• CUSTOMIZATION LOCKING BOLTS

The models described in the catalogue are standard and minimum manufacturing batches are not required. However, there is the possibility of customizing them to suit better customer's needs. See below some of the most common customizations.

If any modification is needed, please ask NAFSA about the possibility and the minimum manufacturing batch required.

1. ELECTRICAL CUSTOMIZATION

NAFSA's locking bolts are standard linear solenoid adapted to work standing radial forces. With this modification, the plunger works as bolt.

Therefore, all electrical customization that are made in the standard solenoid are also applicable in the locking bolts. For example one ER model which has been adapted to de used as locking bolt, can be modified with any electrical customization described in the ER serie. It will be the same for all other series.

Some of the most common customizations are free wheel diode, varistor, rectifier diodes, PWM electronic (pulse width modulation), thermal protection, etc... integration in the solenoid.

The PWM mounting is particularly interesting in this type of locking bolts since it allows working with more force, so this will allows to mount harder springs if necessary. This can be done keeping the 100% duty-cycle.

2. MECHANICAL CUSTOMIZATION:

2.1) Bolts plunger lenght and shape:

a) Flat

b) Spherical

c) Conical

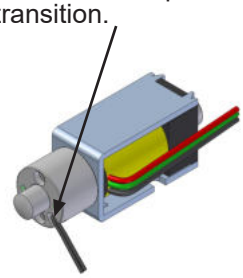
d) Slip at 30º

e) Slip at 45º

2.2) Position detection system integration:

a) Magnetic sensor

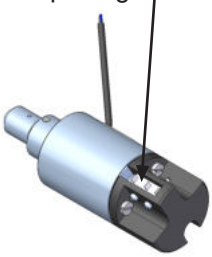
In this example the magnetic sensor is integrated in the guide, and its detects the position transition.



Example:
ERB35-05_NDBCP

b)Microswicht

In this case, the microswicht is integrated in the cover and its detects bolt opening

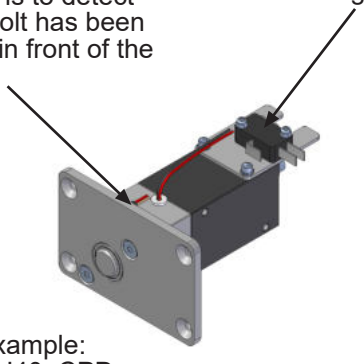


Example:
ECH40-10_BM

b) Combination of magnetic sensor and microswicht:

Magnetic sensor: In this example magnetic sensor is integrated in the support. Its function is to detect when the bolt has been positioned in front of the closure.

Microswicht: In this case it detects when the locking bolt is closing the door.



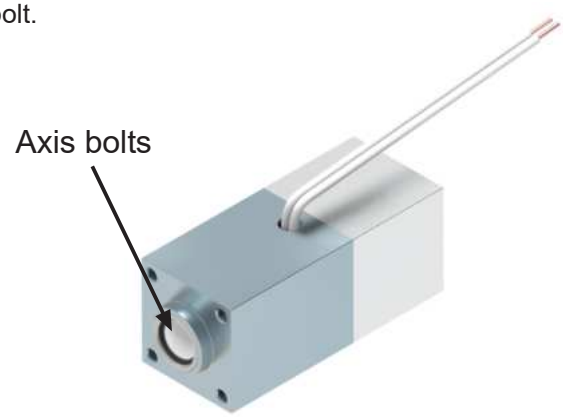
Example:
CU40_CPD

NOTE: All this customizations cannot be applied to all models, ask NAFSA for each case.

• CU 20/CPXU TYPE

These locking bolts are simple effect linear solenoids, where the shaft has been reinforced to assure the performance in case of radial stress.This model assures the locking with voltage (active security).
It has got frontal fixing.
It design makes it good to be used as industrial locking bolt.

Protection rate: **IP40**
Insulation class: **B (130ºC)**
Standard voltage: **24Vdc**
Available voltages: **6 a 48Vdc**
Duty-cycle (ED%): **100**
Abs. power at 20ºC: **4.8W**
Standard stroke"s": **10mm**
Temperature increase "ΔV_{31}": **70ºC**
Plunger weight (Kg): **0.017**
Locking bolt weight (Kg): **0.090**
Incorporated return spring: **YES**
Return spring force ED100% (N):
from 0.7 (compressed, under voltage)
to 0.15 (extended, without voltage)
Pushing force at stroke 10mm (N): **0.35**



- Voltage under demand:
They can be manufactured at any voltage between the maximum and minimum voltage values shown in the chart.

- To feed in alterning current the solenoid will have a rectifier mounted in.

- If any change from the original is needed, please contact us.

Ordering code: *CU20/CPXU --V ED--%*

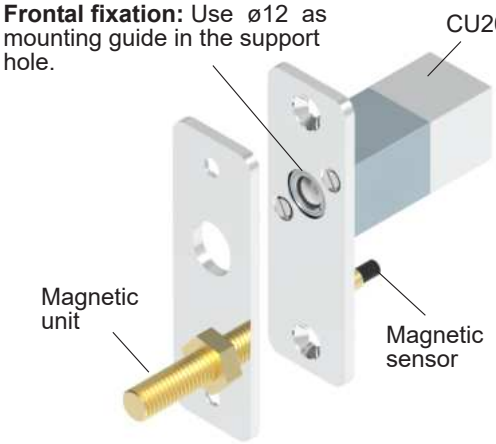
Voltage: 24Vdc, Duty cycle 100%:

CU20/CP XU24VdcED100%

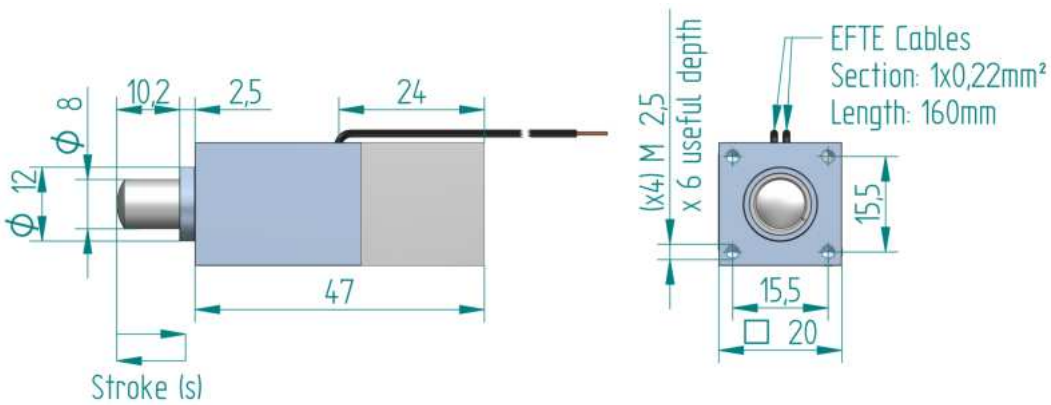
Possibility of supply with detection system integrated in the supports.

Reference: CU20/CPXUM

Frontal fixation: Use ø12 as mounting guide in the support hole.



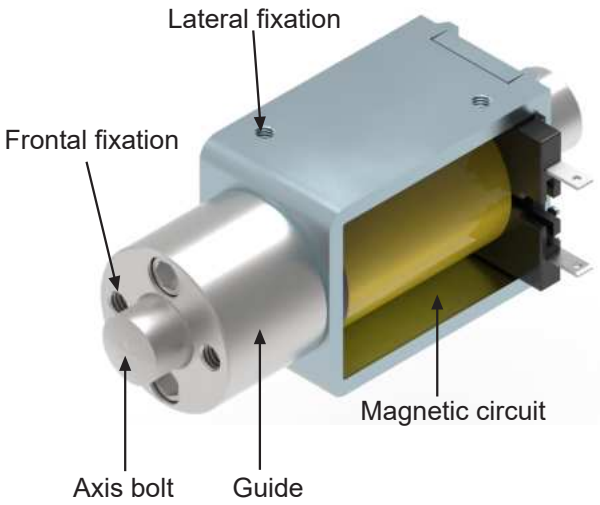
Solenoid under voltage (s=0mm position)



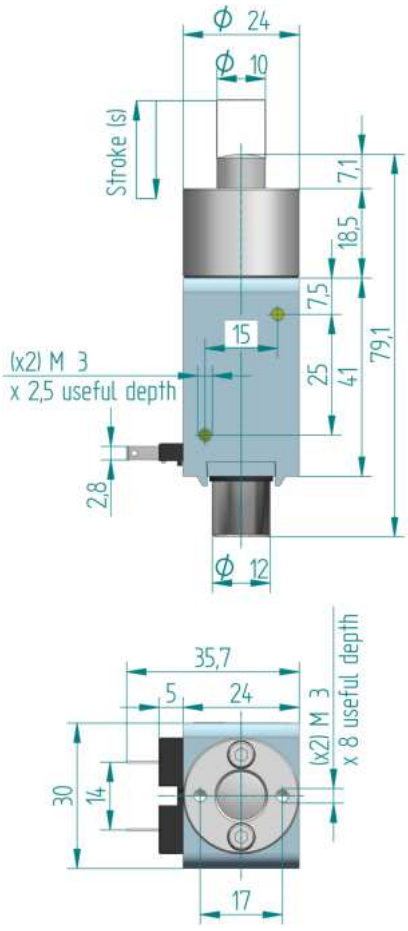
• ER 30/CCR TYPE

Derivative of ER series, and reinforced with a guide to guarantee the operation of the axis bolt before possible radial efforts. The closing takes place under voltage (active security).
This indicated to work in automatism where an intense use is not required.
It is possible to be fixed frontally or laterally.

Solenoid protection rate: **IP00**
Insulation class: **B (130ºC)**
Standard voltage: **24Vdc**
Duty cycle (ED%): **100**
Absorbed power at 20ºC: **8W**
Under demand voltage: **Vdc (de 3V a 205V)**
Under demand voltage: **Vac (de 24V a 230V)**
Standard stroke "s": **10mm**
Temperature rise "ΔV_{31}": **70ºC**
Plunger weight (Kg): **0.060**
Locking bolt weight (Kg): **0.220**
Return spring incorporated: **YES**
Spring return force (N): **from 1.6 to 0.6**
Maximum radial effort with lateral fixation: **20N**
Maximum radial effort with frontal fixation fixing in the guide diameter: **1000N**



Solenoid without voltage



- Voltage under demand:
They can be manufactured at any voltage between the maximum and minimum voltage values shown in the chart.
- To feed in alterning current, the solenoid will have a rectifier incorporated. Faston terminals will be changed by flying leads (L=150mm).
- If any changes from the original are needed, please contact.
- Earthing is recommended if the metallic parts are accessible.

Frontal fixation (recommended Assembly): it is advisable to realize a small bush of the guide thus to secure the optimal efficiency.

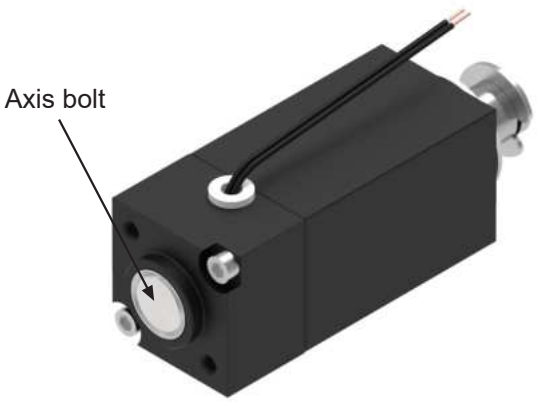
Lateral fixation (Only for smaller lateral stress than 20N): The length of the assembly screws does not have to exceed of the thickness of the magnetic circuit

Ordering code:
ER30/CCR --V ED100%
Example:
Voltage: 24Vdc: *ER30/CCR 24Vdc ED100%*
Voltage: 48Vdc: *ER30/CCR 48Vdc ED100%*

• CU 30/CP TYPE

These locking bolts are simple effect linear solenoids, where the shaft has been reinforced to assure the performance in case of radial stress. This model assures the locking with voltage (active security).
It has got lateral and frontal fixing.
Its design makes it good to be used in robotics where an intensive work is required.

Solenoid protection rate: **IP40**
Insulation class: **B (130ºC)**
Standard voltage: **24Vdc**
Duty-cycle (ED%): **100 or 25**
Absorbed power at 20ºC: **7.5W (ED100%); 29W (ED25%)**
Under demand voltage: **Vdc (from 3V to 205V)**
Standard stroke "s": **10mm**
Temperature rising "ΔV_{31}": **70ºC**
Plunger weight (Kg): **0.060**
Locking bolt weight (Kg): **0.330**
Return spring incorporated: **YES**
Return force ED100%(N): **from 1.5 (compressed spring, with voltage) to 1 (free, without voltage)**
Return force ED25%(N): **from 2.8 (compressed spring, with voltage) to 1.8 (free, without voltage)**
Maximum radial effort (N): **3000N**



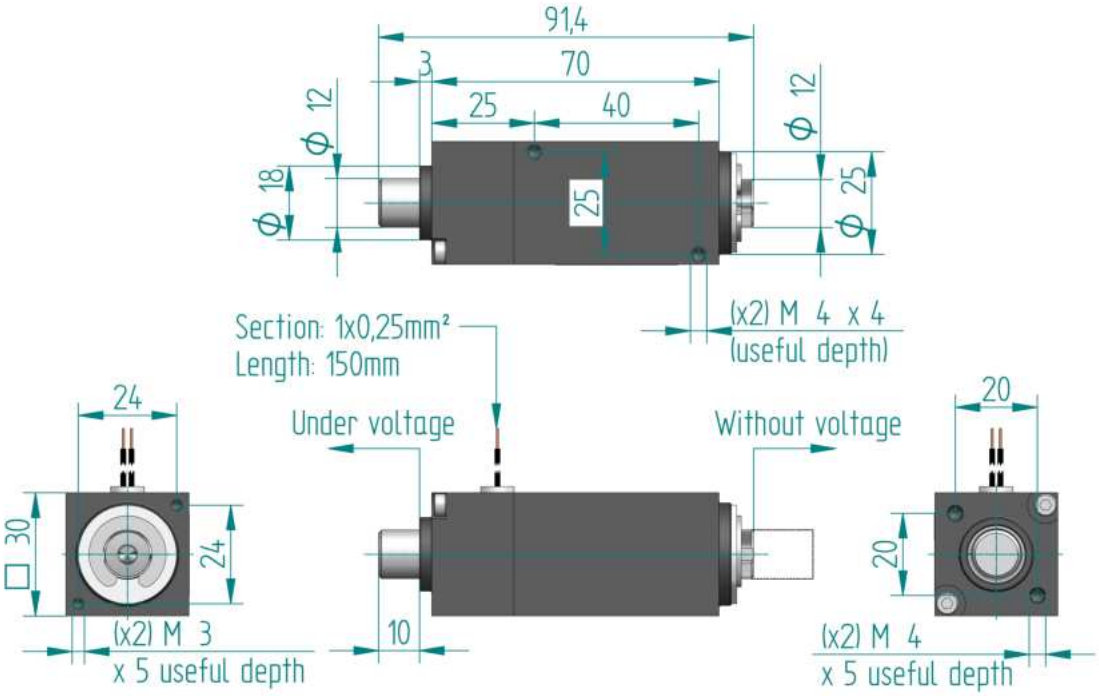
Ordering code:
CU30/CP --V ED100% or ER25%
Example:
24Vdc 100%ED: *CU30/CP100 24Vdc ED100%*
48Vdc 25%ED: *CU30/CP25 48Vdc ED25%*

- Voltage under demand:
They can be manufactured at any voltage between the maximum and minimum voltage values shown in the chart.

- To feed in alterning current the solenoid will have a rectifier mounted in.

- If any change from the original is needed, please contact us.

Solenoid under voltage (s=0mm position)



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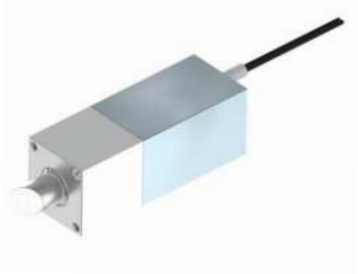
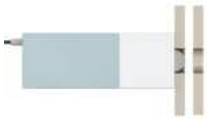
• CU 20/CP TYPE

These locking bolts are simple effect linear solenoids, where the shaft has been reinforced to assure the performance in case of radial stress. This model assures the locking without voltage (passive security). It has got frontal and rear fixing.The bolt has a slip with anti-rotation system. Its design makes it good to be used as industrial locking bolt.





Model: CU20CP100

Protection rate: **IP40**
Insulation class: **B (130ºC)**
Standard voltage: **VDC (12V;24V;48V)**
Duty cycle (ED%): **100%**
Absorbed power at 20ºC: **4,2W**
Standard stroke "s": **7mm**
Temperature rising "ΔV_{31}": **70ºC**
Mobil plunger weight (Kg): **0.017**
Locking bolt weight (Kg): **0.107**
Return spring incorporated: **1.1N (Opened lock, with voltage) to 0.2N (Closed lock, without voltage).**
Mimimum force at stroke 7mm with incorporated spring (N): **0,3**
Maximum radial stress (N): **2000N (Assembly A)**
Maximum radial stress (N): **750N (Assembly B)**

Model: CU20CP25

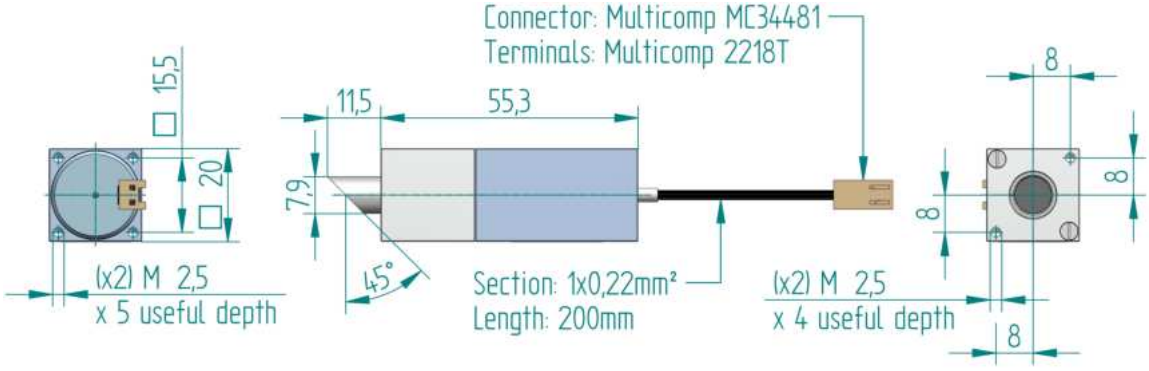
Protection rate: **IP40**
Insulation class: **B (130ºC)**
Standard voltage: **VDC (12V;24V;48V)**
Duty cycle (ED%): **25%**
Absorbed power at 20ºC: **17W**
Standard stroke "s": **7mm**
Temperature rising "ΔV_{31}": **70ºC**
Mobil plunger weight (Kg): **0.017**
Locking bolt weight (Kg): **0.107**
Return spring incorporated: **1.5N (Opened lock, with voltage) to 0.5N (Closed lock, without voltage).**
Mimimum force at stroke 7mm with incorporated spring (N): **1,75**
Maximum radial stress (N): **2000N (Assembly A)**
Maximum radial stress (N): **750N (Assembly B)**

- If any change from the original is needed, please contact us.
-The connector can be deleted or replaced.
- To use the solenoid with the electric saver, see page 109 Electric saver.

Ordering code:
-CU20CP100 12VDC100%: Features: Vn (12VDC) ; ED (100%) ; Pn (4,2W)
-CU20CP25 12VDC25%: Features: Vn (12VDC) ; ED (25%) ; Pn (17W)
-CU20CP100 24VDC100%: Features: Vn (24VDC) ; ED (100%) ; Pn (4,2W)
-CU20CP25 24VDC25%: Features: Vn (24VDC) ; ED (25%) ; Pn (17W)
-CU20CP100 48VDC100%: Features: Vn (48VDC) ; ED (100%) ; Pn (4,2W)
-CU20CP25 48VDC25%: Features: Vn (48VDC) ; ED (25%) ; Pn (17W)

Lay out:
Vn= Standard voltage ; ED= Duty-cycle ; Pn= Standard power

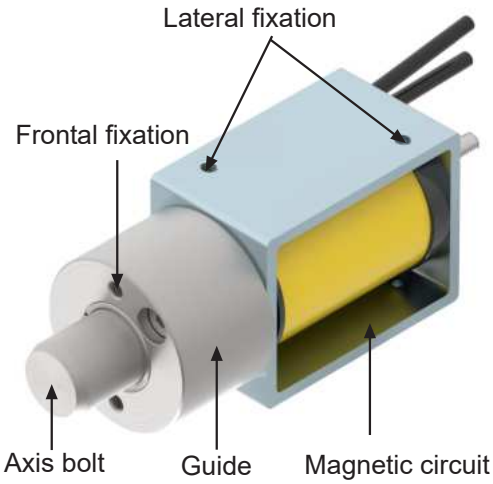
Solenoid without voltage (s=7mm position)



• ERC 30/CP TYPE

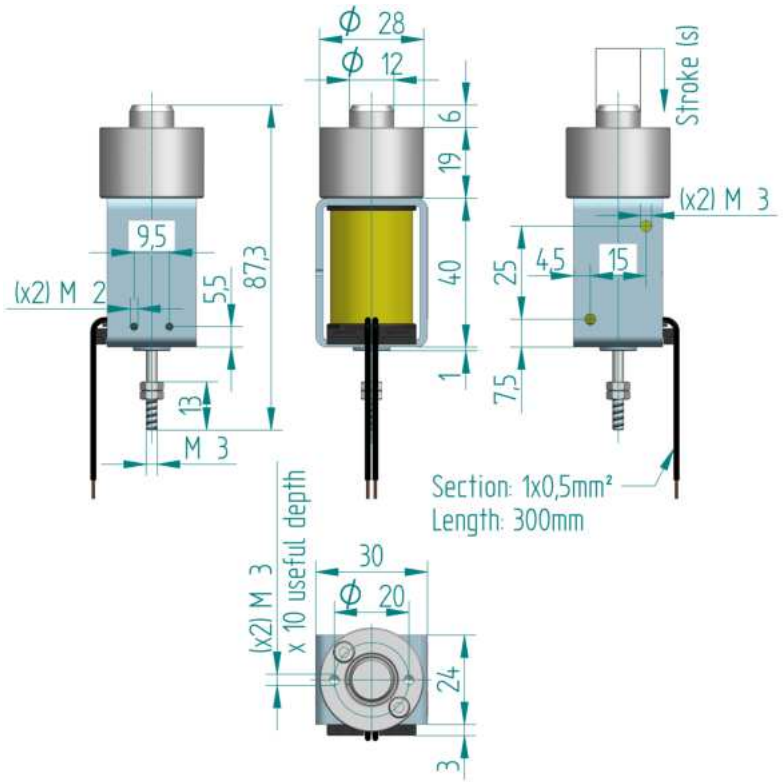
Based on ERC series, it has been reinforced with a guide to guarantee the performance of the plunger as a bolt in case of radial forces. The locking takes place without voltage (passive security).
It is indicated to work in automatismes where an intense use is required.
It is possible to be fixed frontally or laterally.

Protection rate: **IP00**
Insulation class: **B (130ºC)**
Standard voltage: **24Vdc**
Duty-cycle (ED%): **100% or 25%**
Abs. power at 20ºC: **8W (100%ED), 30W (25%ED)**
Voltages under demand: **Vdc (12,24,48,105,125,205)**
Voltages under demand: **230Vac**
Standard stroke "s": **8mm**
Temperature increase"ΔV_{31}": **70ºC**
Plunger weight (Kg): **0.038**
Locking-bolt weight (Kg): **0.215**
Spring return force: **YES**
Return spring force ED100% (N): **from 1.6 (compressed, under voltage) to 0.6 (extended, without voltage)**
Return spring force ED25% (N): **from 6.7 (compressed, under voltage) to 3.1 (extended, without voltage)**



- Voltage under demand: They can be manufactured at any voltage between the maximum and minimum voltage values shown in the chart.
- If any changes from the original are needed, please contact.
- Earthing is recommended if the metallic parts are accessible.

Solenoid under voltage (s=0mm position)



Frontal fixation (recommended Assembly): it is convenient to make a bushing of the guide to obatin the optimal performance.
Max. radial effort:2500N

Lateral holes can be used to integrate position detection system, for example, using microswicht:

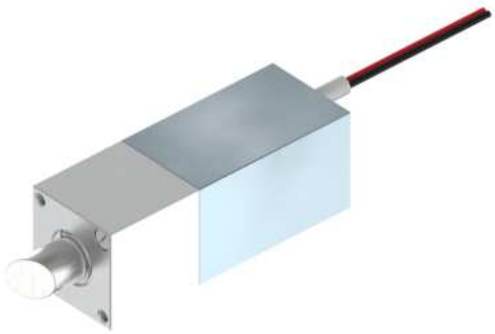
Ordering code
ERC30/CP --V ED100%: Example: Voltage: 24Vdc: *ERC30/CP100 24Vdc*
ERC30/CP --V ED25%: Example: Voltage: 24Vdc: *ERC30/CP25 24Vdc*

• CU 20/CPB TYPE

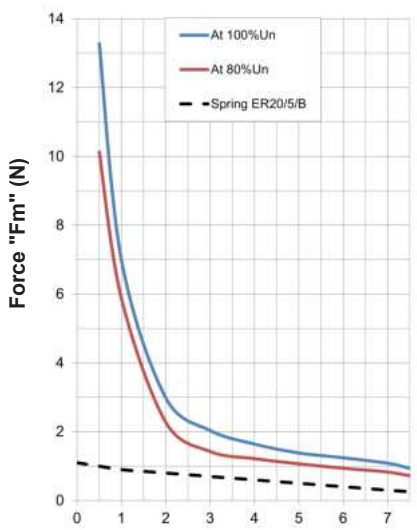
Based on CU20CP model, it is a bistable locking bolt where the movement from initial to final position is made by electromagnetic forces. The return to initial position takes place by an inverse polarizing pulse combined with external forces or by an incorporated spring.

The bistable solenoid has two working and mantained positions without voltage. One will be held by a permanent magnet system and the other one by a return spring or external forces. The bolt has a slip with anti-rotation system and frontal, rear and lateral fixations, and the guide has been reinforced for a correct performance in case of radial stress.

Protection rate: **IP40**
Insulation class: **Y (90ºC)**
Voltages under demand: **VDC (3, 3,6; 5; 6; 9:12; 24; 48)**
Duty-cycle (ED%): **25%**
Abs. power at 20ºC: **12W (ED25%)**
Standard stroke "s": **7.5±0.3mm**
Plunger weight (Kg): **0.019**
Locking bolt weight (Kg): **0.090**
Minimum pulse time: **20ms**
Incorportaed return spring: **YES**
Maximum radial stress (N): **2000N (assemble A)**
Maximum radial stress (N): **750N (assemble B)**



Force-stroke curve



Assembly A:

With lateral guided

Assembly B:

Work depending on the feeding mode:

Unlocked position (held by magnet 15N)

Red cable: +Vdc
Black cable: -Vdc

(F-S) Coil+magnet

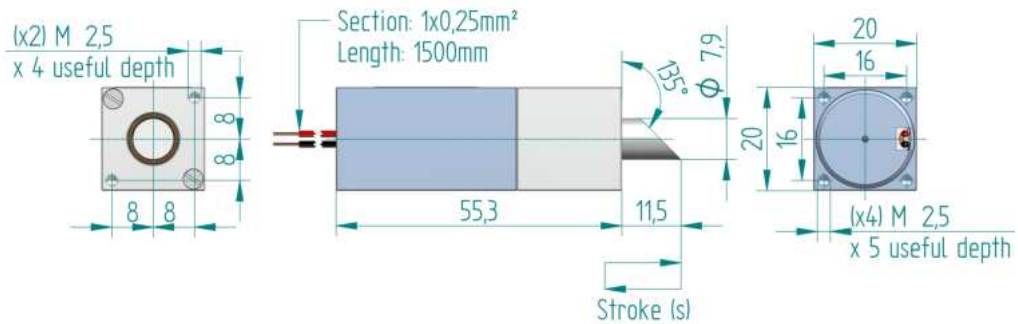
(F-S) Spring

Locked position (held by spring 0.25N)

Red cable: -Vdc
Black cable: +Vdc

F-S:Force-stroke

Solenoid without voltage (s= 7.5mm position)

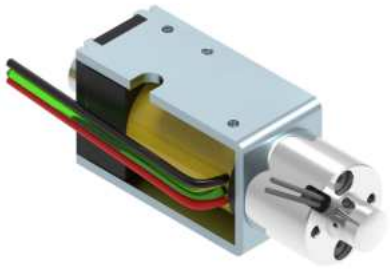


Ordering code: *CU20/CPB--V ED25%*
Voltage: 24Vdc ED25%: CU20/CPB 24Vdc ED25%
Voltage: 12Vdc ED25%: CU20/CPB 12Vdc ED25%

• ERB 35-05/NDBCP TYPE

This locking bolt is double coil bistable solenoid, where the stroke movement from initial (unlocked) to final position (locked) is made by electromagnetic forces when coil 1 is feeded. The return to initial positions takes place by an inverse polarizing pulse (when coil 2 is feeded) combined with an incorporated spring. It has proximity sensor integrated to detect locked position and free wheel diode to protect the coil against reverse polarity.

Protection rate: **IP00**
Insulation class: **Y (90ºC)**
Available voltages: **12, 24, 48Vdc**
Coil 1 duty-cycle (ED%): **20**
Coil 2 duty-cycle (ED%): **25**
Cycle duration: **3 minutes**
Standard stroke "s": **7mm**
Temperature stroke "ΔV_{31}": **70ºC**
Work: **push/pull**
Incorporated return spring: **YES**

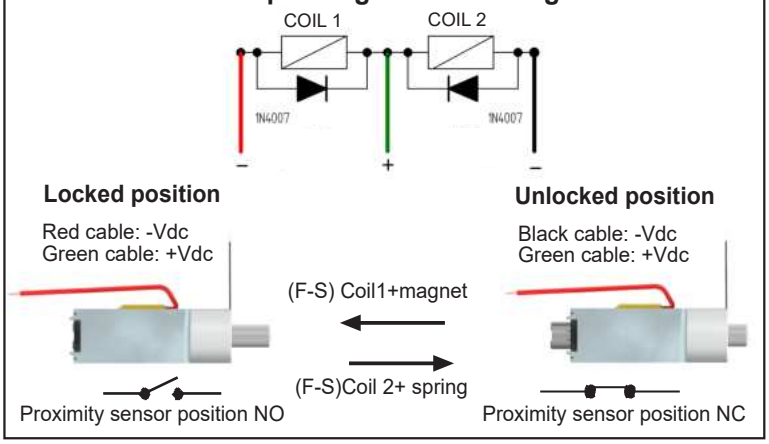


Standard voltage:	24Vdc
Coil 1 duty-cycle ED(%)	20
Coil 1 abs. power at 20ºC (W)	24
Coil 2 duty-cycle ED(%)	25
Coil 2 abs. power at 20ºC (W)	22
Vac (V) 1) 2)	NP
Plunger weight (kg)	0.046
Solenoid weight (kg)	0.218

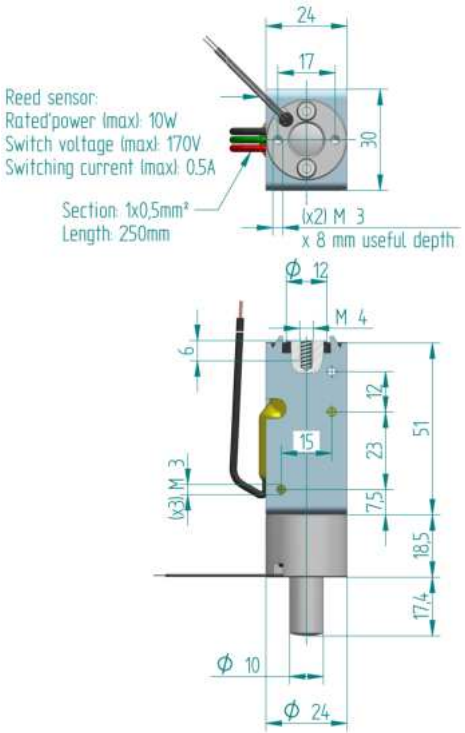
NP= Not available

- They can be manufactured at any voltage between the maximum and the minimum voltage values shown under chart.
- If any variation from the original is needed please contact.
- Earthing is recommended if the metallic are accesssible.

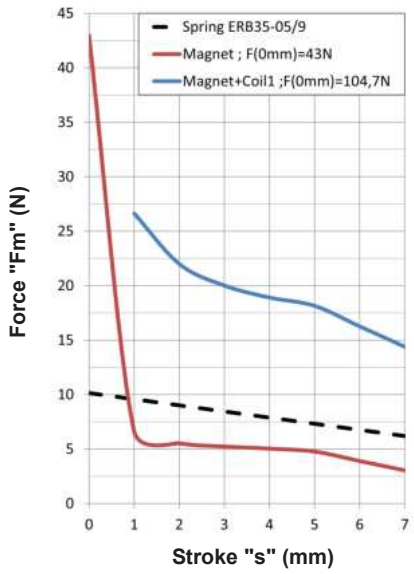
Work depending on the feeding mode:



Solenoid locked (s=0mm position)



Force-stroke curve(F-S)



Frontal fixation: it is imperative to realize a small bush of the guide thus to secure the optimal efficiency.

Ordering code: *ERB35-05/NDBCP --V ED20%ED25%*

Example: Voltage: 24Vdc: *ERB35-05/NDBCP 24Vdc ED20%ED25%*

ASSEMBLY: the screw does not to have to exceed the wall of the magnetic circuit

• C30 TYPE

Protection rate: **IP00**
Insulation class: **B (130º C)**
Standard voltage: **24-48-125Vdc and 230Vac**
Power at 20ºC: **8.5W**
Duty cycle: **ED 100%**
Weight: **0.6Kg**

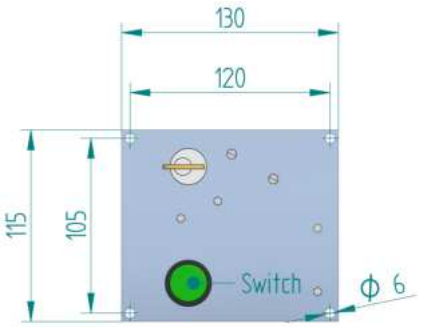
DESCRIPTION

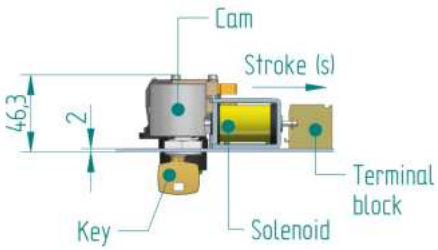
This bolt is locked without voltage, the locking is made by an incorporated spring. With an electrical signal the bolt turns to unlocked.
The key has two positions, in the locked position the key cannot be removed. To remove it, it is necesary to unlock the bolt.
Microswitch number and its operation mode (normaly open, closed or combined) depends on the application required.
Applications: it is designed to protect properly from electrical accidents, it is assembled inside the front of the high, medium and low voltage electrical equipment and for all those applications where an electrical signal needs to be sent or turn off by a combined security activation (thumb switch/ key turn).

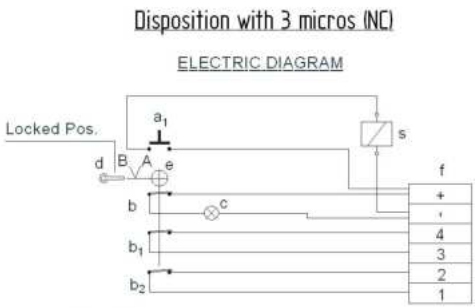
OPERATION MODE

To operate any part of the line and for being sure that the electrical accident does not happen to people, the bolt must be unlocked.
Push the (a1) thumb switch, at the same time turn the key 90º to (A), in this position the microswitches (b1-b2) are working and the line of actuation is cut, stop pushing the thumb switch and extract the key (d), this must be kept out of the electrical equipment, in the unlock position the lamp is switched off, it switches on when locking.
To lock introduce the key and turn 90º to (B).

*Earthing is recommended if the metallic parts are accessible.







LAY OUT

s=Solenoid
a_1=Switch with lamp
b=Microswitch (to keep lamp on when actionate the key)
b_1-b_2=Microswitch available
c=Lamp
d=Bolt key to actionate the cam (e)
e=Cam to actionate accionamiento micros (b-b_1-b_2)
f=Terminal block

The bolt will be provided with two keys.

Ordering code: *C30--V ED100%*

Example: Voltage: 24Vdc: *C30 24Vdc ED100%*