

Guard your assets - it pays!



Select exactly what you need

Safeguard your plant stoppers and other essential machines. Machine Guard MG-4 is a stand-alone continuous monitoring unit, ideal for automatic surveillance of unmanned machines.

MG-04 uses:

- True RMS vibration severity measurement on one or two channels.
- True SPM bearing condition evaluation on two additional channels.

More than 90% of all mechanical faults are announced by increasing vibration or shock pulse levels. Planned maintenance and condition triggered emergency shutdown prevent accidents and production stops.

A cost-efficient package of options

Breakdown costs are always too high. MG-4 is insurance with a payback guarantee. Choose the channel combination that gives maximum safety at lowest cost. Measuring ranges, two-step alarm levels, alarm delays, and relay combinations can be programmed. Condition evaluation is automatic. There are no operating costs: install and feel safe.

Back-lighted
LCD display

Transducer
line test

Ex proof
accessories

Measuring results,
4 x 16 characters

Status display,
2 alarm levels

Automatic
condition
evaluation



Polycarbonate
casing, IP65
Easy mounting

Easy
programming:
Measuring range
Alarm levels
Alarm delays

30 years
condition monitoring
experience

Signal input, TNC,
2 channels VIB,
2 channels SPM

Analog outputs
4 x 4-20 mA, programmable

Relay outputs
1 x 250 V, 4 x 125 V

Power supply 230/115 V AC,
24 V AC/DC, 12 V DC

Dependable condition monitoring

Good asset management requires preventive maintenance based on condition information.

Machine Guard MG-4 uses the two most reliable methods for automatic machine fault detection. It provides

- Shock pulse for early warning in case of poor bearing lubrication, stressed bearings, or the onset of damage.
- maintenance alert in case of a significant increase in vibration severity.

Early condition alert is the best money saver: ample planning time for maintenance, no production stop, no damage. The analog outputs can send on-line condition information to your PLC.

For better economy

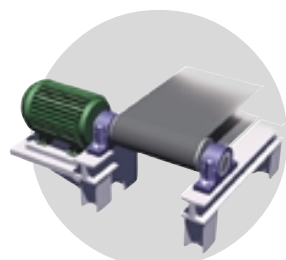
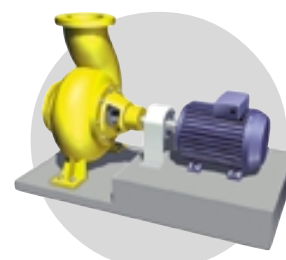
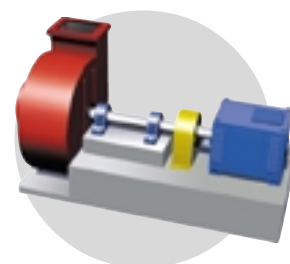
Breakdowns happen, but the big bang can be avoided. A shut down circuit, triggered by a sudden heavy increase of the vibration level, prevents

- danger to personnel and other hazards
- secondary damage to machines and surroundings
- unnecessary production stops and quality losses.

Good condition monitoring equipment has a very short payback time. Consider the downtime cost for your last machine failure, then make a sound investment.

Sound technique, fit for anything

Machine Guard MG-4 is easy to install on all types of rotating machinery. A wide range of transducers and installation accessories has proved reliable in many harsh industrial environments.



SPM Machine Guard MG-4.

Specs and options – pick your own monitoring kit!

Technical specifications

General

Channels:	max. 2 VIB + 2 SPM
Analog outputs:	4 - 20 mA, 1 per channel, programmable ranges
Relays:	250 V (1) 125 V (max. 4)
Power supply:	230 V AC, 115 V AC, 24 V AC/DC, 12 V DC
Temperature range:	0° to 50° C
Casing:	polycarbonate, IP65
Display screen:	LCD 4 x 16 characters back-lighted as option
Status display:	green, yellow, red LED
Dimensions:	200 x 144 x 77 mm
Weight:	1150 grams

Vibration channel (VIB)

Measuring range:	0.5 to 49.9 mm/s RMS 0.00 to 1.90 inch/s RMS
Resolution:	0.1 mm/s 0.01 inch/s
Frequency, lower limit:	3, 10, or 100 Hz
Frequency, upper limit:	1000 or 2000 Hz
Alarm limits:	2, programmable
Alarm delay:	0 to 600 seconds

Bearing channel (SPM)

SPM monitoring methods:	dBm/dBc or LR/HR with SPM evaluation
Measuring range:	-9 to 99 dBsv
Resolution:	1 dBsv
Alarm limits:	2, programmable
Alarm delay:	0 to 600 seconds
System security:	transducer line test



Ex proof accessories available.



Sensitive instruments in their natural environment.
Tough, but they are made to last.

Ordering numbers

Standard configurations

MG4-1	1 channel VIB
MG4-2	2 channels VIB
MG4-12	1 channel VIB, 2 channels SPM
MG4-22	2 channels VIB, 2 channels SPM

Transducers and measuring cables

TRV-20	Vibration transducer, M8
TRV-21	Vibration transducer, UNF 1/4"-28
TRX-18	Isolated installation foot for TRV-20
TRX-19	Isolated installation foot for TRV-21
40000	SPM transducer for cable length below 4 m
42000	SPM transducer for cable length 4–100 m
45011-L	Cable for transducers (L = length in meters)

Always within reach

Reliable equipment backed up by world wide service: SPM has experience from most branches of industry and is represented in more than 50 countries.



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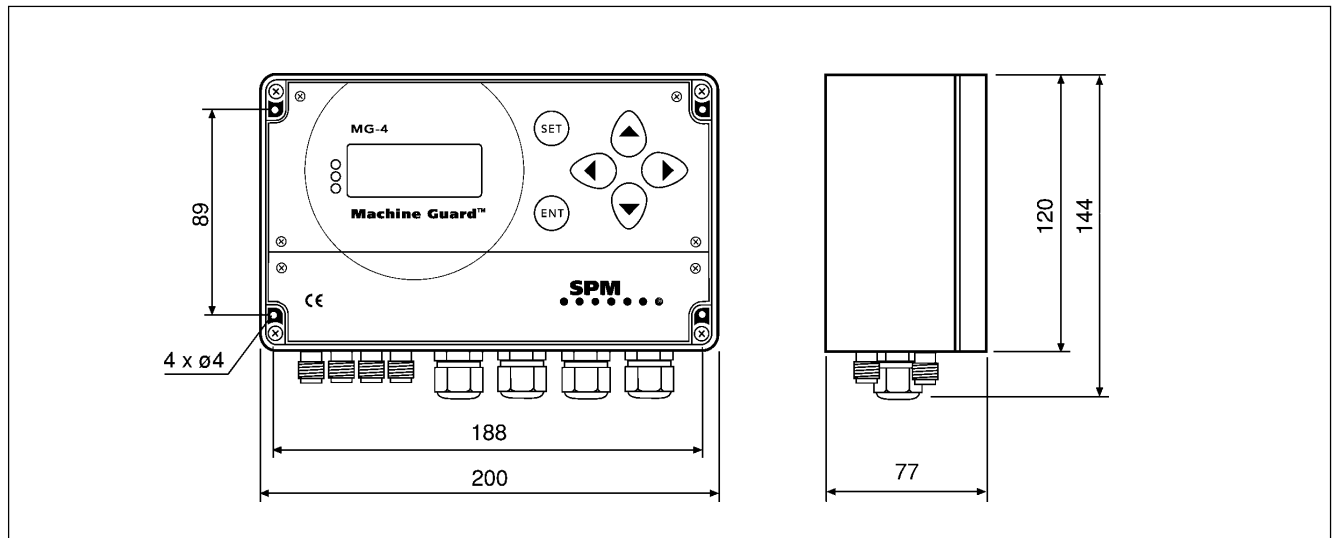
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Machine Guard MG4-22



Machine Guard MG4-22 is a stand-alone measuring unit for continuous monitoring of machine vibration (two channels) and bearing condition (two channels). It measures vibration severity (true RMS value of vibration velocity) according to ISO 10816 and shock pulses according to the true SPM method.

Machine Guard MG4-22 provides:

- Two programmable alarm levels per channel and status display (green - yellow - red light)
- Display of measured value with continuous updates
- Analog output current 4 - 20 mA with programmable range or complete data on LAN (Modbus network using RTU)
- Relays 250 V (1) and 125 V (4) with programmable alarm levels.

MG4-22 has a casing for wall mounting, IP65. It can be supplied with mains power or be connected to a PLC. Measuring time, alarm levels, alarm delay and the channel/relay combinations are programmed, using the push buttons on the front panel.

The following options are selected on ordering the unit:

Power supply:

- 230 Vac, 115 Vac or 15 to 30 Vac/Vdc

Vibration channel:

- Lower frequency range 3, 10 or 100 Hz
- Upper frequency range 1000 or 2000 Hz
- Modification for vibration transducers without pre-amplifier (TRV-01, TRV-12/13)

Bearing channel:

- dBm/dBc or LR/HR technique

As an option the MG4 can be equipped with a RS-485 port for sending data via a LAN network. MG4 units equipped for network have no analog outputs.

Technical specifications

Vibration channels:	2, multiplexing
SPM channels:	2, multiplexing
Analog outputs (4):	4 - 20 mA, selective range, no galvanic separation
Main relay (1):	250 Vac, 5 A, 1250 VA
Secondary relays (4):	125 Vac, 1 A, 60 VA, 150 Vdc, 1 A, 30 W
Power supply:	230 Vac, 115 Vac or 15 to 30 Vac/Vdc
Power consumption:	max. 6 VA
Temperature range:	0° to 50° C (32° to 122° F)
Casing:	Polycarbonate/PVC, IP65
Input connectors:	Silver plated brass, 10 - 15 µ
Display screen:	LCD, 4 x 16 characters, back-lighted
Status display:	Green, yellow, red LED
Dimensions:	200 x 144 x 77 mm
Weight:	1150 grams

Vibration channel (VIB)

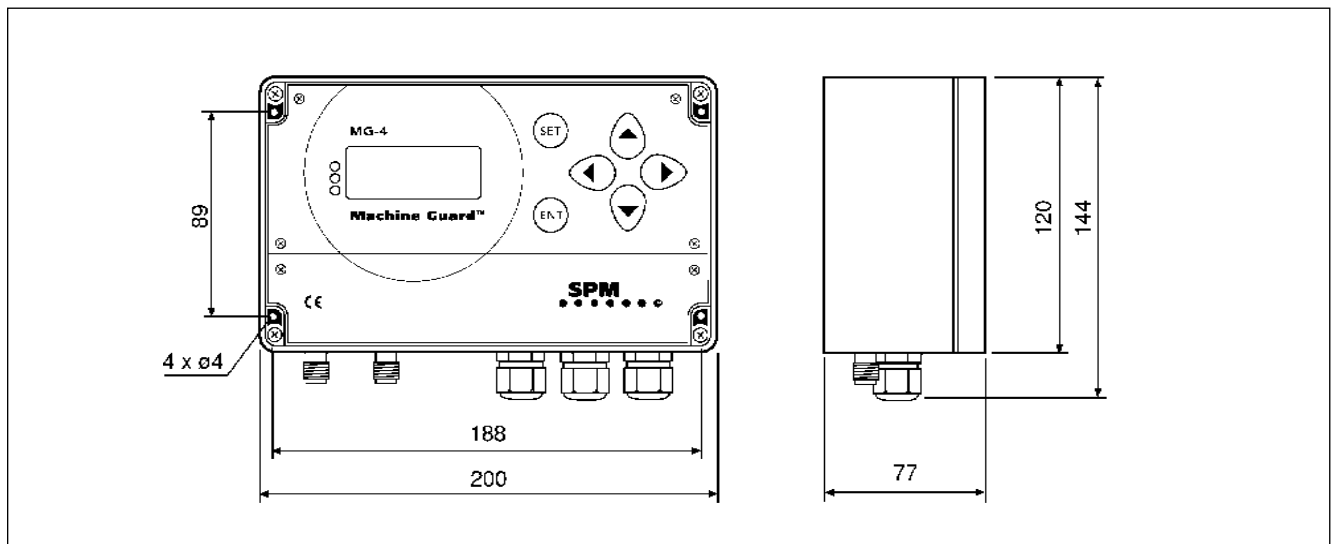
Measuring range:	0.5 to 49.9 mm/s RMS (0 to 1.9 inch/s RMS)
Resolution:	0.1 mm/s (0.01 inch/s)
Frequency, lower limit:	3, 10, or 100 Hz
Frequency, upper limit:	1000 or 2000 Hz
Measuring time:	Programmable 1 to 15 s
Alarm limits:	2, programmable
Alarm delay:	0 to 600 seconds, steps of 2 s
Fault indication:	Transducer line test for short and open circuit
Transducer type:	TRV-18/19 or TRV-20/21 with isolated installation foot TRX-18/19

Bearing channel (SPM)

SPM method:	dBm/dBc or LR/HR, evaluated
Measuring range:	0 to 99 dBsv
Resolution:	1 dBsv
Alarm limits:	2, programmable
Alarm delay:	0 to 600 seconds, steps of 2 s
Fault indication:	Transducer line test of measuring circuit quality
Transducer type:	SPM 40000 or 42000



Machine Guard MG4-2



Machine Guard MG4-2 is a stand-alone measuring unit for continuous monitoring of machine vibration on two channels. It measures vibration severity (true RMS value of vibration velocity) according to ISO 10816.

Machine Guard MG4-2 provides:

- Two programmable alarm levels per channel and status display (green - yellow - red light)
- Display of measured value with continuous updates
- Analog output current 4 - 20 mA with programmable range or complete data on LAN (Modbus network using RTU)
- Relays 250 V (1) and 125 V (4) with programmable alarm levels.

MG4-2 has a casing for wall mounting, IP65. It can be supplied with mains power or be connected to a PLC. Measuring time, alarm levels, alarm delay and the channel/relay combinations are programmed, using the push buttons on the front panel.

The following options are selected on ordering the unit:

Power supply:

- 230 Vac, 115 Vac or 15 to 30 Vac/Vdc

Vibration channel:

- Lower frequency range 3, 10 or 100 Hz
- Upper frequency range 1000 or 2000 Hz
- Modification for vibration transducers without pre-amplifier (TRV-01, TRV-12/13)

As an option the MG4 can be equipped with a RS-485 port for sending data via a LAN network. MG4 units equipped for network have no analog outputs.

Technical specifications

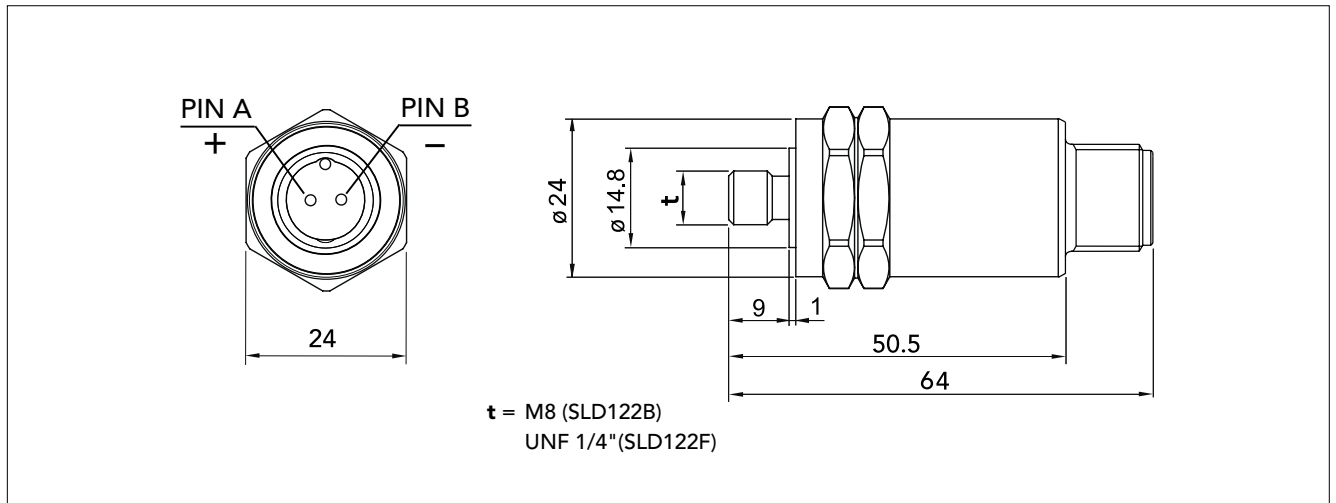
Vibration channels:	2, multiplexing
Analog outputs (2):	4-20 mA, selective range, no galvanic separation
Main relay (1):	250 Vac, 5 A, 1250 VA
Secondary relays (4):	125 Vac, 1 A, 60 VA, 150 Vdc, 1 A, 30 W
Power supply:	230 Vac, 115 Vac or 15 to 30 Vac/Vdc
Power consumption:	max. 6 VA
Temperature range:	0° to 50° C (32° to 122° F)
Casing:	Polycarbonate/PVC, IP65
Input connectors:	Silver plated brass, 10–15 μ
Display screen:	LCD, 4 x 16 characters, back-lighted
Status display:	Green, yellow, red LED
Dimensions:	200 x 144 x 77 mm
Weight:	1070 grams

Vibration channel (VIB)

Measuring range:	0.5 to 49.9 mm/s RMS (0 to 1.9 inch/s RMS)
Resolution:	0.1 mm/s (0.01 inch/s)
Frequency, lower limit:	3, 10, or 100 Hz
Frequency, upper limit:	1000 or 2000 Hz
Measuring time:	Programmable 1 to 15 s
Alarm limits:	2, programmable
Alarm delay:	0 to 600 seconds, steps of 2 s
Fault indication:	Transducer line test for short and open circuit
Transducer type:	SLD122 or TRV-18/19/20/21 with isolated installation foot TRX-18/19

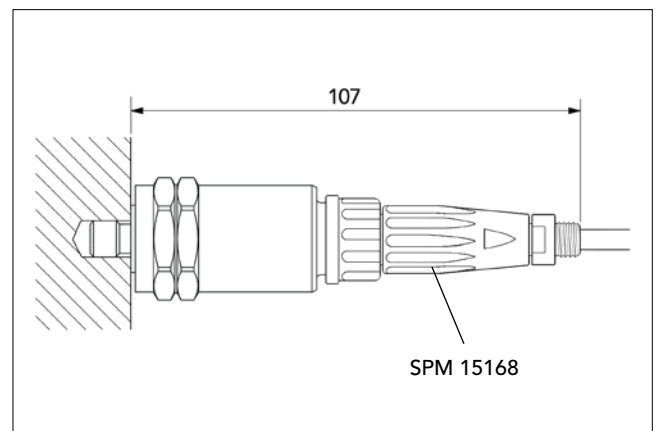


Vibration Transducer SLD122B / SLD122F



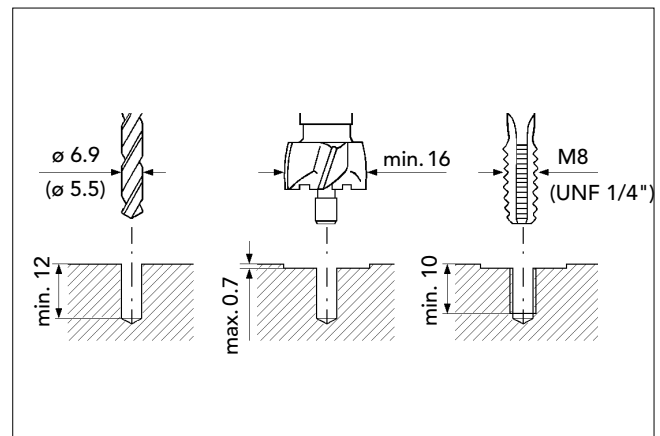
The vibration transducer SLD122B and SLD122F are piezo-electric accelerometers of compression type with built-in preamplifier, designed for vibration monitoring of industrial machinery. The electrical signal is isolated from the transducer housing.

The transducer is mounted against a smooth, flat surface on the machine. SLD122B has thread size M8 and SLD122F has thread size UNF 1/4". The transducer is connected via a twisted pair cable with 2 pin connector, compatible with 2 pin MIL-C-5015 style.



Technical data

Nominal sensitivity, main axis:	4 mV/m/s ² *
Transverse sensitivity:	max. 10%
Typical base strain sensitivity:	0.01 m/s ² /μ strain
Linear frequency range:	2 to 5000 Hz (± 1 dB)
Max. peak acceleration:	600 m/s ²
Settling time:	3 sec
Bias point:	6 to 9 V (typical 8 V)
Temperature range:	-40° C to +125° C (-40° F to 260° F)
Power requirements:	12 to 24 V, 2 to 5 mA
Casing:	Stainless acid proof steel
Sealing:	IP 67 together with appropriate connector
Torque limit:	10 Nm (7.4 lbf·ft)
Weight:	110 grams (4 oz)
Connector type:	Compatible with 2 pin MIL-C-5015 style



Mounting tools

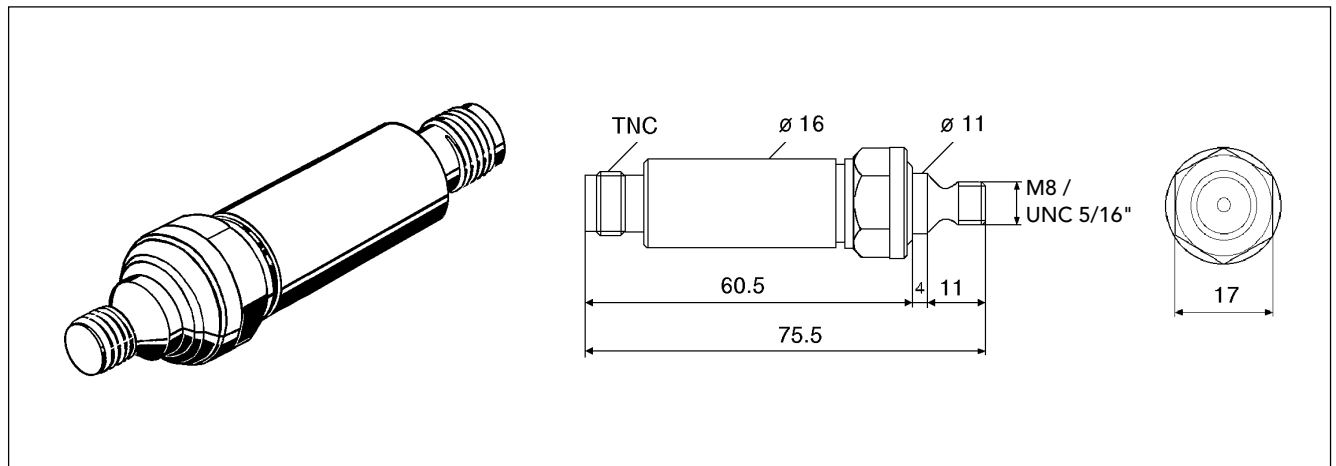
- 81027 Holder for counterbore
- 81030 Pilot for UNF 1/4" (SLD122F)
- 81031 Pilot for M8 (SLD122B)
- 81057 Counterbore, diameter 20 mm

To drill the mounting hole, use drill bit 6.9 mm for M8 and 5.5 mm for UNF 1/4". Torque the transducer with a 24 mm torque wrench.

* Individual value given on the calibration chart.



Shock Pulse Transducer with TMU

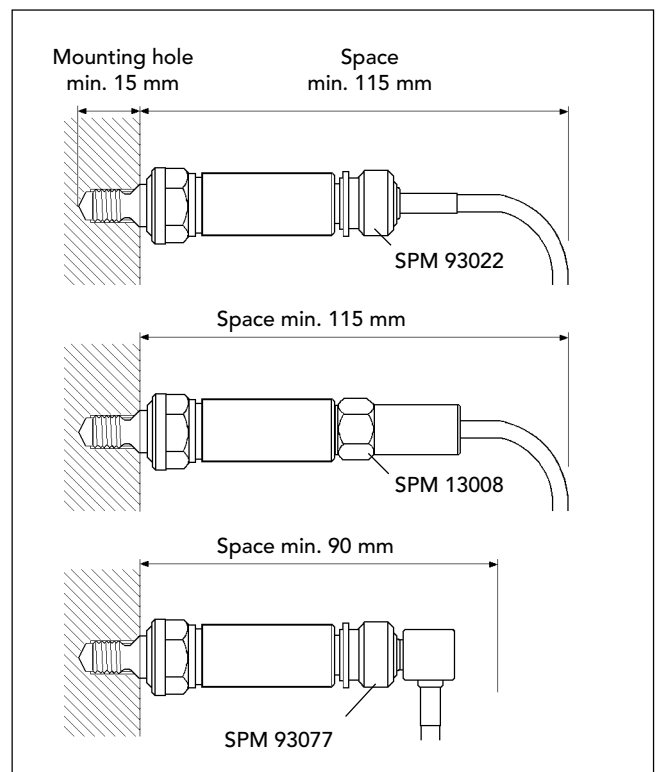


The shock pulse transducer with TMU is used in permanent SPM installations for bearing monitoring, in cases where the cable length between transducer and measuring unit exceeds 4 m. This allows a cable length of max. 100 m. The transducer with TMU is installed in a countersunk mounting hole on the bearing housing, in the same way as a standard transducer.

A shock pulse transducer with TMU (TMU = Transducer Matching Unit) converts the shock pulses emitted by the bearing into an electric signal, and stabilizes the signal for transmission via a long cable. A coaxial cable connects the transducer with a measuring terminal or measuring device.

Transducer housing and base are made of stainless, acid proof steel (SS 2382), suitable for aggressive environments. Thread size is M8, with UNC 5/16" as an alternative.

The transducer is normally connected with a TNC plug, SPM 93022. In moist environments, the coaxial cable must be connected with a sealing TNC plug, SPM 13008. A TNC angle plug, SPM 93077, can be used in narrow spaces.



Ordering numbers

- 42000 Shock pulse transducer with TMU, M8
- 42100 Shock pulse transducer with TMU, UNC 5/16"

Technical data

Measuring range	Max. 100 dBsv
Housing, base	Stainless steel, SS 2382
Design	Sealed
Temperature range	-30° C to +100° C
External overpressure	Max. 0.7 MPa (7 bar)
Torque	15 Nm, max. 20 Nm
Connector	TNC jack

Mounting tools

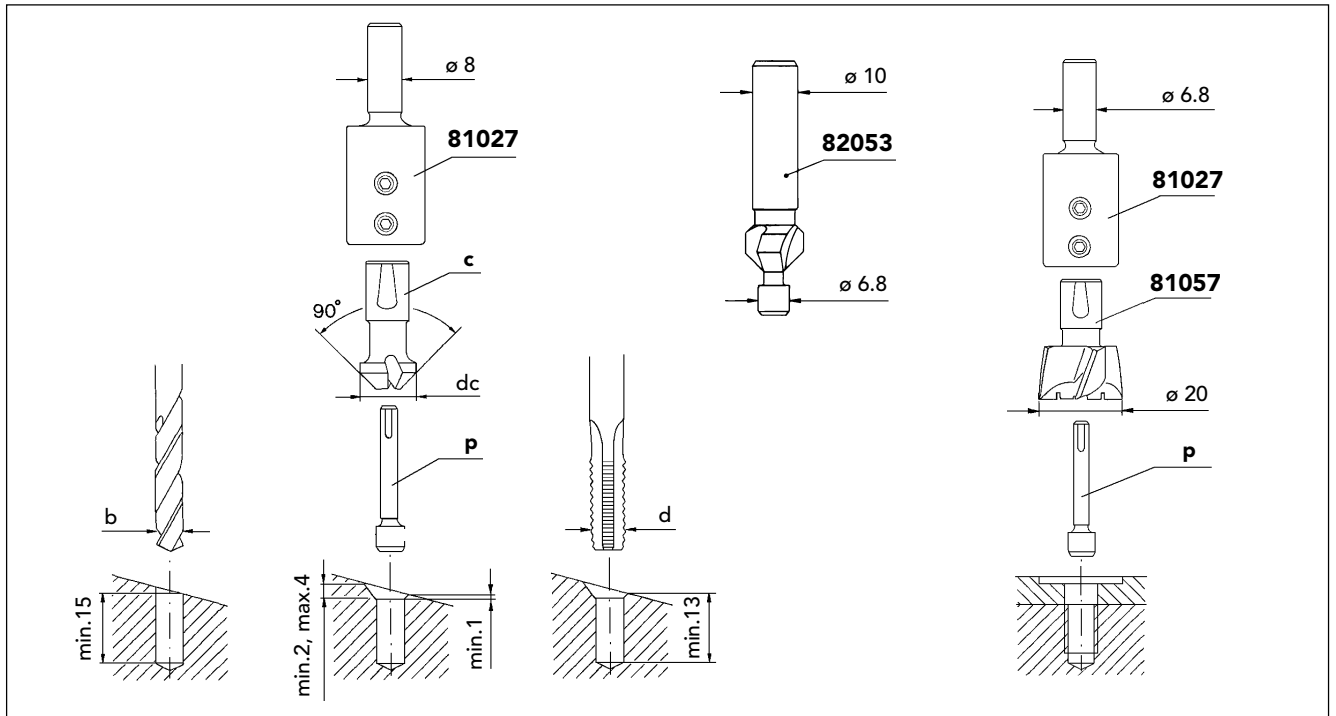
- 82053 Countersink with fixed pilot for M8
- 81027 Holder for countersink
- 81028 Countersink, angle 90°, 12 mm dia.
- 81031 Pilot for M8
- 81032 Pilot for UNC 5/16"

To drill the mounting hole, use drill bits 6.9 mm for M8, 6.6 mm for UNC 5/16".

Torque and unscrew the transducer with a torque wrench and a long 17 mm socket (SPM 81092).



Countersinking tools for adapters and transducers



Combination tools

The listed tools are used for correct countersinking of mounting holes for adapters and standard shock pulse transducers. The combination tool consists of a holder, a replaceable countersink and replaceable pilots. Ordering numbers are shown beside.

81057 Counterbore

The counterbore is used for flat face milling of mounting holes for shock pulse transducers in bolt design and vibration transducers. The counterbore is mounted in holder 81027 together with a pilot according to the table beside.

82053 Countersink with fixed pilot

The countersink is intended for mounting hole M8.

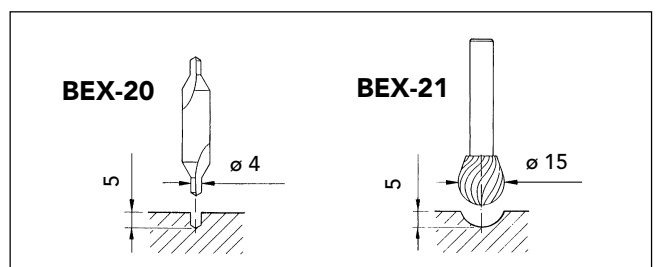
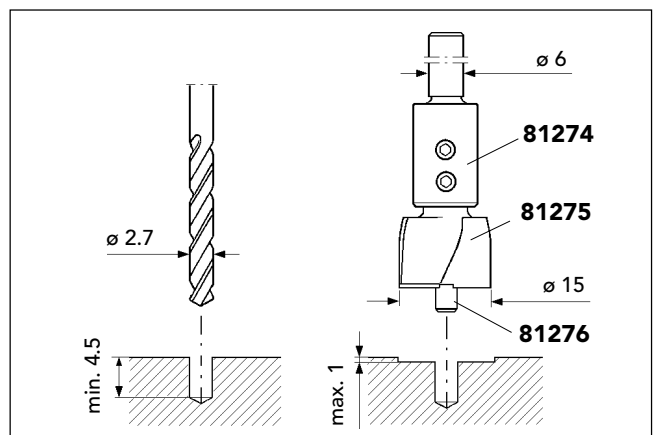
Counterbore for Glue-on Transducer 40010

- 14042 Counterbore, complete
- 81274 Holder for counterbore
- 81275 Counterbore, diameter 15 mm
- 14041 Pilot, diameter 2.7 mm

Tools for measuring point preparation

BEX-20 center drill and BEX-21 ball shaped rotary file are used to prepare measuring points for the probe transducer, and to facilitate drilling of mounting holes for adapters, studs, and transducers at an angle.

b (mm)	p	c	dc (mm)	d
5.5	81030	81028	ø12	M6 / UNF 1/4"
6.9	81031	81028	ø12	M8
6.6	81032	81028	ø12	UNC 5/16"
8.6	81033	81028	ø12	M10
8.1	81034	81028	ø12	UNC 3/8"
10.3	81035	81029	ø15	M12
10.9	81036	81029	ø15	UNC 1/2"



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