

Leonova[®] IS

INTRINSICALLY SAFE



Technical
data sheets





Leonova Diamond IS is a three-channel handheld machine condition analyser approved for use in explosive environment. The following functions are always included for unlimited use:

- Data logging with Condmaster® Ruby
- Balancing, SPM HDm/HDc and/or LR/HR
- ISO 2372 vibration monitoring
- Speed and temperature measurements
- Automatic recording, up to 50 hours
- Stethoscope function
- Recording of vocal comments

The main Leonova functions are user selected, see TD-360. With synchronous measurement, enveloping, true zoom and up to a 25600 line spectrum over DC up to 40 kHz, Leonova Diamond IS has full vibration analysis capacity. The evaluation tables of the ISO 10816 standards for broadband measurement of vibration velocity, acceleration and displacement are also incorporated. For single and dual plane rotor balancing, an easy-to-use graphical guide calculates balancing weights and their position.

Article numbers

DIA500IS Leonova Diamond IS, incl. wrist strap. DIA500IS must be combined with selectable basic platform function (DIA510/DIA520/DIA530/DIA550), see TD-360

Required accessories for use in non hazardous environment

16999 USB-isolator incl. communication cables
CHA01IS Battery charger incl. AC adapter, Euro plug
CHA02IS Battery charger incl. AC adapter, UK plug
CHA03IS Battery charger incl. AC adapter, US plug
CHA04IS Battery charger incl. AC adapter, AU plug

Accessories approved for use in hazardous environment

DIA162 Extra memory, 4 GB
DIA163 Extra memory, 8 GB
16850 Optional battery pack

Optional accessories for use in non hazardous environment

CAS25 Carrying case, plastic, foam insert, 54 x 41 x 21 cm
CAS26 Carrying case, soft, modular insert, 39 x 23 x 26 cm
81469 Silica gel (moisture absorbent) spare for CAS25
81468 Code lock, TSA approved, for CAS25

Parts of the Leonova system are specified on the technical data sheets (TD) listed below:

Instrument specifications	TD-358
User selected functions	TD-360
Shock pulse method SPM HD frequency and time domain analysis	TD-361
SPM Shock pulse method dBm/dBc	TD-406
SPM Shock pulse method LR/HR	TD-362
SPM Spectrum®	TD-407
Vibration monitoring ISO2372	TD-408
Vibration monitoring ISO10816 with spectrum	TD-363
3-channel simultaneous vibration monitoring	TD-364
Vibration Advanced	TD-459
FFT spectrum with symptoms	TD-460
Vibration Expert	TD-365
EVAM evaluated vibration analysis	TD-401
Run up/Coast down and Bump test	TD-402
HD Order tracking	TD-403
Frequency Response Function, FRF	TD-402
Orbit analysis/Shaft centerline plot	TD-368
Balancing, single and dual plane	TD-369
Recording function	TD-409
Leonova Service Program	TD-379
Accessories	TD-378
Tachometer/Temperature probe	TD-448

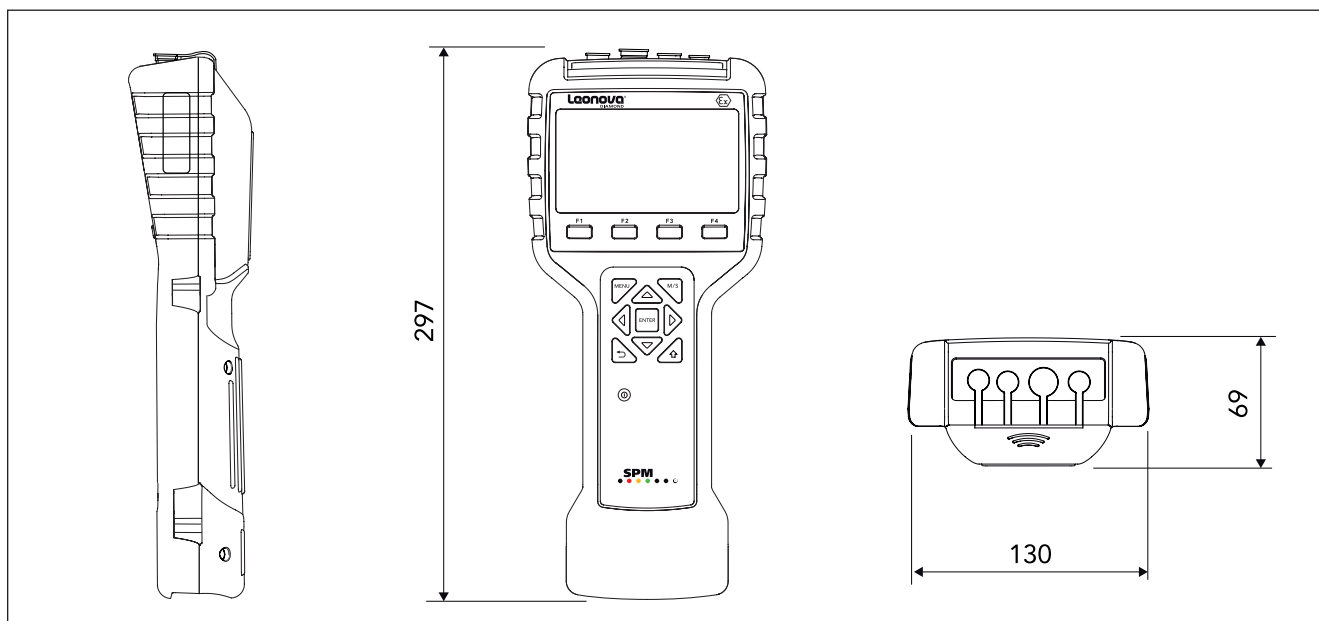
Spare parts

16645	Protection foil for display
14661	Wrist strap
90362	AC adapter, Euro plug, 100-240 V AC
90380	AC adapter, UK plug, 100-240 V AC
90379	AC adapter, US plug, 100-240 V AC
90528	AC adapter, AU plug, 100-240 V AC
16863	Battery charger IS
PRO52	Leonova Service Program
72000	Leonova Diamond IS User guide
CAB94IS	Communication cable, USB-mini USB, 1 m
CAB104IS	Communication cable, USB-USB, 1 m
17102	Battery pack removal tool

Patent No.: US#7,313,484, US#7,167,814, US#7,200,519, US#7,054,761, US#7,324,919, EP#1474664, DE#60304328.3, FR#1474664, GB#1474664, NL#1474664, SE03731865.6, US#7,711,519, US#7,949,496, EP#1474660, EP#1474662, EP#1474663, FR#1474660, US#7,774,166, EP#1474659, UK#1474659, US#6,725,723, US#6,499,349, SE#0400586-4, SE#0951017-3, SE#1000631-0, US#7,301,161C-1



Leonova Diamond® IS – Instrument Specifications



Technical data, instrument

Certificate number:	Sira 13ATEX2295 IECEX SIR 13.0107
Ex marking:	I M1 Ex ia I Ma T ₆ : -10°C to +50 °C II 1G Ex ia IIC T4 Ga T ₆ : -20°C to +50 °C
CE number:	CE 0470
Housing:	ABS/PC/TPE, IP65
Dimensions:	297 x 130 x 69 mm
Weight:	1005 g
Keypad:	Sealed, snap action
Display:	TFT colour, 480 x 272 pixels, 4.3 inch widescreen, adjustable backlight
Main processor:	400 MHz ARM
Memory:	256 MB RAM, 512 MB Flash, SD card 1GB expandable up to 8GB
Operating system:	Microsoft Windows® CE
DSP processor:	375 MHz floating point
Communication:	USB 2.0
Power supply:	Rechargeable battery pack
Battery power:	For min. 12 hours normal use (20°C)
Charging temperature:	0 to 45 °C
General features:	Language selection, battery status indication, transducer line test, metric or imperial units

Output/input

Headphones/microphone:	3.5 mm stereo plug
Communication:	Mini USB, via USB-isolator

Stethoscope

Transducer types:	Shock pulse and vibration transducer
Settings:	Filter, volume and gain

Vibration monitoring

Vibration channels:	3 simultaneous
Dynamic range:	120 dB
Frequency range:	0 (DC) to 40 kHz

Resolution:	Max. 25 600 lines
Vibration transducer input:	< 24 Vpp. Transducer supply of 2,5 mA for IEPE (ICP) type can be set On/Off
Transducer types:	SLD244S, B and F or any transducers (acc., disp., vel.) with voltage output
Measuring techniques:	ISO 2372, ISO 10816, EVAM Evalu- ated Vibration Analysis, Orbit, 3 channels simultaneously, balancing

Bearing monitoring

Measuring range:	SPM HD: -30 to 110 dBsv (44011 transducer) dBm/dBc: -9 to 99 dBsv LR/HR: -19 to 99 dBsv
Resolution:	0.2 dB/HD, 1 dB dBm/dBc and LR/HR
Transducer types:	SPM 44011, 44111, 44211, probe transducer TRA78IS and transducer with quick connector TRA79IS

RPM input

Measuring range:	1 to 150 000 PPM
Resolution:	1 pulse
Accuracy:	± (1 pulse + 0.01% of reading)
Transducer types:	SPM TTP10IS

AUX input

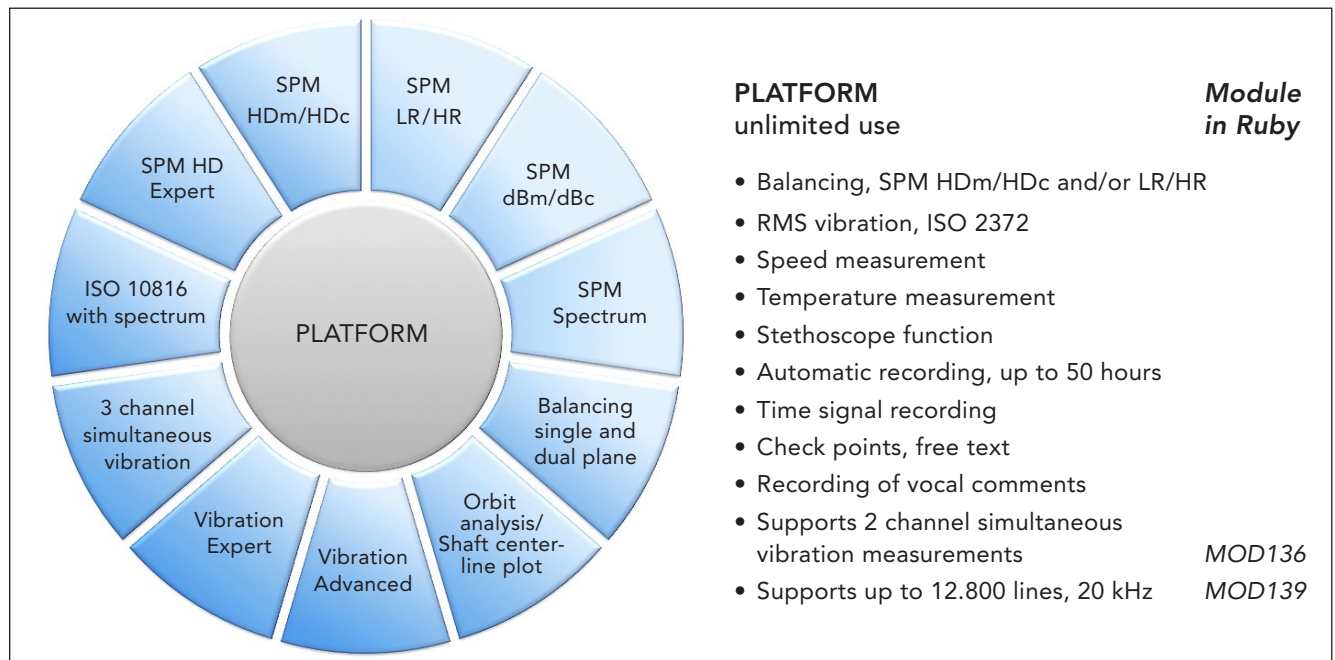
Interface:	According NAMUR standard IEC60947-5-6
Rated supply voltage:	8.2 V
Operating Frequency:	up to 40 kHz
Switching time:	< 10 µs
Switching position:	1.6 mA
Switching current difference:	0.3 mA
Functional cable length:	Max 100m, shielded if > 3m

Temperature measurement

Transducer type:	TTP10IS Tachometer/Temp. probe
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Patent No.: US#7,313,484, US#7,167,814, US#7,200,519, US#7,054,761, US#7,324,919,
EP#1474664, DE#60304328.3, FR#1474664, GB#1474664, NL#1474664, SE03731865.6,
US#7,711,519, US#7,949,496, EP#1474660, EP#1474662, EP#1474663, FR#1474660,
US#7,774,166, EP#1474659, UK#1474659, US#6,725,723, US#6,499,349,
SE#0400586-4, SE#0951017-3, SE#1000631-0, US#7,301,161C-1





To obtain the optimal performance range and instrument price, Leonova users can select any or all of the condition diagnosis and maintenance functions below, under two alternative conditions of sale. The choice is between unlimited and limited use (Function & Use).

When use is limited, the price for the function itself is much lower. Instead, the user prepays a tankful of 'credits'.

Choose your basic platform (compulsory)

DIA510	Leonova Diamond IS, HDm/HDc
DIA520	Leonova Diamond IS, Balancing
DIA530	Leonova Diamond IS, LR/HR
DIA550	Leonova Diamond IS, HDm/HDc + LR/HR

Functions for Unlimited Use **Module in Ruby**

DIA195	SPM HD Expert, time and frequency domain analysis	MOD195
DIA197	Shock pulse method HDm/HDc	(Platform)
DIA130	Shock pulse method dBm/dBc	MOD130
DIA131	Shock pulse method LR/HR	MOD131
DIA132	SPM Spectrum, 12.800 lines, 20 kHz	MOD132 MOD139
DIA133	Vibration ISO 10816 with spectrum	MOD133
DIA138	Orbit analysis/Shaft centerline plot	MOD138
DIA192	3 channel simultaneous vibration	MOD192
DIA193	Vibration Expert EVAM evaluated vibration analysis (MOD135) 25.600 lines, 40 KHz (MOD194) HD Order Tracking Time signal, Post trigger Run up/coast down Bump test and FRF (MOD137)	MOD193
DIA194	Vibration Advanced FFT spectrum with symptoms 12.800 lines, 20 kHz, Time signal, HD Order Tracking, Post trigger	MOD134
DIA109	Balancing, single and dual plane	

Leonova automatically deducts credits from the tank when its 'Measure' key is pressed. Thus, the user's operating costs depend on the number of measurements taken. Credit tanks are refilled, and/or new functions added, by loading a coded file ordered via the local distributor.

Unlimited and limited functions can be combined at will. Platform functions are always for unlimited use.

Functions for Limited Use (Function & Use)

DIA295	SPM HD Expert, time and freq. domain analysis (3)
DIA297	Shock pulse method HDm/HDc (2)
DIA230	Shock pulse method dBm/dBc (1)
DIA231	Shock pulse method LR/HR (2)
DIA232	SPM Spectrum (2)
DIA233	Vibration ISO 10816 with spectrum (1)
DIA238	Orbit analysis (5), Shaft centerline plot (5)
DIA292	3 channel simultaneous vibration (6)
DIA293	Vibration Expert incl. HD Order Tracking, Time signal and 25.600 lines/40 KHz (no credit consumption) EVAM evaluated vibration analysis (2) Post trigger (25) Run up / coast down (50) Bump test (25) Frequency Response Function, FRF (25)
DIA294	Vibration Advanced incl. HD Order Tracking, Time signal and 12.800 lines/20 kHz (no credit consumption) FFT spectrum with symptoms (2) Post trigger (25)
DIA209	Balancing, single and dual plane Single plane (4 runs: 16 / 2 runs: 42) Dual plane (80)

Credit consumption is stated within brackets.

DIA290 Credits for limited functions

DIA291 Credits for limited functions, refill



Leonova Emerald® IS is a handheld machine condition analyser approved for use in explosive environment. Following functions are always included for unlimited use:

- Data logging with Condmaster® Ruby
- Shock pulse method SPM HDm/HDc and/or LR/HR
- ISO 2372 vibration monitoring
- 1 channel vibration monitoring
- Speed and temperature measurements
- Automatic recording, up to 50 hours
- Stethoscope function
- Recording of vocal comments

The main Leonova functions are user selected, see TD-376. With synchronous measurement, enveloping, true zoom and up to a 12 800 line spectrum over DC up to 20 kHz, Leonova Emerald® has full vibration analysis capacity. SPM has also incorporated the evaluation tables of the new ISO 10816 standards for broadband measurement of vibration velocity, acceleration and displacement. For single rotor balancing, an easy to use graphical guide calculates balancing weights and their position.

Article numbers

EME600IS Leonova Emerald IS, incl. wrist strap. EME600IS must be combined with selectable basic platform (EME610/EME630/EME650), see TD-376

Required accessories for use in non hazardous environment

16999 USB-isolator incl. communication cables
CHA01IS Battery charger incl. AC adapter, Euro-plug
CHA02IS Battery charger incl. AC adapter, UK-plug
CHA03IS Battery charger incl. AC adapter, US-plug
CHA04IS Battery charger incl. AC adapter, AU-plug

Accessories approved for use in hazardous environment

16850 Optional battery pack

Optional accessories for use in non hazardous environment

81468 Code lock, TSA approved, for CAS25
81469 Silica gel (moisture absorbent) for CAS25
CAS25 Carrying case, plastic with foam insert 54x41x21 cm
CAS26 Carrying case, soft with modular insert 39x23x26 cm

Parts of the Leonova system are specified on the technical data sheets (TD) listed below:

Instrument specifications	TD-374
User selected functions	TD-376
Shock pulse method SPM HD frequency & time domain analysis	TD-435
SPM Shock pulse method dBm/dBc	TD-440
SPM Shock pulse method LR/HR	TD-436
SPM Spectrum®	TD-441
Vibration monitoring ISO2372	TD-446
Vibration monitoring ISO10816 with spectrum	TD-442
Vibration Premium	TD-366
FFT with symptoms	TD-367
HD Order tracking	TD-439
Vibration Supreme	TD-445
EVAM Evaluated Vibration	TD-438
HD Order tracking	TD-439
Balancing, single plane	TD-443
Recording function	TD-444
Leonova Service Program	TD-437
Accessories	TD-378
Tachometer/Temperature probe	TD-448

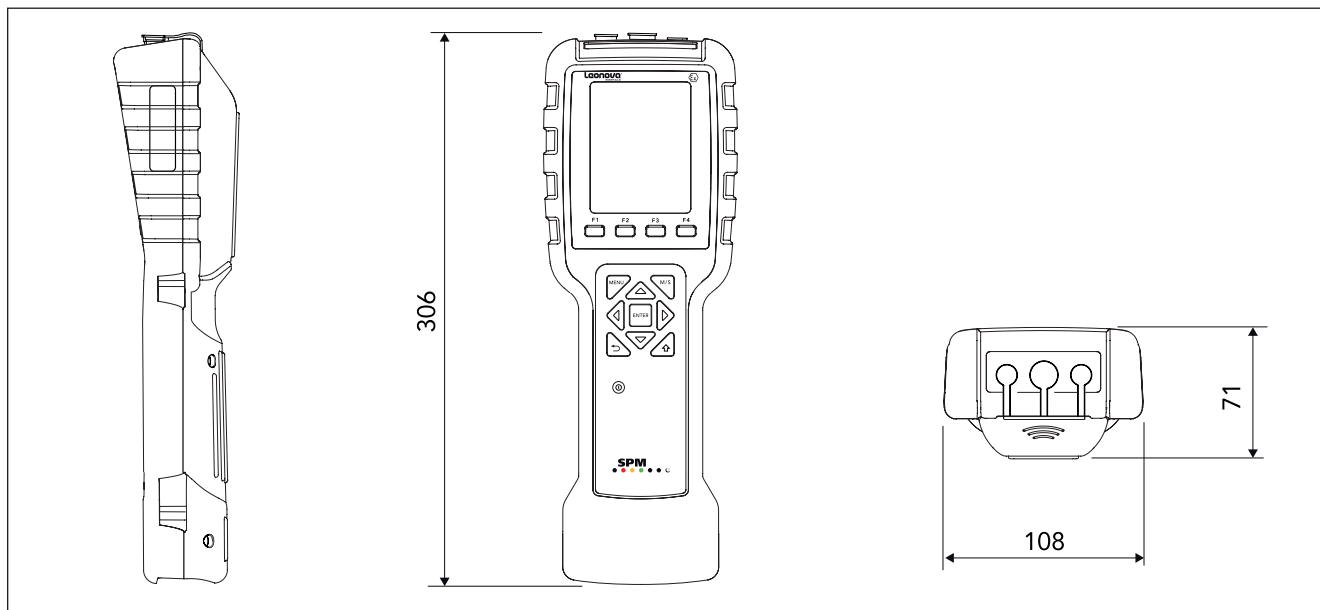
Spare parts

16686 Protection foil display
14661 Wrist strap
90362 AC adapter, Euro-plug, 100-240 V AC
90380 AC adapter, UK-plug, 100-240 V AC
90379 AC adapter, US-plug, 100-240 V AC
90528 AC adapter, Australia plug, 100-240 V AC
16863 Battery charger IS
PRO52 Leonova Service Program
71998 Leonova Emerald User guide
CAB94IS Communication cable, USB-mini USB, 1 m
CAB104IS Communication cable, USB-USB, 1 m
17102 Battery pack removal tool

Patent No.: US#7,313,484, US#7,167,814, US#7,200,519, US#7,054,761, US#7,324,919, EP#1474664, DE#60304328.3, FR#1474664, GB#1474664, NL#1474664, SE03731865.6, US#7,711,519, US#7,949,496, EP#1474660, EP#1474662, EP#1474663, FR#1474660, US#7,774,166, EP#1474659, UK#1474659, US#6,725,723, US#6,499,349, SE#0400586-4, SE#0951017-3, SE#1000631-0, US#7,301,161C-1



Leonova Emerald® IS – Instrument specifications



Technical data, instrument

Certificate number:	Sira 13ATEX2295 IECEX SIR 13.0107
Ex marking:	I M1 Ex ia I Ma T_a : -10°C to +50 °C II 1G Ex ia IIC T4 Ga T_a : -20°C to +50 °C
CE number:	CE 0470
Housing:	ABS/PC/TPE, IP65
Dimensions:	306 x 108 x 71 mm
Weight:	960 g
Keypad:	Sealed, snap action
Display:	TFT colour, 240 x 320 pixels, 3.5 inch, adjustable backlight
Main processor:	400 MHz ARM
Memory:	256 MB RAM, 512 MB Flash, SD card 1 GB
Operating system:	Microsoft Windows® CE
DSP processor:	375 MHz floating point
Communication:	USB 2.0
Power supply:	Rechargeable battery pack
Battery power:	For min. 14 hours normal use (20°C)
Charging temperature:	0 to 45 °C (32 to 113 °F)
General features:	Language selection, battery status indication, transducer line test, metric or imperial units

Output/input

Headphones/microphone:	3.5 mm stereo plug
Communication:	Mini USB, via USB-isolator

Stethoscope

Transducer types:	Shock pulse and vibration transducers
Settings:	Filter, volume and gain

Vibration monitoring

Vibration channels:	1
Dynamic range:	120 dB
Frequency range:	0 (DC) to 20 kHz
Resolution:	Max. 12 800 lines
Vibration transducer input:	< 24 Vpp. Transducer supply of 2,5 mA for IEPE (ICP) type can be set On/Off
Transducer types:	SLD244S, B and F or any transducers (acc, disp., vel.) with voltage output
Measuring techniques:	ISO 2372, ISO 10816, FFT with symptoms, EVAM Evaluated Vibration Analysis, balancing

Bearing monitoring

Measuring range:	SPM HD: -30 to 110 dBsv (44011 transducer) dBm/dBc: -9 to 99 dBsv LR/HR: -19 to 99 dBsv
Resolution:	0.2 dB / HD, 1 dB / dBm/dBc and LR/HR
Transducer types:	SPM 44011, 44111, 44211, probe transducer TRA78IS and transducer with quick connector TRA79IS

RPM input

Measuring range:	1 to 150 000 PPM
Resolution:	1 pulse
Accuracy:	± (1 pulse + 0.01% of reading)
Transducer types:	SPM TTP10IS

Temperature measurement

Transducer type:	TTP10IS Tachometer/Temp. probe
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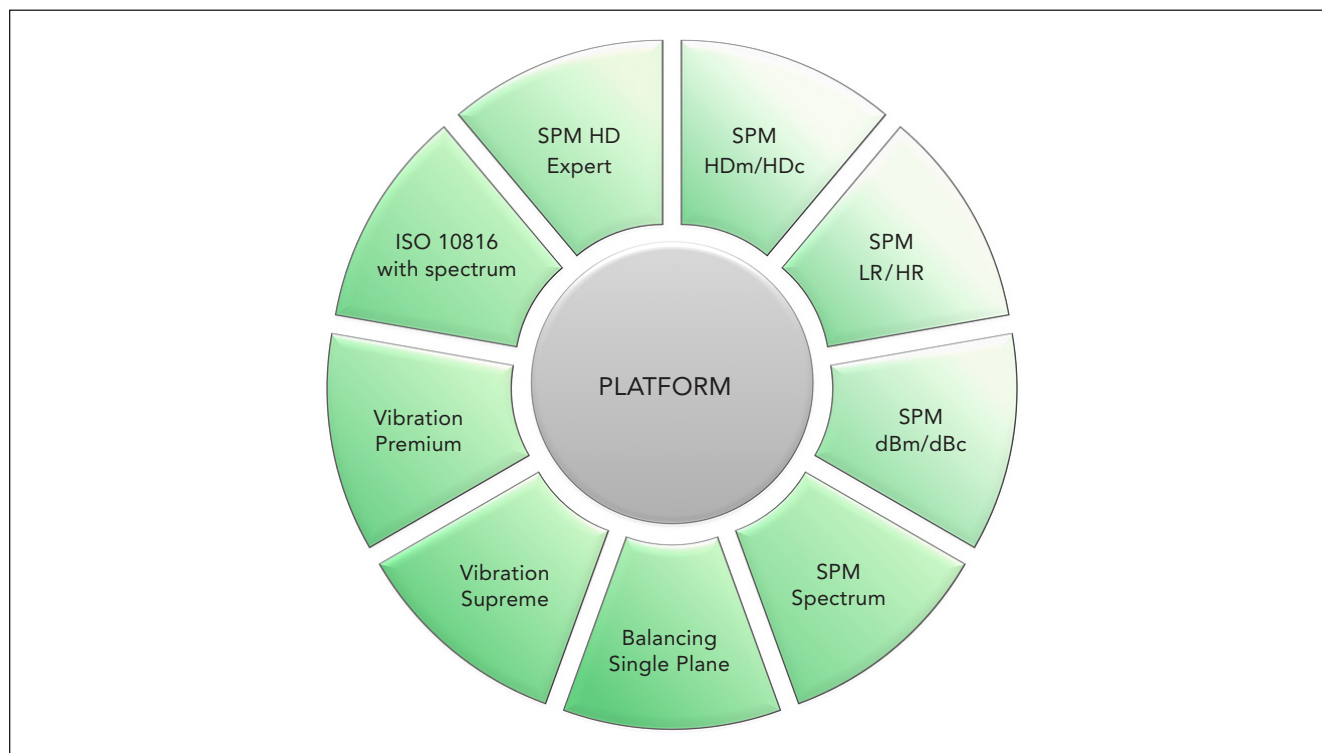
SPM Instrument AB • Box 504 • SE-645 25 Strängnäs • Sweden

Tel +46 152 225 00 • Fax +46 152 15075 • info@spminstrument.se • www.spminstrument.com

Patent No.: US#7,313,484, US#7,167,814, US#7,200,519, US#7,054,761, US#7,324,919,
EP#1474664, DE#60304328.3, FR#1474664, GB#1474664, NL#1474664, SE03731865.6,
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US#7,774,166, EP#1474659, UK#1474659, US#6,725,723, US#6,499,349,
SE#0400586-4, SE#0951017-3, SE#1000631-0, US#7,301,161C-1



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ISO 9001 certified. © Copyright SPM 2014-03. TD-374 B



To obtain the optimal performance range and instrument price for their purpose, Leonova users can select any or

all of the condition diagnosis and maintenance functions below. Platforms are selectable.

Choose your basic platform (compulsory)

- EME610** Leonova Emerald IS, HDm/HDc
EME630 Leonova Emerald IS, LR/HR
EME650 Leonova Emerald IS, HDm/HDc + LR/HR

Platform functions

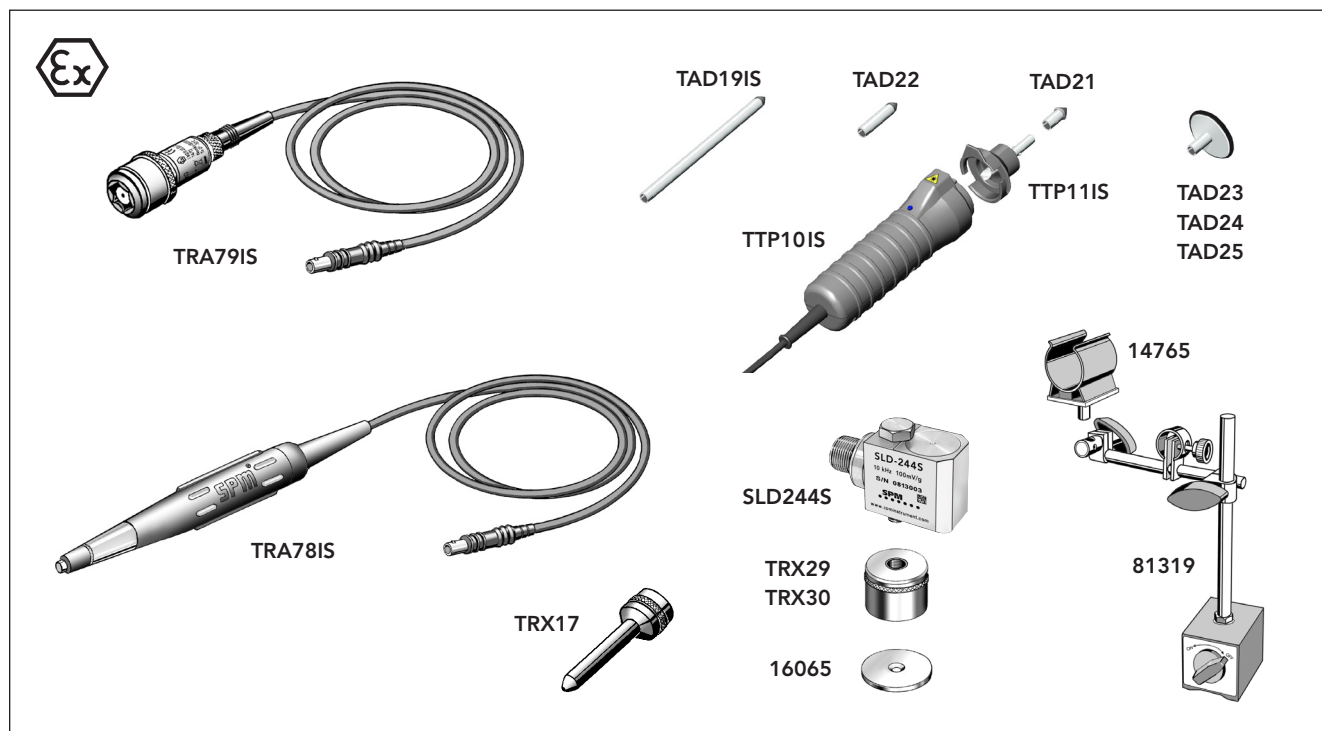
- SPM HDm/HDc + LR/HR
- RMS vibration, ISO 2372
- Speed measurement
- Temperature measurement
- Stethoscope function
- Recording
- Manual recording, free quantity
- Check points, free text
- Recording of vocal comments
- Supports up to 6400 lines, 10 kHz

Optional functions

Module in Ruby

- EME195** SPM HD Expert, freq. and domain analysis **MOD195**
- EME130** Shock pulse method dBm/dBc **MOD130**
- EME131** Shock pulse method LR/HR **MOD131**
- EME132** SPM Spectrum **MOD132**
- EME133** Vibration ISO 10816 with spectrum **MOD133**
- EME134** Vibration Premium **MOD135**
 FFT spectrum with symptoms
 6400 lines, 10 kHz
 HD Order tracking
 Time signal
 Post trigger
- EME193** Vibration Supreme **MOD197**
 EVAM evaluated
 vibration analysis (MOD135)
 12800 lines, 20 kHz (MOD139)
 + all functions in EME134
- EME109** Balancing, single plane

Leonova Diamond®/Emerald® IS – Accessories



Shock pulse monitoring

CAB80IS	Measuring cable, mini coax - BNC slip on, 1.5 m
CAB81IS	Measuring cable, mini coax - BNC 1.5 m
CAB101IS	Measuring cable, mini coax - TNC, 1.5 m
TRA78IS	Shock pulse transducer with probe (TD432)
TRA79IS	Shock pulse transducer with quick connector for measuring adapters (TD433)

Vibration monitoring

SLD2XX	Vibration transducers (TD215, TD300)
TRX29	Magnetic foot for vibration transducer, M8
TRX30	Magnetic foot for vibration transducer, UNF1/4"
16065	Mounting disc for magnetic foot TRX29/30
TRX17	Probe for vibration transducer, M8
CAB82IS	Measuring cable, 6 pin-2 pin 1.5 m, spiral
CAB83IS	Measuring cable, 6 pin-2 pin 10 m
CAB83IS-L	Measuring cable, 6 pin-2 pin (L=length in meter)
CAB88IS	3 channel vibration split cable, 6 pin, 0.25 m (Diamond Ex)
CAB89IS	2 channel vibration split cable, 6 pin, 0.25 m (Diamond Ex)
CAB97IS	Measuring cable, 6 pin-BNC, 1.5 m, spiral

Vibration transducers, see TD215 and TD300.

Speed and temperature monitoring

TTP10IS	Tachometer and temperature Probe (TD448)
TAD21	Contact center, rpm, short (30mm)
TAD22	Contact center, rpm, long (60mm)

TAD19IS	Contact center, rpm, extra long (170mm)
TAD23	Contact wheel m/min.
TAD24	Contact wheel yd./min
TAD25	Contact wheel ft./min
TAD16	Reflecting tape, 5 sheets

Balancing

81319	Magnetic base
14765	Holder for tachometer probe TTP10IS

Headset

EAR16IS	Headset with headband (TD447)
EAR17IS	Headset with helmet brackets (TD447)
EAR18IS	Headset with neckband (TD447)
EAS11	Hygiene set for headset and headphones
16632	Adapter 6,3/3,5 mm phones plug

Spare parts

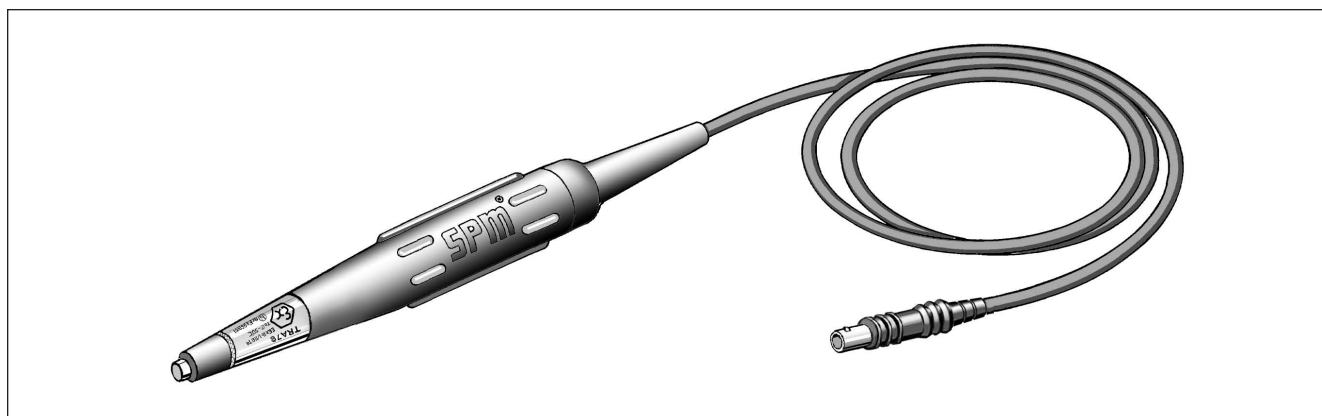
13108	Sleeve for probe tip (TRA78IS)
TTP11IS	Contact adapter for TTP10IS
CAB79IS	Cable for TRA78IS, 1.2 m
CAB103IS	Cable for TRA79IS, 1.5 m
CAB94IS	Communication cable, USB-mini USB, 1 m
CAB104IS	Communication cable, USB-USB, 1 m

Others

16999	USB-isolator incl. communication cables
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Shock Pulse Transducer with Probe TRA78 IS



TRA78IS is a hand-held probe transducer permitted for use together with SPM's handheld Ex instruments in applications with potentially explosive atmosphere. The probe is directionally sensitive and must be held aligned against the bearing and not deviate from this direction by more than $\pm 5^\circ$. The probe tip is spring loaded and moves within a sleeve made of chloroprene rubber (neoprene) and tolerates 110°C (230°F).

Measuring points for the probe should be located directly on the bearing housing and the signal path should be in a direct line to the contact area. The strongest shock pulses are emitted from the loaded region of the rolling interface in the bearing. The loaded region for radial load covers a sector of $\pm 45^\circ$ from the load direction, for axial load the region is 360° . Measuring points should be clearly marked, for instance with the SPM marker BEX19.

To maintain a steady pressure on the tip, press the probe tip against the measuring point until the rubber sleeve is in contact with the surface. Avoid pressing the probe tip against cavities and fillets which are smaller than the probe tip.

Safety

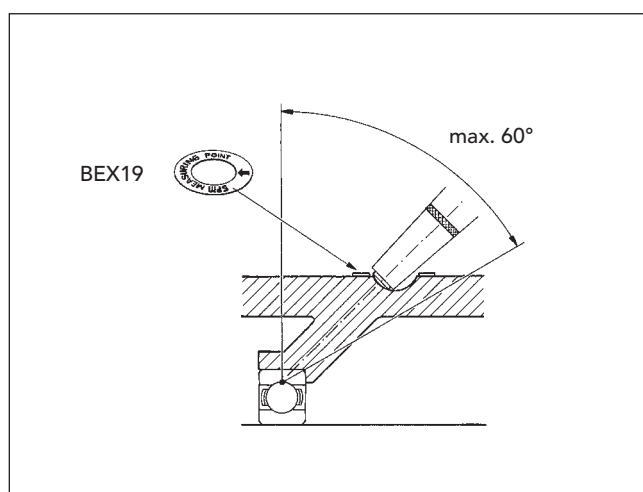
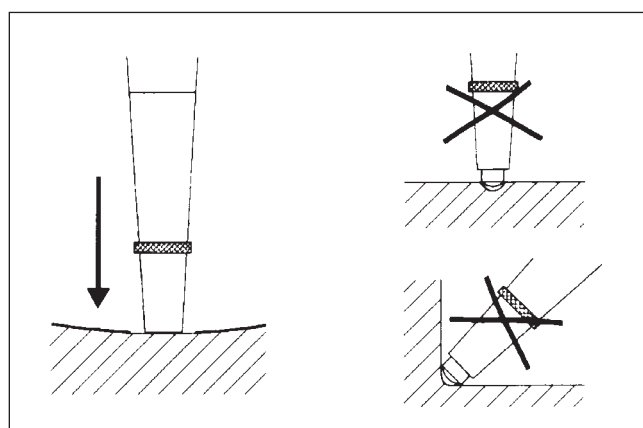
The cable must be fitted to the transducer to maintain an ingress protection of minimum IP65.

No maintenance is required.

Exchange of cable or probe tip sleeve are the only repair actions allowed.

Technical data

Certificate number:	IECEX SIR 13.0074X Sira 13ATEX2197X
Ex marking:	I M1 Ex ia I Ma II 1G Ex ia IIC T4 Ga U_i : 28 V, I_i : 120 mA, P_i : 300 mW, C_i : 2 nF
Ambient temperature, T_a :	-20°C to $+50^\circ\text{C}$
CE number:	CE 0470
Measuring range:	Max. 100 dB _{SV}
Enclosure:	Stainless steel, TPE (rubber alike) grip
Sealing:	IP65
Dimensions:	260 x 25 mm
Weight:	275 g (incl. cable)
Coaxial cable:	Total length 1.5 m, PVC
Electrical connector:	mini Coax



List of Complying Standards

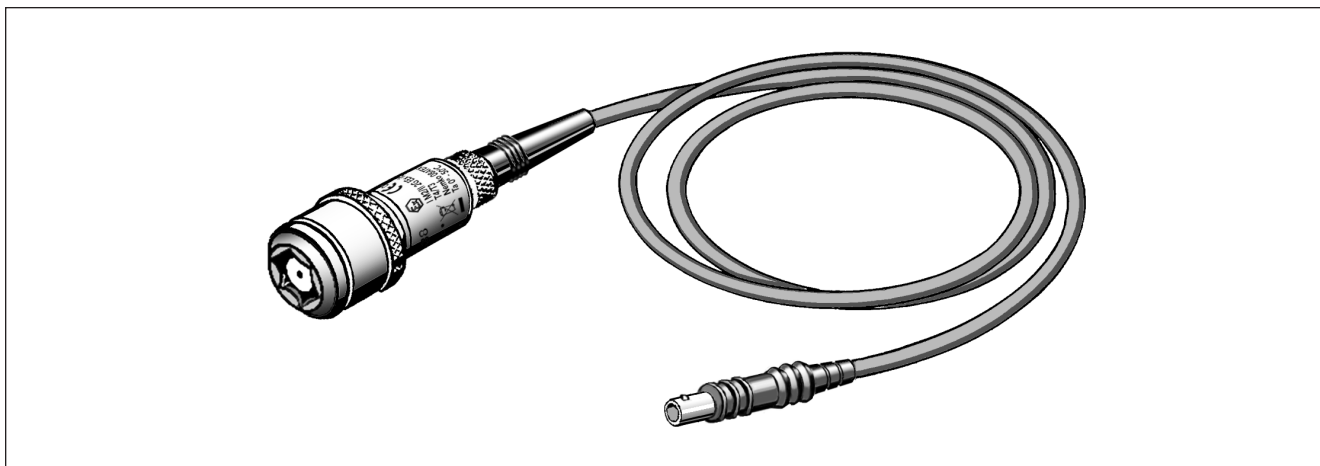
EX – General requirements:	IEC 60079-0:2011, EN 60079-0:2012
EX – Intrinsic safety:	IEC 60079-11:2011, EN 60079-11:2012
EX – Ga Equipment:	IEC 60079-26:2006, EN 60079-26:2007

SPM Spare parts

13108	Sleeve for probe tip
CAB79IS	Coaxial cable for TRA78IS



Shock Pulse Transducer with quick connector TRA79 IS



TRA79IS is a shock pulse transducer with quick connector for measurements on permanently installed adapters. The transducer is used together with SPM's handheld Ex approved instruments and is specially designed for applications with potentially explosive atmosphere. The transducer is connected to the instrument via a 1.5 m (5 feet) coaxial cable.

The transducer has bayonet catch. To attach TRA79IS to an adapter, push the transducer firmly onto the adapter and twist it clockwise. Twist counter clockwise to unfasten the transducer.

Safety

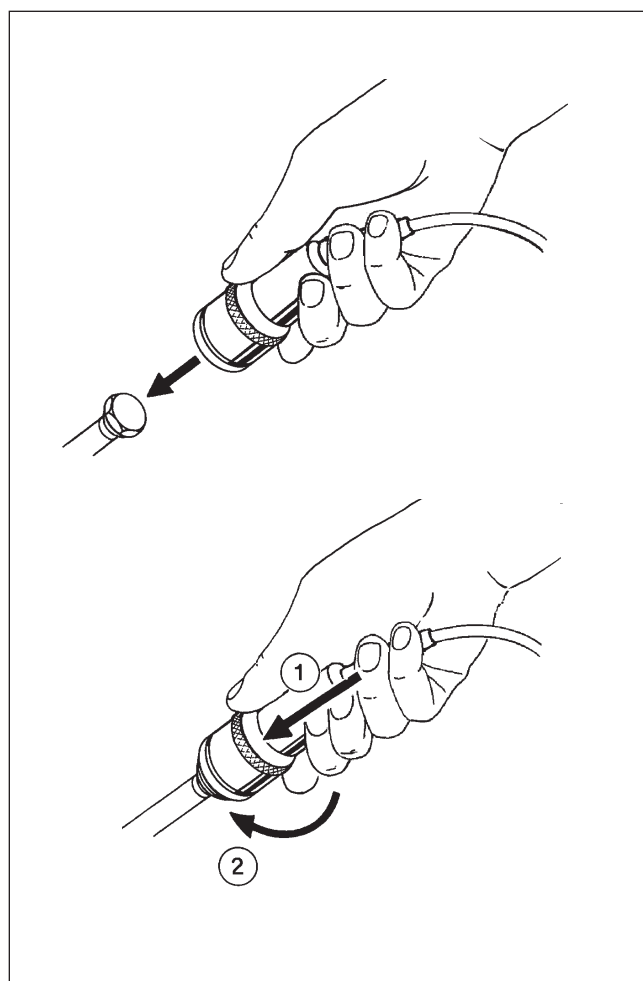
The cable must be fitted to the transducer to maintain an ingress protection of minimum IP65.

No maintenance is required.

Exchange of cable is the only repair action allowed.

Technical data

Certificate number:	IECEXSIR 13.0074X Sira 13ATEX2197X
Ex marking:	I M1 Ex ia I Ma II 1G Ex ia IIC T4 Ga U _i : 28 V, I _i : 120 mA, P _i : 300 mW, C _i : 2 nF
Ambient temperature, T _a :	-20 °C to +50 °C
CE number:	CE 0470
Measuring range:	Max. 100 dB _{SV}
Enclosure:	Stainless steel
Sealing:	IP65
Dimensions:	66 x 28 mm
Weight:	200 g (incl. cable)
Coaxial cable:	Length 1.5 m, PVC
Electrical connector:	mini Coax



List of Complying Standards

EX – General requirements:	IEC 60079-0:2011, EN 60079-0:2012
EX – Intrinsic safety:	IEC 60079-11:2011, EN 60079-11:2012
EX – Ga Equipment:	IEC 60079-26:2006, EN 60079-26:2007

SPM Spare parts

CAB103IS Coaxial cable for TRA79IS

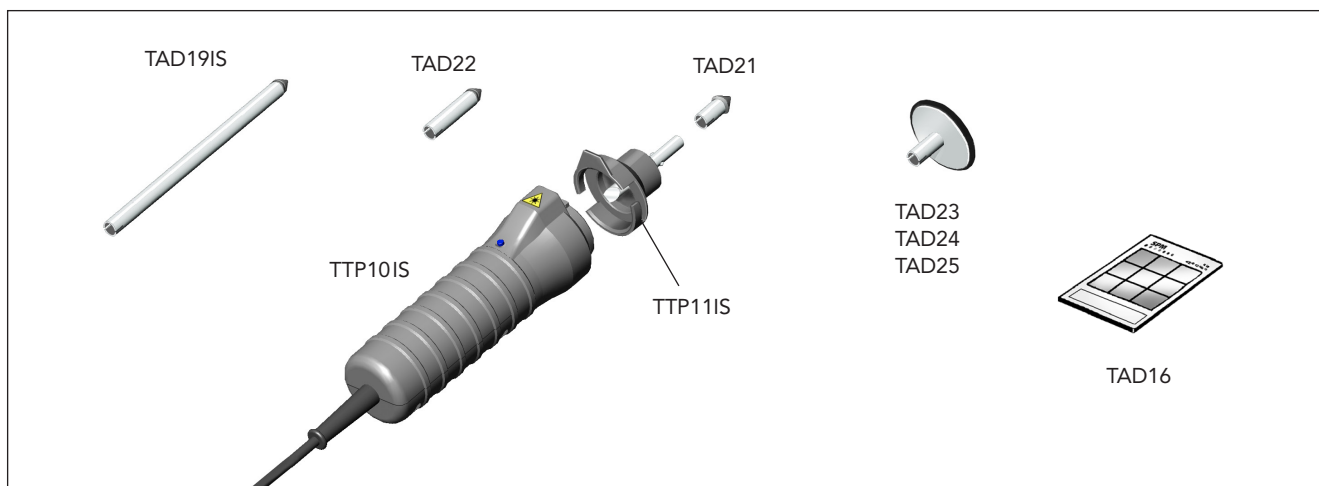


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Tachometer and Temperature Probe TTP10 IS



The Tachometer and Temperature Probe TTP10IS is used together with Leonova Diamond® and Emerald® instruments for optical or contact measurement of the rate of rotation and for contact measurement of peripheral speed. It also has a built-in temperature sensor.

Optical measurement of the rate of rotation

A light beam is directed against a reflecting tape on the rotating object, from a distance of 30-500 mm and from an angle of 5-75°.

Contact measurement of rpm

The contact adapter TTP11IS with a rubber tipped contact center, TAD-21/22/19IS, is attached onto the probe and then held against the center of a shaft end or a wheel.

Contact measurement of peripheral speed

The contact adapter TTP11IS with contact wheel is held against the circumference of a shaft, a belt, etc. The speed is read out in units, depending on which contact wheel is used: TAD-23/24/25.

Temperature measurement

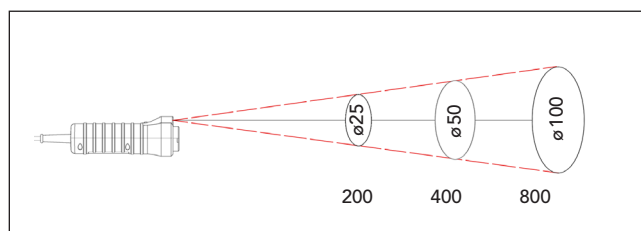
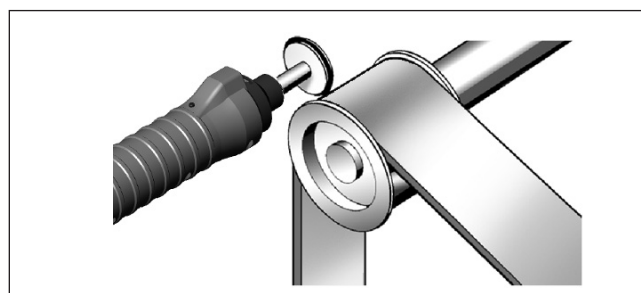
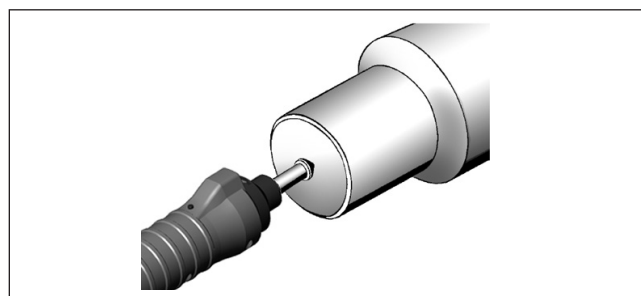
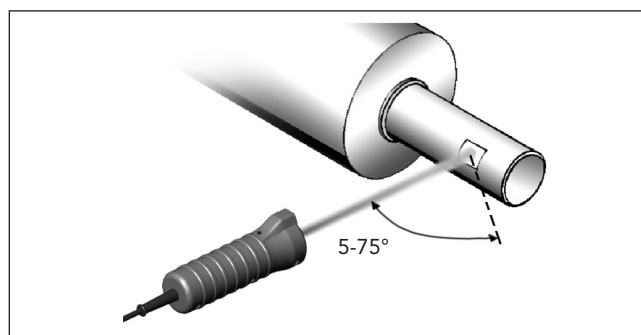
The Tachometer and Temperature Probe TTP10IS is also used together with Leonova Diamond/Emerald for temperature measurements with a thermopile element in the range -20 to +300 °C.

Ordering numbers

TTP10IS	Tachometer and Temperature Probe, incl. TTP11IS
TAD21	Contact center, rpm, short, 30 mm
TAD22	Contact center, rpm, long, 60 mm
TAD19IS	Contact center, rpm, extra long, 170 mm
TAD23	Contact wheel m/min.
TAD24	Contact wheel yd./min
TAD25	Contact wheel ft./min
TAD16	Reflecting tape for thin shafts, 5 sheets
TTP11IS	Contact adapter (spare part)

Technical specifications TTP10IS

Certificate number	SIRA 13ATEX2295 IECEX SIR 13.0107
Measuring range, rpm	max. 100 000 (pulses) optical
Measuring distance, rpm	30 to 500 mm
Indicator, rpm	blue LED
Measuring range, temp.	-20 to +300 °C
Measuring accuracy, temp.	± 2,5° C *

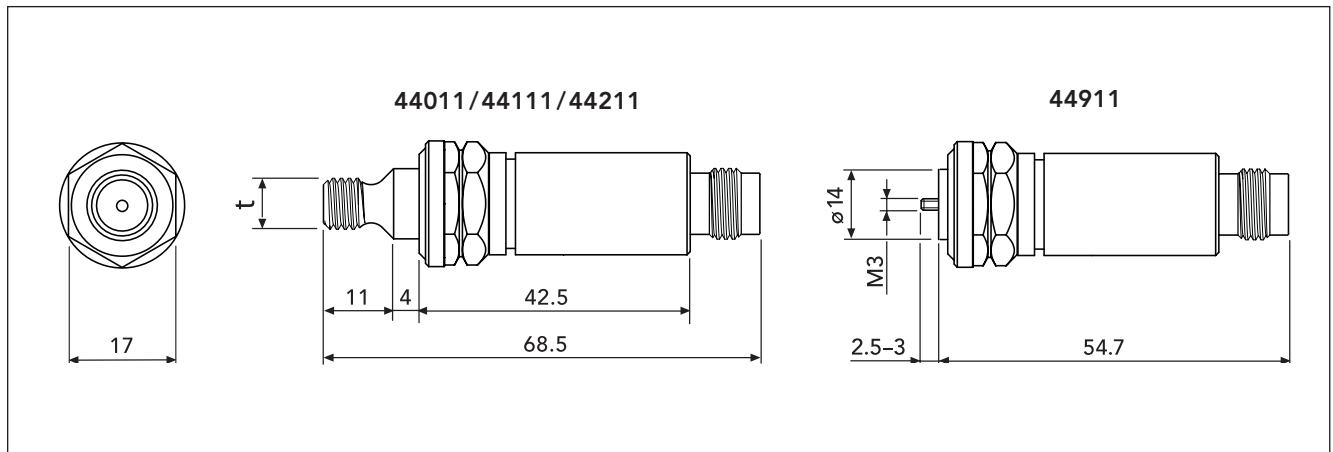


D:S, temp	8:1
Operating temperature	0 to + 40 °C
Weight	210 g
Dimensions	137 x 50 mm, 179 incl. TTP11IS

* If RF emission is present at 625MHz to 655MHz, the accuracy is possibly reduced to ±2.5°C – 10% of full scale



Shock pulse transducers for potentially explosive atmosphere



Shock Pulse Transducer

The 44000-family of transducers for explosive atmosphere is approved for use in mining, explosive gases and dust.

The transducer is connected to a measuring SPM instrument for bearing condition monitoring. Measuring instruments in hazardous areas must be suitable certified. Instruments outside hazardous areas must be connected via a suitable and certified barrier.

Family members are 44011, 44111 and 44211 with the mounting thread as the only difference. Transducer 44911 has a flat base which is glued to the measuring point, and a M3 screw for unloading and fixing. The recommended adhesives are 3M DP810, Loctite 638 or Loctite 480.

Safety

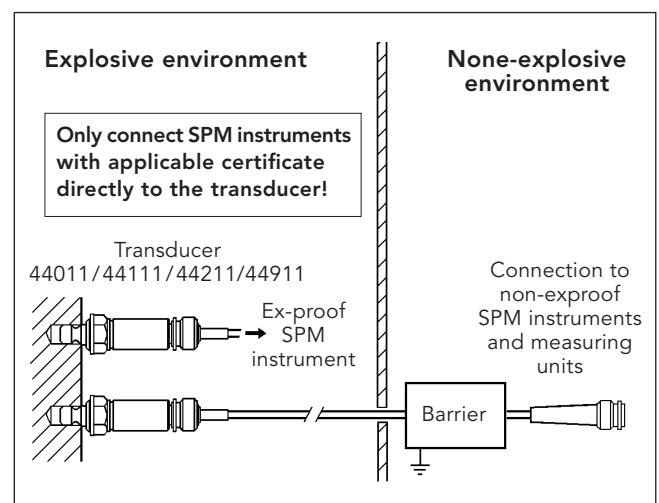
Transducer connector must be fitted with either a mating cable plug or a protection plug to maintain an ingress protection of minimum IP54.

Installation to be conducted in accordance with IEC 60079-14. The transducer intrinsically safe circuit (cable screen) is earthed via its enclosure, ie in the hazardous end. Only if the installation is effected and maintained in such a manner that there is a high level of assurance that potential equalization exists between each end of the circuitry, then the cable screen may be connected to earth also at the other end of the cable.

No maintenance is required. The Transducer is neither repairable.

Technical data

Certificate number	Sira 13ATEX2197X IECEX SIR 13.0074X
Ex certification	I M1 Ex ia I Ma II 1G Ex ia IIC T4 Ga II 1D Ex ia IIIC T 135 °C Da T_a : -40 °C to +120 °C U_i : 28 V, I_i : 120 mA, P_i : 300 mW, C_i : 2 nF
Measuring range:	max. 100 dB _{SV}
Environment:	-40° C to +120° C max. 1 MPa (10 bar)
Enclosure:	stainless acid proof steel IP67 (depends on TNC plug)



Electrical connector:	TNC
Mounting thread (t):	44011: M8 x 1.25 44111: UNC 5/16-18 44211: M10 x 1.5
Maximum mounting torque:	15 Nm
Weight:	65g (44911: 55g)

List of Complying Standards

EX – General requirements:	IEC 60079-0:2011, EN 60079-0:2012
EX – Intrinsic safety:	IEC 60079-11:2011, EN 60079-11:2012
EX – Ga equipment:	IEC 60079-26:2006, EN 60079-26:2007

Accessories

93035	TNC dust cup, IP67
13008	Sealed TNC cable plug, crimp, IP67, stainless steel, (TD296)
15837	Sealed TNC cable plug, crimp, IP67, stainless steel, conduit hold, (TD292)
15291	Sealed TNC cable plug, crimp, composite, IP67 (TD257)
90267	Coaxial cable, 105 pF/m
90472	Adhesive, 3M DP810 (50ml)



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Technical data are subject to change without notice.

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EAR16/17/18IS are specially selected headsets for Leonova Diamond/Emerald, providing excellent sound reproduction even in noisy environments. The headphones are equipped with microphone for voice recording of comments to the measuring points. In order to use the EAR16/17/18 with Leonova Diamond/Emerald needs an adapter (16332).

- Individually sprung headband wires of stainless sprung steel provide an even distribution of pressure around the ears. Steel headband wires retain their resilience better than plastic through a wide temperature range.
- Low, two-point fasteners and easy height adjustment with no protruding parts.
- Soft, wide foam and fluid-filled sealing rings with built-in pressure-equalizing channels provide low pressure, effective sealing and ideal comfort.
- Connection cord, 0.75 to 1.4 m, of soft spiral polyurethane with a 6.3 mm stereo plug.
- Frequency range 125-8000 Hz

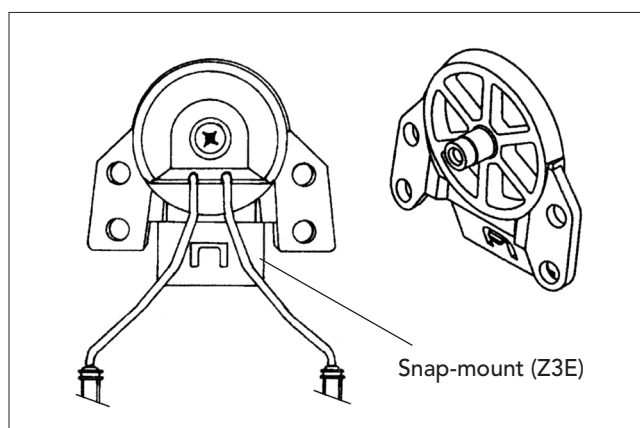
The headsets are tested and approved in accordance with PPE directive 89/686/EEC and EMC directive 89/336/EEC to meet the demands for CE labelling.

Headset with headband, EAR16IS

The headset EAR16IS is a headset with two parallel connected earphones and a microphone. It has a collapsible headband for convenient storage when you are not using the headset.

Headset for helmet, EAR17IS

The headset with microphone EAR17IS is a headset with two parallel connected earphones and a microphone. The headset fits most safety helmets available in the market today. The headphones have standard snap-mounts (Z3E) and are adapted to a specific helmet by simple manipulation.



Headset with neckband, EAR18IS

The headset EAR18IS is a headset with two parallel connected earphones and a microphone. It has a neckband for use with or without helmet.

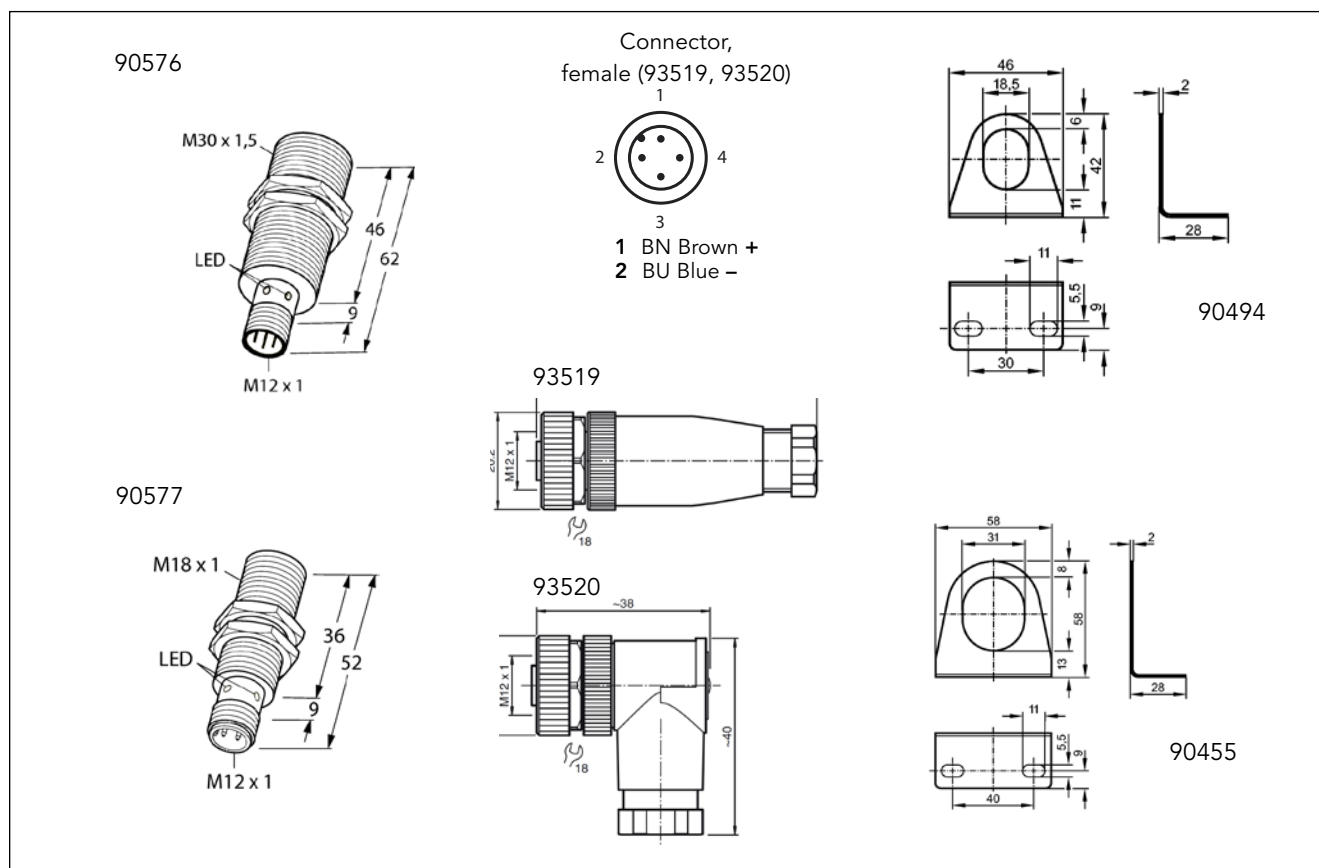
To mount the headphone, snap the helmet attachment into the slot on the helmet. Note: The cups can be set in three positions: working position, ventilation position and parking position. When in use, the cups must be placed in working position. Press the wires inward until you hear a click on both sides. Make sure that the cup and the headband wire in working position are not pressing on the helmet lining or the edge of your hard hat so that leakage can occur. Parking position should not be used if the cups are damp inside after an intense period of use.

Marking

II 2G Ex ib IIC T4 -20°C ≤ Ta ≤ +50°C *
IECEx NEM 09.0005X

Part numbers

EAR16IS	Headset with headband
EAR17IS	Headset with helmet brackets
EAR18IS	Headset with neckband
EAS11	Hygiene set (consists of two sets of attenuating cushions and snap-in sealing rings.)
16332	Adapter 6,3/3,5 mm phones plug



The inductive proximity switches of NAMUR standard have LED indicators for easy operation and adjustment. The angle brackets 90455 and 90494 are made of galvanized steel.

Shock resistance: 30g
 Protection category: IP 67
 Switching state: LED, yellow
 Voltage: Nom. 8.2 VDC
 Actuated current consumption: ≤ 1.2 mA
 Non-actuated current consumption: ≥ 2.1 mA
 Connection: male M12X1

Technical data

Ex marking: II 1G Ex ia IIC T6 Ga
 II 1D Ex ia IIIC T115°C

Standards: DIN EN 60947-5-6

Housing material: metal, CuZn, chrome-plated

Material active face: plastic, PBT

Rated operating distance, S_n :

90576	10 mm
90577	5 mm

Switching frequency:

90576	0.5 kHz
90577	1 kHz

Hysteresis: 1... 10%

Ambient temperature:

90576	-25° C to +70°C
90577	-25° C to +70°C

Max. tightening torque housing nut:

90576	75 Nm
90577	25 Nm

Part numbers

90576 Inductive Proximity Switch M30
 90577 Inductive Proximity Switch M18
 93516 M12-connector with 2 meter cabel, straight, (female)
 93517 M12-connector with 2 meter cabel, angle, (female)
 93519 M12-connector, straight (female)
 93520 M12-connector, angle (female)
 90494 Angle bracket M18
 90455 Angle bracket M30