Smart encoders & actuators

User's guide

DWP Series

Miniature potentiometer draw-wire encoder

- **Potentiometer draw-wire encoder**
- **Robust and compact design**
- **2 meter measuring length**
- **4-20 mA or 0-10 V outputs**

Suitable for the following models:

- DWP-2M-4A-RL2
- DWP-2M-0V-RL2

General Contents

Table of contents

Typographic and iconographic conventions

	This icon, followed by the word **WARNING**, is meant to highlight the parts of the text where information of great significance for the user can be found: user must pay the greatest attention to them! Instructions must be followed strictly in order to guarantee the safety of the user and a correct use of the device. Failure to heed a warning or comply with instructions could lead to personal injury and/or damage to the unit or other equipment.

Preliminary information

This guide is designed to provide the most complete and exhaustive information the operator needs to correctly and safely install and operate the **DWP potentiometer draw-wire encoders**.
The DWP cable-pulling encoder is aimed at speed and position measurements and controls in a variety of industrial applications through the movement of a **2,000 mm (78.74")** stainless steel wire. The typical back and forth travel of the moving equipment causes the wire to reel and unreel and thus the linear movement to be converted into a rotative motion detected by the encoder which is coupled to the drum.

The DWP potentiometer based encoder provides the following output signals:

- DWP-2M-4A-RL2 = 4-20mA current output
- DWP-2M-0V-RL2 = 0-10V voltage output

1 Safety summary

1.1 Safety

- Always adhere to the professional safety and accident prevention regulations applicable to your country during device installation and operation;
- installation and maintenance operations have to be carried out by qualified personnel only, with power supply disconnected and stationary mechanical parts;
- device must be used only for the purpose appropriate to its design: use for purposes other than those for which it has been designed could result in serious personal and/or the environment damage;
- high current, voltage and moving mechanical parts can cause serious or fatal injury;
- warning ! Do not use in explosive or flammable areas;
- failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the equipment;
- Lika Electronic assumes no liability for the customer's failure to comply with these requirements.

1.2 Electrical safety

- Turn OFF the power supply before connecting the device;
- connect according to the explanation in the ”Electrical connection” section on page 11;
- the wires of unused output signals must be cut at different lengths and insulated singularly;
- in compliance with 2014/30/EU norm on electromagnetic compatibility, following precautions must be taken:
  - before handling and installing the equipment, discharge electrical charge from your body and tools which may come in touch with the device;
  - power supply must be stabilized without noise; install EMC filters on device power supply if needed;
  - always use shielded cables (twisted pair cables whenever possible);
  - avoid cables runs longer than necessary;
  - avoid running the signal cable near high voltage power cables;
  - mount the device as far as possible from any capacitive or inductive noise source; shield the device from noise source if needed;

- to guarantee a correct working of the device, avoid using strong magnets on or near by the unit;

- Minimize noise by connecting the shield and the frame to ground. Make sure that ground is not affected by noise. Ground the encoder cable shield at the cable end. If this is not sufficient, the ground can also be attached at the encoder side, but there is the risk of increasing conducted EMI by creating a ground loop. The best solution to minimize the interference will be unique to each installation and must ultimately be determined by the user.

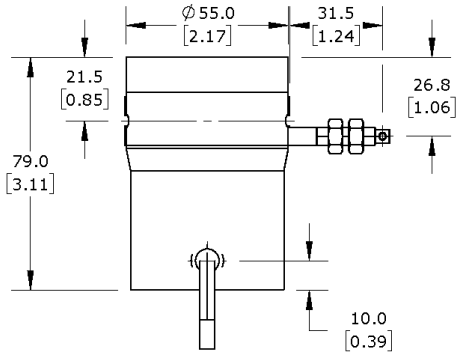
1.3 Mechanical safety

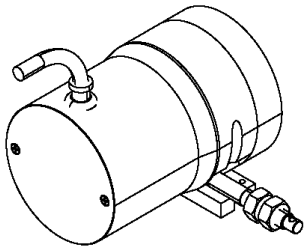
- Install the device following strictly the information in the "Mechanical installation" section on page 7;
- mechanical installation has to be carried out with stationary mechanical parts;
- do not disassemble the unit;
- do not tool the unit;
- delicate electronic equipment: handle with care; do not subject the device to knocks or shocks;
- respect the environmental characteristics of the product;
- we suggest installing the unit providing protection means against waste, especially swarf as turnings, chips, or filings; should this not be possible, please make sure that adequate cleaning measures are in place in order to prevent the wire from jamming;
- to avoid failures, never exceed the maximum measuring length and prevent the wire from tangling up;
- never release the wire freely, always help the wire wind properly: risk of personal injury and/or equipment damage;
- always keep the wire aligned not to damage the equipment;
- do not lubricate the wire;
- the feed out per turn of the draw-wire unit is 100 mm (3.937").

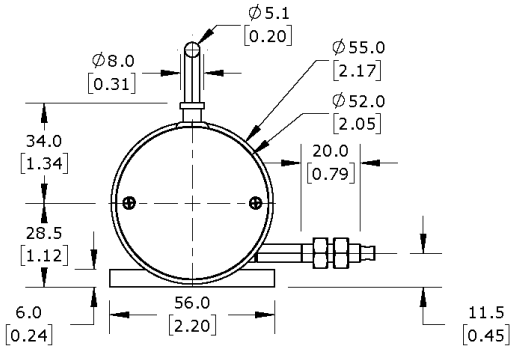
2 Mechanical installation

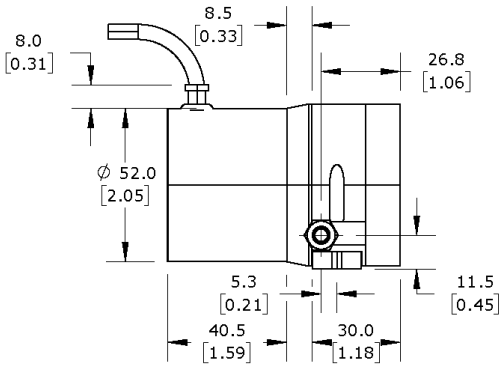
WARNING
Installation has to be carried out by qualified personnel only, with power supply disconnected and mechanical parts completely stopped.

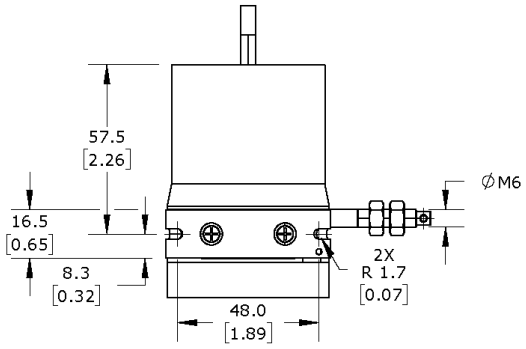
2.1 Overall dimensions





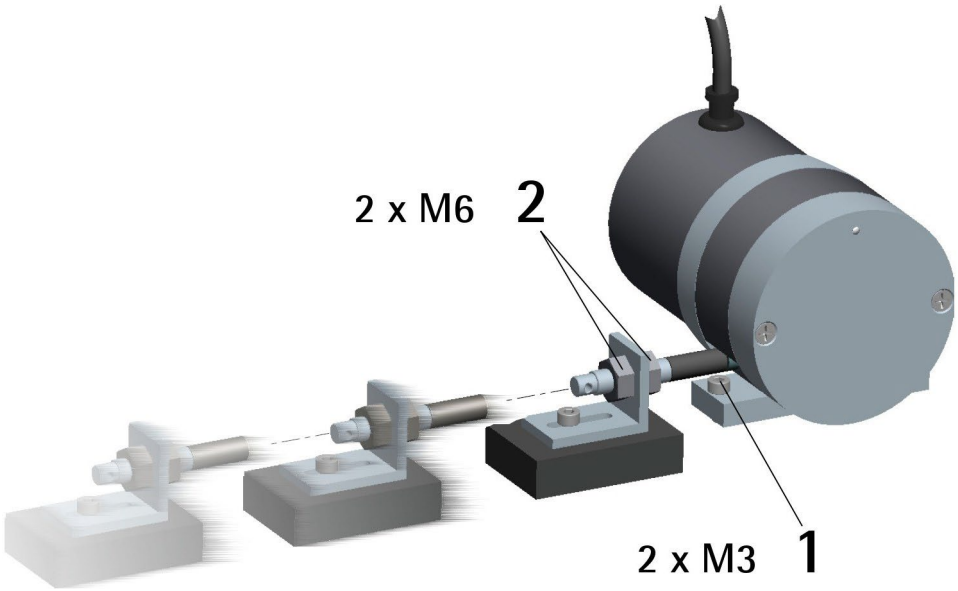






Values are expressed in mm

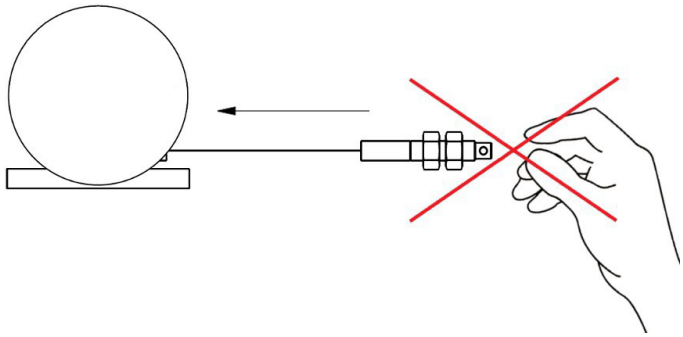
2.2 Mounting instructions



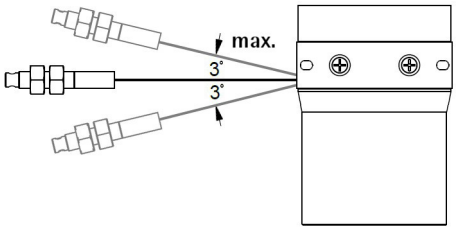
- Fasten the draw-wire unit onto a fixed support using **two M3 screws 1**;
- remove the transport safety wire that pins the end of the measuring wire;
- fix the end of the measuring wire to the moving element using the provided **M6 nuts 2**.

WARNING
We suggest installing the unit providing protection means against waste, especially swarf as turnings, chips, or filings; should this not be possible, please make sure that adequate cleaning measures are in place in order to prevent the wire from jamming.
To avoid irreparable failures, never exceed the maximum measuring length and prevent the wire from tangling up.

Never release the wire freely, always help the wire wind properly: risk of personal injury and/or equipment damage.



Always keep the wire aligned not to damage the equipment (maximum deviation: 3°).



2.3 Maintenance

The measuring system does not need any particular maintenance; but it should be handled with care like any delicate electronic equipment. From time to time we recommend the following operations:

- the unit and the wire have to be cleaned regularly using a soft and clean cloth to remove dust, chips, moisture etc.; do not use oil to clean the wire.

3 Electrical connection

WARNING
Electrical connection must be carried out by qualified personnel only, with power supply disconnected and mechanical parts completely stopped.

WARNING
If wires of unused signals come in contact, irreparable damage could be caused to the device. Thus they must be cut at different lengths and insulated singularly.

3.1 Analog versions connection

Function		Cable
DWP-2M-0V-RL2	**DWP-2M-4A-RL2**	
+10Vdc +30Vdc	**+15Vdc +30Vdc**	Red
n.c.	**0Vdc**	Black
Iout	**Vout**	Green
Shielding		Shield

n.c. = not connected

3.2 Cable specifications

Model:	LIKA encoder cable
Cross section:	3 x 0.22 mm^2 (24 AWG)
Jacket:	PVC, oil and flame resistant
Shield:	Tinned copper braid, coverage 65%
Outer diameter:	4.0 mm ± 0.15 mm / 0.157" ± 0.006"
Min. bend radius:	Outer diameter x 10, static application Outer diameter x 15, dynamic application
Work temperature:	-20°C +80°C / -4°F +176°F, static application -5°C +70°C / +23°F +158°F, dynamic application, not for continuous use

3.3 Ground connection

Minimize noise by connecting the shield and the frame to ground. Make sure that ground is not affected by noise. Ground the encoder cable shield at the cable end. If this is not sufficient, the ground can also be attached at the encoder side, but there is the risk of increasing conducted EMI by creating a ground loop. The best solution to minimize the interference will be unique to each installation and must ultimately be determined by the user.

3.4 Output value

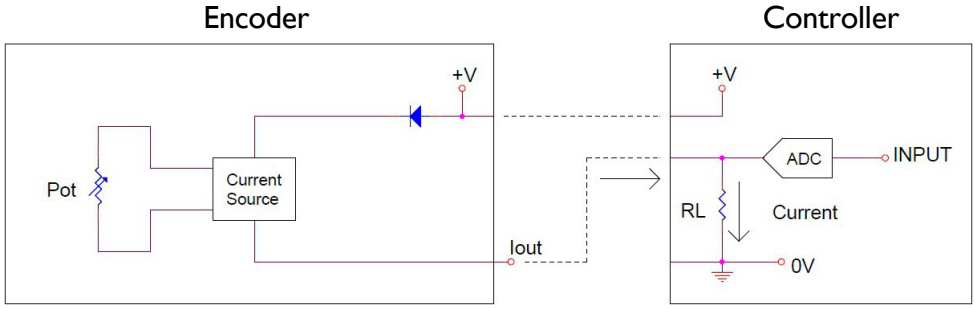
The analog output values increase when pulling out the cable.
For more information please refer also to the "Output signals" section on page 13.

4 Output signals

4.1 Analog signals

Current output (DWP-2M-4A-RL2) = 4-20 mA
0 position = 4mA max. position = 20mA

Recommended circuit



Voltage output (DWP-2M-0V-RL2) = 0-10 V
0 position = 0V max. position = 10V

Recommended circuit