



## IF\* and VIE\*-\*\* (Ex) Inductive Pickups and Pulse Amps for use at extreme temperatures

The main advantage of the IF\* pickup is its resistance to extreme temperatures. Special versions with separate pickup and amplifier as shown below are available for fluid temperatures ranging from  $-273^{\circ}\text{C}$  up to  $+350^{\circ}\text{C}$ . The max. permissible temperature varies in accordance with the type of flow meter used, it is defined as follows:

max.  $+150^{\circ}\text{C}$  for SRZ helical flow meters

max.  $+180^{\circ}\text{C}$  for ZHM gear flow meters

max.  $+350^{\circ}\text{C}$  for HM turbine flow meters

The IF pickup and VIE\* amplifier are also available in a compact design which combines both units in one.



IF\* Pickup



IF\* HTK Pickup with heat sink




VIEG Amplifier

### Principle

The IF\* inductive pickup detects the r.p.m. of a KEM turbine-, helical- or gear flow meter. Each passage of a rotorblade or gear respectively changes the magnetic field of the pickup and an alternating voltage is induced in the pickup because of the change in magnetic flux. The VIE\* will amplify the sinusoidal output voltage of the pickup and convert it to a current or voltage squarewave signal with a number of pulses per time unit proportional with the instantaneous flow rate.

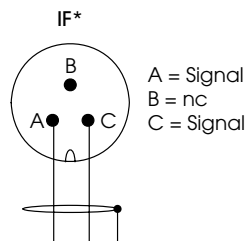
The VIE\* amplifier may be operated in two- or three-wire connection. A low-impedance input transmitter provides isolation and high resistance to interference.

IS-approved versions as per ATEX 100a  II 2G EEx ia IIC T6 are available.

Our intrinsically safe power supply and separation amplifier type EWS is recommended to power the IS versions.

Technical Data IF\*

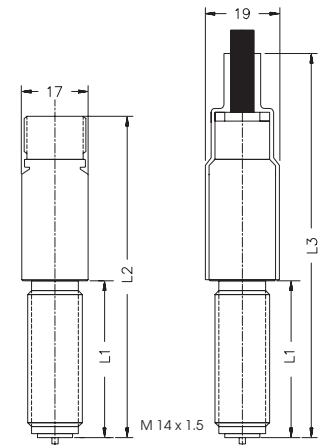
max. fluid temperature: +120°C (IF\*), +240°C (IF\*.HT), +350°C (IF\*.HTK)  
 max. ambient temperature: +125°C (special version IFL-HT up to +200°C available)  
 output: voltage  $U_{ss}$  0.5 to 500mV  
 electrical connection: IF\*: 3-pin amphenol plug type 8001-10SL-3P-FP-A3 and socket type MS3106A-10SL-35, max.  $\varnothing$  22mm  
 IF\*.PG: 3m NF cable blue



Marking of the pickup

0123 II 2 G EEx ia IIC T6  
 BVS 03 ATEX E 206  
 IF\*-\*\* Nr. 1234567

output resistor: < 100Ω  
 weight: IFK, IFR: approx. 70g, IFL, IFS: approx. 90g; IF3: approx. 50g  
 inductivity: < 25mH  
 no. of windings: approx. 1,325  
 core  $\varnothing$ : 0.08mm  
 Ex-protection ATEX 100: II 2 G EEx ia IIC T6  
 pickup housing: stainless steel as perDIN 1.4101  
 dimensions: IFK, IFR:  
 L1 = 40mm, L2 = 86mm, L3 = 99mm  
 IFL, IFS:  
 L1 = 80mm, L2 = 126mm, L3 = 139mm  
 IFE:  
 L1 = 40mm, L2 = 185mm  
 IF 3  
 L1 = 22mm, L2 = 67mm




Ordering Information

IF\*.\*\*-Ex

- Ex = Ex-protected version ATEX 100 II 2 G EEx ia IIC T6
- PG = with cable sleeve 4–6 mm and 3m cable
- HT = high temperature version for up to +240°C
- HTK = with heat sink for up to +350°C (no Ex-version)
- K = short, for ZHM 02–04 and HM series
- L = long, for ZHM 02–07 and HM series
- R = short for ZHM 01 and SRZ series
- S = long for ZHM 01 and SRZ series up to +150°C fluid temp.
- E = extra long for flow meters with heat jacket
- 3 = for HM series (follow-up of IG 03)

Technical Data VIE\*

Ex-protection 100a:	 II 2 G EEx ia IIC T6, BVS 03 ATEX E 207
allowable ambient temperature:	-20°C up to +50°C
fluid temperature:	max. + 120°C with a distance of at least 25mm
(not relevant for type VIEG)	between flow meter and amplifier housing
	max. + 150°C with a distance of at least 65mm
	between flow meter and amplifier housing
supply voltage $U_B$ :	+7 up to 29VDC
quiescent current $I_R$ :	< 4mA
frequency range:	7 up to 3,000Hz according to flow meter
input impedance:	< 100Ω
input:	0.5 up to 500mV
electrical connection:	one or two 3-pin terminals for inductive pickup, amplifier, supply and output signals, max. wire size 2.5mm <sup>2</sup>
housing:	aluminium, L = 64, B = 58, H = 37 (mm) one or two cable sleeves type PG7
pickup housing:	stainless steel as per DIN 1.4104
protection class:	IP65 (DIN 40050)
weight:	approx. 400g
outputs:	frequency output, selectable: <i>voltage level three-wire NPN/PNP</i>
	a) three-wire active NPN
	high level: $U_{high} > U_B - 0.6V - (2.6k\Omega \cdot I_{out})$
	low level: $U_{low} < 0.6V + (1.3k\Omega \cdot I_{out})$
	b) three-wire passive NPN/open collector
	high level: $U_{High} > U - (1.3k\Omega \cdot I_{out})$
	low level: $U_{Low} < 0.6V + (1.3k\Omega \cdot I_{out})$
	U is applied at the output, max. 29V
	c) three-wire active PNP (not available for Ex-versions)
	high level: $U_{high} > U - 0.6V - (150\Omega \cdot I_{out})$
	low level: $U_{low} = \text{blocking}$
	$I_{max.} = 60mA$ , $P_{max.} \text{ an } R_s = 1W$ , $R_s = 150\Omega$
	<i>current level two-wire DIN 19234 NAMUR</i>
	high level: $I_{high} > 2.2mA$
	low level: $I_{low} < 1.1mA$

## Safety-relevant parameters (only for Ex-versions)

a) *three-wire active NPN, version VIE\*-3A*

input:	terminal 1 and 2:	$U_{max.} = 30V$	$I_{max.} = 150mA$	
		$R_i = 1.2k\Omega$	$C_i = 0$	$L_i = 0$
output:	terminal 2 and 3:	$U_{max.} = 30V$	$I_{max.} = 25mA$	$P_{max.} = 106mW$
		$R_i = 1.2k\Omega$	$C_i = 0$	$L_i = 0$

b) *three-wire passive NPN/open collector, version VIE\*-3P*

input:	terminal 1 and 2:	$U_{max.} = 30V$	$I_{max.} = 150mA$	
		$R_i = 1.2k\Omega$	$C_i = 0$	$L_i = 0$
output:	terminal 2 and 3:	$U_{max.} = 30V$	$I_{max.} = 500mA$	
		$R_i = 1.2k\Omega$	$C_i = 0$	$L_i = 0$

c) *two-wire DIN 19234 NAMUR, version VIE\*-2N*

in-, output:	terminal 1 and 2:	$U_{max.} = 30V$	$I_{max.} = 150mA$	$P_{max.} = 175mW$
		$C_i = 100nF$	$L_i = 0$	$R_i = 0$
	terminal 2 and 3	$U_{max.} = 30V$	$I_{max.} = 500mA$	
	terminal 3 n. c.			

d) *version VIEG\*\*-\*\**

inputs:	terminal 5 and 6:	$U_{max.} = 0.8V$	$I_{max.} = 2mA$	
		$R_i = 15\Omega$	$C_i = 0$	$Leq = 10mH$

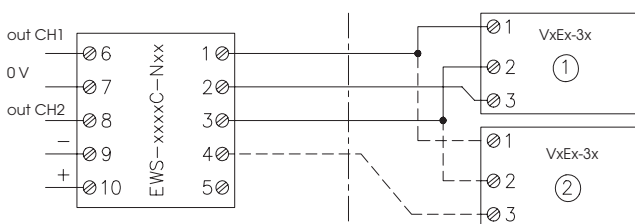
Connect only pickups of the following safety-relevant values to input terminals 5 and 6:

$U_{max.} = 30V$	$I_{max.} = 65mA$
$P_{max.} = 25mW$	$L/R < 2.4mH/\Omega$

## Examples for connecting Ex-versions

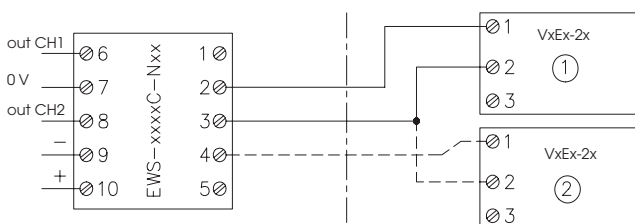
outside hazardous area

inside hazardous area



### three-wire connection

EWS-xxxxC-Nxx with one or two off VIE\*-3\*




### two-wire connection



EWS-xxxxC-Nxx with one or two off VIE\*-2\*

EWS = intrinsically safe power supply and separation amplifier

## Marking of the pulse amplifier

### Two-wire connection

 Küppers Elektromechanik GmbH

 0123  II 2 G EEx ia IIC T6

BVS 03 ATEX E 207

V\*E\*2\* Nr. 12345678

$-20^{\circ}\text{C} \leq T_a \leq 50^{\circ}\text{C}$

KL 1/2  $U_i = 30\text{ V}$ ,  $I_i = 150\text{ mA}$ ,  $P_i = 175\text{ mW}$ ,  $C_i = 100\text{ nF}$ ,  $L_i = 0$


KL 2/3  $U_i = 30\text{ V}$ ,  $I_i = 500\text{ mA}$



KL 5/6  $U_i < 0.8\text{ V}$ ,  $I_i < 2\text{ mA}$ ,  $R_i = 15\ \Omega$ ,  $C_i = 0$ ,  $L_i = 10\text{ mH}$  <sup>1)</sup>

KL 1 =  $U_b$ , 2 = 0 V, 3 = n.c.

KL 4 = shield, 5/6 = coil<sup>1)</sup>

### Three-wire connection

 Küppers Elektromechanik GmbH

 0123  II 2 G EEx ia IIC T6

BVS 03 ATEX E 207

V\*E\*-3\* Ser.Nr. 12345678

$-20^{\circ}\text{C} \leq T_a \leq 50^{\circ}\text{C}$

KL 1/2  $U_i = 30\text{ V}$ ,  $I_i = 150\text{ mA}$ ,  $R_i = 1,2\text{ k}\Omega$ ,  $C_i = 0$ ,  $L_i = 0$

KL 2/3  $U_i = 30\text{ V}$ ,  $R_i = 1.2\text{ k}\Omega$ ,  $C_i = 0$ ,  $L_i = 0$

VIE\*-3A:  $I_i = 25\text{ mA}$ ,  $P_i = 106\text{ mW}$

VIE\*-3P:  $I_i = 0,5\text{ A}$

KL 5/6  $U_i < 0.8\text{ V}$ ,  $I_i < 2\text{ mA}$ ,  $R_i = 15\ \Omega$ ,  $C_i = 0$ ,  $L_i = 10\text{ mH}$  <sup>1)</sup>

KL 1 =  $U_b$ , 2 = 0 V, 3 = output

KL 4 = shield, 5/6 = coil<sup>1)</sup>

<sup>1)</sup> only type VIEG

The sticker indicates year of manufacture and person in charge of test.

## Notes on Installation

The following has to be adhered to:

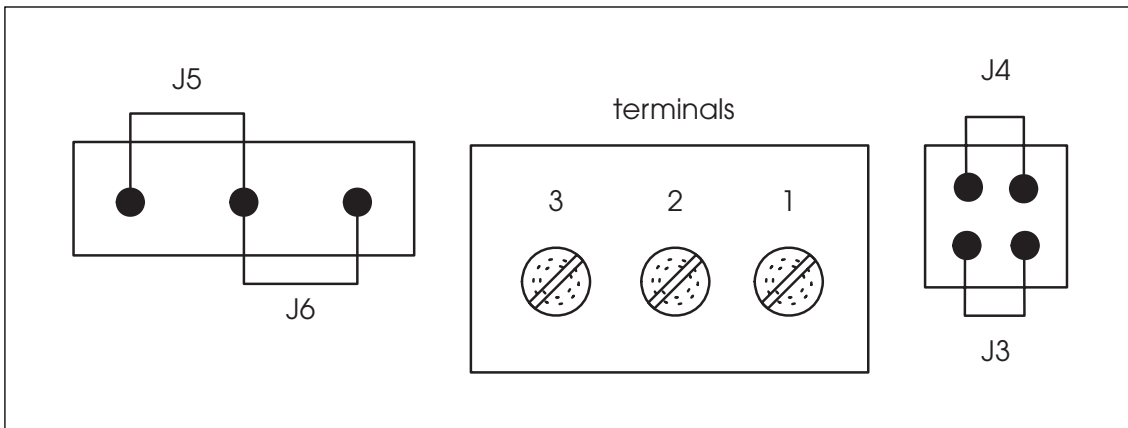
- Installation instructions for electrical devices  
Installation instructions for associated intrinsically-safe devices  
The »Special conditions for safe use« as per EC-Type Examination Certificate
- The amplifier has to be installed in a way that the max. ambient temperature does under no circumstances exceed  $+50^{\circ}\text{C}$  (consider self heating).
- With cables care should be taken, that the max inductivity and capacity of the respective voltage or gas group are not exceeded.
- Exceeding or falling below the regular measuring range will cause invalid frequency output signals.
- Shielded cables are to be used as connecting lines.
- Generally, supplied units have to be connected by an expert according to EMC stipulations.

## Adjusting the output mode

The output mode is adjustable via jumpers located on the amplifier board. The table below is also printed on the inside of the housing top.

With Ex-versions the output mode is adjusted by KEM according to customers' specifications and cannot be changed afterwards.

output mode	Jumper J3	Jumper J4	Jumper J5	Jumper J6
two-wire (current level)	...off	...on	...off	...off
three-wire active NPN	...on	...off	...off	...on
three-wire active PNP (PLC)	...on	...off	...on	...off
three-wire passive NPN	...off	...off	...off	...on



## Electrical connection

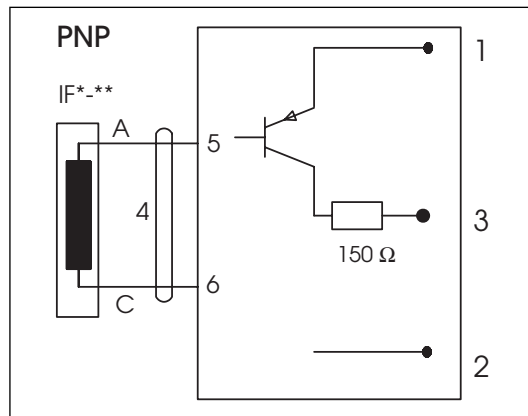
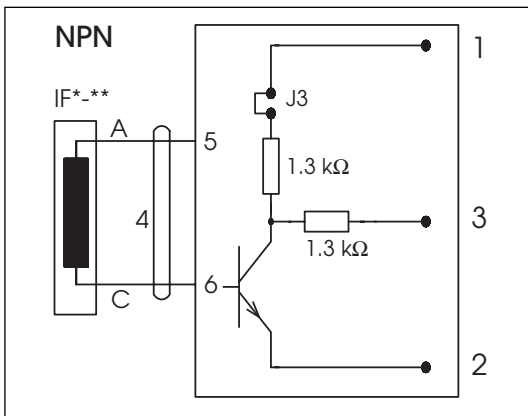
The electrical connection is to be effected via one or two 3-pin terminals inside the amplifier which are accessible via cable sleeves 4–6 mm.

*pin connection compact versions:*

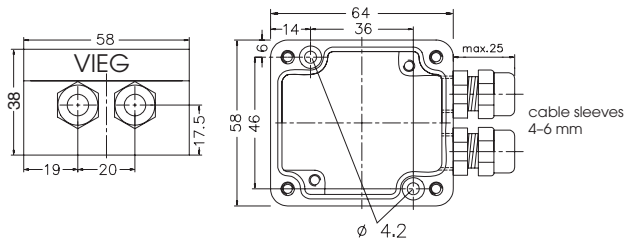
- 1 = +U<sub>B</sub>
- 2 = 0V/GND
- 3 = output signal

*pin connections separated versions type VIEG*

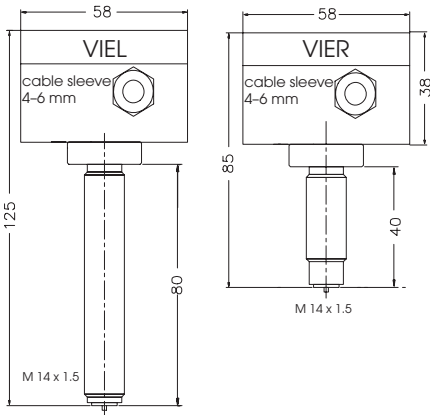
- 1 = +U<sub>B</sub>
- 2 = 0V/GND
- 3 = output signal
- 4 = 0V/GND/shield
- 5 = signal IF-coil
- 6 = signal IF-coil



## Dimensional drawings (mm)



**VIEG**  
separated version without pickup



**VIE\***  
compact version with pickup

## Ordering Information

### VIE\*

- EG = separated version: amplifier without pickup
- EK = short version with pickup for ZHM 02–04 and HM series depending on size
- EL = long version with pickup for ZHM 02–07 and HM series depending on size
- ER = short version with pickup for ZHM 01 and SRZ series
- ES = long version with pickup for ZHM 01 and SRZ series up to +150°C fluid temp.

### VIE\* - \*\* (Ex), Ex-protection ATEX100 II 2 G EExia IIC T6

- 2N = two-wire DIN 19234 NAMUR
- 3A = three-wire active NPN
- 3P = three-wire passive NPN/open collector
- EG = separated version: amplifier without pickup
- EK = short version with pickup for ZHM 02–04 and turbines depending on size
- EL = long version with pickup for ZHM 02–07 and turbines depending on size
- ER = short version with pickup for ZHM 01 and SRZ-series
- ES = long version with pickup for ZHM 01 and SRZ series up to +150°C fluid temp.

