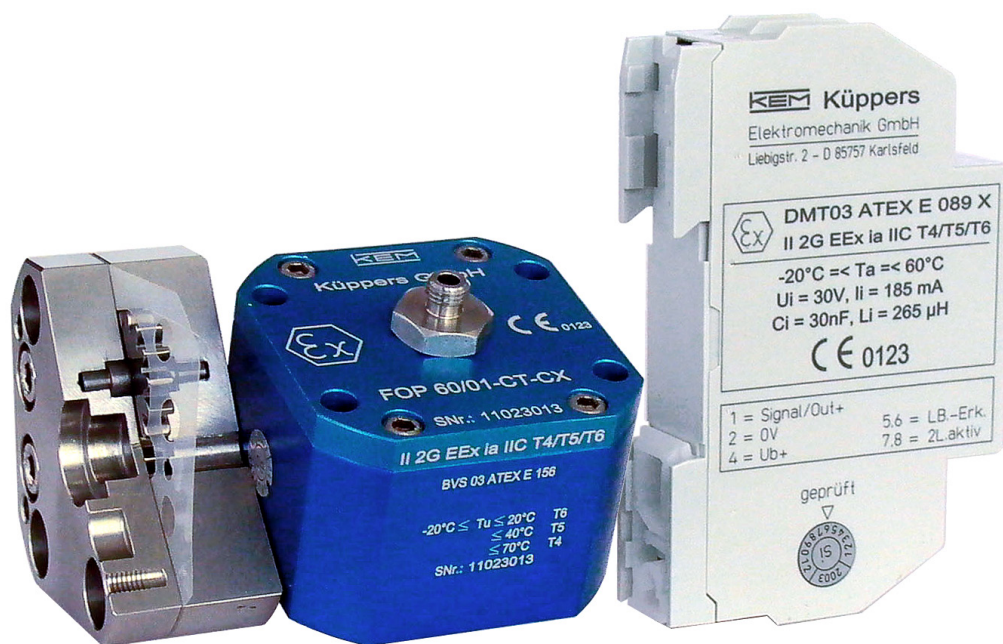


# Technical Datasheet



## FOP 60 and OPTV

Fiber Optical Amplifier and  
Light Pulse Receiver

# Fiber Optic Amplifier and Receiver – FOP 60 and OPTV

## Application

The FOP is a fiber optic amplifier for KEM gear flow meters used in high-voltage applications. Its integral pickup detects the r.p.m. of the gears and the FOP provides a flow-proportional light pulse signal. The OPTV receiver will convert the light pulses into a current or voltage squarewave signal which may be used for evaluation.

## Applications

- Interference-free Pulse Detection
- No Electrical Connection to OPTV Receiver
- Anodised Aluminum Housing
- Light Weight and Handy Design

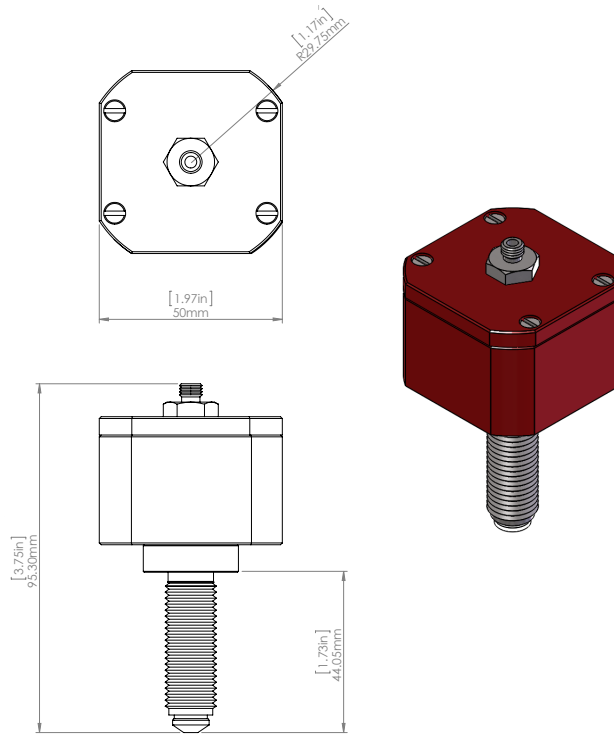
## Technical Data FOP 60

FOP Fiber Optic Amplifier	
Power Supply	Lithium battery (exclusively use original batteries)
Battery Lifetime	Max. 2 years with 24h-operation
Ambient Temperature	-20 °C up to +50 °C [-4 °F up to +122 °F]
Frequency Range	7 up to 1,000 Hz
Weight	Approx. 190 g
Ingress Protection	IP65
Ex-protection	ATEX: II 2G EEx ia IIC T4/T5/T6 cCSAus: Ex ia IIC (Can) and Class 1, Zone 0, AEx ia IIC (US)
Housing	Anodised aluminum (for dimensions please see drawings)

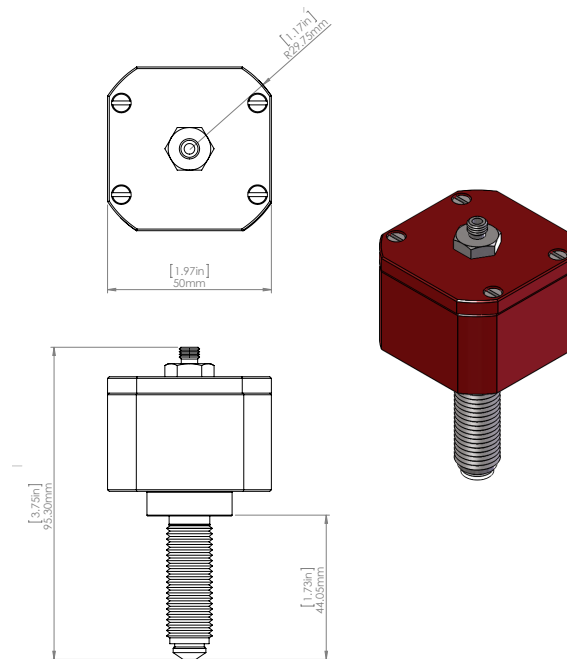
## LW cable LABS-free, incl. pre-assembled plugs

Type	HITRONIC POF
Cable Ø	5.5 mm
Plug Ø	< 8.5 mm
Bending Radius	Permanently installed: 55 mm, temporarily: 30 mm
Tensile Strength	Permanently installed: 100 N, temporarily: 600 N
Ambient Temperature	-20 °C up to +70 °C [-68 °F up to +158 °F]
Protection Class	IP65
Cable Length	Max. 10 m
Wire Tip Material	1.4305 [AISI 303]

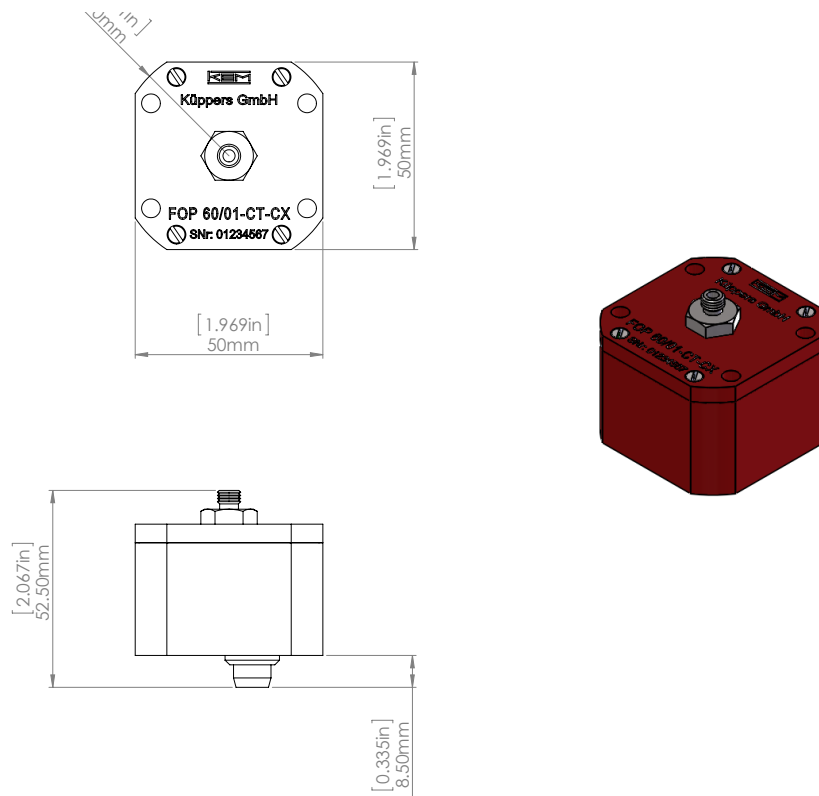
## Dimensional Drawing – FOP 60-XX-XX-SK



## Dimensional Drawing – FOP 60-XX-XX-SR



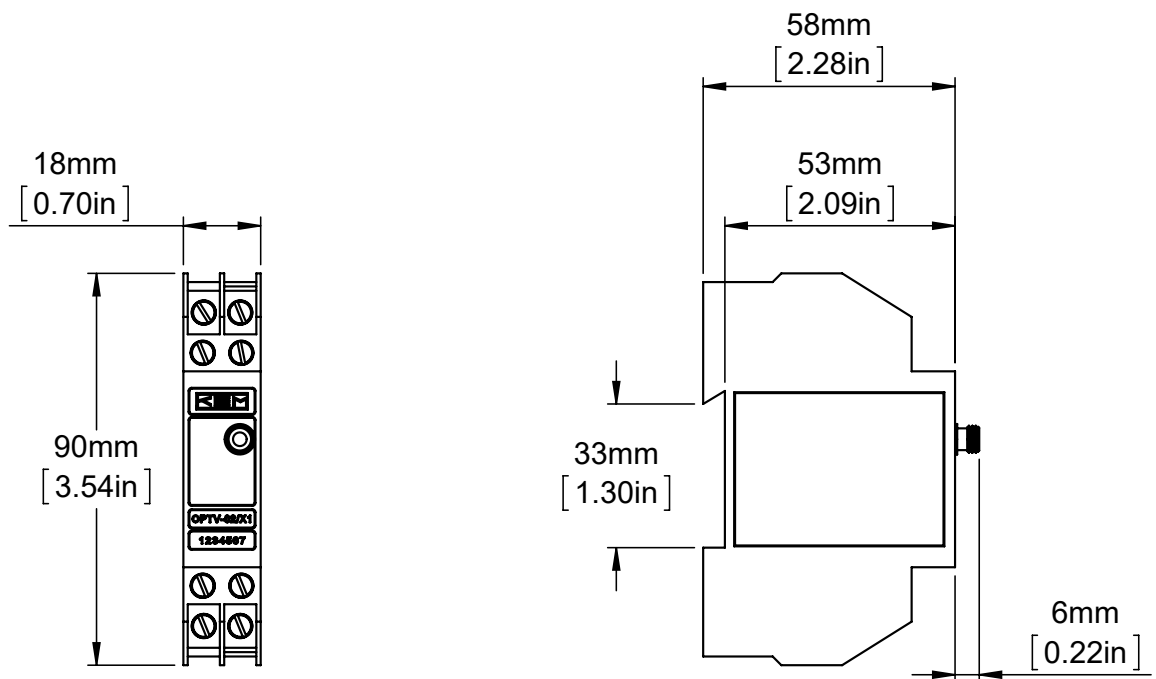
## Dimensional Drawing – FOP 60-01-CT-CX



## Technical Data – OPTV

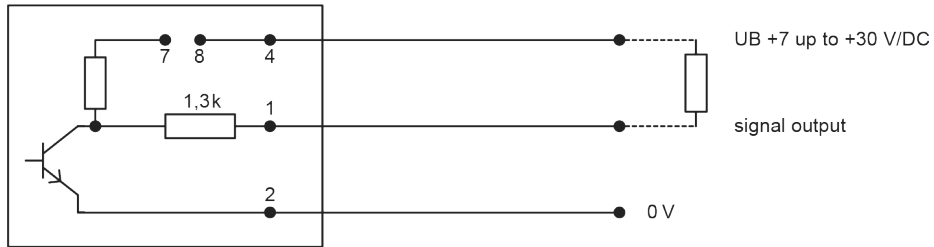
OPTV-02/X0 Light Pulse Receiver and Converter	
Ambient Temperature	-20 °C up to +60 °C [-4 °F up to +140 °F]
Supply Voltage	$U_B$ : 7 up to 30 V
Quiescent Current	$I_R < 1.1$ mA
Output	Frequency output, constant pulsetime 500 µsec
Electrical Data, Alternatively	<p>Voltage outputs (3-wire connection)</p> <p>a. Active output            High level: <math>U_{high} &gt; U_B - 0.6 \text{ V} - [2.5 \text{ k}\Omega \times I_{out} \text{ (mA)}]</math>            Low level: <math>U_{low} &lt; 0.6 \text{ V} + [1.3 \text{ k}\Omega \times I_{out} \text{ (mA)}]</math></p> <p>b. Passive output            High level: <math>U_{high} &gt; U - [I_{out} \text{ (mA)} \times 1.3 \text{ k}\Omega]</math>            Low level: <math>U_{low} &lt; 0.6 \text{ V} + [1.3 \text{ k}\Omega \times I_{out} \text{ (mA)}]</math>            U is the voltage applied at the output, max. 30 V</p> <p>Current output (2-wire connection)</p> <p>a. For <math>U_B &lt; 9</math> V (NAMUR supply units)            High level: <math>I_{high} &gt; 2.2</math> mA            Low level: <math>I_{low} &lt; 1.1</math> mA</p> <p>b. For <math>U_B</math> 7 up to 30 V            High level: <math>I_{high} = [(U_B - 0.6 \text{ V})/1.3 \text{ k}\Omega] + I_{low}</math>            Low level: <math>I_{low} = (U_B - 4 \text{ V})/7.5 \text{ k}\Omega</math></p>
Frequency Range	3 up to 1,500 Hz according to flow meter
Electrical Connection	Two off 4-pin screw terminals for supply and output signals (see wiring schemes)
Ex Protection	ATEX: II 2G EEx ia IIC T6 cCSAus: n.a.
Housing	Grey-coloured polycarbonate for DIN hat top rail mounting

## Dimensional Drawing – OPTV

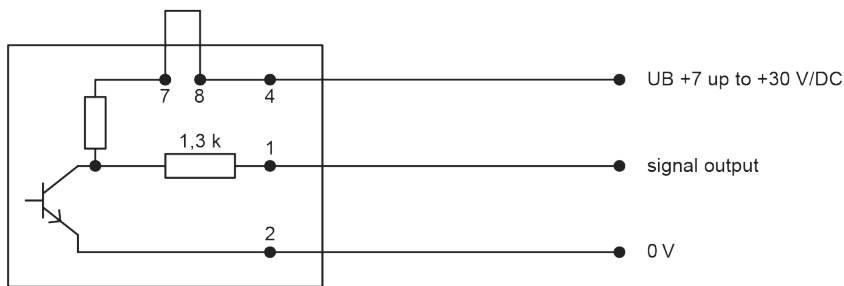


## Electrical Connection OPTV

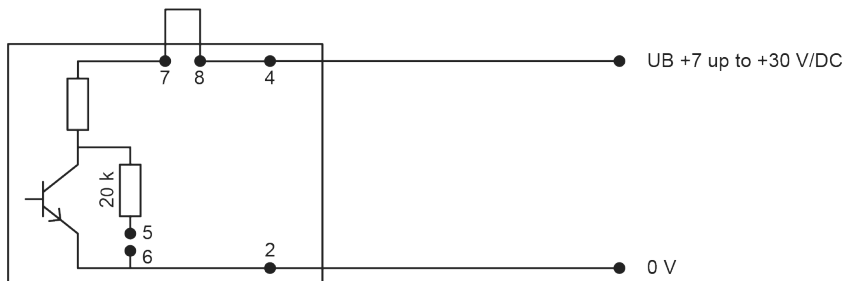
### 3-wire passive



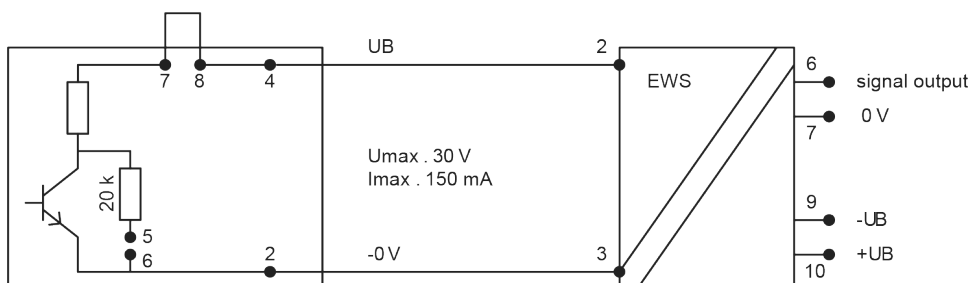
### 3-wire active



### 2-wire



### 2-wire with KEM separation amplifier type EWS



# Fiber Optic Amplifier and Receiver – FOP 60 and OPTV

## Ordering Code

	FOP60		-	X	X	-	X	X	-	X	X	-	X
<b>Meter size</b>													
ZHM 01 with pickup to plug	0	1											
Optional	X	X											
<b>Meter design</b>													
Cartridge design				C	T								
Optional M14x1.5				X	X								
<b>Pickup nose</b>													
With threadless transducer in Cartridge design										C	X		
Short pickup with thread M14 x 1.5 for ZHM 02-04										S	K		
Short pickup with thread M14 x 1.5 for ZHM 01/*										S	R		
<b>Ex-Protection</b>													
ATEX (II 2G EEx ia IIC T4/T5/T6)													ATEX
cCSAus (Ex ia IIC (Can) und Class1, Zone 0, AEx ia IIC (US))													CSA

## Marking

### FOP 60:

KEM Küppers Elektromechanik GmbH

CE 0123 Ex II 2G EEx ia IIC T4/T5/T6

BVS 03 ATEX E 156

Ex ia IIC (Can) and Class 1, Zone 0, AEx ia IIC (US)

cCSAus approval no. 2448153

FOP 60/\*\*-\*\*-\*\* Ser.Nr. 123456789

-20 °C [-4 °F] ≤ Ta ≤ +20 °C [+68 °F] T6  
 ≤ +40 °C [+104 °F] T5  
 ≤ +70 °C [+158 °F] T4

### OPTV:

KEM Küppers Elektromechanik GmbH

CE 0123 Ex II 2G EEx ia IIC T6

DMT 03 ATEX E 089X

OPTV-02 Ser.No. 123456789

-20 °C [-4 °F] ≤ Ta ≤ +60 °C [+140 °F]

U<sub>i</sub> = 30 V; I<sub>i</sub> = 185 mA

C<sub>i</sub> = 30 nF; L<sub>i</sub> = 265 μH

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



## Safety Instructions

The following has to be adhered to:

- a. Installation instructions for electrical devices,
- b. Installation instructions for associated intrinsically-safe devices,
- c. The »Special conditions for safe use« as per EC-Type Examination Certificate
- d. The devices have to be installed in a way that the max. ambient temperature does under no circumstances exceed the mentioned maxima (consider self heating).
- e. With cables care should be taken, that the max. inductivity and capacity of the respective voltage or gas group are not exceeded.
- f. Exceeding or falling below the regular measuring range will cause invalid frequency output signals.
- g. Shielded cables are to be used as connecting lines.
- h. Generally, supplied units have to be connected by an expert according to EMC stipulations.
- i. Terminals 5 - 6 and 7 - 8 must not be connected with an other device.



### 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](http://www.kem-kueppers.com)*