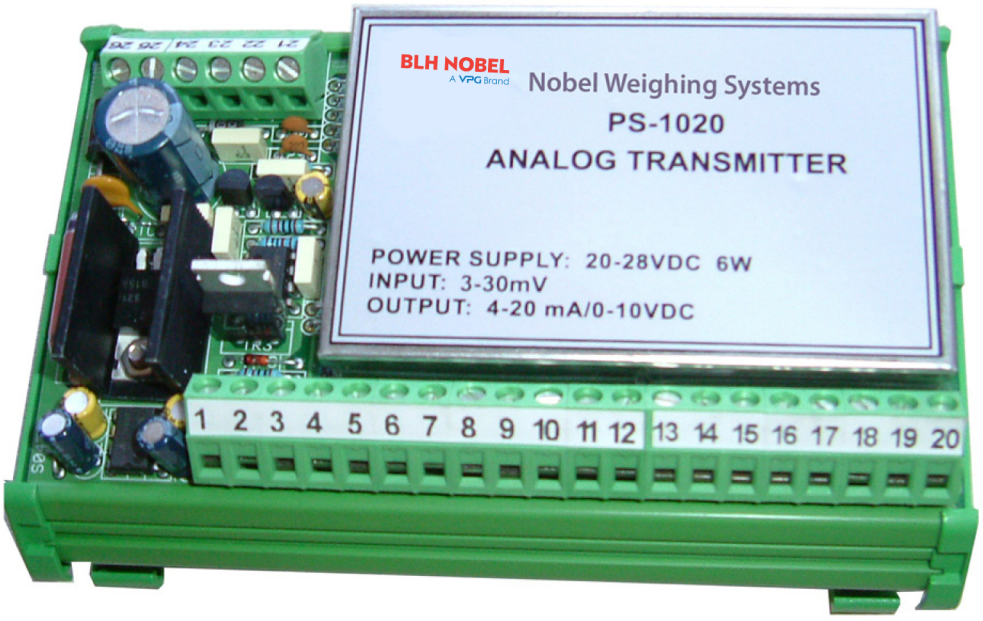
GB

# Analog Weight Transmitter
# PS-1020




## Installation and Operating Manual

BLH NOBEL
A VPG Brand

LIST OF CONTENTS

SECTION 1
GENERAL INFORMATION

## Introduction

PS-1020 Analog Transmitters are electronic devices utilizing solid-state integrated components. They provide the user with a selectable voltage or current output directly proportional to the input signal within a specified linearity.

## Description

The transmitters are intended for field mounting close to the vessel site, thereby reducing installation costs. An integral 20-connector terminal strip provides connections for up to four transducers, thus eliminating the need for a separate summing junction box.

Two screw type terminal strips provide connections for the supply voltage, transducer wiring, and analog outputs.

The zero and span adjustments for the analog outputs are accomplished with two sets of dip-switches and trim pots.

The units also include an adjustable filter which can be used to stabilize the output. Filtering is used to minimize the effects of vibration caused by agitators or other devices.

The standard packaging is an ABS plastic DIN-Rail mounted enclosure.

The transmitters are available with an optional 24 Vdc power supply enabling the unit to be operated with 115 Vac.
For additional information, please refer to Section 3.

## Specifications

**PERFORMANCE**

| | |
|---|---|
| Full Scale Range | 3 mV to 30 mV |
| Linearity | ±0.2% of full scale |
| Excitation Voltage | 10 Vdc |
| Load Current | 200 mA (four - 350 ohm load cells) |
| Thermal Stability | 28 ppm/°F (full scale range) |

**ENVIRONMENTAL**

| | |
|---|---|
| Operating Temperature | -10 to +40°C |
| Storage Temperature | -20 to +50°C |
| Relative Humidity | 85% non-condensing |

**ELECTRICAL**

| | |
|---|---|
| Input Voltage | 24 Vdc ±15% |
| Power Consumption | 6 watts max |

**ANALOG OUTPUT** (jumper selectable)

| | |
|---|---|
| Voltage | 0 to 10 Vdc<br>(2kohm min load) |
| Current | 0 to 20 or 4 to 20 mA<br>(500 ohm max load) |

**CONFIGURATION**

| | |
|---|---|
| Coarse Zero | 4-position DIP-switch |
| Fine Zero | 20-turn trim pot |
| Coarse Span | 4-position DIP-switch |
| Fine Span | 20-turn trim pot |
| Analog Filter | adjustable, 270° turn trim pot |

**ENCLOSURE**

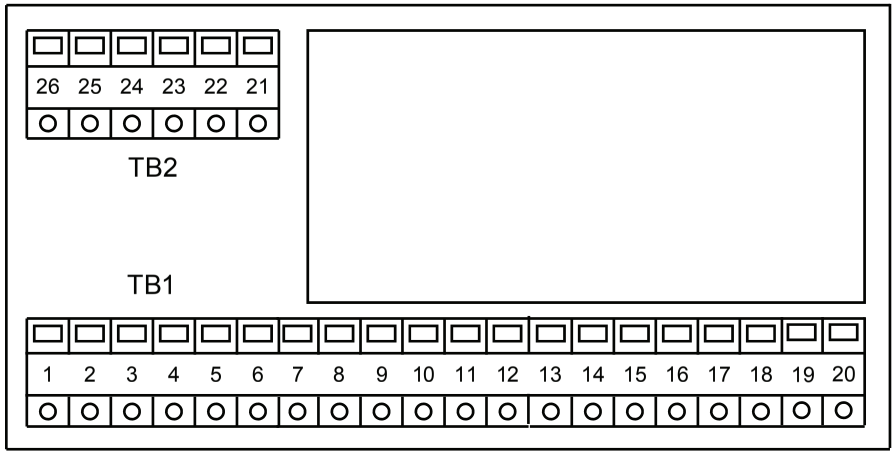
| | |
|---|---|
| Overall Dimensions | 134 x 93 x 60 mm (L x H x D) |
| Mounting | DIN rail mount |
| Material | ABS Plastic |
| Weight | 215 gram |
| Wiring Connections | terminal blocks, pitch 5 mm |

**OPTIONS**

| | |
|---|---|
| 230 VAC Power Supply | DIN rail mount |

Vishay BLH is continually seeking to improve product quality and performance.
Specifications may change accordingly.

FIGURE 1
Wiring Connections




Mount the transmitter horizontally on a section of DIN-Rail with Terminal Block TB1 positioned on the bottom. If an optional 230 Vac to 24 Vdc power supply is used, the cable between the two devices must not exceed 1 meter.

The PS-1020 is designed to be installed in the field close to the vessel. Terminal strip TB1 provides connections for up to four transducers, thereby eliminating the need for a separate summing junction box.

| TB1 | | TB2 |
|---|---|---|
| 1. - Excitation (cell # 1) | 11. - Excitation (cell # 3) | 21. + 0/20 or + 4/20 mA |
| 2. + Excitation (cell # 1) | 12. + Excitation (cell # 3) | 22. + 0-10 Vdc |
| 3. - Signal (cell # 1) | 13. - Signal (cell # 3) | 23. - Analog Output |
| 4. + Signal (cell # 1) | 14. + Signal (cell # 3) | 24. - 24 Vdc (supply) |
| 5. Shield | 15. Shield | 25. + 24 Vdc (supply) |
| 6. - Excitation (cell # 2) | 16. - Excitation (cell # 4) | 26. Ground |
| 7. + Excitation (cell # 2) | 17. + Excitation (cell # 4) | |
| 8. - Signal (cell # 2) | 18. - Signal (cell # 4) | |
| 9. + Signal (cell # 2) | 19. + Signal (cell # 4) | |
| 10. Shield | 20. Shield | |

NOTE: Some transducer manufacturers utilize a 6-conductor cable (+/- Sense leads). When using these type of transducers, the + Sense lead must be connected to the + Excitation terminal and the - Sense lead must be connected to the - Excitation terminal.

## SECTION 2
## CALIBRATION

Prior to calibrating the instrument perform the following calculations. This will enable you to determine where the dip-switches should be positioned for zero and span. Obtain the capacity and full scale output of the transducer/s from the calibration certificates.
If required, convert them into the engineering units being used in the system.

Use the above values in the following formulas to determine the zero and span mV values.

Multiply the full scale mV/V output of the transducer/s by the excitation voltage to obtain mV.

Example: 3.0 mV/V x 10 Vdc = 30 mV.

Zero (mV) = Z x O / C

Z = Tare weight (vessel, agitator, etc)
O = Full scale output in mV
C = Total capacity of the transducers.

Set the zero adjustment dip-switches so the calculated value is within the minimum/maximum mV ranges given in Table 1 (page 9).

Span (mV) = S x O / C

S = Net weight (live or product weight)
O = Full scale output in mV
C = Total capacity of the transducers.

Set the span dip-switches so the calculated value is within the minimum and maximum mV ranges given in Table 2 (page 10).

Sample calculation:

Three 1000 kg load cells, output = 3.0 mV/V
Tare weight = 500 kg.
Net weight = 2000 kg.
3.0 mV/V x 10 Vdc = 30 mV
Zero (mV) 500 kg x 30 mV / 3,000 kg = 5 mV
Table 1 dip-switch setting = Off, On, Off, Off (3.0 to 5.5 mV)
Span (mV) 2000 kg x 30 mV / 3,000 kg = 20 mV
Table 2 dip-switch setting = On, On, On, On (15.2 to 24.7 mV)

**Calibration Procedure**

Remove the metal cover to expose the dip-switches, jumpers and trim pots as shown in Figure 2 below.

Set the zero and span dip-switches so the calculated values are within the minimum and maximum mV ranges given in Tables 1 and 2.

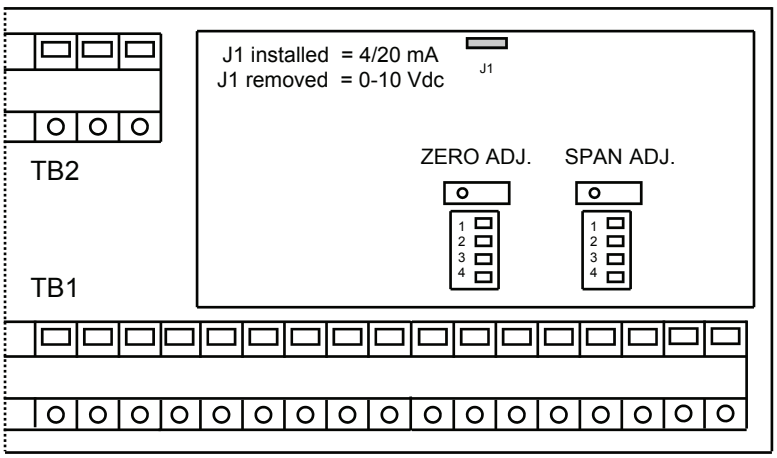
Position jumper J1 for current or voltage output. See Figure 2.

Connect a digital multi-meter to terminal strip TB2
terminals 21 and 23 for current output or to
terminals 22 and 23 for voltage output.

Apply power to the unit and allow a couple of minutes for the transmitter to warm up before making any adjustments.

Remove any weight from the system and adjust the fine zero trim pot for a reading 0 Vdc or 4 mA. Turn the trim pot clockwise to increase the output, or counter-clockwise to decrease the output.

FIGURE 2
Zero & Span Adjustments



**Calibration Procedure (cont'd)**

Apply a known weight and adjust the fine span trim pot for the correct output. Turning the trim pot clockwise increases the output while turning it counter clockwise decreases the output.

Re-check "zero" and "span" calibration and re-adjust if required.

Replace the metal cover after calibration has been completed.

Analog Filter Adjustment

If the output is unstable under normal operating conditions, slowly turn the filter adjustment clockwise until the output stabilizes.
See Figure 3 (page 10) for location of the filter adjustment.

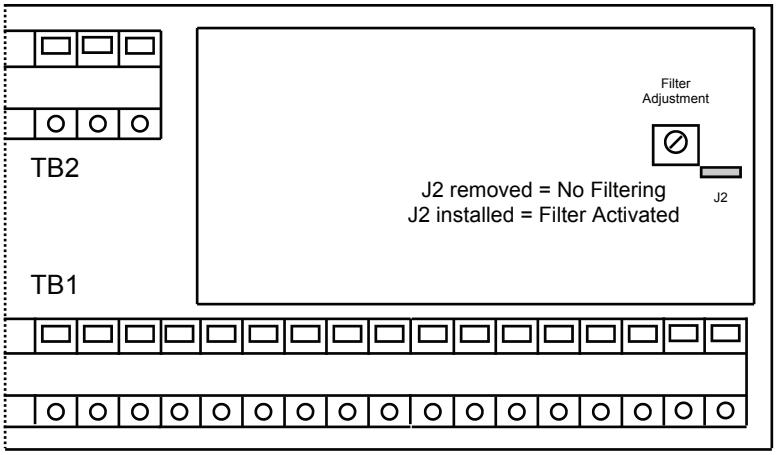
TABLE 1

| 1 | 2 | 3 | 4 | mV min | mV max |
|---|---|---|---|---|---|
| OFF | OFF | OFF | OFF | -0.8 | 1.6 |
| ON | OFF | OFF | OFF | 1.2 | 3.7 |
| OFF | ON | OFF | OFF | 3.0 | 5.5 |
| ON | ON | OFF | OFF | 4.6 | 7.1 |
| OFF | OFF | ON | OFF | 5.9 | 8.4 |
| ON | OFF | ON | OFF | 7.2 | 9.7 |
| OFF | ON | ON | OFF | 8.3 | 10.8 |
| ON | ON | ON | OFF | 9.3 | 11.8 |
| OFF | OFF | OFF | ON | 10.2 | 12.8 |
| ON | OFF | OFF | ON | 11.0 | 13.6 |
| OFF | ON | OFF | ON | 11.8 | 14.3 |
| ON | ON | OFF | ON | 12.5 | 15.0 |
| OFF | OFF | ON | ON | 13.1 | 15.7 |
| ON | OFF | ON | ON | 13.7 | 16.2 |
| OFF | ON | ON | ON | 14.3 | 16.8 |
| ON | ON | ON | ON | 14.8 | 17.3 |

TABLE 2
Span Adjustment Dip-switches

| 1 | 2 | 3 | 4 | mV min | mV max |
|---|---|---|---|---|---|
| OFF | OFF | OFF | OFF | 2.6 | 2.8 |
| ON | OFF | OFF | OFF | 2.8 | 3.0 |
| OFF | ON | OFF | OFF | 3.0 | 3.2 |
| ON | ON | OFF | OFF | 3.2 | 3.5 |
| OFF | OFF | ON | OFF | 3.4 | 3.7 |
| ON | OFF | ON | OFF | 3.7 | 4.0 |
| OFF | ON | ON | OFF | 4.0 | 4.4 |
| ON | ON | ON | OFF | 4.3 | 4.9 |
| OFF | OFF | OFF | ON | 4.8 | 5.4 |
| ON | OFF | OFF | ON | 5.3 | 6.1 |
| OFF | ON | OFF | ON | 5.9 | 7.0 |
| ON | ON | OFF | ON | 6.8 | 8.2 |
| OFF | OFF | ON | ON | 7.8 | 9.7 |
| ON | OFF | ON | ON | 9.3 | 12.2 |
| OFF | ON | ON | ON | 11.6 | 16.5 |
| ON | ON | ON | ON | 15.2 | 24.7 |

FIGURE 3
Analog Filter Adjustment



SECTION 3
OPTIONS

## 24 V Power Supply, PS-121

### Specifications

**Power**

| | |
|---|---|
| Input Voltage | 230 Vac, 50/60 Hz |
| Output Voltage | 24 Vdc (nominal) |
| Power Consumption | 10 VA maximum |
| Fuse | T 160 mA |
| Isolation | Class II |

**Environmental**

| | |
|---|---|
| Operating Temp. Range | -10 to +40ºC |
| Storage Temp. Range | -20 to +50°C |
| Relative Humidity | 85% non-condensing |

**Enclosure**

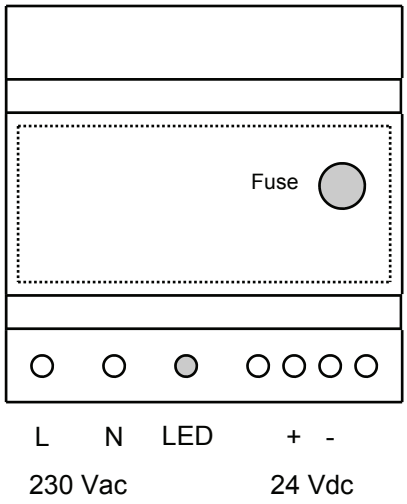
| | |
|---|---|
| Dimensions (L x H x D) | 50 x 90 x 60 mm |
| Mounting | 35 mm DIN-Rail |
| Material | ABS Plastic |
| Weight | 360 g |

**Installation**

- Make sure the installation complies with local regulations and electrical codes.
- Connect AC voltage to the terminals marked “L” and “N”.
- The DC voltage is available on the terminals marked “+” and “-”.
- A red LED is illuminated when the power supply is “ON”.

Refer to Figure 4 on the following page for terminal locations.

FIGURE 4
PS-121 Power Supply




**Fuse Replacement**

- The following procedures require work inside the power supply enclosure and should be performed by qualified Vishay service personnel.
- Before opening the unit, disconnect the AC voltage.
- Remove the front cover from the power supply.
- Press down gently on the cover of the fuse holder, and turn counter-clockwise.
- Pull out the cover and fuse as an assembly, replace fuse with a new one.
- Re-install fuse and cover as an assembly, press down gently and turn clockwise.
- Replace the front cover on the power supply.
- Re-apply AC voltage to the unit.

In the event of a malfunction, please contact the nearest Vishay service office for assistance. Any attempt to modify or repair the power supply will void the manufacturers warranty.

# EC DECLARATION OF CONFORMITY

CE

**We:** **Vishay Nobel AB**
**Box 423**
**S-691 27 KARLSKOGA**
**SWEDEN**

Hereby declares that the product: **PS-1020**
Complies with the essential requirements of the directives 89/336/CEE, 93/68/CEE when used for its intended purpose

The product is made in accordance with the following standards

## ELECTROMAGNETIC COMPATIBILITY:

**EN 50081-1**
**EN 61000-6-2**

**The CE mark has been applied on the product**

Karlskoga, May 07, 2004

.....
Bengt Schultz, Managing director

APPENDIX 1

# EC DECLARATION OF CONFORMITY

CE

**We: Vishay Nobel AB**
**Box 423**
**S-691 27 KARLSKOGA**
**SWEDEN**

Hereby declares that the product: **PS-121**
Complies with the essential requirements of the directives 73/23/CEE, when used for its intended purpose

The product is made in accordance with the following standards

## ELECTROMAGNETIC COMPATIBILITY:

**EN 61000-3-2**
**EN 61000-3-3**

## ELECTRICAL SAFETY:

**EN 61010-1**

**The CE mark has been applied on the product**

Karlskoga, May 07, 2004

.....
Bengt Schultz, Managing director

APPENDIX 2

Document no. 35202
Article no. 600 690 R2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