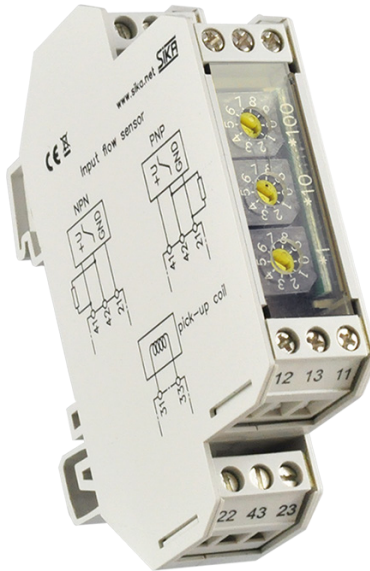


TU 7052 – Electronic frequency divider for flow and volumetric sensors



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Please keep this operating manual for future reference.

If the appliance is resold, please provide the operating manual along with it.

0 About this operating manual

- The operating manual is aimed at specialists and semi-skilled personnel.
- Before each step, read through the relevant advice carefully and keep to the specified order.
- Thoroughly read and understand the information in the section “Safety instructions”.

If you have any problems or questions, please contact your supplier or contact us directly at:



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Hazard signs and other symbols used:



DANGER! Risk of death due to electric current!

This sign indicates dangers which could lead to serious health defects or to death.



CAUTION! / WARNING! Risk of injury!

This sign indicates dangers that cause personal injuries that can lead to health defects or cause considerable damage to property.



CAUTION! Material damage!

This sign indicates actions which could lead to possible damage to material or environmental damage.



ADHERE TO OPERATING MANUAL!



NOTICE!

This sign indicates important notices, tips or information.



NO DOMESTIC WASTE!

The device must not be disposed of together with domestic waste!



Pay attention to and comply with information that is marked with this symbol.



Follow the specified instructions and steps. Adhere to the given order.

☐ Check the specified points or notices.

→ Reference to another section, document or source.

• Item

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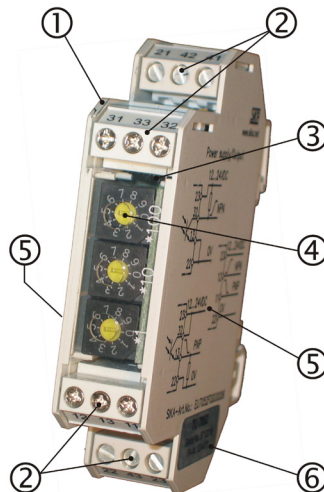
1 Device description

The frequency divider TU 7052 divides the high frequencies of the input signal in order to provide a lower pulsed output signal. The division ratio can be set freely between 1:1 and 1:999.

All SIKA flow or volumetric sensors can be connected to the TU 7052.

Design / Components:

- ① Casing:
The TU 7052 has a plastic casing for rail mounting in accordance with DIN EN 60715.
- ② Terminals:
For the electrical connection of TU 7052.
- ③ Front panel:
Protects the electronics against static discharges and mechanical damage.
- ④ Coding switches:
The coding switches for adjusting the division ratio are located behind the front panel.
- ⑤ Electrical connection:
Connecting diagrams for the supply voltage, the inputs and the outputs are printed on both sides of the casing.
- ⑥ Type plate:
The type plate displays the serial and manufacturing number.



Scope of delivery:

- 1x TU 7052.
- 1x Pull-up / Pull-down resistor 5kΩ: Fastened to the side of the plastic casing of TU 7052.

1.1 Intended use

The frequency divider TU 7052 should only be used to divide the frequency signals of SIKA flow or volumetric sensors.

The suitability of other sensors must be tested prior to the delivery of TU 7052. Please contact your supplier or SIKA for more details.

The operational safety of the supplied equipment is only guaranteed if it is operated according to its intended use. The specified limit values (see 8 "Technical data") should never be exceeded.

Always make sure that TU 7052 is suitable for your requirements prior to installation and commissioning.

2 Safety instructions



Before you install the TU 7052, read through this operating manual carefully. If the instructions contained within it are not followed, in particular the safety guidelines, this could result in danger for people, the environment, and the device and the system it is connected to.

The TU 7052 correspond to the state-of-the-art technology. This concerns the accuracy, the operating mode and the safe operation of the device.

In order to guarantee that the device operates safely, the operator must act competently and be conscious of safety issues.

SIKA provides support for the use of its products either personally or via relevant literature. The customer verifies that our product is fit for purpose based on our technical information. With this verification all hazards and risks are transferred to our customers; our warranty is not valid.

Qualified personnel:

⚠ The personnel who are charged for the installation, operation and maintenance of TU 7052 hold a relevant qualification.

This can be based on training or relevant tuition. The personnel must be aware of this operating manual and have access to it at all times.

⚠ The electrical connection should only be carried out by a fully qualified electrician.

General safety instructions:

⚠ In all work, the existing national regulations for accident prevention and safety in the workplace must be complied with. Any internal regulations of the operator must also be complied with, even if these are not mentioned in this manual.

⚠ Degree of protection IP20:

The device is not intended for outdoor use or for use in damp conditions.

Special safety instructions:

Warnings that are specifically relevant to individual operating procedures or activities can be found at the beginning of the relevant sections of this operating manual.

3 Connections and functions

Connections:

- ①: Sensor NPN / PNP connection.
- ②: Inductive sensor connection.
- ③: Output circuit connection.
- ④: Supply voltage connection.

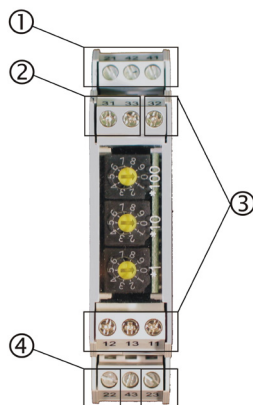
Function:

The frequency signal at the input of TU 7052 is divided by the set value of the divider and provided at the outputs as a square-wave pulse signal.

The output frequency is calculated as follows:

$$\text{Output frequency} = \frac{\text{Input frequency}}{\text{Divider}}$$

With a corresponding circuit, the NPN/PNP output and the optocoupler output can be used simultaneously.



4 Installation and electrical connection

Prior to installation and electrical connection:

- Switch off the system.
- Make sure that the system is isolated from all possible sources of supply and is completely de-energised.

4.1 Rail mounting

The TU 7052 has a plastic casing for rail mounting in accordance with DIN EN 60715. It can be mounted before or after electrical connection.

- ↳ Place the TU 7052 on the mounting rail from above and ensure that the plastic casing locks in-to position.

4.2 Electrical connection

WARNING! Danger of death due to electrical hazard!



The electrical connection of TU 70xx should only be carried out by a fully qualified electrician.

CAUTION! Material damage!



The TU 7052 may be damaged if the connection cables are swapped.

- ↳ Only connect TU 7052 to the specified connections.

4.2.1 Flow or volumetric sensor connection

All SIKA flow or volumetric sensors can be connected to TU 7052.

CAUTION! Material damage!



Malfunctioning and damage may occur if several sensors are connected.

- ↳ Only connect one flow or volumetric sensor.

4.2.1.1 NPN / PNP sensors

For a sensor current consumption of ≤ 50 mA (> 50 mA), the supply voltage (+U) is connected to terminal 41 (23). The sensor signal (\perp) is connected to terminal 42 and the ground (GND) to connection cable 21.

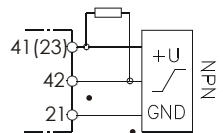


Integrated pull-up (pull-down) resistor:

The following circuit with an external resistor is not required if a sensor with integrated resistor is connected.

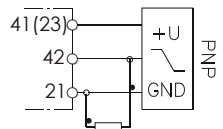
NPN sensor:

The supplied resistor should be connected between terminal 42 and terminal 41 (23) for NPN sensors.



PNP sensor:

The supplied resistor should be connected between terminal 42 and terminal 21 for PNP sensors.



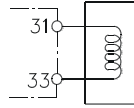
4.2.1.2 Inductive sensor

CAUTION! Material damage!



A pull-up (pull-down) resistor should not be used if inductive sensors are connected.

Remove any existing pull-up (pull-down) resistors.



- The inductive sensor is connected to TU 7052 at terminals 31 and 33.

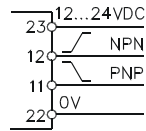
4.2.2 Output wiring

The NPN/PNP output and the optocoupler output can be used simultaneously.

4.2.2.1 NPN/PNP output

The NPN and PNP output of TU 7052 each have an internal 5kΩ pull-up / pull-down resistor. This ensures that both signals can be used simultaneously.

- The NPN signal and PNP signal are collected via terminal 12 and terminal 11 respectively.



4.2.2.2 Optocoupler output

The optocoupler of TU 7052 has a direct open-collector output which can be connected as either a NPN or PNP output.

CAUTION! Material damage!



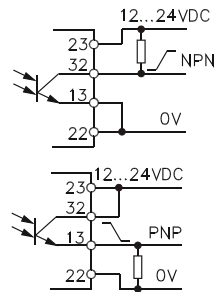
The optocoupler output is not equipped with a protective circuit. The load should not exceed max. 30 V_{DC} and 10 mA.

NPN wiring:

- Connect an external pull-up resistor between terminals 32 and 23. The NPN signal can be collected at terminal 32.

PNP wiring:

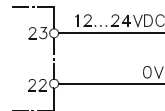
- Connect an external pull-down resistor between terminals 13 and 22. The PNP signal can be collected at terminal 13.



4.2.3 Supply voltage connection

The TU 7052 can be powered with a supply voltage of between 12...24 V_{DC}.

- Connect the supply voltage to terminals 23 (+U) and 22 (0 V) of TU 7052.



VTI SENSOR:

When using a VTI flow sensor, the power supply should not fall below 12 V.

5 Divider setting

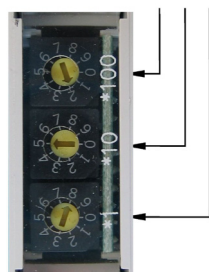
The divider is set via the three coding switches of TU 7052. Use a screwdriver to set the switches to a value between 0 and 9.

The value of the respective switch is displayed on the front panel.

The desired value of the divider is simply set, like written a number, from top to bottom:

- ↖ The top coding switch is used to set the hundreds (*100),
- ↖ the middle coding switch is used to set the tens (*10) and
- ↖ the bottom coding switch is used to set the units (*1).

Divider = 2 5 8



SPECIAL SETTINGS:

Setting "0 0 0" switches off the output.

The frequency is not divided at setting "0 0 1".

6 Commissioning

Commissioning occurs after the electrical connections have been carried out and tested:

- ↖ Switch on the supply voltage.

The TU 7052 is ready for operation:

As soon as a medium passes through the connected flow or volumetric sensor, the frequency of the input signal is divided by the set value of the divider. The lower square-wave pulse signal appears at the outputs.

7 Maintenance, decommissioning and disposal

Maintenance:

The TU 7052 is maintenance-free and cannot be repaired by the user. In the unlikely event of a defect, the device has to be returned to the manufacturer for repair work.



TIP:

Check all connection cables and the supply voltage to eliminate other error sources in advance.

Decommissioning:

- ↖ Switch off the system.
- ↖ Make sure that the system is isolated from all possible sources of supply and is completely de-energised.
- ↖ Disconnect the electrical connections and remove TU 7052 from the mounting rail.

Disposal:

Compliant with the Directives 2011/65/EU (RoHS) and 2012/19/EU (WEEE)*, the device must be disposed of separately as electrical and electronic waste.



- ↖ Take the TU 7052 to your local recycling plant

or

- ↖ send it back to your supplier or to SIKA for correct disposal.

* WEEE reg. no.: DE 25976360

8 Technical data

The technical data of customised versions may differ from the data in the instructions. Please observe the information specified on the type plate.

TU 7052

Input signal characteristics (sensor)

Input frequency	0 ... max. 1.700 Hz
Signal level NPN / PNP	"Low": < 3,3 V "High" > 6 V
Signal level sinus signal (inductive)	10 ... 200 mV
Sensor supply	$U_{\text{Sensor}} = U_{\text{Supply}} - < 2 V_{\text{DC}}$

Frequency output characteristics

Divider (division range)	1:1 ... 1:999 • can be set via rotary switches
Type of signal	Square-wave signal • duty cycle 1:1

NPN/PNP output: (short-circuit proof)

- Signal current	Max. 20 mA, limited current
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Optocoupler output: (without a protective circuit)

- Max. load voltage	$\leq 30 V_{\text{DC}}$
- Max. load current	$\leq 10 \text{ mA}$
- Load resistance	5 k Ω (recommendation)

Electrical characteristics

Supply voltage (U_{Supply})	12 ... 24 $V_{\text{DC}} \pm 10\%$
Current consumption	< 25 mA at 24 V_{DC} (without a sensor) • max. 1 W
Electrical safety measures	Reverse polarity protection (supply voltage)
Protection class	IP 20

further technical data

Ambient temperature	0 ... 60 °C
Storage temperature	-10 ... +80 °C
Casing	Plastic casing for rail mounting

8.1 Dimensions

