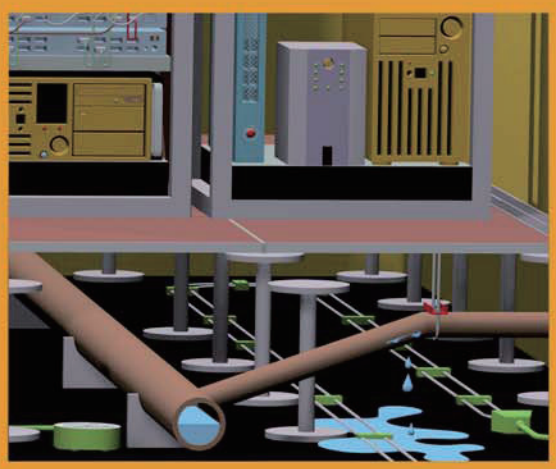
Conductive Leakage detectors of the LeakConductive range

with electrode and relay



DMEL 6 and DMEL 6-Z10 conductive mat electrodes

Conductive mat electrodes are designed to signal via a connected conductive electrode relay the presence of an electrically conductive liquid caused, for example, by burst pipes.

Conductive mat electrodes should only be used in normally dry environments. They can be installed on the floor or in a collection tub below pipelines or small tanks.

DMEL 6(-Z10)

The conductive DMEL 6... mat electrode is fitted with 6 sensitive elements in form of 6 sensor cables: 3 control electrodes and 3 ground electrodes. A ground electrode is always positioned next to a control electrode, a control electrode next to a ground electrode and so on. As soon as an electrically conductive liquid (e.g. water, acid etc.) creates a conductive path between a control electrode and a ground electrode, a control current flows from the corresponding conductive electrode relay. The latter is then energised and a contact made.

The 6 sensor cables of a DMEL 6... mat electrode in form of 6 stainless steel ropes are woven into an approx. 30 cm wide polyester fabric as part of the warp, and the polyester fabric keeps them permanently equidistant from one another. This polyester fabric is designed to prevent contact of the stainless steel ropes with one another or with an electrically conductive surface (e.g. steel tub, steel pipe etc.) and thus to avoid as far as possible false alarms, whilst allowing leakage liquid to penetrate through to the stainless steel ropes.

To avoid false alarms, it is essential that the surroundings of the mat electrodes are absolutely dry under normal circumstances, as the mat electrodes have the ability to bind moisture (including high levels of air humidity) causing false alarms particularly with long mat electrodes.

The conductive measuring principle

The conductive measuring principle is used for the detection of **electrically conductive liquids**.

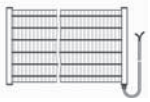
It is not suitable for the detection of electrically non-conductive liquids (e.g. oils, diesel, fuel oil, demineralised water ...).

Electrically conductive liquids are generally aqueous solutions of salts, acids or alkalis. The molecules of these substances dissociate in water into positive and negative ions which give the aqueous solution its electrical conductivity.

The conductive leakage detector of the LeakConductive range consists of the combination of a conductive electrode and a conductive electrode relay. This combination detects the presence of an electrically conductive liquid at the electrodes, and an alarm signal is then emitted.

The measurement process uses alternating current to ensure exact response sensitivity and to prevent galvanic processes at the electrodes.

Leakage detection with conductive “LeakConductive” surface sensors

Conductive mat electrodes	DMEL 6	
	DMEL 6-Z10	

Explanation of the colours used:

= **without** cable break monitoring

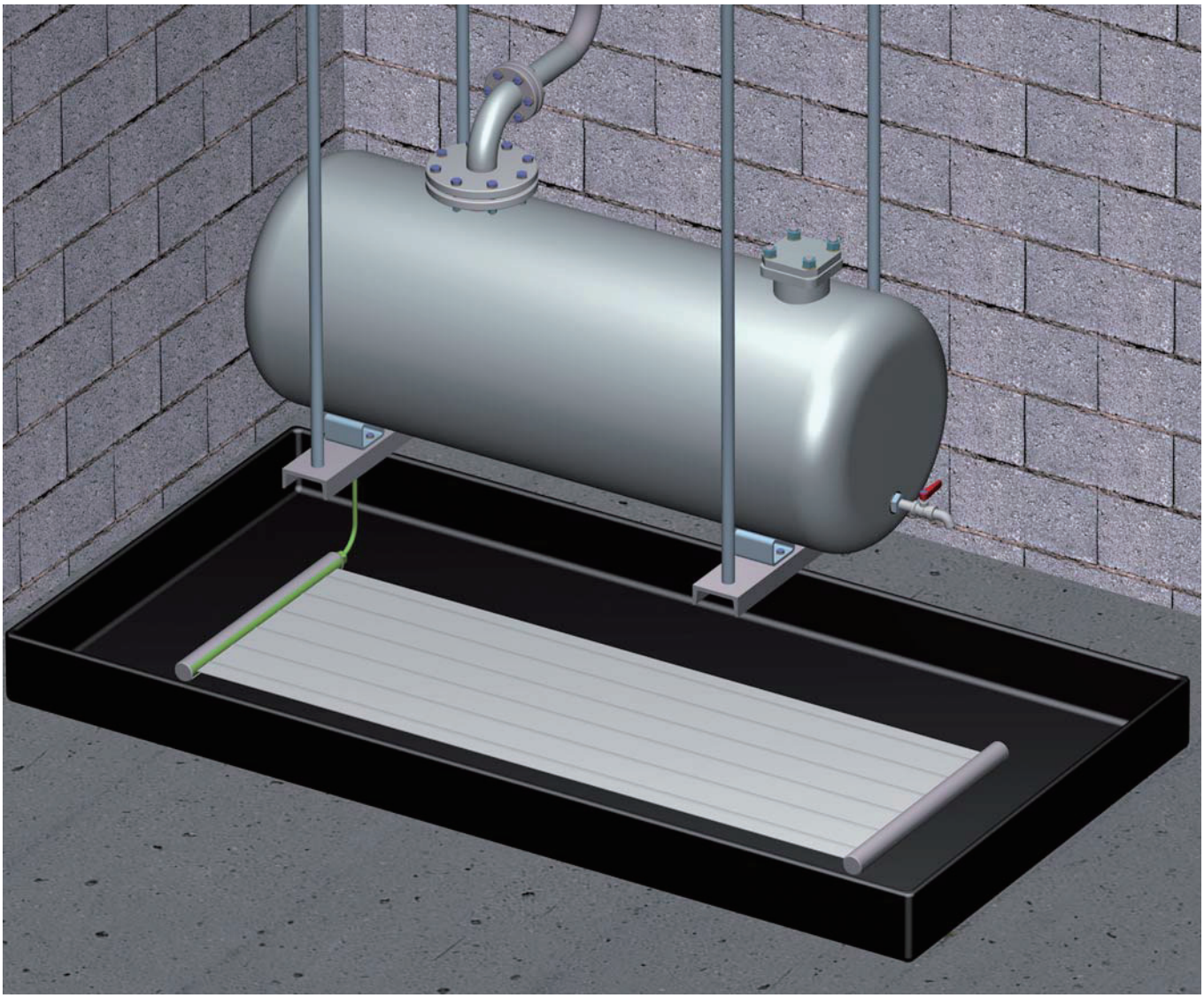
= **with** cable break monitoring

= with relay: **without** cable break monitoring or

= with electrode + relay: **with** cable break monitoring

Leakage detection with conductive “LeckConductive” surface sensors

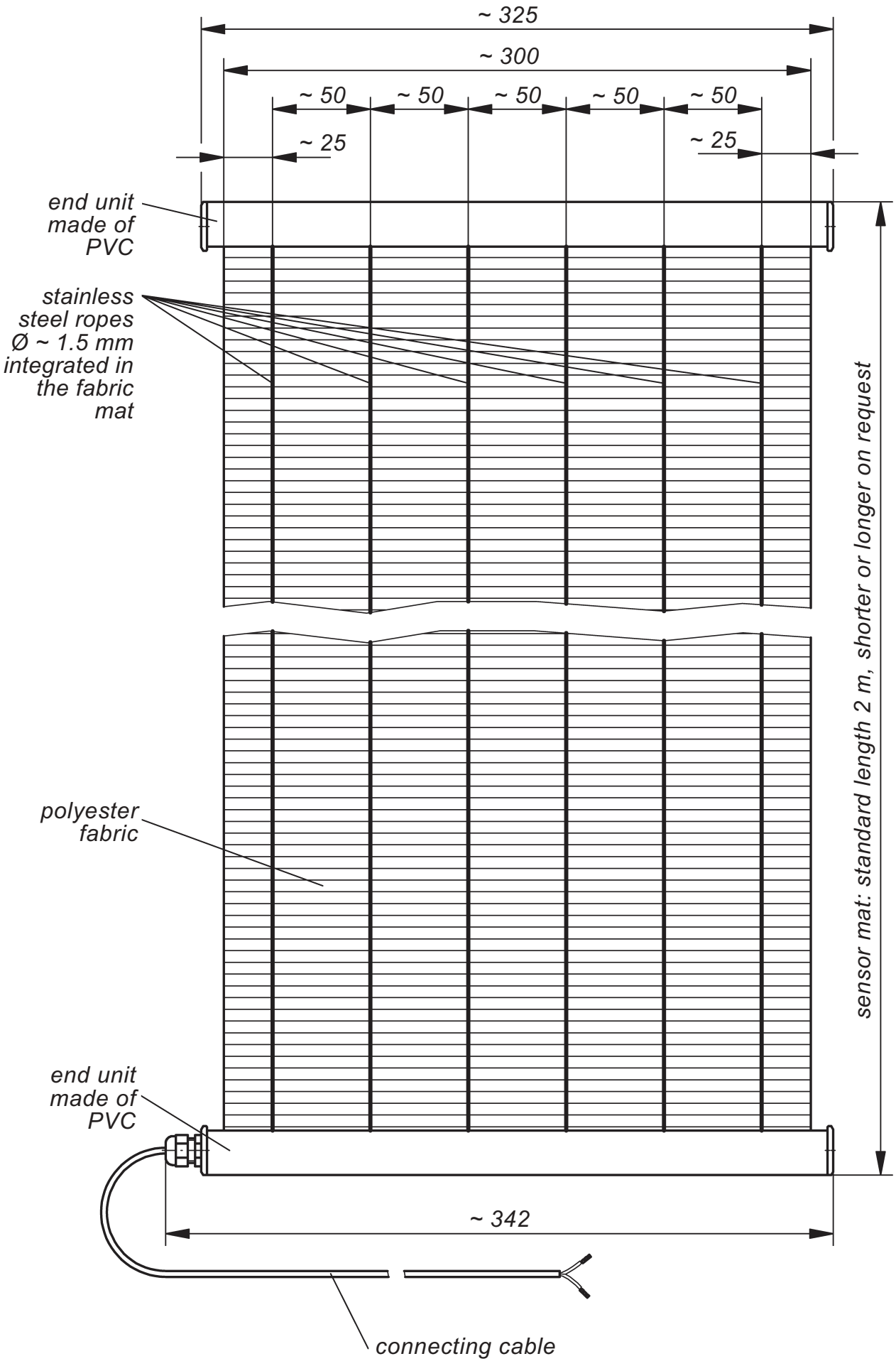
Application example with a conductive mat electrode



Use of a mat electrode for leakage detection of an electrically conductive liquid in a collection tub

DMEL 6 and DMEL 6-Z10
conductive mat electrode

Technical data	DMEL 6	DMEL 6-Z10
Design	3 control electrodes and 3 ground electrodes	
Sensitive elements	6 sensor cables in form of 6 ropes made of stainless steel 316, each 1.5 mm in dia., woven into an approx. 300 mm wide polyester fabric sensor mat at a spacing of approx. 50 mm, end units of the sensor mat made of PVC length 2 m, shorter or longer on request	
Max. length of the sensor mat	10 m, if the sensor mat is wound around a pipe or tank, the possible length may be considerably shorter depending on the type and method of laying.	
Electrical connection	connecting cable 2X0.75 length 2 m, on request: • longer • halogen-free	
Temperature range	– 20°C to + 60°C	
Cable break monitoring to monitor the connecting cable and the sensor cables	**without**	**with** integrated Z10 cable break monitoring unit
Classification	connection to one of the following conductive electrode relays	
• **with** cable break monitoring unit, **without** DIBt certificate		**LeakConductive 101** or **LeakConductive 101/S:** one MEL 6-Z10 **LeakConductive 171/1** or **LeakConductive 171/2:** one MEL 6-Z10 **LeakConductive 155** or **LeakConductive 255 :** max. five MEL 6-Z10
• **without** cable break monitoring unit, **without** DIBt certificate	**LeakConductive 5** or **LeakConductive 5/G:** any number of MEL 6 may be connected in parallel to either one of these relays.	
Max. length of connecting cable	1,000 m between electrode relay and mat electrode minus 3 x the length of the mat electrode	



Dimensions in mm

Examples of electrically conductive liquids

Accumulator acid, 32 %
Acetic acid, 70 %
Acrylic acid, 70 %
Adipic acid *
Aluminium chloride *
Aluminium potassium sulphate: see alums
Aluminium salts from mineral acids: see alums
Aluminium sulphate *
Alums (Me(I)-Me(III) sulphates) *
Ammonia water (ammonia solution), 25 %
Ammonium acetate *
Ammonium bromide *
Ammonium carbonate *
Ammonium chloride *
Ammonium fluoride *
Ammonium nitrate *
Ammonium phosphate *
Ammonium sulphate *
Ammonium sulphide, 40 %
Ammonium thiosulphate *
Anodic oxidation bath (HNO_3-30 %, H_2SO_4-10 %)
Anticalcium: see antiliming agent (sulfamic acid)
Antiliming agent (sulfamic acid), 50 g/l of H_20
Aqua regia, nitrohydrochloric acid, 1 : 1

Barium carbonate *
Barium chloride *
Barium hydroxide *
Barium nitrate *
Bicarbonate of ammonia *
Borax (sodium tetraborate) *
Borofluoric acid (tetra boro fluoric acid), 35 %
Bromine water *

Cadmium chloride *
Cadmium sulphate *
Calcium acetate *
Calcium bromide *
Calcium chloride *
Calcium fluoride *
Calcium hydroxide *
Calcium hypochlorite *
Calcium sulphate
Caustic potash solution (potassium hydroxide) *
Caustic soda, 32 %
Chlorine water *
Chloroacetic acid, saturated
Chlorsulfon acid, > 97 %
Chromic acid, 5 %
Chromic sulfuric / acid mixture
Citric acid *
Cupric chloride *
Cupric cyanide *
Cupric nitrate *
Cupric sulphate *

Electroplating bath, $AgNO_3$/KCN
Ethylen diamine tetra acetic acid (trilon B)

Ferric (III) chloride *
Ferrous (II) sulfate
Formaldehyde, 40 %
Formic acid, 80 %

Glycol acid, 50 %

Hydrazine hydrate, 80 %
Hydrobromic acid, aqueous solution *
Hydrochloric acid, 37 %
Hydrofluoric acid (fluohydric acid), 40 %
Hydrogen peroxide, 30 %

Javel water / bleaching lye: see sodium hypochloride

Liquid fertilizer application: see manuring salts

Magnesium chloride *
Magnesium hydroxide carbonate (magnesium carbonate) *
Magnesium sulphate *
Manuring salts / saline manure
Mercury nitrate *
Mercury sulphate *

Naphtalene sulphonic acid *
N-butyric acid, 70 %
Nickel chloride *
Nickel nitrate *
Nitrating acid mixture: see aqua regia, nitrohydrochloric acid
Nitric acid (fuming)
Nitric acid (not fuming), approx. 65 %
Nitrolotriacetic acid (Trilon A) *
Nitrosylsulphuric acid, 30 %

Oleum: see sulfuric acid, fuming

Phenidone (1-Phenyl-3-Pyra-zolidinone)
Phosporic acid, concentrated
Photographic developer, pure
Picric acid *
Potassium bicarbonate *
Potassium borate *
Potassium bromade
Potassium bromide *
Potassium carbonate (potash) *
Potassium chlorate *
Potassium chloride *
Potassium cyanide *
Potassium ferrocyanide and potassium ferricyanide *
Potassium iodide *
Potassium nitrate *
Potassium sulphate *
Propionic acid, 80 %

Salicylic acid *
Silver nitrate, 2 % solution
Sodium acetate *
Sodium aluminium sulphate: see alums
Sodium bisulphite *
Sodium bromide *
Sodium carbonate *
Sodium chlorate *
Sodium chloride *
Sodium cyanide *
Sodium dichromate *
Sodium dithionite *
Sodium hydrogen carbonate *
Sodium hydrogen sulphate *
Sodium hypochlorite (up to 30°C; 150 g/l of active chlor)
Sodium nitrate *
Sodium nitrite *
Sodium peroxide *
Sodium phosphate *
Sodium silicate *
Sodium sulfide *
Sodium sulphate *
Sodium sulphite *
Sodium tetraborate: see Borax
Sodium thiosulphate *
Sulfuric acid, 20 %
Sulfuric acid, 96 - 98 % **
Sulfuric acid, fuming (oleum), 65 % SO_3 **
Sulfurous acid, 5 - 6 % SO_2

Tartaric acid *
Tin(II) chloride *
Trichloracetic acid

Water (tap water)

Zinc chloride *
Zinc nitrate *
Zinc sulphate *

* Saturated solution

** Only suitable for point sensors, because the line and surface sensors have a too long reaction period

A reliable detection of electrically poor conductive liquids (compared to the above-mentioned liquids) can be achieved by adaption of the sensitivity of the conductive electrode relay in our works (on request).