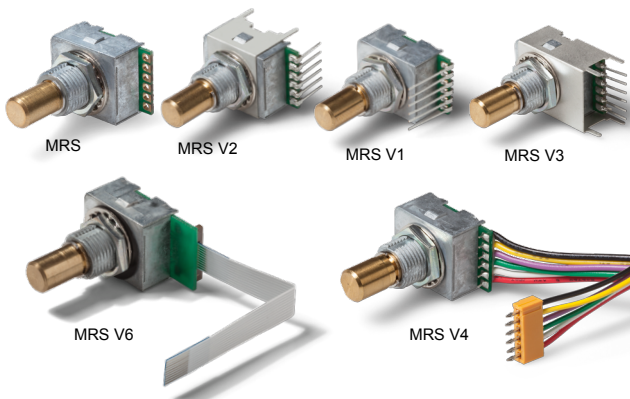


# Data Sheet for Panel Encoders

## Optoelectronic Panel Encoder

## Series MRS



- Compact design, ideal for small installation spaces
- Various electrical connection variants
- Resolution 4, 6 or 8 pulses per revolution
- IP protection grade from shaft side until IP65
- With our without detent, push button switch
- Supply voltage 5V or 3,3V

Thanks to the quality of MRS, the variety of variants and the compact housing dimensions - MRS is a perfect choice as panel encoder for low end applications.

The finely tuned selection of the components is the guarantee for a pleasant haptic, a long lifespan also in applications with increased environmental requirements.

### Electrical Data Sensor

Output signal	A, B	
Number of pulses	4, 6 or 8 pulses per rev. <small>Please note that the number of pulses does not correspond to the number of detents</small>	
Output voltage high	≥ (supply voltage - 0.5V)	
Output voltage low	≤ 0.5V	
Limit frequency	100 Hz	
Supply voltage	5 V ±5%	3,3 V ±4%
Power consumption (no load)	< 20 mA	< 40 mA
Insulation voltage 1.)	250 VAC, 1 min	
Insulation resistance 1.)	100 MOhm @ 250 VDC	
Output electronics	Open Collector (Pull-Up-Resistance ≥ 10kOhm)	
Switch-on delay	max. 2µs	

### Mechanical and Environmental Data Sensor

Mechanical angle of rotation /stroke 1.)	360° without stop
Number of detents per revolution	16 (4 pulses per revolution), 24 (6 pulses per revolution), 32 (8 pulses per revolution)
Lifespan 2.)	> 1 Mio. shaft revolutions
Bearing	Sleeve bearing
Operational torque / detent torque:	
Without detent	< 0.2 Ncm
With detent	0.4 ±0.2 Ncm
With detent with increased torque	1.1 ±0.5 Ncm
Operating temperature range	-10..+70 °C
Storage temperature range	-20..+80 °C
Protection grade shaft (IEC 60529)	IP40
With shaft sealing option D (only from shaft side)	IP65

# Data Sheet for Panel Encoders

Optoelectronic Panel Encoder

Series MRS

## Mechanical and Environmental Data Sensor

Housing diameter / length	15 x 16 mm
Housing depth	8,5 mm
Shaft diameter	6 mm (option 6,35mm)
Shaft type	Solid shaft
Max. radial load	< 10 N
Max. axial load	< 15 N
Connection type	Solder lugs, solder pin's, flat band cable with soldering aid (plug), foil flatband cable
Connection position	Radial
Sensor mounting	Bushing
Mass	app. 11 g
Fastening parts included in delivery	Hex nut (AF11), flat washer and tooth washer For option D with additional sealing ring
Fastening torque mounting nut	1 Ncm
Material shaft	Brass
Material housing	Zinc Alloy
Material disc	POM (Polyoxymethylene)

## Electrical Data Push Button Switch

Max. voltage push button switch	12 VDC
Max. current push button switch	50 mA
Resistance push button switch	< 200 mOhm
Insulation voltage 1.)	250 VAC, 1 min
Insulation resistance 1.)	100 MOhm @ 250 VDC

## Mechanical and Environmental Data Push Button Switch

Lifespan push button switch	> 1 Mio. operations
Travel of push button switch	0,5 ±0,3 mm
Operating temperature range	0..+60 °C
Storage temperature range	-20..+80 °C
Operational force of push button switch	4,5 ±1 N
Bounce time	max. 10 ms

1.) According IEC 60393

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

# Data Sheet for Panel Encoders

Optoelectronic Panel Encoder

Series MRS

## Order Code

Description		Selection: standard=black/bold, possible options=grey/cursive									
<b>Series</b>	<b>MRS</b>										
<b>Shaft:</b> Ø 6 x 17,5 mm Ø 6,35 x 17,5 mm <i>Option shaft length in mm</i> <i>Option shaft diameter in mm (≤6,35 mm)</i>	- <b>6,35</b> <i>Ax,xx</i> <i>DMx,xx</i>										
<b>Detent:</b> Standard with detent without push button switch <i>Option without detent</i>			<b>C</b> -								
<b>Push button switch:</b> Standard without push button switch Standard with push button switch					- <b>T</b>						
<b>Pulses per revolution:</b> Standard 8 pulses (32 detents) per revolution <i>Option 6 pulses (24 detents) per revolution</i> <i>Option 4 (16 detents) pulses per revolution</i>						<b>8</b> 6 4					
<b>Supply voltage:</b> Standard 5 V <i>Option 3,3 V</i>							<b>5</b> 3,3				
<b>Standard output signal: A+B</b>								<b>B</b>			
<b>Shaft sealing:</b> Standard without shaft sealing <i>Option D with shaft sealing</i>									- <i>D</i>		
<b>Electrical connection:</b> Standard with solder lugs Standard with contact pin's backside Contact with pin's in rectangular direction in dependence to the shaft <i>Contact pin's front side</i> <i>Option 100 mm flatband cable incl. solder aid (plug)</i> <i>Option FPC connector for foil flatband cable</i>										- <b>V2</b> <b>V3</b>  V1 V4 V6	
<b>Detent torque:</b> (only applicable if detent is chosen) Standard with detent torque 0,4 Ncm <i>Option detent with increased torque 1,1 Ncm</i>											- V5

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

For example:

- Other resolutions
- Other number of detents
- Customized detent torque
- Special shaft design
- Special cable and connection design

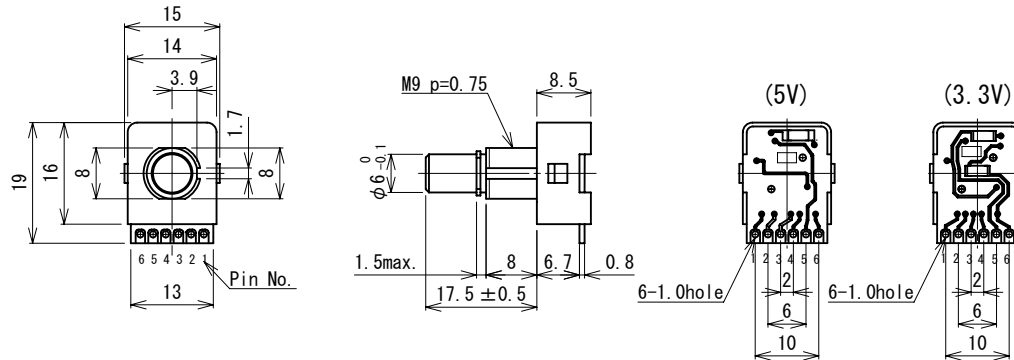
# Data Sheet for Panel Encoders

Optoelectronic Panel Encoder

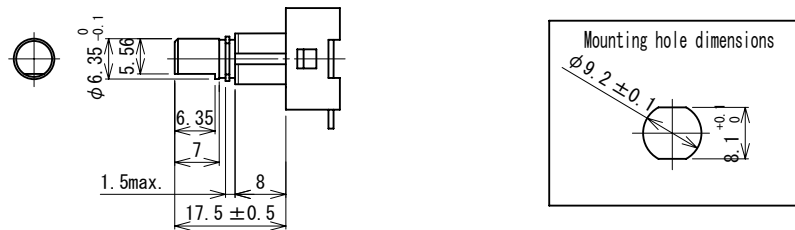
Series MRS

## Drawing

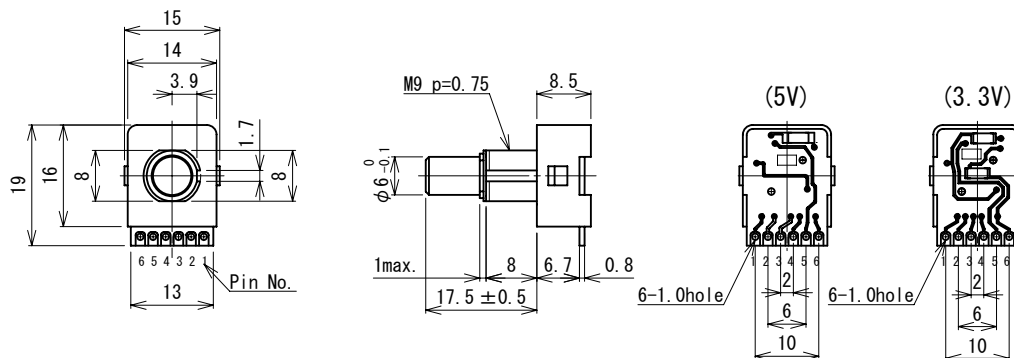
### ● With Push Switch



### ● $\phi 6.35$ mm shaft

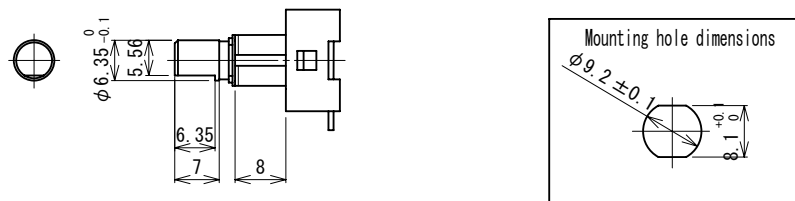


### ● Without Push Switch



### ● $\phi 6.35$ mm shaft

Pin Assignment	
1	GND
2	Push switch if present
3	Push switch if present
4	Signal B
5	Signal A
6	Supply voltage



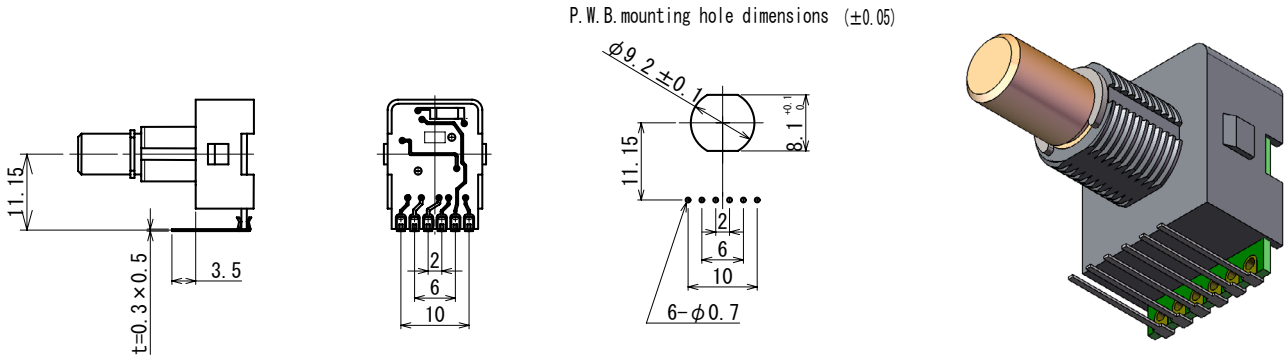
# Data Sheet for Panel Encoders

Optoelectronic Panel Encoder

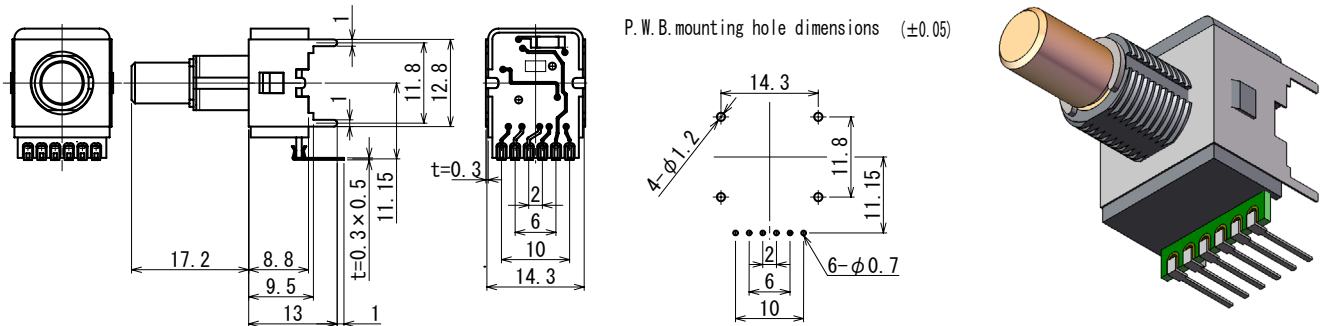
Series MRS

## Drawing

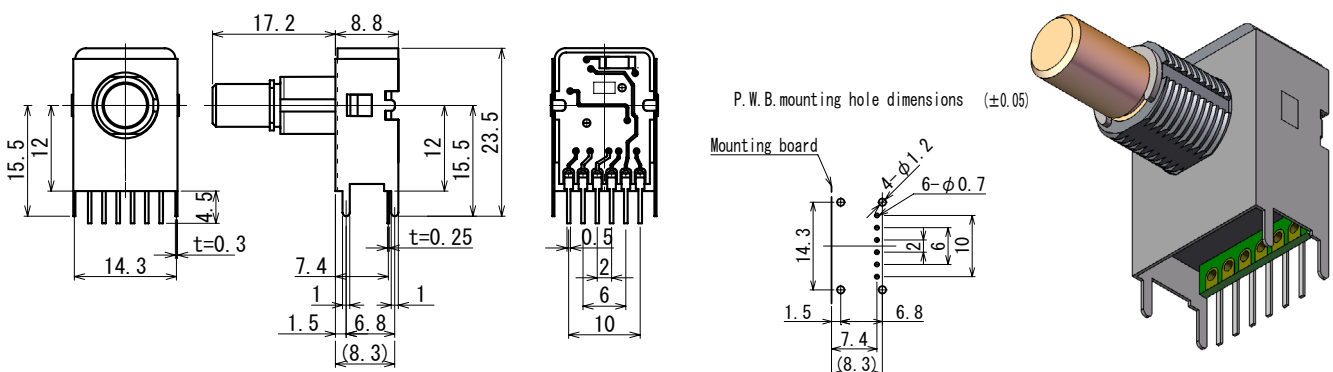
### Option V1:



### Option V2:



### Option V3:



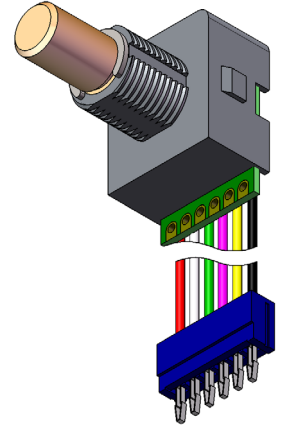
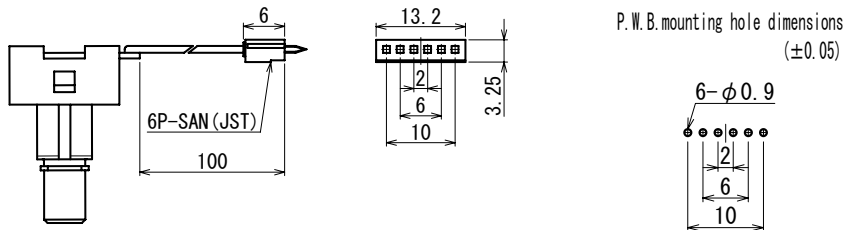
# Data Sheet for Panel Encoders

Optoelectronic Panel Encoder

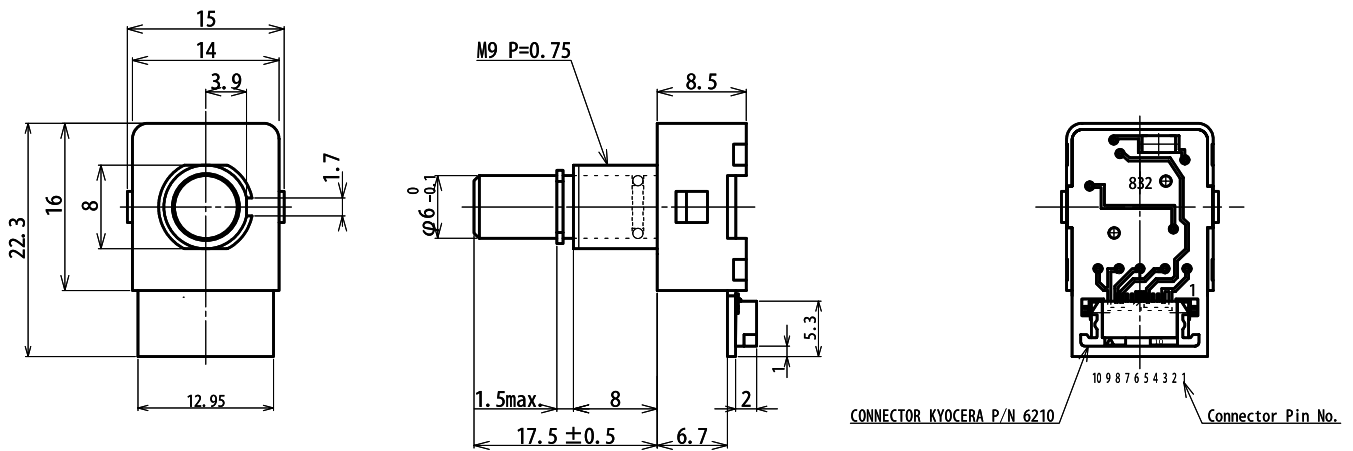
Series MRS

## Drawing

Option V4:



Option V6:

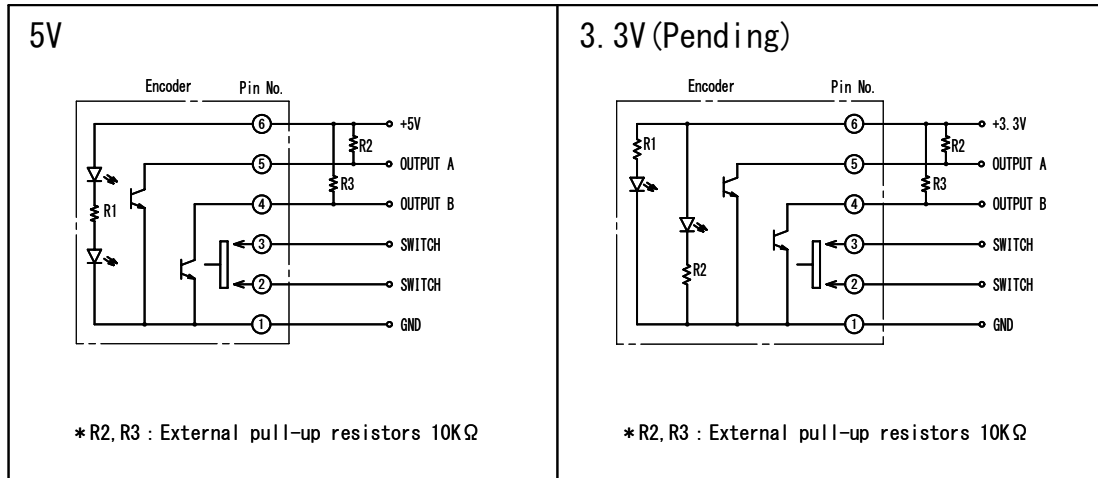


Dimensions in mm

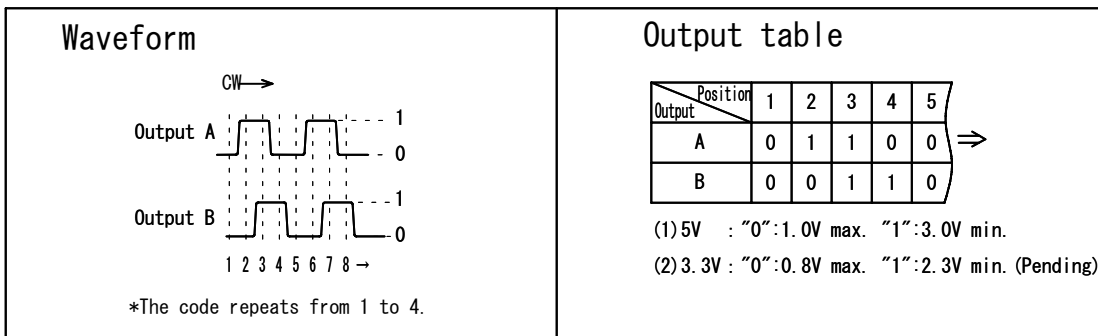
PIN ASSIGNMENT	
1	Supply Voltage
2	
3	
4	Channel A
5	Supply Voltage
6	GND
7	
8	
9	Channel B
10	Switch — Other switch contact connected with GND

Connected on PCB

### Circuit



### Waveform and output table



### How to mount the water proof washer

