**PINTSCH BUBENZER**

**MONITORING SYSTEM CMB-3 FOR SB AND SF BRAKES**
BRAKING UNLIMITED

Made in Germany

# Monitoring System CMB-3 for SB brakes

Made in Germany

After many years of successful operation in the market, the brake condition monitoring systems CMB-2 have been improved.

The new system CMB-3 can handle double amount of sensors.

### New Features

> Profibus or Profinet bus system possible
> Automatic power supply range switch 110-240 V AC
> One CMB-3 box can handle up to
  > 2 brakes SB28 / SB23 / SB16
  > 2 brakes SF10...SF40
  > 1 dual caliper brake SF50
> Cable for sensors have a plug M12 on each end for easy troubleshooting
> Same type of box for SF and SB brake types

### Features

> Industrial display with 4 rows of 20 characters for indication of measurement data and error messages
> High ambient temperature range -20°C.....+70°C
> Protection class IP65
> Internal keypad for parameter change.
> Up to 20 m cable length from sensor to electronic box (Option).
> Brake operation cycle counter (up to 100 million Cycles)
> One common error relay contact
> Profibus / Profinet:
  All scaled measures signals and error bits are transferred by bus system to the main control PLC. No expensive analogue inputs are required in control PLC.

### Option

> Stainless steel electronic box IP66
> sunshine protection cover for outdoor use

Supply voltage 110-240 V AC

Profibus/ Profinet
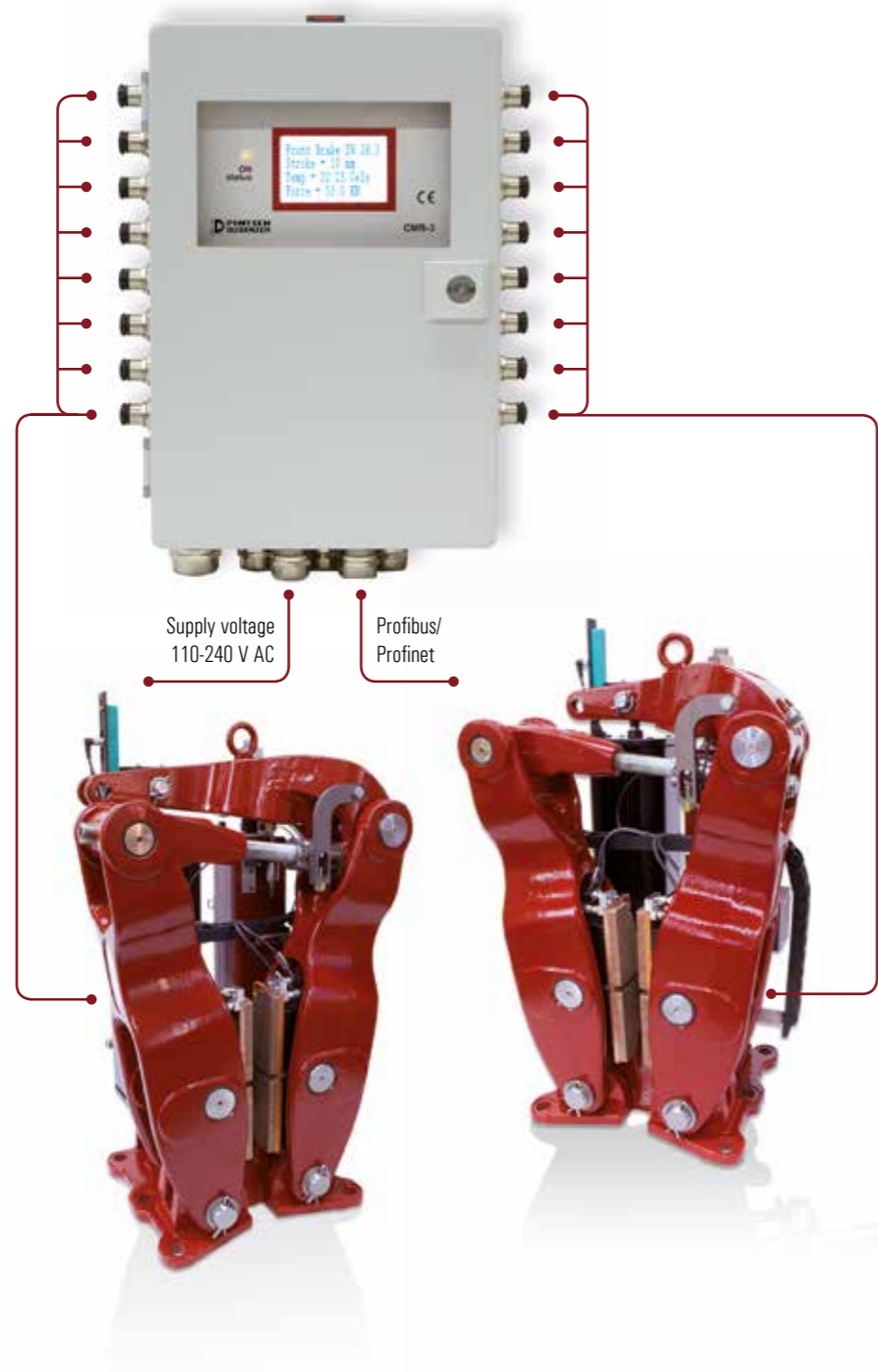
## 1.  Parts of CMB-3 system for SB brakes

### 1.1  Pad wear sensors:

If the minimum brake pad thickness is reached, the sensors (A) send a signal to the CMB-3.

### 1.2  Temperature sensors:

A pair of Pt100 sensors (B) measures the temperature of the each brake pad. If the temperature is too high or if the temperature is unequal from left to right side the unit generates a signal that is displayed in the panel. This error signal is given also on the Profibus / Profinet connection.

### 1.3  Stroke sensor:

The analogue sensor measures the position of the thruster piston rod. The reserve stroke is measured and checked that it is at the perfect position of 10 mm when the brake is correctly closed. The maximum measurement range is 100 mm.
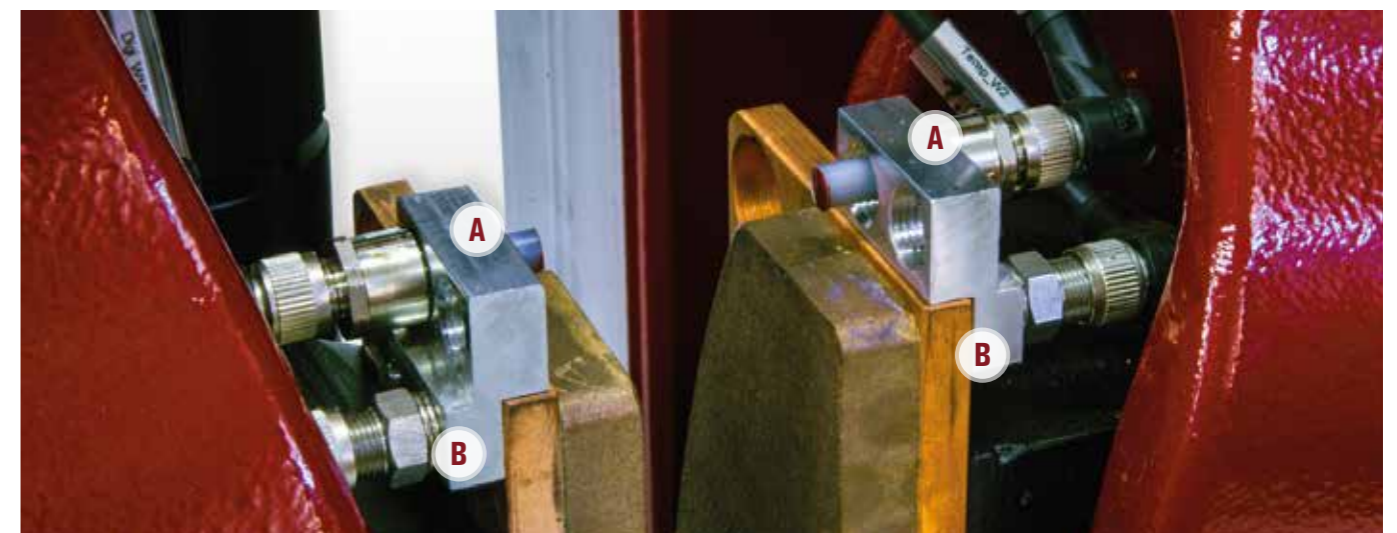
### 1.4  Force sensor:

One load cell pin, located in the top of one brake lever, measures the contact force in the closed condition of the brake. This signal is used to detect an incorrect or broken spring setting.

Stroke sensor

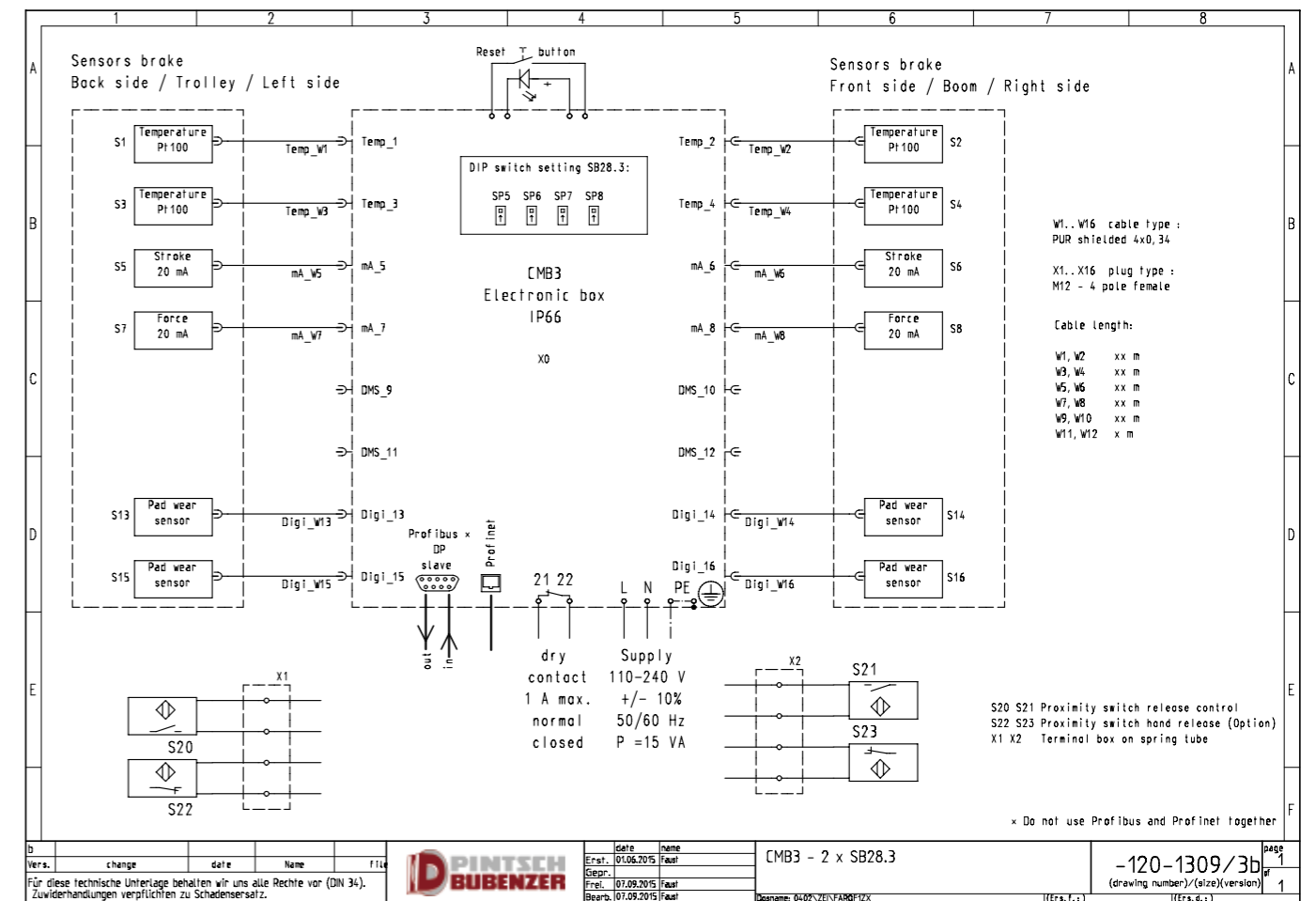Force sensor

Pad wear and temperature sensors

Brake type SB28.3 with BUEL thruster and CMB3 monitoring system.



Typical position of the CMB3 unit.
(Other options available)

## 1.5 Electrical diagram CMB-3 for SB brakes

## 2. Parts of CMB-3 system for SF brakes

### 2.1 Temperature sensor:

A pair of Pt100 sensors measures the temperature of the each brake pad. If the temperature is too high or if the temperature is unequal from left to right side the unit generates a signal that is displayed in the panel. This error signal is given also on the Profibus / Profinet connection.
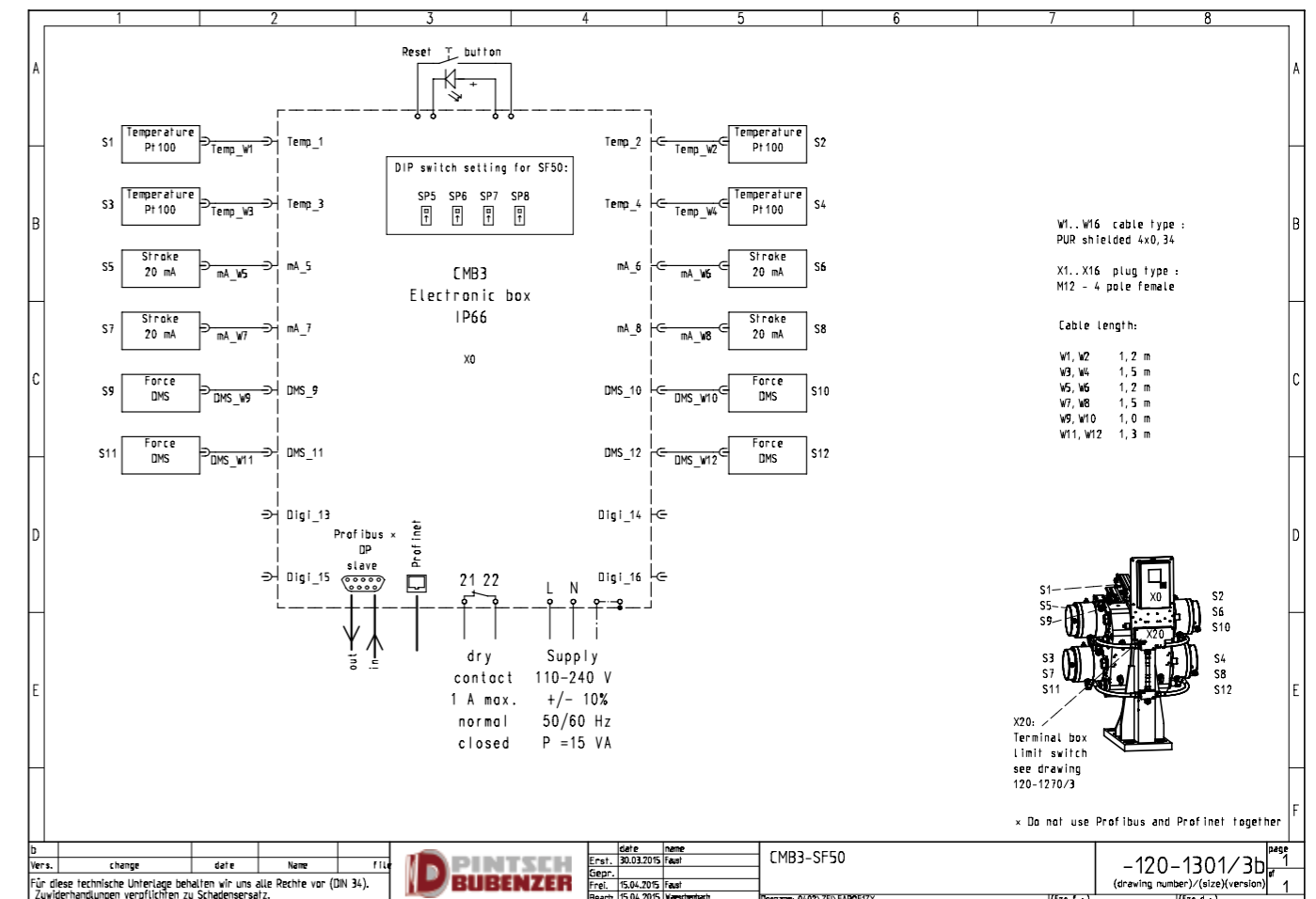
### 2.2 Stroke sensor:

Analogue sensors measure the stroke of each cylinder. If the stroke exceeds the maximum of 2.5 mm, a warning signal and an error message will be generated. The maximum measurement range is 3 mm.

### 2.3 Force sensor:

Analogue strain gauge sensors, located in the spring housing, measures the contact force of each cylinder on the closed (set) brake. If the force drops below the rated force of the brake, a warning signal and error message will be generated.
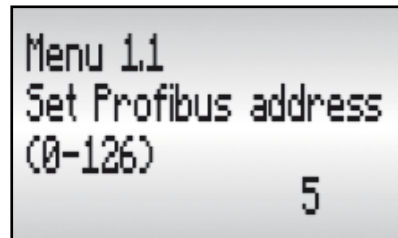
Temperature sensor

Stroke sensor (right one)

Force sensor

Brake type:
Two SF24 on console with one CMB3.

### 2.4 Electrical diagram CMB-3 for SF brakes



CMB3-SF50   -120-1301/3b

## 3. Comment parts

### 3.1 Display:

All measured analogue signals, digital signals and error messages are shown on the display in English language. Other languages are available on request. The display is readable under direct sunshine and has a LED backlight for use in a dark environment, such as steel mills.

### 3.2 Keypad:

With the internal keypad, the user can adjust parameters such as changing the temperature display from Celsius (°C) to Fahrenheit (°F) or setting of the Profibus address.

### 3.3 Reset button:

The LED pushbutton on top of the electronic box indicates a wrong brake adjustment by a flashing red light. After the problem on the brake is solved, the status of the CMB-3 can be reset to normal operation by pushing the button.

### 3.4 Profibus or Profinet:

All measured data (scaled) and warning signals are transferred to the main control PLC. No expensive analogue inputs (6 pc per brake) are required in the main PLC. The address of the DP slave can be easily set using the internal keypad. More than 100 brakes can be connected to one bus master on the main PLC.

Profibus

Keypad

### 3.5 Data interface table

| | | Signals from CMB3 brake to customer PLC over Profibus or Profinet | | | | | | Signals from customer PLC to CMB3 over Profibus or Profinet | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Data type | Offset (Byte): | SB-brake on Left side box SF-brake top side | Offset (Byte): | SB-brake on right side box SF-brake bottom side | Metric system Example | Unit | | Data type | Offset (Byte): | |
| INT | 0 | Brake pad temperature (left side) | 32 | Brake pad temperature (left side) | -50.... +600 | °C | | Bool | 0.0 | Reset    1 = Reset |
| INT | 2 | Brake pad temperature (right side) | 34 | Brake pad temperature (right side) | -50.... +600 | °C | | Bool | 0.1 | |
| INT | 4 | Stroke | 36 | Stroke | -1,0... +100,0 | mm | | Bool | 0.2 | |
| INT | 6 | Stroke (SF only: right side cylinder) | 38 | Stroke (SF only: right side cylinder) | -1,0... +100,0 | mm | | Bool | 0.3 | |
| INT | 8 | Contact force | 40 | Contact force | -10,0.... +450,0 | KN | | Bool | 0.4 | |
| INT | 10 | Contact force (SF only : right side cylinder) | 42 | Contact force (SF only : right side cylinder) | -10,0.... +450,0 | KN | | Bool | 0.5 | |
| INT | 12 | | 44 | | | | | Bool | 0.6 | |
| INT | 14 | | 46 | | | | | Bool | 0.7 | |
| INT | 16 | | 48 | | | | | Bool | 1.0 | |
| INT | 18 | | 50 | | | | | Bool | 1.1 | |
| INT | 20 | | 52 | | | | | Bool | 1.2 | |
| INT | 22 | | 54 | | | | | Bool | 1.3 | |
| INT | 24 | | 56 | | | | | Bool | 1.4 | |
| DWORD | 26 | Brake cycle counter | 58 | Brake cycle counter | 0....99999999 | | | Bool | 1.5 | |
| Bool | 30.0 | Heartbeat Bit 1 Hz | 62.0 | Heartbeat Bit 1 Hz | 0....1 | | | Bool | 1.6 | |
| Bool | 30.1 | Common Warning Bit | 62.1 | Common Warning Bit | 0....1 | 0 = warning | | Bool | 1.7 | |
| Bool | 30.2 | Common Error Bit | 62.2 | Common Error Bit | 0....1 | 0 = error | | INT | 2 | |
| Bool | 30.3 | Temperature warning | 62.3 | Temperature warning | 0.....1 | 0 = warning | | INT | 4 | |
| Bool | 30.4 | Temperature error | 62.4 | Temperature error | 0.....1 | 0 = error | | INT | 6 | |
| Bool | 30.5 | Contact force warning | 62.5 | Contact force warning | 0.....1 | 0 = warning | | | | |
| Bool | 30.6 | Contact force error | 62.6 | Contact force error | 0.....1 | 0 = error | | | | |
| Bool | 30.7 | Stroke warning | 62.7 | Stroke warning | 0.....1 | 0 = warning | | | | |
| Bool | 31.0 | Stroke error | 63.0 | Stroke error | 0.....1 | 0 = error | | | | |
| Bool | 31.1 | Air gap warning | 63.1 | Air gap warning | 0.....1 | 0 = warning | | | | |
| Bool | 31.2 | Air gap error | 63.2 | Air gap error | 0.....1 | 0 = error | | | | |
| Bool | 31.3 | Pad wear 1 (SB only) | 63.3 | Pad wear 1 (SB only) | 0.....1 | 0 = error | | | | |
| Bool | 31.4 | Pad wear 2 (SB only) | 63.4 | Pad wear 2 (SB only) | 0.....1 | 0 = error | | | | |
| Bool | 31.5 | | 63.5 | | 0.....1 | 0 = error | | | | |
| Bool | 31.6 | | 63.6 | | 0.....1 | 0 = error | | | | |
| Bool | 31.7 | Release control | 63.7 | Release control | 0.....1 | 1 = brake is open | | | | |
| | | **Total 32 Bytes / 16 Words** | | **Total 32 Bytes / 16 Words** | | | | | **Total 8 Bytes / 4 Words** | |

**PINTSCH BUBENZER**

Internal circuit board



**Dimensions CMB-3**



Cable glands free for customer:
M25: Profinet. Max cable diameter 17 mm
M20: Signals to crane, max cable diameter 13 mm
M20: Profibus In, max cable diameter 17 mm
M20: spare
M20: Profibus Out, max cable diameter 13 mm
M20: Supply voltage, max cable diameter 13 mm

2nd edition