

Introduction

The Portal Crane Group PCG has been proudly serving the crane and hoist industry for over thirty years. Quality products and exceptional customer service are paramount for our company. Our company is headquartered in Metro Vancouver, Canada.

The three main operating divisions at The Portal Crane Group are Portal Crane, Precision Crane and BRELX.

Portal Crane Parts Ltd. was incorporated in 1987 and is a global supplier for lumber and bulk material-handling cranes throughout the world. We offer services such as replacement parts, inspections, rebuilds and upgrades. We are the licensed distributor for Colby crane parts, as well as Kingsway cranes. Since 2013 Portal Crane has expanded to certify, inspect and service large material-handling equipment. Portal Crane also specializes in the supply of cable, festoon systems and cable reels for various material-handling crane types. The newest addition to our scope of supply are spare part components for Container Cranes, such as twist lock pin kits, guide blocks for container spreaders, wheel assemblies for trolleys and gantries, sheaves for main hoists and boom hoists, spare parts for spreaders, electrical parts for port equipment, customized gearboxes for crane applications, wheel rims and similar tear and wear components. We also supply EMG Eldro & Elhy and ZPMC thrusters.

Precision Crane supplies and services various types of Industrial shop cranes, hoists, winches and other lifting equipment in Western Canada. We provide parts and equipment from a wide variety of major manufacturers, thus enabling us to satisfy the needs of all our customers. Our team of fully qualified Service Technicians offer preventive maintenance inspections and repairs for industrial cranes, shop cranes and hoists.

BRELX is a diverse and dynamic company that challenges existing storm brake designs and concepts. As a division of the Portal Crane Group, it benefits from over three decades of experience in providing parts and services to the material handling industry. The determination of a strong team of engineers and service professionals has resulted in cutting edge designs in storm brakes applications. The goals set out to our engineers when started were ambitious, yet design solutions delivered are simple, robust and reliable. We are experts in crane braking systems such as storm brakes, service brakes and emergency brakes. We have expended our product lines to include Hydraulic Wheel Grippers for bulk material rail car dumpers. All BRELX hydraulic equipment is powered by our Hydraulic Power Units.



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RRC-RETRACTABLE RAIL CLAMPS



RRC releases and retracts the mechanism completely above the rail head; no mechanical guiding means at rail level. Designed for modern high speeds cranes.

RRC Retractable Rail Clamps are designed to clamp on both sides of a rail. They are spring set and hydraulically OR electrically released.



Applications:

- Ship to shore cranes
- Automated stacking cranes
- Wide Span Cranes
- Shiploaders
- Rail-mounted material handling equipment

Benefits

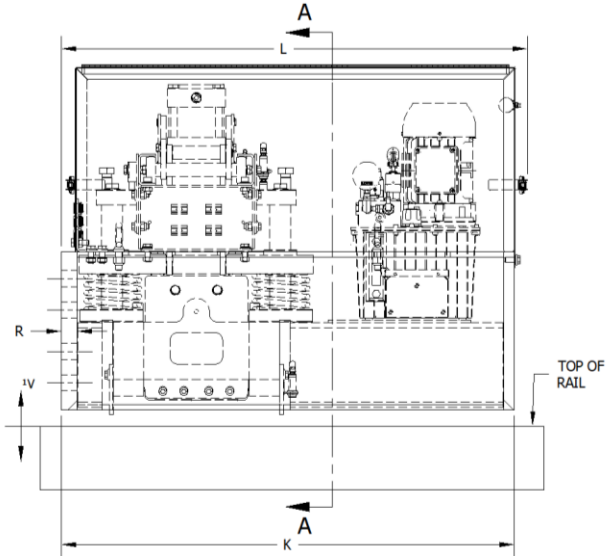
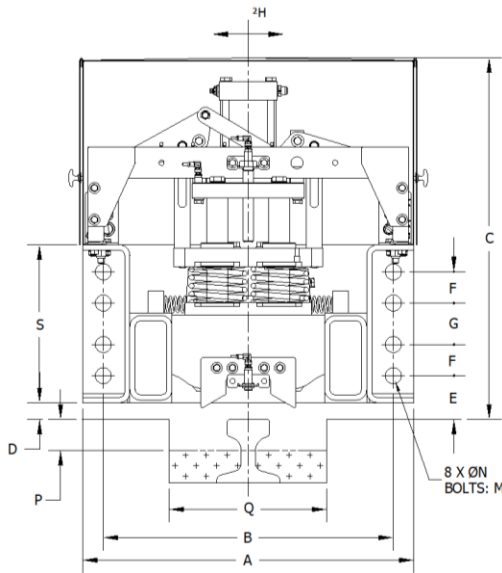
- Simple single cylinder solution that lifts all the critical components completely free of the rail
- Serrated shoes protected from hitting the rail sides, no wear and tear to guide means, brake shoes or rail head itself
- Top suspended mechanism allows for very low mechanism float forces, no need for lubrication points
- Low friction mechanism stability device, allows for reliable setting of the rail clamp mechanism and positioning on a rail
- Floating mechanism allowing compensation of horizontal $\pm 30\text{mm}$ and vertical $\pm 25\text{mm}$ rail deviation (more available upon request)
- Top mounted hydraulic cylinder with no rod connection, easily removable for quick maintenance and replacement
- Clamp release, positioning and reserve stroke monitoring by proximity switches
- As result of the above mentioned improvements, reliability and safety are increased while maintenance costs are lower



RRC-Spring Set, Hydraulic Release Rail Clamp shown
RRC-Spring Set, Electric Release Rail Clamp available

STANDARD FEATURES

- SF Side Flange mount to the crane structure
- TF Top Flange mount available (50 to 600 kN)
- Stainless steel removable cover with inspection doors (SF)
- Caging bolts for mechanical release
- Paint system for C4 environment and 5 years warranty
- Prewired junction box
- Hand pump and caging bolts for manual release
- Solenoid valve with manual override
- Solenoid coil with LED indicator
- Integrated Temperature/Level Switch
- Adjustable setting time from 2-30 seconds



MODEL	HOLDING CAPACITY (kN)	A	B	C	D	E	F	G	K	L	M	N	P	*Q	R	S
RRC-HS-50-SF	50	578	530	735	30	75	50	65	860	885	20	22	70	280	22	254
RRC-HS-100-SF	100	705	635	785	40	85	65	90	860	885	27	29	75	340	32	310
RRC-HS-150-SF	150															
RRC-HS-200-SF	200															
RRC-HS-250-SF	250															
RRC-HS-300-SF	300															
RRC-HS-350-SF	350	800	700	870	105	75	100	1095	1125	36	39	75	380	38	380	
RRC-HS-400-SF	400															
RRC-HS-450-SF	450															
RRC-HS-500-SF	500															
RRC-HS-600-SF	600	850	730	1000	120	110	170	1210	1240	39	42	75	380	38	580	
RRC-HS-800-SF	800															
RRC-HS-900-SF	900															
RRC-HS-1000-SF	1000	900	780	1050	115	100	180	1400	1430	42	45	75	400	45	530	
RRC-HS-1200-SF	1200															

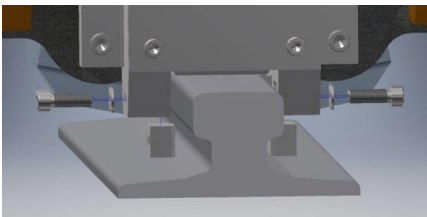
*Q – Dimensions are subject to a specific rail size.
 1 V-Vertical Rail Deviation (Float) ±25 relative to Rail Clamp enclosure at full rated capacity.
 2 H-Horizontal Rail Deviation (Float) ±30 relative to Rail Clamp enclosure at full rated capacity. Larger floats available upon request.
 Models with holding capacities calculated with friction factor 0.5. Models with holding capacities calculated with friction factor 0.25 available upon request.
 All dimensions (mm) and capacities (kN) subject to change without notification.

GRC-GUIDED RAIL CLAMPS



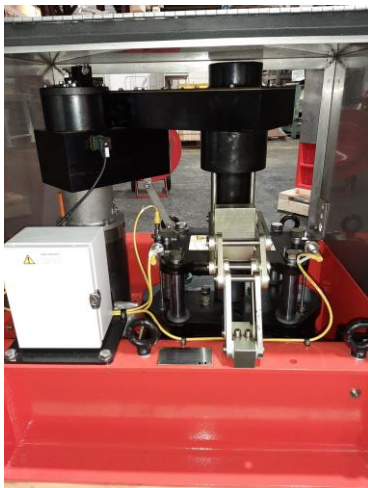
GRC Rides on the rail on two hardened flangeless cylindrical rollers, guided by hardened steel guides. Capable to accommodate rail with large vertical fluctuations.

GRC Guided Rail Clamps are designed to clamp on both sides of a rail. They are spring set and hydraulically OR electrically released.



Applications:

- Ship to shore cranes
- Automated stacking cranes
- Wide Span Cranes
- Shiploaders
- Stacker Reclaimers
- Tripper Cars



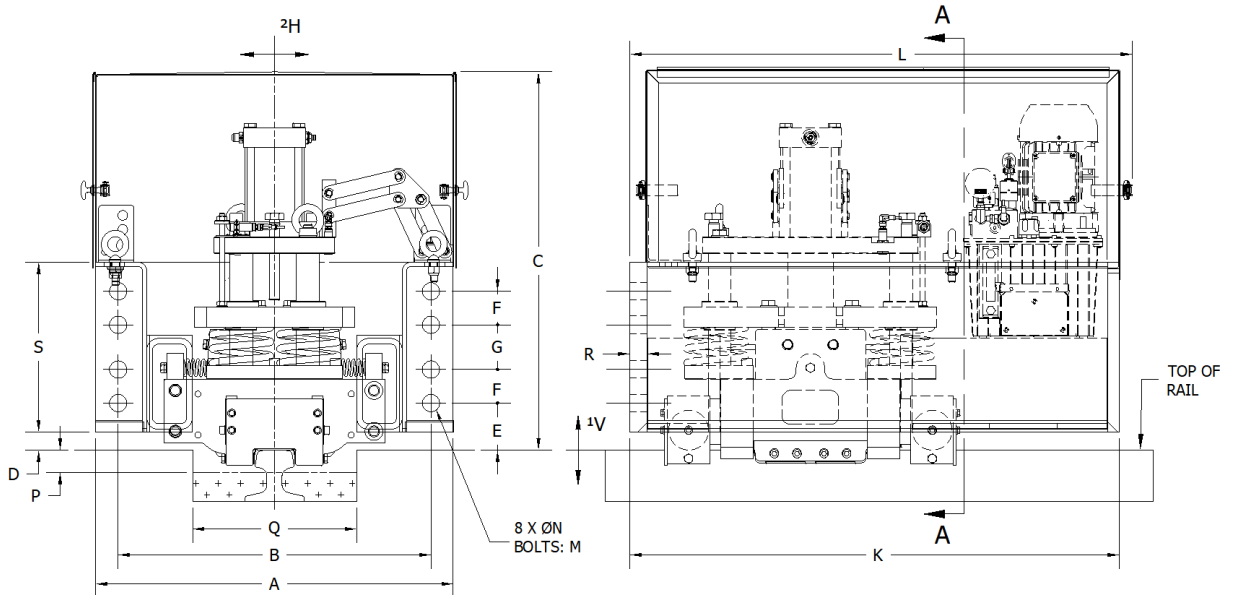
Benefits

- Rail Clamp mechanism weight is distributed to two hardened, low friction flangeless Cylindrical Rollers.
- Top mounted hydraulic cylinder with no rod connection, easily removable for quick maintenance and replacement
- Serrated shoes protected from hitting the rail sides; limited wear and tear to guide means, brake shoes as well as rail head itself
- No need for lubrication points for the floating mechanism
- Simple design eliminates expensive replacement of profiled guide wheels with worn-out flanges
- Floating mechanism allowing compensation of horizontal $\pm 30\text{mm}$ and vertical $\pm 25\text{mm}$ rail deviation (more available upon request)
- Clamp release and reserve stroke monitoring by proximity switches
- As result of the above mentioned improvements, reliability and safety are increased while maintenance costs are lower

GRC-Spring Set, Hydraulic Release Rail Clamp shown
GRC-Spring Set, Electric Release Rail Clamp available

STANDARD FEATURES

- SF Side Flange mount to the crane structure
- TF Top Flange mount available (50 to 600 kN)
- Stainless steel removable cover with inspection doors (SF)
- Caging bolts for mechanical release
- Paint system for C4 environment and 5 years warranty
- Prewired junction box
- Hand pump and caging bolts for manual release
- Solenoid valve with manual override
- Solenoid coil with LED indicator
- Integrated Temperature/Level Switch
- Adjustable setting time from 2-30 seconds



MODEL	HOLDING CAPACITY (kN)	A	B	C	D	E	F	G	K	L	M	N	P	*Q	R	S
GRC-HS-50-SF	50															
GRC-HS-100-SF	100	578	530	735	30	75	50	65	860	885	20	22	50	280	22	254
GRC-HS-150-SF	150															
GRC-HS-200-SF	200															
GRC -HS-250-SF	250	705	635	785		85	65	90	860	885	27	29	50	340	32	310
GRC-HS-300-SF	300															
GRC-HS-350-SF	350															
GRC-HS-400-SF	400															
GRC-HS-450-SF	450	800	700	870	40	105	75	100	1095	1125	36	39	50	380	38	380
GRC-HS-500-SF	500															
GRC-HS-600-SF	600															
GRC-HS-800-SF	800															
GRC-HS-900-SF	900	850	730	1000		120	110	170	1210	1240	39	42	50	380	38	580
GRC-HS-1000-SF	1000															

*Q & *P – Dimensions are subject to a specific rail size.

*Q – Dimensions are subject to a specific rail size

¹ V-Vertical Rail Deviation (Float) ±25 relative to Rail Clamp enclosure at full rated capacity.

² H-Horizontal Rail Deviation (Float) ±30 relative to Rail Clamp enclosure at full rated capacity. Larger floats available upon request.

Models with holding capacities calculated with friction factor 0.5. Models with holding capacities calculated with friction factor 0.25 available upon request.

All dimensions (mm) and capacities (kN) subject to change without notification.

LRC - LIMITED RAIL CLAMPS

LRC is guided by hardened steel guides along the rail. Designed for cranes riding on a rail with minimum vertical fluctuations.



LRC Limited Rail Clamps are designed to clamp on both sides of a rail. They are spring set and hydraulically OR electrically released.



Applications:

- Ship to shore cranes
- Automated stacking cranes
- Wide Span Cranes
- Shiploaders
- Stacker Reclaimers
- Tripper Cars

Benefits

- Rail Clamp mechanism guided along the rail with hardened steel guiding blocks
- Top mounted hydraulic cylinder with no rod connection, easily removable for quick maintenance and replacement
- Serrated shoes protected from hitting the rails sides by guiding blocks
- No need for lubrication points for the floating mechanism
- Simple design eliminates expensive replacement of profiled guide wheels with worn-out flanges
- Floating mechanism allowing compensation of horizontal $\pm 30\text{mm}$ and vertical $\pm 5\text{mm}$ rail deviation
- Clamp release indication signal provided by proximity switch
- Simple mechanism with small number of moving parts for easy maintenance

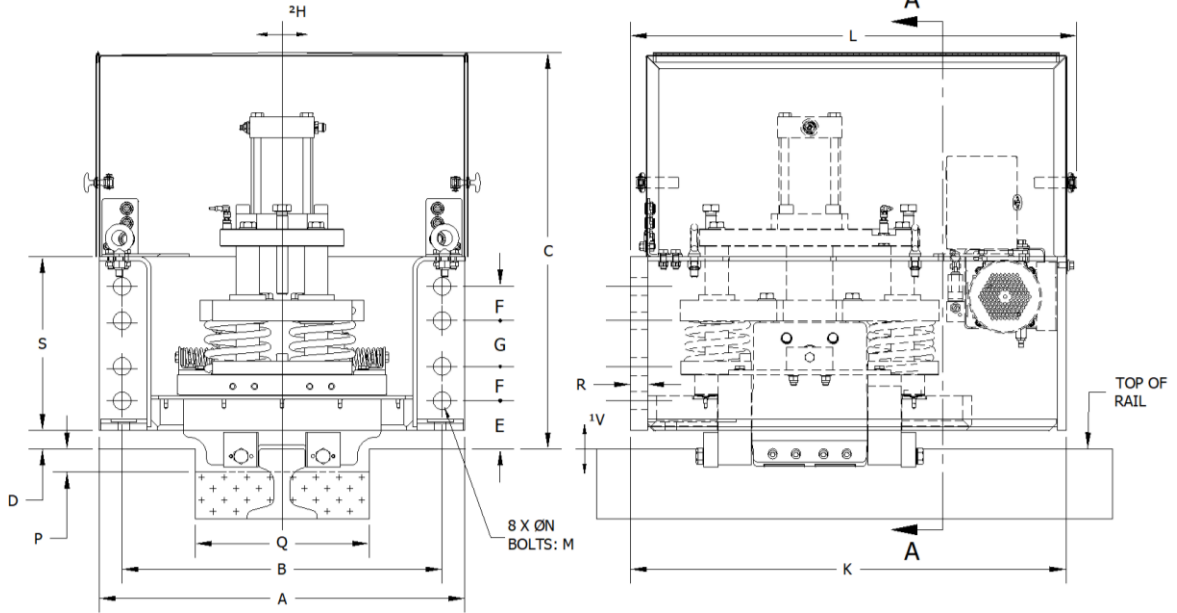


LRC-Spring Set, Hydraulic Release Rail Clamp shown
LRC-Spring Set, Electric Release Rail Clamp available

STANDARD FEATURES

- SF Side Flange mounting to the crane structure
- TF Top Flange mount available
- Stainless steel cover (SF model)
- Paint system for C4 environment and 5 years warranty

- Prewired junction box
- Hand pump and/or caging bolts for manual release
- Solenoid valve with manual override
- Solenoid coil with LED indicator
- Integrated Temperature/Level Switch
- Adjustable setting time from 2-30 seconds



MODEL	HOLDING CAPACITY (kN)	A	B	C	D	E	F	G	K	L	M	**N	P	*Q	R	S
LRC-HS-50-SF	50															
LRC-HS-100-SF	100	540	470	665	30	60	140	x	681	x	24	26	50	300	22	203
LRC-HS-150-SF	150															
LRC-HS-200-SF	200															
LRC-HS-250-SF	250	705	635	700		85	65	90	860	884	27	29	50	350	32	310
LRC-HS-300-SF	300															
LRC-HS-350-SF	350															
LRC-HS-400-SF	400				40											
LRC-HS-450-SF	450															
LRC-HS-500-SF	500	800	700	860		105	75	100	955	985	36	39	50	380	38	380
LRC-HS-600-SF	600															
LRC-HS-650-SF	650															

*Q – Dimensions are relative to a specific rail size.

**N – LRC-50/100 series come with four holes bolt pattern.

¹ V-Vertical Rail Deviation (Float) ±5 relative to Rail Clamp enclosure at full rated capacity.

² H-Horizontal Rail Deviation (Float) ±30 relative to Rail Clamp enclosure at full rated capacity. Larger floats available upon request.

Models with holding capacities calculated with friction factor 0.5. Models with holding capacities calculated with friction factor 0.25 available upon request.

All dimensions (mm) and capacities (kN) subject to change without notification.

RB-C RAIL BRAKES - CLASSIC



RB Rail Brakes directly apply spring force on the top of the rail while allowing a large rail vertical fluctuation.

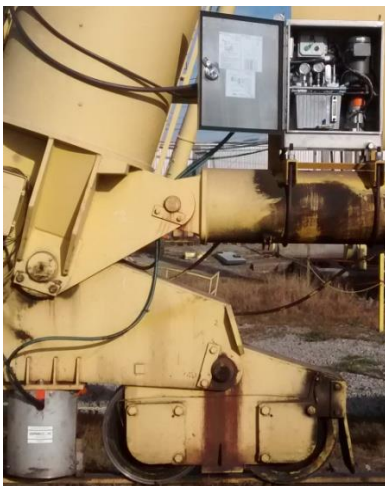
RB Rail Brakes utilize the weight of a crane in the braking process and provide the braking force along the rail. They are spring set and hydraulically released. Once released, the brake hangs above the rail at a pre-designed clearance.

Actual braking capacity depends on the applied force and applicable coefficient of friction (different for static and dynamic braking).



Applications:

- Ship to shore cranes
- Automated stacking cranes
- Wide Span Cranes
- Rail Mounted Gantry Cranes
- Log Handling Cranes
- Ship Loaders



Benefits

- Allows for large variations of the rail height by means of a longer spring stroke
- Provides a balanced braking force / stroke curve
- Serrated / Smooth shoes fully protected from hitting the top of the rail for less wear and tear
- Oversized longer lasting springs for reduced maintenance
- Flow control valve installed on the brake for controlled setting time
- Proximity switch for release indication
- Brake shoes easily removed and replaced
- Made with high quality structural steel
- Simple mechanism with small number of moving parts for easy maintenance

SRC-C Static Rail Brake-Classic Spring Set, Hydraulic Release shown

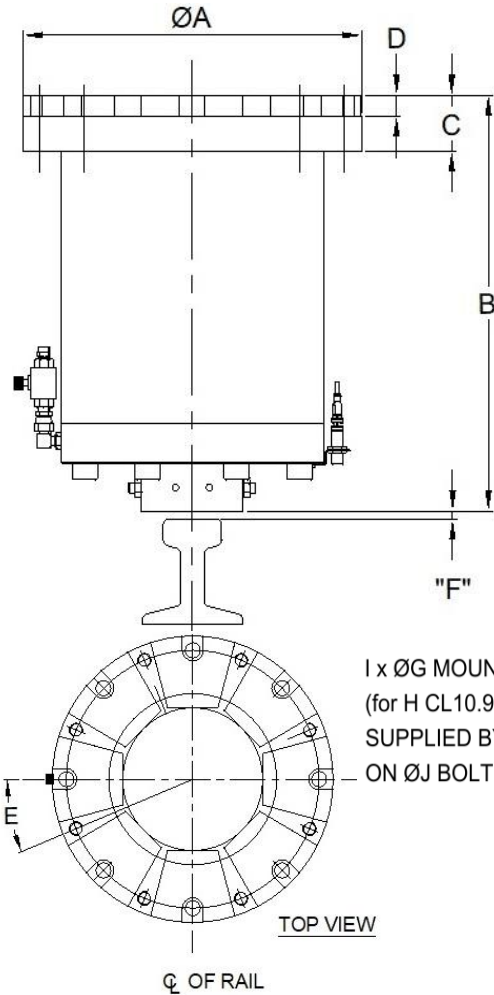
DRB-C Dynamic Rail Brake-Classic Spring Set, Hydraulic Release with smooth shoes available

STANDARD FEATURES

- Fabricated from high quality structural steel.
- Brake shoes easily removed and replaced
- Paint system for C4 environment and 5 years warranty

SUPPLIED WITH BRELX HPU HYDRAULIC POWER UNIT

- Prewired junction box
- Hand pump for manual release
- Solenoid valve with manual override
- Solenoid coil with LED indicator



OPERATING SPECIFICATIONS - SRB-220-C

SHOE EXTENSION "F", mm	APPLIED FORCE kN	BRAKING FORCE kN ($\mu = 0.5$)
0	595	—
8	517	258
12	479	239
16	440	220
20	402	201

NOMINAL SPECIFICATIONS SRB-220-C

- NOMINAL BRAKING FORCE 220 kN @ SHOE EXTENSION "F" AND COEFFICIENT OF FRICTION $\mu=0.5$
- BRAKE MUST BE INSTALLED ABOVE THE RAIL AT A HEIGHT OF "B" mm + "F" (APPLICABLE PISTON ROD EXTENSION) +/- 2mm
- STATIC SERIES "S" OF RAIL BRAKES MUST BE USED FOR STATIC BRAKING (CRANE AT STOP POSITION)

MODEL	HOLDING CAPACITY (kN)	A	B	C	D	E	F	G	H	J	I
SRB-130-C	130	508	578	83	31	30	16	27	M24	457	8
SRB-220-C	220	508	610	83	31	22.5	16	27	M24	457	8
SRB-300-C	300	572	752	89	35	15	16	32	M30	478	12

Static models braking capacities calculated with coefficient of friction factor 0.5
All dimensions (mm) and capacities (kN) subject to change without notification.

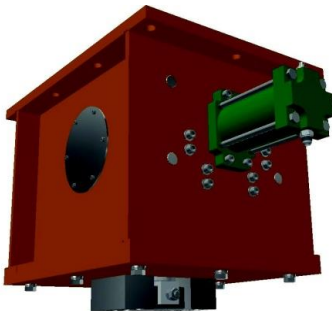
RB-SA RAIL BRAKES – SELF ADJUSTING



RB Rail Brakes compensates an extra large $\pm 19\text{mm}$ rail vertical fluctuation by automatically adjusting before braking.

RB-SA Rail Brakes are designed with a two-stage braking process; first stage compensates shoe to rail head travel and the second stage provides full spring force on the top of a rail. They are spring set and hydraulically OR Electrically released. Once released, the brake hangs above the rail at a pre-designed clearance.

Actual braking capacity depends on the applied force and applicable coefficient of friction (different for static and dynamic braking).



Applications:

- Ship to shore cranes
- Automated stacking cranes
- Wide Span Cranes
- Rail Mounted Gantry Cranes
- Log Handling Cranes
- Ship Loaders

Benefits

- Completely spring-set rail brake
- Allows up to 38mm rail deviation while providing uniform rated capacity over the full range of movement
- Consistent spring stroke for longer spring life.
- Serrated / Smooth shoes fully protected from hitting the top of the rail for less wear and tear
- All components, including the hydraulic release cylinder are fully enclosed in a sealed housing, out of the elements
- Flow control valve installed on the brake for controlled setting time
- Proximity switch for release indication signal
- Brake shoes easily removed and replaced
- Made with high quality structural steel
- Compact design fits most existing locations, even those with drop pins. Low height allows retrofitting with adapter flanges.



SRB-SA Static Rail Brake-Self Adjusting Spring Set, Hydraulic Release shown

DRB-SA Dynamic Rail Brake-Self Adjusting Spring Set, Hydraulic Release with smooth shoes available

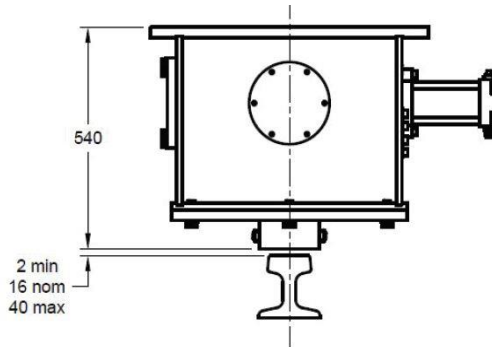
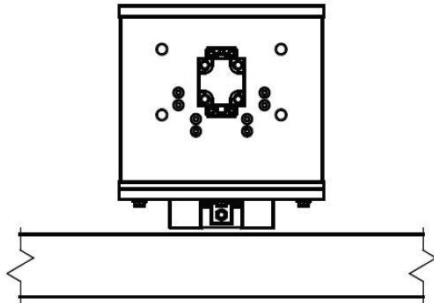
RB-E-SA Rail Brake-Self Adjusting Spring Set, ELECTRIC Release Rail Brakes available

STANDARD FEATURES

- Fabricated from high quality structural steel.
- Brake shoes easily removed and replaced
- Paint system for C4 environment and 5 years warranty

SUPPLIED WITH BRELX HPU HYDRAULIC POWER UNIT

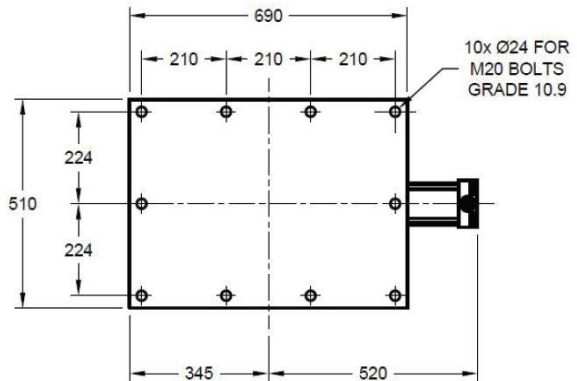
- Prewired junction box
- Hand pump for manual release
- Solenoid valve with manual override
- Solenoid coil with LED indicator



SELF ADJUSTING MECHANISM (PATENT PENDING)

RB-SA-220 – Braking force at various stroke extensions

Shoe Extension "A" (mm)		Applied force (kN)	Braking force (kN, $\mu=0.5$)
"RELEASED"	0	470	235
	2	450	225
	8	445	222
"SET"	16	440	220
	28	420	210
	40	410	205



AVAILABLE SIZES:

Static Rail Brake: SRB-SA: 150kN & 220kN.

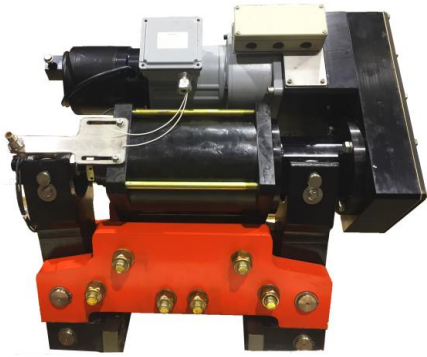
Dynamic Rail Brake: DRB-SA: 120kN & 180kN

NOMINAL SPECIFICATIONS SRB-220-SA

- NOMINAL BRAKING FORCE 220 kN @ SHOE EXTENSION "F" AND COEFFICIENT OF FRICTION $\mu=0.5$
- BRAKE MUST BE INSTALLED ABOVE THE RAIL AT A HEIGHT OF 540 mm + "A" (APPLICABLE PISTON ROD EXTENSION) +/- 2mm
- STATIC SERIES "S" OF RAIL BRAKES MUST BE USED FOR STATIC BRAKING (CRANE AT STOP POSITION)

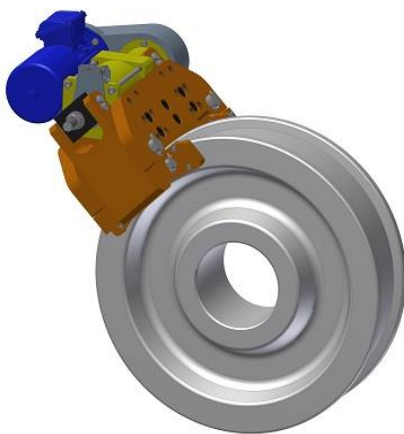
Static models braking capacities calculated with coefficient of friction factor 0.5
All dimensions (mm) and capacities (kN) subject to change without notification.

EWB WHEEL BRAKES - ELECTRIC RELEASE



WB Wheel Brakes apply force generated by springs on the both sides of crane wheels. Oversized brake shoes with bonded friction material apply on the side flanges of idler wheels, providing the friction forces, and thus, braking capacity.

Designed as parking brakes to be applied when equipment comes to a full stop, WB wheel brakes can be also used as dynamic brakes in an emergency situation (e-stop). By applying spring force directly on the wheel flanges, they minimize the amount of stress and strain otherwise placed on sill beams and truck assemblies of a crane.



Applications:

- Ship to shore cranes
- Automated stacking cranes
- Wide Span Cranes
- Rail Mounted Gantry Cranes
- Log Handling Cranes
- Ship Loaders

Benefits

- Spring Set – patented fully Electric Release
- No hydraulic components, so no environmental or fire liabilities
- High efficiency actuator for spring applied braking devices utilize an electro-mechanical release and hold system
- Actuator holding brake in sealed enclosure and with low power consumption, keeps wheel brake pads released until power is cut-off or lost
- Setting time can be adjusted by a mechanical regulator for setting time delay from 3 to 30 seconds
- The regulator does not use friction and is free from wear
- Brake release monitored by proximity switch
- Equipped with shoe alignment device
- Maximum pad wear is 6mm per side



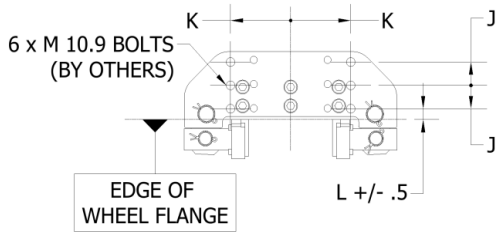
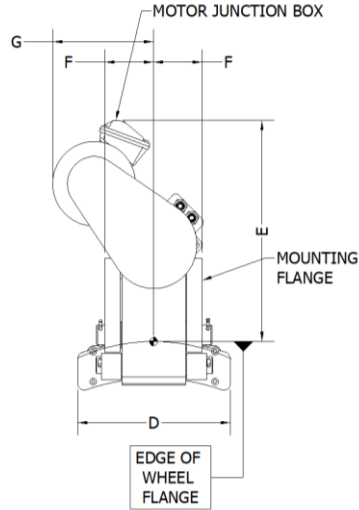
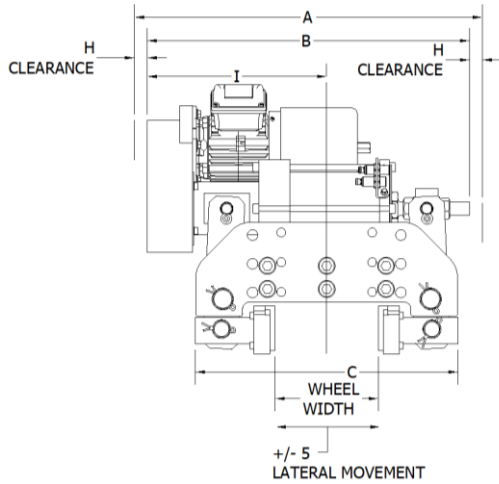
EWB-Electric Wheel Brake Dynamic Spring Set, Electric Release shown

STANDARD FEATURES

- Fabricated from high quality structural steel.
- Brake shoes easily removed and replaced
- Paint system for C4 environment and 5 years warranty

SUPPLIED WITH BRELX LINEAR ACTUATOR

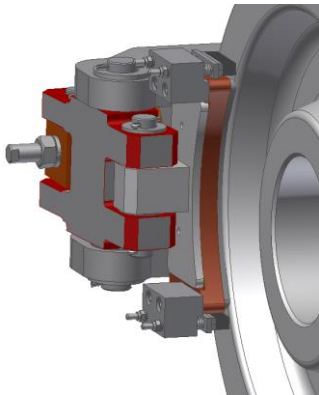
- High efficiency actuators
- Supplied with release nut for mechanical brake release
- All electric drive components are easily accessible and removable
- Electric actuator drive is easy to understand and service



MODEL	HOLDING CAPACITY (kN)	A	B	C	D	E	F	G	H	I	J	K	L	M
EWB-30-A	30	735	675	500	315	475	75	250	30	380	50	125	25	M20
EWB-30-B											57	89	26	M20
EWB-60-A	60	735	675	500	315	475	75	250	30	380	50	125	25	M20
EWB-60-B											57	89	26	M20
EWB-90-A	90	735	675	550	315	508	110	250	30	361	55	145	30	M24
EWB-90-B											57	89	26	M20
EWB-120-A	120	735	675	550	315	508	110	250	30	361	55	145	30	M24
EWB-120-B											57	89	26	M20

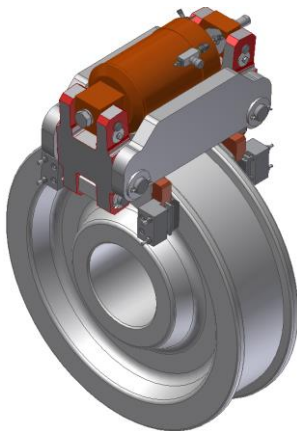
Dynamic models braking capacities calculated with coefficient of friction factor 0.4
 All dimensions (mm) and capacities (kN) subject to change without notification.

HWB WHEEL BRAKES – HYDRAULIC RELEASE



WB Wheel Brakes apply force generated by springs on the both sides of crane wheels. Oversized brake shoes with bonded friction material apply on the side flanges of idler wheels, providing the friction forces, and thus, braking capacity.

Designed as parking brakes to be applied when equipment comes to a full stop, WB wheel brakes can be also used as dynamic brakes in an emergency situation (e-stop). By applying spring force directly on the wheel flanges, they minimize the amount of stress and strain otherwise placed on sill beams and truck assemblies of a crane.



Applications:

- Ship to shore cranes
- Automated stacking cranes
- Wide Span Cranes
- Rail Mounted Gantry Cranes
- Log Handling Cranes
- Ship Loaders

Benefits

- Spring Set – Hydraulic Release
- Flow control valve installed on the brake for the controlled setting time 3 to 30 seconds
- Self-lubricating bushings and stainless steel pins on all pivot points
- Proximity switch for release indication signal
- Brake shoes easily removed and replaced
- Made with high quality structural steel
- Nominal retracted clearance 1mm per side. Recommended maximum clearance 2mm per side
- Equipped with shoe alignment device
- Supplied with release nut for mechanical brake release
- Operated and released by Brelix Hydraulic Power Unit HPU



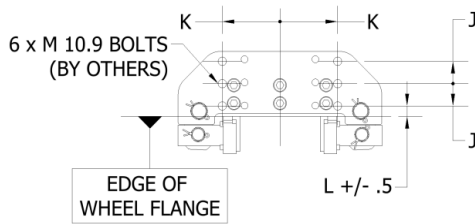
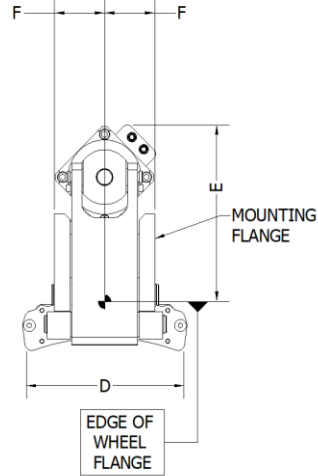
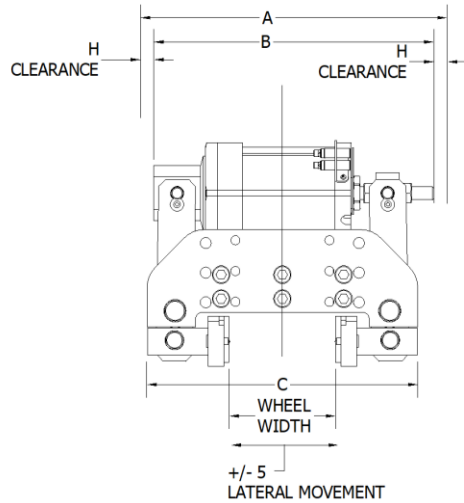
HWB-Hydraulic Wheel Brake Dynamic Spring Set, Hydraulic Release shown

STANDARD FEATURES

- Fabricated from high quality structural steel.
- Brake shoes easily removed and replaced
- Paint system for C4 environment and 5 years warranty

SUPPLIED WITH BRELX HPU HYDRAULIC POWER UNIT

- Prewired junction box
- Hand pump for manual release
- Solenoid valve with manual override
- Solenoid coil with LED indicator



MODEL	HOLDING CAPACITY (kN)	A	B	C	D	E	F	H	J	K	L	M
HWB-30-A	30	600	535	500	315	330	75	30	50	125	25	M20
HWB-30-B									57	89	26	M20
HWB-60-A	60	600	535	500	315	330	75	30	50	125	25	M20
HWB-60-B									57	89	26	M20
HWB-90-A	90	600	535	550	315	330	110	30	55	145	30	M24
HWB-90-B									57	89	26	M20
HWB-120-A	120	600	535	550	315	330	110	30	55	145	30	M24
HWB-120-B									57	89	26	M20

Dynamic models braking capacities calculated with coefficient of friction factor 0.4
All dimensions (mm) and capacities (kN) subject to change without notification.

TSB - Thruster Service Brake



TSB braking force is applied to the brake shoes by a pre-stressed coil spring. The oversized brake shoes with bonded friction material press on the both sides of a rotating steel disc, providing the friction forces and thus braking capacity. Brake shoes are released from the disc by an electro-hydraulic thruster.



Designed as a service brakes to be applied on high speed shafts of modern drives in order to stop its rotational movement. Thruster disc brakes possess a scalable torque tube which means that torque can be adjusted to the exact torque amount which yields more precise braking and enhanced safety.

Applications:

- Ship to shore cranes
- Automated stacking cranes
- Wide Span Cranes
- Gantry Cranes
- Crane Systems/Winches
- Conveyor Belts
- Steelworks
- Material transport



Features and Benefits

- Spring Set – Electro-Hydraulic Release
- Enclosed spring tube increases protection against dirt and damage
- Stainless steel pins and self-lubricating bushings on all pivot points
- Brake shoes with organic or asbestos free sintered metal linings easily removed and replaced
- Left/Right or Centered position lever for mechanical brake release
- Made with high quality structural steel
- Adjustable brake torque for more precise braking
- Equipped with Automatic Wear Compensator
- Means for shoe alignment for parallel air gap

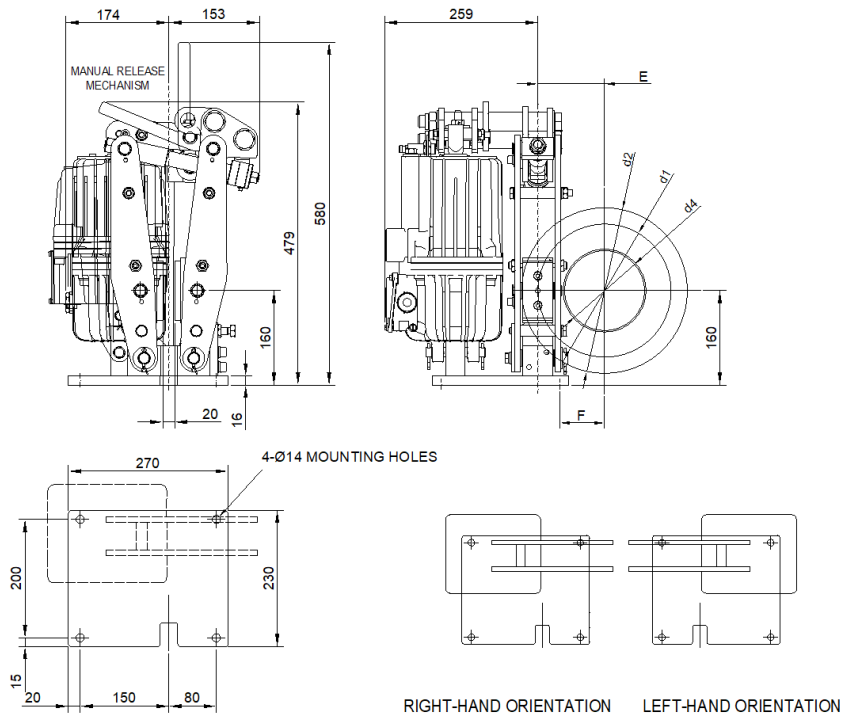
TSB-16 Thruster Service Brake Spring Set, Electro-Hydraulic Release

STANDARD FEATURES

- Proximity switch for release indication signal
- Manual release lever centered orientation
- Sintered metal linings for high friction speeds
- Zinc rich primer paint system DFT: 200-275 µm
- Standard supply with EMG Eldro Thrusters

AVAILABLE OPTIONS

- Proximity switch for lining wear and lever released indication
- Prewired control junction box
- Manual release lever Left/Right handling
- Paint system for highly corrosive environments
- EMG Thruster Right or Left position



MODEL	TSB-16 Ed-23-50	TSB-16 Ed-30-50	TSB-20 Ed-23-50	TSB-20 Ed-30-50	TSB-20 Ed-50-60	TSB-20 Ed-80-60	TSB-28 Ed-121-60	TSB-28 Ed-201-60	TSB-28 Ed-301-60	TSB-28 Ed-301-120
DISC										
Ø(mm)	TORQUE (Nm)									
250	195	270								
280	225	315								
315	260	365								
355	300	420	420	590	830	1540				
400	345	485	490	690	960	1790				
450	395	555	560	800	1110	2070	2730			
500	445	625	640	910	1260	2350	3120	5040		
560					1440	2690	3590	5800	8460	
630					1650	3080	4130	6680	9750	13250
710							4760	7690	11220	15250
800							5460	8820	12880	17500
900									14720	20000
1000									16560	22500

Models with holding capacities calculated with friction factor 0.4
All dimensions (mm) and capacities (Nm) subject to change without notification.

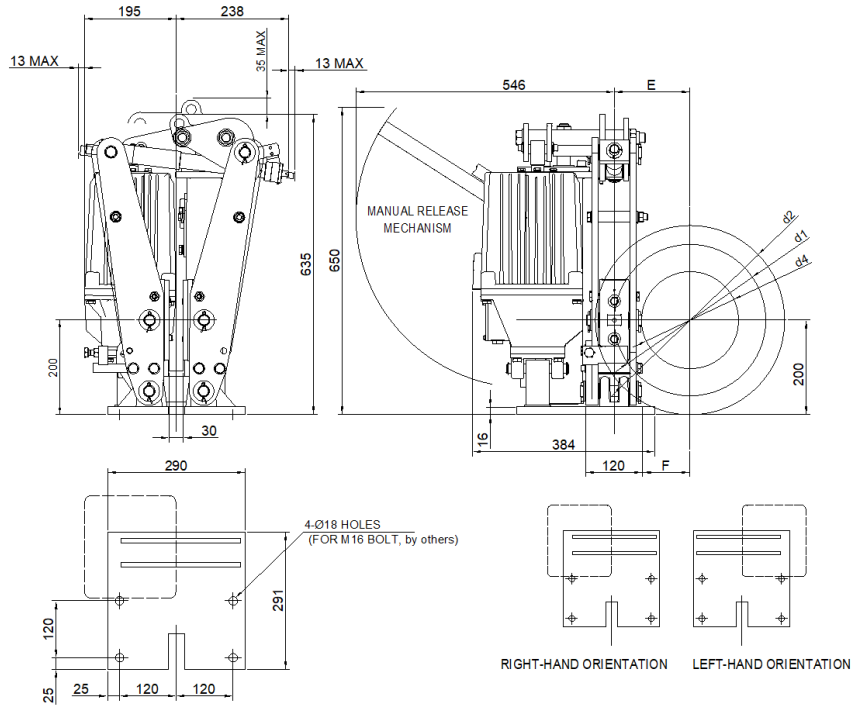
TSB-20 Thruster Service Brake Spring Set, Electro-Hydraulic Release

STANDARD FEATURES

- Proximity switch for release indication signal
- Manual release lever centered orientation
- Sintered metal linings for high friction speeds
- Zinc rich primer paint system DFT: 200-275 µm
- Standard supply with EMG Eldro Thrusters

AVAILABLE OPTIONS

- Proximity switch for lining wear and lever released indication
- Prewired control junction box
- Manual release lever Left/Right handling
- Paint system for highly corrosive environments
- EMG Thruster Right or Left position
- Brake disc with hub or coupling



MODEL	TSB-16 Ed-23-50	TSB-16 Ed-30-50	TSB-20 Ed-23-50	TSB-20 Ed-30-50	TSB-20 Ed-50-60	TSB-20 Ed-80-60	TSB-28 Ed-121-60	TSB-28 Ed-201-60	TSB-28 Ed-301-60	TSB-28 Ed-301-120
DISC										
Ø(mm)	TORQUE (Nm)									
250	195	270								
280	225	315								
315	260	365								
355	300	420	420	590	830	1540				
400	345	485	490	690	960	1790				
450	395	555	560	800	1110	2070	2730			
500	445	625	640	910	1260	2350	3120	5040		
560					1440	2690	3590	5800	8460	
630					1650	3080	4130	6680	9750	13250
710							4760	7690	11220	15250
800							5460	8820	12880	17500
900									14720	20000
1000									16560	22500

Models with holding capacities calculated with friction factor 0.4
All dimensions (mm) and capacities (Nm) subject to change without notification.

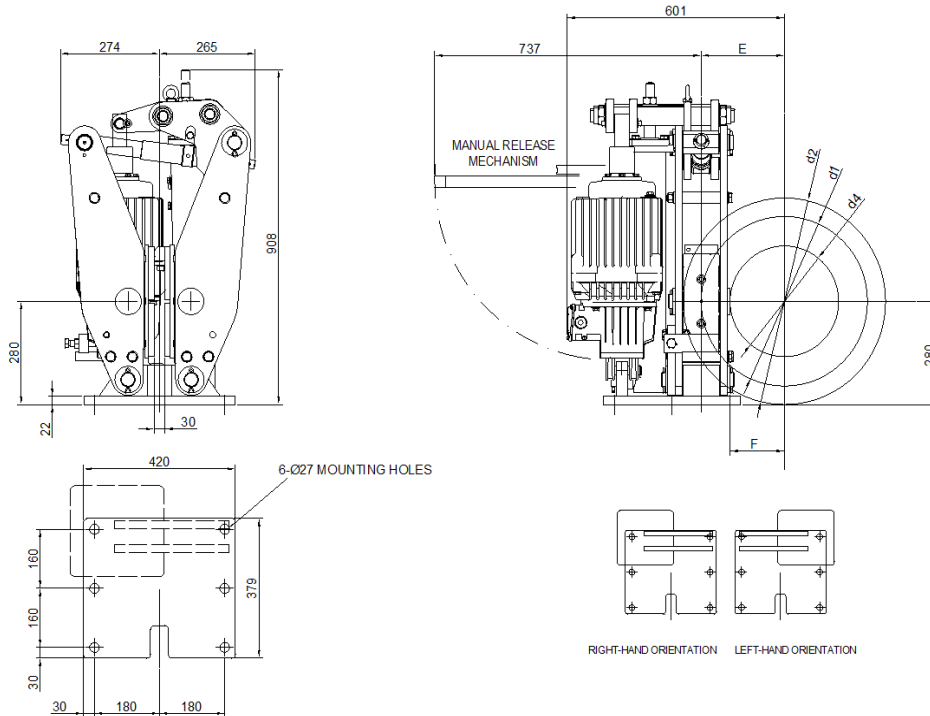
TSB-28 Thruster Service Brake Spring Set, Electro-Hydraulic Release

STANDARD FEATURES

- Proximity switch for release indication signal
- Manual release lever centered orientation
- Sintered metal linings for high friction speeds
- Zinc rich primer paint system DFT: 200-275 µm
- Standard supply with EMG Eldro Thrusters

AVAILABLE OPTIONS

- Proximity switch for lining wear and lever released indication
- Prewired control junction box
- Manual release lever Left/Right handling
- Paint system for highly corrosive environments
- EMG Thruster Right or Left position
- Brake disc with hub or coupling



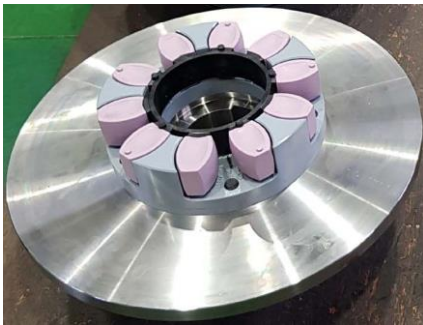
MODEL	TSB-16 Ed-23-50	TSB-16 Ed-30-50	TSB-20 Ed-23-50	TSB-20 Ed-30-50	TSB-20 Ed-50-60	TSB-20 Ed-80-60	TSB-28 Ed-121-60	TSB-28 Ed-201-60	TSB-28 Ed-301-60	TSB-28 Ed-301-120
DISC										
∅(mm)	TORQUE (Nm)									
250	195	270								
280	225	315								
315	260	365								
355	300	420	420	590	830	1540				
400	345	485	490	690	960	1790				
450	395	555	560	800	1110	2070	2730			
500	445	625	640	910	1260	2350	3120	5040		
560					1440	2690	3590	5800	8460	
630					1650	3080	4130	6680	9750	13250
710							4760	7690	11220	15250
800							5460	8820	12880	17500
900									14720	20000
1000									16560	22500

Models with holding capacities calculated with friction factor 0.4
 All dimensions (mm) and capacities (Nm) subject to change without notification.

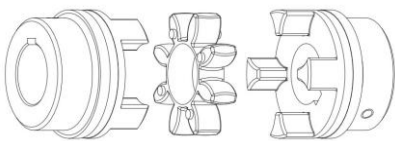
FCD – Flexible Coupling with Disc



FCD Flexible Coupling is used to transmit power (torque) from one shaft to another via elastic intermediate ring, compensating for minor amounts of misalignment. It provides protective functions such as vibration dampening or noise reduction. Supplied with Disc and brake system, they allow for safe stopping of a drive.



Flexible Coupling with Disc can be used in a wide variety of machines, from general industrial drives to high speed applications with high dynamic loads. They are designed with small dimensions, low weight and low mass moments of inertia yet transmitting high torques.



Applications:

- Ship to shore cranes
- Automated stacking cranes
- Wide Span Cranes
- Gantry Cranes
- Crane Systems/Winches
- Conveyor Belts
- Steelworks
- Material transport



Features and Benefits

- Five parts design allows for replacement of the elastic intermediate ring or the brake disc without moving any equipment
- The jaws, holding the spider insert are subject to pressure only (min bending stress), which allows the teeth to accept higher loads
- Spider type, intermediate ring is resistant to scientifically higher temperatures and has considerably longer service life
- Continuous temperature: -50 °C to +120 °C
- Max temperature short time: -50 °C to +150 °C
- Improved dumping of vibrations
- Large selection of coupling sizes and brake discs available

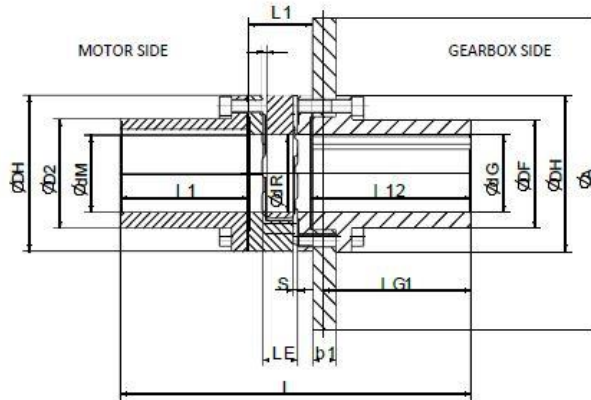
FCD – Flexible Coupling with spider insert and Disc

STANDARD FEATURES

- Significantly longer service life
- Very good temperature resistance
- Spider insert with 98 Shore A hardness
- Transmission of high torques with average dumping
- Compact diameters

AVAILABLE OPTIONS

- Dynamically balanced according to ISO 1940 Grade: G 2.5; G 6.3
- Coupling hubs finish bore and keyway acc. to DIN 6885
- Coupling hubs pilot bore
- Gear side and motor side hubs in custom lengths
- Various brake disc thicknesses available

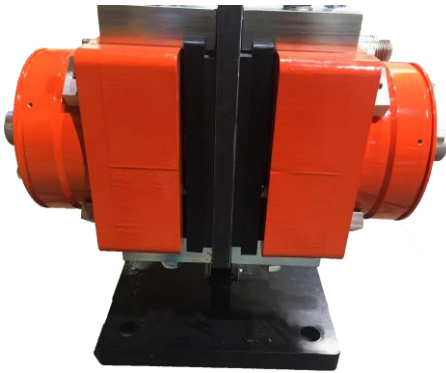


Coupling Size FCD-R65 FCD-R75 FCD-R90 FCD-R100 FCD-R110 FCD-R125 FCD-R140 FCD-R160

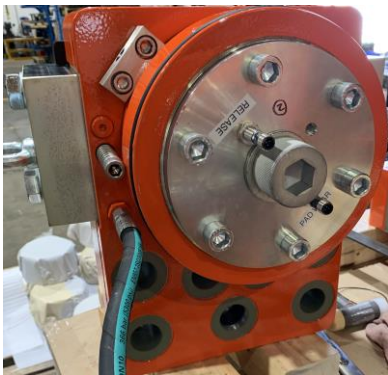
T_{kn}	Nm	940	1920	3600	4950	7200	10000	12800	19200
T_{kmax}	Nm	1880	3840	7200	9900	14400	20000	25600	38400
n_{max}	rpm	3450	3250	3000	2800	2600	2250	1800	1500
ØdG/ØdM pilot bore max. bore	mm	28	28	38	48	48	58	58	78
ØDH	mm	135	160	200	225	255	290	320	370
ØD2	mm	94	108	142	158	178	206	235	270
ØDF	mm	92	108	140	158	176	206	235	270
ØdR	mm	68	80	100	113	127	147	165	190
l1	mm	113.5	133	165.5	155	203.5	200.5	247	229
l12	mm	166	166.5	206.5	206.5	212.0	212.0	252.5	252.5
lG1	mm	150	150	190	190	195	195	235	235
L1	mm	65	75	82	97	103	116	128	146
L	mm	344.5	374.5	454	458.5	518.5	528.5	627.5	627.5
LE	mm	35	40	45	50	55	60	65	75
S	mm	4.5	5	5.5	6	6.5	7	7.5	9
Cylinder bolt DIN912-12.9	Qty.	12xM10x30	15xM12x40	15xM16x40	15xM16x50	15xM20x50	15xM20x60	15xM20x60	15xM24x70
Ma	Nm	83	120	295	295	580	580	580	1000
ØAx _{b1} brake disc		* Design, weight m, moment of inertia J							
Ø315x30	kg	30,7							
	kgm ²	0,254							
Ø355x30	kg	38							
	kgm ²	0,393							
Ø400x30	kg	42,3	50,5	64,4					
	kgm ²	0,616	0,627	0,759					
Ø450x30	kg	50,1	58,3	72					
	kgm ²	0,969	0,978	1,104					
Ø500x30	kg		67,1	80,8	94,3	113,4			
	kgm ²		1,472	1,595	1,773	1,97			
Ø560x30	kg		78,9	92,6	106,1	124,9	150,5		
	kgm ²		2,297	2,417	2,6	2,776	3,268		
Ø630x30	kg			108	121,5	140,3	165,9	208,2	
	kgm ²			3,774	3,968	4,127	4,622	5,411	
Ø710x30	kg			127,8	141,3	160,1	185,5	228	281
	kgm ²			5,992	6,18	6,32	6,842	7,62	9,434
Ø800x30	kg					185,3	210,9	253,2	306,2
	kgm ²					9,909	10,412	11,193	13,02

Models with holding capacities calculated with friction factor 0.4
All dimensions (mm) and capacities (Nm) subject to change without notification.

HEB – Hydraulic Emergency Brake



HEB is spring applied and hydraulic released emergency brake. Braking force is directly applied to the brake shoes by a high capacity spring pack. The organic brake friction shoes press on the both sides of a rotating steel disc, providing the friction forces and thus braking capacity. Emergency Brakes are imperative for crane safety.



Hydraulic Emergency Brakes are used on the low-speed shaft side of a drive and must provide sufficient torque to overcome a low-speed failure such as a gearbox, coupling, or other transmission failure. They apply braking torque on a disc bolted to the drum flange in order to stop or hold the load.

Applications:

- Ship to shore cranes
- Ship Loaders / Unloaders
- Crane Systems/Winch
- Conveyor Drives
- Hot Metal Cranes



Features and Benefits

- Spring Set – Hydraulic Release
- Consists of two identical caliper halves
- Direct acting pushes piston against the brake pad
- Compact design with few moving parts
- 1mm air gap per side
- Fast response time for maximum safety
- Fast and easy adjustment of pad wear
- Convenient lining replacement
- Made with high quality structural steel

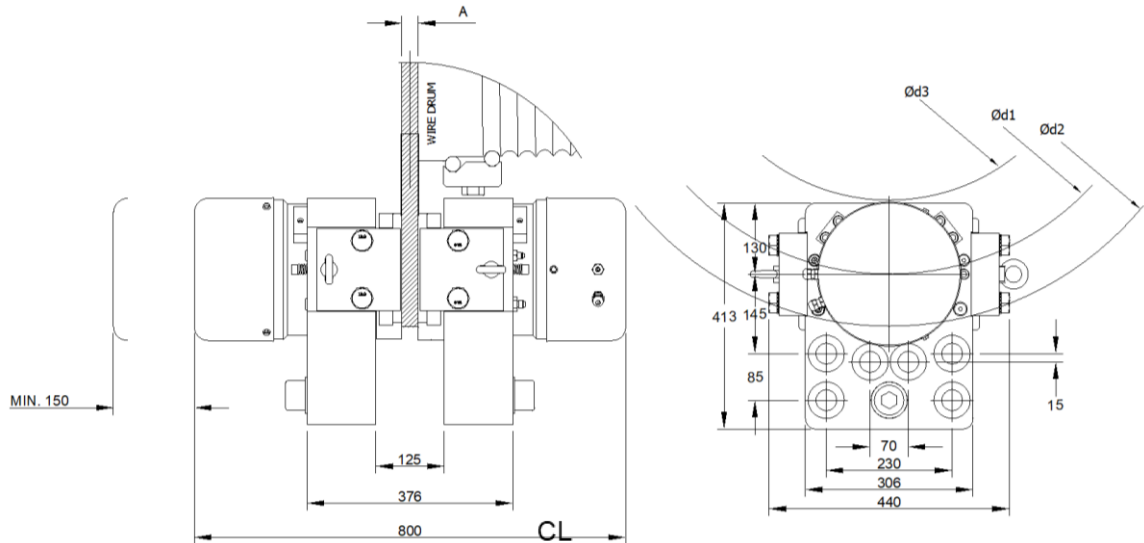
HEB- Hydraulic Emergency Brake Spring Set, Hydraulic Release

STANDARD FEATURES

- Proximity switch for release indication signal
- G3/8 BSPP hydraulic oil port
- G3/8 BSPP air bleed port for maintenance
- Maximum pad wear 8mm
- Paint system for C4 environment and 5 years warranty
- Caging bolt for mechanical release

AVAILABLE OPTIONS

- Proximity switch for lining wear
- Hydraulic Power Unit
- Hose and fitting package
- Mounting stand
- Paint system for highly corrosive environments
- Hydraulic oil drain ports on cylinders



FRICTIONAL DIAMETER	d1 = d2-200 mm
DISC OUTER DIAMETER	d2
MAX. HUB DIAMETER	d3 = max.(d2-480)mm

MODEL	CONTACT FORCE caliper half (kN)	BRAKING FORCE @ $\mu=0.4$ (kN)	RELEASE PRESSURE (bar)	MAXIMUM PRESSURE (bar)	OIL VOLUME/1mm STROKE / caliper half (cm ³)	WEIGHT (kg)
HEB-250	250	200	130	160	20.4	540
HEB-290	290	232	150	170	20.4	540

MODEL	NUMBER OF MOUNTING BOLTS	SIZE M	GRADE CL	TORQUE (Nm)
HEB-250	6	36	10.9	2560 ± 150
HEB-290	6	36	10.9	2560 ± 150

Models with holding capacities calculated with friction factor 0.4
All dimensions (mm) and capacities (Nm) subject to change without notification.

SDB Thruster Drum Brake – Standard DIN 15435

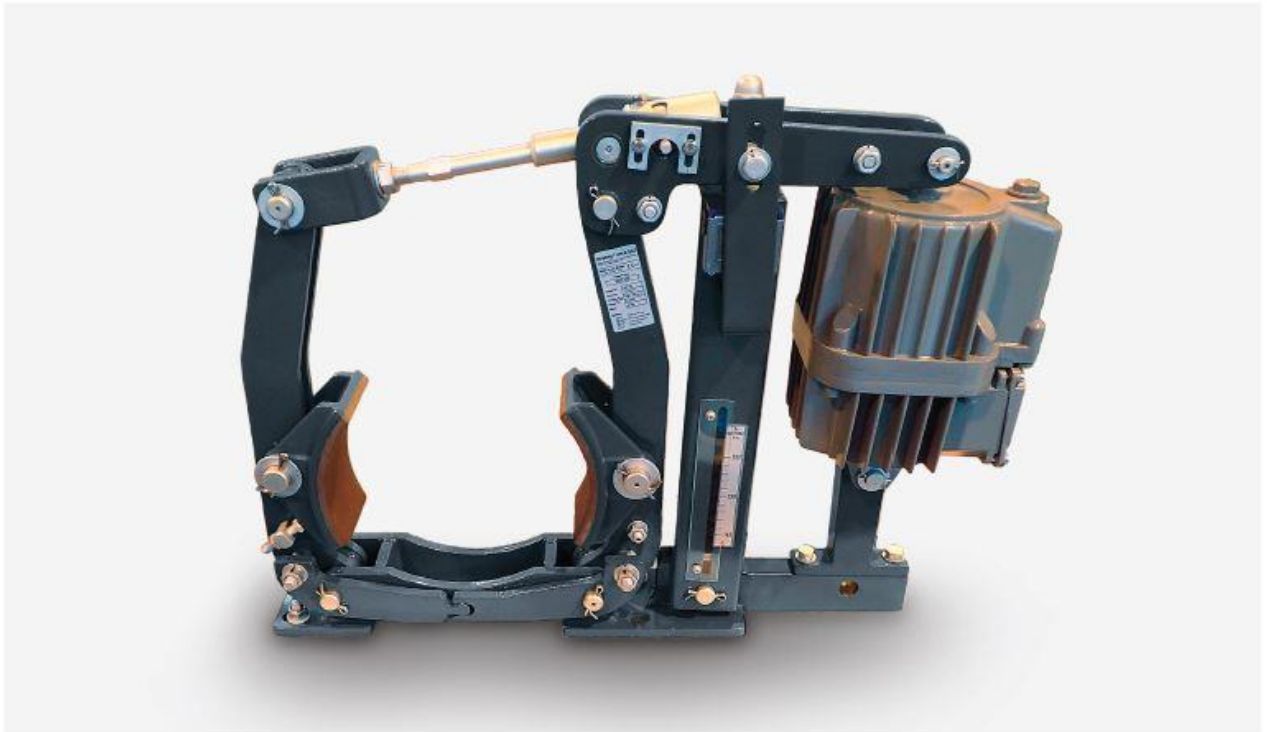
Standard DIN 15435

- Spring application braking
- Thruster release
- Standard voltage 230/400 VAC 50Hz
- Protection level C4M
- Automatic lining wear compensation

- Brake shoe auto-aligning device
- Scale for torque adjustment
- Brake lever synchronization
- Aluminium shoes with non asbestos organic linings
- Self lubricated bushings at main hinge points
- Galvanized steel spindles and hinges

Operating conditions

- Ambient temperature : -20°C to 50°C
- Relative humidity no higher than 90%
- IP rating: IP65



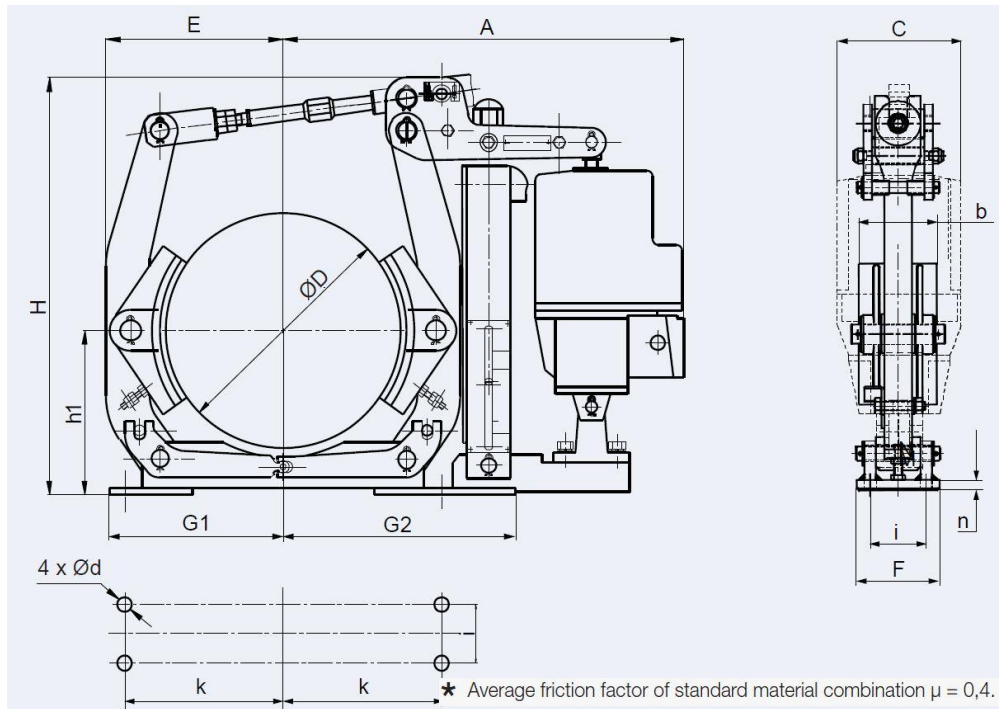
Options :

HRL	Manual release lever with or without stop
BRLS	Switch for opening monitoring
LWI	Full lining wear indicators
SS1	Special Switch: Schneider XCKM 110H29
SS2	Special Switch: Schmersal Z4VH335 11Z
AV - DV	Thruster delay : Ascent Valve or Descent Valve
SV 415V 50Hz SV 500V 50Hz SV 480V 60Hz	Special Voltage
SW	Steel Works (specific oil in the thruster + heat resistant sealings)
SPA	Special paint according to the customer

Thruster Technical Data :

Thruster type	Power (W)	Current at 400 V (A)	Weight (kg)
TS 230/5	165	0.52	10
TS 300/5	200	0.46	14
TS 500/6	200	0.48	21
TS 800/6	330	1.42	24
TS 1210/6	330	1.44	39
TS 2010/6	450	1.45	39
TS 3010/6	550	1.46	40

SDB Thruster Drum Brake – Standard DIN 15435



BRAKE TYPE	THRUSTOR	TORQUE (N.m.)		WEIGHT (kg)	DIMENSIONS (mm)													
		min.	max.		A	b	C	D	d	E	F	G1	G2	H	h1	i	k	n
SDB 160	TS 230/5	80	160	28	428	65	160	160	14	140	85	145	195	418	160	55	130	8
SDB 200	TS 230/5	110	260	35	470	70	160	200	14	172	90	165	255	490	160	55	145	10
	TS 300/5	140	380	38														
SDB 250	TS 230/5	140	300	45	533	90	160	250	18	202	110	200	290	583	190	65	180	12
	TS 300/5	180	380	48														
	TS 500/6	300	600	53														
SDB 315	TS 230/5	180	340	70	670	110	160	315	18	253	115	245	330	585	230	80	220	14
	TS 300/5	250	500	70														
	TS 500/6	315	770	75														
	TS 800/6	630	1200	80														
SDB 400	TS 500/6	400	960	138	695	140	195	400	22	310	160	310	420	715	280	100	270	14
	TS 800/6	630	1500	140														
	TS 1210/6	1000	2400	155														
SDB 500	TS 800/6	800	1920	176	925	180	240	500	22	380	180	365	535	803	340	130	325	21
	TS 1210/6	1250	3000	204														
	TS 2010/6	2000	4800	204														
SDB 630	TS 1210/6	1800	3780	310	1150	225	240	630	27	465	220	450	600	1025	420	170	400	20
	TS 2010/6	2500	6000	310														
	TS 3010/6	4000	8500	315														
SDB 710	TS 2010/6	3150	6000	435	1180	225	240	710	27	520	240	500	630	1135	470	190	450	25
	TS 3010/6	5000	9600	441														

SAB Drum Service Brake – AISE N. 11-63 120

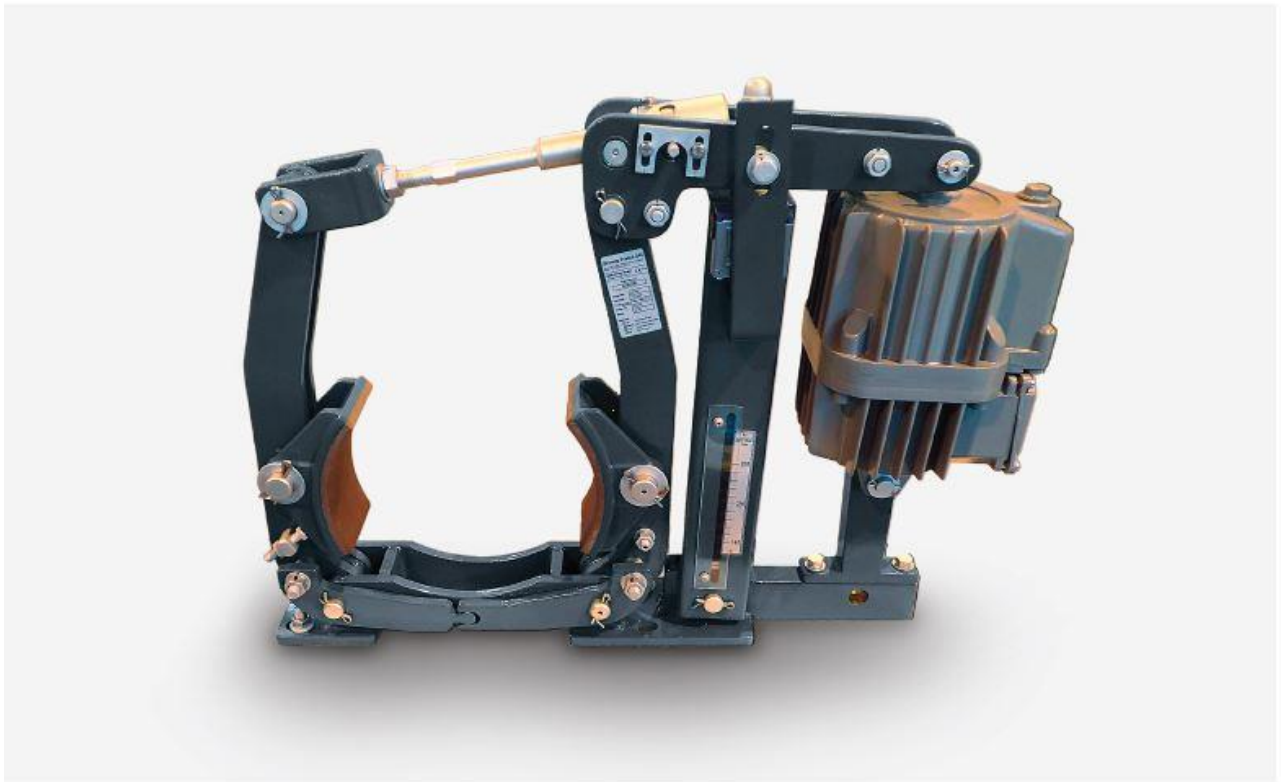
According to standard **AISE N. 11 - 63.120**

- Spring application braking
- Thrustor release
- Standard voltage 230/460 VAC 60Hz
- Paint color RAL7021

- Automatic lining wear compensation
- Brake shoe auto-aligning device
- Scale for torque adjustment
- Brake lever synchronization
- Aluminium shoes with non abestos organic linings
- Self lubricated bushings at main hinge points
- Galvanized steel spindles and hinges

Operating conditions

- Ambient temperature : -20°C to 50°C
- Relative humidity no higher than 90%
- IP rating : IP65



Options :

HRL	Manual release lever with or without stop
BRLS	Switch for opening monitoring
LWLS	Switch for lining wear monitoring
LWI	Full lining wear indicators
SS1 - SS2	Specific switch
AV - DV	Thrustor delay : Ascent Valve or Descent Valve
SW	Steel Works
SPA	Paint according to Customer Specification
SPR	Protection level C4
SV	Special Voltage

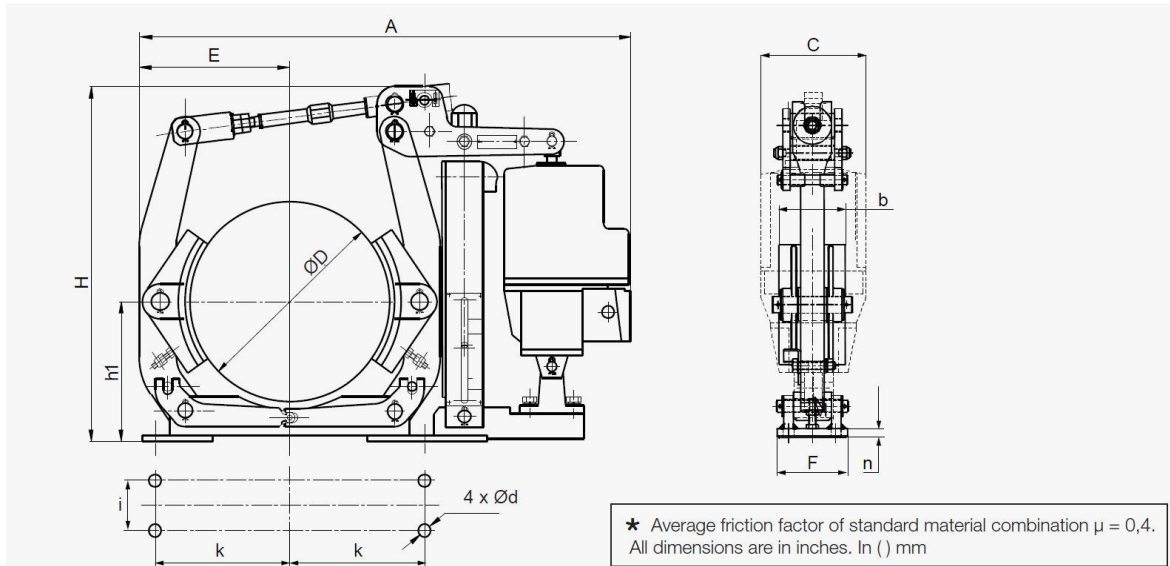
Thrustor Technical Data :

Thrustor type	Power (W)	Current at 400 V (A)	Weight (kg)
TS 230/5	200	0.5	14
TS 300/5	200	0.5	14
TS 500/6	210	0.5	23
TS 800/6	330	1.2	24
TS 1210/6	330	1.2	39
TS 2010/6	450	1.3	39
TS 3010/6	550	1.4	40

SAB Drum Service Brake – AISE N. 11-63 120

SAB brakes

According to standard **AISE N. 11 - 63.120**



Brake type	Thruster TS	$M_{BR\ MAX}$ (lb-ft) ★	A	b	C	D	d	E	F	H	h1	i	k	n	Weight (lb)
SAB - 6"	230/5	55-110	17	1.65	6.3	6 (152)	3/8 (9.5)	5.5	7.25	16.5	4.75 (120)	3 (76)	4 (102)	0.38	70
SAB - 8"	230/5	85-190	26.00	3.00	6.3	8 (203)	0.69 (17)	6.77	7.25	20	7.0 (178)	5.76 (146)	3.25 (83)	0.31	77
	300/5	140-275													84
SAB - 10"	230/5	110-220	30.30	3.54	6.3	10 (254)	0.69 (17)	7.95	8.00	23.2	8.38 (213)	6.26 (160)	4.0 (102)	0.60	100
	300/5	140-280													106
	500/6	220-440	31.00		7.7	116									
SAB - 12"	300/5	170-345	37.00	5.51	6.3	12 (305)	0.81 (21)	10.40	11.00	23.4	9.88 (251)	9.0 (228)	5.75 (146)	0.60	155
	500/6	270-540													7.7
	800/6	430-855			176										
SAB - 13"	300/5	180-375	37.00	5.51	6.3	13 (330)	0.81 (21)	10.40	11.00	23.4	9.88 (251)	9.0 (228)	5.75 (146)	0.60	160
	500/6	295-590													7.7
	800/6	460-930			176										
SAB - 15"	500/6	330-665	40.20	6.49	6.3	15 (381)	1.06 (27)	12.20	13.25	28.4	12.13 (308)	10.76 (273)	7.5 (191)	0.60	300
	800/6	515-1030													9.45
	1210/6	840-1675	44.50		30.3	335									
SAB - 16"	500/6	355-710	40.20	6.49	7.7	16 (406)	1.06 (27)	12.20	13.25	28.4	12.13 (308)	10.76 (273)	7.5 (191)	0.60	304
	800/6	550-1110													9.45
	1210/6	900-1800	44.50		30.3	335									
SAB - 19"	800/6	665-1330	49.00	8.50	7.7	19 (483)	1.06 (27)	15.00	16.20	31.9	13.25 (337)	13 (330)	9.25 (235)	0.79	445
	1210/6	1055-2110													9.45
	2010/6	1700-3390			455										
SAB - 23"	1210/6	1220-2440	63.40	10.98	9.45	23 (584)	1.31 (33)	17.50	18.75	41.0	15.88 (403)	16 (406)	11.75 (298)	0.79	695
	2010/6	1900-3870													695
	3010/6	2850-5760													705
	3010/12	3450-6900													705
SAB - 30"	1210/6	1400-2800	68.00	14.01	9.45	30 (762)	1.56 (40)	21.50	23.00	44.5	20.75 (527)	19 (482)	15.0 (381)	1.18	950
	2010/6	2360-4720													950
	3010/6	3650-7370													980
	3010/12	4400-8800													980

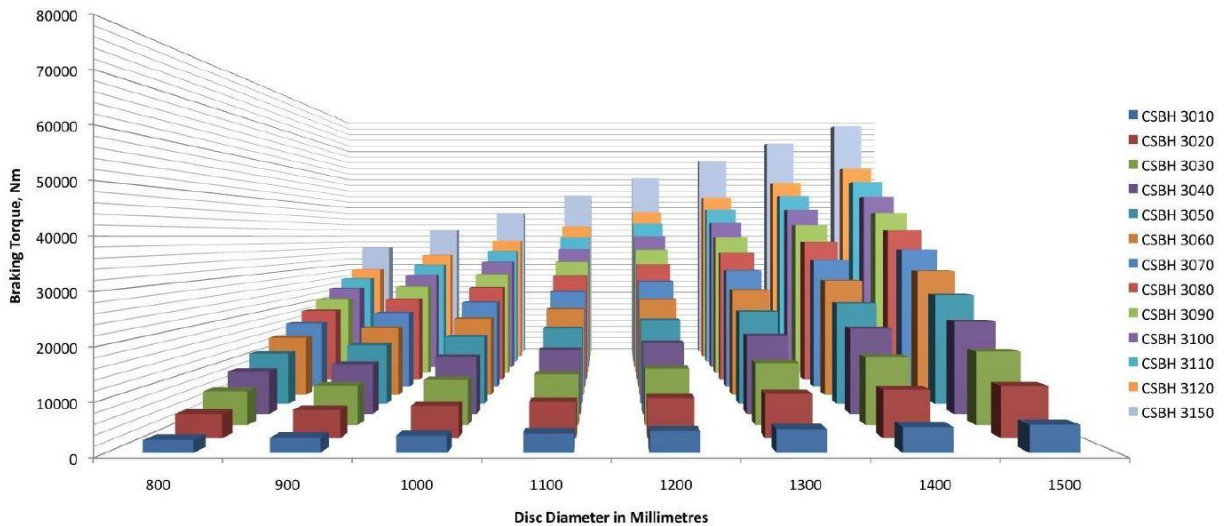
CSB Caliper Service Brake

CSBH3000

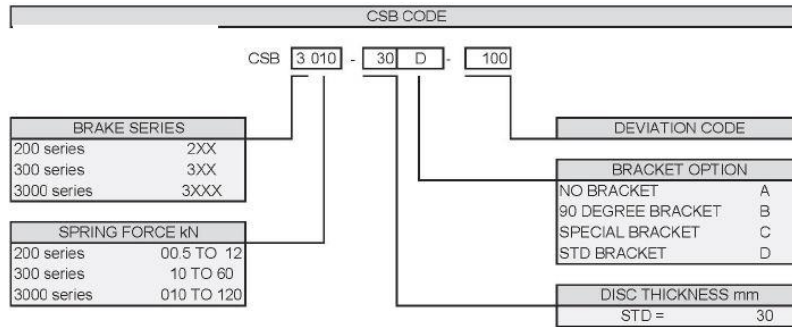
The CSBH3000 is a spring applied and hydraulically released fail-safe disc brake with a clamping force up to 160KN.

- Designed in Australia for tough mining conditions
- Mechanical safety lockout
- Lower operating pressure
- Minimum moving parts
- Stainless steel adjusting screw and pad retainers
- Stainless steel pistons
- Cartridge style spring pack
- On / Off and pad wear proximity switches on both caliper halves
- Organic non-asbestos or sintered metal brake pads
- Brake suitable for marine and corrosive environments
- Custom designed power pack to operate the brake - available with various options

Brake Type and Size Selection

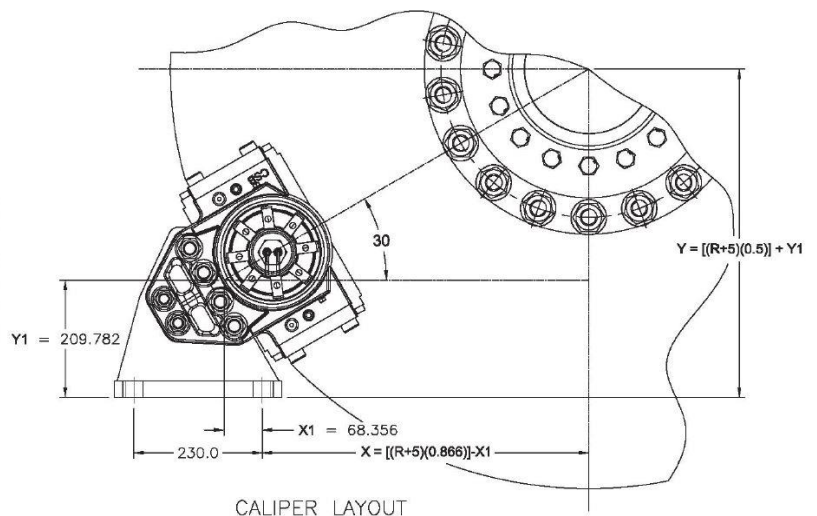
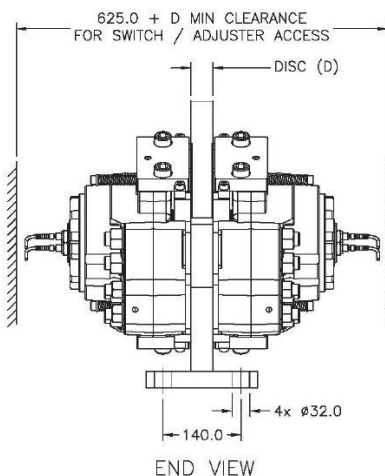


CSB Caliper Service Brake



COMMON FEATURES	3000 Series
Weight excl. Bracket (kg)	130
Bracket Weight (kg)	28
Brake pad width (mm)	200
Area brake pad Organic cm ²	596
Area brake pad Sintered Metal cm ²	360
Max wear of pad half mm	10
Pressure connection ports BSPP	2x1/4"
Drain connection ports BSPP	2x1/4"
Min pipe size (mm, ID)	8
Max operating pressure (bar)	230
Temperature range °C	-20 to 70
Minimum Disc thickness (mm)	20
Min. disc diam. (mm)	800
Max outer coupling diameter (mm) = disc diameter less	412

Caliper	Clamping Force	Braking Force	% Force loss/mm	Balanc e Pressure @ 1mm	Pressure at full retraction
Model	N	N	%	bar	bar
3010	10000	8000	4%	8	38
3020	20000	16000	3%	16	46
3030	30000	24000	4%	24	54
3040	40000	32000	1%	31	61
3050	50000	40000	4%	39	69
3060	60000	48000	3%	47	77
3070	70000	56000	6%	55	85
3080	80000	64000	3%	63	93
3090	90000	72000	3%	71	101
3100	100000	80000	6%	79	109
3110	110000	88000	6%	87	117
3120	120000	96000	5%	94	124
3150	150000	120000	8%	118	145
3160	160000	128000	7%	126	155





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