# Electronic signal transmitter

**RE 29754/04.05** 1/8
Replaces: 07.02

**Type VT 10406**

Series 3X
Two axes version

F 87014_d

## Overview of contents



## Features

Contained within the VT 10406-3X electronic signal transmitter are the electronic and mechanical components which are used to convert the lever movement into two independent proportional signals. Due to the design of the lever joint safe operation of only one axis is also guaranteed.

- Sensitive control due to low operating forces
- Integrated evaluation electronics
- ±15 V DC supply voltage
- Replacable gaiter
- Switched off if there is a cable break in the supply cables
- Polarity protection

**Options:**

- Dead-man switch in the hand lever
- Additional controls are possible via various switches fitted into the hand lever
- Can be held in any position by means of friction brakes in the X and Y axes
- The zero point may be mechanically locked
- Directional contacts for electrical monitoring of the hand lever movement

## Ordering details

**VT 10406 –3X/ – – – ***

Two axes signal transmitter

Series 30 to 39 **= 3X**
(30 to 39: unchanged technical data and connection allocation)

**Additional functions**

| | |
|---|---|
| Friction brakes on X and Y axes | **= BXY** |
| Friction brakes on X axis, spring return on Y axis | **= BX0** |
| Friction brakes on Y axis, spring return on X axis | **= B0Y** |
| Spring return on X and Y axes | **= FXY** |

| Lever form | Additional functions | Protection to EN 60529 | |
|---|---|---|---|
| Hand lever | None | IP 65 | **= 0** |
| Hand lever | Push button | IP 65 | **= 1** |
| Hand lever | Rocker switch | IP 65 | **= 2** |
| Hand lever | Pressure operated switch | IP 65 | **= 3** |
| Hand lever | Rocker switch with detent | IP 65 | **= 4** |
| Ball lever | None | IP 65 | **= 5** |
| Ball lever | With dead-man contact | IP 53 | **= 6** |
| Ball lever | With mech. pull detent | IP 65 | **= 7** |

**S =** Standard
**K =** Cross-form limiting gate

**Direction contact**
**R00 =** No contact
**RXY =** Contact in X and Y axes

Further details in clear text

## Function

### Mechanics

The simple robust mechanism consists of a control lever mounted in a swivel bearing. Two plastic track potentiometers are adjusted, these are orientated in relation to the associated axis. When the control lever is released, springs return to its neutral position. The mechanical components are protected by means of a gaiter. The transmitter can be fitted with a friction brake on both axes which makes it possible to hold the control lever in any position. When the actuation of only one axis is permissible a cross-form of gate can be fitted. (simultaneous actuation of both axes is thereby not possible).

### Zero position, directional and dead-man contacts

In order to be able to electrically monitor the direction of lever movement and the zero position, a contact can be fitted per half axis. This contact closes when the lever is moved out of its neutral position within the range of ±5 % to ±10 % (referred to the output signal of ±10 V).

The transducer can also be fitted with a dead-man switch. This is operated by pressing the upper half of the hand lever (at right angles to the plane of installation).

When these functions are required, they are connected via a 2nd non-screened cable.

### Electronics

The plastic track potentiometer is connected in series with an impedance converter, which ensures that the control curve remains within the specified limits, even with varying loading on the control output. The electronics also carry out other protective functions. Should a cable break in the ±15V supply lines occur, then the supply to the transducer is automatically switched off internally. The electrical connection is via a multi-core screened cable.

The combination of plastic track potentiometer and impedance converter ensures that a long service life is achieved.

## Engineering guidelines

**Attention:** If the transmitter is installed in a fully isolated manner, then the transmitter housing must be earthed by a separate cable!

## **Techicnal data** (for applications outside these parameters, please consult us!)

| | | |
|---|---|---|
| **Elektronics** | | |
| Supply voltage | $U$ | ±15 VDC (± 1 %) stabilised |
| Current consumption | $I$ | Approx. 40 mA |
| Control outputs | | |
| – Output voltage | $U$ | Max. ±10 V |
| – Output current | $I$ | Max. ±5 mA |
| Switched contact | | 2 A, max. 30 VDC (ohmic load) |
| Fuse | $I_S$ | 2 A, medium blowing characteristics |
| **Mechanics** | | |
| Lever displacement angle | $\alpha$ | Approx. 20° from the spring centred position to the end position (when operated in the X or Y directions) |
| Operating force | $F$ | Start value approx. 7 N<br>Final value approx. 16 N |
| **Protection to EN 60529** | | |
| – Above the mounting plane | | See ordering details |
| – Below the mounting plane | | IP 65 |
| **Cable length** | $I$ | 600 mm |
| **Permissible ambient temperature** | $\vartheta$ | –25 to +70 °C |
| **Weight** | $m$ | Approx. 1.8 kg |

## Cable allocation

**Colour of the connecting cable** (cable 1 – screened):

| | | |
|---|---|---|
| **Supply lines:** | Red | +15 V |
| | Black | M0 (measured zero) |
| | Blue | –15 V |
| **Signal lines:** | White | M0 (measured zero) |
| | Pink | X axis |
| | Green | Y axis |
| **Screen:** | Yellow/Green | Housing transmitter |
| | Transparent | Screen |

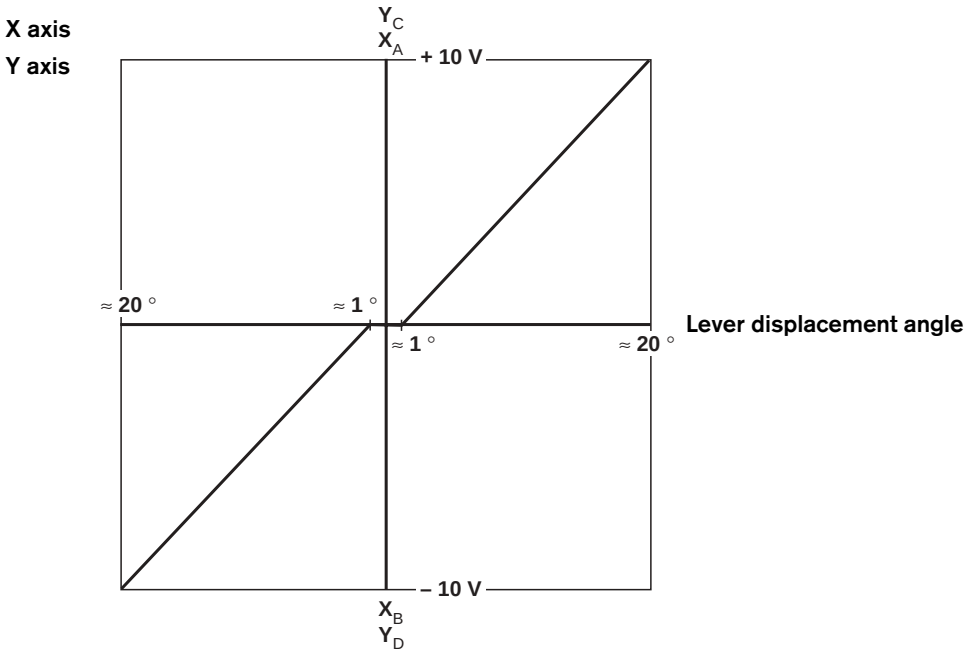
**Notes:** – The cable screen is not connected internally!

– If the transmitter is installed in a fully isolated manner, then the transmitter housing must be connected to earth!

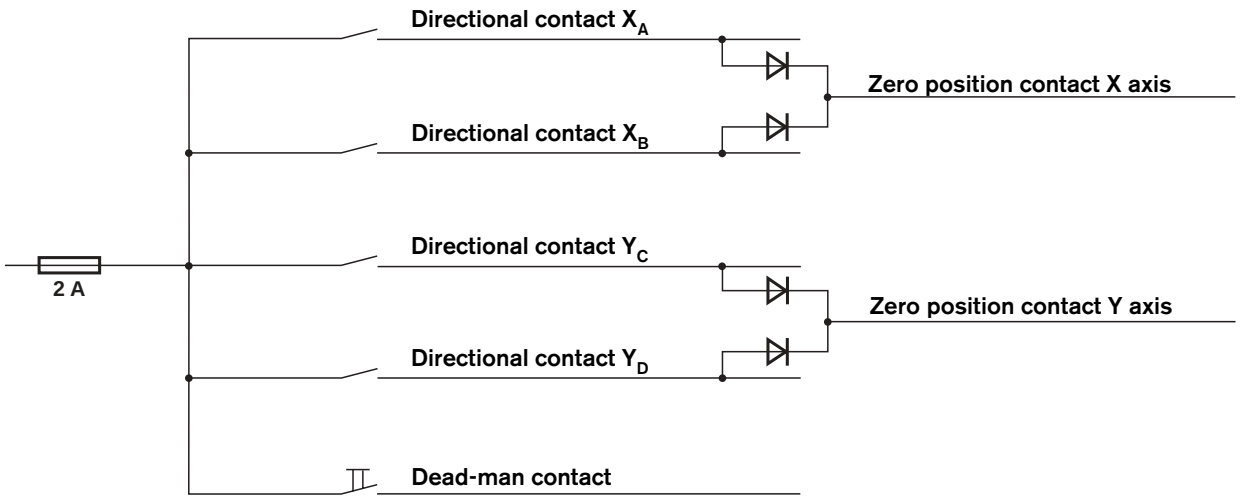
**Colour of the connecting cable** (cable 2 – non-screened):

| | | |
|---|---|---|
| **Feed cable:** | Blue | |
| **Directional contacts:** | Grey/Pink | $X_A$ |
| | Red/Blue | $X_B$ |
| | Yellow | $Y_C$ |
| | Brown/Green | $Y_D$ |
| **Dead-man contact:** | Grey | |
| **Zero position contact:** | Black | X-Achse |
| | Green | Y-Achse |

## Characteristic curves



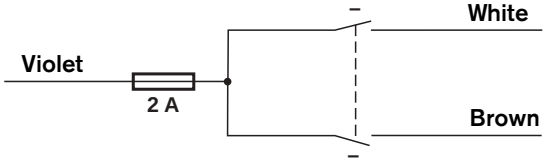
## Zero position, directional and dead-man contacts




## Switch in the lever

**Pressure switch and push button:**

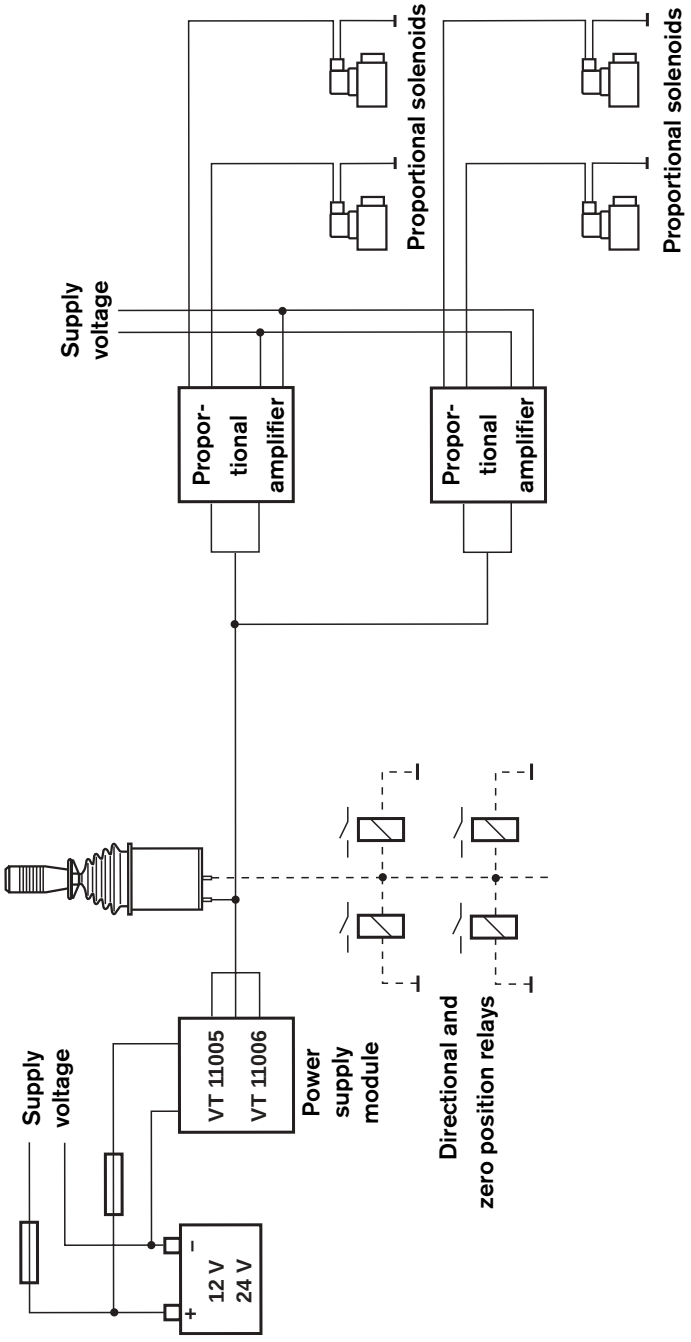

**Rocker switch and rocker switch with detent:**



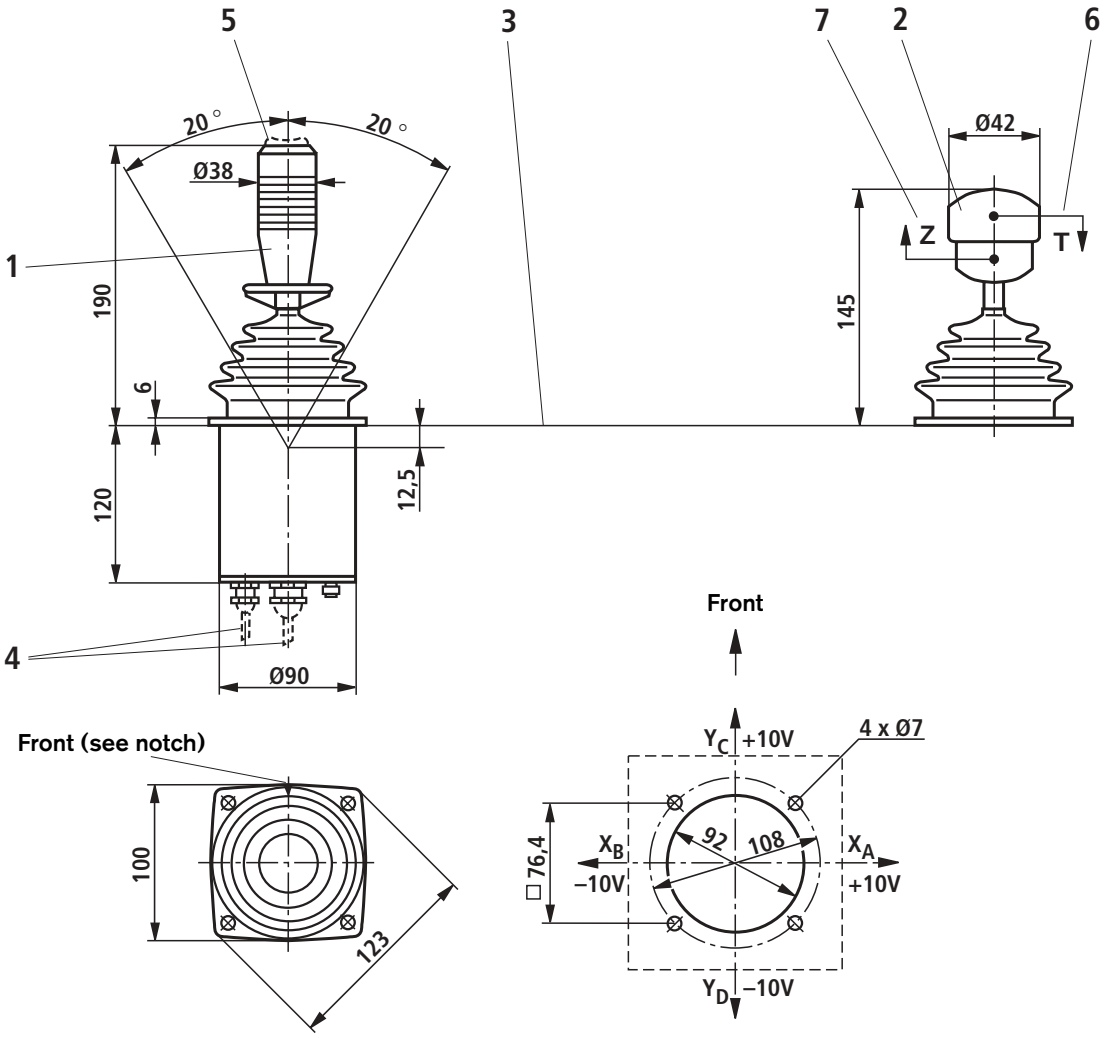

**Colour of the connection cables** (cable 2 – non-screened):

| | |
|---|---|
| **Feed cable:** | Violet |
| **Pressure operated switch and push button:** | White |
| **Rocker switch and rocker switch with detent:** | Brown |

## Circuit example



## **Unit dimensions** (dimensions in mm)




**1** Hand lever
**2** Ball lever
**3** Mounting face
**4** Connecting cables (length 600 mm)
**5** Switch in lever (see ordering details)
**6** Dead-man contact
**7** Pull detent