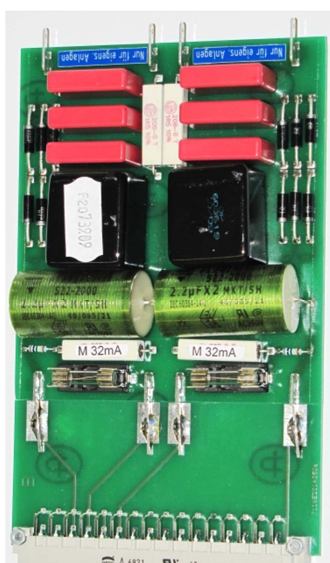


LF coupler of type iKNF5

Ordering data

Designation	Type	Item no.
LF coupler	iKNF5	128 805 21 AX
LF coupler iKNF5 with adapter board, 32-pin plug connector of Eurocard size (100x160 mm)	iKNF5	128 805 21 11 AX
Subrack for 14 x iKNF5 with adapter board		118 805 10



iKNF5 with adapter board



Subrack

- **LF transmission from intrinsically safe into non-intrinsically safe circuits and vice versa**
- **Transmission range 0.3 ... 100 kHz**
- **For the DC-free transmission of:**
 - **LF telecontrol signals in telecontrol and automation systems (ZM51)**
 - **Voice in intercom systems**
- **Plug-in module 100x160mm (Eurocard size) for 19" subracks**

Application

The type iKNF5 coupler is used to couple intrinsically safe with non-intrinsically safe circuits. The coupler has to be installed in a housing which either is located outside the potentially explosive atmosphere and at least ensures protection type IP20 as per EN 60529, or conforms to an acknowledged protection type (e.g. "flame-proof enclosure"). The coupler is of protection type [Ex ia Ma] I.

Mode of operation

Two identical circuit sections inside the iKNF5 coupler ensure the transmission of the respective LF voltages (frequency range 0.3 to 100 kHz) between an intrinsically safe and a non-intrinsically safe circuit and vice versa. A transformer in each circuit section ensures the safe electrical isolation between the intrinsically safe and the non-intrinsically safe side.

Protective resistors in connection with one fuse each and one current limiting

capacitor on the non-intrinsically safe side as well as voltage limiting Zener diodes and decoupling capacitors plus protective resistors on the intrinsically safe side ensure the limiting of the voltages and currents on the intrinsically safe side.

Configuration

The coupler consists of a printed circuit board of size 100x100mm which is equipped with all electrical components.

To connect the external circuits, each side of the board is fitted with clearly marked connectors (flat connectors for receptacles on the intrinsically safe side and angular pins for mounting in protective housings and cabinets on the non-intrinsically safe side).

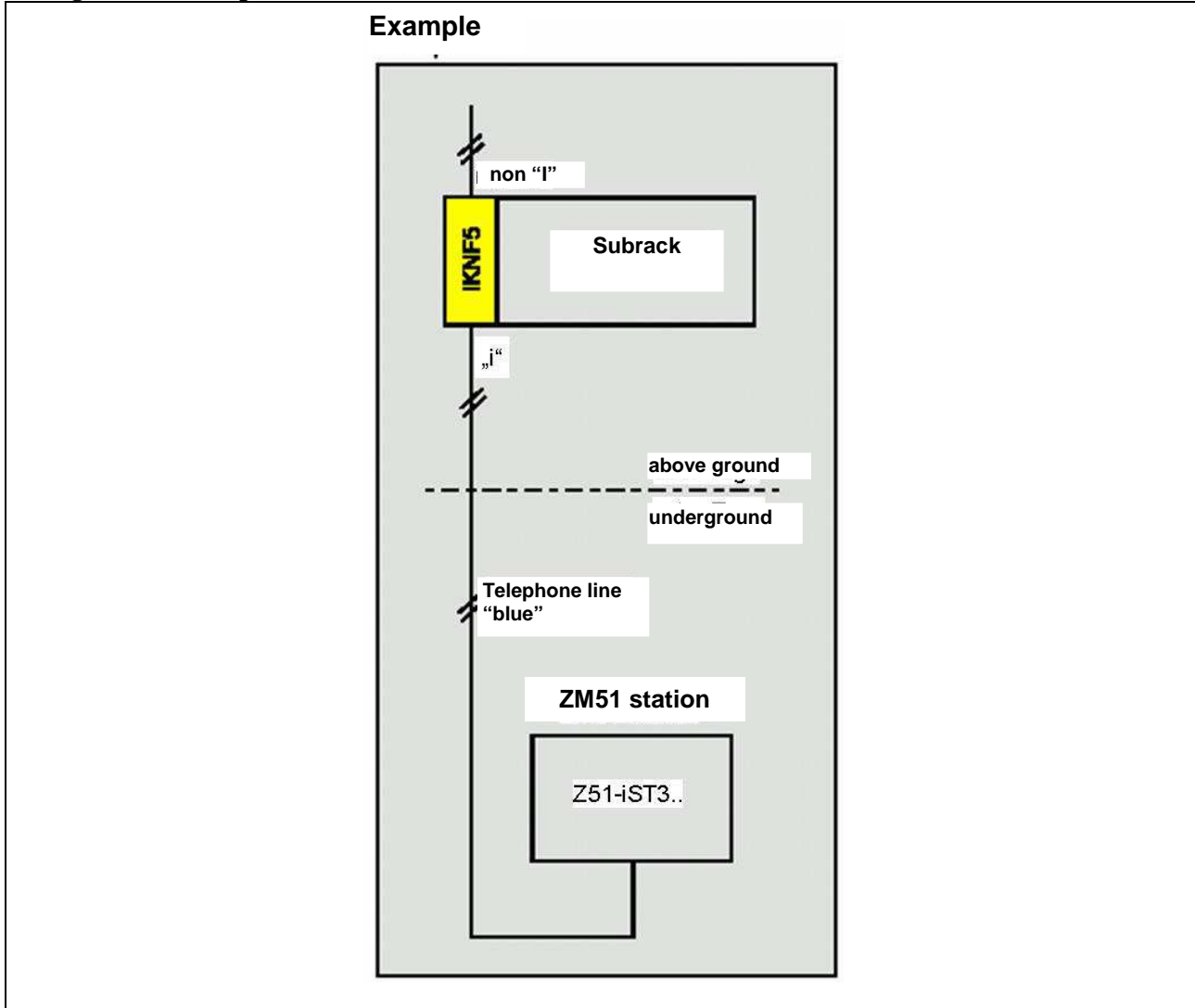
LF coupler of type iKNF5

For operation in a subrack, the iKNF5 coupler is extended by an adapter board (100x60mm) so that a

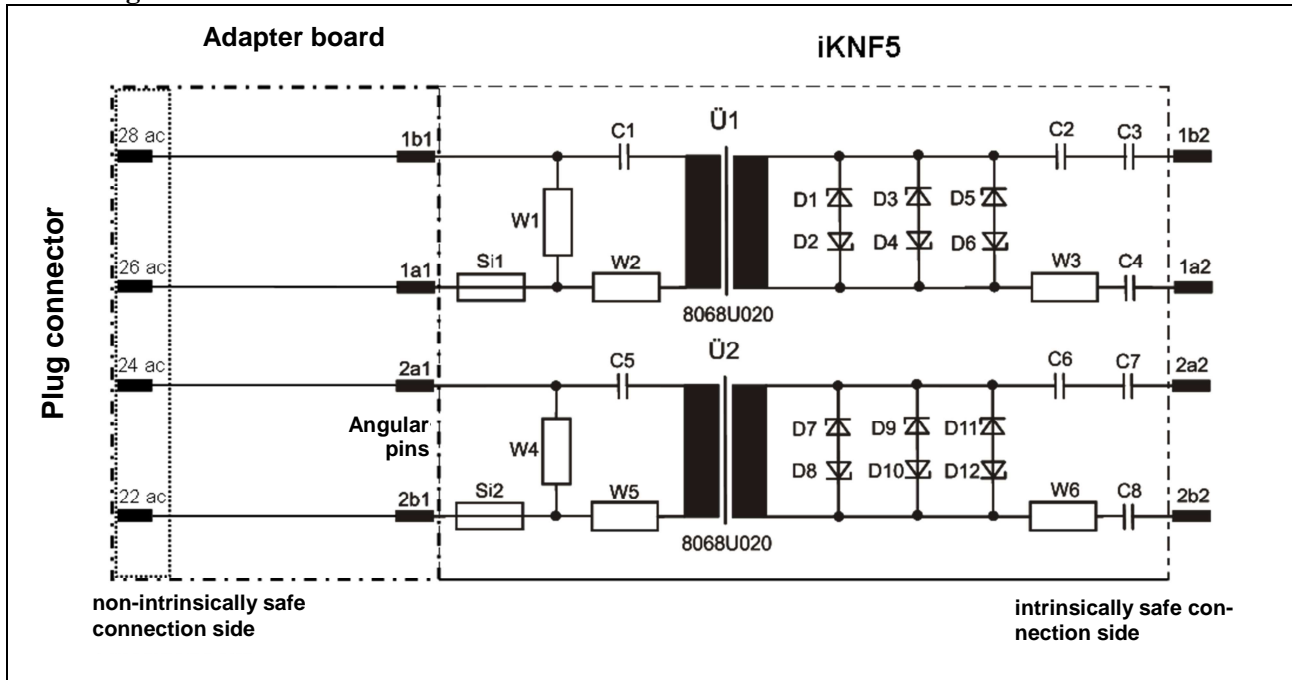
flush mounted unit is generated. The angular pins on the non-intrinsically safe side are fixed on the adapter

board by soldering. For connecting the contacts on the subrack, a 32-pin C type plug connector is used.

Configuration example



Block diagram



Technical data

Designation	LF coupler
Type	IKNF5
Non-intrinsically safe audio frequency circuits	
Connections (iKNF5 non-intrinsically safe side)	1a1 / 1b1 and 2a1 / 2b1
Connections (plug connector of adapter board)	26ac, 28ac and 22ac, 24ac
Rated voltage for uninterrupted operation	5 V _{eff} AC
Frequency range	300 Hz ≤ f ≤ 100 kHz U _m 253 V AC 50 Hz
Intrinsically safe audio frequency circuits	
Connections	1a2 / 1b2 and 2a2 / 2b2
Voltage U ₀	5 V _{eff} AC (7.2 V _s)
Current I ₀	154 mA
Power P ₀	200 mW
Effective internal capacitance C _i	4 μF
Effective internal inductance L _i	negligible
Voltage U _i	20 V _{eff} AC 30 V DC) ¹
Current I _i) ²	
Power P _i	750 mW
) ¹ superimposed DC voltage	
) ² not applicable due to design	
Temperature range	
- Operation	-20°C to +40°C
- Storage	-25°C to +60°C
- Transport	-25°C to +60°C
Test and approval	
- Type of protection	I (M1) [Ex ia Ma] I
- Appr. no.	DMT 02 ATEX E 174 U
Operating conditions	
- Outside operating areas susceptible to fire-damp	Installation in an enclosure of at least IP20 as per EN 60529
- Inside operating areas susceptible to fire-damp	Installation in an enclosure of an acknowledged type of protection (e.g. "flame-proof enclosure")
Operating mode	Continuous operation
Dimensions	100 mm x 160 mm
Weight	approx. 0.248 kg
Marking	
The nameplate is marked as follows:	
Company	FHF Bergbautechnik 42551 Velbert
Type	iKNF5 ⊕ I (M1) [Ex ia Ma] I DMT 02 ATEX E 174 U CE 0158
	F. No.... Test....(short sign, month/year)

Installation, mounting and advice on use

For an application outside the potentially explosive atmosphere, the coupler of type iKNF5 has to be installed in an enclosure which at least ensures protection type IP20 as per EN 60529. For use inside the potentially explosive atmosphere the coupler shall be installed in an enclosure of an acknowledged protection type (e.g. "flame-proof enclosure). After activation of the coupler's non-intrinsically safe side, a waiting time of at least 7s for the discharge of the capacitors on that side shall be observed before opening the enclosure is permissible whose design has to conform to an acknowledged type of protection. The internal wiring in this enclosure has to be configured as per section 06.03.12 and 7.6.e of EN 60079-11:2012. Connecting terminals or plug connectors for the intrinsically safe circuits have to be arranged as per section 6.2.1 and/or 6.2.2 of EN 60079-11:2012.

Normally, the iKNF5 is inserted into a 19" subrack for customary control cabinets. The subrack itself is 3HU (132.5 mm) high, while in the cabinet a height of 4HU is required, as all lines on the front side (intrinsically safe side) need to be supported and routed through a cable duct. On its rear side, the subrack is provided with 14 type C socket connectors, with 32 pins with soldering tags. Upon inserting the coupler components, these pick up the plug connectors on the non-intrinsically safe side.

In connection with the use of the coupler, an appropriate rack for insertion of the individual board as an alternative to the above mentioned 19" subrack is available.

Disposal

The disposal of the packaging material and of used parts must be realised in compliance with the regulations of the country in which the device is installed.

Warnings & Safety Advice

<p>This equipment item is a device protected against firedamp and conforms to equipment group I. Especially the following warnings and safety advice shall be observed:</p>
<p>The interconnection with other electrical equipment must be certified separately.</p>
<p>Connection and installation of the equipment item have to be carried out by an instructed qualified expert in due consideration of the specified type of protection and in accordance with the applicable regulations for installation. The wires of the intrinsically safe and of the non-intrinsically safe side must not be installed in joint cable ducts. They have to be isolated in accordance with the regulations of installation. When these cables can come into contact with metallic parts, they either have to be protected mechanically or have to be fixed to protect them against damage.</p>
<p>The device may only be connected and operated with the specified voltage. Any polarity specifications have to be observed.</p>
<p>Make sure to avoid any damage to the subrack.</p>
<p>The device must only be operated under the indicated ambient conditions. Harsh ambient conditions can result in damage to the device and therefore lead to a possible risk for the life of the user. Harsh ambient conditions can be:</p> <ul style="list-style-type: none"> • moisture, dusts (pay attention to degree of protection) • combustible gases, vapours, solvents which the type of protection does not cover. • excessively high ambient temperatures (>+40°C) • excessively low ambient temperatures (<-20°C)
<p>The ambient temperature range specified for the device must neither be exceeded nor fallen short of during operation (-20°C to +40°C), storage and transport (-20°C to +60°C).</p>
<p>The LF coupler iKNF5 must only be operated in a subrack or equivalent mounting system.</p>
<p>Attachment or installation of further parts is not permitted.</p>
<p>Non-observance of the above mentioned points results in loss of the explosion protection.</p>

<p>FHF Bergbautechnik GmbH & Co. KG Eintrachtstr. 95 42551 Velbert</p>	 <p>FHF Bergbautechnik GmbH & Co. KG</p>	<p>Tel: +49 (0) 2051 270 – 0 Fax: +49 (0) 2051 270-366 Email: info@fhf-bt.de www.fhf-bt.de</p>
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BESCHEINIGUNG der KONFORMITÄT

gemäß Richtlinie 94/9/EG Artikel 8 Absatz 3

CERTIFICATE of CONFORMITY

according to Direction 94/9/EC Article 8 (3)

Wir erklären in alleiniger Verantwortung, dass das Produkt auf das sich diese Bescheinigung bezieht mit der/den folgenden Norm(en) oder normativen Dokumenten übereinstimmt.

Die Merkmale der Komponente sowie die Bedingungen für deren Einbau sind in diesen Verwendungshinweisen festgelegt.

Herewith we declare bearing sole responsibility that the product referred in this certificate is in conformity with the following standards or normative documents and regulations of the directive.

The characteristics of the component and the conditions for their installation are specified in these instructions for use.

Beschreibung des Erzeugnisses	Koppler
Description of product	Coupler
Komponentenbezeichnung Type designation of component	iKNF5
Bestimmung der Richtlinie Provisions of the directive	Nr. und Ausgabedatum der Norm(en) No. and date of issue of the standard(s)
94/9/EG: Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen 94/9/EC: Equipment and protective systems intended for use in potentially explosive atmospheres	EN 60079-0:2012 EN 60079-11:2012 EN 50303:2000
EG-Baumusterprüfbescheinigung EC-type-examination certificate	DMT 02 ATEX E 174 U
Kennzeichnung Marking	I (M1) [Ex ia Ma] I
Benannte Stelle für die Bescheinigung Notified body of the certificate <i>Kennnummer / Inspection number</i>	DEKRA EXAM 0158
Hersteller / Anschrift Manufacturer / Factory address	FHF Bergbautechnik GmbH & Co. KG Eintrachtstr. 95 D - 42551 Velbert

Geschäftsführer:
Managing director:

Schwengers, Jörg

.....
(Name, Vorname / name, prename)

Velbert

.....
(Ort / place)

02.07.13
.....
(Datum / date)


.....
(Unterschrift / signature)