

Certified according to DIN EN ISO 9001

## Technical Datasheet



## FOP 60 and OPTV Fibre-Optic Amplifier and Receiver

Description .....	3
Technical Data .....	3
Electrical Connections .....	7
Ordering Information .....	8
Marking .....	8
Notes on Installation .....	9

# Index

Index


## Description

The FOP is a fibre-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.

### Features

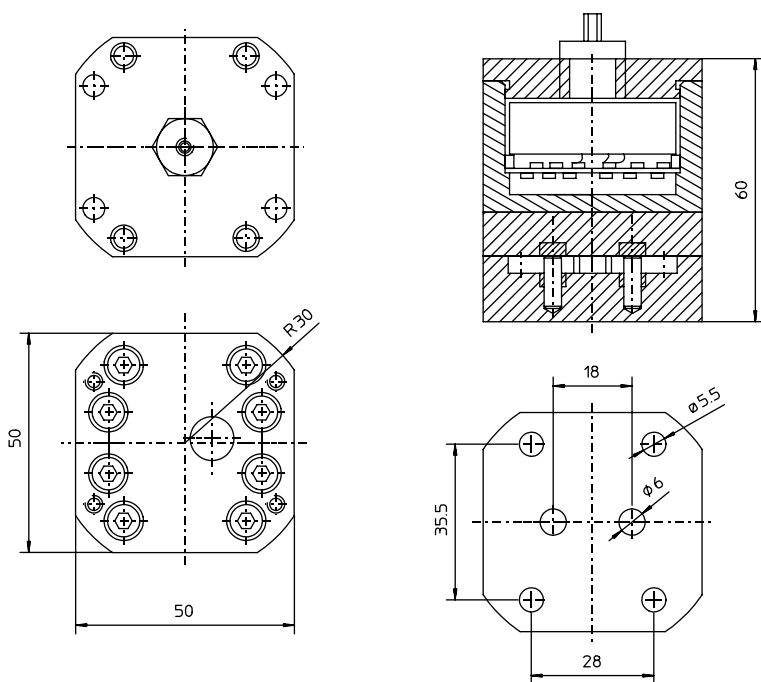
- Interference-free pulse detection
- No electrical connection to OPTV receiver
- Blue-anodised aluminum housing
- Light weight and handy design

## Technical Data - FOP


FOP fibre-optic amplifier	
Power supply	lithium battery
Battery lifetime	max. 2 years with 24h-operation
Ambient temperature	-20 up to +50 °C
Frequency range	3 up to 1,000 Hz
Weight	approx. 190 g
Ex-protection, IS	 2 G EEx ia IIC T4/T5/T6, BVS 03 ATEX E 156
Housing	IP65, anodised aluminium (for dimensions please see drawings)

Fibre-optic cable, silicone-free, ready-to-wire	
Type	OKE1000-C, orange-coloured
Cable Ø	5.5 mm
Plug Ø	< 8.5 mm
Bending radius	> 10/50 mm
Tensile strength	250/100 N
Bending strength in alternate directions	> 10,000
Ambient temperature	-30 up to +80 °C
Plug type	2 off LWST1000 65
Protection class	IP 65
Cable length	max. 10 m
Wire tip material	nickel-silver (ARCAP)

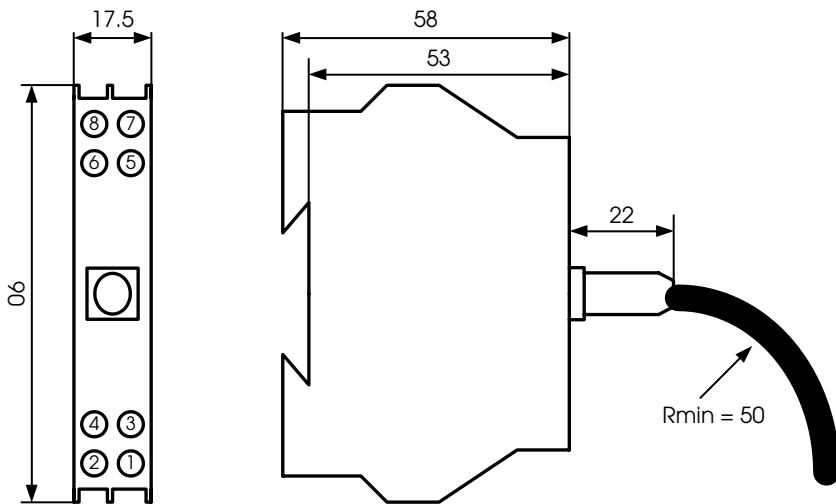
Dimensional drawing (mm) - FOP 60



## Technical Data - OPTV

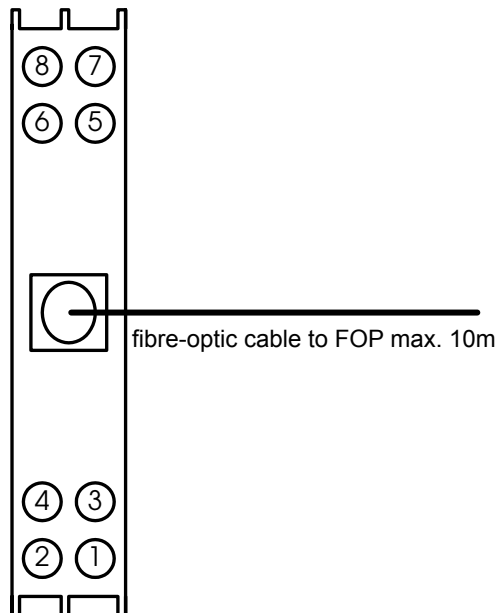
OPTV-02/X light pulse receiver and converter	
Ambient temperature	-20 up to +60 °C
Supply voltage	$U_B$ : 7 up to 30 V
Quiescent current	$I_R < 1.1$ mA
Output	frequency output, constant pulsetime 500 µsec
Electrical data, alternatively	<p>voltage outputs (3-wire connection)</p> <p>a) active output  high 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 \text{ V}</math> (NAMUR supply units)  high level: <math>I_{high} &gt; 2.2 \text{ mA}</math>  low level: <math>I_{low} &lt; 1.1 \text{ mA}</math></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 2,000 Hz according to flow meter
Electrical connection	two off 4-pin screw terminals for supply and output signals (cf. wiring schemes)
Ex protection	 II 2 G EEx ia IIC T6, DMT 03 ATEX E 089X
Housing	grey-coloured polycarbonate for DIN hat top rail mounting

Dimensional drawing (mm) - OPTV



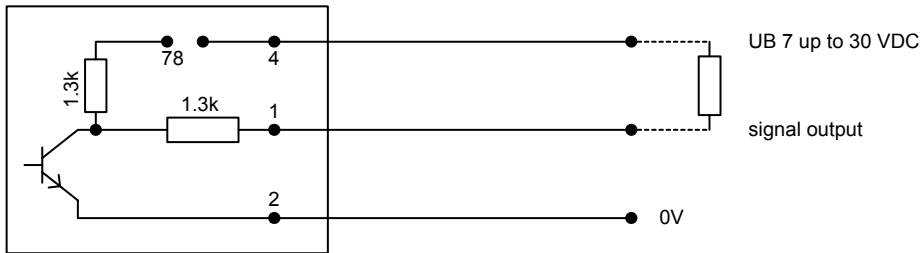
- 1= signal/out+
- 2= 0V
- 3= n.c.
- 4= UB+
- 5= detection of line breakage
- 6= detection of line breakage
- 7= 2-wire active
- 8= 2-wire active

connection via  
screw terminals

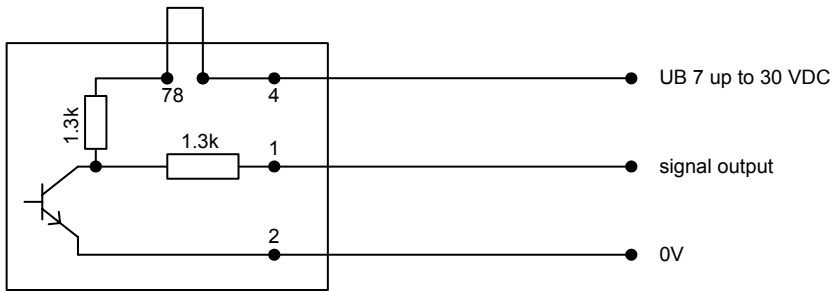


Electrical Connections - OPTV

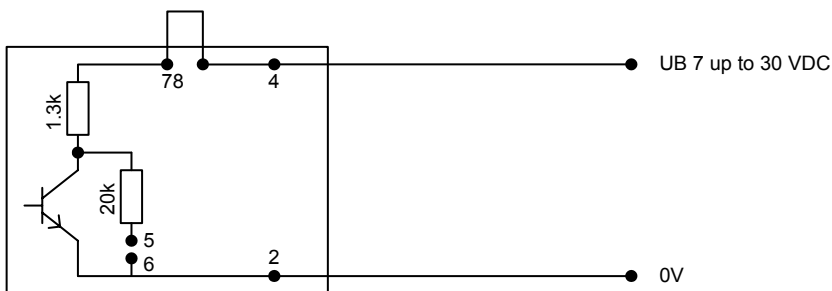
3-wire passive



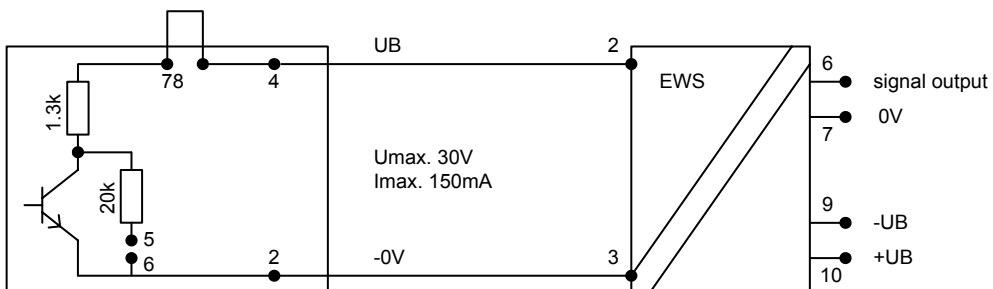
3-wire active



2-wire



2-wire with KEM separation amplifier type EWS



## Ordering Information

FOP \*\*/\*\*\_\*\*\_\*\*



- C\* = with threadless pickup coil
- SK = short pickup coil with thread M14 x 1.5 for ZHM 02 - 04
- SR = short pickup coil with thread M14 x 1.5 for ZHM 01/\*
- SS = long pickup coil with thread M14 x 1.5 for ZHM 02
- 60/01/1-CT = with threadless pickup coil for ZHM...CT
- \*\* -CM = with threadless pickup coil for LFM 10

## Marking

### FOP 60:

KEM Küppers Elektromechanik GmbH

CE 0123 Ex II 2G Ex ia IIC T4/T5/T6  
DMT 03 ATEX E 156

FOP60/\*\*\_\*\*\_\*\* Ser.Nr. 123456789

-20 °C ≤ Ta ≤ 20 °C T6  
≤ 40 °C T5  
≤ 70 °C T4

### OPTV:

KEM Küppers Elektromechanik GmbH

CE 0123 Ex II 2G Ex ia IIC T4/T5/T6  
DMT 03 ATEX E 089X

OPTV-02 Ser.Nr. 123456789

-20 °C ≤ Ta ≤ 60 °C

Ui = 30 V; li = 185 mA

Ci = 30 nF; Li = 265 μH

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

## Notes on Installation

The following has to be adhered to:

- a) Installation instructions for electrical devices,  
Installation instructions for associated intrinsically-safe devices,  
The »Special conditions for safe use« as per EC-Type Examination Certificate
- b) The amplifier has to be installed in a way that the max. ambient temperature does under no circumstances exceed +50 °C (consider self heating).
- c) With cables care should be taken, that the max inductivity and capacity of the respective voltage or gas group are not exceeded.
- d) Exceeding or falling below the regular measuring range will cause invalid frequency output signals.
- e) Shielded cables are to be used as connecting lines.
- f) Generally, supplied units have to be connected by an expert according to EMC stipulations.
- g) The light pulse receiver must always be placed inside a housing with protection class IP20.
- h) When the light pulse receiver is installed inside a housing made of plastics or light alloy the material must be in accordance with paragraph 7.3.2 or 8 of EN50014:1997.
- i) The internal wiring in this housing must be in accordance with paragraph 6.4.11 and 7.6.e of EN50020:1994.
- j) Terminals or plug connections for the intrinsically safe current circuits must be arranged as per paragraph 6.3.1 or 6.3.2 of EN50020:1994.
- k) Terminals 5–6 and 7–8 must not be connected with an other device.

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