SKF TMSU 1

Instructions for use

Table of contents

EC Declaration of conformity

We, SKF Maintenance Products, Kelvinbaan 16,
3439 MT Nieuwegein, declare that the

SKF Ultrasonic Leak Detector
TMSU 1

is designed and manufactured in accordance with the
Low Voltage Directive 73/23/EEC
EMC Directive 2004/108/EC

The Netherlands, September 2007

Sébastien David
Manager Product Development and Quality

Safety recommendations

- Do not expose the equipment to rough handling or heavy impacts.
- Always read and follow the operating instructions.
- Opening the housing of the instrument may result in hazardous mishandling and voids warranty.
- The equipment should not be used in areas where there is a risk for explosion.
- Do not expose the equipment to high humidity or direct contact with water.
- All repair work should be performed by an SKF repair shop.
- Using any other headset than the one supplied with the instrument can cause internal damage to the detector.

1. Introduction

The SKF Ultrasonic Leak Detector TMSU 1 is designed to detect leaks in compressed air systems, pneumatic brake systems, vacuum systems, pressurized gas storage, and steam traps.

1.1 Intended use

It can be used to verify the integrity of compressed air systems, and the tightness of containers, trucks, buses, cars, storage systems, building envelopes, containment walls, tanks, recreational vehicles, and more....

1.2 Principle of operation

The principle of operation of the TMSU 1 can be compared to a special microphone, sensitive only to high frequency ultrasounds.
A sensitive piezoelectric crystal is used as a sensor element. Minute sound waves excite the crystal, creating an electrical pulse that is amplified and then "heterodyned" or translated into an audible frequency that the user can hear through a pair of noise-reduction headphones.

1.3 Distinguishing features

- As a leak passes from a high to a low pressure, it creates turbulences. These turbulences generate a high-frequency sound component which is detected by the sensitive piezoelectric element, allowing the user to quickly guide the sensor to the loudest point in order to pinpoint the leak.
- The TMSU 1 indicates the presence of a leak by producing a quality signal that is truly representative of that leak. In fact each leak has its own unique sound. TMSU 1 is not producing a "beep" but a real signal, an amplified "image" of that unique sound.

2. Description

The flexible sensor is directly linked to the internal electronics in order to operate TMSU 1 in either of two modes. The operator can either select the desired continuous mode or the non-continuous operation. The volume can be adjusted to 7 different levels for better amplification of the ultrasounds.

2.1 Components

The SKF Ultrasonic Leak Detector TMSU 1 is made of two main components, the handheld unit with the controls and sensor and a pair of noise-reduction headphones. A rubber nozzle is also provided for reduced access areas.

3. Technical data

TMSU 1	
Description	SKF Ultrasonic Leak Detector
Controls	Continuous or non-continuous operation switch Silicone rubber button to control stop-start non-continuous operation and volume adjustment
Amplification	7 levels: 20, 30, 40, 50, 60, 70 and 80 dB
Ultrasound sensor	Open sensor with a 16 mm (1/2 in Ø) diameter (19 mm – 3/4 in Ø – exterior), central frequency of 40 kHz
Detected frequencies	38,4 kHz, ± 2 kHz (-3 dB)
Audio output	Stereo jack connector of 6,35 mm (1/4 in) (use only the headset supplied with the unit)
Power	Two alkaline AA batteries, 1,5 V. Rechargeable batteries can also be used but the usage time will be reduced
Usage time	± 20 hours. This varies based on: including the charge of the battery in the detector, the level of amplification used and the quality of the batteries
Body	Made with machined and assembled sheets of high impact polystyrene, shock resistant
Dimensions	Body: 170 x 42 x 31 mm (6,70 x 1,65 x 1,22 in) Flexible tube length: 400 mm (15,75 in)
Weight	412 grams with the batteries (14,53 oz)
Operating temperature range	From -10 ºC to + 50 ºC / 14 ºF to 122 ºF

4. Operation

- For listening comfort while performing a leak survey, the fingertip volume control gives instant and precise adjustment to instrument sensitivity for more effective and safe inspections.
- The ultrasonic sensor is mounted at the end of a flexible metal tube. This tube can be bent and twisted in multiple directions. Its diameter is small enough to perform inspections through tight access holes and inside cabinets. A precision focus tube is mounted over the sensor to increase the accuracy of detection and eliminate parasitic noise.
- A red LED shows the unit is operational. If the LED does not illuminate check that the batteries have sufficient power, and replace if necessary.

4.1 Non-continuous operation

- Slide the small switch on the right side of the unit up to the top:
- Maintain pressure on the centre of the yellow button to keep the unit operating.
- To increase the volume (sensitivity) of the TMSU 1 push the (+) side of the yellow button. When the desired sensitivity is reached hold the entire button in the down position to begin your survey. Leaks are generally found by moving the detector back and forth and up and down in the direction of the leak source.
- As soon as you hear the typical “hissing” sound of a leak move towards the source. Remember that ultrasounds travel through the air in a directional pattern. The source of the leak is therefore easy to pinpoint by following the loudest signal.
- As you near the source of the leak the volume in the headphones may increase dramatically. Reduce the sensitivity of the detector by pushing the (-) side of the yellow button to return the TMSU 1 to a comfortable listening level.
- To turn off the detector, release the yellow button.

4.2 Continuous operation

- Slide the small switch on the right side of the unit down to the bottom, The LED will light up:
- To increase the volume (sensitivity) of the TMSU 1 push the (+) side of the yellow button. When the desired sensitivity is reached release the yellow button and begin your survey. Leaks are generally found by moving the detector back and forth and up and down in the direction of the leak source.
- As soon as you hear the typical “hissing” sound of a leak move towards the source. Remember that ultrasounds travel through the air in a directional pattern. The source of the leak is therefore easy to pinpoint by following the loudest signal.
- As you near the source of the leak the volume in the headphones may increase dramatically. Reduce the sensitivity of the detector by pushing the (-) side of the yellow button to return the TMSU 1 to a comfortable listening level.
- To turn off the detector, slide the switch at the side to the top to halt operation. The LED will go out.

5. Remarks

- The volume of the TMSU 1 will remain at the same level the next time it is switched on.
- A short acoustic beep is audible in the headphone when changing the amplification.
- The TMSU 1 can be used in combination with either alkaline (non-rechargeable) or rechargeable AA batteries. Use only two of the same battery types at the same time.
- When battery charge is too low, the red operation LED will not light up. When the remaining battery charge goes below acceptable operation levels during operation, the user will be notified with an acoustical signal (5 consecutive low frequency beeps).
- Rechargeable batteries cannot be charged while inside the TMSU 1.

6. Spare parts

TMSU 1-1	handset
TMSU 1-2	headset

SKF Maintenance Products

www.mapro.skf.com
www.skf.com/mount

MP5348E