1 Description

The ELMP 150 controller provides simultaneous control of two proportional solenoids (spread width and spread density) in accordance with the steplessly adjustable control settings and with the vehicle speed. The operating controls and status-indicating LEDs are located on the back-lit front panel. The unit requires a 24 V DC or 12 V DC smoothed power supply. The unit is factory-set for 24 V DC but can be easily reset for 12 V DC. The controller offers four operating modes: Spread, Unload, Maximum Spread ("Blast") and Test. In Spread mode the two outputs are driven in accordance with the control settings and the road speed signal. If the road speed signal falls below a threshold value, the spread density output is cut off. In Unload mode the spread density control setting is ignored and the output goes to maximum, and the spread width output goes to zero. In Maximum Spread ("Blast") mode either: - the existing spread width output is maintained and the spread density output goes to maximum -or- both outputs go to maximum (de-pendent on jumper setting). In Test mode the outputs are driven in accordance with the control settings together with an internally-simulated road speed signal. As a road signal, either a Impulse-generator or a proximity switch can be used to provide the external road speed signal.

2 Technical data

<table>
<thead>
<tr>
<th>Electrical characteristics</th>
<th>Unit</th>
<th>Description, value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply</td>
<td>V</td>
<td>12 … 24 (standard), smoothed. Ripple &lt; 10%</td>
</tr>
<tr>
<td>No. of outputs</td>
<td></td>
<td>2 x proportional; 5 x ON/OFF</td>
</tr>
<tr>
<td>Adjustable min. current, spread width (I_{minB})</td>
<td>A</td>
<td>0.1 … 1.2</td>
</tr>
<tr>
<td>Adjustable max. current, spread width (I_{maxB})</td>
<td>A</td>
<td>0.6 … 2.5</td>
</tr>
<tr>
<td>Adjustable min. current, spread density (I_{minD})</td>
<td>A</td>
<td>0 … 1.2</td>
</tr>
<tr>
<td>Adjustable max. current, spread density (I_{maxD})</td>
<td>A</td>
<td>1 … 2.5 (but not less than I_{minD})</td>
</tr>
<tr>
<td>Max. permissible output current (I_{zul})</td>
<td>A</td>
<td>proportional outputs 2.5 ; ON/OFF outputs 3 A</td>
</tr>
<tr>
<td>Dither frequency</td>
<td>Hz</td>
<td>set at 100 (rectangular)</td>
</tr>
<tr>
<td>Frequency input for road speed signal:</td>
<td>Hz</td>
<td>80 … 200 optionally 600 … 1500</td>
</tr>
<tr>
<td>maximum input frequency voltage levels at frequency input</td>
<td></td>
<td><em>Low-Signal</em>&lt;5 V; <em>High-Signal</em>&gt;7.5 V</td>
</tr>
<tr>
<td>input impedance of frequency input</td>
<td></td>
<td>1 kW or 10 kW after removal of a resistor</td>
</tr>
</tbody>
</table>
### Electrical characteristics

<table>
<thead>
<tr>
<th>Description, value</th>
<th>Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply for NPN pulse emitter (Road speed)</td>
<td>V</td>
<td>9</td>
</tr>
<tr>
<td>Max. loading of power supply for NPN pulse emitter</td>
<td>mA</td>
<td>10</td>
</tr>
<tr>
<td>Threshold value for road speed signal</td>
<td>V</td>
<td>0.15 alternatively 0.03 ( x_f_{max} )</td>
</tr>
<tr>
<td>Speed simulation voltage (Test mode)</td>
<td>V</td>
<td>1.4 ... 3.8 at frequency input</td>
</tr>
</tbody>
</table>

### Notable features
- Power supply terminals are reverse-polarity protected;
- For the duration of a short circuit, the relevant amplifier switches off automatically;

### Enclosure protection
- IP30

### Operating temperature
- \( ^\circ \)C | -20 ... +50

### Dimensions
- mm | approx. 65 x 185 x 180 (aluminium-housing)

### Weight
- kg | approx. 1.55

### Connection
- Twenty-pin solder plug H-A 16 Sta 20S with housing H-A 16 KAg

### Electro-magnetic compatibility
- EN 14982 radiated emission
- ISO 11452-2-5
  - Immunity radiated electromagnetic energy
  - ISO/TR 10605 Immunity against discharge static electricity
  - ISO 7637-0-2
  - Immunity against circuit disturbance; class D, A
- e1 directive 95/54/EG radiated emissio prepared by vehicles

### Commissioning

The set-up procedures must be carried out at operating temperature. The two outputs can be set in either order, since they are independent of each other.

1. Connect the controller in accordance with the connection diagram and switch it on.
2. Provide a speed signal (frequency) equivalent to the maximum road speed and set the Test/Operating switch to Operating. Using the trimming potentiometer \( P_5 \), adjust the voltage between test point MP3 and pin 20 (Ground) to 6.5 V (factory setting is 133 Hz; at 8 impulses per meter of travel, this corresponds to a speed of 60 km/hr).
3. Set the Unload switch to Unload. Using the trimming potentiometer \( P_9 \), and adjusting UP to the final value, set the maximum possible auger/belt speed.
4. Switch off the Unload switch. Set the spread width control to maximum. Using the trimming potentiometer \( P_7 \), and adjusting UP to the final value, set the maximum spinner speed.
5. Set the spread width to minimum. Using the trimming potentiometer \( P_8 \), and adjusting DOWN to the final value, set the minimum spinner speed.
6. Set the Test/Operating switch to Operating. Set the spread width and spread density controls to minimum and the road speed to the required minimum. Using the trimming potentiometer \( P_3 \), adjust the spread density to the required minimum.
7. Set the controls for spread width and spread density to maximum and the road speed to the required maximum. Using the trimming potentiometer \( P_2 \), adjust the spread density to the required maximum.
8. Repeat steps 6 and 7 until the required accuracy is achieved.
9. Set the Test/Operating switch to Test. Using the trimming potentiometer \( P_4 \), set the test speed to the desired value. The road speed simulation voltage can be checked across the middle pin of potentiometer \( P_4 \) and terminal 20 (Ground).

The potentiometers that are sealed with colour spots are pre-set in the factory.
4 Connection diagram

ELMP 150-01G24 / 01
Id-Nr.: 015147

max. 10 A

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

- Solenoid- for Spinner
  max. 2,5 A

- Solenoid-Auger/belt
  max. 2,5 A

- Microphone for spread monitoring
  max. 10 mA

Sensor Speed
8 Impulses / Metre

- Microphone for microphone only
  max. 3A

- Beacon
  max. 3A

- Wet salt
  max. 3A

- Right
  max. 3A

- Left
  max. 3A

- Work light
  max. 3A

- Power supply
- Main screening

max. 3A

max. 3A
By removing the high-mounted resistance R49, the input impedance of the digital frequency input can be increased to 10 kΩ.

### ELMP150-01G24/01

<table>
<thead>
<tr>
<th>J1 1-2</th>
<th>J1 3-4</th>
<th>Frequency input</th>
</tr>
</thead>
<tbody>
<tr>
<td>x</td>
<td>x</td>
<td>25 - 60 Hz</td>
</tr>
<tr>
<td>x</td>
<td>-</td>
<td>60 - 90 Hz</td>
</tr>
<tr>
<td>-</td>
<td>x</td>
<td>bis 250 Hz</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>bis 1100 Hz</td>
</tr>
</tbody>
</table>

### ELMP150-01G24/02

<table>
<thead>
<tr>
<th>J1 1-2</th>
<th>J1 3-4</th>
<th>Frequency input</th>
</tr>
</thead>
<tbody>
<tr>
<td>x</td>
<td>x</td>
<td>150 - 250 Hz</td>
</tr>
<tr>
<td>x</td>
<td>-</td>
<td>250 - 450 Hz</td>
</tr>
<tr>
<td>-</td>
<td>x</td>
<td>bis 1000 Hz</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>bis 2200 Hz</td>
</tr>
</tbody>
</table>

### Road signal

- **without R54**: low < 5V high > 7,5V
- **with J3**: low < 3V high > 5V
- **without J3**: low < 5V high > 7,5V

### Max./Blast-Function

- Spinner and auger/belt max.
- Auger/belt only max.

### Supply

- 24V
- 12V

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**Characteristic curve auger/belt „JP3“**

- **Split**: V=60Km/h Breite: 10m

**Panel illumination** when main switch on

**LED-Error**

**Microphone + unload**

**On - Off**

**Spin**

**Auger/belt**

**Supply**

**X1** = Diagnostic plug

1. Spinner
2. Ub = 9V
3. Uref = 4V
4. Speed 0 kmh
5. Auger/belt
6. Ground
7. 3,9V
8. Signal speed
6 Ordering code

Electronic product
Unit with housing = L
Controller = MP
Type
Model
Power supply DC, 12V or 24V (jumper-selectable)

Variants / special features
with frequency input as speed signal (600 Hz to 1500 Hz maximum frequency) (Option) = 02
with frequency input as speed signal (80 Hz to 200 Hz maximum frequency) (Standard) = 01

other special features - please give full description when ordering

7 Accessories

For Road speed, either a impulse-generator or a proximity switch (NPN or Namur) can be supplied for measuring the travel speed. Connector plugs, type GDM 309, can be use to connect to the solenoids. In the event of proportional valve malfunc-tions that are caused by long power leads, use connector plugs type GDM 209D.

<table>
<thead>
<tr>
<th>Description</th>
<th>Ordering No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solenoid plug GDM 309</td>
<td>100064970</td>
</tr>
<tr>
<td>Solenoid plug GDM 209D</td>
<td>100014130</td>
</tr>
<tr>
<td>Angular momentum sensor DIG 360</td>
<td>100016803</td>
</tr>
<tr>
<td>Proximity switch BiS-P18-YOX</td>
<td>100014642</td>
</tr>
<tr>
<td>Socket outlet application</td>
<td>100217331</td>
</tr>
<tr>
<td>Socket shell PG 16 straight</td>
<td>100209521</td>
</tr>
<tr>
<td>Socket shell PG 16 lateral</td>
<td>100607668</td>
</tr>
<tr>
<td>Socket shell PG 21 staight</td>
<td>100607419</td>
</tr>
<tr>
<td>Plastic- protective cover for socket shells</td>
<td>100607750</td>
</tr>
<tr>
<td>Plastic-protective cover for mounting case</td>
<td>100607751</td>
</tr>
</tbody>
</table>

For a description of these accessories, see data sheet P70010, “Electronic Accessories”.

8 Special models

The controller can be supplied with a different front plate. This can feature other scale divisions and/or a company logo or can be in a different language.
9 Fault finding

9.1 Fault finding - Spinner

- **No Spinner function**
- **Are LEDs 3 & 4 lit**?
  - yes
  - no

- **Does supply voltage exist at terminals 17/18 (+ve) and 19/20 (-ve)**?
  - yes
  - no
  
  - **Check power supply cable for breaks short circuits, etc.**
  - **10 A semi-delay fuse OK?**
    - yes
    - no
      
      - **Electronics defective**
      - **Check hydraulic system**

- **Switch Unload OFF**

- **Using the spread width control, is current adjustable in the range:**
  - app. 0.7 ... 1.6 A (for 12V coil)
  - app. 0.3 ... 0.8 A (for 24V coil)
  - yes
  - no
  
  - **current always max.**

- **Check coil lead and coil for short circuit. Does short circuit exist?**
  - yes
  - no
    
    - **Cure the short cct.**

- **Disconnect coil. Voltage at terminals 1 & 2 now?**
  - yes
  - no
    
    - **Coil lead is broken or coil is defective**
    - **Short circuit in coil lead or coil**

- **Check output voltage to coil (terminals 1 & 2). app. 24V (or 12V)?**
  - yes
  - no
    
    - **Fit new fuse**

- **Does supply voltage exist at terminals 17/18 (+ve) and 19/20 (-ve)?**
  - yes
  - no
    
    - **Check power supply cable for breaks short circuits, etc.**
9.2 Fault finding - Auger/belt

No Auger/belt function

Are LEDs 1, 2 & 4 lit?
no LED 4 only yes

No speed signal is being received

Switch Unload ON

Using P9, is current adjustable in the range:
app. 0.7 ... 1.8 A (for 12 V coil)
app. 0.3 ... 0.9 A (for 24 V coil)
yes no current current always max.

Check hydraulic system

Check output voltage to coil (terminals 3 & 4),
app. 24 V (or 12 V)?

Discoonect coil. Voltage at terms. 3 & 4?now?

Check coil lead and coil for short circuit.
Does short circuit exist?

Coil lead is broken or coil is defective

Electronics defective
Cure the short cct

Short circuit in pulse gen. or pulse gen. lead

Disconnect pulse generator from terminal 7. Is 9V ref. voltage available across terminals 7-to-6 now?

Check power supply cable for breaks, short circuits, etc

Does supply voltage exist at terminals 17/18 (+ve) and 19/20 (-ve)?

no yes

10 A semi-delay fuse OK?

Fit new fuse

Is 9 V ref. voltage available across terminals 7-to-6 ?

no yes

Disconnect pulse generator from terminal 7. Is 9V ref. voltage available across terminals 7-to-6 now?