



INSTRUCTION MANUAL

SIL 2 Vibration Transducer Interface, DIN-Rail and Termination Board, Model D6062S



Characteristics

General Description: The single channel DIN Rail Vibration Transducer Interface D6062S is a high integrity analog input interface suitable for applications requiring SIL 2 level (according to IEC 61508:2010 Ed. 2) in safety related systems for high risk industries. It provides a fully floating dc supply for energizing vibration transducers, accelerometers or 2-3 wires sensors, and repeats the sensor input voltage in a totally isolated circuit to drive vibration monitors or analyzers for rotating machinery control and supervision purposes. Mounting on standard DIN-Rail, with or without Power Bus, or on customized Termination Boards.

Functional Safety Management Certification: G.M. International is certified by TÜV to conform to IEC61508:2010 part 1 clauses 5-6 for safety related systems up to and included SIL3.



Technical Data

Supply:

24 Vdc nom (18 to 30 Vdc) reverse polarity protected, ripple within voltage limits ≤ 5 Vpp, 2 A time lag fuse internally protected.

Current consumption @ 24 V: 90 mA with 20 mA transducer consumption and 2 mA output load, typical.

Power dissipation: 2.0 W with 24 V supply voltage, 20 mA transducer consumption and 2 mA output load typical.

Isolation (Test Voltage):

In/Out 1.5 KV; In/Supply 1.5 KV; Out/Supply 500 V.

Input:

0 V to -20 V (10 K Ω impedance at terminals 7-8 or 8-9).

3 wires sensor supply voltage:

more than -22 V at 0 mA supply, more than -17 V at 15 mA supply (current limited at ≈ 23 mA) at terminals 7-10 or 9-10.

2 wires sensor supply voltage:

more than -17 V with constant current supply mode at terminals 7-8 or 8-9.

Supply current selectable at 4 mA, 6 mA or 10 mA via internal DIP– Switch.

Output:

0 to -20 V on 10 K Ω load, with 10 Ω output resistance.

Response time: ≤ 10 μ s (10 to 90 % step change).

Output ripple: ≤ 35 mVrms on 0.5 to 20 KHz band.

Frequency response: DC to 20 KHz within 1 dB maximum.

Performance:

Ref. Conditions 24 V supply, 10 K Ω load, 23 ± 1 °C ambient temperature.

Calibration accuracy: $\leq \pm 0.05$ % of full scale.

Linearity error: $\leq \pm 0.05$ % of full scale.

Supply voltage influence: $\leq \pm 0.005$ % of full scale for a min to max supply change.

Temperature influence: $\leq \pm 0.01$ % on zero and span for a 1 °C change.

Compatibility:



CE mark compliant, conforms to Directive: 2014/30/EU EMC, 2014/35/EU LVD, 2011/65/EU RoHS.

Environmental conditions:

Operating: temperature limits – 40 to + 70 °C, relative humidity 95 %, up to 55 ° C.

Storage: temperature limits – 45 to + 80 °C.

Approvals:



TÜV Certificate No. C-IS-722134640-01, SIL 2 conforms to IEC61508:2010 Ed.2.

SIL 3 Functional Safety TÜV Certificate conforms to IEC61508:2010 Ed.2, for Management of Functional Safety.

Mounting:

T35 DIN-Rail according to EN50022, with or without Power Bus or on customized Termination Board.

Weight: about 150 g.

Connection: by polarized plug-in disconnect screw terminal blocks to accommodate terminations up to 2.5 mm².

Protection class: IP 20.

Dimensions: Width 12.5 mm, Depth 123 mm, Height 120 mm.

Ordering information

Model: D6062S

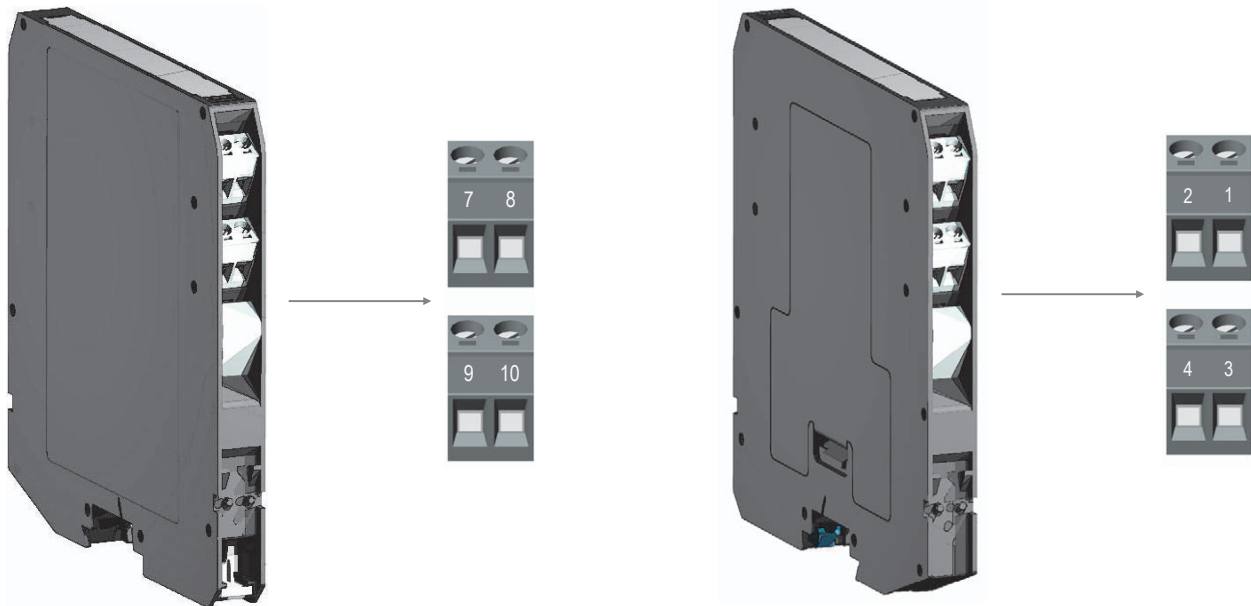
Power Bus and DIN-Rail accessories:
 Connector JDFT049
 Cover and fix MCHP196
 Terminal block male MOR017
 Terminal block female MOR022

Front Panel and Features



- SIL 2 according to IEC 61508:2010 Ed. 2 for Tproof = 3 / 20 yrs ($\leq 10\%$ / $> 10\%$ of total SIF)
- PFDavg (1 year) 3.35×10^{-4} , SFF 68.08%
- Systematic capability SIL 3
- 0 to -20 V Input/Output Signal.
- Input selection via DIP-Switch.
- Wide band signal transfer.
- Input and Output short circuit proof.
- High Accuracy.
- Three port isolation, Input/Output/Supply.
- EMC Compatibility to EN61000-6-2, EN61000-6-4, EN61326-1, EN61326-3-1 for safety system.
- TÜV Certification.
- TÜV Functional Safety Certification.
- Simplified installation using standard DIN-Rail and plug-in terminal blocks, with or without Power Bus, or customized Termination Boards.

Terminal block connections



7/9 Common Input

8 - Signal Input

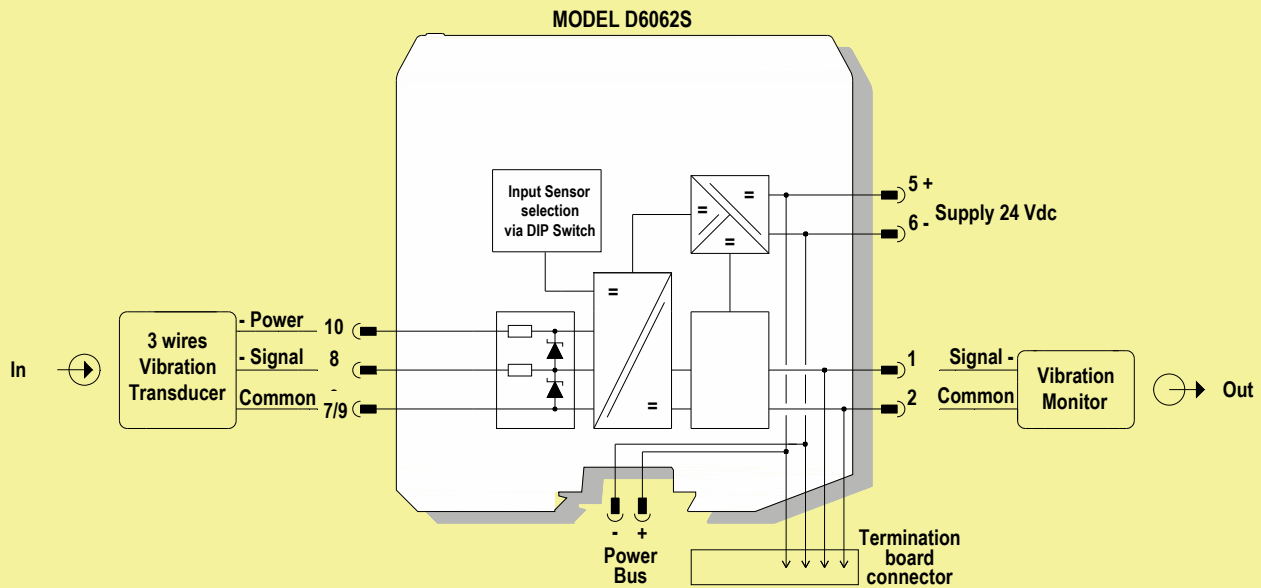
10 - Power Input

1 - Signal Output

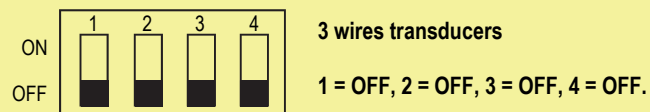
2 Common Output

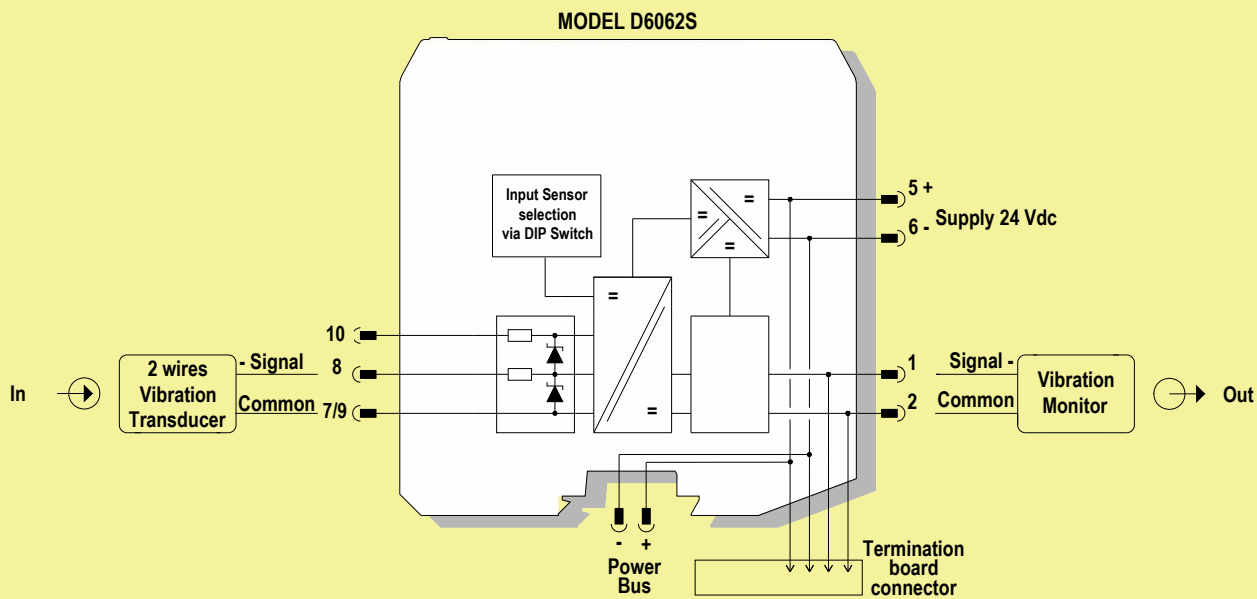
5 + Power Supply 24 Vdc

6 - Power Supply 24 Vdc

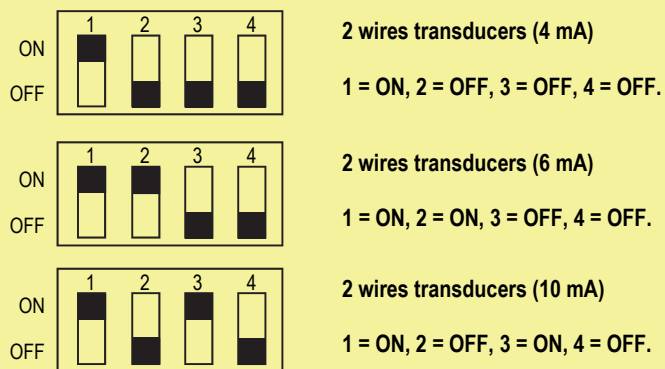


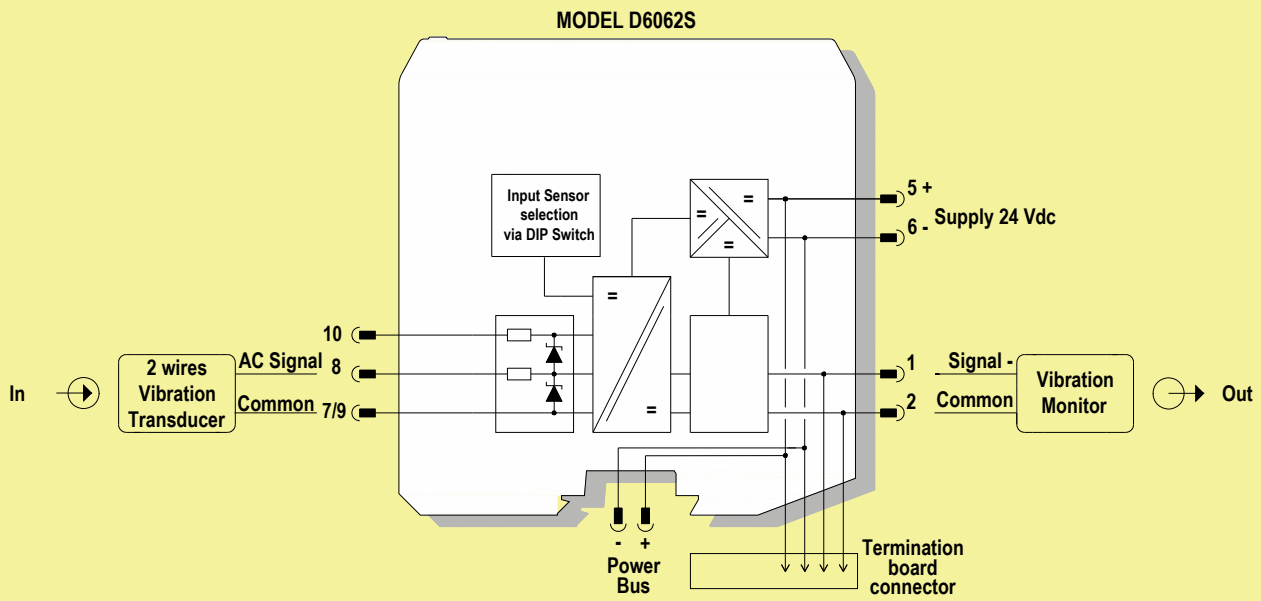
Input configuration selection via internal Dip-Switch



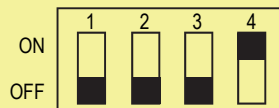


Input configuration selection via internal Dip-Switch





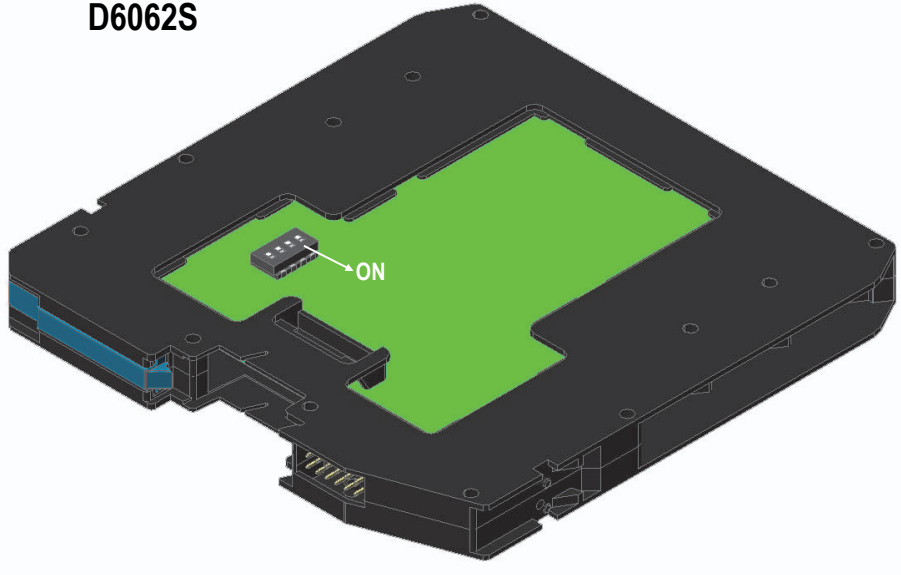
Input configuration selection via internal Dip-Switch



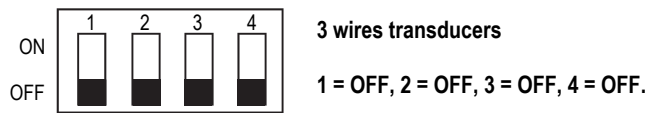
2 wires AC transducers

1 = OFF, 2 = OFF, 3 = OFF, 4 = ON.

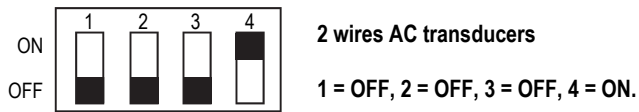
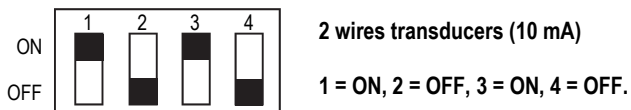
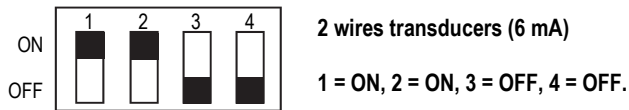
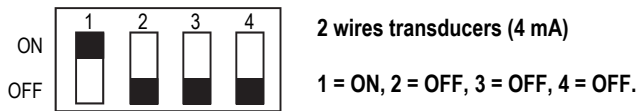
D6062S



DIP switch configurations (all valid for SIL applications):



This mode is factory settings



Warning

The D6062 series must be installed, operated and maintained only by qualified personnel, in accordance with the relevant national/international installation standards. Failure to properly installation or use of the equipment may risk to damage the unit or severe personal injury. The unit cannot be repaired by the end user and must be returned to the manufacturer or his authorized representative. Any unauthorized modification must be avoided

Operation

The D6062S module provides a fully floating DC supply for energizing vibration transducers, accelerometers or 2-3 wires sensors and repeats the sensor input voltage in a totally isolated circuit to drive vibration monitors or analyzers for rotating machinery control and supervision purposes. The module provides 3 port isolation (input / output / supply) and a "POWER ON" green led is lit when the unit is supplied.

Installation

The D6062 series devices are vibration transducer interfaces housed in a plastic enclosure suitable for installation on T35 DIN-Rail according to EN50022, with or without Power Bus, or on customized Termination Boards.

The D6062 unit can be mounted with any orientation over the entire ambient temperature range.

Electrical connection of conductors up to 2.5 mm² are accommodated by polarized plug-in removable screw terminal blocks which can be plugged inside/outside a powered unit without suffering or causing any damage.

The wiring cables have to be dimensioned according to their current and length.

In the "Function Diagram" section and on the enclosure side, a block diagram identifies all connections and configurations with 2 or 3 wires sensors.

Identify the function and location of each connection terminal using the wiring diagram in the corresponding section, for example:

Connect a 24 Vdc power supply voltage between terminals "5" (positive pole) and "6" (negative pole).

For 3 wires powered sensors (such as eddy current probes, piezo-ceramic accelerometers and similar sensors), connect the sensor negative supply wire to terminal "10", the sensor signal wire to terminal "8" and the sensor common wire (identical for both signal and supply) to terminal "7" or "9".

For 2 wires powered sensors (such as position, velocity or acceleration sensors, operating in constant current mode), connect the sensor signal wire to terminal "8" and the sensor common wire to terminal "7" or "9".

The sensor constant current supply mode is enabled selecting the appropriate DIP switch configurations (see the "Function Diagram" of "Configuration" section).

The sensor supply current is selectable between the three different values of 4 mA, 6 mA and 10 mA. Each supply current value corresponds, as shown in the "Function Diagram" and "Configuration" sections, to a different DIP switch configuration.

For 2 wires unpowered sensors (such as suspended mass "seismic" accelerometers or other magnetic pick-up sensors), connect the sensor signal wire to terminal "8" and the sensor common wire to terminal "7" or "9".

This type of sensor generates AC signals only; therefore, the D6062 input must be biased in order to provide a half scale output value with 0 Vdc input, by selecting the appropriate DIP switch configuration for 2 wires AC transducers (see the "Function Diagram" of "Configuration" section).

Connect the output signal wire to terminal "1" and the output common wire to terminal "2" (output port for the vibration monitor interface).

Units must be protected against dirt, dust, extreme mechanical (e.g. vibration, impact and shock) and thermal stress, and casual contacts.

If the enclosure needs to be cleaned, use only a cloth lightly moistened by a mixture of detergent in water.

Any penetration of cleaning liquid must be avoided to prevent damage to the unit. Any unauthorized card modification must be avoided.

According to EN61010, the D6062 series must be connected to SELV or PELV supplies.

Start-up

Before powering the unit, check that all wires are properly connected, in particular supply conductors and their polarity and input and output wires.

Check conductors for exposed wires that could touch each other causing dangerous unwanted shorts. When the power supply voltage is turned on, the "power on" green led must be lit.

For 3 wires powered sensors, the sensor negative supply voltage (referred to common terminals "7" / "9") must be more negative than -17 Vdc (supposing a 15 mA maximum value for the transducer current consumption).

In addition, for 2 or 3 wires powered sensors, the output signal should be corresponding to the input sensor signal, verifying that the output signal is kept within the 0 to -20 V range (supposing a 10 K Ω output load). Instead, for 2 wires unpowered sensors, the AC output signal should be corresponding to the AC input sensor signal, considering that the output signal also comprises a -10 Vdc component (absent in the input signal) because of the offset introduced by the DIP switch configuration for 2 wires AC transducers shown in the "Configuration" section.