

# Data Sheet for Panel Encoders

Optoelectronic Panel Encoder

Series MHU



- Valuable, compact handwheel
- Diameter knob 46 mm / housing 60 mm
- Installation depth only 10 mm
- Knob with metal inlet for a premium haptic
- 100 mechanical detents
- 5 V supply voltage
- Voltage output or linedriver
- Installation on the operation panel by means of 3 x M3 threaded bolts with union nuts
- Electrical connection via M3 screw terminals
- Also available as IP64 version

The high-quality handwheel MHU with mechanical detent has a rotary knob with built in metal inlet. Due to the high weight of the knob and the inertia of the mass whilst fast rotary movements an overtwist is ensured. This overtwist allows a quick change of values. Due to the low installation depth of only 10 mm and the choice between 4 different output electronics, a high compatibility to many applications is given.

Electrical Data	Voltage Outputs			Linedriver
	NPN (Standard)	NPN1 (Option: compatible to MELDAS specifications)	NPN2 (Option: compatible to FANUC specifications)	N (Standard)
Output signal	A, B			
Number of pulses	25, 100 ppr		25 ppr	25, 100 ppr
Output voltage high	VSUP -1 V		5 V ±10%	>2,5 V
Output voltage low	< 0,5 V			
Limit frequency	5 kHz			
Supply voltage	4.5..13.2 V	5 V ±10%	12 V ±10%	5 V ±5%
Power consumption (no load)	< 50 mA	< 70 mA	< 50 mA	< 100 mA
Output capacity	20 mA			
Insulation voltage 1.)	1 kV/AC, 1 min			
Insulation resistance 1.)	50 MOhm @ 500 VDC			
Output electronics	Voltage output			Linedriver
Switch-on delay	max. 1 µs		max. 1.5 µs	max. 200 ns

## Mechanical and Environmental Data, Miscellaneous

Mechanical angle of rotation /stroke 1.)	360° without stop
Number of detents per rev.	100 (@ 25 or 100 pulses per rev.)
Lifetime 2.)	> 1 mio. shaft revolutions
Bearing	Sleeve bearing
Starting torque / Detent torque	3.9 ±1 Ncm
Operating temperature range	-10..+60 °C
Storage temperature range	-20..+70 °C
Protection grade front side (IEC 60529) Standard	IP64
Vibration (IEC 68-2-6, Test Fc)	10-55 Hz; 1.5 mm 2h each direction
Shock (IEC 68-2-27, Test Ea)	50 g (11 ms, halvesine)

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## Mechanical and Environmental Data, Miscellaneous

Housing diameter / length	60 mm
Housing depth	9.7 mm
Knob diameter	46 mm (scale 58 mm)
Max. radial load	< 19.6 N
Max. axial load	< 9.8 N
Connection type	Screw terminals
Connection position	Axial
Mass	app. 200 g
Fastening parts included in delivery	None
Material shaft	Stainless steel
Material housing	Polybutylenterephthalat (PBT)
Material disc	Glass
Immunity ESD, human body model (MIL-STD-883, Method 3015.8)	± 4 kV (Contact) ± 8 kV (Air)

1.) According IEC 60393

2.) Determined by climatic conditions according to IEC 68-1, para. 5.3.1 without load collectives

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## Order Code

Description	Selection: standard=black/bold, possible options=grey/cursive						
<b>Series</b>	<b>MHU</b>						
<b>Housing diameter:</b> <b>60 mm</b>	<b>60</b>						
<b>Resolution in pulses per revolution:</b> <i>Option 25 pulses (100 detents) per revolution</i> <b>100 pulses (100 detents) per revolution</b> (100 pulses per revolution are not available for NPN 1 electronic)			<i>25</i> <b>100</b>				
<b>Supply voltage:</b> <b>4.5..13.2 V</b> (Only in connection with NPN electronic) <b>5 V ±5%</b> (Only in connection with linedriver electronic N) <i>Option 12 V ±10 %</i> (Only in connection with 25 pulses per revolution and NPN1 electronic) <i>Option 5 V ±10 %</i> (Only in connection with NPN2 electronic)				<b>512</b> <b>5</b> <i>12</i>  <i>505</i>			
<b>Output signal: A+B</b>					<b>B</b>		
<b>Output electronics:</b> <b>Voltage output in connection with 512 supply voltage</b> (Output circuit: collector output in series circuit with diode and 2kOhm pull up resistor) <b>Linedriver</b> (only in connection with 5V ±5 % supply voltage) <i>Option (compatibility with MELDAS specifications):</i> <i>voltage output in combination with 12 V ±10 % electronic and 25 pulses per revolution</i> (Output circuit MHU: collector output in series circuit with diode and 2 kOhm pull up resistor and Z diode between collector and emitter) <i>Option (compatibility with FANUC specifications):</i> <i>voltage output in combination with 5 V ±10 % electronic and 25 pulses per revolution</i> (Output circuit MHU: collector output in series circuit with diode and 330 Ohm pull up resistor)						<b>NPN</b>  <b>N</b>  <i>NPN1</i>  <i>NPN2</i>	
<b>Protection grade:</b> <b>IP64</b>							<b>IP</b>
<b>Knob colour:</b> <b>Silver</b> <b>Black</b>							<b>Silber</b> <b>Schwarz</b>

## Order example MHU

### Requirement:

100 pulses per revolution, supply voltage 5 V ±5%, 2 channels, linedriver output electronics, without shaft sealing IP40, housing colour knob black

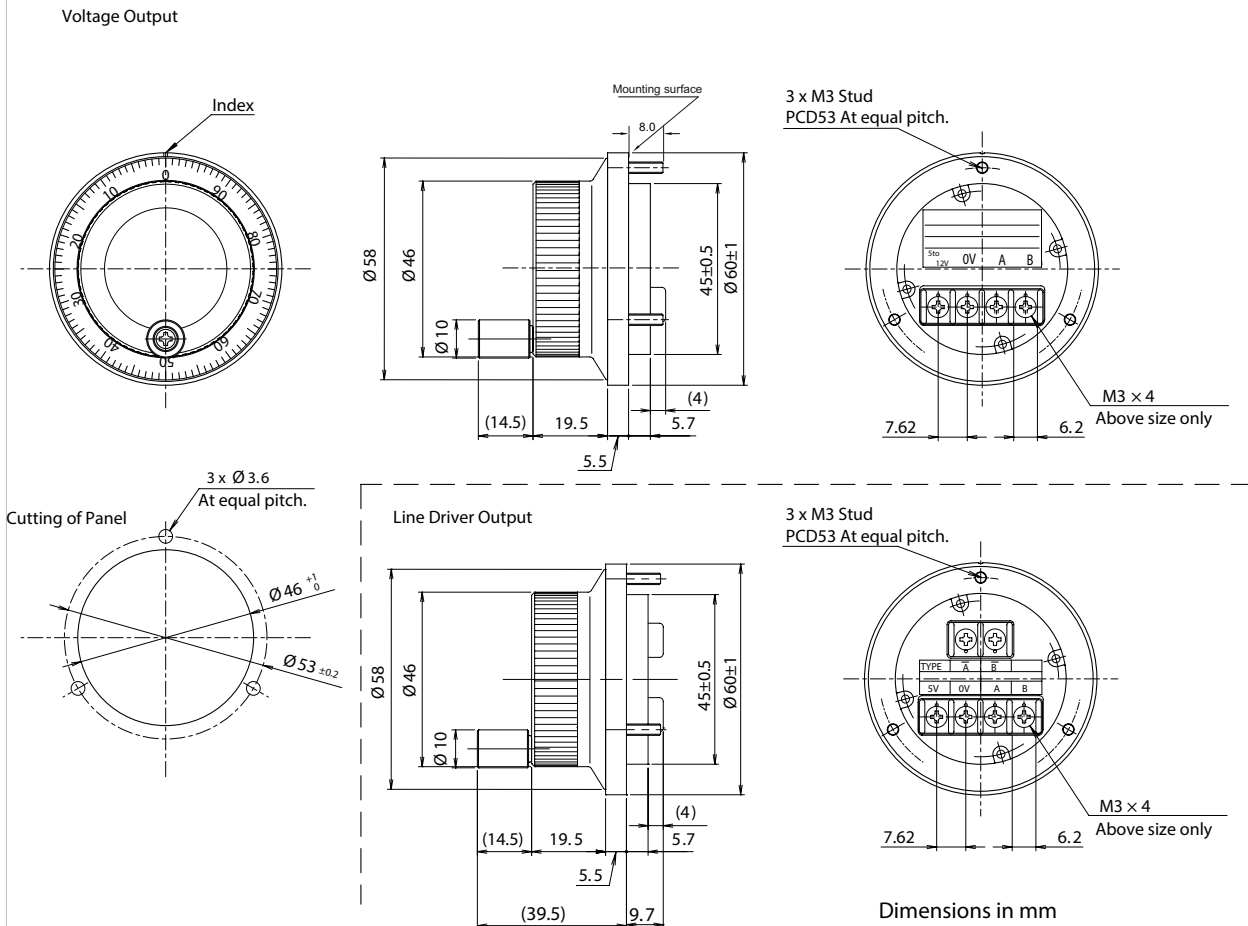
**Example for order coder:** MHU 100 5 B N IP Schwarz

## For higher quantities or on-going demand, additional options are available as described below

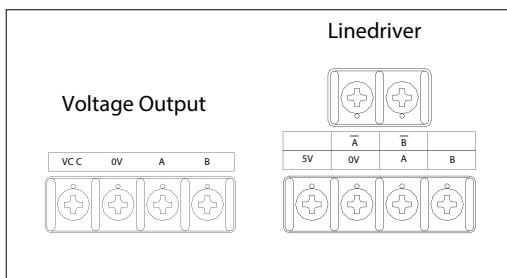
For example:

- Other resolutions
- Other amount of detents
- Customer specific detent torque

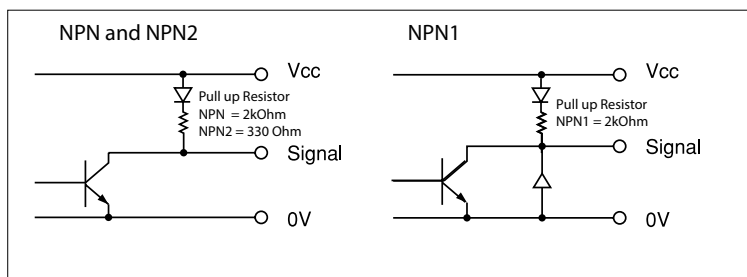
### Technical Drawing



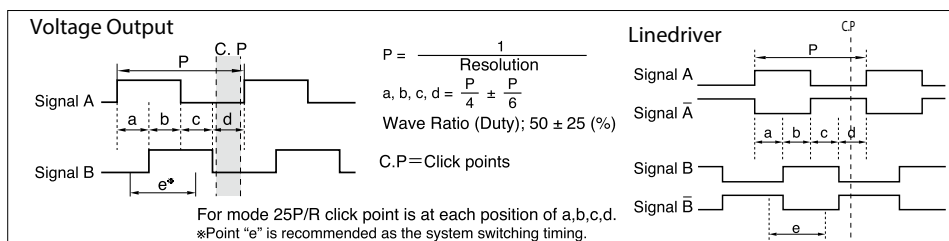
### Electrical Connections



### Output Circuit: Voltage Output



### Wave Form



### Output Circuit: Linedriver

