

TOX®-Sensors

Data sheet 110.00
2021/04



Table of contents

| | |
|---|-----------|
| Pressure indicator ZDA | 3 |
| Electronic pressure switch ZDO | 4 |
| External linear position sensor ZHW | 5 |
| Linear position sensor ZKW | 6 |
| Potentiometer travel measurement ZW-x | 7 |
| External, analog displacement transducer ZWW | 8 |
| Press force sensor ZPS | 9 |
| Anti-rotation device ZPSV | 10 |
| TOX®-Press Force Sensor CKN | 11 |
| TOX®-Miniature Force Sensor CKNM | 12 |
| TOX®-Press Force Sensor ZKNW | 13 |
| 3 in 1 tool fixture ZAK with force sensor | 14 |
| Strain Sensor ZKN | 15 |
| Precision limit switch ZWE | 16 |
| Proximity switch ZHS for forward and return stroke monitor ZHU | 17 |

Pressure measurement

Pressure indicator ZDA

The function keys on the front part of the pressure indicator are used for programming. The function “instantaneous value storage” is available for recording variable measuring signals. Further tests are possible with the peak value memory. An analogue output (4...20mA, 0...10V) is available for connection with a PLC. As option, a serial interface for the transmission of the measured data to a PC is available.



Application

- TOX®-Powerpackage

Technical data:

- 5-digit display, 2-colors
- Peak value memory
- Analogue input
- 2 programmable set points
- Analogue output for SPS

| | |
|-------------------------|-------------------------|
| Sampling rate: | 10/s |
| Supply voltage: | 90 ... 264VAC, 50/60 Hz |
| Dimensions (W x H x D): | 96x48x187 mm |
| Panel cutout: | 92+0.5 x 45+0.5 mm |

Pressure sensor ZDS

The oil pressure in the high pressure chamber of the TOX®-Powerpackage is measured by the pressure sensor and is displayed by a 5-digit display on the pressure indicator with integrated power supply. The measured “pressure” is displayed in bar or kN.

Technical data:

| | |
|--------------------------------|----------------------|
| Pressure range: | 0 – 400 bar |
| Connection: | M12x1 plug |
| Analogue output: | 4 – 20 mA |
| Deviation from characteristic: | 1 % FS* |
| Repeat accuracy: | 0,1 % FS* |
| Supply voltage: | 12 – 30 VDC (by ZDA) |

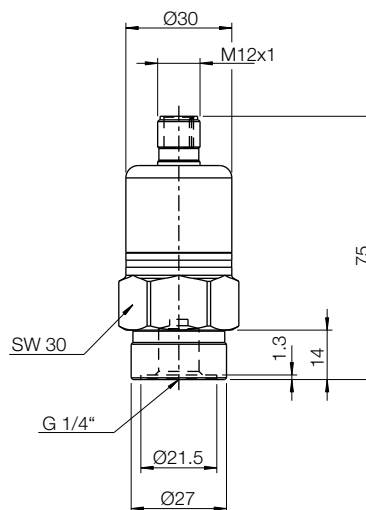
* FS = Full Scale

Scope of delivery:

- Pressure indicator ZDA
- Transducer ZDS, incl. mounting plate ZMP
- HP measuring hose ZHM 630, connection 1 x 90°, compl. assembled, filled and bled
- Connection cable between transducer and pressure indicator

Option:

- Serial interface



Example for ordering

ZDA-230AC
 └── Supply voltage
 └── Pressure indicator

When ordering please do not forget to specify the type of TOX®-Powerpackage.

Pressure measurement

Electronic pressure switch ZDO

Application

- TOX®-Powerpackage

Programmable functions

- LED display unit bar, psi, Pa
- Switching logic PNP
- Maximum value memory
- LED display can be flipped 180°
- LED display off

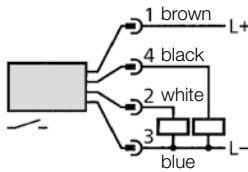
Failure is displayed if:

- System pressure > 10% of max. nominal pressure
- Short circuit in switch output 1 or switch output 2

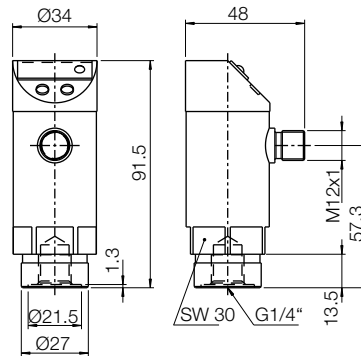
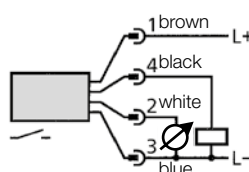


Connection scheme:

ZDO 01



ZDO 01.400A
with analog output



Dimensions in mm

Technical data:

| Type | ZDO 01.010 | ZDO 01.400 | ZDO 01.600 | ZDO 01.400A |
|--------------------------------|---|----------------|---|---------------|
| Full Scale (bar): | -1 – 10 | 0 – 400 | 0 – 600 | 0 – 400 |
| Increment (bar): | 0.01 | 1 | 1 | 1 |
| Repetive accuracy: | ± 0,1 % FS* | < ± 0,25 % FS* | < ± 0,25 % FS* | < ± 0,1 % FS* |
| Switch point accuracy: | ± 0,5 % FS* | ± 1,5 % FS* | ± 1,5 % FS* | < ± 0,5 % FS* |
| Display: | LED 7-Segments | | | |
| Delay time: | 0 - 50 s | | | |
| Supply voltage: | 18 – 30VDC | | | |
| Protection class: | IP65 | IP67 | IP67 | IP67 |
| Switching function per output: | hysteresis / normally closed window function / normally closed | | hysteresis / normally open window function / normally open | |
| | in addition analog output 4 – 20mA/0 – 10V | | | |

* FS = Full Scale

Example for ordering

ZDO 01.400A

- With SP2 as analog output
- Max. pressure 400 bar
- Version 01
- Electronic pressure switch

Distance measurement

External linear position sensor ZHW

The external linear position sensor provides the absolute position of the working piston in the TOX®-Powerpackage even after power failure. Due to the external mounting on the TOX®-Powerpackage, the mounting position can be adapted to the conditions inside the press.

By default, the linear position sensor is mounted on the front service side of the TOX®-Powerpackage. For the TOX®-Powerpackage types Q-S, X-S, X-AT and RZS the sensor can be mounted on one of three sides. For the types Q-K and X-K, two mounting sides are possible.

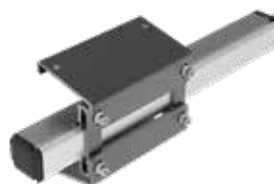
Function:

The piston position is determined via a special barrel and a magnetic ring on the working piston.

It is also possible to combine this linear position sensor type ZHW with the end position sensor option type ZHU.

Application

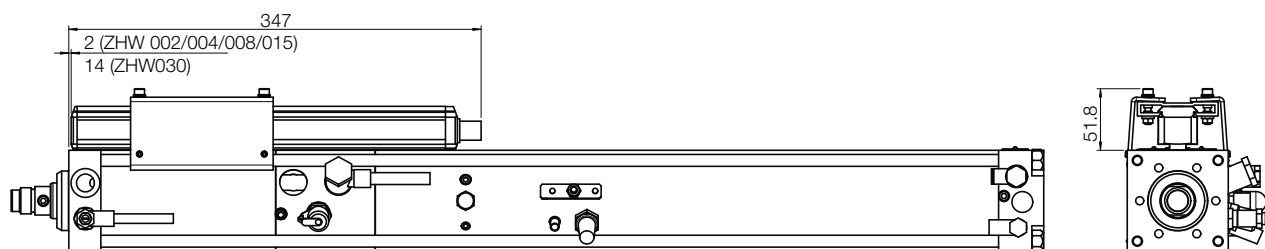
- TOX®-Powerpackage line-X, line-Q
- TOX®-Presses
- TOX®-Tongs



Advantages:

The linear position sensor provides non-contact sensing technology resulting in the following features:

- Wear-free
- Resistant to contamination



Dimensions in mm

Technical data:

| | |
|--|-------------------------|
| Repeat accuracy: | ± 10 µm |
| Supply voltage: | 10 ... 30V (stabilized) |
| Linear deviation: | ≤ ± 0.15 mm |
| Protection class: (in connected condition) | IP67 |
| Output | |
| Output voltage: | 0 ... 10V |
| Load current: | ≤ 5 mA |

Note:

- When using the accessory ZHW, the effective total stroke of the TOX®-Powerpackage has to be reduced by 20mm. The power stroke remains the same. In order to achieve the described repeat accuracy and linear deviation it is necessary to prevent the working rod of the TOX®-Powerpackage from rotating.
- Using of the ZHW only up to size S30.

Pin assignment connector S32 (view to connector at sensor) for shielded cable (max. 20m) Ø6 to 8 mm.



Delivery condition ZHW:

The TOX®-Powerpackage is delivered with the sensor's output voltage of 0 ... 10V already calibrated for the total stroke.

Scope of delivery:

- Sensor with right angle connector 90°
- Mounting bracket

Option USB communication box/PC software
see page 6

Output signal

| Pin | Cable | Interface |
|-----|-----------|-------------------|
| 1 | YE yellow | not used |
| 2 | GY grey | 0V |
| 3 | PK pink | 10 ... 0V |
| 4 | RD red | La ⁽²⁾ |
| 5 | GN green | 0 ... 10V |

Supply voltage (external)

| Pin | Cable | Interface |
|-----|----------|--------------------|
| 6 | BU blue | GND ⁽¹⁾ |
| 7 | BN brown | 10 ... 30V |
| 8 | WH white | Lb ⁽²⁾ |

⁽¹⁾ Reference potential for supply voltage and EMV-GND.

⁽²⁾ La = Lb = communication line

Example for ordering

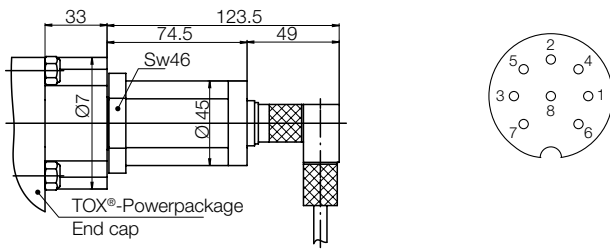
Q-S 002.030.100.12 – ZHW



Distance measurement

Linear position sensor ZKW

The linear position sensor ZKW determines the actual position of the TOX®-Powerpackage piston, even after a power failure. The measuring system works contactless. Therefore it is free of wear, insensitive to dirt and interferences. Final values are adjustable. CANopen and PROFIBUS-DP interfaces are available on request.



Dimensions in mm

Technical data:

| | |
|---------------------------------------|----------------------------|
| Repeat accuracy: | ± 10 µm |
| Supply voltage: | 20 ... 28V DC (stabilized) |
| Remaining ripple: | ≤ 0.5V _{ss} |
| Current consumption: | ≤ 150 mA |
| GND against housing: | 500V |
| Output | |
| Output voltage: | 0 ... 10 and 10 ... 0V |
| Electric strength: | ≤ 5 mA |
| Load current in connected condition): | IP67 |

Application



- TOX®-Powerpackage type K/AT/HZL/HZO (from size K 02/HZ 07) and X-K/X-AT (from size X-AT 50)
- TOX®-Presses
- TOX®-Tongs

View of soldered connection of the bush body.

Connector S 32 for shielded cable (max. 20m) Ø 6 to 8mm.

Output signal

| pin | cable | |
|-----|--------------|--------------|
| 1 | YE yellow | not occupied |
| 2 | GY grey | 0V |
| 3 | PK pink | 10 ... 0V |
| 4 | not occupied | |
| 5 | GN green | 0 ... 10V |

Supply voltage (external)

| pin | cable | |
|-----|----------|----------|
| 6 | BU blue | GND (1) |
| 7 | BN brown | + 24V DC |
| 8 | WH white | GND |

(1) Reference potential for distribution voltage and EMV-GND

Scope of delivery:

Sensor with connector, 90° angled.

Order no.

K 2.100.8 - **ZKW**

└── Path measuring system
└── Order no. of TOX®-Powerpackage

Option USB communication box/PC software

The option USB communication box provides two outputs via USB interface.

Output 1 for total stroke; output 2 freely configurable (e.g. for the last 5 mm of the stroke).



Features of the USB communication box with PC software:

- Online display of the current sensor position
- Graphical support for adjusting functions and characteristics
- Simple parameterising
- Freely configurable characteristics
- Two individually usable and adjustable outputs

System requirements:

- Operating system Windows 7 or better
- Min. screen resolution 1024 x 768 pixel
- 10MB free hard drive space
- Java Runtime Environment version 1.4.2 or newer
- USB interface

Distance measurement, Accessory, electrical

Potentiometer travel measurement ZW-x

Easy mounting to return stroke lock and press head. Scope of delivery: travel sensor, cable incl. plug M8x1, mounting bracket, cable guard and cable accessory.

Application

- TOX®-FinePress



Toggle Presses

| Type | for press type |
|--------------|-------------------------------|
| ZW-K 075.001 | KFS 002 KFSU/KFLU/KFWU 008 |
| ZW-K 075.002 | KFSU/KFLU025 |

Rack and Pinion Presses

| Type | for press type |
|--------------|----------------|
| ZW-Z 075.000 | ZFS 002 |
| ZW-Z 100.000 | ZFS/L/W 004 |

Pneumatic Presses

| Type | for press type |
|--------------|---|
| ZW-P 080.000 | PFL/W 008 PFL013 PFL022 PFL056 |
| ZW-P 100.000 | PFS 002 PFL/W 004 |

Pneumatic Presses with manual approach

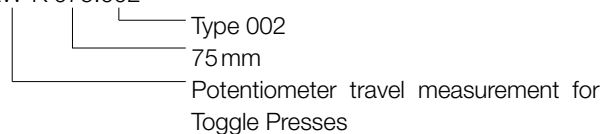
| Type | for press type |
|---------------|--|
| ZW-PH 075.000 | PFHL/W 008 PFHL 013 PFHL 022 PFHL 056 |

Technical data:

| Type: | Travel sensor ZW-P/ZW-Z100 | Travel sensor ZW-PH/ZW-K075/ZW-Z075 |
|----------------------|----------------------------|-------------------------------------|
| Electric range: | 100 mm + -1 mm | 75 mm + -1 mm |
| Output voltage: | 0 ...10V, 10V ... 0V | 10 ...0V, 0V ... 10V |
| Linearity tolerance: | + -0.1% | + -0.1% |
| Resolution: | < 0.01 mm | < 0.01 mm |
| Mechanical travel: | 105 mm | 80 mm |

Example for ordering

ZW-K 075.002



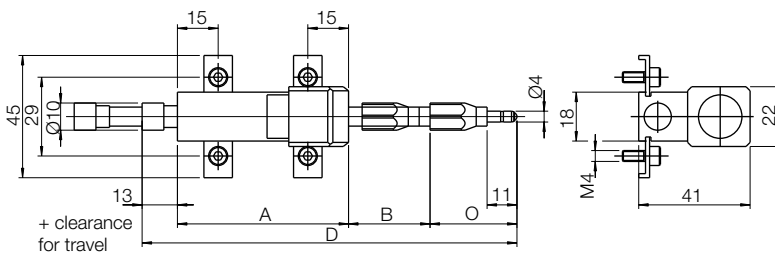
Distance measurement, Accessory, electrical

External, analog displacement transducer ZWW

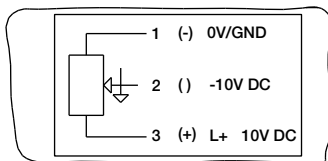
The displacement transducer ZWW indicates the absolute instantaneous position of the working rod or ram, even during power failure. The measurement system is almost wear-free, and it is not sensitive to dirt or interference. The sensor is mounted externally in a die set or on the working rod.

Application

- TOX®-Powerpackage
- TOX®-Presses



Wiring diagram



Wire colors:

- PIN 1 – Supply voltage
- PIN 2 + Signal output
- PIN 3 + Supply voltage

| Type | Measuring range | A | B | C | D |
|-------------|-----------------|-----|-----|----|-----|
| ZWW 010.000 | 10 mm | 48 | 15 | 32 | 108 |
| ZWW 025.000 | 25 mm | 63 | 30 | 32 | 138 |
| ZWW 050.000 | 50 mm | 88 | 55 | 40 | 196 |
| ZWW 100.000 | 100 mm | 138 | 115 | 40 | 307 |

Technical data:

| | |
|-----------------|---|
| Repeatability: | ±0.01 mm |
| Supply voltage: | 10VDC |
| Resistance: | 1 kΩ – 5 kΩ |
| Linearity: | 0.1 – 0.3% full scale |
| Connection: | plug, 5 pin, Binder 10-09-2013-00-05 |
| Protection: | IP54 |

Scope of delivery:

- Sensor
- Connector
- Mounting

Example for ordering

ZWW 100.000
 Variant 100mm
 Description

Force measurement

Press force sensor ZPS

The press force sensor ZPS can be mounted directly on the working piston of the TOX®-Powerpackage.

It is possible to measure the press forces in push and pull direction. The sensor is sealed against dirt and moisture. The anti-rotation device ZPSV is recommended to avoid damage of the connection cable (see next page).

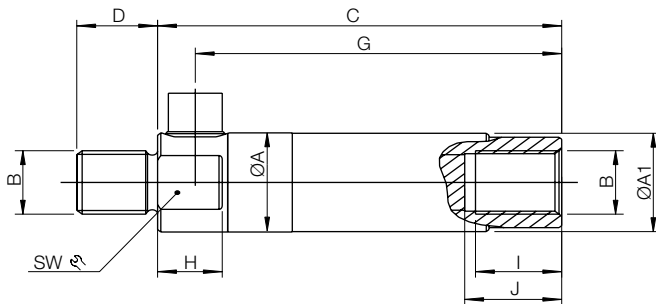
Application

- TOX®-Powerpackage
- TOX®-ElectricDrive
- TOX®-Presses

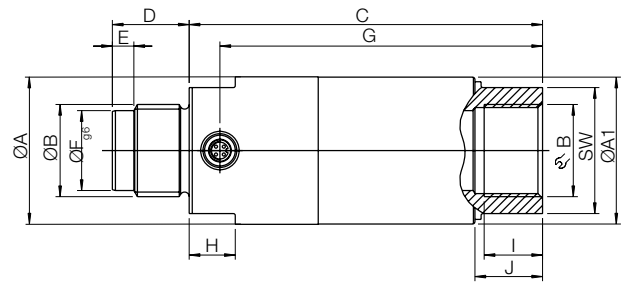


Advantages:

- Highly precise
- Robust
- Compact



ZPS 001 / ZPS 002



ZPS 004 - ZPS 200

| Type | Press force max. kN | ØA | ØA1 | B | C | D | E | ØF _{90°} | G | SW | H | I | J | Retracting force max. kN |
|---------|---------------------|-----|------|---------|-----|----|---|-------------------|-----|-----|----|----|----|--------------------------|
| ZPS 001 | 13 | 20 | 20.7 | M12x1.5 | 60 | 12 | - | - | 53 | 16 | 8 | 10 | 14 | 9 |
| ZPS 002 | 21 | 25 | 25.7 | M16x1.5 | 75 | 15 | - | - | 68 | 21 | 12 | 13 | 16 | 20 |
| ZPS 004 | 52 | 30 | 31 | M22x2 | 90 | 20 | 7 | 18 | 83 | 26 | 14 | 14 | 16 | 25 |
| ZPS 008 | 81 | 48 | 49 | M30x2 | 115 | 25 | 7 | 26 | 105 | 41 | 15 | 19 | 22 | 40 |
| ZPS 015 | 160 | 48 | 49 | M30x2 | 115 | 25 | 7 | 26 | 105 | 41 | 15 | 19 | 22 | 40 |
| ZPS 030 | 325 | 58 | 60 | M39x2 | 130 | 35 | - | - | 120 | 50 | 20 | 36 | 40 | 110 |
| ZPS 050 | 500 | 68 | 70 | M42x2 | 150 | 40 | - | - | 136 | 55 | 20 | 42 | 59 | 110 |
| ZPS 100 | 1030 | 100 | 102 | M64x2 | 180 | 60 | - | - | 155 | 85 | 22 | 63 | 66 | 245 |
| ZPS 200 | 2000 | 150 | 152 | M80x2 | 220 | 80 | - | - | 200 | 140 | 28 | 83 | 88 | 350 |

Dimensions in mm

Technical data:

| | |
|------------------------|------------------|
| Rated output: | 1.1 mV/V |
| Temperature range: | -10° to +65° |
| Zero balance: | ± 2 % |
| Supply voltage: | 10VDC (max. 15V) |
| Insulation resistance: | 1 GΩ |
| Nominal impedance: | 760Ω |
| Electric connection: | System Fischer |
| Combined error: | < ± 0.5 % |
| Overload: | 115 % |
| Protection class: | IP54 |

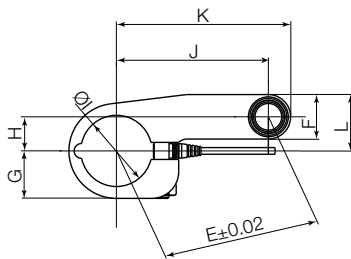
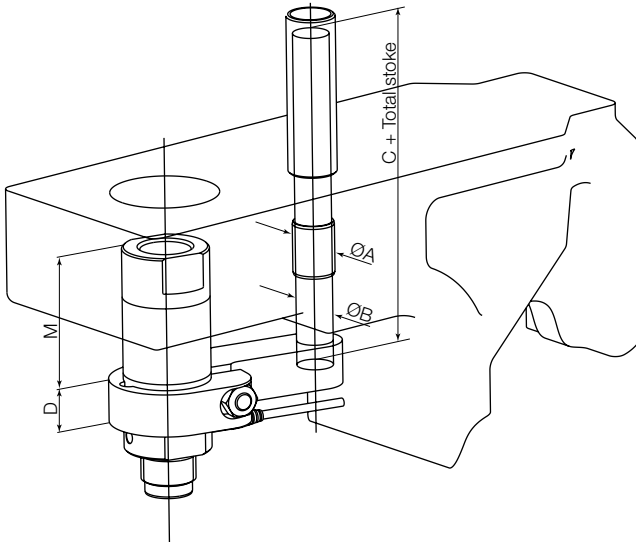
Force measurement

Anti-rotation device ZPSV

Prevents damage to the sensor cable. The center of the guide bushing bore must be set at dimension E from the centerline of the sensor. When ordering, please advise the total stroke of the TOX®-Powerpackage.

Application

- TOX®-Powerpackage
- TOX®-ElectricDrive
- TOX®-Presses



Scope of delivery:

- Anti rotation device
- Guide bushing
- Shaft

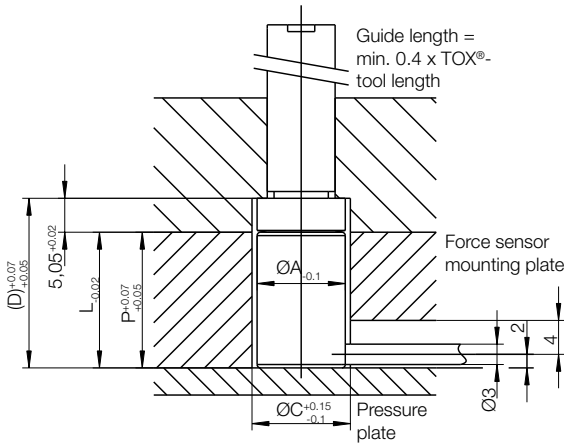
| Type | For press force sensor type | $\varnothing A_{H7}$ | $\varnothing B$ | C | D | E | F | G | H | $\varnothing I$ | J | K | L | M |
|----------|-----------------------------|----------------------|-----------------|-----|----|-----|----|----|----|-----------------|--------|--------|----|------------|
| ZPSV 001 | ZPS 001 | 14 | 12 | 70 | 17 | 52 | 18 | 19 | 17 | 20 | 49.14 | 58.14 | 26 | 37 |
| ZPSV 002 | ZPS 002 | 14 | 12 | 85 | 17 | 52 | 18 | 21 | 17 | 25 | 49.14 | 58.14 | 26 | 49 |
| ZPSV 004 | ZPS 004 | 18 | 16 | 100 | 19 | 80 | 24 | 23 | 20 | 30 | 77.46 | 89.46 | 32 | 59 |
| ZPSV 008 | ZPS 008 | 23 | 20 | 90 | 24 | 105 | 30 | 32 | 23 | 48 | 102.45 | 117.45 | 38 | 75 |
| ZPSV 015 | ZPS 008 ZPS 015 | 23 | 20 | 90 | 24 | 110 | 30 | 32 | 23 | 48 | 107.57 | 122.57 | 38 | 75 |
| ZPSV 030 | ZPS 030 | 28 | 25 | 150 | 24 | 170 | 38 | 37 | 27 | 58 | 167.84 | 186.84 | 46 | 85 |
| ZPSV 050 | ZPS 050 | 28 | 25 | 150 | 24 | 180 | 38 | 42 | 27 | 68 | 177.96 | 238.96 | 46 | 105 |
| ZPSV 100 | ZPS 100 | 28 | 25 | 338 | 24 | 235 | 38 | 58 | 39 | 100 | 231.74 | 250.74 | 39 | 122 |
| ZPSV 200 | ZPS 200 | | | | | | | | | | | | | on request |

Dimensions in mm

Force measurement

TOX®-Press Force Sensor CKN

In-Die sensor for TOX®-Punch or TOX®-Die. This force transducer specially developed by TOX® PRESSOTECHNIK allows measurement of relatively high forces under critical space requirements.



Application

- TOX®-Powerpackage
- TOX®-ElectricDrive
- TOX®-Presses
- TOX®-Tongs

| Type | Rated capacity max. kN | ØA | ØB | L | ØC | D | P |
|-------------|------------------------|----|----|----|----|----|----|
| CKN 027.000 | 27 | 13 | 3 | 25 | 13 | 30 | 25 |
| CKN 040.000 | 40 | 15 | 3 | 25 | 15 | 30 | 25 |
| CKN 055.000 | 55 | 17 | 3 | 30 | 17 | 35 | 30 |
| CKN 072.000 | 72 | 19 | 3 | 30 | 19 | 35 | 30 |
| CKN 091.000 | 91 | 21 | 3 | 35 | 21 | 40 | 35 |
| CKN 112.000 | 112 | 23 | 3 | 35 | 23 | 40 | 35 |
| CKN 140.000 | 140 | 26 | 3 | 35 | 26 | 40 | 35 |
| CKN 150.000 | 150 | 27 | 3 | 40 | 27 | 45 | 40 |
| CKN 190.000 | 190 | 30 | 3 | 40 | 30 | 45 | 40 |

Dimensions in mm

Requirements:

- Press force +20% < rated capacity of the sensor
- Included 5 pin connector
- Cable 1.9m long
- Sensor must be installed in such a way that no side-, torsion-, or pre-loads are present

Technical data:

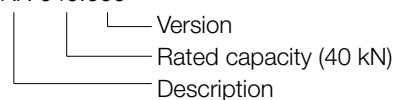
| | I | U |
|------------------------|--------------------------|----------------|
| Rated output: | 8 mV at 12 mA excitation | 2.2 - 2.7 mV/V |
| Supply voltage: | - | 5V |
| Excitation current: | 12 mA | - |
| Temperature range: | +10 °C to 65 °C | |
| Zero balance: | ±3% | |
| Insulation resistance: | >5x10 ⁹ Ω | |
| Nominal impedance: | 350 Ω | |
| Combined error: | ≤ ±2% | |
| Overload: | 120% | |
| Protection: | IP54 | |

Wire colors:

- black + Supply voltage
- red - Supply voltage
- white + Signal output
- green - Signal output

Example for ordering

CKN 040.000



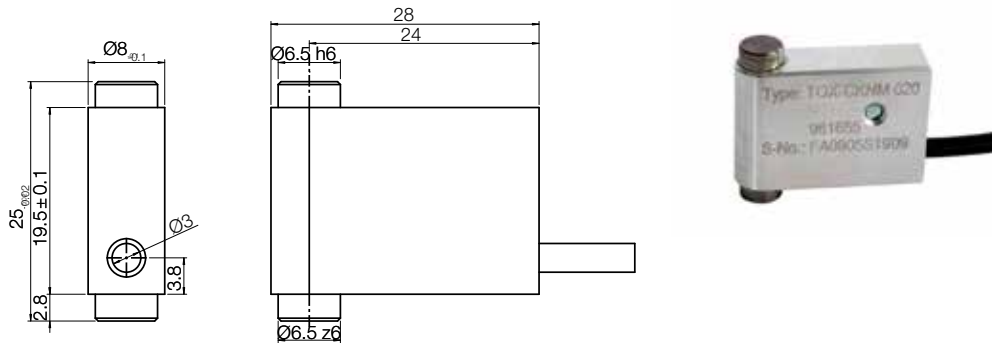
Force measurement

TOX[®]-Miniature Force Sensor CKNM 20

Compact miniature sensor for use in very small tools.

Application

- TOX[®]-Powerpackage
- TOX[®]-ElectricDrive
- TOX[®]-Presses
- TOX[®]-Tongs



Technical data:

| | |
|--------------------|-----------------|
| Rated output: | 2.5 mV/V |
| Temperature range: | +10 °C to 65 °C |
| Zero balance: | ± 0.25 mV/V |
| Supply voltage: | 10V |
| Nominal impedance: | 1000 Ω |
| Linearity: | ± 2 % F.S. |
| Overload: | 120 % |
| Protection: | IP54 |

Wire colors:

| | |
|--------|------------------|
| white | + Supply voltage |
| brown | - Supply voltage |
| yellow | + Signal output |
| green | - Signal output |

Order no.

CKNM 20

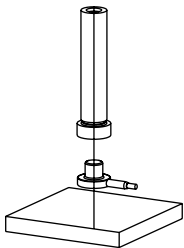
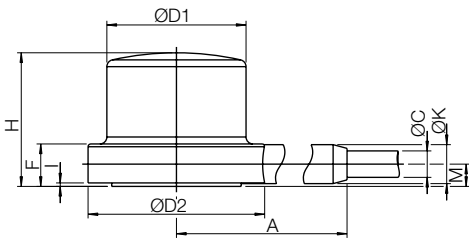
Force measurement

TOX®-Press Force Sensor ZKNW

Compact miniature sensor for use in very small tools.

Application

- TOX®-Powerpackage
- TOX®-ElectricDrive
- TOX®-Presses
- TOX®-Tongs



Example: sensor under TOX®-Die

| Type | Rated capacity max. kN | ØD1 | ØD2 | F | A | H | I | ØC | ØK | M |
|--------------|------------------------|------|------|------|------|------|------|-----|-----|-----|
| ZKNW 001.000 | 1 | 6.4 | 12.7 | 3.05 | 14.9 | 9.6 | 0.25 | 1.9 | 2.8 | 1.6 |
| ZKNW 002.000 | 2 | 6.8 | 12.7 | 3.05 | 14.9 | 9.6 | 0.25 | 1.9 | 2.8 | 1.6 |
| ZKNW 005.000 | 5 | 7.7 | 12.7 | 3.05 | 14.9 | 9.6 | 0.25 | 1.9 | 2.8 | 1.6 |
| ZKNW 010.000 | 10 | 10.0 | 12.7 | 3.05 | 14.9 | 9.6 | 0.25 | 1.9 | 2.8 | 1.6 |
| ZKNW 020.000 | 20 | 14.0 | 15.9 | 6.0 | 16.5 | 16.0 | 0.25 | 1.9 | 2.8 | 3.1 |
| ZKNW 050.000 | 50 | 19.7 | 22.4 | 6.0 | 19.7 | 16.0 | 0.25 | 1.9 | 2.8 | 3.1 |
| ZKNW 100.000 | 100 | 25.5 | 44.0 | 15.0 | 35.0 | 38.0 | 0.50 | 3.0 | 7.0 | 7.5 |

Dimension in mm

Technical data:

| | |
|------------------------|------------------|
| Rated output: | 1,5 mV/V |
| Temperature range: | +10 °C to 65 °C |
| Zero balance: | ± 1 % |
| Supply voltage: | 3VDC (max. 5VDC) |
| Insulation resistance: | 10 MΩ |
| Bridge resistance: | 350 Ω nominally |
| Combined error: | ≤ ±0.5 % |
| Overload: | 150 % |
| Protection: | IP54 |

Wire colors:

- white + Supply voltage
- brown – Supply voltage
- yellow + Signal output
- green – Signal output

Example for ordering

ZKNW 010.000
 └── Version
 └── Rated capacity 10kN)
 └── Description

Force measurement

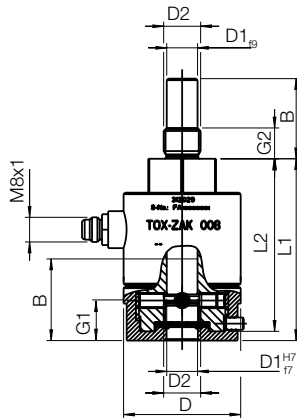
3 in 1 tool fixture ZAK with force sensor

Application

- TOX®-FinePress

Scope of delivery:

- Force sensor
- Cable incl. plug M8x1 and mounting bracket
- Cable guard
- Cable accessory



| Type | Nominal force of sensor | For press type | Nominal force of press | Measuring accuracy (depending on press) | B | D | D1 | D2 | G1 | G2 | L1 | L2 |
|--------------|-------------------------|------------------------------|------------------------|---|----|----|----|---------|------|----|------|----|
| ZAK 001* | 1.0 kN | for special applications | | 0.5% | 26 | 55 | 10 | M12x1 | 13 | 10 | 74 | 71 |
| ZAK-K04.000* | 4.0 kN | KFS 002 | 2.5 kN | 0.8% | 26 | 55 | 10 | M12x1 | 13 | 10 | 86 | 83 |
| ZAK-Z04.000* | 4.0 kN | ZFS 002 ZFS/L/W 004 | 2.5 kN 4.0 kN | 0.8% 0.5% | 26 | 55 | 10 | M12x1 | 13 | 10 | 86 | 83 |
| ZAK-P04.000* | 4.0 kN | PFS 002 PFL/W 004 | 2.0 kN 4.0 kN | 1.0% 0.5% | 26 | 55 | 10 | M12x1 | 13 | 10 | 86 | 83 |
| ZAK-K08.000 | 8.0 kN | KFSU/LU/WU 008 PFHL/W 008 | 8.0 kN 8.5 kN | 0.5% 0.5% | 26 | 38 | 10 | M12x1 | 13 | 10 | 59 | 56 |
| ZAK-K16.000 | 16.0 kN | PFHL 013 | 13.5 kN | 0.6% | 26 | 38 | 10 | M12x1 | 13 | 10 | 59 | 56 |
| ZAK-P16.000 | 16.0 kN | PFL/W 008 PFL 013 | 8.5 kN 13.5 kN | 0.9% 0.6% | 26 | 38 | 10 | M12x1 | 13 | 10 | 59 | 56 |
| ZAK-K25.000 | 25.0 kN | KFSU/LU 025 | 25.0 kN | 0.5% | 26 | 38 | 10 | M12x1 | 13 | 10 | 59 | 56 |
| ZAK-K34.000 | 34.0 kN | PFHL 022 | 22.5 kN | 0.8% | 26 | 50 | 14 | M16x1.5 | 15.5 | 12 | 67.5 | 62 |
| ZAK-P34.000 | 34.0 kN | PFL 022 | 22.5 kN | 0.8% | 26 | 50 | 14 | M16x1.5 | 15.5 | 12 | 67.5 | 62 |
| ZAK-K57.000 | 57.0 kN | PFHL 056 | 57.5 kN | 0.5% | 26 | 50 | 14 | M16x1.5 | 15.5 | 12 | 67.5 | 62 |
| ZAK-P57.000 | 57.0 kN | PFL 056 | 57.5 kN | 0.5% | 26 | 50 | 14 | M16x1.5 | 15.5 | 12 | 67.5 | 62 |

*The types ZAK-..001/04 provide a mechanical overload protection. As a result, the guidance accuracy is reduced.

Technical data:

| | |
|--------------------|----------------|
| Rated output: | 1,10 mV/V |
| Temperature range: | -10° C – 65° C |
| Supply voltage: | 10VDC |

Example for ordering

ZAK - K08

- Nominal force 8 kN
- For Toggle Presses
- Tool force sensor with fixture

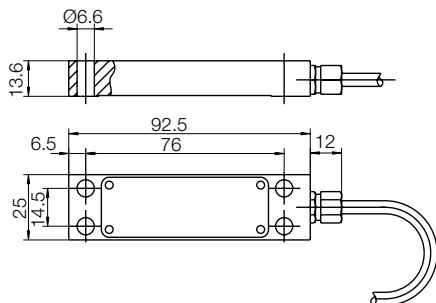
Force measurement, Accessory electrical

Strain Sensor ZKN

The surface sensor measures the strain between two bolted locations. The measured signal is proportional to the elongation of the structure. The sensor can measure elongation and compression, and provides the respective signal.

Assembly instructions:

The strain sensor ZKN must be mounted on a machined surface with a minimum ISO surface finish of N9 and a maximum flatness tolerance of 0.05 mm. The tightening torque should be 14 + 1 Nm. Use mounting screws M6x25 with a grade of 10.9 or higher.



Application

- TOX®-Powerpackage
- TOX®-ElectricDrive
- TOX®-Presses
- TOX®-Tongs



Wire colors:

Passive (pull and press):

- brown + Excitation
- green - Excitation
- yellow + Signal output
- white - Signal output

Active (pull and press):

- white + Supply voltage
- rosa - Supply voltage (GND)
- grey + Signal output
- blue - Signal output (OV)
- green - Tara-Signal

Technical data:

Passive:

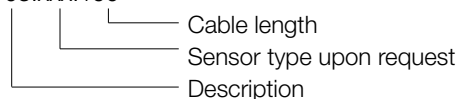
| | |
|------------------------|--------------------|
| Rated output: | 1.25 mV/V (250 µE) |
| Temperature range: | + 10 °C to 65 °C |
| Zero balance: | ± 100 % possible |
| Supply voltage: | 5VDC (max. 10VDC) |
| Insulation resistance: | >10 MΩ |
| Nominal impedance: | 350 Ω |
| Combined error: | ≤ ± 2 % |
| Overload: | 120 % |
| Standard cable length: | 2 m |
| Protection: | IP67 |

Active:

| | |
|------------------------|--------------------|
| Rated output: | 10V (250 µE) |
| Temperature range: | + 10 °C to 65 °C |
| Zero balance: | ± 100 % possible |
| Supply voltage: | max. 24VDC ≤ 30 mA |
| Insulation resistance: | >10 MΩ |
| Combined error: | ≤ ± 2 % |
| Overload: | 120 % |
| Standard cable length: | 1.90 m |
| Protection: | IP67 |

Example for ordering

ZKN 103.xxx.190



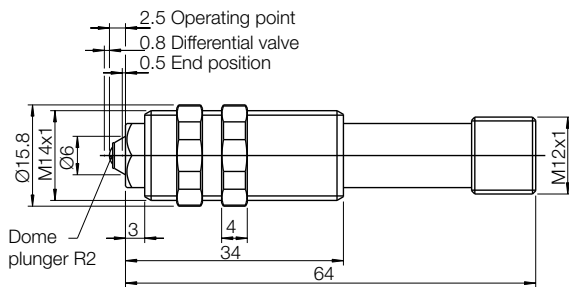
Distance measurement, Accessory electrical

Precision limit switch ZWE

This precision limit switch ZWE can be used to monitor the control dimension X for clinching applications.

Application

- TOX®-Powerpackage
- TOX®-Presses
- TOX®-FinePress



Wiring diagram



Wire colors:

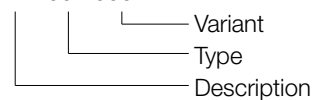
- PIN 1 + Supply voltage
- PIN 4 - Switching signal

Technical data:

| | |
|---------------------------------|----------------|
| Operating voltage: | 18 ... 30VDC |
| Switching current min. at 1 mV: | 1 mA |
| Operating point accuracy: | ± 0.01 mm |
| Mechanical life: | ≥ 10 million |
| Actuating force: | 10 N |
| Mounting position: | optional |
| Connection: | M12 round plug |
| Protection: | IP54 |

Example for ordering

ZWE 001.000



Position sensor, Accessory electrical

Proximity switch ZHS for forward and return stroke monitor ZHU

Attached to the working piston permanent magnet is which is detected by the sensors through the special tube.

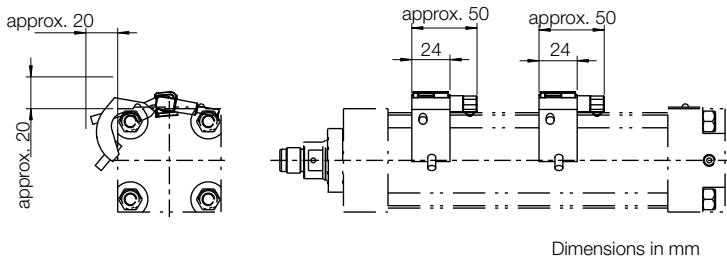
Application

- TOX®-Powerpackage
- TOX®-Presses
- TOX®-FinePress
- TOX®-Tongs

Notes:

The total stroke of the TOX®-Powerpackage is shortened by the ZHU installation:

- For types S/K/AT 01–30 up to 10 mm
- For types HZ 05–48 with total stroke up to 200 mm by 20 mm
- For series line-Q and line-X no stroke reduction is required



Technical data:

| | |
|--------------------------|--|
| Supply voltage: | 10–30VDC |
| Residual ripple: | ≤ 15 % |
| Max. admissible current: | max. 200 mA |
| Turn-on time: | ≤ 0.5 ms |
| Turn-off time: | 20–50 ms |
| Hysteresis: | 0,5...1 mm |
| Plug connection: | With LED, M 8 according to DIN 43 650 IP65 |

Options:

- Proximity switch, magnet-sensitive, with LED, ZHS 001.000
- Holding angle ZMP for proximity switch ZHS
- Cable box M8 x 1 with 5 m cable, straight

Order no.

S 1.32.6 - **ZHU**

Stroke monitor without sensors and holding fixture
Order no. of TOX®-Powerpackage