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Revision:

STORM BRAKES  
GRC – GUIDED RAIL CLAMP  
BROCHURE

**BRELX**  
Storm Braking Solutions  
A Division of the Portal Crane Group



## GUIDED RAIL CLAMP GRC BROCHURE



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## RELIABILITY THROUGH QUALITY AND INNOVATION

### WHERE TO USE (APPLICATIONS)

Storm Brakes are parking and safety devices which provide friction forces onto the crane rails. They prevent the crane from uncontrolled moving along the rail in case of sudden bursts (micro burst) of wind. Rail Clamps are Storm Brakes which are designed to apply (bite) on both sides of a rail.

Rail Clamps are vital for outdoor cranes, including Ship to Shore cranes, Automated Stacking Cranes, Rail Mounted Gantry cranes, Shiploaders and other rail mounted material handling equipment in order to prevent a crane runway incident from happening.

### RAIL CLAMP DEFINITION

Rail Clamps are spring set and hydraulically released. Spring force pushes levers with serrated shoes to the sides of a crane rail thus providing a friction forces which prevent a crane from moving. In general rail clamps ride above the rail with a guiding means being rail guides, guide rollers or guide wheels which continuously make contact with the rail. This is required to provide designed shoe to rail side clearance in order for brake shoes to make positive contact with the rail. When crane comes to a full stop position the clamps are engaged (apply on the side of the rail).

Conventional design of horizontal and vertical float mechanism (float blocks, guide bars) where the weight of the mechanism is carried by floating mechanism and guide rollers/wheels allows for rail clamp jamming and guide wheel flanges and bearings wear out. Shoes are no longer protected from hitting the sides of a rail and eventually serrations wear thin. This results in reduction of its coefficient of friction and thus loss of rated braking capacity.

BRELEX Rail Clamp mechanism design allows for its weight to be distributed to two hardened, low friction Plain Rollers. The weight is additionally distributed to four low friction bearings guided on two channel bars at the top of the rail clamp mechanism. This allows the mechanism to float vertically and horizontally with ease.

For horizontal float, we supply hardened guides that attach to the guide roller frame. Because our clamp mechanism can float laterally with very little friction there should be a minimum guide wear.

Unique but simple design eliminates expensive replacement of profiled guide wheels with worn-out flanges and ensures that rail clamp shoes are protected from damage. This reduces the maintenance costs and increases rail clamp reliability.

BRELEX model for Guided Rail Clamp is superior choice for new and replacement applications, where guiding means are preferred.

### OPERATIONAL DESCRIPTION

The solenoid valve SV1 is normally open when de-energized to allow setting of the rail clamp when control power is lost. The hydraulic oil can flow from the cylinder to tank under spring pressure. To release the rail clamp, the solenoid valve is energized allowing the hydraulic pump flow to be blocked to the tank and sent to the hydraulic cylinder, thus compressing the rail clamp springs, and fully opening the clamp jaws (levers with serrated shoes).

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## KEY FEATURES

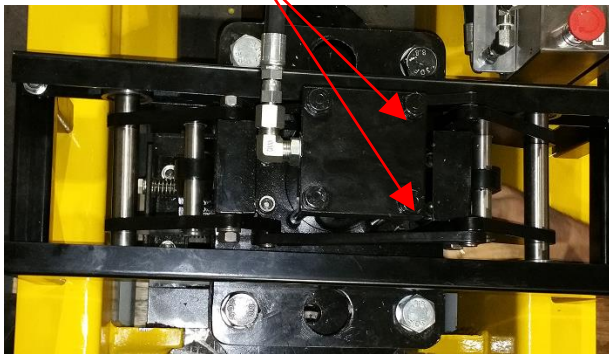
- Low friction hardened flangeless Plain Rollers support the mechanism and ride on the rail.
- Top supported Rail Clamp mechanism.
- Hardened steel rail guides supplied for horizontal float attach to the guide roller frame. Because our clamp mechanism can float laterally with ease and with minimum tilting, there is a minimum wear.
- Horizontal  $\pm 30$  mm and Vertical  $\pm 30$  mm compensation by floating mechanism (more can be available upon request).
- The guide frames also act as final rail plows (scrapers).
- Roller & guide assembly can be easily lifted out of the clamp body for ease of maintenance.
- No Float Blocks & Guide Bars for guiding the mechanism. This eliminates the possibility of mechanism jamming.
- No need for lubrication points for floating mechanism
- Rail clamp shoes retract beyond the guide frames and are protected from hitting the side of a rail during crane traversing
- Robust levers made out of quality structural steel (not cast iron)
- The hydraulic cylinder is top mounted with no rod connections and can be easily removed for maintenance or replacement in minutes, by undoing four bolts.
- Uninterrupted braking even during a cylinder replacement
- Powder coated coil springs and mechanism.
- Coil springs do not need additional protection cover for maintenance personnel safety.
- Frame painted with Marine grade painting system for superior corrosion protection (5 Year warranty on paint system)
- Modular design incorporates power unit and mechanism in the same enclosure.
- Stainless Steel removable cover with hinged inspection doors on both sides of a rail clamp.
- Simple, reliable & corrosion resistant door locks
- Hand pump for manual hydraulic release of Rail clamps if power is not available.
- Caging bolts provided to allow caging of rail clamps in open position (released).
- Mechanical release with caging bolts
- Clamp release status monitored by IFM Proximity Switch
- Labels for Visual indication of Rail Clamp released status
- Labels for Visual indication of Rail Clamp serrated shoe wear status
- Labels for Visual indication of Rail Clamp “Shoe Replacement” position for caging and quick and safe clamp shoe removal.
- Shoes replaceable in field without need for clamp removal from the crane.
- Controlled setting time by a flow control valve (adjustable from 2 to 30 sec).
- CSA, UL, CE approved components, NEMA or IEC style.
- Rail Clamp performance is witnessed by a reputable third party inspection company

## KEY BENEFITS

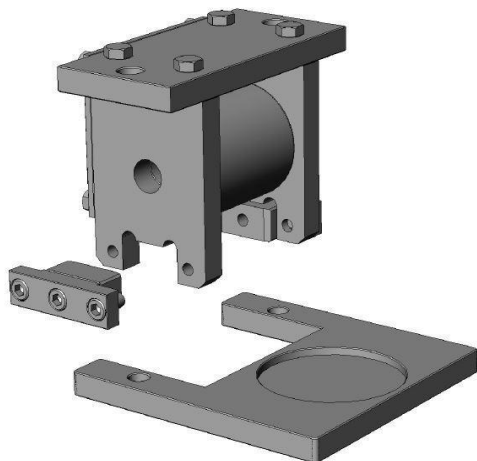
BRELEX Rail Clamps come with an innovative approach focused on low maintenance requirements.

A ram type hydraulic cylinder is top mounted with no rod connections to the mechanism. It can be easily removed for maintenance or replacement in minutes, by disconnecting the hydraulic hose and undoing four bolts.

Cylinder mounting bolts



Low friction, hardened flangless Plain Rollers



supplied along with hardened rail guides.

This eliminates expensive replacement of profiled guide wheels with worn-out flanges and bearings and ensures that rail clamp shoes are protected from damage.

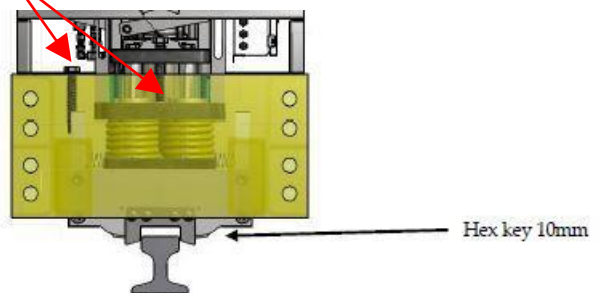
There is no need for lubrication points for the floating mechanism.

These features reduce the maintenance costs and increase rail clamp reliability.

Shoes are field replaceable without the need for clamp removal from the crane. Mechanism is caged with supplied caging bolts in “Shoe Replacement” Position”. It allows convenient access for removal of two bolts holding each shoe.

### Rail Clamp caged in “Shoe Replacement” Position

Caging bolts

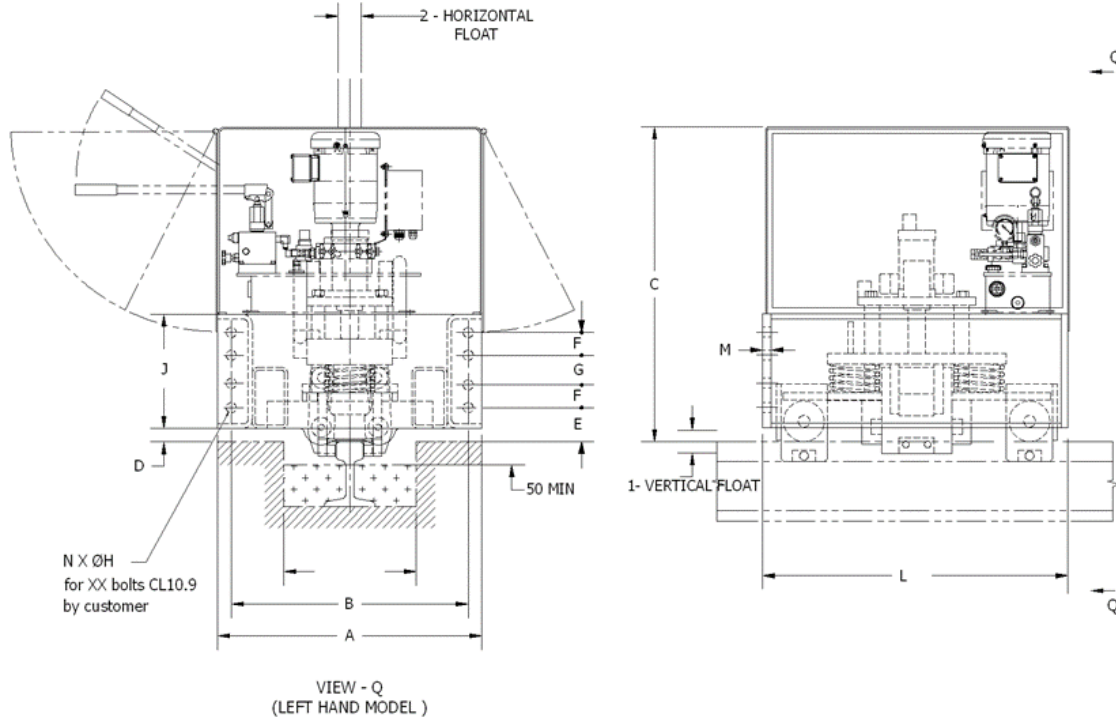


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## STANDARD GRC-SF SIDE FLANGE MOUNT MODELS AND AVAILABLE HOLDING CAPACITIES



MODEL	HOLDING CAPACITY (kN)	A	B	C	D	E	F	G	H	J	L	M	Vertical Float <sup>1</sup> (±)	Horizontal Float <sup>2</sup> (±)
GRC-50-SF	50	600	530	730	30	75	50	65	22	254	760	22	25	30
GRC-100-SF	100													
GRC-150-SF	150	705	635	820	40	85	65	90	29	310	940	25		
GRC-200-SF	200													
GRC-250-SF	250													
GRC-300-SF	300	800	700	850	40	105	75	100	39	380	1145	32		
GRC-350-SF	350													
GRC-400-SF	400													
GRC-450-SF	450													
GRC-500-SF	500	800	700	850	40	105	75	100	39	380	1145	32		
GRC-600-SF	600													

<sup>1</sup> Vertical Rail Deviation (Float) relative to Rail Clamp enclosure at full rated capacity.

<sup>2</sup> Horizontal Rail Position Deviation (Float) relative to Rail Clamp enclosure at full rated capacity.

Models with holding capacities calculated with friction factor 0.25 available upon request.  
 All dimensions (mm) and capacities (kN) subject to change without notification.

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## QUALITY

### *Reliability through Quality and Innovation*

All products are quality inspected as per BRELX standard quality policy. Our brakes are hydraulic proof-tested before shipment. Standard 12 / 18 months warranty applies for all braking systems.

## PERFORMANCE TEST

All rail clamps are static devices which employ hardened tool steel serrated shoes. Hardened tool steel shoes with razor sharp edges “bite” the rail providing a longitudinal friction force.

BRELX provides factory performance testing for all sizes of Rail Clamps. This “Push Testing” is completed in our factory on the actual rail clamp. It consists of applying a longitudinal force equivalent to the rated capacity of an individual rail clamp. The force applies to the rail in order to push it through a rail clamp with the jaws in the set position.

If the serrated shoes which grab the rail do not slip, and the rail does not move, the rail clamp has holding capacity as specified.

## BRELX Rail Clamp



## BRELX Rail Clamp on a test stand

