

# Integrated Amplifier

As an option to sensors of models  
8262-8279, 8310-8316, 85073-85082

|           |                     |
|-----------|---------------------|
| Code:     | 83-IMV EN           |
| Delivery: | with related Sensor |
| Warranty: | 24 months           |



- For pressure and differential pressure sensors as well as load cells
- Prevents interference
- Current, voltage or frequency output
- Economical price
- Small dimensions

## Applications

The purpose of integrated measurement amplifiers is to raise the output signals from strain gauges that, being small, are easily susceptible to electromagnetic interference, to a higher level. The ratio of the information signal to the interference is thus significantly improved. This generally contributes to raising the reliability and precision of the measurement.

Integrated measurement amplifiers can be delivered with almost any pressure sensor or load cell with mechanical dimensions above a certain minimum. The decision in favor of an integrated amplifier must be made in combination with the choice of sensor, since retrofitting is not possible.

A variety of measurement amplifier types are available to the user, differing in the supply voltage required and in the output signal.

Simple handling, high reliability, small dimensions and an economical price open a wide field of applications in all branches of engineering to measuring sensors with integrated amplifiers.

## Description

The electronics of the integrated measurement amplifier are constructed on a printed circuit board and consist of the complete strain gauge bridge excitation circuit and the measurement amplifier. The electronics are contained in the sensor housing. As a result, the housing of pressure sensors is about 28.5 mm longer. The electronics for load cells and differential pressure sensors are housed in the enlarged connection box. The minimum diameter of the pressure sensor or of the connection box required is 38.1 mm.

The regulation of the power supply for the operation of a sensor with an integrated amplifier does not have to be particularly good. The stabilized excitation voltage for the strain gauge bridge is generated from the supply voltage. It is internally fixed at the required value, and the operating voltage for the amplifier is obtained from this. The output signal from the amplifier can also be transmitted over long connecting lines and can be used directly for further processing. An adjustment facility for correcting the zero point of the bridge and the sensitivity are located under sealed screw plugs at the rear of the housing. The adjustment range of both covers  $\pm 15\%$  of the output signal range.

The technical figures for the strain gauge sensors, such as the precision or the nominal temperature range, are in no way negatively affected by the integrated electronics. This is ensured by the amplifier components, which are specially matched to the particular type.

**Technical Data**

| Key in Order Code of Sensor | Excitation [V DC]    | Current Consumption [mA] | Output                        | Frequency Response -3 dB [Hz] | Noise Suppression                    | Model (in Past) |
|-----------------------------|----------------------|--------------------------|-------------------------------|-------------------------------|--------------------------------------|-----------------|
| x1xxxxxx                    | 26 ... 32<br>or ± 15 | 45                       | 0 ... 5 V<br>at max. 2.5 mV   | 0 ... 3000                    | 60 dB (26 ... 32 V)<br>80 dB (±15 V) | IML             |
| x2xxxxxx                    | 26 ... 32<br>or ± 15 | 45                       | 0 ... ± 5 V<br>at max. 2.5 mV | 0 ... 3000                    | 60 dB (26 ... 32 V)<br>80 dB (±15 V) | IMA             |
| x3xxxxxx                    | 11 ... 28            | 40                       | 0 ... 5 V<br>at max. 5 mA     | 0 ... 3000                    | 60 dB                                | IMF             |
| x4xxxxxx                    | 22 ... 32            | 65                       | 4 ... 20 mA                   | 0 ... 2500                    | 60 dB                                | IMC             |
| x5xxxxxx                    | 13 ... 40            | 4 ... 28                 | 4 ... 20 mA                   | 0 ... 2500                    | 60 dB                                | IMH             |

Excitation voltage: refer to table  
 The excitation voltage is protected against polarity reversal

Range of operation temperature: - 20 °C ... 85°C

Range of bridge zero point: ± 15 % F.S.

Adjustable range of sensitivity: ± 15 % F.S.

Electrical connection:  
 6 pin connector with bayonet lock Souriau 851-07A-10-6P

Wiring code:

|       |                      |                           |
|-------|----------------------|---------------------------|
| pin A | excitation           | positive                  |
| pin B | output               | reference point, negative |
| pin C | excitation           | negative                  |
| pin D | output               | positive                  |
| pin E | calibration resistor |                           |
| pin F | calibration resistor |                           |

Mating connector: model 9945 or 9946  
 Souriau 851-06E-C-10-6S or Amphenol 62-GB-16F-10-6S  
 included in scope of delivery of the sensor

Dimensions:  
 Integrated amplifiers may be integrated in pressure transducers with a housing diameter of 38.1 mm or greater. The length of the housing is growing by 28.5 mm, at model 8262 and 8263 it is growing by 40.6 mm.

On load cells the amplifier may be mounted in a case, made of stainless steel, on the side of the sensor body. Please consider the required space.

Weight (additional): ca. 100 g

**Model overview**

**Option x1xxxxxx**  
**Voltage output (4 wire technology)**  
 Output: 0 ... 5 V  
 This amplifier is appropriate for use with, for example, pressure sensors, whether absolute or relative to atmospheric pressure. If powered by ± 15 V the output voltage is with reference to ground, but if supplied with 26 ... 32 V, the output voltage is with reference to the negative pole. This is at a potential of half the excitation voltage. Subsequent devices must incorporate an isolating amplifier or must be floating.

**Option x2xxxxxx**  
**Voltage output (4 wire technology)**  
 Output: ± 5 V, safe against short-circuit ground  
 This amplifier is appropriate for use with, for example, differential pressure sensors or with tension/compression load cells. If powered by ± 15 V the output voltage (0 ... ± 5 V) is with reference to ground, whereas if the power supply is 26 ... 32 V and output voltage of ± 5 V, with reference to the negative output, is available. In this case, therefore, the negative output is not at ground, but is at half the excitation voltage. Subsequent devices must incorporate an isolating amplifier or must be floating.

**Option x3xxxxxx**  
**Voltage output (3 wire technology)**  
 Output: 0 ... 5 V  
 Designed for operation from vehicle accumulators, an electronic or battery-operated power unit for mobile use, e.g. for automobile tests. The integrated stabilization circuit regulates out the changes in battery voltage and voltage peaks.

**Option x4xxxxxx**  
**Current output (3 wire technology)**  
 Output: 4 ... 20 mA, max. load impedance 500 Ω , short-circuit safe  
 The „current“ measurement signal is relatively insensitive to electromagnetic interference. For that reason, relatively long connection lines are not a problem with this type of amplifier in most cases. Each connection pin is, moreover, safe against short-circuits to ground. The regulator and control equipment, which are designed for Live-Zero can be connected directly.

**Option x5xxxxxx**  
**Transmitter (2 wire technology)**  
 Output: 4 ... 20 mA, max. load impedance 500 Ω , short-circuit safe  
 The transmitter is designed for application in tough industrial environments. It requires only an unregulated voltage supply. Due to its two-wire connection, it is appropriate for control and regulation equipment or to devices with transmitter connections. The transmitter operates accurately and with little sensitivity to interference even when the signal lines are long. This amplifier can only be used with sensors that are supplied with 5000 Ω bridges.

**Overview of the possible combinations of sensor and integrated amplifier**

| Integrated Amplifier Model | Available for Sensor Models: |      |      |      |      |      |      |      |      |      |      |      |       |       |       |       |       |       |   |
|----------------------------|------------------------------|------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|---|
|                            | 8262                         | 8263 | 8264 | 8267 | 8268 | 8270 | 8279 | 8310 | 8313 | 8314 | 8315 | 8316 | 85041 | 85043 | 85073 | 85075 | 85081 | 85082 |   |
| x1xxxxxx                   |                              |      | •    | •    | •    | •    | •    |      |      |      |      |      | •     | •     | •     |       |       |       |   |
| x2xxxxxx                   |                              |      |      |      |      |      |      | •    | •    | •    | •    | •    |       |       |       |       | •     | •     | • |
| x3xxxxxx                   | •                            | •    | •    | •    | •    |      |      | •    | •    | •    | •    | •    | •     | •     | •     | •     | •     | •     | • |
| x4xxxxxx                   | •                            | •    | •    | •    | •    | •    | •    | •    | •    | •    | •    | •    | •     | •     | •     | •     | •     | •     | • |
| x5xxxxxx                   |                              |      | •    | •    | •    |      |      |      |      |      |      |      |       |       |       |       |       |       |   |

**Structure of Order Code**

8267 - 5100 - V4000000

