

BRIDGEBOY 1 & 3 RELAYS

Single hoisting



Different references:

BRIDGE	BOY-48VAC-1R	BB 48 VAC IP54 CE 1 relay + Option ALIM-115VAC
BRIDGE	BOY-230VAC-1R	BB 230 VAC IP54 CE 1 relay
BRIDGE	BOY-48VAC-3R	BB 48 VAC IP54 CE 3 relays + Option ALIM-115VAC
BRIDGE	BOY-230VAC-3R	BB 230 VAC IP54 CE 3 relays

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1. GENERAL

These instructions describe the procedure to be followed for installing and adjusting the BRIDGEBOY electronic load system in cases where it is applied to a single hoisting device (no summation).

If you are already familiar with this procedure, you may go straight to chapter 4.

1.1. Introduction

The BRIDGEBOY limitation systems must absolutely be installed in a metal casing connected with the earth. In the case of a very busy electric line, the supply to the BRIDGEBOY must be filtered through a Schaffner filter.

Always make sure these adjustments are done with the hook at the same height in order to be free of effects of the weight of the cables.

The zero-point should always be adjusted after any lowering and the sensitivity adjustments, after lifting, to avoid all effects of friction in the pulley-blocks.

The BRIDGEBOY is an auto-supervised device. In case of a breakage, a cut or short-circuit of the supply-cable, the transducer or the measuring cable, the device immediately commutes to security mode.

1.2. Principle

The BRIDGEBOY -1R is equipped with one changeover relays. When switched off, the relay is in « rest » position. The BRIDGEBOY -3R is equipped with three changeover relays.

When the BRIDGEBOY-1R is switched on and the load applied is lower than the thresholds, the relays are in « working » mode and contact is made between terminals 14 and 15 (SP 1). The led on the front is green. If the applied load is greater than the threshold, then the relay return to the "rest" position and the led becomes red.

Once a threshold has been exceeded, the load should be reduced by at least 20% of the nominal capacity of the bridge, so the alarm is deactivated (hysteresis). If specified in the order, the value of the hysteresis can be reduced for example in order to manage a low threshold for the detection of cable-slack. For the BRIDGEBOY-3R, the 3dthreshold is in standard configured for the detection of cable-slack.

Each threshold has a time delay, in order to avoid the alarm going on in case of occasional overloads due to dynamic effects.

1.3. Exceptional cases

There are two variations for the use of the BRIDGEBOY:

- The SUPPLEMENTARY BRIDGEBOY. In case that more than 3 threshold is needed.
- The SUMMING BRIDGEBOY. In case of the need to limit the load of a sum of two hoisting devices.

Documents for these two variations are available at SENSY S.A.

2. INSTALLATION AND ADJUSTMENTS

Install the force transducer. In case of load-pin the arrow has to be pointing in the direction of the force. Put the system power on approximately 15 minutes before beginning any adjustment. Lift several times the nominal load in order to stabilize the system mechanically.

2.1. Short calibration procedure

In case of urgency and if the calibration load is equal to the maximum load (usually 110 % of the nominal load) it is possible to calibrate the BRIDGEBOY with following the short calibration procedure here below:

- Put the load on the ground.
- Check that the SP1 led is green. If it is red, turn the potentiometer Z clockwise ↻ so that this led becomes green.
- Turn the SP1 potentiometer 20 turns in the clockwise direction ↻ (maximum set-point).
- Turn the D1 potentiometer 20 turns in the anti-clockwise direction ↻ (minimum delay)
- Lift up the load.
- Turn slowly the SP1 potentiometer in the anti-clockwise direction ↻ till the SP1 led becomes red.
- Put down the load and lift it up again to check that the limitation work properly.
- If, when lifting smaller loads it appears that the BRIDGEBOY trigger because of the presence of dynamical forces, increase the value of the delay by turning the potentiometer D1 clockwise ↻
This action has to be made carefully because it creates a delay between the detection of the force and the commutation of the relay.

For a better calibration and to know the adjustment parameters, it is better to follow the full calibration procedure here after:

2.2. Full calibration procedure (recommended)

2.2.1. Transducer supply voltage

This measurement allows you to be certain of the quality of the cabling.

Measure the tension at terminals 3 (-) and 4 (+) of the terminal box. Using the potentiometer I, bring the voltage to 8 volts.

2.2.2. Zero

The zero-point and sensitivity of the BRIDGEBOY can be measured using the output voltage situated on the terminals 6(-) and 8(+). The test point "common (0V)" on the front at the left side just above the terminals of the power supply is equivalent to the terminal nr 6 (Ground).

	By default	Your case
Output voltage with no load	0 V	
Output voltage with 110% of nominal load	8 V	

Unload the hook and adjust the output voltage to 0 Volt, using the potentiometer Z.
 If an indicator has been installed, activate the tare and the display will indicate « zero ».

2.2.3. Sensitivity (span).

Load the system with a calibrated mass as close as possible (50% minimum) to the nominal load of the hoisting system and bring the output voltage (via the potentiometer S) to the value Vs, calculated using one of the following formulas:

If your load is 110%, the voltage between 6(-) and 8(+) will be adjust at 8V.

By default :

$$V_s = \boxed{8 \text{ Volt}} \times \frac{\text{Cal. mass}}{\text{Nom. load} \times 1,1}$$

$$V_s = \boxed{7,27 \text{ Volt}} \times \frac{\text{Cal. mass}}{\text{Nom. load}}$$

Your particular case :

$$V_s = \boxed{\text{ Volt }} \times \frac{\text{Cal. mass}}{\text{Nom. load} \times 1,1}$$

$$V_s = \boxed{\text{ Volt }} \times \frac{\text{Cal. mass}}{\text{Nom. load}}$$

- If a pre-programmed indicator is connected to the analogue output of the BRIDGEBOY, it should display the hoisted load.
- Put down the load. If the voltage is not equal to zero redo operation 2.2.2 and 2.2.3.

Example particular case: For an overhead crane with a nominal load of 25 tons and a calibrated mass of 18.6 tons

2.2.4. Adjustment of the set-point(s).

The voltage corresponding to the set-point(s) are measured between the test point "common 0V (-) and the set-points SP1 (SP2, SP3) (+) situated on the front side. This voltage (s) should be adjusted by their respective potentiometer(s) SP1 (SP2, SP3).

The set-point(s) will be adjusted following the same rules than the sensitivity.

For a set-point of 110% of the nominal capacity, the voltage should be set at 8 volts and for a set-point of 80%, the voltage will be adjusted at:

On the BRIDGEBOY-3R is set-point 3 dedicated by default to slack cable detection and only 1 set point is adjusted at 8volts.

2.2.5. Adjustment of the delay of the set-point(s)

Turn the delay potentiometer(s) D1, (D2, D3) situated on the front side 20 turns anti-clockwise ↺ (minimum delay).

Lift a weight equal to the nominal load of the hoisting device (100 %).

In case the BRIDGEBOY detects a dynamic overload because of movements, turn the delay potentiometer D1 (D2, D3) clockwise ↻, in order to increase the time delay.

This action has to be made carefully because it creates a delay between the detection of the force and the commutation of the relay.

Remark: The led) are green in the safe situation. They become red in case of the corresponding set-point is in fault situation. They are white in the transient period when the set-point is reached but the relay not yet (des)activated. This allows to check the efficiency of the delay.

The BRIDGEBOY has a test button on the front side that allows you to commute to security mode.

3. PROBLEMS AND SOLUTIONS

3.1. The adjustment on potentiometer I has no influence on the 8 Volt transducer power supply

- If this voltage is ± 13 Volts, the supply circuit of the transducer has been cut off.
- Measure the resistance of the transducer between the brown and yellow cables: it should be of $380\Omega \pm 30\Omega$.
- Check the connections.
- If you have any further problems, contact your dealer.

3.2. Impossible to bring the zero signal to 0 Volt

- Measure the output voltage of the transducer (mV) between the terminals 1 (+) and 2 (-) and check it increases when some load is applied.
- Too big load when empty. Modify the adjustment parameters by default and redo any necessary calculations eventually with your dealer.
- If all else fails, contact your dealer

3.3. Impossible to adjust the signal to 8 volts for a load of 110%

- The voltage stays too high. Reduce the power supply of the transducer without going below 6 Volts. Re-adjust the zero point.
- The voltage at 110 % remains lower than 8V, Choose a lower value for the set-points at 110 % (ex: 6V) and calculate the set-points adjustments in function of this new value.
- If all else fails, contact your dealer.

4. SPECIFICATIONS

Power supply : (specify on order ; see front of the BRIDGEBOY)	48-115-230VAC
Adjustable current generator	10...28 mA
Maximum voltage	11 V
Voltage output	0-10V (max load 4mA)
Current output	4-20mA (max load 10V)
Isolation	1,5 kV Alternative / 500 V Continuous
Zero input voltage	From -1.2 to 4.5 mV
Full scale	From 9 to 25 mV
<u>Alarms</u>	
Adjustable set-point	From 0 to 100% (0...10V)
Hysteresis	Definable on order (de 0 à 20%)
Adjustable delay	From 60ms to 1s
<u>Accuracy</u>	
Maximum error	< 0.5%
Supply current	< 0.1% / 10° C
Output signal	< 0.1% / 10° C
Set-point	< 0.2% / 10° C
Influence from supply voltage	< 0.2% / 10%
<u>General</u>	
Relay contact data	Changeover (250VAC/6A)
Temperature range	- 20 à +60 ° C
Sealing	IP55
Weight	0.8 kg
Terminals	BRIDGEBOY-1R : 14 pins BRIDGEBOY-3R : 20 pins

5. INSTALLATION AND ADJUSTMENT DIAGRAMS



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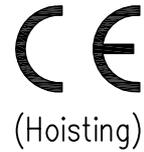
LOAD LIMITER

model BRIDGE 1 Setpoint relay

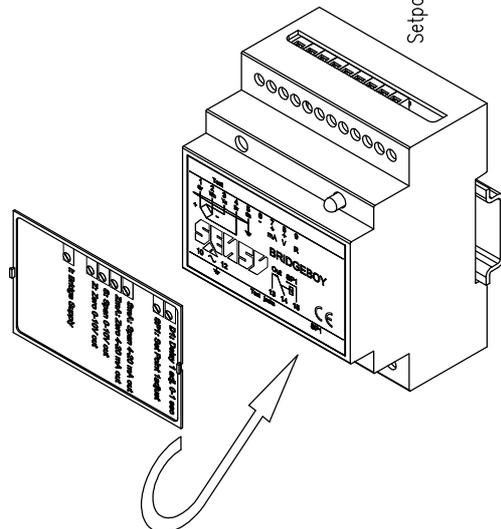
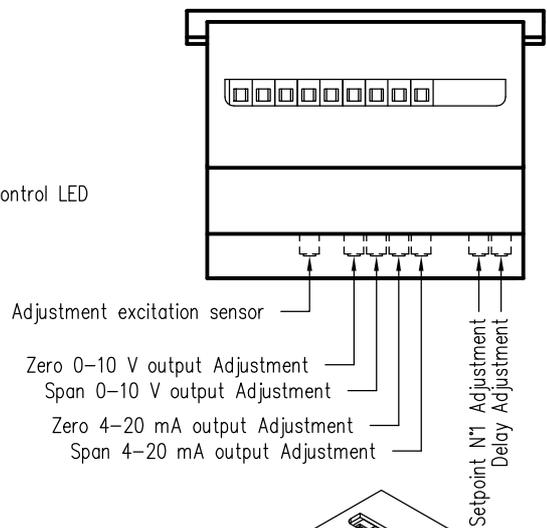
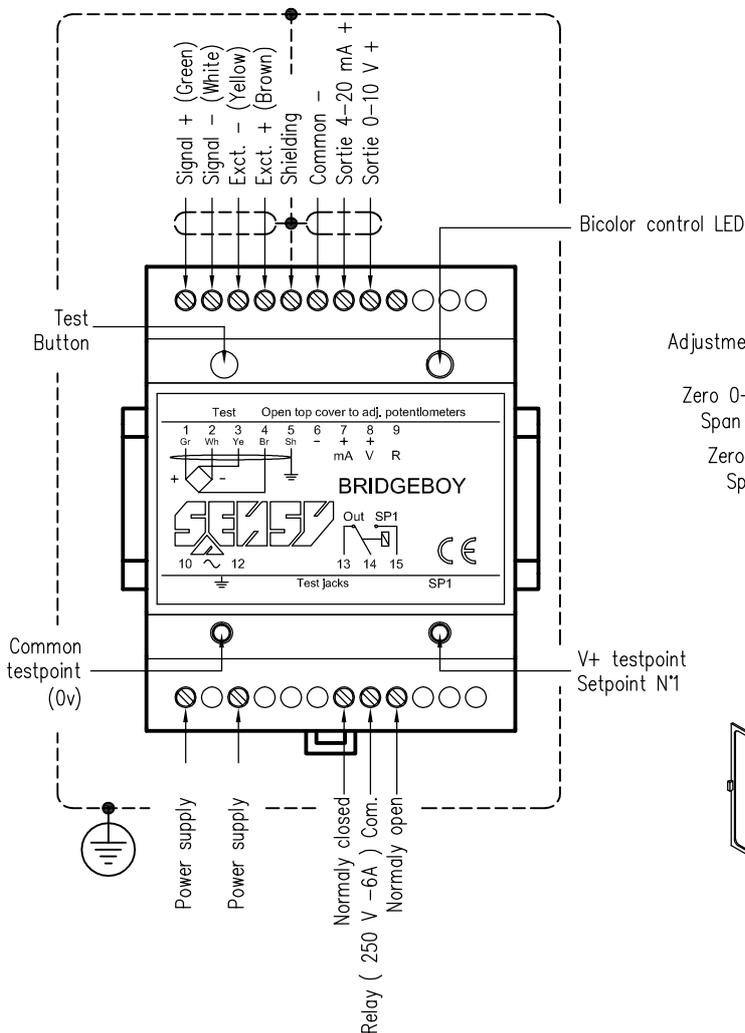
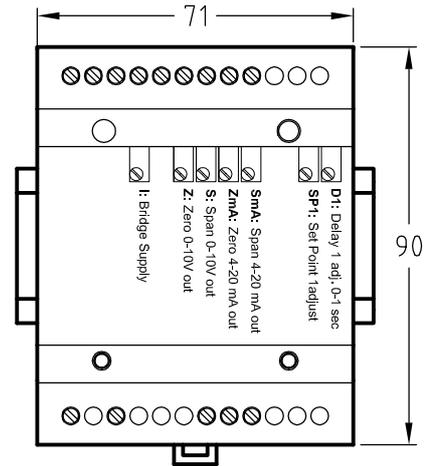
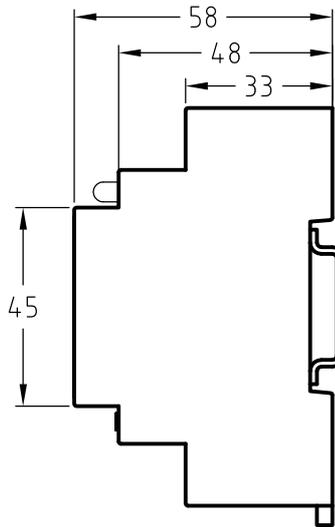
Compact model for mounting on DIN rail TS35 IP54

Available power supply

48-115-230 VAC



Ref :
BRIDGE-BOY-48VAC-1R
BRIDGE-BOY-115VAC-1R
BRIDGE-BOY-230VAC-1R



Rev.26/05/2008



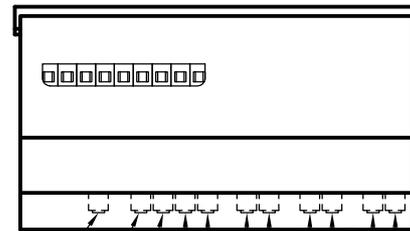
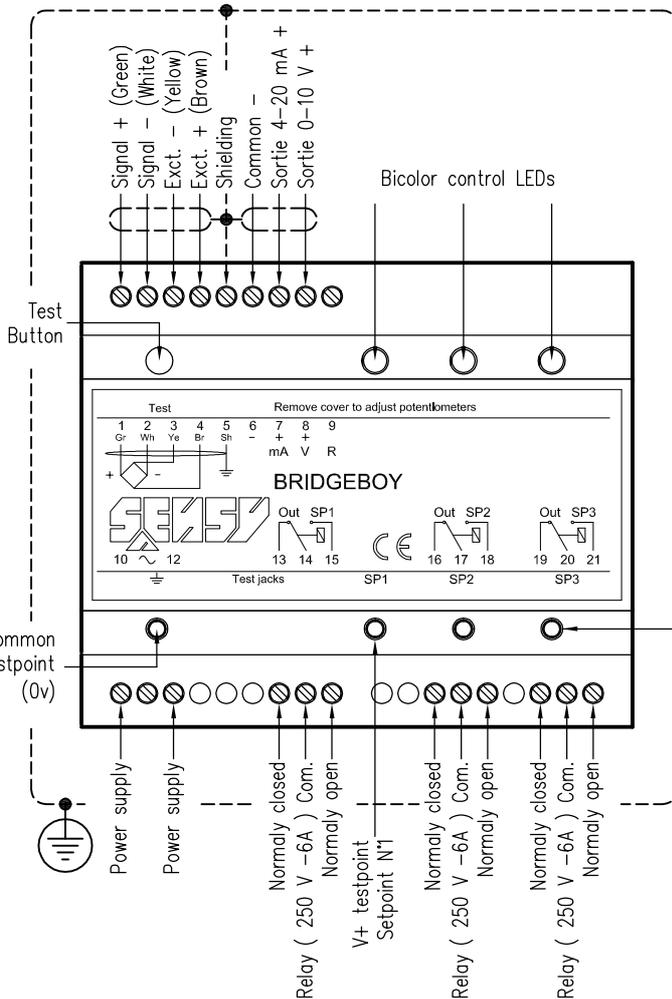
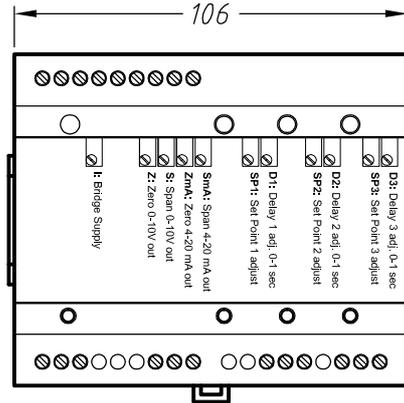
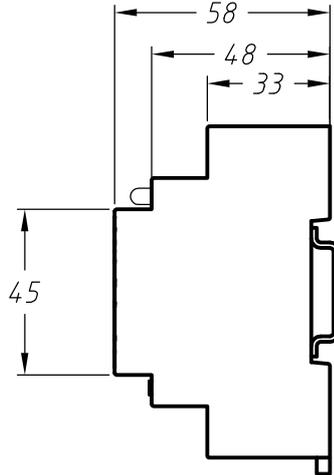
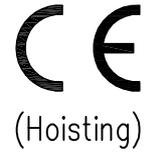
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LOAD LIMITER

model BRIDGE 3 Setpoint relay

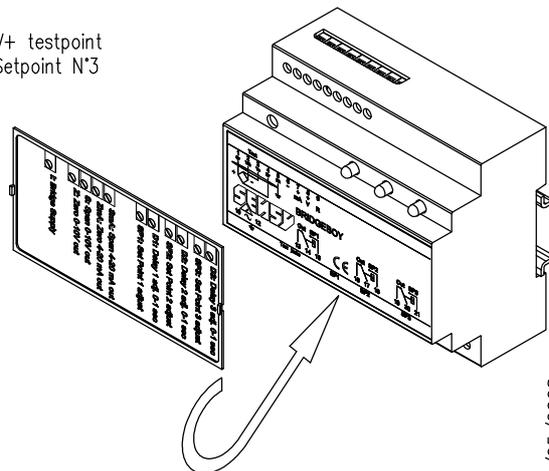
Ref :
 BRIDGE-BOY-48VAC-3R
 BRIDGE-BOY-115VAC-3R
 BRIDGE-BOY-230VAC-3R

Compact model for mounting on DIN rail TS35 IP54
 Available power supply
 48-115-230 VAC



- Adjustment excitation sensor
- Zero 0-10 V output Adjustment
- Span 0-10 V output Adjustment
- Zero 4-20 mA output Adjustment
- Span 4-20 mA output Adjustment
- Setpoint N1 Adjustment Delay Adjustment
- Setpoint N2 Adjustment Delay Adjustment
- Setpoint N3 Adjustment Delay Adjustment

V+ testpoint
Setpoint N'3



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