

The 3M12-2-2-0.2T is a three-axis, 1% accuracy magnetic field-to-voltage transducer with an analog output for each of the three components of the measured magnetic field. The transducer consists of two modules connected by a flexible cable (see Fig.1). The magnetic field sensitive module H contains a high quality 3-D Hall generator. The unique feature of this device is that it measures all three components of a magnetic field at a single point. To build up a complete measurement system, connect the module E with a simple power supply and three voltmeters.

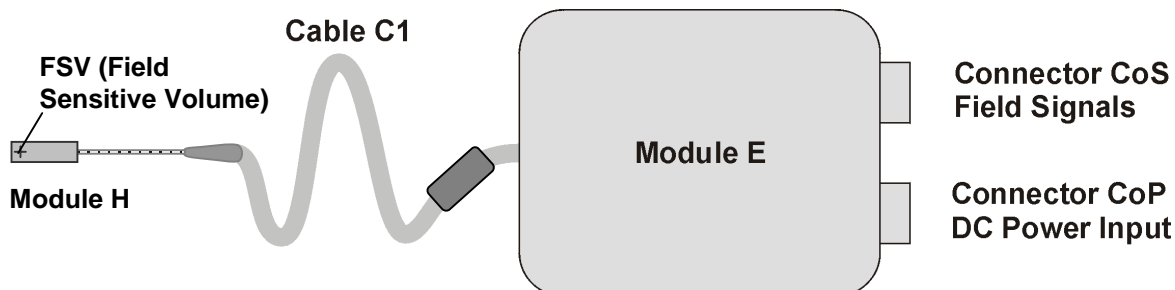


Figure 1: Structure of the Three-Axis Magnetic Field Hall Transducer 3M12-2-2-0.2T

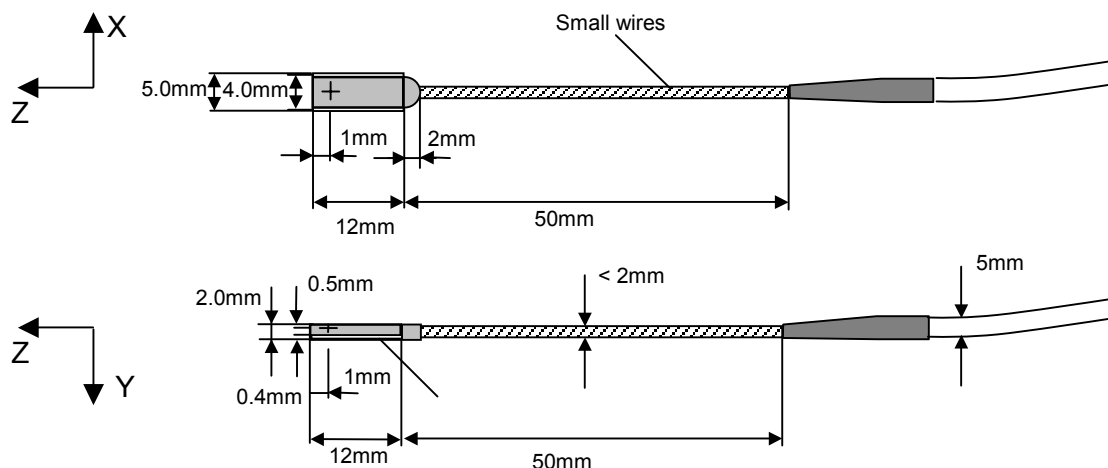


Figure 2: Probe dimensions of the Three-Axis Magnetic Field Hall Transducer 3M12-2-2-0.2T (Module H)

Specifications:

(Specifications are given at a nominal operating temperature (23°C) and after a warm-up time of 10 minutes.)

Output signal for channels X, Y & Z

Maximum magnetic field	± 0.4 T
Linear magnetic field range	± 0.2 T (full scale)
Output voltage at full-scale (VB)	± 10.000 V, differential
Sensitivity to magnetic field	5 V/T (0.5mV/G)
Tolerances of sensitivity (B = 1T)	± 1 %
Non Linearity of output (B \leq 2T)	< 1 %
Long term instability	< 1 % over 10 years
Temp. coefficient of sensitivity (T= 23 \pm 10°C)	< 300 ppm /°C

Offset at B = 0T	< ± 15 mV
Temp. coefficient of offset	< 1.5 mV/°C

Output noise and ripple (peak) 0.01..100Hz	
for the x & z - axis:	< ± 0.5 mV (0.1 Gauss)
for the y - axis:	< ± 1 mV (0.2 Gauss)

Output resistance for all channels < 10 Ohm, short circuit proof

Frequency response

Typical Bandwidth for X-Axis (-3dB): >1kHz
 Typical Bandwidth for Y-Axis (-3dB): >1kHz
 Typical Bandwidth for Z-Axis (-3dB): >1kHz

Environmental

Temperature (operating) 10° to 50°C
 (storage) -20° to 85°C
 Electromagnetic see EMC-Test conditions
 RF conducted disturbances IEC/EN 61000-4-6, ENV 50141
 Radiated electromagnetic field ENV 50140
 Pulse modulated electromagnetic field ENV 50140
 Electrical fast transient burst IEC/EN 61000-4-4
 Electrostatic discharge IEC/EN 61000-4-2 *

Mechanical

Coordinates	X	Y	Z
Field sensitive volume (FSV)	0.25 x	0.20 x	0.25 mm ³
Sensitive point (the center of FSV)	2.5,	1.5,	-1 mm
Angular accuracy of the axes	± 0.1° between axes ± 0.5° to the reference ceramic		
Probe total outside dimensions	5.0 x	2.0 x	14 mm
Probe-to-Electronics cable	permanently connected, shielded 2m standard length with ferrite sleeve		
Connector CoS	DIN KVF70, 7 pole, 60°. (Mating Plug, SV70) field signal X+, X- Pins 6 and 5 respectively field signal Y+, Y- Pins 4 and 3 respectively field signal Z+, Z- Pins 2 and 1 respectively signal common Pin 7		
Connector CoP	DIN SFV50, 5 pole. (Mating Plug, KV50) power, +12V Pin 3 power, -12V Pin 1 power common Pin 2		
Electronics module	high mechanical strength, electrically shielded aluminum case 95 W x 120 L x 37 H mm with mounting provision.		

Power

Voltage +12V, -12V nominal, ±10%.
 Current ca. 50mA

Magnetic Induction Field (B) Units

1T = 10kG, 1µT = 10mG

Optional accessories:

Power supply S12-5 (±12 V) 110/220V
 Zero gauss chamber: ZG12
 Output cable 1.5 meter: CO15

Installation manual 3M12-2-2 Transducer

The 3M12 Hall-Transducer consists of a unique very small encapsulated hall-sensor element. The probe head is build as robust as possible for a small precision device, however, it has to be handled with care. The following precautions will help not to damage the probe when installing or handling and to preserve their accurate calibration.

The probe has to be mounted with very low pressure on probe head and their thin wires. If the probe head is clamped, make sure that the surface in contact with the ceramic plate is flat and covers the whole of the ceramic plate. Don't apply more force then required to hold the probe in place. The probe cable has to be clamped nearby the probe head, so the very thin wires can't be torn away from the probe head. The thin wires of the flexible section at the probe head can be folded carefully, repeated strong flexing should be avoided.

The small probe head is shipped protected by a plexiglas tube. The tube protects the flexible section and the probe head against mechanical damage and against direct high voltage discharge. Remove the protection tube only when there is no danger of a mechanical shock or electronic discharge.

EMC-Test conditions:

- The transducer 3M12-2-2-0.2T was supplied with Senis' "S12" power supply which corresponds to the directives 73/23/EEC and 89/336/EEC.
- The output cable was a Senis' "CO15" shielded cable with ferrite RI-14-28 (25MHz , 177 ohm). The "Gnd" output contact was grounded.
- For the ESD** Test, the flexible section (thin wires) and the probe head were sheltered in the protection tube delivered with the transducer.

During the EMC test temporary degradation of the transducers function like offset drift can occur. After the EMC tests no damage or change of the sensor parameter appears, the transducer continues to operate according to its specifications.

In order to improve the operations in a electrically noisy environment, the probe head and the thin wires of the flexible section has to be mounted in a grounded metal shelter.

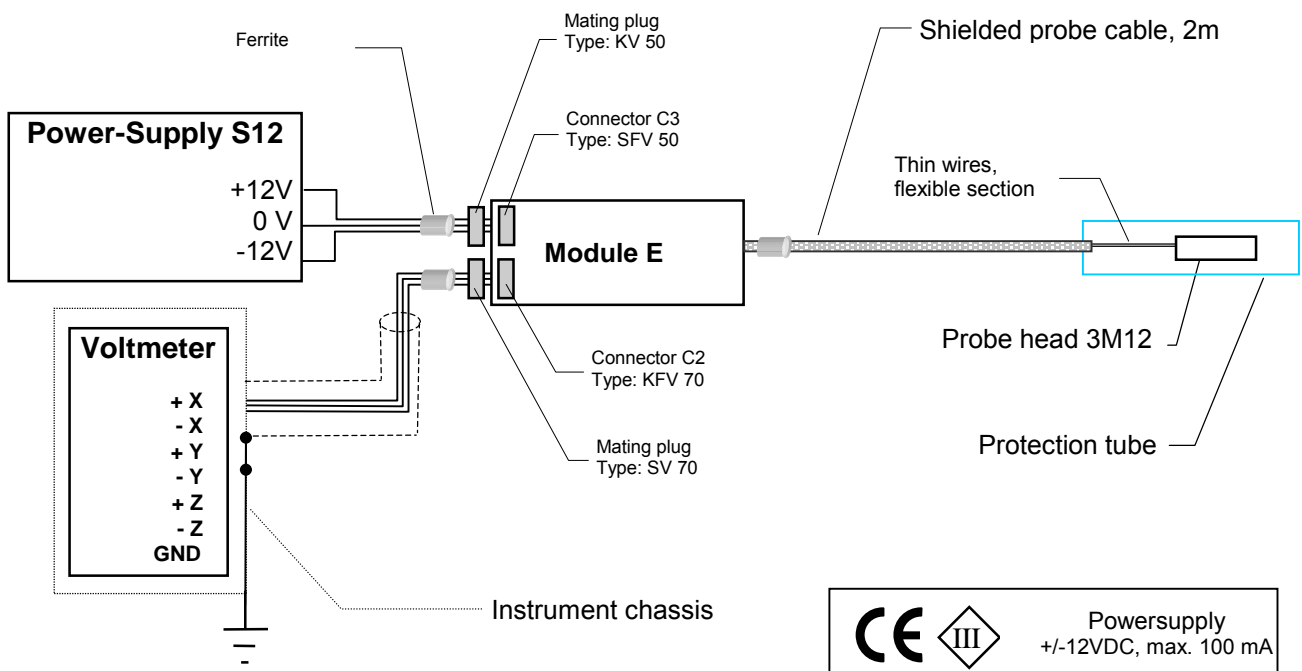


Figure 3: Set-up for all EMC-test