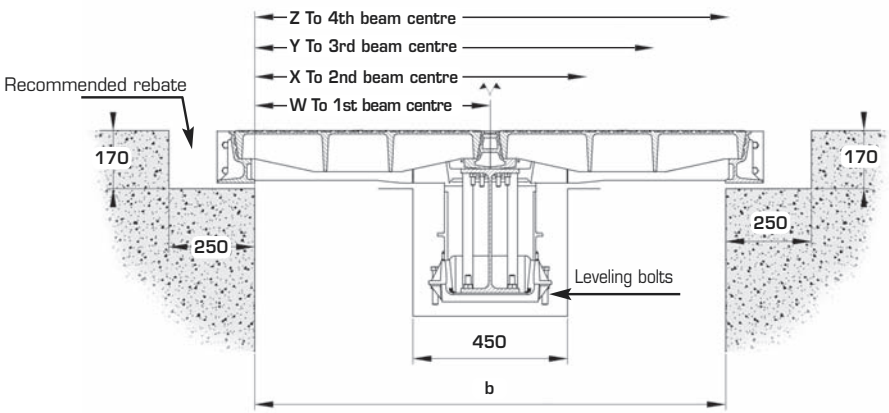
Installation
see recommendations on p. 79

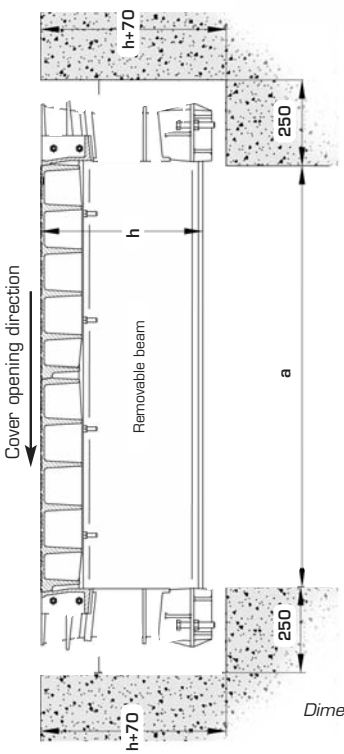
Infilling of recessed covers
see recommendations on p. 85

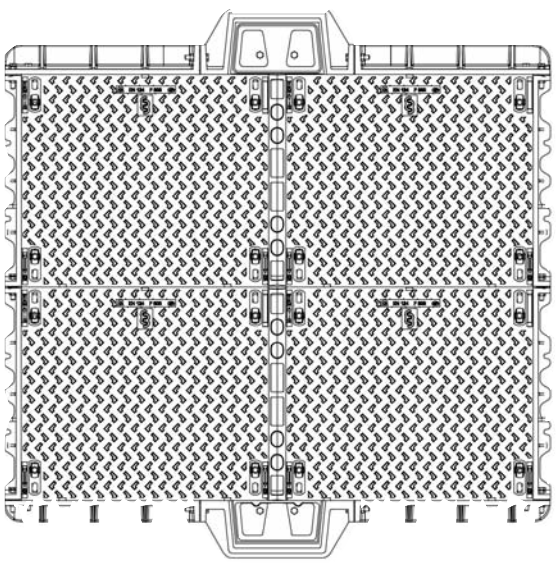
How to specify
see detail on p. 89

ERMATIC®
D 400

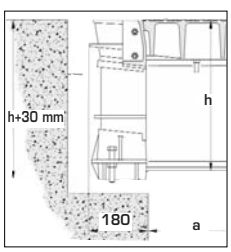


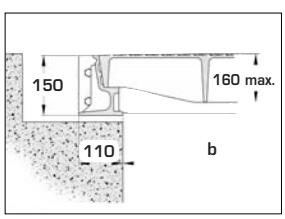






Solid top cover with anti-slip surface



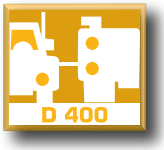


Dimensions in mm

Multiple covers with removable beams
Solid top cover with anti-slip surface

Specification

- ERMATIC® D 400 multiple access covers with removable beams
- Solid top cover with anti-slip surface
- Clear opening (a x b) in mm reference ER5S (a x b) in cm
- Machined horizontal and vertical contact faces
- In order to facilitate the levelling of ERMATIC systems, **adjusting bolts**
- Ductile cast iron according to ISO 1083 and EN 1563
- Galvanised mild steel Beams
- Quality assurance by third party certification to ISO 9001



Place of installation

Carriageways of roads (including pedestrian steets), hard shoulders and parking areas for all types of road vehicles

Group 4 and lower
As per EN124

Standard clear opening dimensions : a x b (in cm)
for other clear opening dimensions, please consult us

Norinco's reference ER5S (a x b) in cm

		2 covers 1 beam					3 covers 2 beams							4 covers 3 beams									5 covers 4 beams											Removable beam used (mm)
a \ b	clear opening (cm)	137	152	167	182	197	214	229	244	259	274	289	304	291	306	321	336	351	366	381	396	411	368	383	398	413	428	443	458	473	488	503	518	
2 covers	122																																	IPE360 (h = 470)
	137																																	
	152																																	
	167																																	
	182																																	
3 covers	184																																	
	199																																	
	214																																	
	229																																	
	244																																	
	259																																	
	274																																	
4 covers	246																																	2910
	261																																	
	276																																	
	291																																	
	306																																	
	321																																	IPE400 (h = 510)
	336																																	
	351																																	
	366																																	3660

Overall dimensions of cover (a+360mm) x (b+220mm) x (beam box height = h +30mm)

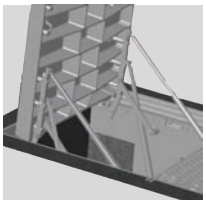
Beam centres (see section opposite)

Clear opening in cm		137	152	167	182	197	214	229	244	259	274	289	304	291	306	321	336	351	366	381	396	411	368	383	398	413	428	443	458	473	488	503	518
Beam centres (mm)	W	685	685	835	835	985	685	685	835	835	835	985	985	685	685	685	835	835	835	835	985	985	685	685	685	835	835	835	835	835	985	985	985
	X	To 2nd beam centre					1455	1605	1605	1755	1905	1905	2055	1455	1455	1605	1605	1755	1755	1905	1905	2055	1455	1455	1605	1605	1755	1755	1755	1905	1905	2055	2055
	Y	To 3rd beam centre												2225	2375	2525	2525	2675	2825	2975	2975	3125	2225	2375	2375	2525	2675	2675	2825	2825	2975	2975	3125
	Z	To 4th beam centre																					2995	3145	3295	3295	3445	3595	3745	3895	3895	4045	4195

NEW

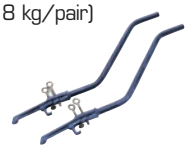
Option: hinge and assisted opening by gas strut

In order to reduce the lifting effort the covers can be provided with hinges and in-built lift assist mechanism gas struts, see details page 5



Lifting

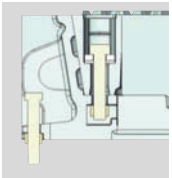
Pair of EM keys (weight 8 kg/pair)
see details on p. 86



Locking
(composed of 4 stainless steel bolts)

Standard locking (VCHC) or security locking (VOTC) add suffix to reference

For example :
ER5S (a x b) VOTC
(see detail on p. 3)



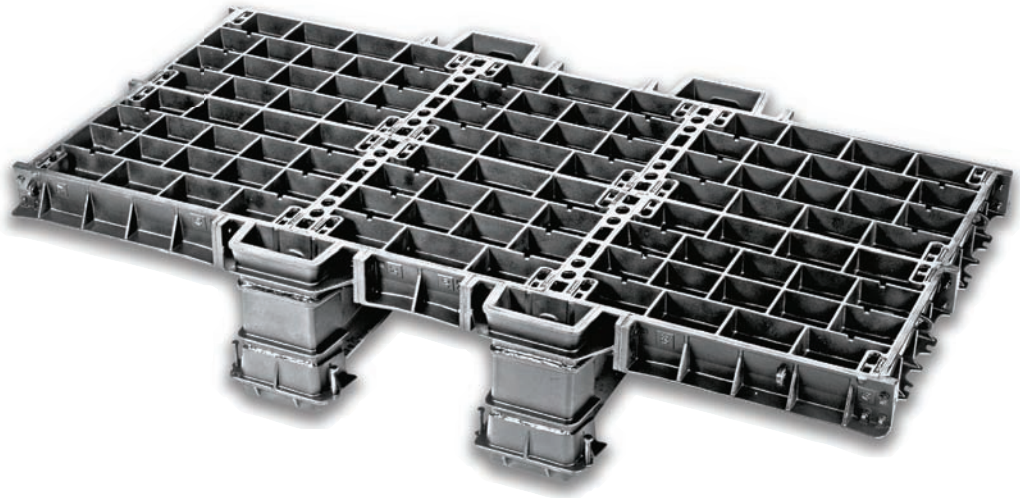
Drawings

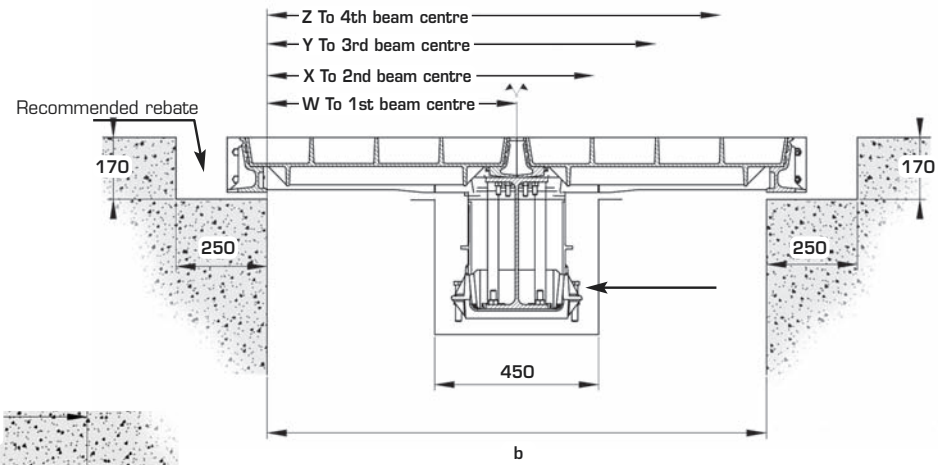
Layout drawings are available showing the cover/frame and the concrete rebate dimensions. Please consult us.

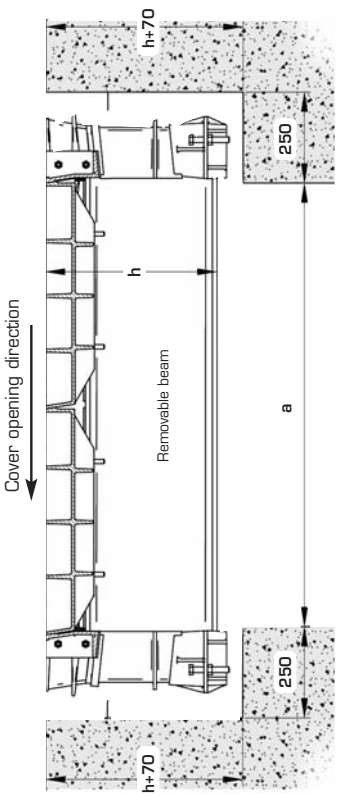
Installation:
see recommendations on p. 79

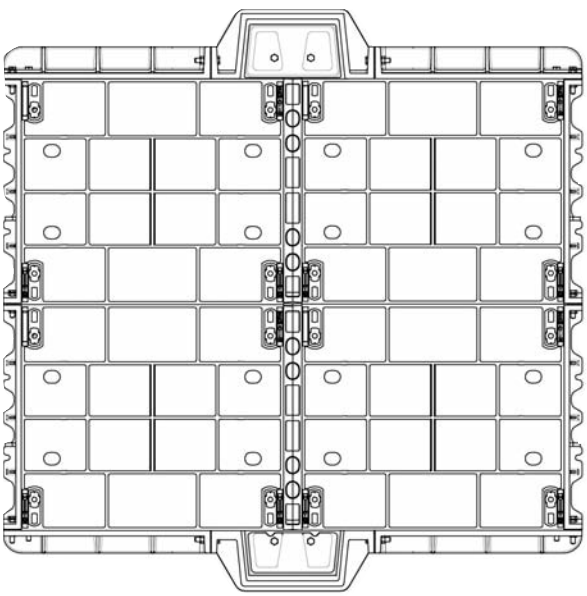
How to specify:
see detail on p. 89

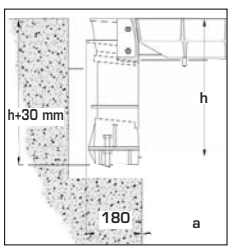
ERMATIC®
E 600

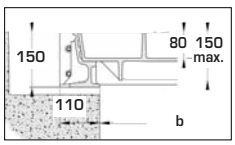












Dimensions in mm

Cover recessed for filling with 40 MPA concrete
See recommendations on p. 84

Multiple covers with removable beams
Covers recessed for concrete infill

Specification

- ERMATIC® E 600 multiple access covers with removable beams
- Covers recessed for concrete infill
- Clear opening (a x b) in mm
  Reference ER6R (a x b) in cm
- Machined horizontal and vertical contact faces
- In order to facilitate the levelling of ERMATIC systems, **adjusting bolts**
- Ductile cast iron according to ISO 1083 and EN 1563
- Galvanised mild steel Beams
- Quality assurance by third party certification to ISO 9001

Place of installation

E 600

Areas imposing high wheel loads e.g. docks, aircraft pavements.

Group 5 and lower
As per EN124

Standard clear opening dimensions : a x b (in cm)
For other clear opening dimensions, please consult us

Référence NORINCO : ER6R (a en cm)(b en cm)

a \ b	clear opening (cm)	2 covers 1 beam					3 covers 2 beams							4 covers 3 beams									5 covers 4 beams											Removable beam used (mm)
		137	152	167	182	197	214	229	244	259	274	289	304	291	306	321	336	351	366	381	396	411	368	383	398	413	428	443	458	473	488	503	518	
2 covers	122																																	IPE360 (h = 470)
	137																																	
	152																																	
	167																																	
	182																																	1840
3 covers	184																																	IPE400 (h = 510)
	199																																	
	214																																	
	229																																	
	244																																	2440
	259																																	IPE450 (h = 560)
	274																																	
4 covers	246																																	IPE400
	261																																	
	276																																	IPE450 (h = 560)
	291																																	
	306																																	IPE500 (h = 610)
	321																																	
	336																																	3360
	351																																	IPE550 (h = 660)
	366																																	

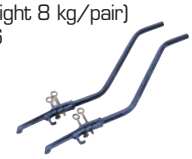
Overall dimensions of cover (a+360mm) x (b+220mm) x (beam box height = h +30mm

Beam centres (see section opposite)

Beam centres (mm)	137	152	167	182	197	214	229	244	259	274	289	304	291	306	321	336	351	366	381	396	411	368	383	398	413	428	443	458	473	488	503	518
W	685	685	835	835	985	685	685	835	835	835	985	985	685	685	685	835	835	835	835	985	985	685	685	685	835	835	835	835	835	985	985	985
X	To 2nd beam centre					1455	1605	1605	1755	1905	1905	2055	1455	1455	1605	1605	1755	1755	1905	1905	2055	1455	1455	1605	1605	1755	1755	1755	1905	1905	2055	2055
Y	To 3rd beam centre												2225	2375	2525	2525	2675	2825	2975	2975	3125	2225	2375	2525	2525	2675	2825	2825	2975	2975	3125	3125
Z	To 4th beam centre																					2995	3145	3295	3295	3445	3595	3745	3895	3895	4045	4195

Lifting

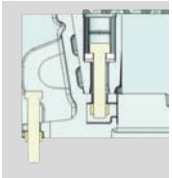
Pair of EM keys (weight 8 kg/pair)
see details on p. 86



Recommended option: Locking (composed of 4 stainless steel bolts)

Standard locking (VCHC)
or security locking (VOTC)
Add suffix to reference.

For example :
ER6R (a x b) VCHC
(see detail on p. 3)



Drawings

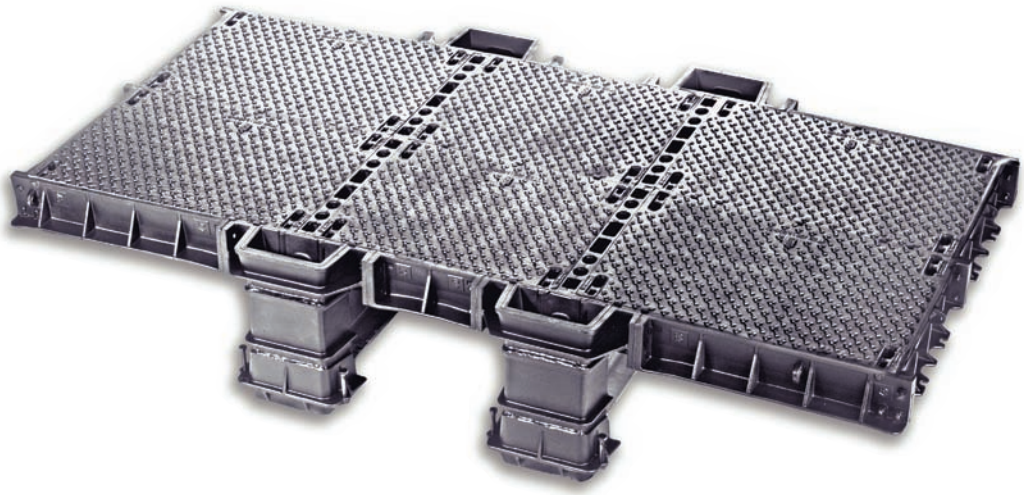
Layout drawings are available showing the cover/frame and the concrete rebate dimensions. Please consult us.

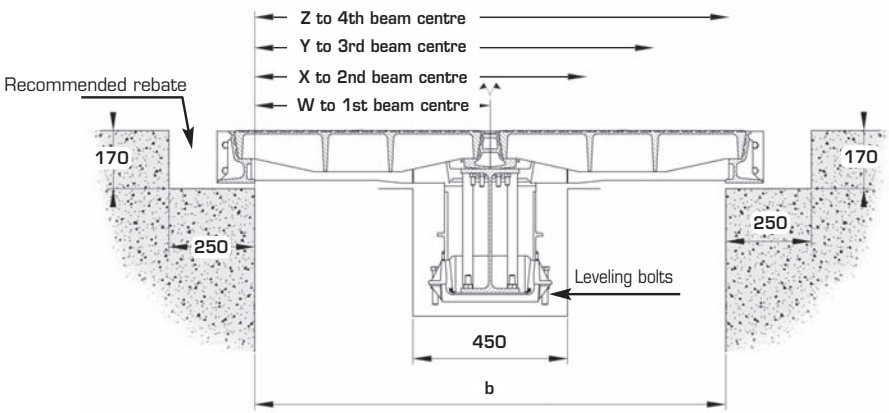
Installation
see recommendations on p. 79

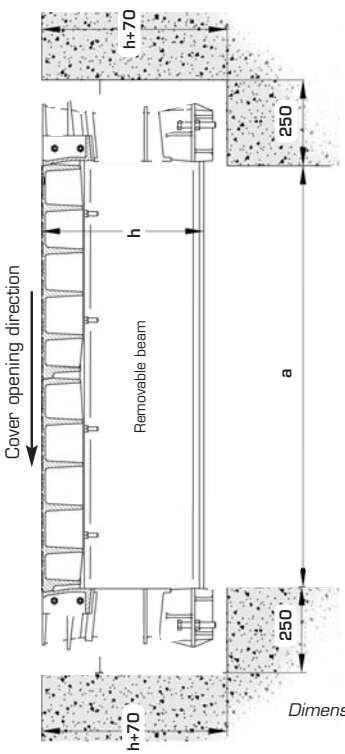
Infilling of recessed covers
see recommendations on p. 85

How to specify
see detail on p. 89

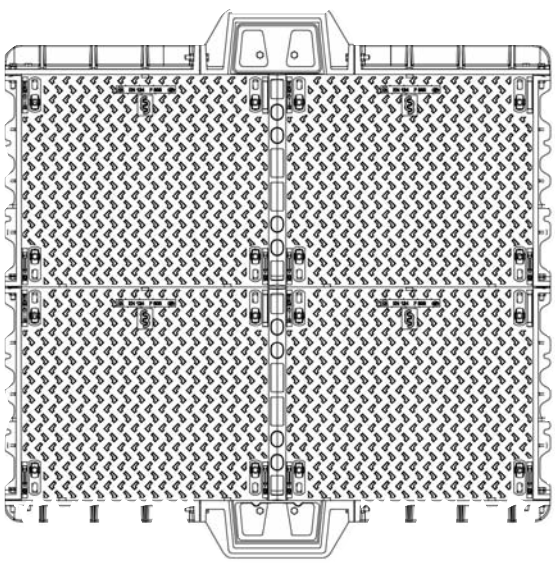
ERMATIC®
E 600



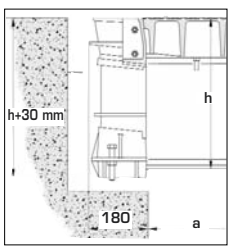


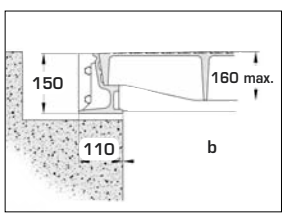


Dimensions in mm



Solid top cover with anti-slip surface





Multiple covers with removable beams
Solid top cover with anti-slip surface

Specification

- Ermatic® E 600 multiple access covers with removable beams
- Solid top cover with anti-slip surface
- Clear opening (a x b) in mm Reference ER6S (a x b) in cm
- Machined horizontal and vertical contact faces
- In order to facilitate the levelling of ERMATIC systems, **adjusting bolts**
- Ductile cast iron according to ISO 1083 and EN 1563
- Galvanised mild steel Beams
- Quality assurance by third party certification to ISO 9001

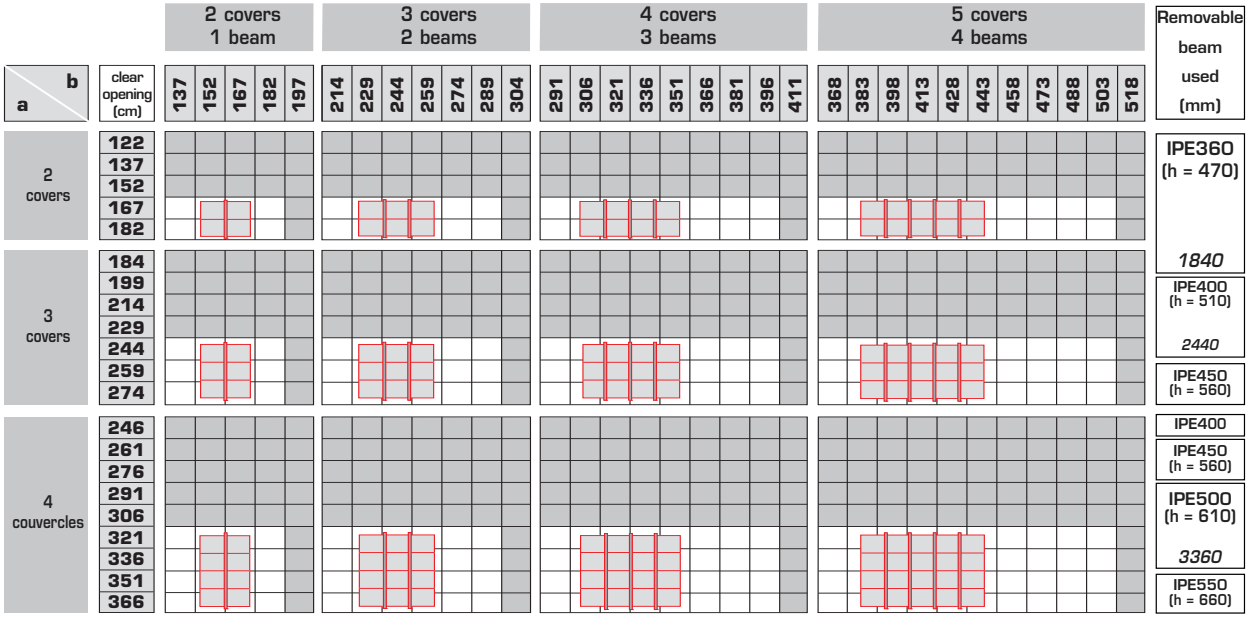
Place of installation

Areas imposing high wheel loads e.g. docks, aircraft pavements.

Group 5 and lower
As per EN124

Standard clear opening dimensions : a x b (in cm)
For other clear opening dimensions, please consult us

Norinco's reference : **ER6S (a x b) in cm**



Overall dimensions of cover (a+360mm) x (b+220mm) x (beam box height = h +30mm)

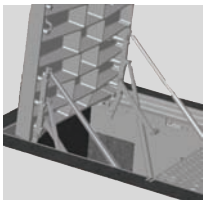
Beam centres (see section opposite)

Clear opening in cm		137	152	167	182	197	214	229	244	259	274	289	304	291	306	321	336	351	366	381	396	411	368	383	398	413	428	443	458	473	488	503	518
Beam centres (mm)	W	685	685	835	835	985	685	685	835	835	835	985	985	685	685	685	835	835	835	835	985	985	685	685	685	835	835	835	835	835	985	985	985
	X	To 2nd beam centre					1455	1605	1605	1755	1905	1905	2055	1455	1455	1605	1605	1755	1755	1905	1905	2055	1455	1455	1605	1605	1755	1755	1755	1905	1905	2055	2055
	Y	To 3rd beam centre												2225	2375	2525	2525	2675	2825	2975	2975	3125	2225	2375	2525	2525	2675	2825	2825	2975	2975	3125	3125
	Z	To 4th beam centre																					2995	3145	3295	3295	3445	3595	3745	3895	3895	4045	4195

NEW

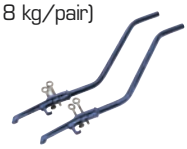
Option: hinge and assisted opening by gas strut

In order to reduce the lifting effort the covers can be provided with hinges and in-built lift assist mechanism gas struts, see details page 5



Lifting

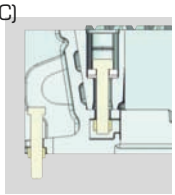
Pair of EM keys (weight 8 kg/pair)
see details on p. 86



Recommended option: Locking (composed of 4 stainless steel bolts)

Standard locking (VCHC)
or security locking (VOTC)
Add suffix to reference.

For example :
ER6S (a x b) VCHC
(see detail on p. 3)



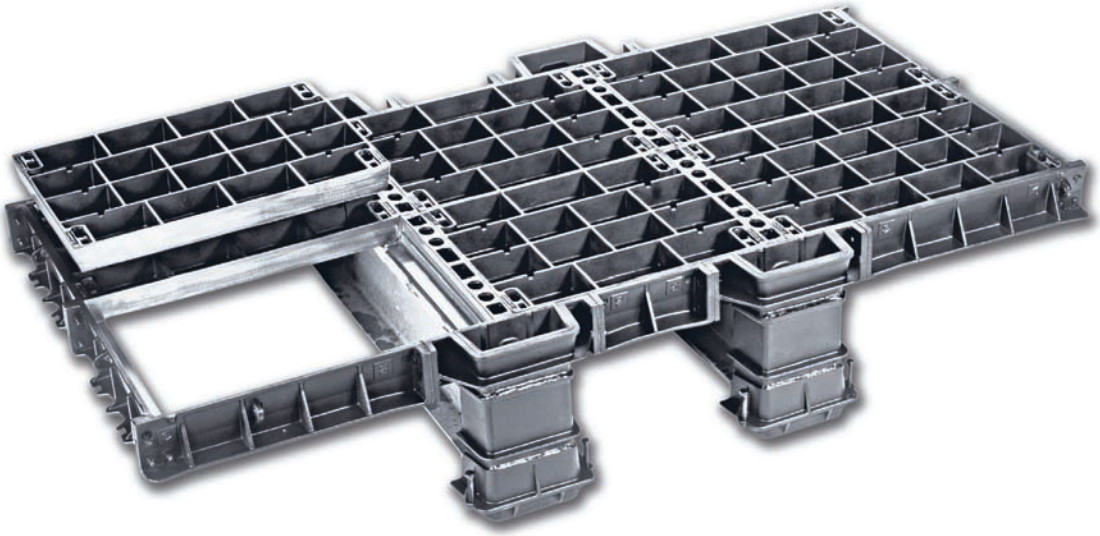
Drawings

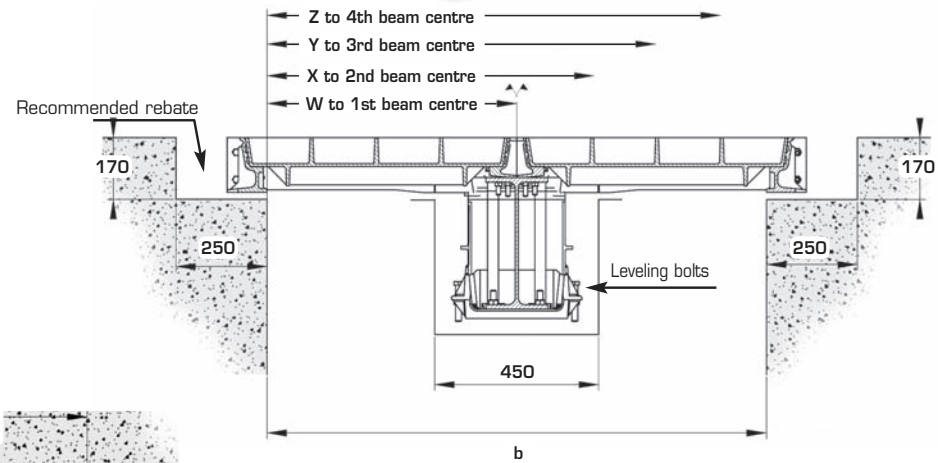
Layout drawings are available showing the cover/frame and the concrete rebate dimensions. Please consult us.

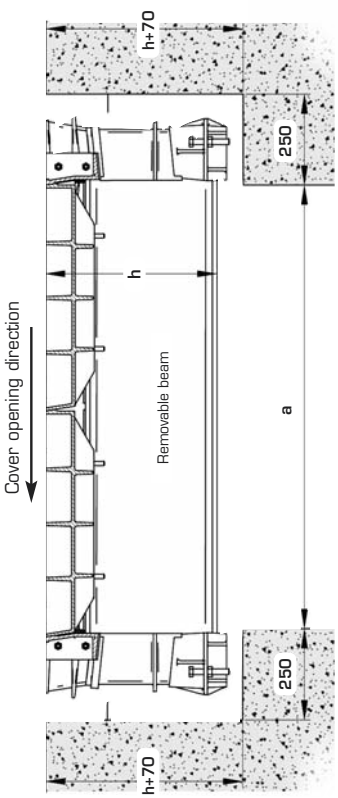
Installation
see recommendations on p. 79

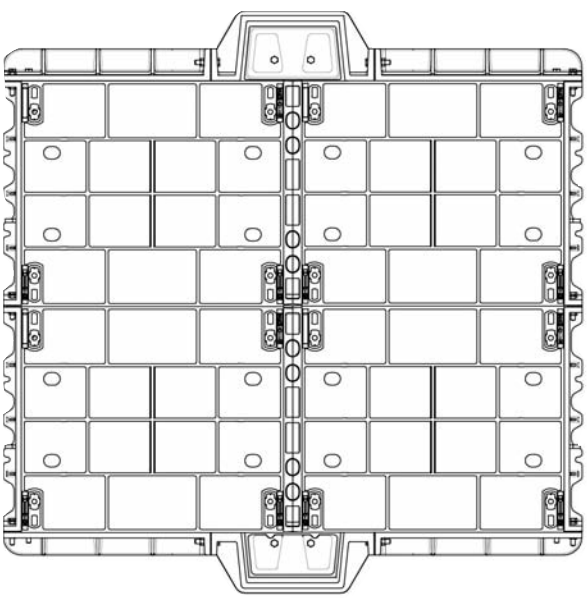
How to specify
see detail on p. 89

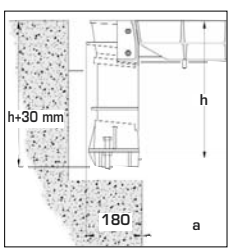
ERMATIC®
F 900

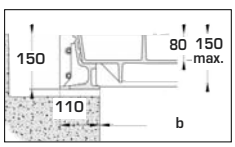












Dimensions en mm

Cover recessed for filling with 40 MPA concrete
See recommendations on p. 84

Multiple covers with removable beams
Covers recessed for concrete infill

Specification

- ERMATIC® F 900 multiple access covers with removable beams
- Covers recessed for concrete infill
- Clear opening (a x b) in mm
  Reference ER9R (a x b) in cm
- Machined horizontal and vertical contact faces
- In order to facilitate the levelling of ERMATIC systems, **adjusting bolts**
- Ductile cast iron according to ISO 1083 and EN 1563
- Galvanised mild steel Beams
- Quality assurance by third party certification to ISO 9001

Filled cover

Place of installation

Areas imposing particularly high wheel loads e.g. docks, aircraft pavements.

Group 6 and lower
As per EN124

Standard clear opening dimensions : a x b (in cm)
For other clear opening dimensions, please consult us

Norinco's reference : **ER9R (a x b) in cm**

a \ b	clear opening (cm)	2 covers 1 beam					3 covers 2 beams							4 covers 3 beams									5 covers 4 beams											Removable beam used (mm)
		137	152	167	182	197	214	229	244	259	274	289	304	291	306	321	336	351	366	381	396	411	368	383	398	413	428	443	458	473	488	503	518	
2 covers	122																																	IPE360 (h = 470)
	137																																	
	152																																	
	167																																	
	182																																	1840
3 covers	184																																	IPE400 (h = 510)
	199																																	
	214																																	
	229																																	
	244																																	2440
	259																																	IPE450 (h = 560)
	274																																	
4 covers	246																																	IPE400
	261																																	IPE450 (h = 560)
	276																																	
	291																																	IPE500 (h = 610)
	306																																	
	321																																	3360
	336																																	
	351																																	
	366																																	IPE550 (h = 660)

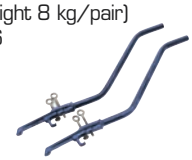
Overall dimensions of cover (a+360mm) x (b+220mm) x (beam box height = h +30mm)

Beam centres (see section opposite)

Clear opening in cm		137	152	167	182	197	214	229	244	259	274	289	304	291	306	321	336	351	366	381	396	411	368	383	398	413	428	443	458	473	488	503	518
Beam centres (mm)	W	685	685	835	835	985	685	685	835	835	835	985	985	685	685	685	835	835	835	835	985	985	685	685	685	835	835	835	835	835	985	985	985
	X	To 2nd beam centre					1455	1605	1605	1755	1905	1905	2055	1455	1455	1605	1605	1755	1755	1905	1905	2055	1455	1455	1605	1605	1755	1755	1755	1905	1905	2055	2055
	Y	To 3rd beam centre												2225	2375	2525	2525	2675	2825	2975	2975	3125	2225	2375	2375	2525	2675	2675	2825	2825	2975	2975	3125
	Z	To 4th beam centre																					2995	3145	3295	3295	3445	3595	3745	3895	3895	4045	4195

Lifting

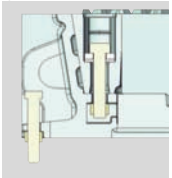
Pair of EM keys (weight 8 kg/pair)
see details on p. 86



Recommended option: Locking (composed of 4 stainless steel bolts)

Standard locking (VCHC)
or security locking (VOTC)
Add suffix to reference.

For example :
ER9R (a x b) VCHC
(see detail on p.3)



Drawings

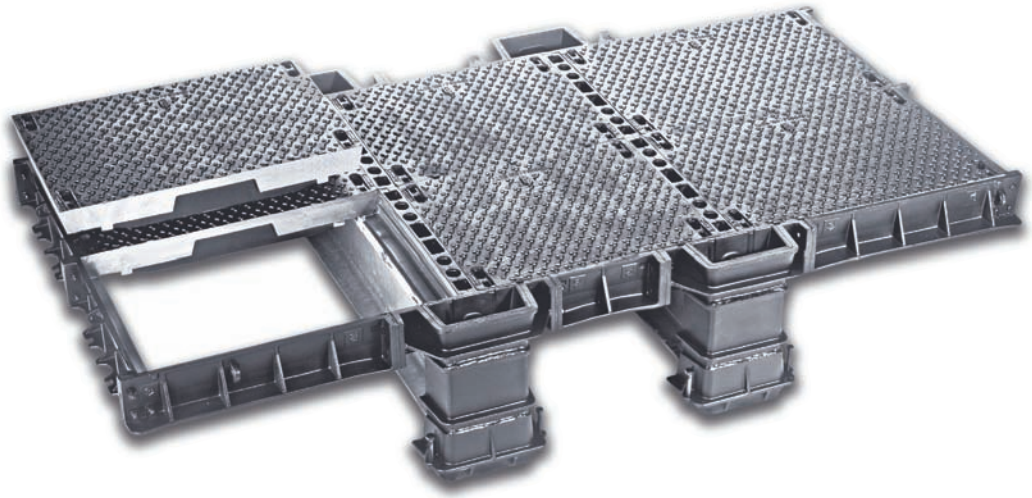
Layout drawings are available showing the cover/frame and the concrete rebate dimensions. Please consult us.

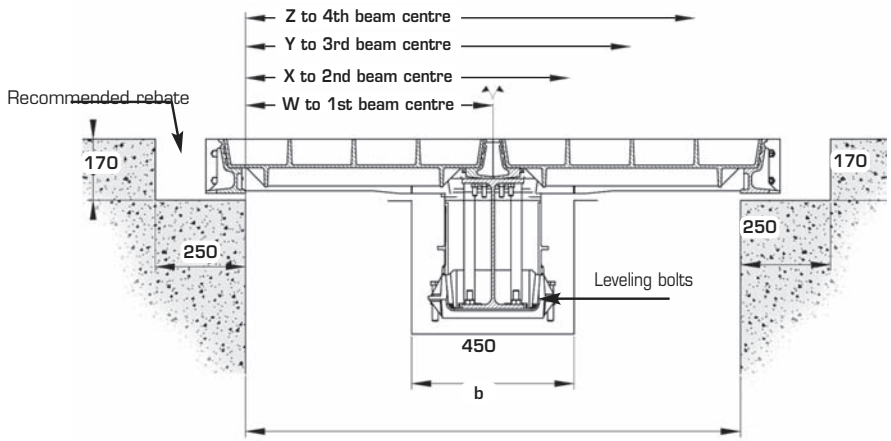
Installation
see recommendations on p. 79

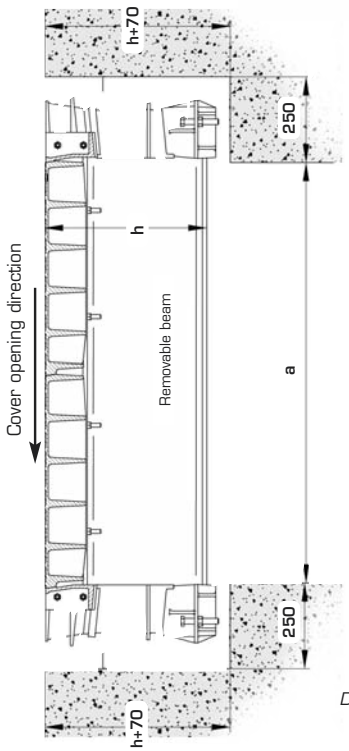
Infilling of recessed covers
see recommendations on p. 85

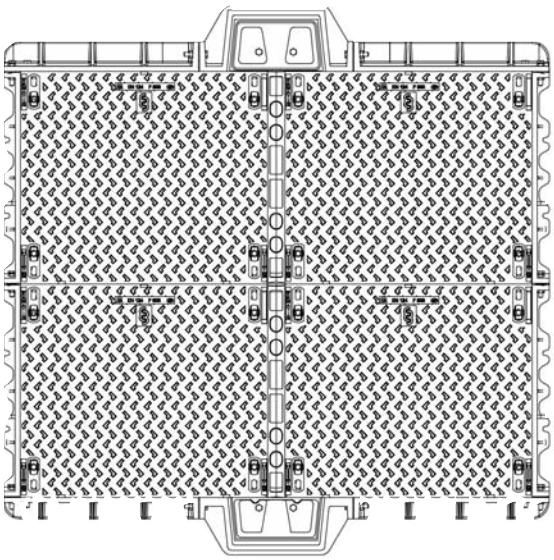
How to specify
see detail on p. 89

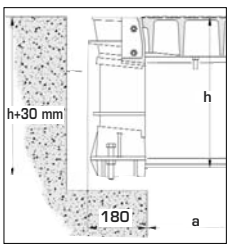
ERMATIC®
F 900

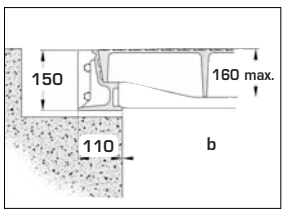












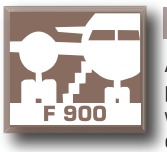
Dimensions en mm

Cover recessed for filling with 40 MPA concrete
See recommendations on p. 84

Multiple covers with removable beams
Solid top cover with anti-slip surface

Specification

- ERMATIC F 900 multiple access covers with removable beams
- Solid top cover with anti-slip surface
- Clear opening (a x b) in mm Reference ER9S (a x b) in cm
- Machined horizontal and vertical contact faces
- In order to facilitate the levelling of ERMATIC systems, **adjusting bolts**
- Ductile cast iron according to ISO 1083 and EN 1563
- Galvanised mild steel beams
- Quality assurance by third party certification to ISO 9001



Place of installation

Areas imposing particularly high wheel loads e.g. docks, aircraft pavements.

Group 6 and lower
As per EN124

Standard clear opening dimensions : a x b (in cm)
For other clear opening dimensions, please consult us

Norinco's reference : ER9S (a x b) in cm

a \ b	clear opening (cm)	2 covers 1 beam					3 covers 2 beams							4 covers 3 beams									5 covers 4 beams											Removable beam used (mm)
		137	152	167	182	197	214	229	244	259	274	289	304	291	306	321	336	351	366	381	396	411	368	383	398	413	428	443	458	473	488	503	518	
2 covers	122																																	IPE360 (h = 470)
	137																																	
	152																																	
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	276																																	
	291																																	IPE500 (h = 610)
	306																																	
	321																																	
	336																																	3360
	351																																	IPE550 (h = 660)
	366																																	

Overall dimensions of cover (a+360mm) x (b+220mm) x (beam box height = h +30mm

Beam centres (see section opposite)

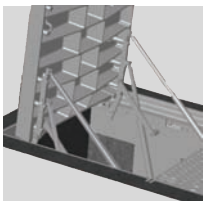
Clear opening in cm		137	152	167	182	197	214	229	244	259	274	289	304	291	306	321	336	351	366	381	396	411	368	383	398	413	428	443	458	473	488	503	518
Beam centres (mm)	W	685	685	835	835	985	685	685	835	835	835	985	985	685	685	685	835	835	835	835	985	985	685	685	685	835	835	835	835	835	985	985	985
	X	To 2nd beam centre					1455	1605	1605	1755	1905	1905	2055	1455	1455	1605	1605	1755	1755	1905	1905	2055	1455	1455	1605	1605	1755	1755	1755	1905	1905	2055	2055
	Y	To 3rd beam centre												2225	2375	2525	2525	2675	2825	2975	2975	3125	2225	2375	2375	2525	2675	2825	2825	2825	2975	2975	3125
	Z	To 4th beam centre																					2995	3145	3295	3295	3445	3595	3745	3895	3895	4045	4195

Overall dimensions of cover (a+360mm) x (b+220mm) x (beam box height = h +30mm

NEW

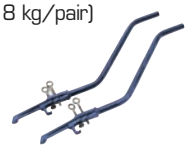
Option: hinge and assisted opening by gas strut

In order to reduce the lifting effort the covers can be provided with hinges and in-built lift assist mechanism gas struts, see details page 5



Lifting

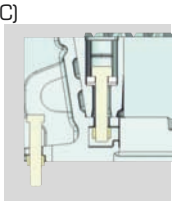
Pair of EM keys (weight 8 kg/pair)
see details on p. 86



Recommended option: Locking (composed of 4 stainless steel bolts)

Standard locking (VCHC) or security locking (VOTC)
Add suffix to reference.

For example :
ER9S (a x b) VCHC
(see detail on p.3)



Drawings

Layout drawings are available showing the cover/frame and the concrete rebate dimensions.
Please consult us.

Installation
see recommendations on p. 79

How to specify
see detail on p. 89

There is no standard or definitive guide to the installation of access covers and frames. These recommendations are designed to assist in the installation of ERMATIC® covers in general situations that present no particular technical difficulties.

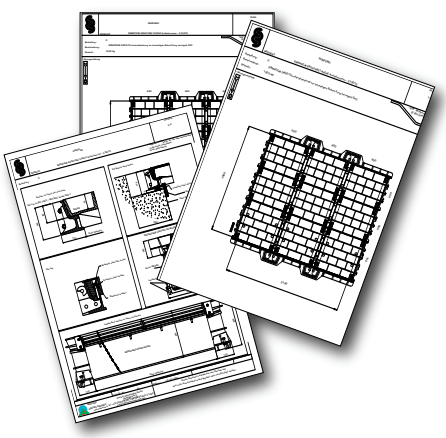
All frames and beam wallboxes must be adequately, solidly and continuously supported to a degree sufficient for the designed load conditions in each particular case.

ERMATIC® covers and frames are made from machined elements, assembled to strict tolerances.

The frames are assembled around their respective covers so as to provide a peripheral contact between their seatings and side contact faces.

When correctly installed, maintaining the tolerance imparted at the factory, ERMATIC® ensure stability and sealing against water and debris.

In order to protect the machined surfaces from contamination with silt and mud, cover and frame components must be positioned or stored on clean surfaces.



Companies responsible for access cover installation can amend or improve upon Norinco's recommendations.

Norinco reminds installers that these recommendations are only indicative and Norinco accepts no liability for the installation of covers and frames.

Technical assistance with installation

For the installation of access covers and frames, Norinco can provide, upon demand, various levels of technical assitance.

Objective of the assistance

To assist the contractor in the installation and grouting of the covers and frames to maintain the tolerances imparted to the factory to guarantee the performance and stability characteristics.
To furnish the contractor with all information necessary to operate and maintain the covers and frame.

Examples of assistance

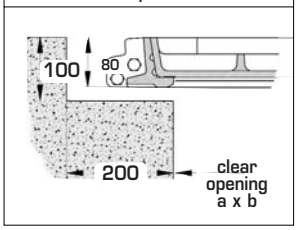
Advice regarding installation.
Technical assistance and training on site.
Supervision of the complete installation including grouting.

1 Rebate

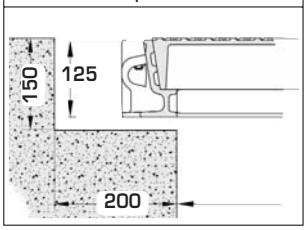
For all Covers and frames, prepare a peripheral rebate in accordance with the suggested dimensions.

For beamed multiples and special ducts with angles and returns, see the specific details provided during the design or accompanying the delivery.

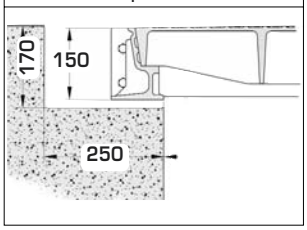
Frame depth: 80mm



Frame depth: 125mm



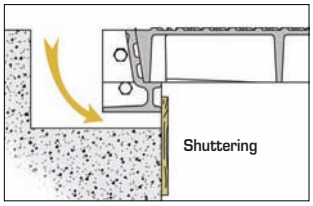
Frame depth : 150mm



Installation and shuttering

See next page

Grouting



Important: The covers must be in their correct position(s) within the frame (and locked if applicable) whilst the frames are grouted in position.

Force the grout beneath the frame.

Fill the rebate in successive layers.

Do not forget to vibrate the grout.

If there is insufficient time to allow the concrete to fully cure before trafficking, use a rapid setting grout such as EMACO T926 or similar.

Filling covers (Recessed series)

Please see instructions for infilling recessed covers on p. 85

Finishing and reopening to traffic

Allow the grout and concrete to fully cure. Take out the covers and point the mortar joints

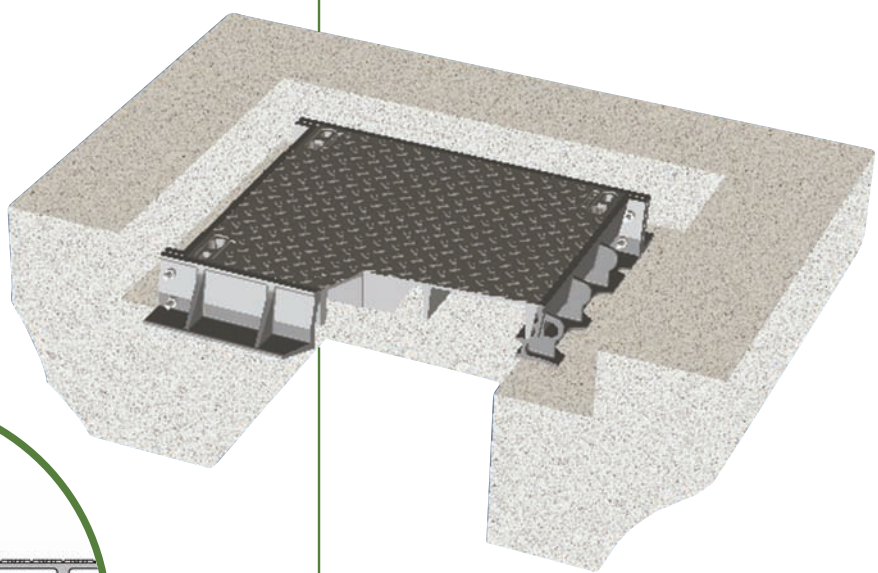
Clean and grease all the contact faces of the cover and frame each time the cover is opened. Use a graphite grease. Norinco recommends ELF CARDREXA GEP 2.

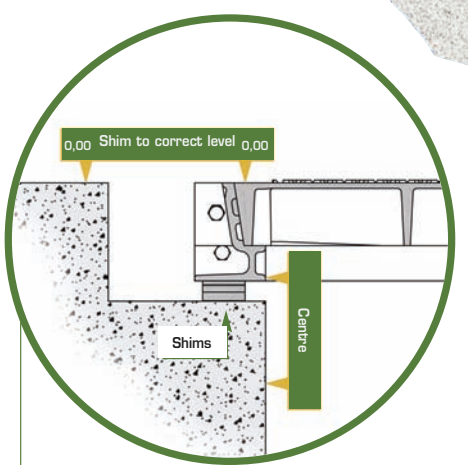
Installation and shuttering

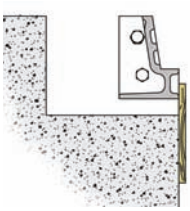
1/2/3 - part covers and frames

Correctly centre the cover and frame within the rebate

Shim to the correct level (✪), at each frame corner, and underneath each frame joint using metal (or similar) packers.

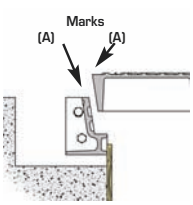






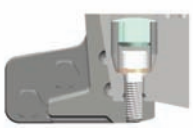
Shutter the gap between the bottom of the frame and the concrete of the chamber.

Check that the machined faces of the cover and frame are free from silt or mud. Clean if necessary.



Position the covers within their respective frames. If applicable, refer to the assembly drawing.

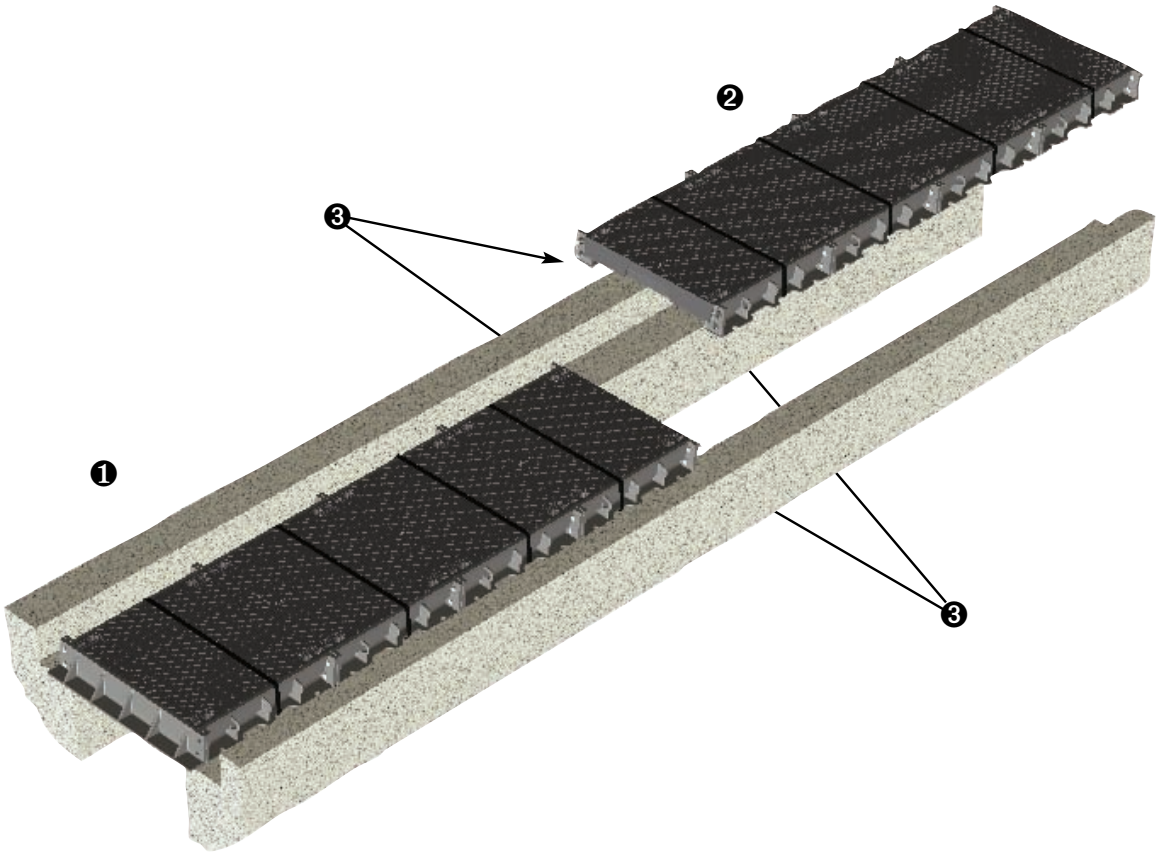
Check that covers do not rock, and covers are in continuous contact with the frames. If necessary, adjust the shims and use clamps to obtain the correct condition.

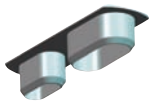


Tighten the locking bolts (if applicable) or the installation screws (if fitted)

Covers and frames for ducts

- Position the first element 1 in the rebate in accordance with the assembly drawing. Do not cut the metal bands connecting the covers with the frames.
- Centre and correctly level (✪) by inserting metal (or similar) shims beneath each frame corner and frame joint.
- Position the second element 2 ❷ in the rebate.
- Centre and correctly level (✪) the second element by inserting metal (or similar) shims beneath each frame angle and frame joint.
- Bolt the second element to the first ❸
- Complete the installation by repeating the previous instructions and proceed element by element.
- Finish the installation with the generic Ermatic® process, elements by elements, after removal of metal bands and covers.





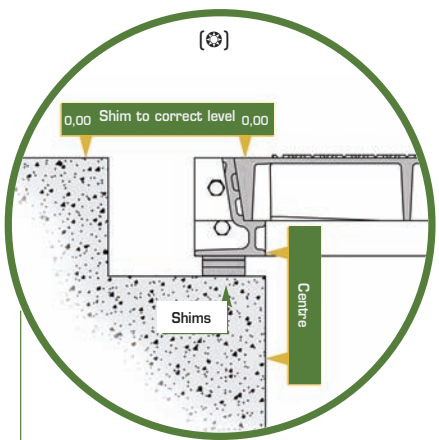
Mask the keyways with the plastic plugs. And, if applicable, fit the oval plastic plugs in the bottom of the covers (recessed covers only)

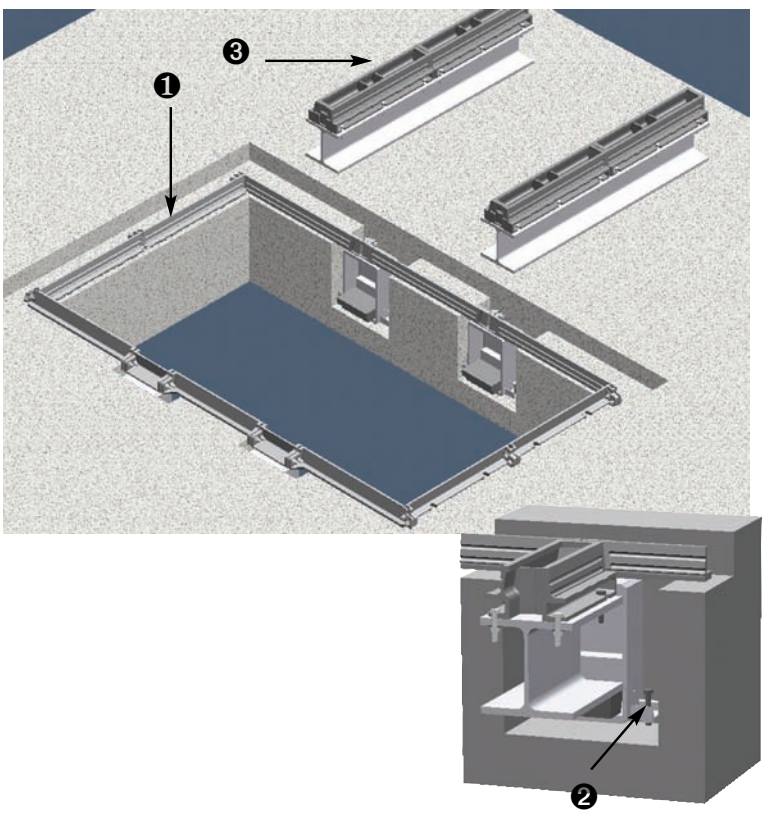
Installation and shuttering

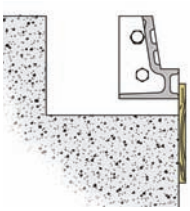
Beamed multiple covers for large chambers

Class B125/C250 access covers :

Correctly position the frame elements in the rebate in accordance with the assembly drawing.
Tighten the bolts .
Centre (❂) the frame correctly within the rebate.
Position the beam box leveling bolts to permit adequate adjustment. Place shims beneath each bolt and at each frame corner to correctly level the frame corners ❷.
Check and adjust the alignment of the beam boxes.
Position the beams ❸ in accordance with the assembly drawing within the beam boxes and check that the top of the beams are in metal to metal contact with the beam boxes.
Check the level of the top of the beam and adjust with the beam box leveling bolts.
Insert shims (metal or similar) beneath each frame joint to correctly level (❂) the frame.

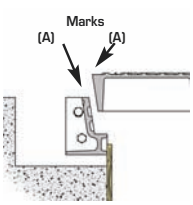






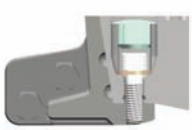
Shutter the gap between the bottom of the frame and the concrete of the chamber.

Check that the machined faces of the cover and frame are free from silt or mud. Clean if necessary.



Position the covers within their respective frames. If applicable, refer to the assembly drawing.

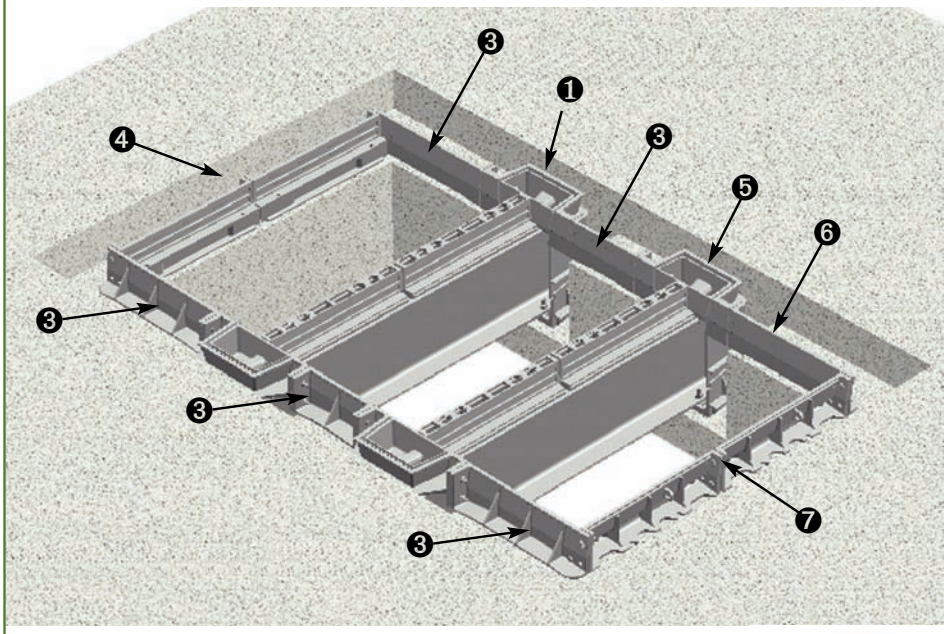
Check that covers do not rock, and covers are in continuous contact with the frames. If necessary, adjust the shims and use clamps to obtain the correct condition.

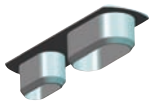


Tighten the locking bolts (if applicable) or the installation screws (if fitted)

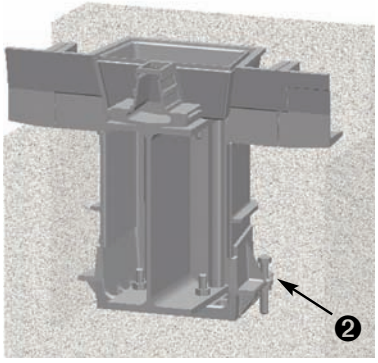
Class D400/E600/F900 access covers :

- Commence the assembly from one end of the chamber in accordance with the assembly drawing.
- Install and correctly centre the 1st beam (still bolted to the wallboxes) within the rebate.
- Correctly level the beam by adjusting the beam leveling bolts ❷.
- Install and bolt to the wallbox, the adjacent end bars ❸.
- Bolt the side frame bars (parallel to te beam) to the end bars ❹.
- Check to ensure that the frame assembly is centered within the chamber .
- Shim to the correct level, (❂) underneath each frame corner and underneath each frame joint using metal (or similar) packers.
- Complete (if necessary) the installation of the next beams and frame elements by repeating the following 3 operations :
- Install and centre correctly within the rebate, the 2nd, 3rd beam etc. (still bolted to the wallboxes) ❺.
- Correctly level the beam by adjusting the beam leveling bolts ❷.
- Bolt to the corresponding end bars.
- Install by bolting the 2 new end bars ❻.
- Finish and close the construction of the frame by bolting to the end bars, the side frame bars (parallel to the beam) ❼





Mask the keyways with the plastic plugs. And, if applicable, fit the oval plastic plugs in the bottom of the covers (recessed covers only)



Recommendations for the concrete infill of covers

In this document, the recommendations are given in good faith and reflect the latest research ; nevertheless, we cannot accept any liability from their adoption.
The description and choice of products must be adequate with the specific conditions of each application (conditions of use and installation).

The covers' concrete infill is part of the complete product, so a particular care should be taken regarding its manufacture and application.
The expected quality shall be the same as required for construction work concrete with high mechanical performances (> 40 Mpa after 28 days on a test cylinder of 150 x 300 mm).
Therefore its composition shall be studied to achieve the highest possible performance with regard to the specific concreting conditions of this application.

I) - SUPPORT

The recesses must be clean, exempt from any trace of products such as grease, oil, sand, dust .... Any non adhesive particles must be removed.

II) - COMPOSITION OF THE CONCRETE

As an indication, the "typical concrete mix design" may be characterized by :

Cement
- a cement CEM I or II 52,2 proportion near to 450 kg/m3.
- its chemical composition shall be adapted to the covers' environment, e.g. cement type PM (marine and chloride environments) for works exposed to a sea atmosphere.

Granulates
- A G/S (gravel / sand) ratio < 1,5.
- The diameter of the biggest granulate shall be < 12,5 mm.
- The required acceptance criteria must be those of construction work concrete, of which the characterized resistance after 28 days is over 40 Mpa.
- If the granulates (or one of those) are (is) classified as potentially reactive (PR), then the total rate of active alkalines in the concrete must be limited to a maximum of 3 kg/m3 (this requirement will often lead to the choice of low alkali cement (< 0,6 %)).

Water
- The ratio of water / cement (W/C) must be smaller than 0,4.
- The water used must be drinking water.

Admixtures
- In order to reduce the W/C ratio and in respect to the maintenance of the rheology for the time necessary to fill the several covers with concrete of the same batch, admixtures must be certified to the NF Mark or complying with national standards (B.S./ASTM/AFNOR ...), such as plasticizers, High Range Water Reducers, set retarding admixtures. The dosage of these products (expressed as a percentage of the cement weight) must be kept inside the limits defined by the supplier or in the product technical information sheet, in order to avoid detrimental effects on the other properties of concrete.

III) - INSTALLATION

Temperature of the concrete at the time of delivery :
- between 10 and 32°C.

Temperature of the support :
- Except special requirements, concreting must not be carried out on supports :
  * of which the temperature is < 5°C, or
  * of which the temperature varies by more than 10°C from the temperature of the concrete.

Vibrating :
- After filling, the concrete must be vibrated, preferrably on a vibration table. In case of vibration needles (pervibrators), the "picking" must be done regularly on the cover surface while avoiding any contact with the cast iron.
- The vibration should obtain a maximum compacity and a perfect filling of the recesses, without causing any segregation.

Finishing :
- The filling must be carried out without excess
- Flatness must be assured and checked by means of a straight-edge. The maximum oscillation allowed is 3 mm.
- The obtained surface must be equivalent to that of the carriageway's surface.

IV) – CURING OF CONCRETE

Immediately after manufacturing and cuffing the free surface, the latter must be protected from free circulation of air and from any evaporation / desiccation.
This can be achieved :
- Either by storing the covers in a place where the atmosphere has a humidity ratio near to 95 %.
- Either by pulverizing it with a curing compound of which the efficiency has been proved (re. list of approval and reference for the execution of carriageways or airfield pavements in concrete).

In case of concreting at low temperatures, every precaution must be taken to make sure that the temperature of the concrete remains above 5°C.

V – RELEASE

The works must only be released when the resistance of the concrete infill will have attained 40MPa.

TECHNICAL ASSISTANCE - OTHER INFORMATION

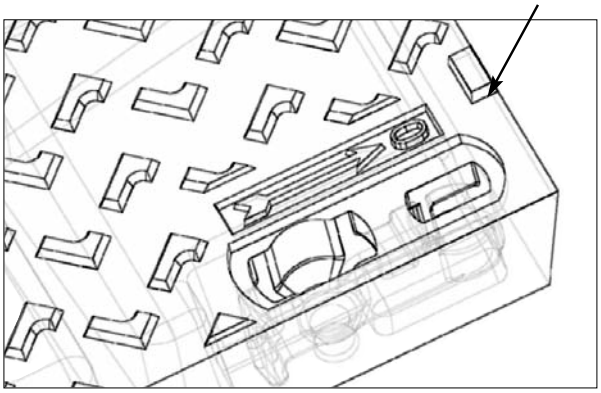
For all precise information, please consult us.

Operation of Ermatic® covers

Opening direction

Covers can only be opened in one direction, indicated by an arrow as shown below.

• Remove the plastic keyhole caps.



Covers with locking bolts

• Note the position of the covers in the frame, they are not interchangeable.

• Unscrew the locking bolts with :
- For CHC: a six sided spanner.
- For OTC: a special OTC spanner. Note that the OTC bolt is left hand thread.

INTERCHANGEABILITY OF COVERS

1/2/3 part covers and frames not locked, class < à D400

The covers are interchangeable within the original frames.

1/2/3 part covers and frames locked, class < à D400 Duct covers (< 3 covers long) Beamed multiples

The covers are not interchangeable. They have to be replaced in accordance with the marking system visibly stamped into each cover and frame at the works.

Cover handling

• To handle the covers, use a pair of EM keys with the blocking and jacking bolts.

OPENING

• Clean the keyways with a screwdriver the opening direction is indicated with an arrow.

• Completely insert the EM keys.

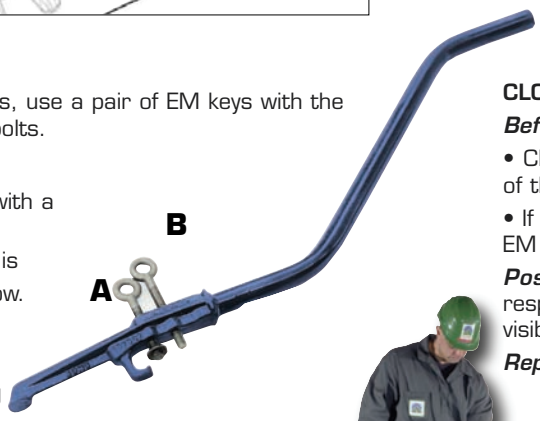
• Tighten the blocking bolt (**A**) to lock the key in position.

• Tighten the jacking bolt (**B**) to put tension on the cover/frame joint.

• Apply downward pressure to the end of the EM keys to assist leverage.

• Lift the one edge of the cover from the frame.

• Pull the cover from the frame along the greased machined seatings.



CLOSING

Before closing:

• Clean and grease the machined faces of the cover and frame.

• If necessary, withdraw the jacking bolt from the EM key so that it does not protrude. (**B**)

Position the covers in place respecting (if appropriate) the marking system visibly stamped into each cover and frame.

Replace the plastic keyhole caps.

Maintenance

Before delivery, all the machined faces of the 1/2/3 part cover and frame are greased (duct covers and beamed multiples are greased by the contractor on site). Covers are partially painted with water soluble black paint.

In service, after each cover opening and when performance and environmental requirement demand, it is necessary to clean and apply and appropriate grease (see later) to the machined faces of the cover and frame.

Characteristics of graphite grease :

- ***Resistance to loading and shock.***
- ***Good adherence.***
- ***Insoluble in water.***
- ***Good resistance to extremes of temperature.***
- ***Elf Cardrexa GEP 2 is recommended.***

A material with remarkable characteristics for RELIABLE and HIGH PERFORMING access covers and frames.

What is SG cast iron ?

Spheroïdal graphite cast iron is better known as ductile cast iron or SG cast iron. Due to the addition of magnesium to the cast iron, the graphite which is present in flake form is transformed into spheroids.

This process provides remarkable features, such as resistance to breakage, better shock resistance and a high modulus of elasticity.

SG cast iron compared to grey iron:

The exceptional ratio of weight/mechanical strength of SG cast iron allows the manufacture of access covers with weights 20 to 30 % lower than the same access covers manufactured in grey iron. Therefore,

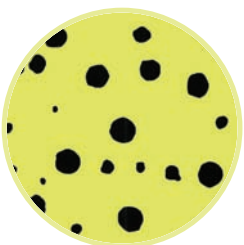
- **cost of transport can be reduced** and

- **cover handling is achieved with lower risk of injury**.

Also due to the strength of SG cast iron **large one piece frames can be manufactured i.e. monobloc construction** (this is not possible with grey iron).

Spheroïdal graphite cast iron

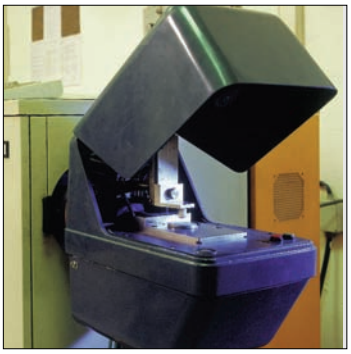
Grey iron



NORINCO cast access covers and frames are made of ductile iron, grade EN GJS 500-7 in accordance with ISO 1083 and NF EN 1563 standards.

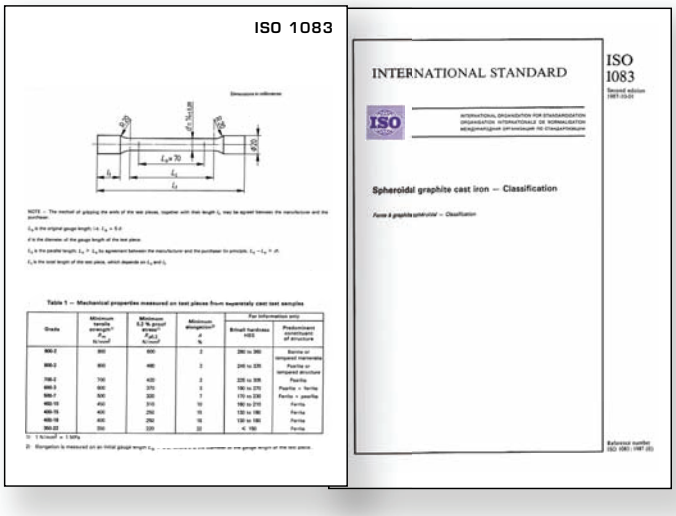
Load tests on access cover

chemical and mechanical sample tests



Spectrometer analyses

Micrographic control (graphite nodular configuration)



road tests

Item	Quantity	Description	Unit price	Total price
.....	.....	**Ermatic® covers and frames :** Reference : **ER**	.....	.....
		Clear opening dimensions : (a x b in mm) :		
		Mechanical characteristics : Construction principles as per EN124: 1994 Class : ..... *(B 125, C 250, D 400, E 600, F 900)* *(F 900 covers concreted for the recessed series)* • **Beams :** *(only applicable to beamed multiple units)* *Conforming to the following French standards* ERMATIC® B 125 : Loading 500 daN/m² ERMATIC® C 250 ; CCTG Chapter 61 clause II ERMATIC® D 400 ; CCTG Chapter 61 clause II ERMATIC® E 600 and F 900 : ADP and STBA		
		Covers : • **Type :** ..... *(Recessed, solid top covers with anti-slip surface)* • **Locking :** ..... *(standard locking VCHC or security locking VOTC)*		
	.....	• **OTC key** for special security (Only when OTC is specified)	.....	.....
		Material : • **Covers and frames :** SG cast iron according to ISO 1083 and EN 1563 • **Beams and other steel components :** Conforming to NF EN 10025/34 - NFA45255/201/201 (Only for beamed multiples)		
		Cover stability : Assured by machining the seating faces of the cover and frame.		
		Sealed against water and debris : By the interposition of a film of grease (Cardrexa GEP2 by ELF) on the contact faces of the cover and frame.		
	.....	**Pair of EM Keys for handling :** By sliding on the machined faces of the cover and frame easily using a pair of EM keys with blocking and jacking bolts.	.....	.....
		Painting : • **Cast iron covers and frames :** Painted with water soluble paint except machined surfaces and surfaces in contact with concrete Covers supplied disassembled : Machined surfaces coated with a protective film. • **Beams and other steel components :** Steel components protected by hot-dip galvanizing to ISO 1461.		
		Installation, concrete filling of recessed covers and operation: As per the manufacturer's recommendations.		
	.....	**Technical assistance on site :** Upon request from the manufacturer for large or complex covers.	.....	.....
		Quality assurance/Certificate of conformity (on application) : System of quality assurance conforms with the requirements of ISO 9001 certified by third party.		

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