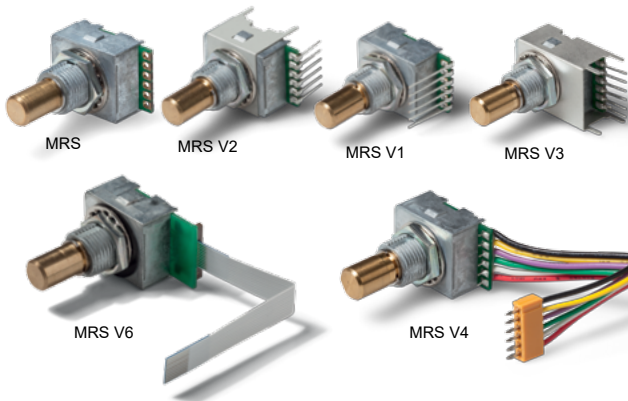


Optoelectronic Panel Encoder

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 or 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 numerous 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 <u>not</u> 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 °C up to +70 °C
Storage temperature range	-20 °C up to +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 °C up to +60 °C
Storage temperature range	-20 °C up to +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 <i>options=grey/italic</i>									
Series	MRS									
Shaft: 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>		- 6,35 <i>Ax,xx</i> <i>DMx,xx</i>								
Detent: With detent without push button switch <i>Option without detent</i>			C -							
Push button switch: Without push button switch With push button switch				- T						
Pulses per revolution: 8 pulses (32 detents) per revolution <i>Option 6 pulses (24 detents) per revolution</i> <i>Option 4 (16 detents) pulses per revolution</i>						8 6 4				
Supply voltage: 5 V <i>Option 3.3 V</i>							5 3,3			
Standard output signal: A+B								B		
Shaft sealing: Without shaft sealing <i>Option D with shaft sealing</i>									- <i>D</i>	
Electrical connection: Solder lugs Contact pins backside Contact pins perpendicular to the shaft <i>Option contact pins front side</i> <i>Option 100 mm flatband cable incl. solder aid (plug)</i> <i>Option FPC connector for foil flatband cable</i>										- V2 V3 V1 V4 V6
Detent torque (only applicable if detent is chosen): 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

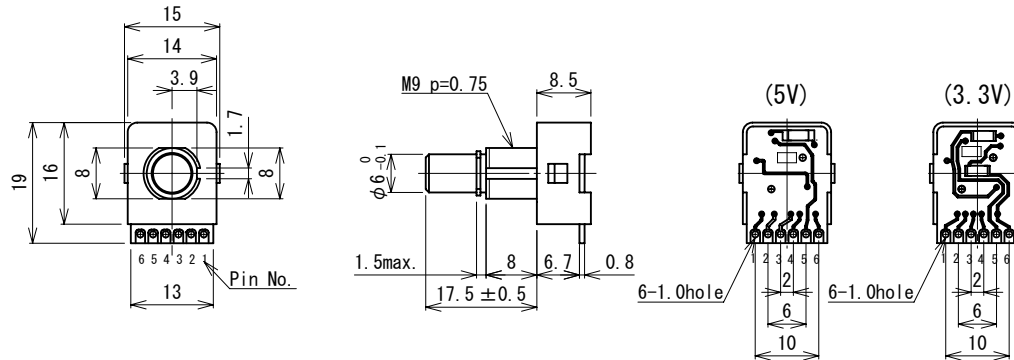
Data Sheet for Panel Encoders

Optoelectronic Panel Encoder

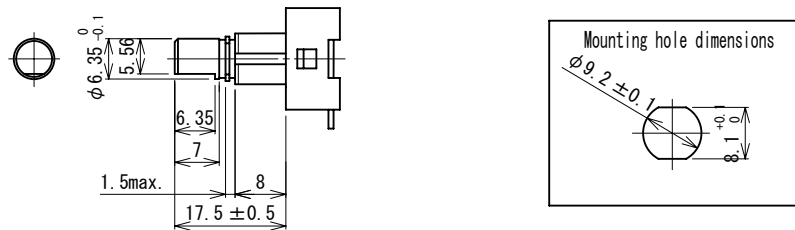
Series MRS

Drawing

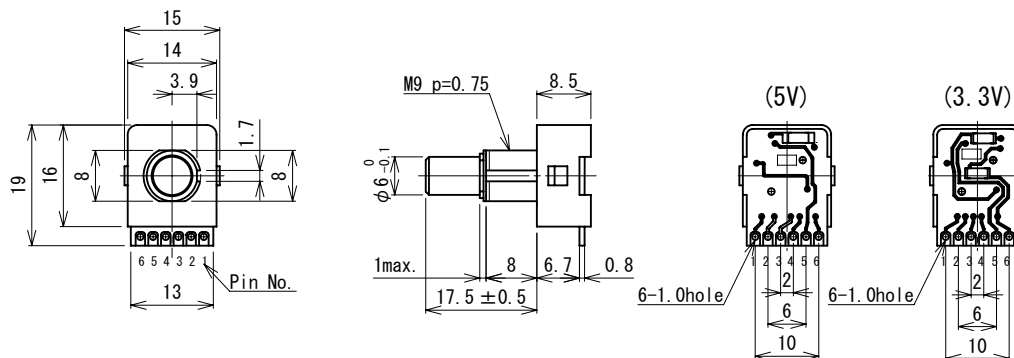
● With Push Switch



● $\phi 6.35\text{mm}$ shaft

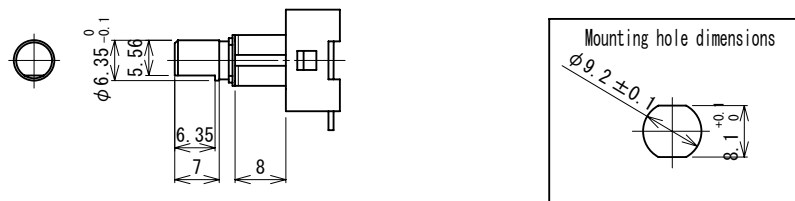


● Without Push Switch



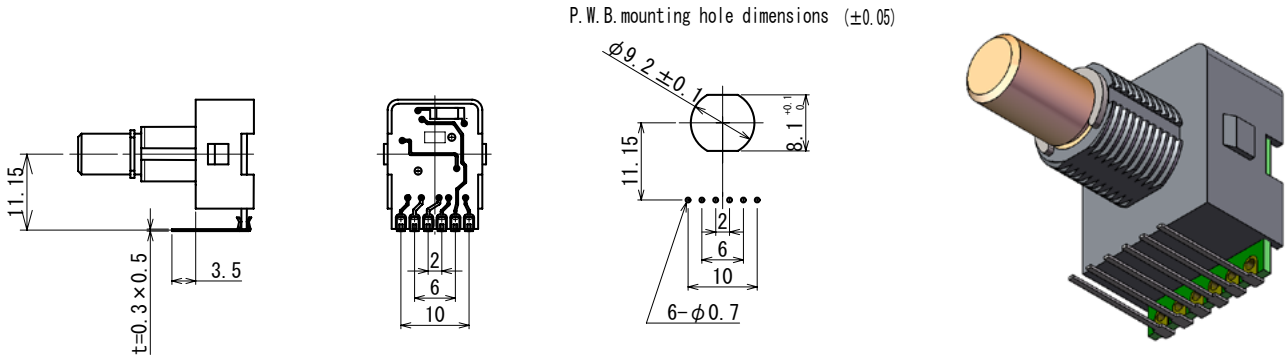
● $\phi 6.35\text{mm}$ shaft

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

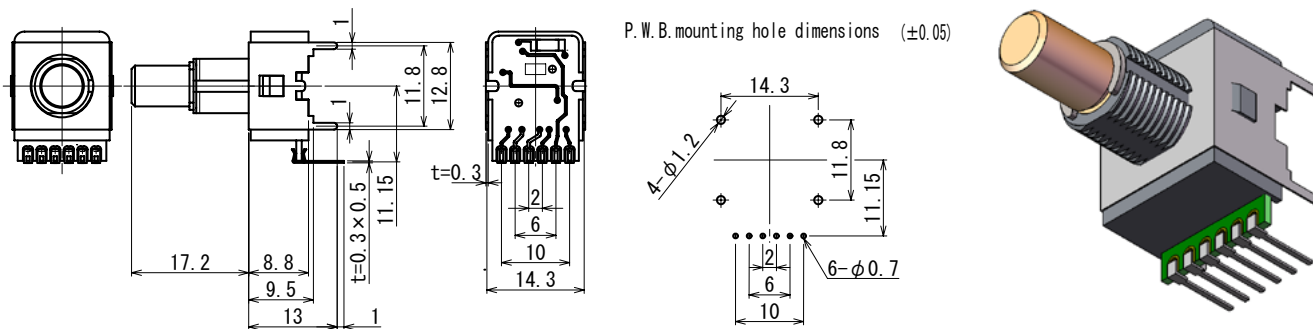


Drawing

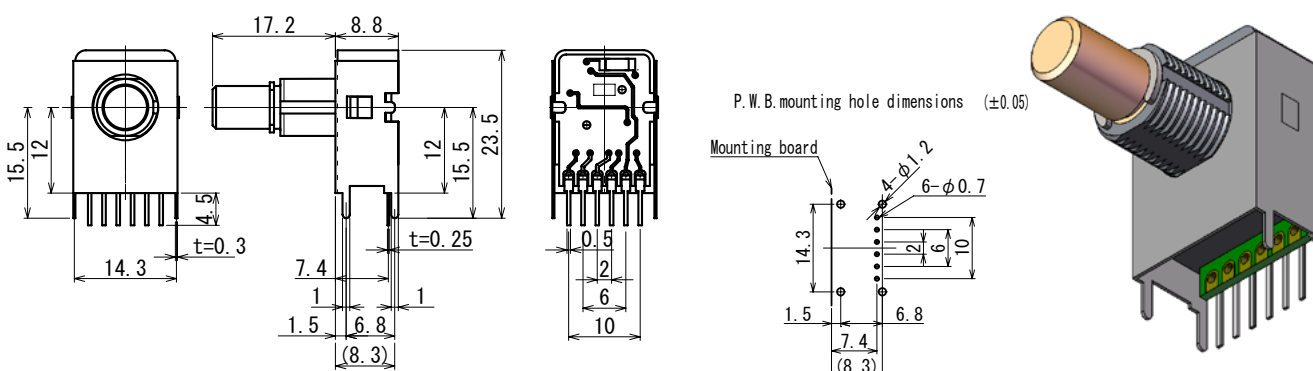
Option V1:



Option V2:



Option V3:



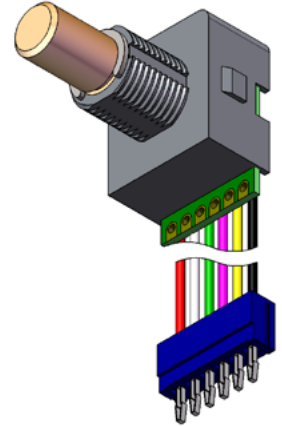
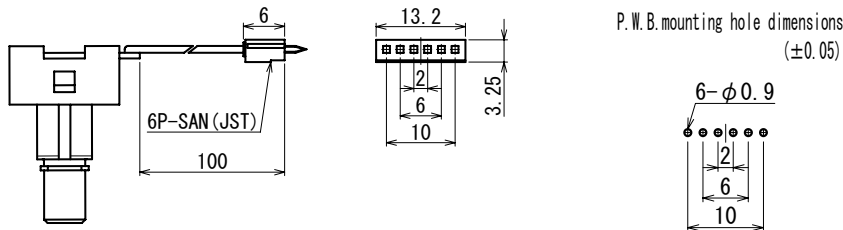
Data Sheet for Panel Encoders

Optoelectronic Panel Encoder

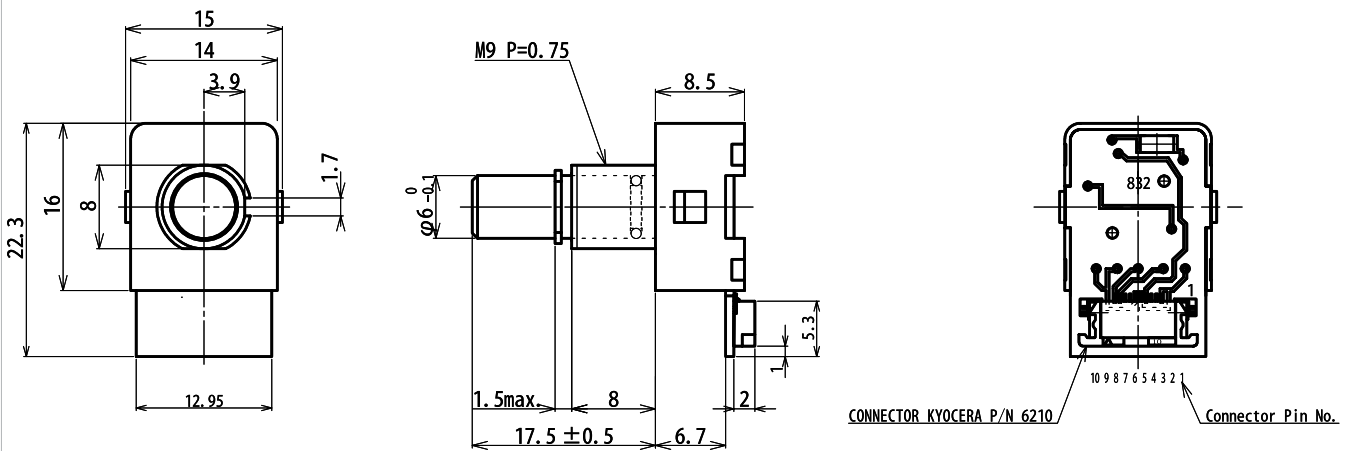
Series MRS

Drawing

Option V4:



Option V6:

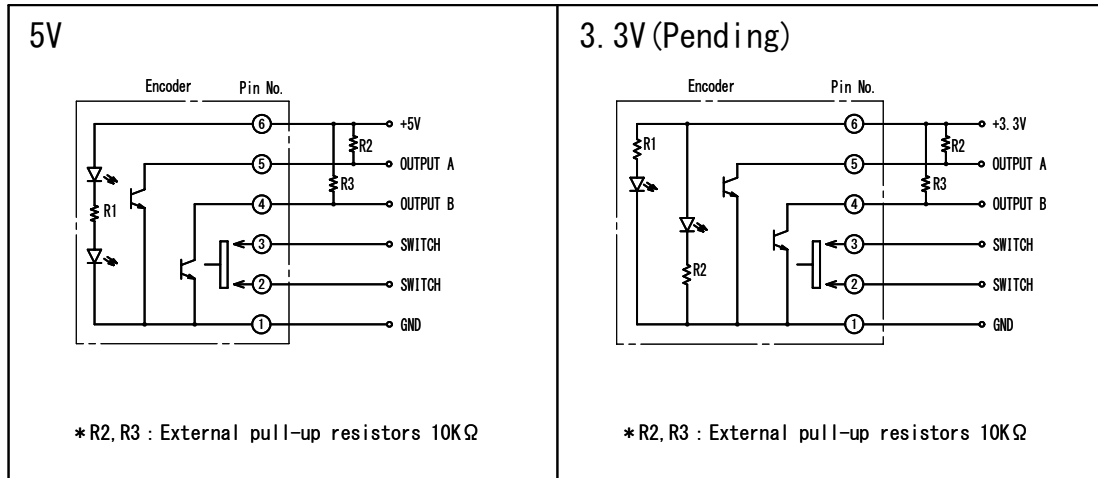


Dimensions in mm

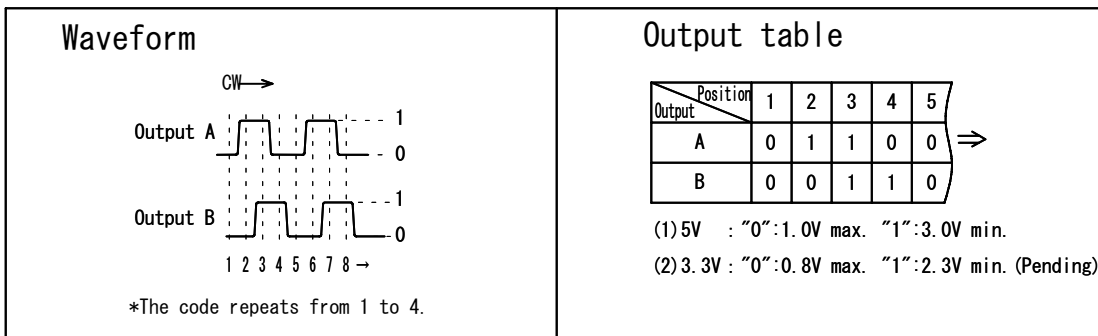
PIN ASSIGNMENT

- | | | |
|----|--|--------------------|
| 1 | Supply Voltage | } Connected on PCB |
| 2 | | |
| 3 | | |
| 4 | Channel A | |
| 5 | Supply Voltage | |
| 6 | GND | |
| 7 | | |
| 8 | | |
| 9 | Channel B | |
| 10 | Switch — Other switch contact connected with GND | |

Circuit



Waveform and output table



How to mount the water proof washer

