

# BOSS®

## BRAKE ONLY SNAG SYSTEM

[www.dellnerbubenzner.com](http://www.dellnerbubenzner.com)



**DELLNER BUBENZNER Germany GmbH**  
Friedrichshuettenstr. 1  
D-57548 Kirchen-Wehbach

Phone +49 (0) 2741 / 9488-0  
[info.de@dellnerbubenzner.com](mailto:info.de@dellnerbubenzner.com)

### PHYSICAL BACKGROUND

Today cranes are able to hoist with 180m/min using huge motors up to 1000kW and more. Using huge equipment means also handling huge inertia that must be accelerated and stopped. The energy that has to be controlled by the hoist is increasing with the square of the lifting speed. In a snag case motors and couplings are still rotating for a short period of time whereas the container or the empty spreader has been already stopped.

During this period of time all kinetic energy has to be absorbed by the wire ropes. The rope tension is increasing tremendously what can cause further damage like ripped off rope drums or even worse broken steel structure up to a total crane collapse. An anti snag system must be able to control and dissipate a huge amount of energy within a very short time.

### FAST REACTION

When snag has happend motor speeds must be reduced to zero as fast as possible in order to avoid rapid damage of the system. For that reason fast closing brakes are needed. DELLNER BUBENZER provides SB28.3 services brakes with ultra-fast setting BUEL® thrusters. Closing times of 36ms help to stop the motor rotation within 100 to 200ms. Due to the fast stopping of the motors the amount of energy that will elongate the wire ropes is very limited.

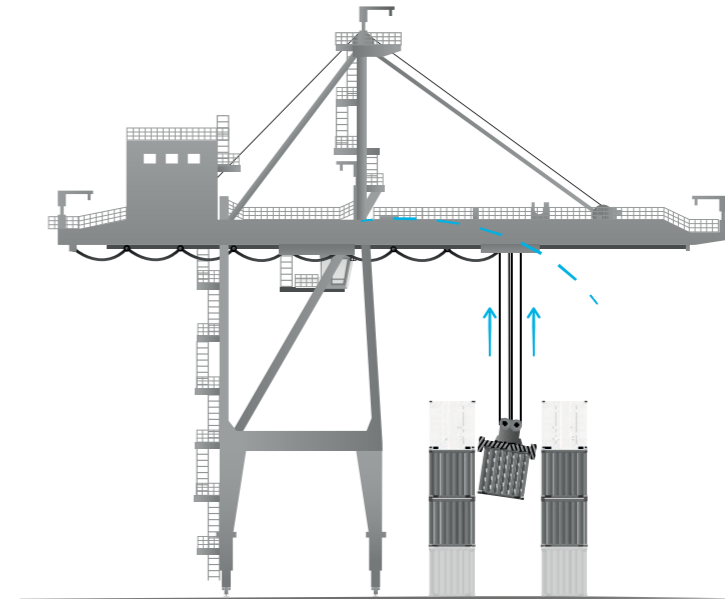
Fast setting emergency brakes additionally help to slow down. Key components like rope tension sensors (load pins) with special, ultra-fast amplifiers guarantee to recognize any overload condition within the shortest possible time. Fast reaction is the key. The BOSS® system combines fast electrical components (hard-wired) with one of the fasted mechanical brakes. The system is limiting the snag load to such a minimum that rope elongation will be within an acceptable range and further damage can be excluded.

### BOSS® INNOVATION

The BOSS® sytem has been developed based on the experience with the SOS system that has been already installed in more than 200 container cranes world wide. Conventional hydraulic anti snag systems have only one fixed tripping point (pressure relief valve).

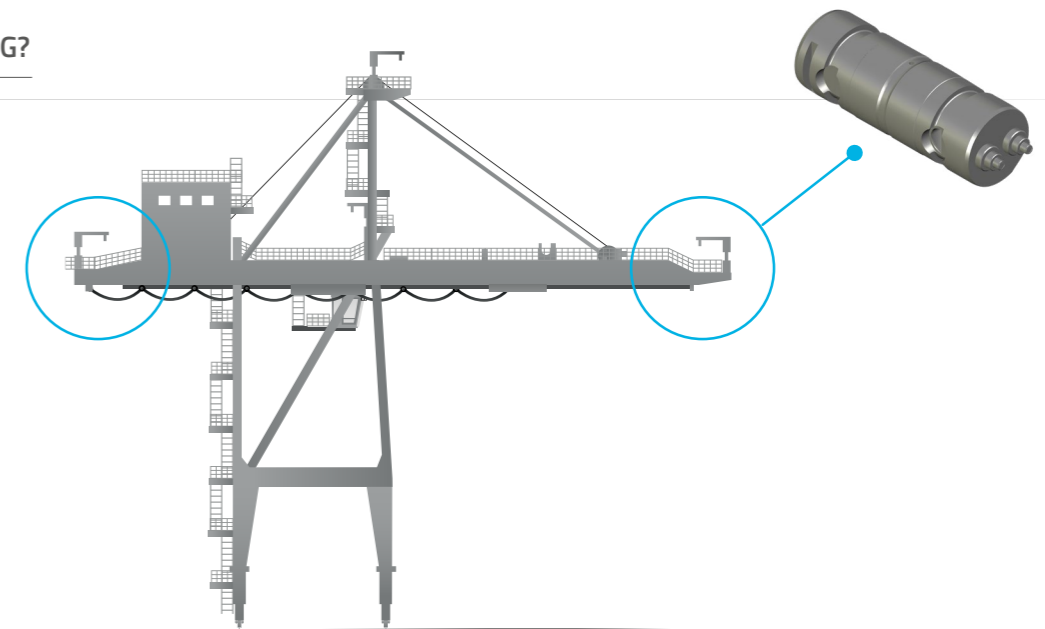
The BOSS® system is working with variable tripping points (each corner individually) depending on the actual corner load measurement and hoisting speed. The BOSS® PLC is pre-calculating the perfect tripping point for each load condition. Working with the best tripping points leads to faster snag detection and less stress in the wire ropes as well as in the crane structure.

### WHAT IS A SNAG?



A snag occurs when a spreader or container jammed in the cell guides or hiding an obstacle during upwards motion. The worst case happens under high speed conditions with empty spreader full speed up due to the high amount of kinetic energy in the system.

### HOW TO DETECT SNAG?



Four two-channel load pins are installed in the boom tip or backreach, monitoring continuously the rope forces.



**STEP 1:** 0 ms →

**STEP 2:** 20 ms →

**STEP 3:** 56 ms →

**STEP 4:** 90 ms →

**STEP 5:** 100-276 ms

#### LOAD PINS

Load pins are detecting an overload on one or more corners.

#### BOSS® PLC

BOSS® PLC will cut off power for BUEL® H thrusters, service brakes and BUEL® G for emergency brakes and hoist motors. The electrical reaction time is only 20ms until the brakes are switched off.

#### SERVICE BRAKE

Service brakes apply full braking torque within **36ms** after power off.

#### EMERGENCY BRAKE

Emergency brakes apply full braking torque within **70ms** after power off.

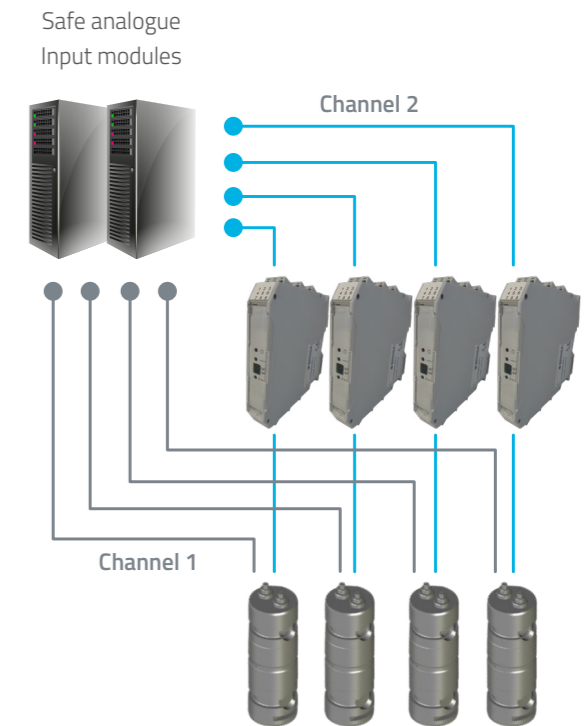
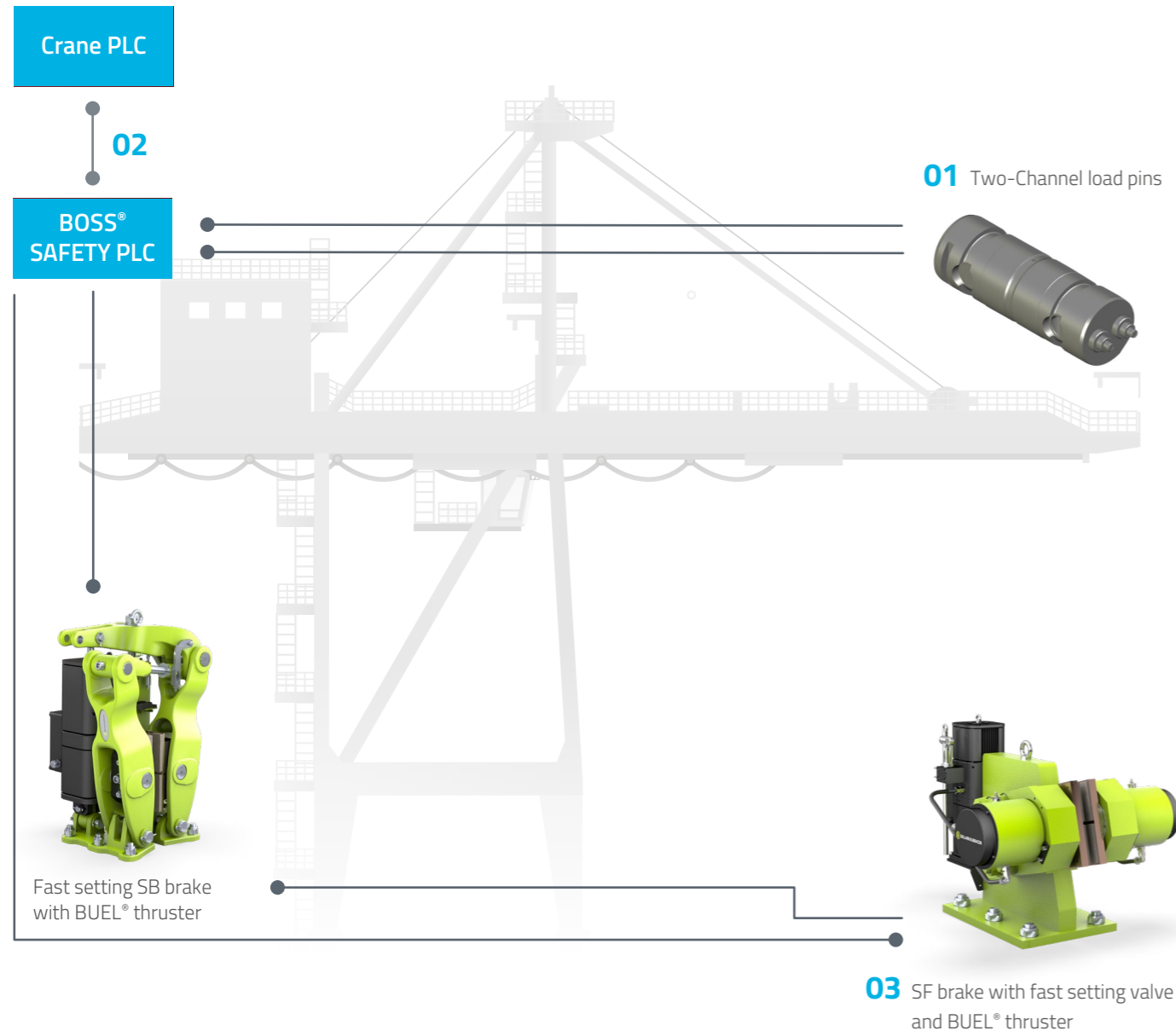
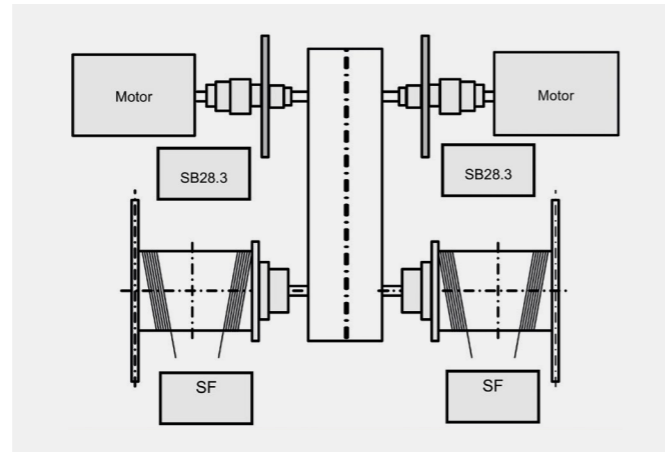
#### HOIST MOTION

Hoist motion will be stopped after **up to 110ms**. The total stopping time from snag detection to stand still is between **100 and 276ms\***.

\*Can variate per system.

KEY COMPONENTS

1. Two-Channel load pins with integrated high speed amplifiers
2. BOSS® PLC
  - Special designed components for snag detection
  - Integrated overload weighing system
  - Profisafe Interface to crane
  - (based on Profibus / Profinet)
3. SB and SF brake with BUEL® H and BUEL® G thruster
  - Five times faster compared to other systems



ADVANTAGES

- Profisafe Interface
- Fastest reaction time
- Precise control
- TÜV certified
- Cross-check of both channels
- Simple calibration and set-up
- Fully integrated
- Closed wired system
- Dynamic snag trip point setting depending on corner load and speed
- No maintenance time required
- No nuisance tripping after e-Stops
- Easy retrofitable

SAFE

SIMPLE SET-UP & INTEGRATION

CERTIFIED

FAST

OVERLOAD + SNAG LOAD

ZERTIFIKAT ◆ CERTIFICATE ◆ CERTIFICADO ◆ CERTIFICAT ◆  
 ЗЕРТИФИКАТ ◆ CERTIFICATE ◆ CERTIFICADO ◆ CERTIFICAT ◆  
 認証証書 ◆ CERTIFICATE ◆ CERTIFICADO ◆ CERTIFICAT ◆



## CERTIFICATE

**Notified Body:** TÜV SÜD Industrie Service GmbH  
Westendstraße 199  
80686 Munich - Germany

**Certificate Holder:** DELLNER BUBENZER Germany GmbH  
Friedrichshüttenstr. 1  
57548 Kirchen-Wehbach – Germany

**Order No.:** 3656470

**Manufacturer:** DELLNER BUBENZER Germany GmbH  
Friedrichshüttenstr. 1  
57548 Kirchen-Wehbach – Germany

**Product:** BOSS control consisting of  
"Snag Load Protection" and "Overload Protection"

**Test laboratory** TÜV SÜD Industrie Service GmbH  
Energy and Systems  
Hoists/Cranes/Logistic Systems  
Westendstraße 199  
80686 Munich - Germany

**Basis for examination:** DIN VDE 0100-410:2018-10  
DIN VDE 0100-420:2019-10  
DIN EN 60204-32:2009-03  
DIN EN ISO 13849-1:2016-06  
DIN EN ISO 13849-2:2013-02

**Test report:** No. 3656470-10 of 2022-08-03

**Outcome:** When used as intended, the product fulfills the requirements of the test basis for the area of application specified in the test report (pages 1 - 8) for this certificate, in compliance with the specified conditions. The Snag Load control with single rope protection for single hoists fulfills performance level "d" / SIL class 2.

**Date of issue:** 2022-10-05

**Validity until:** 2027-10-04

  
Anton Seidl  
Senior Expert

TUV®

DELLNER BUBENZER is an industry-diverse global leader in the design and manufacture of braking systems for the material handling, crane & hoist, container handling, mining, marine, industrial, offshore, oil & gas, and wind energy sectors. Global manufacturing leadership combined with a commitment to service at the local level positions DELLNER BUBENZER as the world's first choice for sustainable braking solutions and installations.

Our brakes are used in the following industries:

- Bridges & Movable Structures
- Container Handling
- Cranes & Hoists
- General Industry
- Iron & Steel
- Marine Propulsion
- Material Handling
- Mining & Bulk Handling
- Offshore
- Oil & Gas
- Pulp & Paper
- Wind Energy

Our vision: BRAKING UNLIMITED.

Our team of talented developers is highly motivated to satisfy the needs of each and every customer.

### ANY QUESTIONS?

Scan the QR code to find your contact person. →



### INTERESTED IN LEARNING MORE?

Do you have any questions or do you want to have an individual appointment? We will be pleased to provide additional information about our products and services.

Contact us:

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✉ info.de@dellnerbubenzler.com



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