

# LINEAR POTENTIOMETER



## LZW Series

### Key-Features:

- Two models with protection class IP65 and IP67
- Available measurement ranges from 50 to 750 mm
- Outputs: potentiometer, analog 0.5...4.5 V, 0...10 V
- Signal conditioner Squeezer: allows teaching of the measurement range and setting a switching point in combination with analog output
- Self-aligning rod end bearings
- Linearity up to  $\pm 0.05\%$
- Working temperature  $-30...+100\text{ }^{\circ}\text{C}$
- Life cycle  $>25 \times 10^6 \text{ m}$  or  $>100 \times 10^6$  operations, whichever is less
- Simple apparatus according to the EN 60079-11 standard

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## TECHNICAL DATA LZW-M /-B / -IP, POTENTIOMETER OUTPUT

Model		LZW-M	LZW-B	LZW-IP
Measurement range *	[mm]	50 / 100 / 130 / 150 / 175 / 200 / 225 / 275 / 300 / 375 / 400 / 450 / 500 / 600 / 750 / 900		
Protection class		IP65	IP65	IP67
Displacement speed	[m/s]	≤5	≤5	≤3
Displacement force	[N]	≤10	≤10	≤30
Linearity	[%]	±0.05	±0.05	±0.05, ±0.075 for measuring range <150 mm
Resolution		Resolution depends on the signal quality of the reference voltage respectively supply voltage.		
Repeatability	[mm]		0.01	
Tolerance on resistance	[%]		±20	
Recommended cursor current	[µA]		<0.1	
Maximum cursor current	[mA]		10	
Dissipation at 40 °C	[W]		3	
Maximum applicable voltage	[V]		60	
Temperature coefficient of resistance	[ppm/°C]		±200	
Temperature coefficient of output voltage	[ppm/°C]		<1.5, for LZW-IP <5	
Electrical isolation			>100 MOhm at 500 V=, 1 bar, 2 s	
Dielectric strength			<100 µA at 500 V~ at 50 Hz, 1 bar, 2 s	
Working temperature	[°C]		-30...+100	
Storage temperature	[°C]		-50...+100	
Life cycle			>25 x 10 <sup>6</sup> m or >100 x 10 <sup>6</sup> operations (whichever is less)	
Electrical connection		4-pole connector, DIN 43650	5-pole connector	4-pole M12-Connector
Rod material		Stainless steel, AISI 303	Stainless steel, AISI 303	C45 steel, chrome-plated 20 µm
Housing material		Anodised aluminium, Nylon 66 G25	Anodised aluminium, Nylon 66 G25	Anodised aluminium

\* additional measurement ranges on request

## TECHNICAL DATA LZW-M WITH ANALOG OUTPUT

Model		LZW-M...-4,5VT	LZW-M...-10VT
Measurement range *	[mm]	50 / 100 / 130 / 150 / 175 / 200 / 225 / 275 / 300 / 375 / 400 / 450 / 500 / 600 / 750	
Protection class		IP65	
Displacement speed	[m/s]	≤5	
Displacement force	[N]	<10	
Linearity	[%]	±0.05	
Output	[V]	0.5...4.5	0...10
Teach function		by using the signal conditioner Squeezer teachable up to approx. 50 % of measurement range	
Resolution	[mV]	1	
Repeatability	[mm]	0,01	
Dynamic	[ms]	1	
Power supply	[VDC]	8...35	
Power consumption	[mW]	150	
Output current		max. 10 mA, min. load resistance 1 kOhm	
Temperature coefficient	[%/K]	0.0013	0.0016
Electrical isolation		>100 MOhm at 500 V=, 1 bar, 2 s	
Dielectric strength		<100 µA at 500 V ~ at 50 Hz, 1 bar, 2 s	
Working temperature	[°C]	-40...+85	
Storage temperature	[°C]	-40...+85	
Life cycle		>25 x 10 <sup>6</sup> m or >100 x 10 <sup>6</sup> operations (whichever is less)	
Reverse polarity protected		Yes	
Short circuit protected		Yes	
EMV		EN 61326-1:2006	
Electrical connection		4-pole connector, DIN 43650	
Rod material		Stainless steel AISI 303	
Housing material		Anodised aluminium, Nylon 66 G 25	

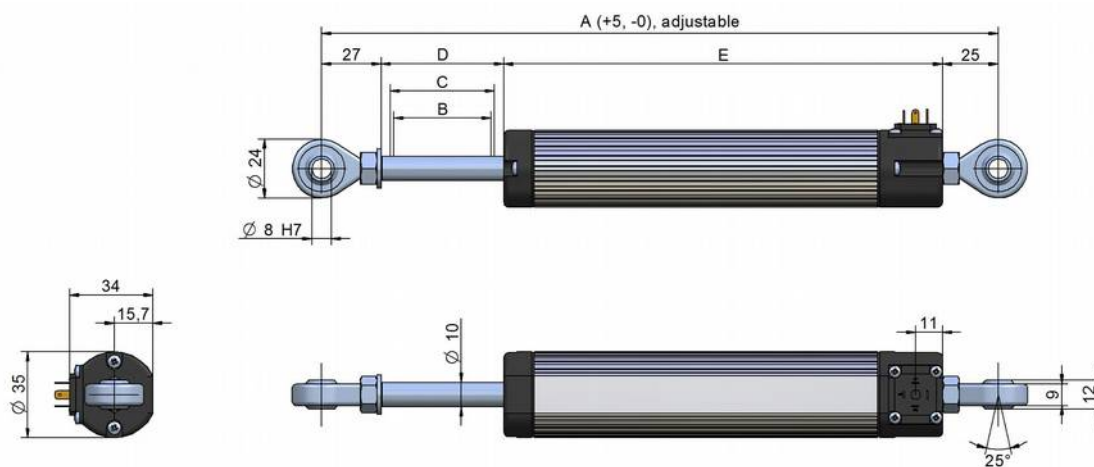
\* additional measurement ranges on request

## DIMENSIONS AND ELECTRICAL DATA

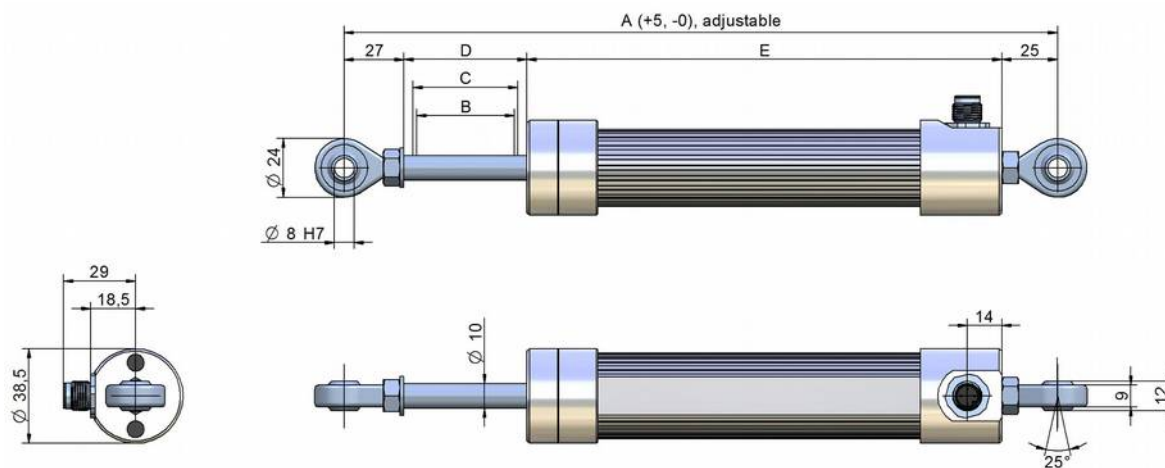
Useful electrical stroke (B) +3/-0	[mm]	50	100	130	150	175	200	225	275	300	360	375	400	450	500	600	750
Theoretical electrical stroke (C) ±1	[mm]	B + 3			B + 4			364			380	406	457	508	609	762	
Resistance	[kOhm]	5															10
Mechanical stroke (D) LZW-M, LZW-B	[mm]	B + 9			B + 10			370			386	412	463	518	619	772	
Mechanical stroke (D) LZW-IP	[mm]	B + 9			B + 10			386			412	463	518	619	772		
Housing length (E) LZW-M, LZW-B	[mm]	B + 129			B + 130			496			512	538	589	664	765	918	
Housing length (E) LZW-IP	[mm]	B + 148			B + 149			515			531	557	608	683	784	937	
Minimum distance (A) LZW-M, LZW-B	[mm]	B + 177			B + 178			544			560	586	637	712	813	966	
Minimum distance (A) LZW-IP	[mm]	B + 196			B + 197			563			579	605	656	731	832	985	

## TECHNICAL DRAWING

### LZW-M / LZW-B



### LZW-IP



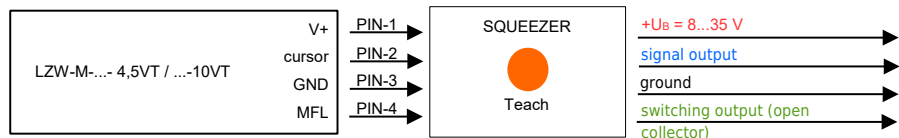
## LZW-M WITH ANALOG OUTPUT 4,5VT, 10VT, SQUEEZER

LZW-M sensors with the analog output versions 5VT and 10VT are equipped with a teachable, internal electronics, called VT-Electronics. The signals provided by the sensor's potentiometer are digitized by the VT-Electronics. This digital information is first processed by the electronics, then transformed back and given out as an analog output signal 0 to 10 V or 0.4 to 4.5 V.

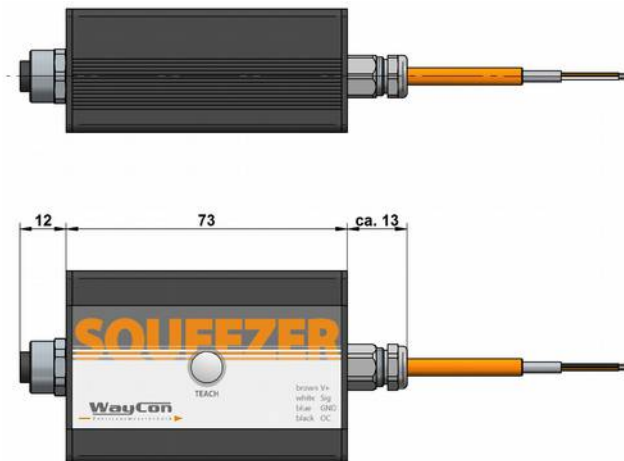
The digitization offers two possibilities of adjustment, by which the sensor can be configured individually using the Squeezer:

- 1) Teaching of the measurement range. After a successful teaching process the Squeezer can be pulled off the sensor and be replaced by a standard cable or connector.
- 2) Setting an individual switching point. The Squeezer allows the setting of an individual switching point open collector. The switching signal is emitted through the Multi-functional line MFL.

You will find a detailed description of the functions in a separate manual.



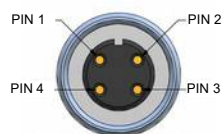
## TECHNICAL DRAWING SQUEEZER



Available cable lengths:  
 Squeezer2M: cable length 2 m  
 Squeezer5M: cable length 5 m  
 Squeezer10M: cable length 10 m

## ELECTRICAL CONNECTION SQUEEZER

In combination with LZW-M-...- 4,5VT / ...-10VT (analog output)



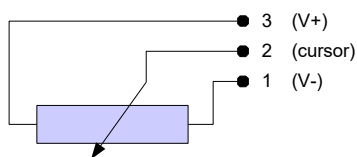
Connector (to sensor)		Cable ends (e.g. to PLC)	
Pin 1	V +	brown	V + (8...35 V)
Pin 2	Signal (cursor)	white	Signal
Pin 3	V - (GND)	blue	GND
Pin 4	MFL*	black	NPN**

\* multifunctional line

\*\* The Open Collector is a NPN switching output

## ELECTRICAL CONNECTION

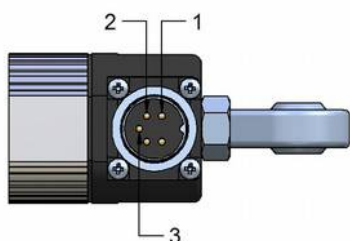
### Electrical connection



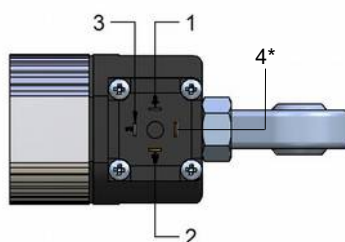
### Installation instructions

- Please pay attention that the sensor is not used as a variable resistor.
- Please be careful while calibrating the sensor to set the stroke so that the output signal does not drop below 1 % or exceed 99 % of the supply voltage.

### Output LZW-B (IP65)

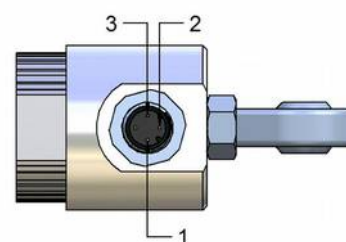


### Output LZW-M (IP65)



\* MFL: connect only when using the functions of a Squeezer

### Output LZW-IP (IP67)



## ACCESSORIES

### Output LZW-IP (IP67)

#### Cable with connector M12, 4 poles, shielded

K4P2M-S-M12	2 m, connector straight, IP67
K4P5M-S-M12	5 m, connector straight, IP67
K4P10M-S-M12	10 m, connector straight, IP67
K4P2M-SW-M12	2 m, connector angular, IP67
K4P5M-SW-M12	5 m, connector angular, IP67
K4P10M-SW-M12	10 m, connector angular, IP67

#### Signal

V+	brown
cursor	white
V-	blue

#### Cable colour K4P...

#### Mating Connector M12, 4 poles, shielded

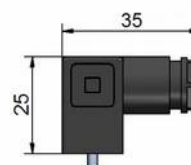
D4-G-M12-S	straight, IP67
D4-W-M12-S	angular, IP67

### Output LZW-B (IP65)



**CON011:** mating connector for self assembly  
IP40, 5 pole, cable diameter 4...6 mm

### Output LZW-M (IP65)



**CON008:** mating connector, angular for self assembly  
IP40, 4 pole, PG9 cable gland, cable Ø 6...8 mm

## SIGNAL CONDITIONER

### PMX-24 Signal Conditioner

- Converts potentiometer signals into analog output signals
- Input: potentiometer 1...20 kΩ
- Configurable output
- DIN-rail-mounting with face-side connector
- For further information please contact WayCon or [download](#) the data sheet.

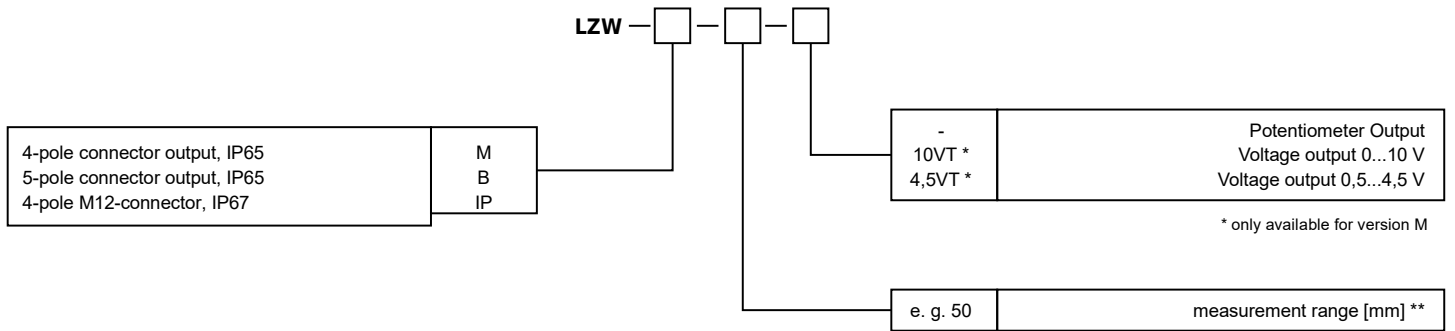


### Squeezer Signal Conditioner for LZW-M-...-4,5VT / ...-10VT

- Converts potentiometer signals into analog output signals 0.5...4.5 V, 0...10 V
- Teachable measurement range
- Input: potentiometer 1...20 kΩ
- Switching point open collector



## ORDER CODE



\*\* custom lengths available for order quantities larger 10 units

## ACCESSORIES

### Connection cables for LZW-IP, 4-pole, shielded, IP67

K4P2M-S-M12	2 m, M12-connector straight, for LZW-IP
K4P5M-S-M12	5 m, M12-connector straight, for LZW-IP
K4P10M-S-M12	10 m, M12-connector straight, for LZW-IP
K4P2M-SW-M12	2 m, M12-connector angular, for LZW-IP
K4P5M-SW-M12	5 m, M12-connector angular, for LZW-IP
K4P10M-SW-M12	10 m, M12-connector angular, for LZW-IP

### Connection cable Squeezer – LZW-M...-4,5VT / ...-10VT

on request

### Mating Connectors

CON008	4-pole, for LZW-M
CON011	5-pole, for LZW-B
D4-G-M12-S	M12 straight, 4-pole, for LZW-IP
D4-W-M12-S	M12 angular, 4-pole, for LZW-IP

### Signal Conditioner

PMX-24	different analog output signals in one device
SQUEEZER2M	2 m cable
SQUEEZER5M	5 m cable
SQUEEZER10M	10 m cable

Subject to change without prior notice

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