

Technical Datasheet



VTE (Ex)

Carrier-Frequency Pulse Amplifiers

Description

The integral carrier-frequency pickup of the VTE detects the r.p.m. of KEM flow meters. During this process the damping of a carrier-oscillator by the gears or blades is picked up through the meters body and evaluated. The frequency of the resultant amplitude modulation of the carrier is equal to the number of revolutions of the wheel and therefore a standard for the flow rate. The VTE may be operated in two- or three-wire mode and provides current or voltage squarewave pulses.

Types VTE *.* (Ex) are IS-approved according to ATEX II 2G EEx ia IIC T6. Our intrinsically safe barrier type EWS is recommended to power the IS-approved versions.

Technical Data

Supply Voltage U_B	7 up to 29 V DC, 8 up to 29 V DC for Ex versions
Quiescent Current	< 4 mA
Frequency Range	3 up to 3,000 Hz according to transducer
Ambient Temperature	-40 °C up to +80 °C [-40 °F up to +176 °F] (non Ex) -20 °C up to +50 °C [-4 °F up to +122 °F] (Ex, T4)
Medium Temperature	Form K + R: -40 °C up to +120 °C [-40 °F up to +248 °F] ¹⁾ Form L + S: -40 °C up to +150 °C [-40 °F up to +302 °F] ²⁾
Housing	Aluminum, l = 64 mm, w = 58 mm, h = 38 mm
Pickup Housing	Stainless steel as per DIN 1.4104 [AISI 430F]
Weight	Approx. 250 g
Ingress Protection	IP65 (DIN 40050)
Ex Protection	II 2 G EEx ia IIC T6
Electrical Connection	3-pin terminals for supply and output signal Max. 2.5 mm ² cable gland 4 - 6 mm or 5-pin Amphenol plug type T3362500 for pin connections see page 3
Outputs	<p>Frequency output, selectable: Voltage level three-wire NPN/PNP</p> <p>a. Three-wire active NPN High level: $U_{high} > U_B - 0.6 V - (2.6 k\Omega * I_{out})$ Low level: $U_{low} < 0.6 V + (1.3 k\Omega * I_{out})$</p> <p>b. Three-wire passive NPN/open collector High level: $U_{high} > U - (1.3 k\Omega * I_{out})$ Low level: $U_{low} < 0.6 V + (1.3 k\Omega * I_{out})$ U is the voltage applied at the output (Open circuit voltage) max. 29 V</p> <p>c. Three-wire active PNP (not for Ex versions) High level: $U_{high} > U_B - 0.6 V - (150 \Omega * I_{out})$ Low level: $U_{low} = \text{sperrand}$ $I_{max.} = 60 \text{ mA}; P_{max.} \text{ an } R_s = 1 W; R_s = 150 \Omega$</p> <p>Current level two-wirer High level: $I_{high} > 2.2 \text{ mA}$ Low level: $I_{low} < 1.4 \text{ mA}$</p>

¹⁾ With a distance >25 mm between flow meter and electronic housing

²⁾ With a distance >65 mm between flow meter and electronic housing

Safety-relevant Parameters (only for Ex versions)

a. Three-wire active NPN, version VTE*-3A

Input:	KL1/KL2:	$U_{max} = 30\text{ V}$	$I_{max} = 150\text{ mA}$	
	$R_i = 1.2\text{ k}\Omega$	$C_i = 0\text{ nF}$	$L_i = 0$	
Output:	KL2/KL3:	$U_{max} = 30\text{ V}$	$I_{max} = 25\text{ mA}$	$P_{max} = 106\text{ mW}$
	$R_i = 1.2\text{ k}\Omega$	$C_i = 0\text{ nF}$	$L_i = 0$	

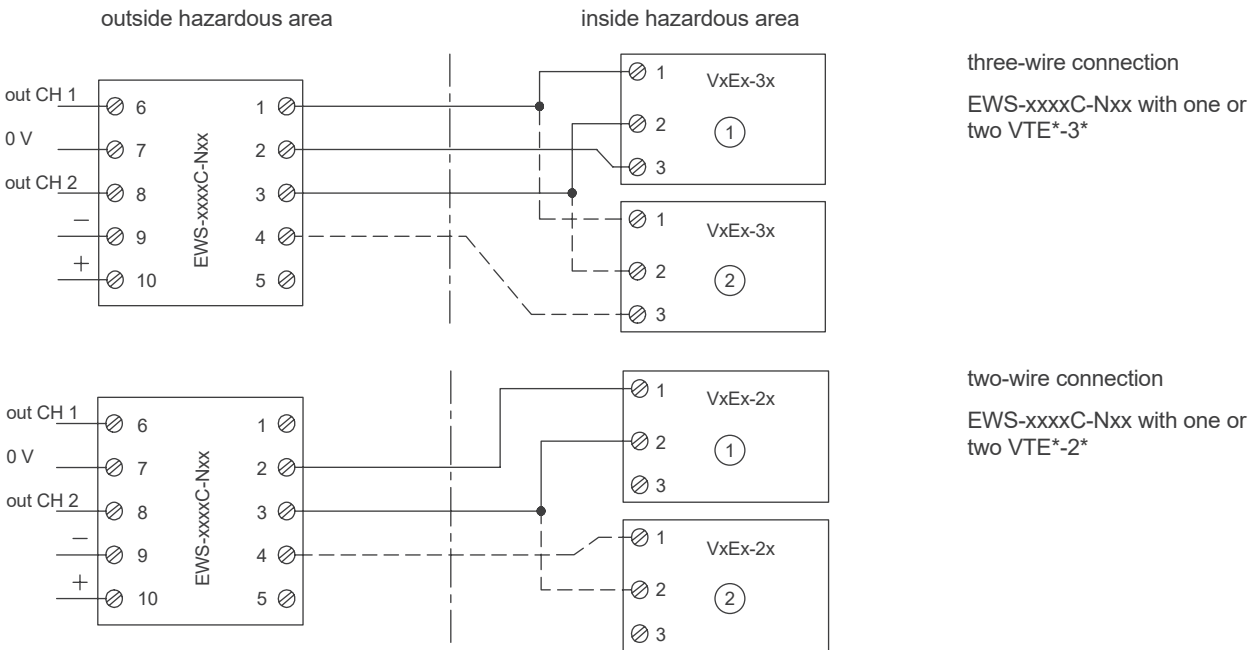
b. Three-wire passive NPN/OC, version VTE*-3P

Input:	KL1/KL2:	$U_{max} = 30\text{ V}$	$I_{max} = 150\text{ mA}$
	$R_i = 1.2\text{ k}\Omega$	$C_i = 0\text{ nF}$	$L_i = 0$
Output:	KL2/KL3:	$U_{max} = 30\text{ V}$	$I_{max} = 500\text{ mA}$
	$R_i = 1.2\text{ k}\Omega$	$C_i = 0\text{ nF}$	$L_i = 0$

c. Two-wire low power, version VTE*-2L

In-, output:	KL1/KL2:	$U_{max} = 30\text{ V}$	$I_{max} = 150\text{ mA}$	$P_{max} = 175\text{ mW}$
	$C_i = 56.4\text{ nF}$	$L_i = 0\text{ nF}$	$R_i = 0$	
	KL2/KL3:	$U_{max} = 30\text{ V}$	$I_{max} = 500\text{ mA}$	
	KL3 n.c.			

Examples for Connecting Ex Versions

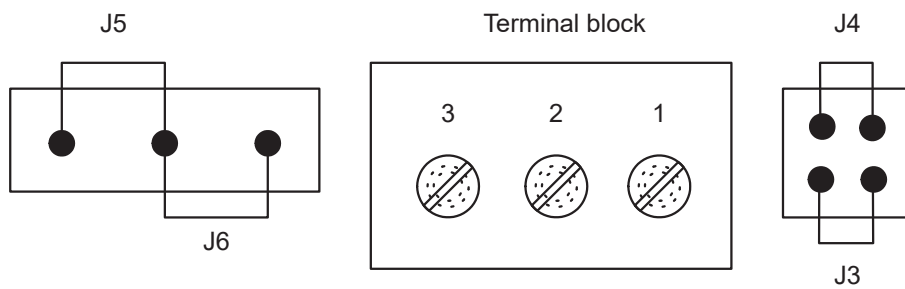


EWS = intrinsically safe power supply and separation amplifier

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	remove	insert	remove	remove
Three-wire Active NPN	insert	remove	remove	insert
Three-wire Active PNP (PLC)	insert	remove	insert	remove
Three-Wire Passive NPN	remove	remove	remove	insert

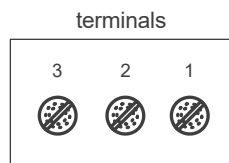


Electrical Connection

The electrical connection is, depending on version, either made with a 3-pin screw terminal, accessible by cable gland (4 - 6 mm) or a 5-pin Amphenol plug.

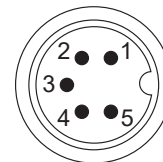
3-pin screw terminals

- 1 = +U_B
- 2 = 0 V/GND
- 3 = Signal



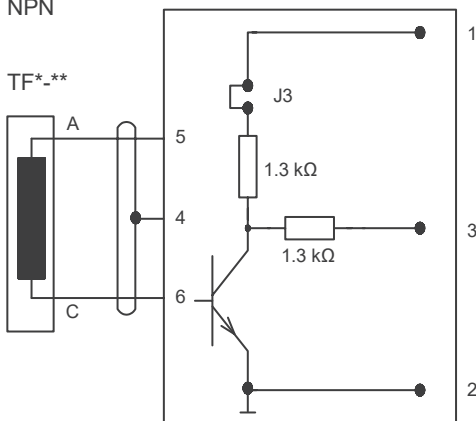
5-pin plug

- 1 = +U_B
- 2 = Signal
- 3 = 0 V/GND
- 4 = n.c.
- 5 = n.c.



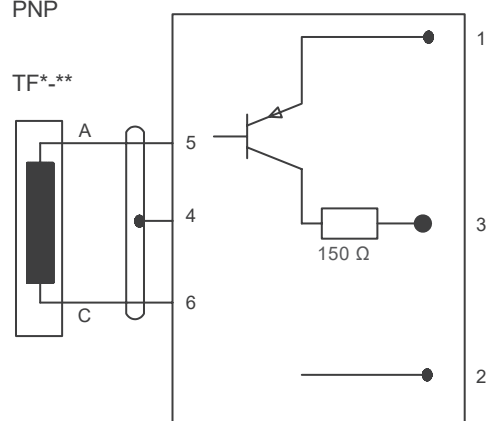
NPN

TF*-**

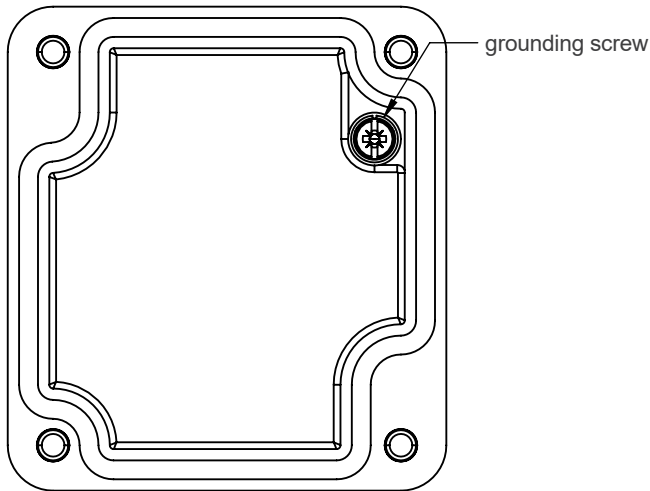


PNP

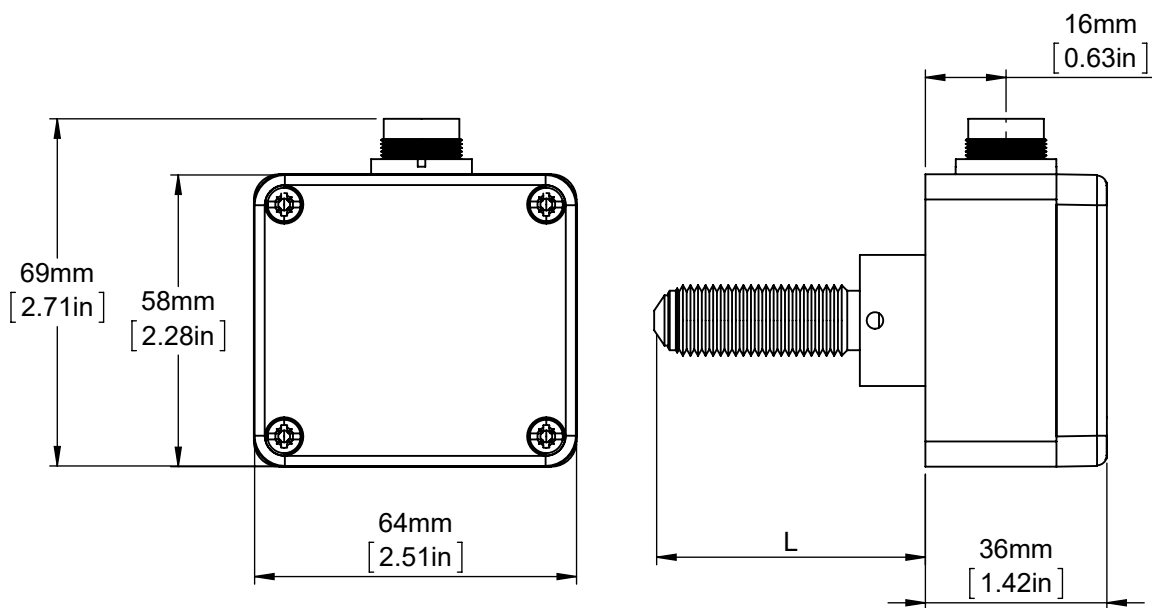
TF*-**



To connect the amplifier, shielded cables must be used. The shield should be connected to the case. For operation in hazardous areas a good connection of PE is mandatory. Therefore please apply the signal cable shield either to the cable gland of the amplifier or to the grounding screw (see drawing below).



Dimensional Drawing



Ordering Code

	VTE	X	-	X	X
Model					
ZHM 02 - 04, HM series		K			
ZHM 01, ZHM 01/*, SRZ series, LFM series		R			
ZHM 02 - 07, HM series		L			
ZHM 01, ZHM 01/*, SRZ series, LFM series		S			
Electronics					
Internal 3-pin screw terminals					
5-pin amphenol plug type T3362500				S	T

Ex Protection as per ATEX II 2G EEx ia IIC T6

	VTE	X	-	X	X	(Ex)
Model						
ZHM 02 - 04, HM series		K				
ZHM 01, ZHM 01/*, SRZ series, LFM series		R				
ZHM 02 - 07, HM series		L				
ZHM 01, ZHM 01/*, SRZ series, LFM series		S				
Electronics						
Two-wire current level low power, NAMUR				2	L	
Three-wire voltage level active NPN				3	A	
Three-wire voltage level passive NPN/OC				3	P	

Safety Instructions

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 °C [+122 °F] (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.



Küppers Elektromechanik GmbH

www.kem-kueppers.com

info@kem-kueppers.com

KEM Headquarters

Liebigstraße 5
85757 Karlsfeld
Germany

T. +49 8131 59391-0
F. +49 8131 92604

info@kem-kueppers.com

KEM Manufacturing Center

Wetzeller Straße 22
93444 Bad Kötzing
Germany

T. +49 9941 9423-0
F. +49 9941 9423-23

production@kem-kueppers.com

KEM Sales

Liebigstraße 5
85757 Karlsfeld
Germany

T. +49 8131 59391-100
F. +49 8131 92604

sales@kem-kueppers.com

KEM Service & Repairs

Wetzeller Straße 22
93444 Bad Kötzing
Germany

T. +49 9941 9423-37
F. +49 9941 9423-24

service@kem-kueppers.com

*More distributors & partners can be found at:
www.kem-kueppers.com*